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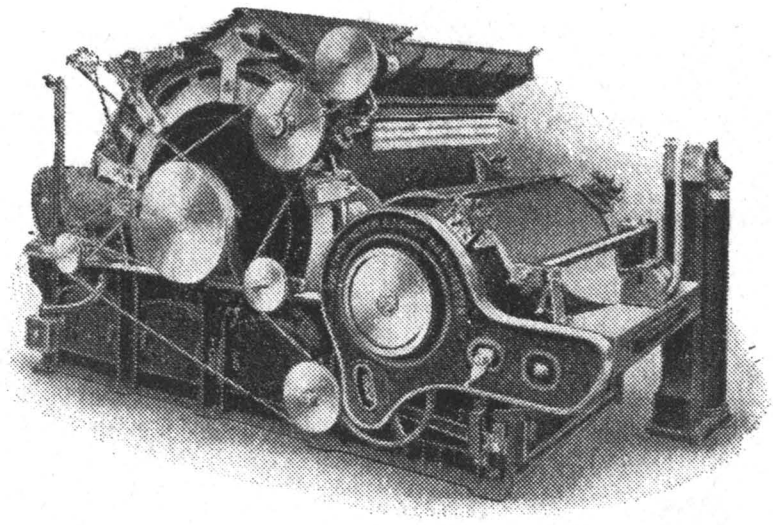

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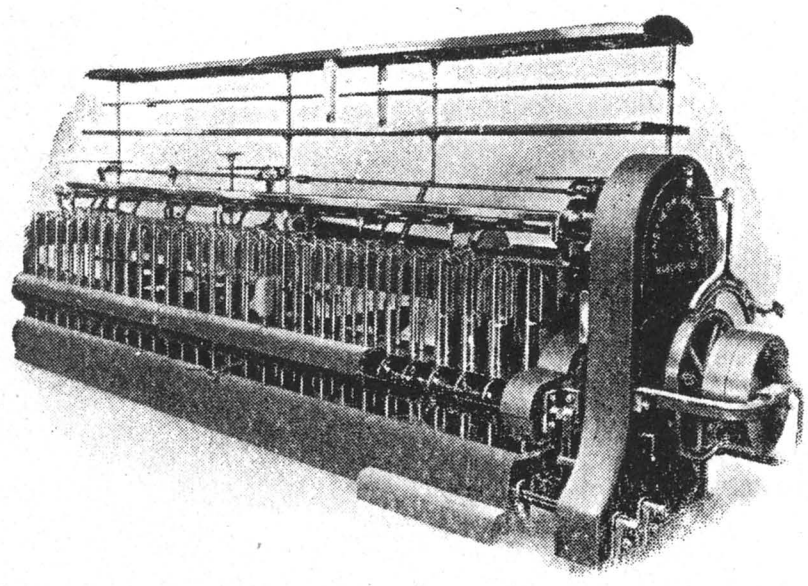

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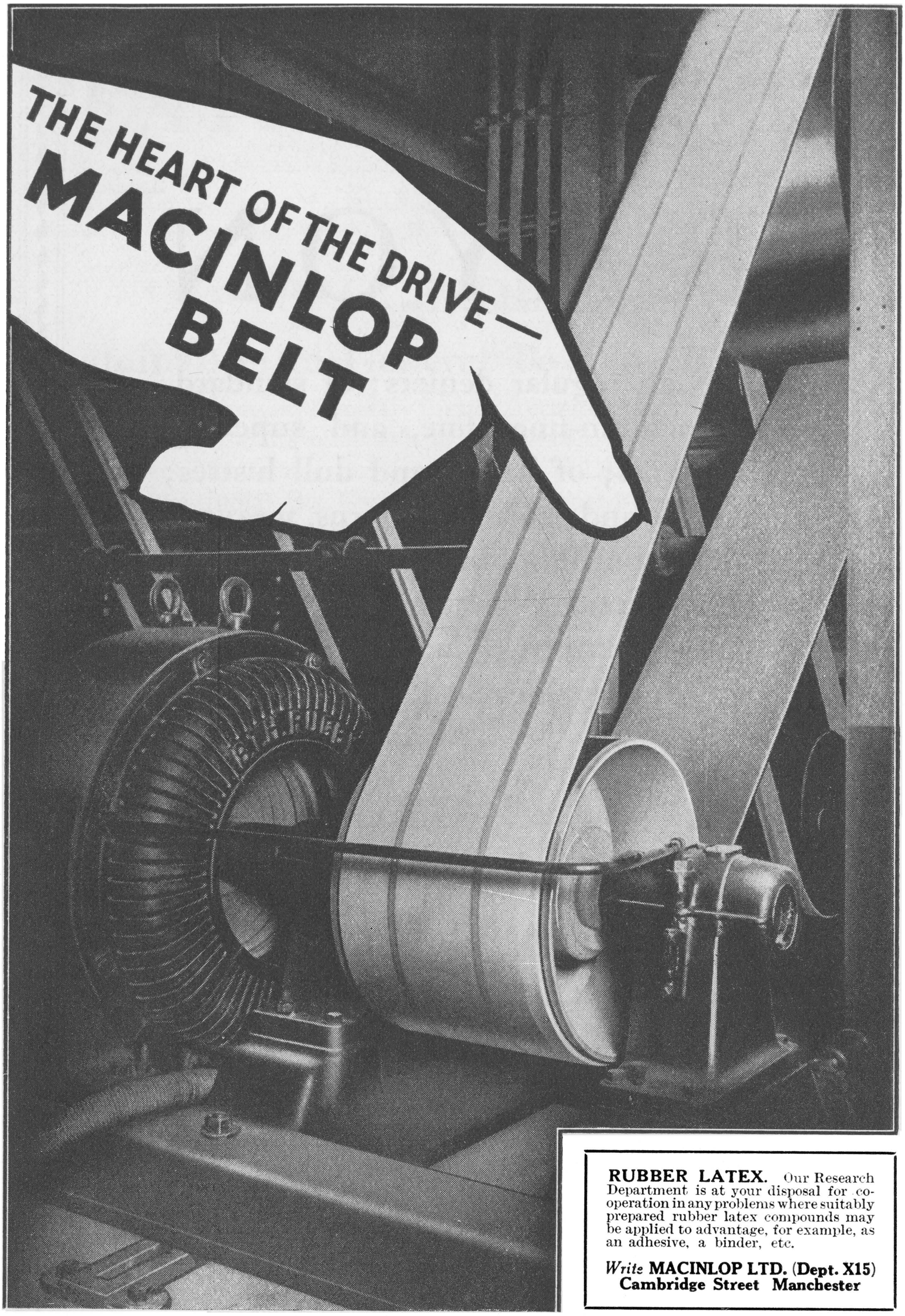

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THE JOURNAL OF THE
TEXTILE INSTITUTE

Vol. XXII DECEMBER 1931 No. 12

PROCEEDINGS

Examination in General Textile Technology

An examination in General Textile Technology in connection with applications for the Associateship of the Textile Institute took place at Headquarters, Manchester, and simultaneously in London, Glasgow, Nottingham, Bombay (India), Mt. Gambier (S. Australia), Buenos Ayres, and Sao Paulo (S. America). For the information of members and others interested, the examination paper, in two parts, is published hereunder—

PART 1 (SECTIONS I AND V OF SYLLABUS)

10 *a.m. to* 1 *p.m.—9th December* 1931

Candidates to answer THREE out of FOUR Questions in each Section of Part I

Section I—Fibres and their Production

(1) With reference to its physical properties, state why flax may be considered superior to cotton for the following purposes—Sheetings; aeroplane wing fabric; table napery; face towels; glass cloths.

(2) What is meant by the term "quality" as applied to wool, and how is it assessed ? Discuss quality in relation to length, diameter, and crimpiness of the fibres.

(3) Artificial humidification is not equally indispensable for the successful manipulation of all types of fibre. Discuss the relative sensitivities of the main textile fibres to humidity conditions, and state in each case where artificial humidification is necessary and why.

(4) Write a short essay on flax production in Europe, describing the general character of the fibre produced in the areas you mention.

Section V—Analysis and Testing of Raw Materials, Yarns, and Fabrics

(1) State what you understand by the following terms—Breaking strain; elasticity; extensibility; stress-strain diagram; moisture content.

(2) Suggest some method by which you could measure the angle of twist in a yarn.

(3) You are asked to examine a fully bleached cotton garment which shows excessive wear after repeated laundering. With a sample of the original material in your possession, how would you proceed to determine whether the laundering was responsible ?

(4) What are the factors which determine the manner in which the threads break down in the lea or skein test ? What precautions should be taken to make the latter as satisfactory a test as possible ?

PART 2 (SECTIONS II, III, AND IV OF SYLLABUS)

2.30 *p.m. to* 5.30 *p.m.—9th December* 1931

Candidates to answer TWO out of THREE Questions in each Section of PART 2

Section II—Conversion of Fibres into Finished Yarns

(1) Briefly describe the processes necessary to convert raw wool into (*a*) woollen yarn, (*b*) worsted yarn.

(2) What advantages have doubled yarns over single yarns ? Name the particular purposes for which doubled yarns may be used advantageously.

(3) Trace the evolution of the spinning frame and give a brief account of later developments, illustrating by reference to any particular fibre.

Section III—Conversion of Yarns into Fabrics, and Fabrics produced by Special Methods

(1) Under what circumstances is it advisable to use two or more warp beams in the process of weaving ? Give two examples of typical fabrics for which two or more beams are essential.

(2) Sketch and describe any one method employed in weaving machinery for controlling the interlacing of warp and weft threads.

(3) Define the following terms used in the knitting industry—Gauge, wale, course, merino, wheeling and fingering yarns, latch needle, spring or bearded needle.

Section IV—Conversion of Fabrics into Finished Materials

(1) What do you understand by the term "finishing" in relation to textile fabrics ? Describe any one method of finishing a fabric composed of either (*a*) silk, (*b*) wool, (*c*) cotton, (*d*) linen, or (*e*) artificial silk.

(2) Contrast the actions of caustic soda and sulphuric acid, each under varying conditions of concentration and temperature, on wool and cotton. Describe how the changes produced can be utilised industrially.

(3) What are the principal bleaching agents used for (*a*) cotton, (*b*) wool and (*c*) silk ? Describe the application of one of them to piece goods.

ANNUAL COMPETITIONS OF THE TEXTILE INSTITUTE
DESIGN AND STRUCTURE OF WOVEN FABRICS

The presentation of the prizes awarded in connection with the 1931 Competitions of the Institute was performed on Saturday, 5th December, at the Institute, Manchester, by Mr. Henry Binns of Bradford, Fellow, and Chairman of Council; an enthusiastic supporter of many movements associated with technical education in relation to the textile industries. Mr. Binns was introduced by Mr. John Crompton, Chairman of the Competitions Committee, who presided and welcomed the participants in the competitions and the representatives of various colleges and schools in attendance. He considered that the exhibits formed a highly satisfactory collection and he warmly congratulated the competitors generally. The task of the adjudicators had been difficult and in the principal competitions it was found impossible to separate the leading albums. Therefore, two equal first prizes and two equal third prizes were awarded. He was glad to note a growing tendency on the part of competitors to submit draping lengths of cloths and trusted that in future years this practice would be more generally adopted. It was far more satisfactory that lengths should be available for exhibition purposes.

Mr. Binns, who subsequently presented the prizes, said that after carefully examining the beautiful samples produced for the various competitions, three impressions were uppermost in his mind. Firstly, he felt great admiration for the designs and colours exhibited; secondly, he felt—the result of his experience as commercial traveller, no doubt—that he would like to be selling these fabrics; and thirdly, he was impressed by the effort put forth not only to produce the specimens, but in setting out their particulars and costings.

The Prince of Wales and Sir Francis Goodenough had repeatedly drawn attention to the needs of British industry in the matter of efficient salesmanship, both at home and abroad. He, the speaker, saw no reason for withholding from salesmanship the same careful consideration given to production. The same precision of measurement was not possible in both cases, but in salesmanship such precision was not, perhaps, necessary. In his opinion the general principles governing the exercise of judgment were already sufficiently clearly defined for commercial guidance.

Salesmanship did not admit of too much generalisation, and distinction must be made between the selling of electrical plant and of dress goods. Mr. Binns said he proposed to confine his remarks to the textile trade. In this industry, or collection of industries, certain groupings could be discerned.

Firstly, there were the Producers, concerned with processes from the raw material to the finished goods. In this field more and more accurate measurement was possible and a vast amount of special knowledge had been built up.

Secondly, there were the Retail Distributors and Consumers who sought to anticipate and supply the requirements of users of textile products. Consumers, in his opinion, developed judgment to some extent as a result of having money and as a result of experience in spending it.

Between these two groups was a less clearly defined group—Agents, Merchants, Garment-makers, and Wholesale Buyers. In this group occurred high development of what the speaker called "intuitional" judgment.

Broadly speaking, contact between producer and consumer is made by way of the commercial traveller to the retailer. He restricted the word "salesman" to individuals who sold commodities from one section to another within a group; the commercial traveller was the link between the main group of producers and the other main group of consumers. Thus the commercial traveller was

an intermediary between the technical knowledge and skill of the producer and the trained judgment of the retailer. The more he had in common with both groups the more efficient link he would be.

Mr. Binns then surveyed the chief functions of a commercial traveller. He must be able to retain old accounts and open new ones. He must sustain and create an emotional interest between his firm and their present and potential customers. This sounded perhaps simple, but in practice was often very difficult; to some individuals it was an impossible task. Correspondence and advertising, while valuable allies, could not supersede the individual contact.

Behind the representative's duty, said the speaker, was the firm's duty—that of supplying goods both smart in appearance and attractive in handle, and if to the superficial, intrinsic value can be added, competition can more successfully be met. With this duty was that of working upon courteous and efficient business methods.

Mr. Binns then stated that in his opinion the assumption that the technically-qualified man and the commercial traveller were distinct types and never combined in one individual, was erroneous. He thought that among the Associates of the Textile Institute a far-sighted firm might find ideal representatives in the commercial sphere. Such a qualified man, possessed of a good general education, of a general knowledge of textile technology, and of detailed knowledge of a specific section of the textile trade, and also some knowledge of applied science, could arouse interest in materials about which he was fully informed technically. Such well-qualified men, if put "on the Road" and given freedom, would no doubt enthusiastically add to their qualifications those others, such as languages, economics, and a knowledge of local customs, which it had been pointed out were sadly lacking in some of this country's overseas representatives.

He felt sure that the prestige of the British textile trade would increase in the world's markets in proportion as we were able to back our selling forces with intellect, knowledge, the power to sustain an emotional interest, and character.

On the motion of Mr. T. E. Mitchell (Rochdale), Chairman of the Lancashire Section of the Institute, seconded by Mr. H. Holroyd (Huddersfield), who attended as representing the Federation of Textile Societies, Mr. Binns and the Chairman (Mr. Crompton) were warmly thanked for their services. Visitors were afterwards entertained to tea, and inspection of the exhibits of fabrics and yarns proceeded until about 6 p.m.

In the evening, the exhibition was visited by members of the British Association of Managers of Textile Works, and an hour's entertainment was provided by Mr. Crompton, who, by means of the lantern and screen, showed a large collection of film records depicting scenery registered in the course of his recent world tour.

Mr. R. J. H. Beanland (Clayton West, Huddersfield), on behalf of the Council of the Institute, welcomed the Managers and their friends, and said he thought the visitors would agree that the exhibits resulting from the current year's competition were highly creditable and encouraging. The exhibits denoted real enthusiasm in relation to the branches of the industry with which the competitors were associated. Coming from Yorkshire, he was glad to find so good a proportion of the prizes were awarded to competitors in that county. Financial support for the Institute's Competitions had not yet been forthcoming from the wool interests, but he would like to assure Mr. Crompton that this matter was receiving earnest consideration. Indeed, he hoped that before another year passed this omission of support would be remedied.

Mr. Fletcher Chadwick, President of the Managers' Association, returned thanks for the cordial welcome and said the Managers greatly appreciated the opportunity afforded each year of demonstrating their interests in this particular branch of the activities of the Textile Institute which Mr. Crompton had so generously supported.

London Section

Meeting at the Clothworkers' Hall, Mincing Lane, E.C., on Tuesday, 10*th November* 1931; *Mr. G. M. Canham in the chair.*

RECENT DEVELOPMENTS IN THE STUDY OF WOOL FINISHING PROCESSES

The Chairman introducing the lecturer, Dr. J. B. Speakman of Leeds University, said he was sure the meeting welcomed Dr. Speakman and was anxious to hear his lecture.

Dr. Speakman said that he considered it a great privilege to speak to the London Section of the Textile Institute, and particularly was it a privilege to speak in the Hall of the Clothworkers' Company since the Company had behaved so generously to the Textile Department of the University to which he had the honour to belong.

Continuing, he said that his lecture would be an attempt to define the part played by the surface scale structure of the wool fibre in wool finishing processes. The scales were far more resistant to chemical and mechanical attack than the interior of the fibre, and for a fabric to possess the best wearing properties, it was essential that the scales should be preserved intact. It had recently been shown that wool was immune to attack by acid and alkali between *p*H 4 and *p*H 8, and for wool to remain undamaged during scouring, the operation must be carried out between these limits. The importance of this result became apparent when it was remembered that the maximum scouring efficiency of soap solutions was only realised at *p*H 10·7, while an 0·5% solution of soda had a *p*H of 11. It was possible to preserve wool intact through the scouring process by the adoption of suint scouring, the commercial scouring liquor being said to have a *p*H of about 7·7, within the stability region. Similarly, piece scouring could be made completely safe by the use of Igepon A, which dissolved in water to give a *p*H of about 6·5. Unfortunately, the milling process could only be carried out in relatively strongly acid or alkaline media and the full benefits of preserving the wool intact through the scouring processes would only be realised with worsteds.

The nature of milling shrinkage was next considered by the lecturer in detail because it was the most important of all wool finishing processes and because the ability of wool to felt had led to the development of an unshrinkable finish for hosiery goods. The method for measuring the scaliness of different wools was outlined and it was shown that no perfect correlation existed between scaliness and milling power. Although the scales were directly responsible for the occurrence of milling shrinkage, other factors played a part in determining the relative milling properties of different wools. Experiments were quoted to prove that, other things being equal, increasing fibre length and fineness would be accompanied by increased rates of milling. Attention was next directed to the fact that the rate of shrinkage of a fabric under defined milling conditions increased with increasing acidity or alkalinity of the milling agent. Experimental data for hydrochloric, sulphuric, and acetic acids were quoted and it was shown that the swelling of wool fibres also increased with increasing acidity or alkalinity of the milling agent. On the other hand, it was shown that the rate of shrinkage of wool

fabrics on a milling machine was at a *maximum* at about 43·5° C., whereas the swelling of wool fibres in water was at a *minimum* at about the same temperature. Thus as regards changing *p*H of the milling agent, the rate of shrinkage increased with increasing swelling, whereas with changing temperature, the rate of shrinkage increased with *decreased* swelling. This contradiction proved that fibre swelling played no direct part in milling shrinkage and some other factor must be sought in its place. This was the *ease of extension of the fibre*. Increasing acidity, alkalinity, and temperature all make fibres easier to stretch and, further, there was no difficulty in visualising how ease of extension might facilitate milling shrinkage. The theory developed was a combination of the views of Arnold and Shorter but it remained to show why milling shrinkage should take place most rapidly at 43·5° C. when fibres became increasingly easy to stretch at temperatures up to 100° C. The reason was that not only must a fibre become easier to stretch for milling to take place rapidly, but it must also retain a high power of recovery from extension. There was marked hysteresis between the processes of extension and contraction and its extent was at a minimum at about 40° C. Above this temperature, the facilitation of milling shrinkage by increasing ease of extension of fibres was opposed by increasing hysteresis between extension and recovery, with the result that a temperature of maximum milling was realised. From these experiments it became clear that two things were required of a fibre before milling skrinkage could occur: that it should possess a surface scale structure and that it should be perfectly elastic. The attempts which had been made to produce milling shrinkage with rayon fibres by giving them a surface scale structure were therefore misguided, because such fibres were remarkable for imperfections of elasticity. This discovery of the two-fold cause of milling shrinkage had an important bearing on the methods employed for imparting an unshrinkable finish to hosiery goods. Hitherto, all such methods had aimed at making wool unshrinkable by rendering the scales inoperative by means of chlorine or hypochlorous acid, but such treatment was accompanied by a marked reduction in wearing properties. There appeared to be no way of escape from the dilemma that hosiery goods were either defective because they shrink or because they possess inferior wearing properties, but it is now clear that there was a second way of making wool unshrinkable—by making it imperfectly elastic. There was no necessity to make this imperfection of elasticity permanent; what was required was that some agent should be added to the scouring medium which makes fibres imperfectly elastic while scouring was carried out, the reagent being removed during washing off and perfect elasticity then restored. In this way it would be possible to retain the high wearing properties of undamaged wool fibres without encountering the difficulty of excessive shrinkage, and the necessity for any unshrinkable finish would disappear.

The Chairman said he was sure that everyone present had appreciated the clear presentation of his subject that Dr. Speakman had given. He invited questions.

Mr. L. J. Mills (Fellow) asked what effect the scouring and milling processes had on carbonised wool, and whether the surface scales were damaged during the rag-pulling processes. He also wished to know what effect from the finishing point of view, the acid used in carbonising had upon carbonised wool. He took the opportunity of proposing a hearty vote of thanks to Dr. Speakman.

Dr. Speakman, replying, said recovered hairs suffered two ways. Pulled wool was short, and for shrinkage a long staple was required. Again during wear and during the tearing operation scales are worn off the individual hairs. Such hairs were possessed of little "life" and milling would necessarily be slow. The loss of scales would also reduce the wearing qualities of the ultimate fabrics.

Fabrics made from recovered wool had a tendency to crease easily and permanently. It was well known that carbonised wool was harsher in handle, and this might be due to the effect of the carbonising process on the wool scales.

The vote of thanks was seconded by Mr. A. Hardman (Associate) and carried unanimously.

YORKSHIRE SECTION ASSEMBLY AT BRADFORD

A social gathering of members of the Yorkshire Section of the Textile Institute took place at the Midland Hotel, Bradford, on the evening of the 19th November last. Mr. Arthur Saville, the Chairman of the Yorkshire Section kindly invited the whole of the members of the Section, together with a few friends, to an assembly arranged so that they could meet the President of the Institute (Mr. George Garnett of Bradford) and others. It was a gathering for the fraternisation of members. Several addresses were contributed and the proceedings took the form of a smoking concert. Mr. Saville introduced Mr. Garnett, and, in doing so, expressed the general sense of appreciation which prevailed as a result of Mr. Garnett's acceptance of the responsibility of the presidential office. Welcoming the large response to his invitation to that gathering, Mr. Saville said his object was to bring members together and, by this event, secure close contact with the President (Mr. Garnett), Past-President (Mr. John Emsley), Mr. Edford Priestley, and others. Mr. Garnett had been one of the warmest supporters of the Institute movement since its foundation and had thoroughly earned the distinction of election to the highest office. The name of Mr. John Emsley was indelibly associated with one of the most important movements ever undertaken by the Institute—The obtaining of the Royal Charter under which the Institute became authorised to award certificates of competency to the textile technologist and to conduct examinations in relation to such awards. In 1922, Mr. Emsley, as President, set himself the task of promoting a scheme of lasting benefit to the Institute and to the Industry, and so determined was he in the pursuit of the object that he remained in office for four years until the object was achieved. The scheme of granting qualifications in the form of Associateship and Fellowship had proved distinctly successful. It was gratifying to know that Yorkshire was taking a creditable share of these distinctions. To-day, there were 165 Fellows and 215 Associates and in these totals Yorkshire was represented by 46 and 45 respectively. In the matter of Institute publications, proposals were in hand for development. The importance of the Information Bureau of the Institute was being emphasised and inquiries, as to textile literature references, sources of supplies of various descriptions, and statistics, were increasing rapidly. Students of the various technical institutions were encouraged by the Institute's annual competitions in regard to design and structure of woven fabrics and several prizes were awarded this year to West Riding representatives. He urged all members to consider the Institute as their own organisation and he particularly welcomed the younger members, some of whom were Associates, because the future of the Institute would depend greatly upon their attitude to the movement.

Mr. George Garnett (President) thanked Mr. Saville for his welcome and hoped the gathering would result in the formation of many lasting friendships. The Institute had a great future before it, and if the spirit which had prevailed in the movement in the past, involving enormous devotion and self-sacrifice, was carried forward, a much higher position would be attained.

Mr. John Emsley congratulated Mr. Garnett on his election and he appealed especially to the young men for unwavering loyalty to the Institute.

Addresses were also contributed by Mr. Frank Hopkinson. Mr. Edford Priestley and Mr. T. Halstead, and, at intervals, songs were contributed.

Midlands Section

KNITTING MACHINE DEVELOPMENTS

The first meeting of the 1931–1932 Session took place at Nottingham in the Recreation Room at the premises of Messrs. I. & R. Morley. Mr. Thomas Morley, Chairman of the Midlands Section Committee, occupied the chair and introduced the Lecturer—Mr. J. Chamberlain (Fellow).

Referring to the fact that industries depended upon supplies of raw material, and upon machinery developments, the lecturer said that in the knitting industry machinery changes were constantly being made, and in his opinion this state of things was likely to continue. Ten years ago there were no 300-needle machines, nor were spring-needle hose machines using reciprocating needles in use; reverse plating on half-hose machines was unknown. Other machines, continued Mr. Chamberlain, were coming into use as a result of the stabilisation of the manufacture and supply of rayon. In a single decade the outlook had changed; development had taken place and improvements had been made. Mr. Chamberlain then proceeded to discuss developments, which were fundamental changes, and improvements, which do not involve such changes, in relation to the needle, the sinkers, the pressers, jacks, and points. He also outlined the two ways in which knitting machines may be developed. Firstly, by general developments applicable to several types of machine, and, secondly, by individual machine developments. In conclusion, a summary of these two classes of developments was given. Mr. H. F. Lilburn kindly supplied refreshments, during which an interesting discussion took place. A hearty vote of thanks to the lecturer terminated the meeting.

VISIT TO NOTTINGHAM LACE FACTORY

Members of the Midland Section of the Textile Institute to the number of twenty were privileged to pay a visit of inspection to the lace factory of Messrs. T. Birkin & Co. Ltd., New Basford, Nottingham, on the 11th November. Representatives of the firm conducted members over the various departments and explained both machinery and processes. Methods of warping, manufacture, and finishing were all considered and, after the factory inspection, the visitors were permitted to examine a complete range of exhibits of the firm's productions, including a large variety of made-up goods composed wholly or partly of lace. The exhibits included several replicas of articles supplied to Royalty or produced in connection with events of national importance. On conclusion of the inspection, Mr. Thos. Morley (Chairman of Midlands Section Committee) moved a hearty vote of thanks to the firm, and said that members were really grateful for the privilege so kindly conceded. His own interests applied to the knitting industry, but he regarded interchange of visits between allied interests as exceedingly interesting and desirable. Mr. J. H. Lester (Manchester) seconded the vote, which was heartily accorded, and Mr. Birkin suitably acknowledged the vote.

NOTES AND NOTICES

The Institute's Annual Competitions

The prospectus of Institute Competitions for 1932 is in course of preparation and will be issued to textile departments of colleges and schools early in January. The Competitions Committee have again given most careful consideration to suggestions received for revision of the requirements in regard to the various competitions, and the prospectus will be found to contain considerable modification of terms and conditions. In the case of the main competition—that which demands a collection of specimens of woven fabrics from each competitor—the number of fabrics required will be 16 instead of 20. An important provision fully retained, however, is that which refers to the variety of fabrics to be submitted. There will be no diminution of demand in respect of versatility. The "C" Competition, for Novel Woven Fabric, will be greatly amended with a view to providing increased scope. It is to be described as a competition in respect of Special Woven Fabric, and competitors will be required to produce a fabric for a definite purpose and present an accompanying statement of claim as to the merits of the fabric for the purpose specified. It is recognised that the range of fabric production has considerably expanded in recent years and, under the new conditions, competitors will be able to consider fabrics for industrial uses as well as for wearing apparel and domestic needs. The matter of framing a competition in relation to the design and structure of knitted fabrics has undergone careful consideration by the Committee of the Midlands Section of the Institute, and the inclusion of a competition for this branch of the industry in the prospectus for the coming year is contemplated.

Journal Development

The coming year, at least so far as the *Journal* of the Institute is concerned, promises to be well-defined. To date, three distinct periods can be seen in *Journal* growth. From 1910–1917 issue was spasmodic and, apart from a very comprehensive bibliography, largely compiled by the late Professor Myers, the volumes were mainly a record of Institute meetings. In April 1918 the *Journal* was placed upon a basis of regular monthly issue and its contents were divided into Proceedings, in which reports of meetings were recorded; Communications, which were records of original research; and Abstracts, in which current textile literature was summarised. The page size was changed from octavo to quarto and revenue from advertisements rapidly increased. During this period the Textile Industrial Research Associations came into being. Fuller co-operation on the part of Research Associations led to the inauguration of the third period of *Journal* development. In 1922 the octavo page size was resumed, on the advice of the Department of Scientific and Industrial Research, and the present-day sections of the *Journal* were established—viz. *Proceedings*, which embrace not only reports of meetings of the Institute but also Notes and Notices and Reviews of Books; *Transactions*; and *Abstracts*, these being almost entirely contributed by the Research Associations. The *Journal* was also constituted the official organ for the publication (as *Transactions*) of publicly-released Memoirs of the Textile Research Associations, and later was constituted its official organ by the Indian Central Cotton Committee. During this period marked development has taken place in all directions, circulation has quadrupled, the number of pages of matter published trebled, and the revenue from Advertisements and Sales more than trebled. In 1932 certain developments in the Proceedings are contemplated and it is expected that articles of a more "general" character will be published. Members should remember that when all is said and done the expansion of the Institute and its use to the textile industries rests with them and them alone. Any suggestions and/or offers of contributions will be welcomed and carefully considered.

The Institute Library

Members of the Institute, whose interest in this Note may be aroused, are requested to ask themselves whether they were aware of the existence of the Institute's Library, whether they could use it or whether they could supplement it ? During the past 12 months the library facilities have been utilised much more freely, and the Library Committee hopes this development will continue and increase.

The library is not by any means a large one, but its growth during the past three years holds out promise that it will ultimately achieve a magnitude of the order felt to be desirable by those in charge of it. It was commenced by gifts and exchanges of periodicals when the Institute began, and some of the first periodicals received are still coming to hand regularly. Unfortunately the foresight exhibited, in many directions, by the founders of the Institute does not seem to have been directed towards a library, and instead of possessing 21 consecutive years' issues of these periodicals it has to be recorded that they were destroyed. By gifts and purchases many valuable sets of periodicals have subsequently been built up, but in the main, publications of this type are not available prior to 1923.

The books section of the library is founded upon the collection of volumes made by the late Professor Fox which, at his death, was purchased and presented to the Institute. This collection was certainly not big but it was well-chosen and many items in it have, for long, been out of print. This collection was supplemented by additions from the library of the late Professor Myers, which enabled many gaps to be closed by books hitherto unprocurable. Though the Institute subscribes to certain periodicals, it rarely purchases a book. Gifts of small numbers of volumes and of single publications are constantly being made, and in this direction the Library Committee anticipates a regular series of additions. It is felt that many members do not yet realise that books, pamphlets, and periodicals which they may almost have come to regard as worthless, would be sure of careful consideration if offered to the Institute Library.

The main source of additions of books to the library is the "review copy." All publishers of note who issue books on textile or allied subjects now regularly submit copies of these works to the Institute for review. These books form a valuable source of annual growth. The periodicals and pamphlets library is regularly augmented by the regular exchange of such publications with the *Journal of the Institute*, and the list of these now contains over 200 names.

A further Section of the library is now being started—a library of Trade Catalogues—since librarians and others are realising how much valuable information for the technologist is, nowadays, often included in these publications. This Section is quite small at present, and gifts would be very welcome. A set of catalogues issued by any of our leading textile machinists, for example, over the past 50 years, would be invaluable.

It must finally be pointed out that a Library Catalogue is available—price 6d. post free—and that this has been supplemented once and will be again early in the New Year.

"On Coming-of-Age"

At the meeting of the Council of the Institute, in December, consideration was given to arrangements for the next Annual Meeting in 1932. This, naturally, brought to mind many recollections of the Annual Meeting in the current year and of those meetings and other events which were, collectively, the Celebrations of the Institute's Coming-of-Age. Portraits of celebrities "at the age of 3," "at the age of 15," and "at 21 years of age" were at one time popular with little or no apparent reason. It would appear to be a well-founded assumption that the history of a living, growing, and increasingly-valuable organisation, such as the Textile Institute, with portraits of those whose untiring energy and continued interest made the origin and growth of that organisation possible, would have

DECEMBER 1931

THE TEXTILE INSTITUTE

NOTICES—INSTITUTE MEETINGS

Tuesday	12th January	*Manchester*—3 p.m. Meeting of Publications Committee, at Institute.
Wednesday	20th January	*Manchester*—1.45 p.m. Meeting of Finance Committee, at Institute.
Wednesday	20th January	*Manchester*—3 p.m. Meeting of Council, at Institute.

LANCASHIRE SECTION

Friday	22nd January	*Manchester*—7.30 p.m. Lecture, "Fashion and Colour in Textiles," by Robert F. Wilson, Manager and Secretary, British Colour Council, at Institute.

LONDON SECTION

Tuesday	12th January	*London*—6.30 p.m. Public lecture, "Scotch Tweeds," by J. Macpherson Brown, F.T.I., at Clothworkers' Hall.
Wednesday	27th January	*London*—7 p.m. Paper, "Woven Fabrics—Institute Competitions Specimens," by J. D. Athey, at 104 Newgate Street.

MIDLANDS SECTION

Wednesday	20th January	*Hinckley*—4.30 p.m. Visit to works of Messrs. Atkins Bros., Hosiery Manufacturers. 7.15 p.m. Discussion on "Works Organisation and Management." Opening speakers, S. E. Ward and J. K. Ebblewhite, at Hinckley and District Technical College.

Other Organisations

Bacup Textile Society—

Wednesday	13th January	*Bacup*—7.30 p.m. Film, "Thirsty Cotton," and lecture by A. H. Milnes, Messrs. Cook & Co. (Manchester) Ltd., at Natural History Rooms.
Saturday	16th January	Visit to Messrs. Fethney Bros., Machinists, Rochdale.
Wednesday	27th January	*Bacup*—7.30 p.m. Lecture, "The World's Cotton Supply," by F. K. Dyke, A.T.I., at Natural History Rooms.

Batley and District Textile Society—

Thursday	14th January	*Batley*—7.30 p.m. Lecture, "The Relative Importance of the Carding Components," by E. W. Booth, at Technical College.

Blackburn Textile Society—

Friday	15th January	*Blackburn*—7.30 p.m. Lecture, "Gold," by Wm. Carmichael, at Technical College.
Saturday	23rd January	Visit to Messrs. Platt Bros. & Co. Ltd., Oldham.
Friday	29th January	*Blackburn*—7.30 p.m. Lecture, "Steam Raising and Power Production," by W. Baldwin, at Technical College.

Bradford Textile Society—

Monday	4th January	*Bradford*—7.30 p.m. Lecture, "Wool and Wool Buying in New Zealand," by H. Hull, at Midland Hotel.
Monday	18th January	*Bradford*—7.30 p.m. Lecture, "Sheep and Wool of Kashmir," by Prof. A. F. Barker, M.Sc., F.T.I., at Midland Hotel.

Society of Chemical Industry, Manchester Section—

Friday	15th January	*Manchester*—7 p.m. Lecture, "Some Aspects of Boiler Water Chemistry," by H. E. Jones, B.A., B.Sc., at Engineers' Club.
Friday	22nd January	*Liverpool*—Joint meeting with members of Liverpool Section of the Society. Lecture, "The Future of Liquid Fuels," by Dr. A. E. Dunstan, F.I.C.

Society of Dyers and Colourists, Manchester Section—

Friday	15th January	*Manchester*—7 p.m. Lecture, "Beam Dyeing with Vat Colours," by J. R. S. Goodall, at College of Technology, Manchester.

Halifax Textile Society—

Friday	15th January	*Halifax*—7.30 p.m. Lecture, "A Survey of the Needs of Industry," by Sir Edwin Stockton, Kt., M.P., at White Swan Hotel.
Wednesday	27th January	*Halifax*—7.30 p.m. Lecture, "Chemistry, as Applied to Textiles," by W. J. Stansfield, A.R.C.S., A.I.C., at White Swan Hotel.

Huddersfield Textile Society—

Monday	11th January	*Huddersfield*—7.30 p.m. Lecture, "Some Considerations Affecting our Woollen Trade in China and Japan," by W. A. Crowther, at Technical College.
Monday	25th January	*Huddersfield*—7.30 p.m. Lecture, "Woollen Yarn Manufacture, by N. Booth, A.T.I., at Technical College.

Leicester Textile Society—

Friday	22nd January	*Leicester*—7.30 p.m. Lecture, "Cottons for the Hosiery Trade," by J. W. Kershaw, at Victoria Hall, Mill Hill Lane.

Leigh Municipal College Textile Society—

Tuesday	19th January	*Leigh*—7.15 p.m. Lecture, "The Tale of Textile Commerce," by G. H. Carter, at Municipal College.

Morley and District Textile Society—

Thursday	14th January	*Morley*—7.30 p.m. Lecture, "Cotton, and some of its Uses," by J. C. North, at Technical Institute.
Thursday	28th January	*Morley*—7.30 p.m. Lecture, "The Importance of Scribbling and Carding to the Woollen Industry," by J. B. Wilson, at Technical Institute.

Nelson Textile Society—

Monday	11th January	*Nelson*—7.30 p.m. Lecture, "Automatic Looms," by John W. Lord, at Technical College.
Thursday	28th January	*Nelson*—7.30 p.m. Lecture, "Public Health," by Dr. Markham (Public Health Officer, Nelson), at Technical College.
Saturday	30th January	Visit to Messrs. Richardson, Tuer & Co. Ltd., Farnworth, near Bolton.

Oldham Technical Association and Old Students' Union—

Saturday	9th January	*Oldham*—7 p.m. Lecture, "Some Observations on Indian Cotton," by Dr. A. J. Turner, at Municipal Technical College.
Saturday	23rd January	*Oldham*—7 p.m. Lecture, "High Pressure Steam Boilers," by W. Bayliss, M.I.M.E., at Municipal Technical College.

Rochdale Cotton Spinning Mutual Improvement Society—

Tuesday	5th January	*Rochdale*—Lecture, "Textile Woven Belting," by A. F. Wray, at Society's Rooms, Barlow Street.
Tuesday	19th January	*Rochdale*—Lecture, "Cardroom Observation," by Mr. Griffiths, at Society's Rooms, Barlow Street.

Shipley Textile Society—

Thursday	14th January	*Shipley*—7.30 p.m. Lecture, "The Oiling of Wool," by J. B. Speakman, D.Sc., F.T.I., at Technical School.
Saturday	23rd January	Visit to Jowett Cars Ltd., Motor Manufacturers, Idle.

British Association of Managers of Textile Works—

Saturday	9th January	*Manchester*—6.30 p.m. Lecture, "Special Textile Accessories," by H. C. Barnes, B.Sc.Tech., B.Com., at The Athenæum.
Saturday	30th January	*Manchester*—6.30 p.m. Lecture, "Finance and Industry," by S. S. Hammersley, M.P., at The Athenæum.

Todmorden Textile Society—

Monday	11th January	*Todmorden*—Lecture, "Loom Tackling," by Mr. Lord.
Saturday	16th January	Visit to Textile Department of Manchester College of Technology.

To all Members of the Textile Institute

YOUR attention is called to the opportunity, of which many members have not as yet availed themselves, of securing a record of the FIRST TWENTY-ONE YEARS of the Institute.

This record is available in the CHRONOLOGICAL RECORD published this year in connection with the Institute's Coming-of-Age. Photographs of Past-Presidents, of Institute Medallists, of the Honorary Fellows, and of the first Warner Medallists are included in the volume with a chronology of outstanding events in the Institute History.

Supporting this Section of the Record is a general chronology of the same Twenty-one Years' period, giving a summary of World Events which enables the reader to associate any local event with the major world happenings.

Seven other sections of the Chronology should make appeal to any and every Student of General Textile Technology. These sections cover Fibres, Yarns, and Fabrics; their production and processing. They deal also with Analysis and Testing; Economics and Welfare; and Research and Education.

A *Supplementary Volume* covers a similar period in Textile and General Statistics. These relate to the production and distribution of Fibres, Yarns, and Piece Goods. General Statistical Information upon Wages, Employment, Cost of Living, Gold and Silver Production, and National and Municipal Finance gives the inquirer the material for a close study of Textiles and their distribution in relation to the economic structure as a whole.

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found ready sale among the members. It can hardly be said, yet, that this is so. The Council of the Institute hopes that the notice, issued with the *Journal* this month, will serve as an adequate reminder to members who have not already done so, that this record—"A Twenty-one Years' Chronology of Textiles"—is available and should be in the hands of every member. It may serve as some slight stimulus to know that one member contemplates presenting copies to his friends at Christmas.

Textile Institute Diplomas

Elections to Fellowship and Associateship have been completed since the appearance of the previous list (November issue of this *Journal*).

FELLOWSHIPS

LORD, Richard (Manchester).
SPEAKMAN, John Bamber (Leeds).

ASSOCIATESHIPS

CLARK, Irene (Nelson).
EDWARDS, Cyril Houghton (Nottingham).
NEWSOME, Henry Smith (London).
HEY, Charles Matthews (Preston).

Membership

At the December meeting of Council, the following were elected to Membership of the Institute—E. Clegg, 53 Lister Street, Accrington (Clerk to Chief Technical Superintendent); B. Crosland, "Chellow Nook," Shaftesbury Avenue, Bradford, Yorks. (Student); T. Fraser, 57 Victoria Street, Dunfermline, Scotland (Damask Designer); Wm. Graham, 1 Long Row, Mellor, near Blackburn (Student); F. Ibbetson, 5 Knowles Street, Dudley Hill, Bradford, Yorks. (Textile Designer); F. C. Johnson, 59 Spenser Road, Herne Hill, London S.E.24 (Wholesale "Linings Department"); H. Laithwaite, 313 Lees Road, Oldham (Assistant Spinning Overlooker); C. J. Lancashire, "Lynton," Cropston, near Leicester (Manager, Hosiery Trade); E. B. Millard, Massachusetts Institute of Technology, Cambridge, Mass., U.S.A. (Professor of Physical Chemistry); T. H. Morris, 77 Fountain Street, Manchester (Secretary, Cotton Spinning and Manufacturing Firm); J. H. Ratcliffe, 32 Nutter Road, Accrington (Loom Overlooker); W. T. Rigby, 19 Mansion House Road, Paisley, N.B. (Foreman Dyer); J. H. Riley, 2 First Avenue, Tottington, near Bury (Sales Manager's Assistant); Geo. Whitaker, 278 Swan Arcade, Bradford, Yorks. (Wool Merchant).

REVIEWS

Elementary Textile Design and Fabric Structure. By John Read, F.T.I. Published by Edward Arnold & Co., London. (5s. net.)

In his introduction to this elementary text book of some 100 printed pages, the author, who is the head of the Textile Department, Royal Technical College, Salford, and a Fellow of the Institute, very modestly states that the book has been prepared for the use of students in the elementary grades of fabric structure and textile design. The author is to be congratulated for breaking away from existing notions on the size of text books by producing a book on fabric structure which is of the same size as the well-known design point paper pads so widely used in technical colleges.

By the simple device of inter-binding nearly 30 full pages of design paper into the book, on which are provided more than 330 point paper designs, drafts, and lifting-plans of all the fundamental fabric structures, the author also provides innumerable examples which are purposely left incomplete, to afford students an opportunity to practice squared-paper designing in a most convenient form. By leaving the back of these pages blank, space is provided which will prove useful

for both practical and more advanced notes on points brought out by experience. In this manner this book becomes not only a text book and exercise book for students, but a useful desk log for those actually engaged in the industry. Seventy-two photographs of typical cotton cloth structures, in addition to the quality particulars of the different classes of fabrics, with their uses, are contained in the text. A separate chapter is devoted to each fundamental fabric structure and the variations possible in each structure are pointed out. The author adopts the term "weave plan" in place of "design," which seems to be more generally favoured in the industry. The book is very obviously the outcome of a long practical experience in the teaching of a difficult subject. The method of showing the peg plan might be open to criticism. This new text book should make a genuine appeal, not only to teachers and students of the subject, but to craftsmen engaged in weaving and to an ever-expanding circle of members of the Institute, each of whom is a specialist in some other branch of textile technology, but also desires knowledge in this important subject of fabric structure. Although the textural matter has been kept down to a minimum it contains all the "meat," and both the designs and the cross-sections through those fabrics which are included have been very well produced. W.H.S.

Der Flachs. Zweite Abteilung Flachsspinnerei. Technologie der Textilfasern Series, V.1. By W. Sprenger. Published by Julius Springer, Berlin, 1931. (254 pp. and Index, R.M. 38.)

This is one of the series published under the title "Technology of Textile Fibres," edited by Dr. R. O. Herzog. It is bound in the usual green cloth cover with gilt lettering, contains 256 pages with 175 illustrations, partly line drawings and partly photographs of machines, all of which are excellently reproduced. Throughout the volume much interesting data is given in tabular form, and at the end are four tables showing respectively—(1) Flax price variations since 1801. (2) Weight of bundles of different counts; equivalent counts in different systems; length and weight relations. (3) Older methods of bundling. (4) Power, floor space, and weight of the chief flax-spinning machines. The book is well indexed and the list of contents is set out very clearly in great detail. After a historical introduction the subject is treated in sections, which follow the usual departments in a flax-spinning mill under the headings—raw flax; flax dressing for spinning; flax spinning; reeling, drying, and packing; attendance, administration, and maintenance of machines and adjustment; the layout of a flax-spinning mill; linen yarn; the mill organisation; flax-spinning calculations; flax yarn doubling. In the section on raw flax, the properties of the fibre are discussed, the methods of estimating quality by handling, and of marketing are described, and some remarks are made on the effect of humidity on the weight. The next three sections are purely descriptive of the machines used, including descriptions of hand hackling and hand spinning, and the purpose of the operation. All the machines for line and tow spinning are described in turn, the important motions of each being clearly illustrated by line drawings. Every opportunity is taken to achieve conciseness by the tabulation of data of dimensions of the machine parts, and by giving the calculations relating to the working of the machines in algebraical form. In this way the continuity in the description of the successive operations is maintained and not masked by pages of calculations as is so frequently the case in textile books. The descriptions of the machines include all the latest improvements such as automatic spreaders, recuperators on cards, electrical driving of spindles, various types of spindles, and automatic doffing. The section on carding is very complete, including tow refining and shaking machines, the finisher card, card waste shaker, short tow card, and cord-teasing machine. The section on spinning includes descriptions of the machines used for gill, dry, and wet spinning. The latter receives the most attention and discusses the methods of heating the water, the choice of temperature, the fluting of the rollers, and the length of the reach to be employed for different kinds of flax. Various methods of yarn drying are mentioned and brief descriptions given of several types of modern tunnel dryers. The section on attendance and administration describes the work in each department, and gives details as to the usual number and duration of stoppages for cleaning, the number of spindles per spinner, oiling, and so on. This section should be very useful to students and the information given is made more accessible by being grouped together in this way. The second part of this section deals with maintenance and setting of the machines, and reference is made to

auxiliary machines used such as roller fluting machines, pinning machine for card clothing, drilling machines. A section is devoted to buildings, motive power, ventilation, mechanical transport systems, weighing, fire protection, and accident prevention. The properties of linen yarns are discussed and methods of testing are described in ten pages. The subsection on testing machines might well have been amplified by including illustrations of the testing apparatus described, which would have been of assistance to elementary students. Actually only the Dietz yarn-testing machine is so illustrated. The author has introduced a further novelty in the make-up of this type of book, in a section entitled "The Spinning Organisation," which discusses in some detail how to estimate the numbers of each kind of machine required, having regard to the relation of the amount of tow to line machinery, the speeds of the machines, the draftings and doublings, and so on. Costing is dealt with briefly in four pages, and the last section describes some types of machines used in thread twisting, polishing, and softening. The author has been very successful in giving a very detailed account of all the processes of flax spinning, and the treatment adopted is to be commended for its clearness and conciseness. The book can be recommended as a valuable contribution to the subject and one which should be of considerable value to the technical student. At the same time it might be pointed out that the price of 38 marks (or at the present time over 45s.) appears to be unduly high for a volume of this size. J.A.M.

The Chemistry of Laundry Materials. By D. N. Jackman. Published by Longman's, Green & Co., 1931. (234 pp., price 6s.)

This little book has been written for laundry workers "in order to meet the demand which has arisen . . . for information about the materials encountered—particularly information of a chemical character." The chapters deal with water, alkalis, soaps, bleaches and stain removing, fibres and fabrics, starches, acids and blues, fuel, miscellaneous matter such as marking inks, fireproofing, mothproofing and simple analytical methods, the *p*H system, and lastly two chapters on general chemistry. The term "58° alkali" (introduced on page 11, but not explained till page 40) will, it is to be hoped, be dropped in favour of the simpler name "soda ash," which explains its nature more scientifically. An understanding of the *p*H system and its importance is well-nigh indispensable in modern applied science, and its explanation in simple language in this book is particularly good. Progress is made possible by accurate measurement, and the dissemination of scientific knowledge amongst the actual workers is a laudable object. The whole book is well written and does give the minimum scientific information which every laundry worker should aim at possessing. An excellent feature of the work is a considerable bibliography of books and papers for further study, including the references to the B.L.R.A. Reports at the end of each chapter. Laundry executives would do well to give a copy of the work to each operative—with his yearly bonus—and keep a copy for themselves. F.C.W.

The Cotton Trade and Industrial Lancashire, 1600-1780. By A. P. Wadsworth and Julia de Lacy Mann. Published by the Manchester University Press. (Pp. 539, price 25s. net.)

Everyone who knew the late Professor George Unwin will appreciate the gracious tribute by the authors of this work to "his immense range of knowledge and synthetic grasp." He had also the gift of inspiring others to share his enthusiasm for research, and Miss Mann and Mr. Wadsworth are unduly modest when they describe their book as "a poor contribution" to the wider scheme of industrial and social research which Unwin planned. Mr. Wadsworth began his studies with a view to presenting an account of the organisation and social background of the Lancashire textile industries in the period prior to the industrial revolution. Miss Mann, under the guidance of the late Professor Lilian Knowles, set out to trace the interaction between English and Continental developments. This initial independence has inevitably led to a measure of overlapping, and explains the "loose framework" within which the joint studies have been placed. But the thoroughness with which both authors have explored new and valuable sources of information in the Public Record Office, in the French *Archives Nationales*, in the private papers of such firms as J. & N. Philips, in legal and political records, is adequate compensation for the enforced lack of continuity in the story they

tell. A work of this type is most valuable because it helps to correct the impression so firmly stamped on many minds that all the essential features of modern industrial structure and working date from the industrial revolution. In the seventeenth century "credit was almost as indispensable to the textile industries as it is to-day," and an elaborate mechanism of trading was built up long before the banks as we know them were established to specialise on the function of finance. In fact it was not until after 1770 that either Manchester or Liverpool had a formal bank.

We are reminded also that in the seventeenth century "agrarian politics came home as closely to the Lancashire cloth producer as the affairs of industry," and it is interesting to trace the process by which problems of tenure, rights of grazing, and the use of the waste were transformed into questions of rates of pay and conditions of work as mechanisation of production displaced the "yeoman" type. Those who think of workers' organisations solely in terms of the nineteenth century history of trade unionism will appreciate the account here given of local associations in the eighteenth century preoccupied with the problem of the price of foodstuffs, and driven from secret to open action in years of acute distress and general social disturbance. Nor is the capitalist employer the peculiar product of the nineteenth century, for in the eighteenth century "considerable sections of the workers in Lancashire were dependent on a few men." It was not, however, until the nineteenth century that Lancashire established her supremacy in the world's cotton trade. It is particularly instructive to read of the "commission system" in its various phases, because this practice has come right into our modern factory system in full measure, though few, probably, will realise the length of its history.

Other instances might be quoted of features of modern textile practice dating back to the sixteenth and seventeenth centuries, but some reference must be made to other items in this fascinating book. Take, for example, the story of the workers' opposition to the Dutch loom (a "devilish invention"); the concern of English manufacturers when the old Kendal green and the rough friezes became drugs in the market because people's tastes ran to "foreign fashions and inventions"; the increase of the scale of manufacture as the market for textiles extended; the controversy about the "middleman" (so modern in its arguments); and the jealous defence of craft and trading rights in the contest between "town" and "country" producers. Need further quotations be given to show that although the main problems of industry and trade have changed in scale in the course of the last four hundred years, we still struggle with fashion, foreign competition, "middleman" dealing, industrial regulation, and the dislike of "rationalisation."

The textile technologist will turn to this book with pleasure, for he may read of fustians, bays, kersays, minikins, and the rest, and reflect upon the place occupied by the manufacture of velvet in the development of Lancashire's staple industry. The discovery of some early seventeenth century cotton cloth and cops at Hackling Hall is recorded, and the story of the displacement of wool working in Lancashire may be linked with the suggestion that water supplies were really more important than climate in determining the localisation of the cotton industry. Lancashire people who know the villages of the county will find much delight in reconstructing the activity and prestige of many centres since reduced by the modern industrial town to insignificance. Those with a taste for the study of "industrial relations" will find that an eighteenth century dispute between employers and operatives lacked nothing in invective, and in days when we hear so much about standards of living it seems quaint to read that the increase of tea-drinking between 1720 and 1750 was a sign of an "advance in real wages."

Such an admirable piece of historical research is bound to inspire others to take a hand in unfolding the whole story of textile developments. For the technician it is also sure to yield a new pride in his craft. A.N.S.

Mitteilungen der Textilforschungs-Anstalt, Krefeld.

Those engaged in research on rayon and interested in methods of testing will know that some of the most noteworthy contributions to these subjects emanate from the laboratories of Dr. W. Weltzien at the Textile Research Institute, Krefeld. These reports appear in the monthly journal, *Seide*, which is now in its 36th year, but they are also collected together in separate annual volumes of "Mitteilungen." The Institute acknowledges with satisfaction the donation of Volumes II–VI. W.

Sur la fixation des Matières grasses émulsionnées par les fibres textiles. By Jacques Corbière. Published by Soc. Anon. de l'Impr., A. Rey, Lyon, 1931. (121 pp.)

The absorption by textile fibres of oils and fats from emulsions is a problem of no little importance to the textile industry throughout the whole series of treatments which textiles undergo from the raw to the finished state, and it is a problem which is still in need of a comprehensive treatment. This book describes the results of some work carried out on the absorption of olive oil by wool and of linseed oil by viscose from emulsions of these oils. The first part of the book is devoted to a general discussion of emulsions and their application to the textile industry. The second part deals with the application of emulsions of olive oil to wool, particularly for carding and spinning purposes, and the influence of various factors such as particle size, soap content of the emulsion, and *p*H of the wool on the absorption of the oil is discussed with reference to the experimental results obtained. The remaining half of the book—some 50 pages or so—is devoted to a consideration of the drying of linseed oil in general, and the effects of various factors such as the degree of oxidation of the oil, concentration, and soap content of the emulsion on the amount of oil absorbed by viscose, are discussed from the point of view of the use of linseed oil emulsions in the sizing of viscose. Consideration is also given to the effect of the ageing of linseed oil on the yarn. Some 100 fairly general references are included in the text. From the title it would be gathered that the absorption of oils from emulsions is dealt with in relation to textile fibres generally, but actually the treatment given is rather too confined to make the work of any very general interest. It is to be hoped, however, that it may pave the way to a wider and more comprehensive treatment of the whole problem. D.A.D.-S.

Silk and the Silk Industry. By Joseph Schober, translated by R. Cuthill, M.Sc., Ph.D. Published by Constable & Co. Ltd., London, 1930. (21s. net.)

This book by the Director of the Hungarian State Filatures, the German original of which was first issued a few years ago, presents surveys of the silk industry, and of the artificial industry considered in its relation to it, from the commercial and statistical as well as from the technical standpoint; the chemical and physical properties of silk are not discussed in detail. The text has been rewritten in part and extended by the author for this translation, and the translator has added sections on the British silk industry. The technical methods, geographical distribution, and trade statistics and usages of each section of the industry are considered together, those of each section in a separate chapter, which is thus in a manner self-contained. Thus Chapter I, on the Cocoon, after introductory sections on the history of the industry and more particularly of the British industry, gives a short account of the principles of silkworm rearing, an informative description fully illustrated of the various kinds and grades of cocoons, a short description of the properties of silk, and a much more detailed discussion of silk cultivation as an industry throughout the world. Japan is the leading sericultural country; its annual crop of cocoons has risen from about 8 million kg. in 1870 to about 370 million kg. at the present time; and in the export of silk it has far outstripped China where, however, the internal consumption is of an enormous but unknown amount. India, in which sericulture is on the whole unorganised, has lost her former position of importance as a silk-producing country. Italy maintains her position as the greatest silk-producing country in Europe and, although her output is small compared with that of China and Japan, she retains her supremacy in the art of sericulture. France, Greece, Bulgaria, Turkey, and other European countries produce much smaller, but (except in France) now increasing, amounts of silk. The Russian crop of about 17 million kg. of cocoons annually now exceeds the pre-war figure. In the British Empire the development of sericulture, which has had a notable success in Cyprus, is fostered by the Advisory Committee on Silk Production of the Imperial Institute. The world's output of silk, or rather perhaps the amount marketed, is now nearly double what it was just before the war. Japanese and Chinese silks, which constitute the greater part of the world's output, are marketed already reeled, or reeled and thrown, but there is a cocoon trade at Milan the usages of which are described. The next five chapters on Silk Yarns, Artificial Silk, Weaving, Ribbons, Knitted Goods, give each in the same way the geographical distribution, statistics, and trade usages of the section of the industry concerned, a plan which, whilst it

involves some repetitions, is successfully executed. In the well-illustrated technological parts of these chapters the descriptions of the mechanical processes of manufacture, particularly weaving, are more complete than those of the chemical processes which, however, apart from some minor errors, are quite sufficient for the scale of the book. There is a final chapter on Cloth Analysis. This useful book contains also a bibliography, glossaries of technical terms, and a list of equivalent technical terms in English and other languages. S.

Artificial Silks. By S. R. Trotman, M.A., F.I.C., and E. R. Trotman, Ph.D., M.Sc., A.I.C. Published by Griffin & Co., London (pp. 274+ix with 79 illustrations. 18s. net).

The authors, after a short introduction, have devoted about 140 pages to the methods of manufacture of various kinds of rayon, 20 pages to analysis and testing, and the rest to bleaching, dyeing, and finishing. The introduction is, frankly, disappointing; the description of manufacturing methods may be accurate but it is not easy reading, and the latter portion of the book is but good in parts.

It is perhaps unfair to criticise portions of a book away from their context, but in order to illustrate the non-critical way in which this book has been compiled, it may suffice to examine the authors' views on the subject of the moisture relations of cellulose in general, and of artificial silk in particular. On page 9 they write that ". . . . cellulose . . . . exposed to a damp atmosphere . . . . absorbs 18% of water." On page 190—"the moisture content (of artificial fibres) is usually between 10% and 12%," and on page 195 appears the really extraordinary statement that "yarn is bought and sold on the understanding that the sum of the dry weight and 11% of the dry weight shall be exactly 100." There is little about moisture equilibrium, nothing about absorption hysteresis, no hint that the magnitude of the moisture regain is connected with the chemical reactivity of the cellulose, and no emphatic statement about the different behaviour towards moisture of regenerated cellulose and ester rayons.

There is need for an authoritative book on rayon, but, unfortunately, as the authors of this book afford little evidence of first-hand experience of the material they set out to write about, and recent work seems to have been rather overlooked, it is hardly possible to commend this book as meeting the need. H.H.

PUBLICATIONS RECEIVED AND PLACED IN THE INSTITUTE LIBRARY

Kingston's Dollar Equivalent Tables. Published by Kingston's Translations Institute, Leadenhall Street, London, E.C.3.

The Tables cover exchanges of $\frac{1}{16}$d. to £100 at eighteen rates of exchange.

The Lancashire Textile Industry 1931, and

The Yorkshire Textile Industry 1931-1932 (Worrall's Standard Textile Publications). Published by John Worrall Ltd., Oldham (16/- each).

These two volumes have been revised and brought up to date. Each has been made more comprehensive to justify the change of title, and improvements in appearance have certainly been effected.

Cotton Production and Distribution in the Gulf South West. U.S. Department of Commerce, Washington, 1931.

The volume is one of a series compiled in connection with a commercial survey of the seven States embraced in this area—Arkansas, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, and Texas.

Report of the Committee on Finance and Industry. (*Chairman*—The Rt. Hon. H. P. Macmillan, K.C.). Printed and published by His Majesty's Stationery Office. Price 5s. net.


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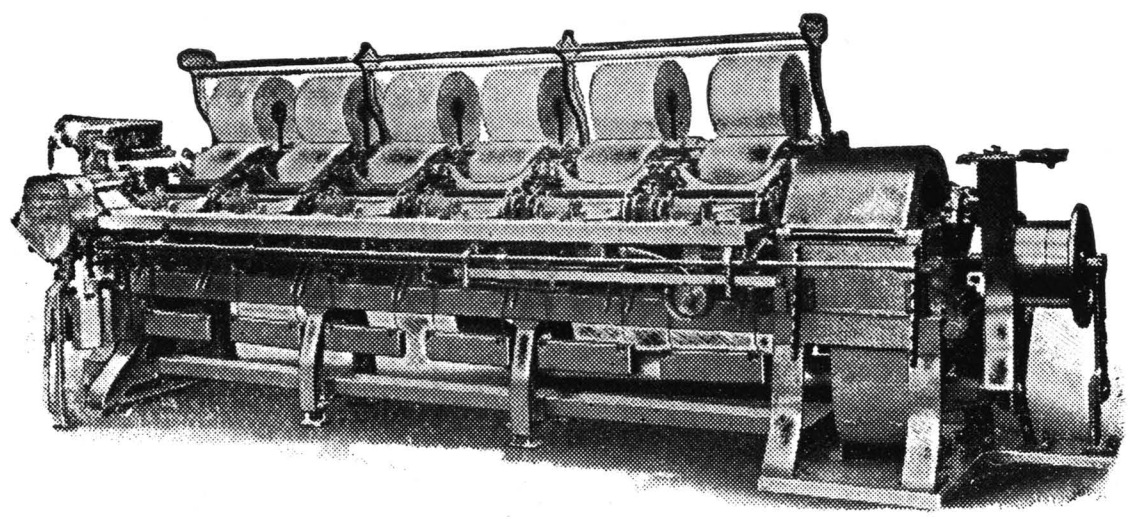

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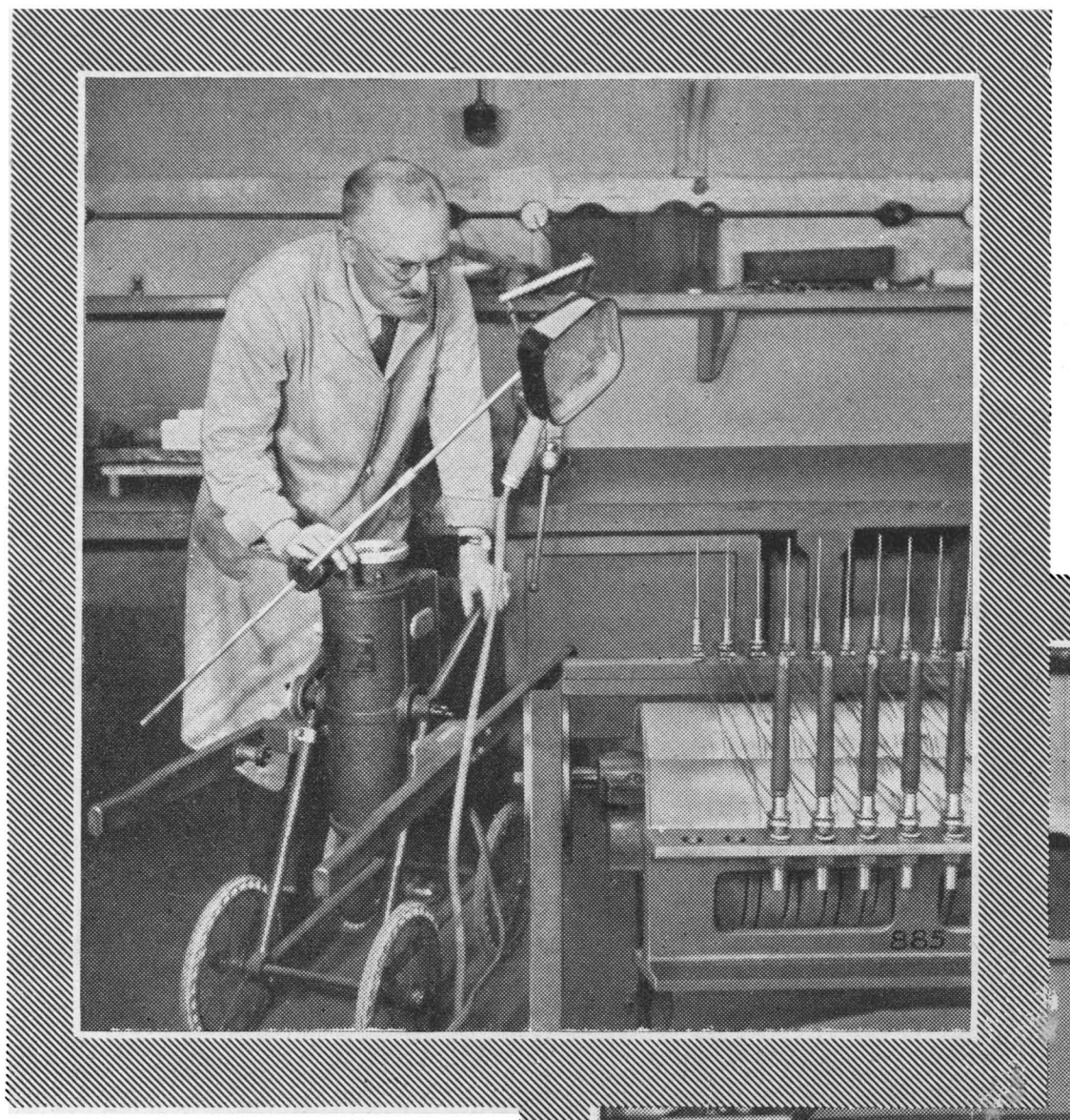

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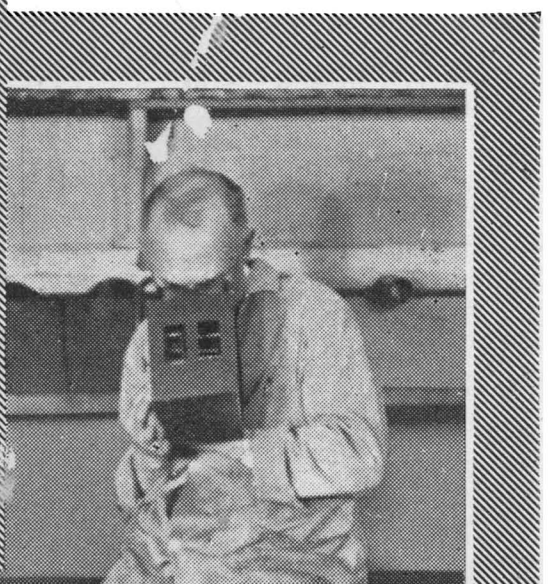

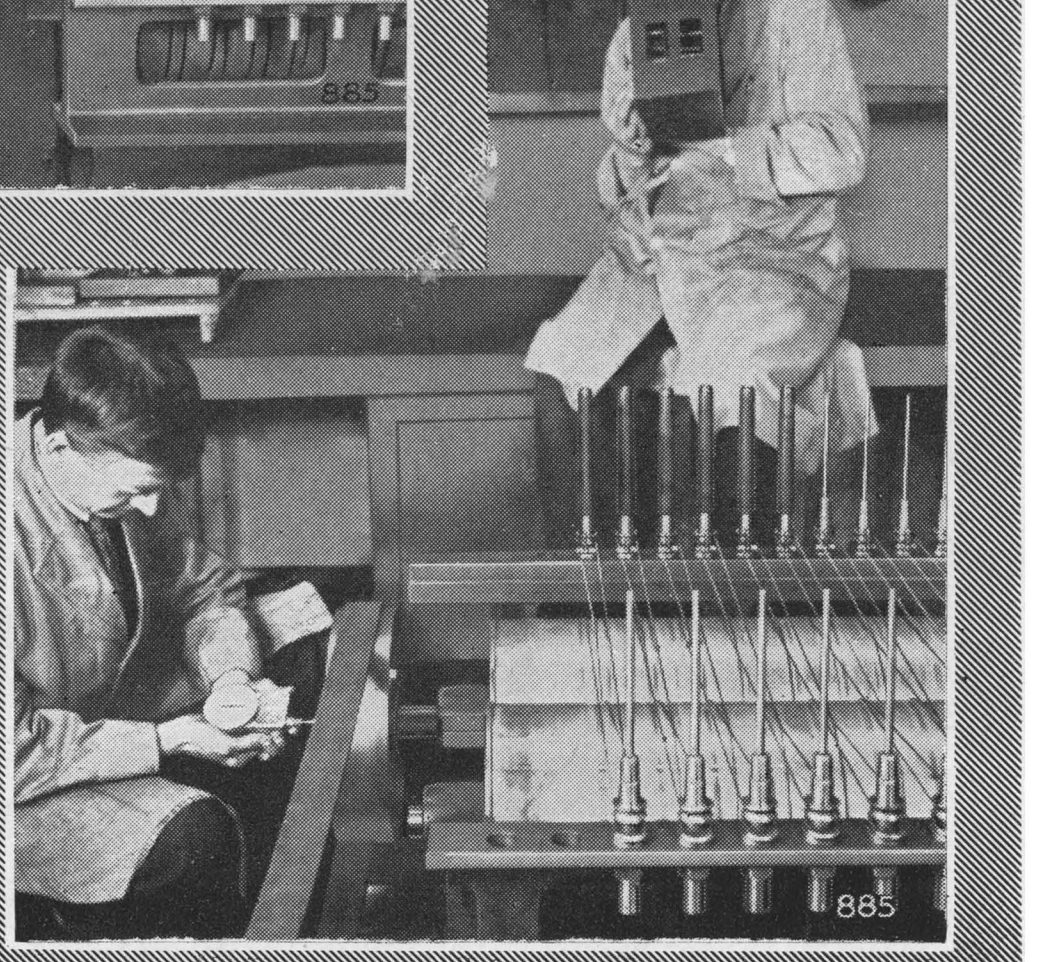

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TRANSACTIONS

39—A COMPARISON OF THE FINENESSES OF BRITISH AND CONTINENTAL STANDARDS FOR COMBED TOPS

By C. G. WINSON, B.Sc., A.Inst.P.
(Wool Industries Research Association)

In relating the term wool quality to the various attributes of the wool fibre there can be little doubt that the property of fineness is the most important single factor. Other characteristics such as length, crimp, elasticity, and lustre are of decided importance in assessing the manufacturing values of a sample of wool, yet it is only in so far as these properties are present to an abnormal degree that an evaluation of quality based on fineness alone is called into question.

This view is supported by the results of a series of measurements recently published from this laboratory. These results show that for a range of selected British tops there was an increase in fineness according to a definite law as the scale of qualities ascended from 48's to 80's quality. The measures of fineness used to establish this relationship were (*a*) the mean cross-sectional area and (*b*) the weight per unit length of fibre.

In all subsequent work it was decided, in accordance with the resolution of the International Wool Conference of 1929, to adopt the system (*b*) and to express fineness in terms of the weight in milligrammes of 10 metres of fibres at a regain of 18¼ per cent.

According to this system of expressing fineness, the relationship found between quality appellation and the mean fineness for the British selected tops may be represented by the equation—

$$\log_{10} \frac{W}{L} = 0{\cdot}068x + 0{\cdot}44,$$

where $\frac{W}{L}$ signifies the weight in milligrammes of 10 metres of fibre at 18¼% regain and the successive values of x.....3, 4, 5, etc. stand for the qualities 80's, 70's, 64's, etc. The psycho-physical implications of this logarithmic relationship are discussed in the previous paper, where it is shown that the Fechner-Weber law, as applied to the visual sense, would account for this manner of variation of fineness from quality to quality. Below the 48's quality on the British scale the law no longer holds. The presence of medullated fibres makes the weight/length method of fineness measurements unreliable over the lower end of the scale, but even when we take the values for cross-sectional area it is difficult to reconcile these with the law governing the finenesses of the higher qualities. It may be that in the estimation of these qualities criteria other than the mean finenesses of the wool have entered.

In the previous paper it was also shown that, when such measurements as were available for the mean finenesses of the French, German, and Italian

standards for combed tops were examined, a similar relationship was found to obtain in every case; the logarithm of the fineness plotted against the successive qualities yielded a straight line. This was interesting since it implied that the fundamental basis underlying wool sorting was the same in all countries. It must be remembered, of course, that in general Continental machinery is adapted to deal with wools which are shorter for their fineness than the types favoured by British manufacturers. Nevertheless it appears that the various qualities differ in point of fineness in exactly the same manner as the English combed tops except that a different number of grades may be employed.

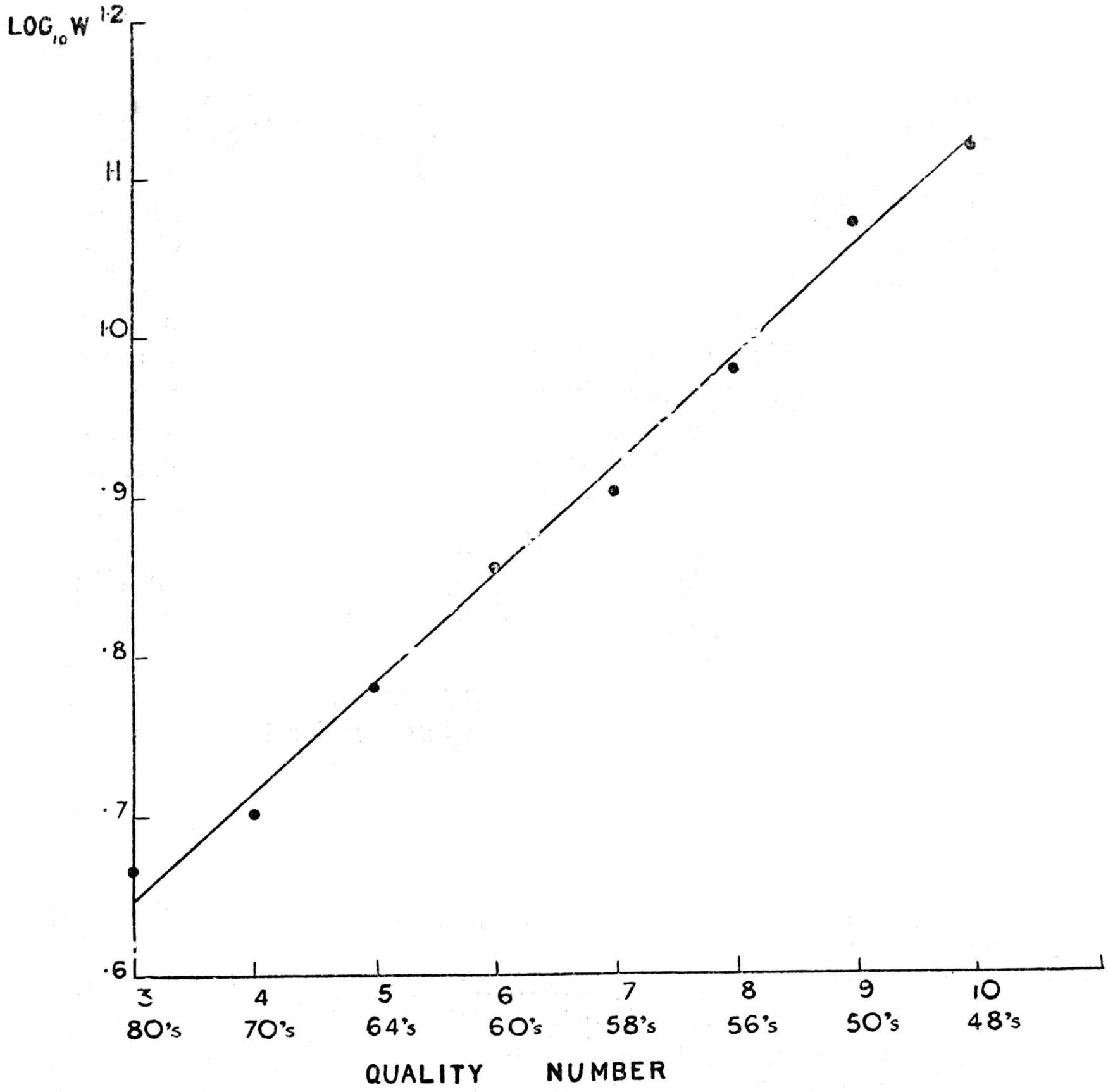

FIG. 1. British Selected Combed Tops.

The measurements of fineness which were used to establish the relationship outlined above were obtained from the literature of the countries in question. Naturally they were not all measured on the same system. The British and French figures applied to measurements made on the weight/length scale, while the German and Italian figures were obtained from microscopic measurements of fibre width. Even when the principle of the method was the same the technique differed and it was therefore difficult to make direct comparisons. The fact that the property of fineness varied in the same perfectly

definite manner from quality to quality makes it possible to use this property to compare qualities on the different national scales.

With this end in view a set of standard combed tops has been obtained from each of the countries France, Belgium, Germany, and Italy. These have been examined by the technique previously employed for the British selected tops and it is thus now possible to make direct comparisons between the different national standards.

EXPERIMENTAL

The method employed consisted essentially in weighing a counted number of fibres cut to a definite length. The work may be conveniently divided into the following stages—

(1) Sampling of top.
(2) Parallelisation and cutting of fibres.
(3) Counting of fibres.
(4) Washing, drying, and weighing of fibres.

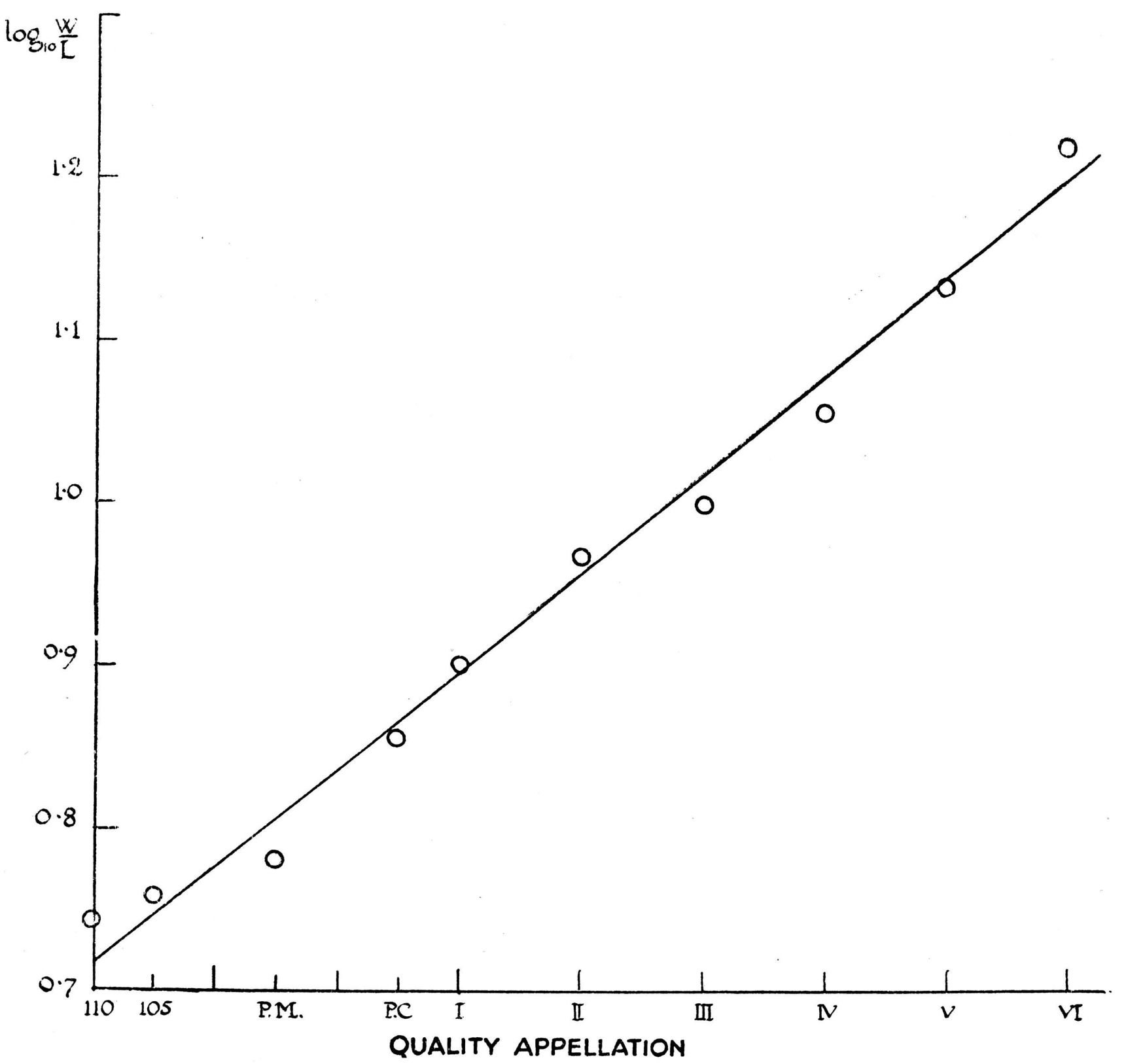

FIG. 2. French Standards for Combed Tops.

(1) From several places along each top small samples were taken between the thumb and finger and separated laterally from the top. Care was taken to maintain the fibres in the same relatively parallel position that they occupied in the top. In top manufacture there is obviously a very thorough mixture of the fibres composing the top, and this method of sampling was shown, by taking duplicate samples, to be very efficient.

(2) By gripping the bundle of fibres in the middle and gently combing towards each end with a dissecting needle, further parallelisation of the fibres was effected and at the same time a number of short fibres which would have to be discarded in the counting operation was eliminated. No short fibres, however, were removed from the middle section so that it will be realised that no kind of preferential combing took place which would affect the composition of the sample finally counted. The bundle of fibres was now placed in position on the instrument designed for cutting off a fixed length from the fibres. The bundle was then clamped in position with the fibres just straightened, and the fixed length cut from the middle portion of the bundle. Clearly the cut length of fibre employed must not be greater than the shortest length of fibre normally occurring in the tops, otherwise these short fibres will contribute nothing to the mean fineness and the result will be vitiated on this account. On the other hand, to cut to a length very much shorter than this yields no advantage, since by this means the percentage error in the length of the cut fibre is increased and the number of fibres which must necessarily be counted

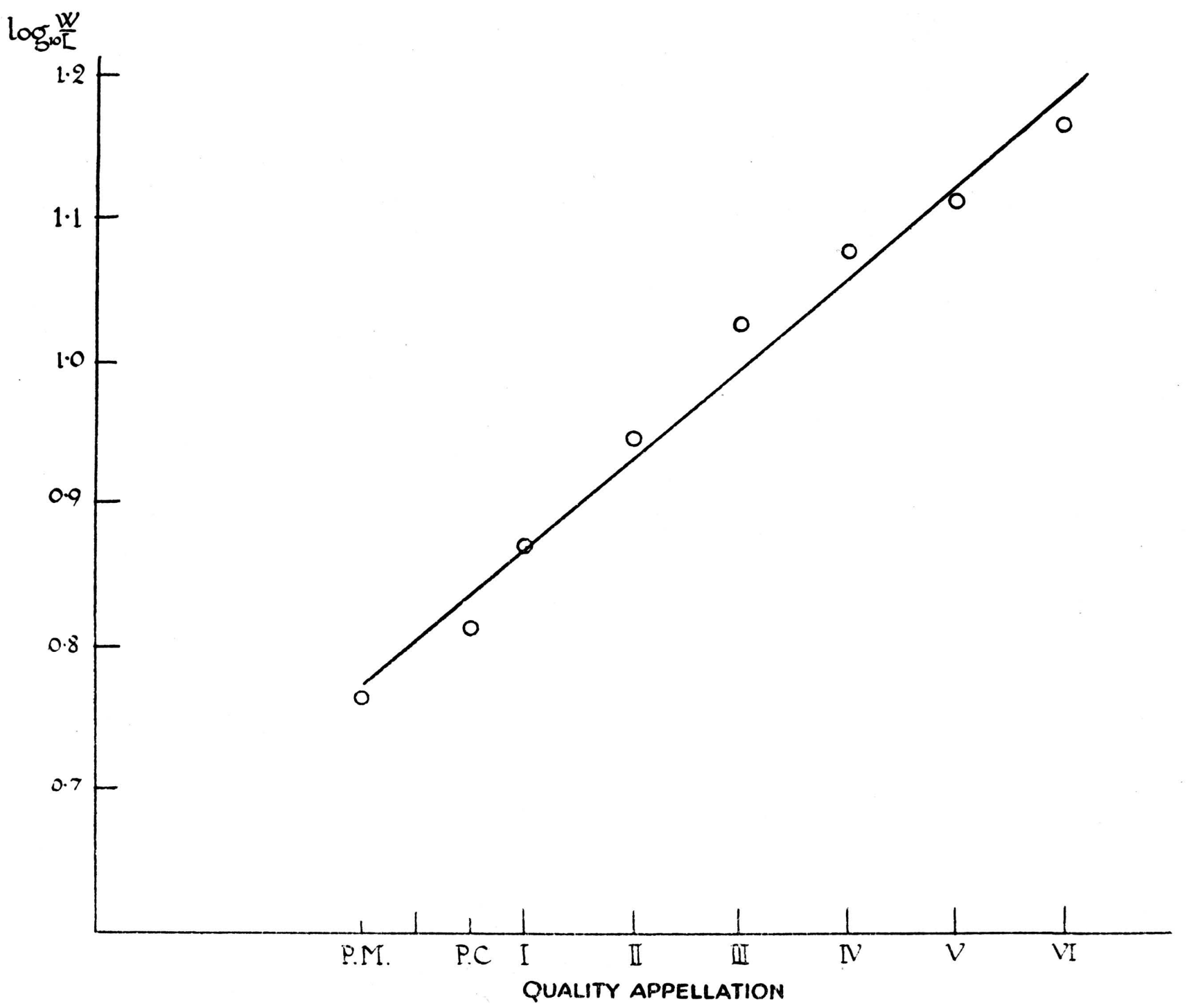

FIG. 3. Belgian Standards for Combed Tops.

out to give a weight determinable with the desired accuracy is much increased, with consequent extra expenditure of time and labour. In the present work the fibres from the 36's–50's tops, and all corresponding qualities, have been cut to a length of 4 cm., while for qualities higher than 56's the cut length has been 3 cm. These lengths were shorter than the length of any fibres likely to occur in the respective tops.

(3) The counting operation consisted in placing the cut bundle of fibres with as little disturbance as possible on to a black velvet board and with suitable forceps separating fibre after fibre, laterally, from the bundle and placing them together in a group until the desired number has been counted out. By taking the fibres in turn from the side of the bundle, there was no danger of any preferential selection such as might have occurred if the fibres had been drawn from the end of the bundles. For the coarser qualities 500 fibres were counted out and 600 or 700 for the higher qualities. A duplicate sample was then prepared and counted out by exactly the same procedure. Care had to be taken, of course, in the counting operation to discard all fibres shorter than the fixed length.

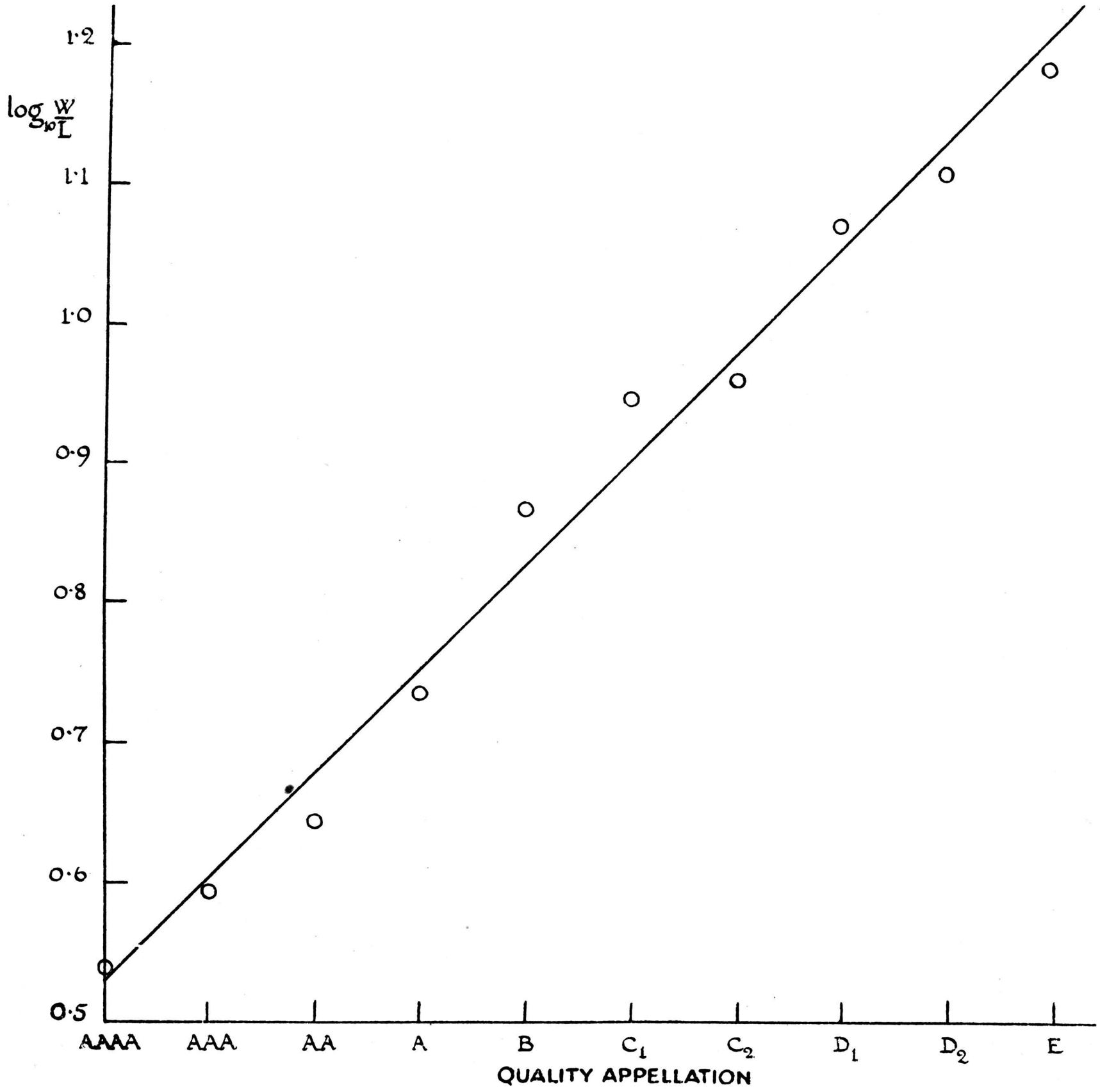

FIG. 4. German Standards for Combed Tops.

(4) The counted groups of fibres were rolled together by the finger into compact bundles which, it was found, did not separate when placed in liquid, and were washed in two changes of warm benzene (60° C.), followed by two rinsings in distilled water. In order to assist in the washing a small quantity of saponin was present in the first vessel of water. At the same time as the counted groups of fibres were washed a sample of approximately a gramme

weight from the corresponding top was dealt with in the same manner. The counted groups and gramme sample were then exposed together in a room of constant humidity and allowed to dry for a day or so. Afterwards, the counted groups were placed in weighing bottles and the larger sample placed in a regain bottle and their weights ascertained on a chemical balance weighing to 0·0001 gramme. The dry weight of the sample in the regain bottle was found, after drying in a stream of dry air at 105° C. had resulted in a constant weight for the sample. The corresponding dry weights of the groups of counted fibres were then calculated, and from these values was found the weight in milligrammes of 10 metres of fibre at a regain of 18¼ per cent.

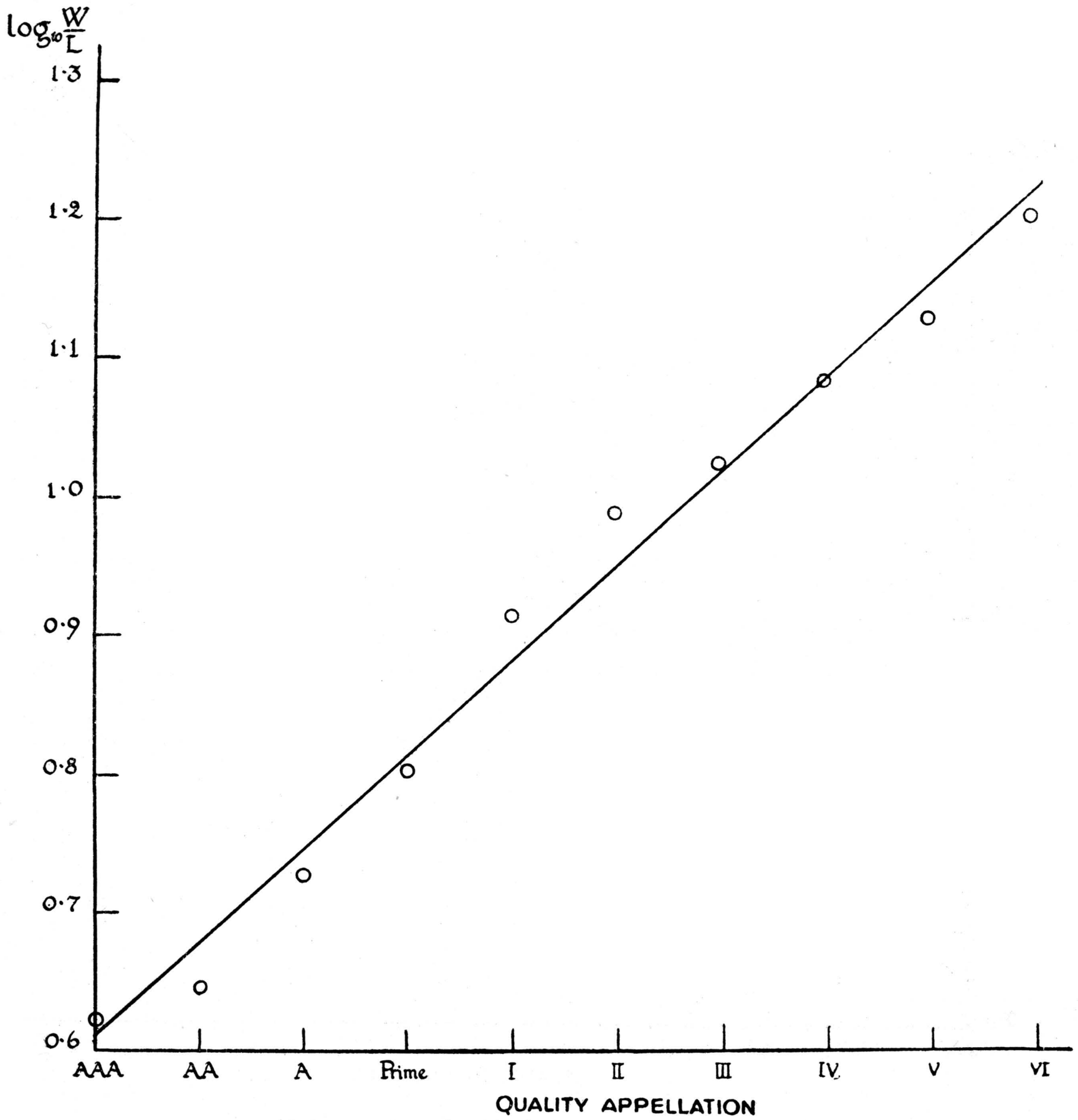

FIG. 5. Italian Standards for Combed Tops.

In order to test whether washing in warm benzene was an efficient means of cleaning the fibre or not the following test was applied. Duplicate samples were washed as described above and a further counted sample was submitted to six hours' treatment with ether in a Soxhlet. The weight of the latter sample differed from the mean of the two ordinarily treated samples by an

amount less than the standard error of the mean, and therefore the more lengthy and elaborate washing treatment was considered unnecessary since it contributed nothing to the accuracy of the final result.

RESULTS

The detailed results, including those for the British selected tops, are given in the following tables—

Table I

British Selected Tops

Quality	Cut Length of Fibres in cm.	Number of Fibres	Weight of Samples in g.	Weight of 10 metres of Fibres in g.	Weight in mg. of 10 metres of Fibres at 18¼% Regain	Logarithm of Preceding Column
80's	2	500	0·00385	0·00392	4·64	·6665
		500	0·00402			
		1000	0·00779			
70's	3	500	0·00636	0·00426	5·04	·7024
		500	0·00645			
		1,000	0·01273			
64's	3	500	0·00758	0·00510	6·03	·7803
		500	0·00758			
		1,000	0·01549			
60's	3	500	0·00906	0·00606	7·17	·8555
		500	0·00897			
		1,000	0·01836			
58's	3	500	0·01006	0·00677	8·01	·9036
		500	0·00997			
		1,000	0·02062			
56's	3	500	0·01201	0·00808	9·55	·9800
		1,000	0·02437			
50's	5	500	0·02419	0·00988	11·69	1·0679
		500	0·02495			
	4	1,000	0·03975			
48's	4	500	0·02191	0·01108	13·10	1·1173
		500	0·02182			
		1,000	0·04494			
46's	4	500	0·02255	0·01134	13·41	1·1274
		500	0·02169		*14·88	*1·1727
		1,000	0·04663			
44's	4	500	0·02638	0·01290	15·25	1·1832
		500	0·02579		*17·16	*1·2345
		1,000	0·05099			
40's	4	500	0·02684	0·01371	16·21	1·2098
		500	0·02743		*17·67	*1·2472
		500	0·02801			
36's	4	500	0·02734	0·01329	15·71	1·1962
		500	0·02515		*18·44	*1·2657
		500	0·02726			

* Values computed from cross-sectional area measurements. Irregularity due to medullated fibres.

Table II

French Standards for Combed Tops

Fineness	Cut Length of Fibres in cm.	Number of Fibres taken	Dry Weights of Duplicate Samples	Mean Dry Weight of 10 metres in g.	Mean Weight in mg. of 10 metres at 18¼% Regain	Logarithm of Preceding Column
Cape—						
110	3	600	0·00851 0·00834	0·00468	5·535	·7431
105	3	600	0·00879 0·00862	0·00484	5·724	·7577
Croisé Prime ...	3	600	0·01100 0·01082	0·00606	7·168	·8554
Australian—						
Merino Prime...	3	500	0·00736 0·00761	0·00499	5·902	·7710
Merino I ...	4	500	0·01294 0·01260	0·00638	7·546	·8777
,, II ...	4	500	0·01508 0·01525	0·00758	8·966	·9526
,, III ...	4	500	0·01703 0·01703	0·00852	10·08	1·0033
,, IV ...	4	500	0·01966 0·01949	0·00979	11·58	1·0637
,, V ...	4	500	0·02386 0·02403	0·01197	14·16	1·1510
Buenos Aires—						
Merino Prime...	3	500	0·00767 0·00802	0·00523	6·186	·7914
Croisé Prime ...	3	500	0·00906 0·00915	0·00607	7·180	·8561
I	3	500	0·01079 0·01096	0·00725	8·576	·9332
II	3	500	0·01246 0·01281	0·00842	9·959	·9982
III	3	500	0·01293 0·01310	0·00868	10·27	1·0114
IV	3	500	0·01571 0·01554	0·01042	12·32	1·0907
V	3	500	0·01637 0·01672	0·01103	13·05	1·1154
VI	3	500	0·02028 0·02175	0·01401	16·57	1·2193
Afrique—						
I	3	500	0·00999 0·00982	0·00660	7·806	·8924
II	3	500	0·01115 0·01142	0·00752	8·894	·9491
III	3	500	0·01209 0·01174	0·00794	9·390	·9727
IV	3	500	0·01291 0·01309	0·00867	10·28	1·0109

Table III
Belgian Standards for Combed Tops

Fineness	Cut Length of Fibres in cm.	Number of Fibres taken	Dry Weights of Duplicate Samples in g.	Mean Dry Weight of 10 metres in g.	Mean Weight in mg. of 10 metres at 18¼% Regain	Logarithm of Preceding Column
120	3	600	0·00766 0·00748	0·00421	4·980	·6972
115	3	600	0·00818 0·00835	0·00459	5·429	·7347
110	3	600	0·00905 0·00871	0·00493	5·830	·7657
105	3	500	0·00791 0·00808	0·00533	6·304	·7996
Prime Merino ...	3	600	0·00877 0·00877	0·00487	5·760	·7604
Prime Croisé ...	3	600	0·01009 0·00983	0·00553	6·540	·8156
I	3	600	0·01175 0·01088	0·00629	7·440	·8716
II	4	500	0·01456 0·01543	0·00750	8·872	·9480
III	4	500	0·01778 0·01830	0·00902	10·67	1·0281
IV	4	500	0·01974 0·02108	0·01016	12·02	1·0797
V	4	500	0·02196 0·02196	0·01098	12·99	1·1136
VI	4	500	0·02473 0·02509	0·01246	14·73	1·1684

Table IV

German Standards for Combed Tops

Fineness	Cut Length of Fibres in cm.	Number of Fibres taken	Dry Weights of Duplicate Samples in g.	Mean Dry Weight of 10 metres in g.	Mean Weight in mg. of 10 metres at 18¼% Regain	Logarithm of Preceding Column
AAAA	3	700	0·00620 0·00603	0·00291	3·442	·5369
AAA	3	700	0·00696 0·00696	0·00331	3·914	·5927
AA	3	600	0·00668 0·00668	0·00371	4·388	·6423
A	3	600	0·00840 0·00807	0·00458	5·418	·7338
B	3	600	0·01136 0·01101	0·00621	7·345	·8660
C_1	3	500	0·01134 0·01099	0·00744	8·800	·9445
C_2	3	500	0·01115 0·01149	0·00755	8·930	·9508
D_1	3	500	0·01439 0·01497	0·00979	11·58	1·0637
D_2	3	500	0·01610 0·01610	0·01073	12·69	1·1035
E	4	500	0·02561 0·02517	0·01270	15·02	1·1767

Table V

Italian Standards for Combed Tops

Fineness	Cut Length of Fibres in cm.	Number of Fibres taken	Dry Weights of Duplicate Samples in g.	Mean Dry Weight of 10 metres in g.	Mean Weight in mg. of 10 metres at 18¼% Regain	Logarithm of Preceding Column
AAA	3	700	0·00771 0·00719	0·00355	4·200	·6231
AA	3	600	0·00666 0·00682	0·00374	4·424	·6458
A	3	500	0·00685 0·00668	0·00451	5·335	·7271
Prime	3	500	0·00810 0·00801	0·00537	6·352	·8029
I	3	500	0·01059 0·01025	0·00695	8·220	·9149
II	3	500	0·01233 0·01233	0·00822	9·722	·9878
III	3	500	0·01322 0·01356	0·00893	10·56	1·0238
IV	3	500	0·01519 0·01554	0·01024	12·11	1·0832
V	3	500	0·01712 0·01694	0·01135	13·42	1·1279
VI	3	500	0·02000 0·02035	0·01345	15·91	1·2016

Table VI

Table of Finenesses Obtained from the Standard Curves

British			French			Belgian			German			Italian		
Quality Appellation	Weight in mg. of 10 m. at 18¼% Regain	Equivalent diam. $\times 10^{-3}$ cm.	Quality Appellation	Weight in mg. of 10 m. at 18¼% Regain	Equivalent diam. $\times 10^{-3}$ cm.	Quality Appellation	Weight in mg. of 10 m. at 18¼% Regain	Equivalent diam. $\times 10^{-3}$ cm.	Quality Appellation	Weight in mg. of 10 m. at 18¼% Regain	Equivalent diam. $\times 10^{-3}$ cm.	Quality Appellation	Weight in mg. of 10 m. at 18¼% Regain	Equivalent diam. $\times 10^{-3}$ cm.
80	4·44	1·92	110	5·24	2·08	Prime Merino	5·92	2·21	AAAA	3·38	1·67	AAA	4·08	1·84
70	5·19	2·07	105	5·61	2·16	Prime Croisé	6·86	2·38	AAA	4·01	1·82	AA	4·77	1·99
64	6·08	2·24	Prime Merino	6·43	2·31	I	7·39	2·47	AA	4·75	1·98	A	5·56	2·15
60	7·09	2·42	Prime Croisé	7·37	2·47	II	8·57	2·66	A	5·63	2·16	Prime	6·50	2·32
58	8·28	2·62	I	7·89	2·56	III	9·94	2·87	B	6·67	2·35	I	7·58	2·51
56	9·68	2·83	II	9·04	2·74	IV	11·52	3·09	C_1	7·91	2·56	II	8·85	2·71
50	11·31	3·06	III	10·36	2·93	V	13·36	3·33	C_2	9·38	2·79	III	10·34	2·93
48	13·21	3·31	IV	11·88	3·14	VI	15·49	3·58	D_1	11·11	3·03	IV	12·06	3·16
...	...	...	V	13·62	3·36	...	...	...	D_2	13·17	3·30	V	14·08	3·42
...	...	...	VI	15·60	3·59	...	...	...	E	15·61	3·60	VI	16·44	3·69

TREATMENT OF RESULTS

The graphs show the result of plotting the logarithm of the mean fineness against the successive quality designations for each country and also the line representing the best linear relationship between fineness and quality. The relationships are expressed by the following set of equations—

$$\text{British} \ldots \quad \ldots \quad \text{Log}_{10}\frac{W}{L} = 0{\cdot}068x + 0{\cdot}44.$$

$$\text{French} \ldots \quad \ldots \quad \text{Log}_{10}\frac{W}{L} = 0{\cdot}059x + 0{\cdot}66.$$

$$\text{Belgian} \quad \ldots \quad \text{Log}_{10}\frac{W}{L} = 0{\cdot}064x + 0{\cdot}74.$$

$$\text{Italian} \ldots \quad \ldots \quad \text{Log}_{10}\frac{W}{L} = 0{\cdot}067x + 0{\cdot}54.$$

$$\text{German} \ldots \quad \ldots \quad \text{Log}_{10}\frac{W}{L} = 0{\cdot}074x + 0{\cdot}46.$$

The significance of x in the above equations varies of course with each country and the following scheme indicates the values of x which have been assigned to the various qualities.

	Quality Designation										
British ... $x=$	80's 3	70's 4	64's 5	60's 6	58's 7	56's 8	50's 9	48's 10	—	—	—
French ... $x=$	110 1	105 1·5	100 2	P.M. 2·5	P.C. 3·5	I 4	II 5	III 6	IV 7	V 8	VI 9
Belgian ... $x=$	P.M. 0·5	P.C. 1·5	I 2	II 3	III 4	IV 5	V 6	VI 7	—	—	—
Italian ... $x=$	AAA 1	AA 2	A 3	P 4	I 5	II 6	III 7	IV 8	V 9	VI 10	—
German ... $x=$	AAAA 1	AAA 2	AA 3	A 4	B 5	C_1 6	C_2 7	D_1 8	D_2 9	E 10	—

The values given to x are quite arbitrary and are merely for the purpose of evaluating the constants of the equations. They may be replaced by any other set of values provided that the relative intervals between the numbers representing the qualities remain unaltered. These intervals, with the exceptions we shall now mention, are all equal. The exceptions occur in the French and Belgian scales and are due to the introduction at one part of the scale of intermediate qualities. Thus, in the French scale the measurements make it clear that the qualities 110, 100, Prime, I, II, etc., form a series obeying the logarithmic law and that the qualities 105, Prime Merino, and Prime Croisé are intermediate qualities. They have accordingly been assigned the values of $x=0{\cdot}5, 2{\cdot}5, 3{\cdot}5$, and are then found to fall into agreement with the law governing the rest of the qualities. The Belgian classification likewise forms a regular series below the Prime quality if we assign the qualities Prime Merino and Prime Croisé to intermediate positions on either side the quality Prime. The qualities higher than Prime on the Belgian scale have for the time being been left out of the scale of standards. This is the only case in which overlapping in respect to fineness occurred, and here, as the figures will indicate,

the mean finenesses of the Prime Merino and Prime Croisé approximate to those for the 110 and 105 qualities respectively. Repeat samples of the Prime Merino and Prime Croisé were obtained and measurements on these confirmed the previous results. An explanation of this anomaly is not as yet forthcoming.

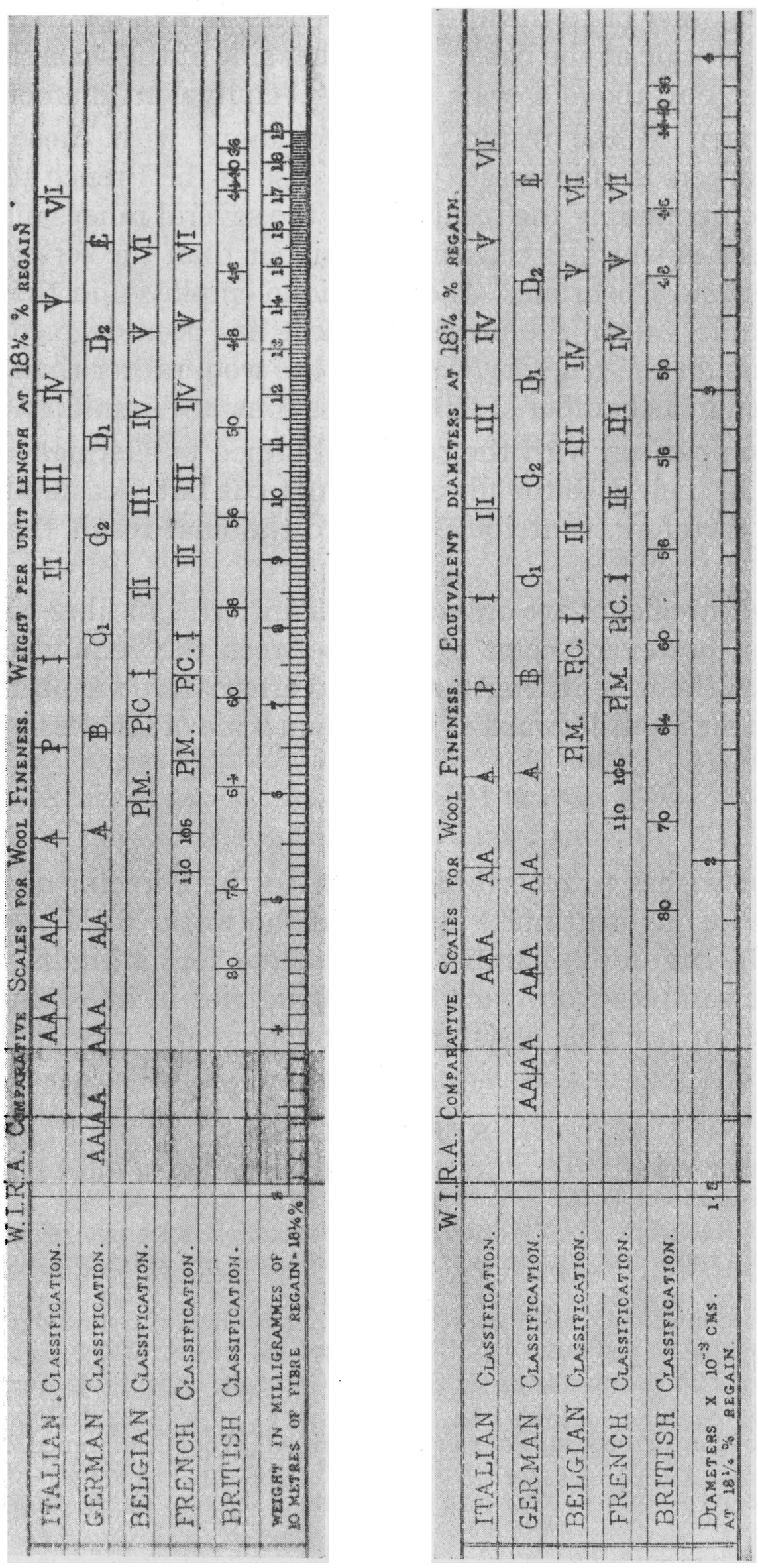

PLATE I

From the lines on the graph, or their equations, a set of values may now be found for each country which will represent the mean values of fineness for the different qualities. The values are shown grouped together in Table VI.

Here also are tabulated, for the convenience of workers using "diameter" or fibre width as a measure of fineness, the "equivalent diameters" calculated on the assumption of circularity of fibre cross-section.

A composite scale (Plate I) has been constructed presenting the data contained in Table VI in a more convenient form. The different national scales are arranged collaterally and a cursor makes it possible to transfer from one scale to the other or to the absolute fineness, in mg. for 10 metres, set out on a logarithmic scale at the base. The other side of the scale shows the same information set out above a scale showing "equivalent diameters."

A comparison of the results obtained above with those obtained by continental workers is of interest. In the case of the French tops the values obtained by compounding the results from the several ranges of tops supplied to us yield a series which is consistently higher than the series published by M. M. Dantzer and Roehrich. The technique employed in the two methods is much the same, but in the present work it has been deemed preferable to base all weights on the true dry weight of the wool rather than on its weight while contained in a chamber of more or less constant humidity.

A direct comparison with the results obtained by German workers is not possible since in their case the fibres were not cut but measured whole. The longer fibres, therefore, contribute more to the final result than the shorter ones.

Italian measurements are only available in terms of fibre width. A very fair agreement, however, seems to exist between the "equivalent diameter" calculated from the weight/length ratio and alternative members of the series of values of fineness put forward as the Italian scale of fineness by Commander Schneider.

The author wishes to record his thanks to the Director of Research, Dr. S. G. Barker, for his continued interest in the work; to Mr. H. T. Tulloch, Secretary of the Bradford Chamber of Commerce, for his kindness in obtaining representative samples from each of the countries in question; and to Miss A. L. Walker, for her able assistance throughout the investigation.

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TRIANGULAR METHOD OF DETERMINING DENSITY

The principle involved in this method was first suggested by Mr. J. A. Fraser Roberts who contributes the following note—

"Some years ago I experimented with methods employing a rectangular area on the skin. My colleague, Dr. A. Stevenson, now of the Scottish Woollen Technical College, Galashiels, suggested that a much better principle would be to make only a single parting at a time and to make the area triangular. I found that, using a fine knitting needle, it was entirely practicable rapidly to separate off a triangular area and remove the wool. It appeared to be possible to make the sides of the triangle quite straight. I have used the method in connection with one or two investigations and am very glad that Mr. Miller has found this a very useful technique and has been able to elaborate and perfect it in so satisfactory a manner."

The principle depends upon the fact that to make a perfectly straight part or shed in the fleece which shall be of adequate length it is advisable to employ only one dividing agent at a time. The reflex sensory-motor system of the sheep's skin is so well developed that cutaneous irritation resulting from the passage across it of an agent which, used carelessly or roughly, may prick the skin, may readily cause a reflex contraction of the cutaneous muscle, with consequent disturbance of the outlines of the area from which the sample is to be removed. In the method to be described it is believed that much of this error is avoided.

The method is of most use for the long-woolled breeds, where separation of tangled staples of wool is difficult under any conditions and impossible under some. It has been found inadvisable to employ any form of instrument in which the points which must separate the wool are short or thick for sheep such as the Scottish Mountain Blackface, Lincoln, Oxford, Cotswold, etc., breeds, and since much of the work in progress at this department includes the use of long-woolled breeds, the triangular method has been devised primarily for them. At the same time, in the hands of Mr. Roberts, and our own, the method has given very satisfactory results in short-woolled sheep—Cheviot, Half-bred, Welsh Mountain, Suffolk, etc.

Instruments—The equipment is simple in the extreme; it consists of an ordinary steel ruler—preferably graduated in sixteenths of an inch along one edge and having a centimetre scale along the opposite edge; a pair of dividers (preferably opening and shutting by a screw action); two ordinary steel knitting needles, each with one end made somewhat sharper than usual, or, even preferably, two large porcupine quills; and three pairs of cross-action aural forceps. These latter are not essential, but they facilitate keeping the surrounding wool from the field of operation. Ordinary black Indian ink, or an indelible pencil, may be used to delineate the corners and edges of the triangle, or if the exact area must be permanently marked for future reference, an electric tattooing machine may be used. Rubber bands are a convenience to slip round each isolated tuft of wool, and a series of envelopes serve as handy receptacles for the samples.

Principle—The principle of the method is that of isolating a triangular tuft of wool from the rest of the fleece in such a way that the sides are straight, the angles cleanly defined, and the divisions in the wool made with as little breaking or tearing of the fibres as possible, consistent with complete separation of the fibres from each other.

Choice of Site—Samples can, by this method, be removed from almost any part of the surface of the body which will give a level flat triangle, of the requisite size. Probably the most convenient body region for ordinary routine sampling is an area on the right or left side of the sheep lying over the ribs. ·In this situation there should be no difficulty in determining anatomical landmarks.

Whatever choice of site is made it should be remembered that if only one sample is required from each sheep the sides of the triangle should be at least $2\frac{1}{2}$–3 in. long if a fairly large sample is required. The smallest sized triangles used in Edinburgh (in a long series of observations made on each sheep at weekly intervals) were of 1·5 to 2·0 cm. length on each side. It is suggested that triangles smaller than these should not be used.

Method—The sheep is secured in the appropriate position on a table for preference. The area from which the sample is to be taken is determined by palpation of bony prominences, and one of the knitting needles (or porcupine quills) is introduced into the fleece until it meets the skin. It is then passed straight along the surface of the skin firmly but gently. It will be found that the line through the wool will not be straight until the needle has entered the wool for a distance of an inch or so; it is consequently necessary to commence the line at least 1 in. below the estimated angle of the triangle.

The needle is now raised (with the point as a fulcrum) $\frac{1}{2}$ in. to 1 in. up from the skin and the wool divided, either with the fingers, or by another needle or quill, into two walls. A pair of cross-limbed forceps is slipped on to that wall which is to lie outside the triangle and separate from it. This serves to preserve the division in the wool already made and prevent entanglement of fibres which constitute the sample, by those outside it.

A second needle or quill is next inserted into the fleece, as shown in Fig. 13 in the same manner 1 in. or more behind the line of the first one and in such a direction that it will form an angle of about 60° with it. Following the same procedure as is described above, a second side of the triangle is demarcated, and the wool to the outside of it secured out of the way by a second pair of cross-limbed forceps. In the same way the third side is prepared and the wool outside it also secured by the third pair of forceps.

It is sometimes convenient to insert the second and third quills immediately after the first side of the triangle has been demarcated; in this way any gross misestimation of the angles can be corrected by withdrawing one and reinserting it more appropriately. It is necessary to emphasise that each needle or quill as it is being inserted must be pushed straight along its track with its point pressed lightly but firmly on the surface of the skin. Each point must not be allowed to rise from the skin level by even a fraction of an inch, or a false and irregular line will result. We believe that upon the careful observance of this rule depends the successful use of the method.

A triangular area of wool is now isolated (Fig. 14). Its angles are approximately of 60° and it is therefore practically equilateral in outline. For convenience and to preserve the identity of the staples which compose it and to ensure that its component fibres will maintain their contiguity and relationships (especially important in a fleece which is undergoing a process of shedding of some of its fibres) the triangular tuft should have a rubber band slipped over it and arranged fairly near its base; this also aids in keeping the

sample rigid while it is being clipped off subsequently. For very long wools, such as those of the Lincoln, Oxford, or Cotswold, etc., two or more rubber bands may be advisable.

The sample is now removed from the skin by clipping with scissors, or it may be removed by cutting with a sharp razor blade. By the latter method there is some risk of injuring the skin if the sheep struggles, or if the skin happens to be pulled up into a fold, but otherwise the sharp razor when used with care is rapid and satisfactory when length of fibre is being studied.

When the sample has been removed, or before if necessary, the three sides of the triangle are measured with the screw-dividers and their dimensions noted. It may be convenient for extreme accuracy, to put a dot of Indian ink on, or mark with the indelible pencil, the exact point of each angle of the triangle before removing the sample, and to measure the distances between these points with the dividers after the sample has been removed, as shown in Fig. 15.

During measurement it is important that the surrounding skin should not be stretched by endeavouring to expose the dots to better view. If the forceps have been correctly adjusted earlier on, it will be found that they continue to hold the wool back from the bared triangle perfectly satisfactorily.

We suggest that the lengths of each of the three sides of the triangle should be noted on the envelope which also shows the number of the sheep and the date of taking the sample—together with other particulars necessary.

The area of the triangle may conveniently be determined by the usual formula as follows—

If the sides of the triangle are denoted by AB, BC, and CA; and if S=half the sum of these sides, the area is

$$\sqrt{S(S-AB)\ (S-BC)\ (S-CA)}$$

It is suggested that for convenience in measuring the sides of the triangle the metric system is the more satisfactory.

Modification of Technique—In fleeces where the density is great and where the fibres are entangled it is sometimes difficult to separate the wool fibres by means of a quill. To overcome this difficulty a triprong divider has been devised and used with success. This consists of the adoption of the principle of the three-armed uterine dilator—a human gynæcological instrument. Reference to Fig. 16 will make verbal description unnecessary. The closed instrument—with the three blades fitting together into a form which is in no way different from the essential of the quill or knitting needle—is used to pass into the fleece and along the line of the skin in exactly the same way as has been described previously. When in position the handles are closed and the three blades open out separating the wool fibres into two parallel lines. The longest blade carrying the dividing point—which is best made like an arrow-head—remains lying on the skin and the two shorter blades move upwards and outwards from it. Into the triangular space between the blades, a quill, or the fingers, can be readily inserted to complete the division of the fibres into two parallel walls. The remainder of the process does not differ from what has been already described.

SUMMARY

(1) A brief review is given of instruments and methods hitherto employed for determining fleece density.

(2) By modification of the earlier principles two other instruments have been devised and are described. The details of their construction and the technique of sampling with them, are illustrated.

(3) These instruments have been named the Wyedena and Wyedesa Fleece Calipers.

(4) A method of sampling employing a triangular area on the skin is described and its uses indicated.

(5) Some suggestions are offered for the evaluation of fleece density by the use of various formulæ.

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The writers wish to thank Professor F. A. E. Crew, of the Institute of Animal Genetics, The University, Edinburgh, for the encouragement and opportunities afforded during the design of these wool sampling instruments.

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They wish to acknowledge the suggestions made during the design of the Wyedesa Fleece Caliper, by Mr. J. G. Becker, of the Wool Laboratory, Onderstepoort, South Africa, and Mr. F. N. Bonsma, of the Sheep and Wool Division, Pretoria University, South Africa.

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The block of the Mentzel Wool Density Measurer is used by the courtesy of Urban and Schwarzenberg, Publishers, Berlin.

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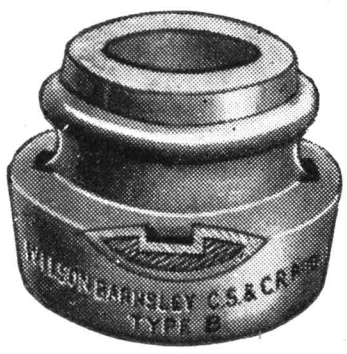

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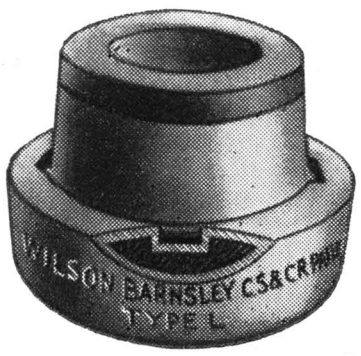

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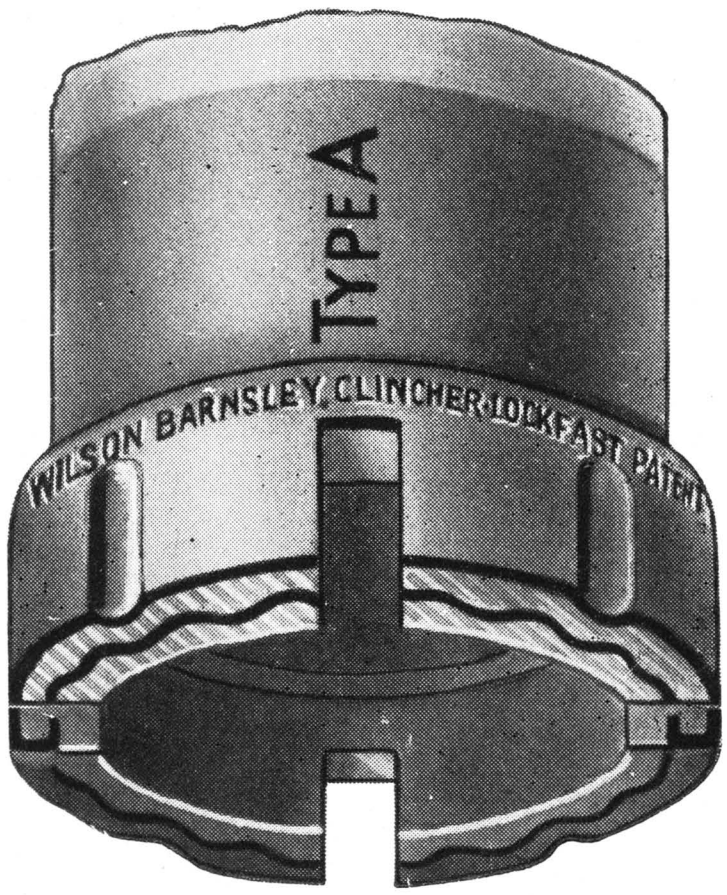

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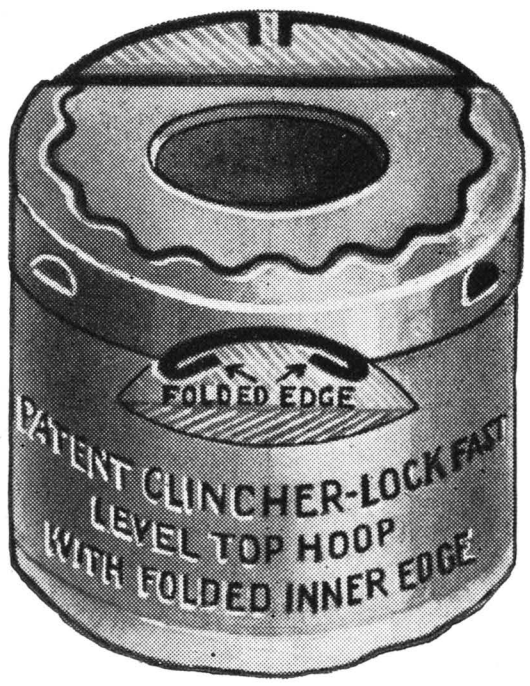

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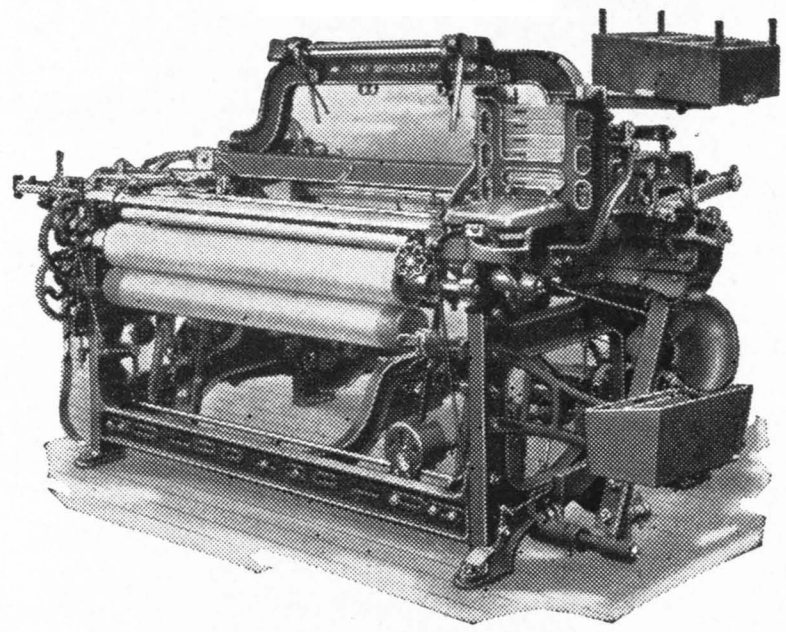

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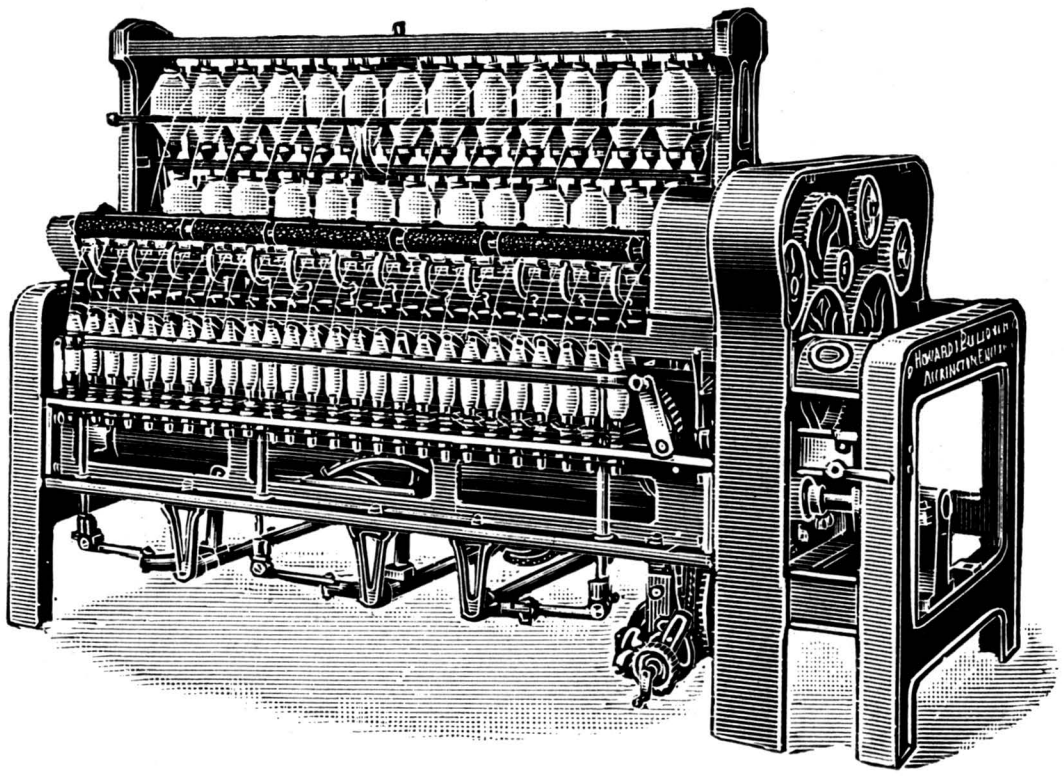

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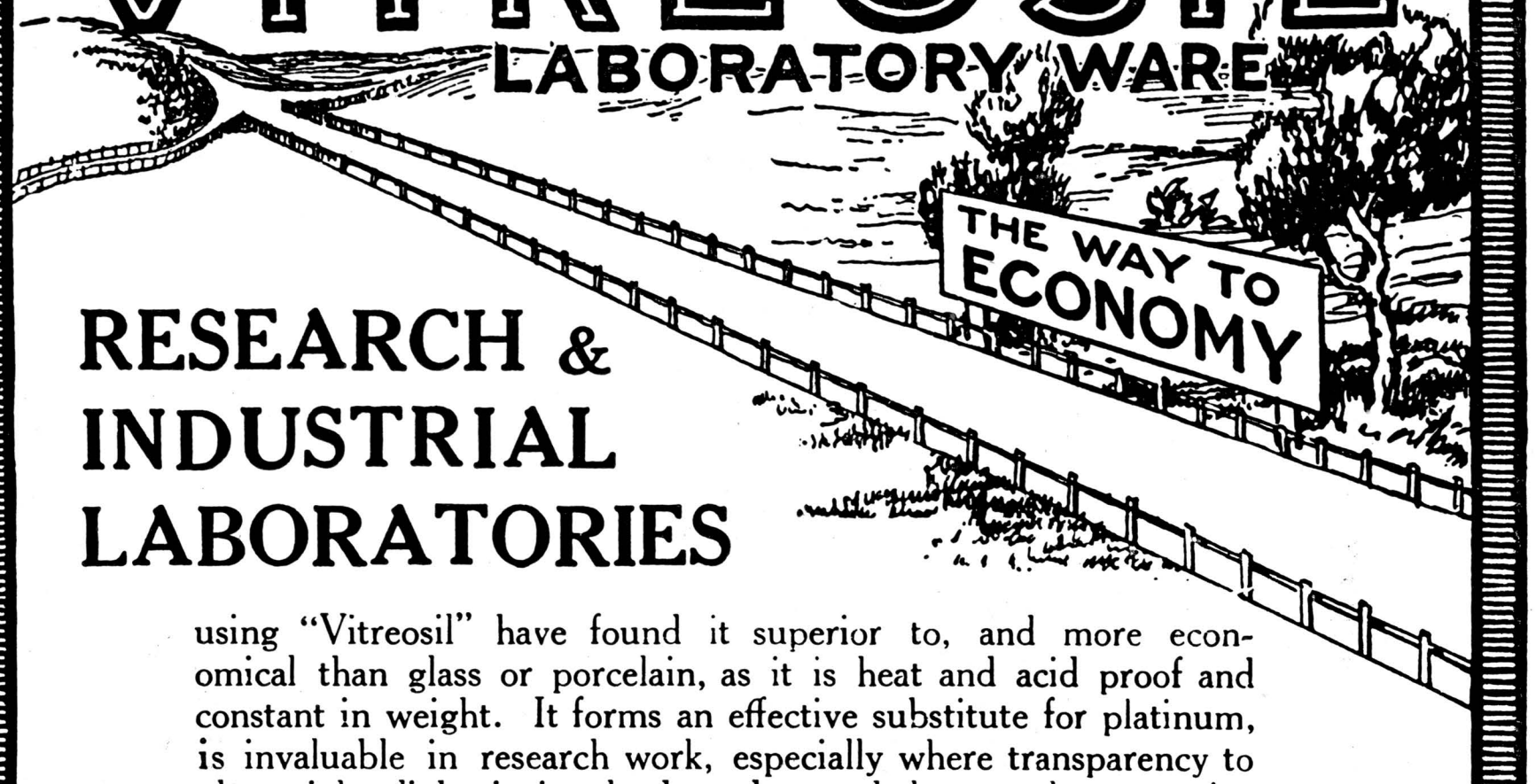

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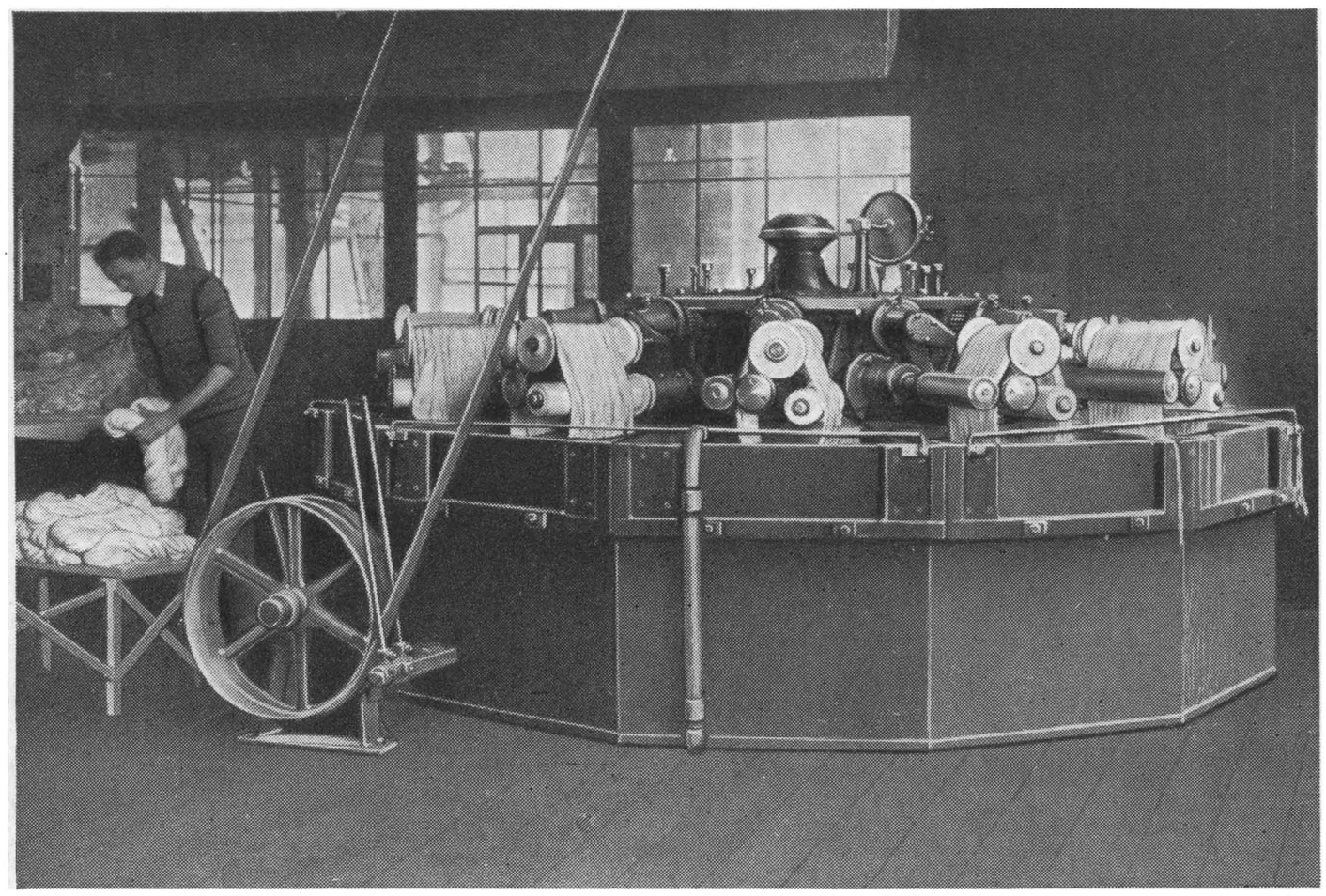

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NOTES—In the references to publications abstracted the name of the publication is followed by the year, Vol., Issue No., or date if necessary, and Page No. (or Nos.).

Literature relating to the composition and manufacture of dyestuffs is not dealt with in the abstracts of this *Journal*.

1—FIBRES AND THEIR PRODUCTION

(C)—VEGETABLE

Cotton: Cultivation in British India. R. C. P. Boone. *Coton et Culture Coton.*, 1929, 4, 235-259; 1930, 5, 17-69, 105-144, 251-264; 1931, 6, 29-46.

A general discussion of the varieties of cotton under cultivation, conditions of climate and soil, methods of cultivation, yields, pests, etc., in the various Provinces and States of British India. C.

Cotton: Cultivation in Arizona. R. S. Hawkins. *Expt. Sta. Rec.*, 1931, 64, 831 (from *Arizona Sta. Bull.* 135, 1930, pp. 553-581).

Cultural, irrigation, and variety tests are discussed. At the Salt River Valley farm the Acala variety had a slight lead over other upland cotton in lint production, whilst Mebane led at Yuma. Pima cotton had the largest gross value of lint per acre by a wide margin at both places after adjustments were made for its extra picking and ginning costs. C.

Cotton: Cultivation in Nyasaland. W. Small and others. *Nyasaland Protectorate Ann. Rpt. Dept. Agric.*, 1930, pp. 6, 12, 15, 28, 35.

The 1930 season was a good one. An increased yield, largely due to planting date propaganda and to the success of the Over-the-top variety in up-country areas is reported. The U4 variety is promising well (bulk sowing of U4 at Makwapala gave 197 lb. of lint per acre), and, although Cambodia may ultimately prove more suitable for Lower Shire and Chikwawa, the mixed bulk U4 grown at the Empire Cotton Growing Corporation stations seems to be all that the country requires. Arrangements are in hand to have mixed bulk U4 in general distribution in 1933 provided conditions and further experience of its behaviour justify it. C.

American Cotton: Variety Tests. P. B. Dunkle. *Expt. Sta. Rec.*, 1931, 64, 735 (from *Texas Sta. Bull.* 417, 1930, 31 pp.).

Comparative tests at the Denton (North Texas) Sub-station during the period 1913-1929 showed the leaders in average acre yields of lint to include Half-and-Half with 283 lb., Sunshine 248, New Boykin 239, Harper 238, and Cliett Superior 236 lb. Half-and-Half had the highest average yield and highest lint percentage,

41·5%, but also had certain objectionable features, such as small bolls and a short staple averaging ¾ in. and untenderable on futures contracts. The better staple varieties such as Sunshine, New Boykin, Harper, and Cliett Superior were big-boll, stormproof varieties with lint percentages ranging from 34 to 39·4 and producing staple of tenderable length averaging $\frac{31}{32}$ to 1 in. The varieties other than Half-and-Half are indicated where suitable prices are paid for their better staples. C.

American Cotton: Variety Tests. H. B. Tisdale and J. T. Williamson. *Expt. Sta. Rec.*, 1931, 64, 735 (from *Alabama Sta. Circ.* 56, 1930, pp. 3).

High-yielding cottons consistently producing a staple of ⅞ in. or longer in North Alabama were Cook 1627, D. and P.L. 4-8, Delfos, and Trice; in Central Alabama, Cook 1627, D. and P.L. 4-8, and Dixie Triumph; and in South Alabama the wilt resistants Dixie Triumph, Cook 307 (Rhyne), and Toole (Council). C.

American Cotton: Variety Tests. P. H. Kime and S. J. Kirby. *Expt. Sta. Rec.*, 1931, 64, 832 (from *North Carolina Sta. Agron. Inform. Circ.* 57, 1931, pp. 6).

Certain strains of Mexican and Cleveland cotton are indicated for light to medium-heavy soils in the Coastal Plain and Piedmont, early light-foliaged sorts, as the Fosters, for heavy and poorly drained sorts in the lower Coastal Plain, and Dixie and Dixie Triumph for wilt-infested soils. The quantity of cotton stapling 1 to $1\frac{1}{16}$ in. consumed by mills located in the South-eastern States far exceeds the production in this region, whilst the domestic demand for short cotton (⅞ in. and under) is very limited. C.

American Cotton: Variety Trials. H. F. Wallace. *Expt. Sta. Rec.*, 1931, 65, 31 (from *Mississippi Sta. Bull.* 287, 1930, pp. 2-14, 19, 20).

Cotton varieties found good for hill land included Cleveland 54, D. and P.L. Nos. 3 and 10, Stoneville 2 and 3, Lone Star, Wilson Type, and Cook 1010, and for valley land Delfos 6102 and its progenies, strains of Lone Star, and Stoneville, Miller, Cleveland 54, Express 121, D. and P.L. Nos. 6 and 8, Roldo Rowden, and Missdel 2. C.

American Cotton: Variety Trials. J. F. O'Kelly and W. W. Hull. *Expt. Sta. Rec.*, 1931, 65, 34 (from *Mississippi Sta. Bull.* 288, 1930, pp. 8).

Varieties of cotton included among the leaders in average acre yields of lint at the station and hill sub-stations during the period 1926-1930 were Cleveland 54, D. and P.L. Nos. 4-8 and 6, Half-and-Half, Delfos, Lone Star, and Wilson Type. Among the leaders in acre value were D. and P.L. 6, Delfos, Cleveland 54, D. and P.L. 4-8, Express, Lone Star, and Deltatype Webber. Red Leaf cotton yielded less than Cleveland 54 or Miller 589. Red Leaf is also objectionable in communities producing pure seed for sale. C.

Cotton Plant: Cultivation and Manuring. E. E. Hall and S. J. Watson. *Expt. Sta. Rec.*, 1931, 64, 629 (from *South Carolina Sta. Rpt.*, 1930, pp. 39, etc.).

The results of cultural and fertiliser trials are indicated. Over a period of years acid-delinted and machine-delinted seed gave better stands and larger yields than undelinted seed. C.

Punjab-American 4F Cotton: Yield Variations. T. Trought. *Indian J. Agric. Sci.*, 1931, 1, 309-350.

A study has been made of the causes contributing to the large variations in yield from year to year of 4F cotton in the Punjab. The variations are due to "failures" in certain years. The symptoms of these failures are described and their possible causes are discussed. Diseases and pests may play a part but are a consequence of other factors and are not initiating factors. The effects of climatic and physiological factors are described and the importance of root development is emphasised. The deduction is drawn that in failure years the overlapping effect of a series of adverse factors operating at comparatively short intervals of time, does not permit of the recovery of the plant before it matures its crop, and results in the failure of the plant to produce properly developed lint and seed. The plant is most susceptible in its early stages, at which time adverse factors are at their maximum. The factors react on root development reducing it from its optimum. The adoption of good agricultural practice will assist in mitigating the effect of these adverse factors, but a complete solution can probably only be obtained by the discovery of a type of plant still more resistant to the severe climatic conditions which prevail. C.

Wilt-resistant Cotton Varieties. D. C. Neal. *Expt. Sta. Rec.*, 1931, 65, 45 (from *Phytopathology*, 1928, 18, 134).

A list, with sources, is given of staple and short cotton varieties showing considerable wilt resistance during trials in 1926 and 1927 and producing well during those tests. Resistant varieties and liberal balanced fertilisation are regarded as the most feasible and economical means of cotton wilt control. C.

Spiny Bollworm Parasite. J. Risbec. *Compt. Rend.*, 1931, 193, 247-250.

A parasite of the spiny bollworm has been found on cotton plants. The appearance of this parasite under the microscope and observations of its life cycle are described. The parasite feeds preferentially on fully-developed bollworms, particularly those which have started to spin their cocoons. C.

Cotton Hair: Effect of Field Conditions on Breaking Load in U.S.A. (Oklahoma). H. J. Harper and others. *Expt. Sta. Rec.*, 1931, 64, 733 (from *Oklahoma Sta. Rpt.*, 1927-1930, pp. 28.....327).

Oklahoma Triumph 44 varied in breaking strength per square inch of cotton cellulose from 30,100 lb. for lint from the poorest land to 40,650 lb. from medium land and 58,100 lb. from good land, indicating that plant food nutrients as well as water are required for quality in cotton. Fibre from fertiliser tests did not show conclusive evidence of quality improvement over checks. Cotton from bottom land was decidedly superior in quality to that from upland soil. Cotton conditioned for 12 hours at 65% R.H. broke from 2,000-3,000 lb. stronger than bone-dry cotton. Five bales picked while the cotton was in its prime graded strict middling with a $\frac{13}{16}$ in. staple and averaged 81,506 lb. breaking strength, whereas five other bales grown under like conditions but picked after several weeks of rain and graded strict low middling with the same staple broke at 77,296 lb. The results showed that cotton left in the field deteriorates, i.e. starts breaking down and becomes weaker. In tests on samples from a number of cottons, the varieties having the longest staple usually were the strongest. Varieties stapling 1 in. and above were stronger than those with a staple less than 1 inch C.

Picked and Snapped Cotton: Spinning Tests. H. J. Harper and others. *Expt Sta. Rec.*, 1931, 64, 733 (from *Oklahoma Sta. Rpt.*, 1927-1930, pp. 28.....327).

Spinning tests on picked and snapped cotton of the 1926 crop indicated that snapping as a harvesting method lowers the grade of the cotton, but no appreciable difference seemed to exist in the strength of the yarns spun from the picked and snapped cotton of the same variety grown under the same conditions. The uniformity of the yarns spun from picked and snapped cotton did not differ significantly, and there was practically no difference in the running qualities of cotton harvested by the two methods. There was a consistent slight decrease in the strength of 22's and 28's yarn spun from the second to the third picking, this decrease possibly being caused by exposure to weather. C.

Cotton: Effect of Ginning on Grade and Staple. D. T. Killough and G. T. McNess *Expt. Sta. Rec.*, 1931, 64, 736 (from *Texas Sta. Bull.*, 416, 1930, 32 pp.).

Cotton of different lengths of staple was ginned from 1926 to 1929 in a two-stand, 70-saw, air-blast gin under varying conditions of saw speed and breastroll density, with and without the use of the standard air-line cleaner to determine the effects of such conditions on the grade and staple. Tests with medium staple cotton (Truitt, $\frac{7}{8}$ to 1 in.) showed in general that the standard air-line cleaner improved the grade of the fibre and the style of ginning, although in most cases by removing the dirt and trash it slightly reduced the lint percentage as compared with cotton not cleaned. The cleaner did not appear to affect appreciably the lint length or the time required for ginning and is deemed a profitable attachment. Increase in the speed of the saws from 640 to 760 and 840 r.p.m., provided the loose breastroll was used, did not seem to affect significantly the grade, lint length, gin cutting of the lint, or the condition of the seed when cottons ranging from $\frac{7}{8}$ to $1\frac{3}{8}$ in. in staple were used. The style of ginning apparently was not affected when the saws were operated at 640 and 760 r.p.m., but at 840 r.p.m. it was slightly lower in a few instances. Increasing the speed of the saws seemed to reduce the time required in ginning when a loose breastroll was used. The loose breastroll generally gave better results with all staple lengths than did medium or tight breastrolls. Increase in the density of the breastroll appeared to lower the grade and the style of ginning, to increase gin cutting, to prolong ginning time, to damage the seed, and in some cases to lower lint percentage. In general, a saw speed of

760 r.p.m., used together with the loose breastroll and the standard air-line cleaner, provided the most favourable conditions for ginning cotton on the air-blast type of gin. C.

Cotton Buds and Bolls: Growth and Development. G. M. Armstrong and W. B. Albert. *Expt. Sta. Rec.*, 1931, 64, 628 (from *South Carolina Sta. Rpt.*, 1930, pp. 39, etc.).

Bolls of the first position on the branch, up to the age of 8 days, were found to be higher in percentage of sugars, dextrins, and starches than comparable third position bolls of the same age. The contrasts were greatest between bolls 2 and 4 days old. The developing seed and lint of bolls at various ages was appreciably higher in percentage of sugars and starches than the boll walls or the pedicels and bracts except when the bolls were nearly mature, the highest percentages of sugars and starches being present when bolls were about 7 to 20 days old. There were no consistent differences in sugar and starch content of leaves adjacent to the above bolls. The walls of bolls of various ages were lower in sugar and starches than the growing seed and lint during the first 11 to 13 days; from then on the percentages of sugars and starches increased, and at the age of 40 to 45 days the boll walls contained higher percentages of sugars and starches than the nearly mature seed and lint. The pedicels and bracts of young bolls contained lower percentages of sugars and starches than the seed and lint. In a series of defoliation and ringing experiments it was observed that first position bolls grew to a larger average size than did second position bolls. Bolls that had the adjacent leaves removed did not attain as large a size as comparable bolls with the adjacent leaves present. More shedding was noted in bolls on branches that had the ends removed as compared with those on normal branches. All the treatments employed appreciably reduced the final size of the bolls. C.

Cotton Plant: Lint Length Correlations. H. W. Barre and —. Armstrong. *Expt. Sta. Rec.*, 1931, 64, 628 (from *South Carolina Sta Rpt.*, 1930, pp. 39, etc.).

Fibre arrays from all bolls on each of 18 branches from plants grown in the greenhouse showed that there was apparently no correlation between lint length or uniformity and position on the branch from base to tip. A study of the bolls from each of five greenhouse plants having about the same conditions for development showed that there was no regularity in the percentage distribution of the different lengths of fibres under such conditions. Comparisons of bolls from the same relative positions on plants from fertilised and unfertilised field plats showed that fertilisers in this case had no effect on lint length. In general appearance the plants differed markedly, and those on the plat with no fertiliser exhibited decided symptoms of potash hunger. The individual seed from a single lock showed considerable variation in lint length and uniformity. Comparisons on the basis of the smallest percentage of fibres less than one inch showed that the best seed from standpoint of length of lint were 7, 8, and 9, numbered from base to tip of the lock. A difference of seven or eight days in the date of blooming between 14th or 15th August and 22nd August gave bolls from the field with fibres which were noticeably different in length. The earlier maturing bolls had appreciably longer fibres on plants both with and without applications of fertiliser. Comparisons of all bolls in the first position on fruiting branches showed no regularity in lint length or uniformity. C.

Upland Cotton: Biometrical Analysis. F. Griffee, L. L. Ligon, and L. H. Brannon. *Expt. Sta. Rec.*, 1931, 64, 735 (from *Oklahoma Sta. Bull.* 187, 1929, 32 pp.).

Measurements and records were made for 24 characters on 19 cotton varieties in 1926 and 25 characters on 18 varieties in 1927. Correlations were calculated with particular reference to the economically important characters, yield of seed cotton, lint percentage, lint length, and number of bolls per pound of seed cotton. Characters of importance in their association with yield of seed cotton in 1926 were length of stem internode, area of the largest leaf, number of vegetative branches, lint length, lint percentage, and lint yield. The multiple correlation of these characters with yield was $0{\cdot}9421 \pm 0{\cdot}0174$ and without the lint yield $0{\cdot}7661 \pm 0{\cdot}0639$. Characters of interest as to their relations to yield in 1927 were the date of the first flower, the time to mature, area of the largest leaf, plant height, number of squares at first flower, and number of flowers on at 18 days. Their multiple correlation coefficient with yield as the dependent variable was $0{\cdot}9565 \pm 0{\cdot}0134$, and omitting time to mature and plant height $0{\cdot}9423 \pm 0{\cdot}0179$. Characters of

interest as to their association with lint percentage in 1926 were date of first flower, number of bolls on fruiting branches, yield of seed cotton, and lint length. These four characters with the lint percentage as the dependent variable had a multiple correlation of 0·5926±0·1003. Only the date of the first open boll, lint length, and number of bolls per pound were of importance in respect to lint percentage in 1927, the multiple correlation therewith being 0·8379±0·0473. Lint length in 1926 was associated to some degree with height to first branch, yield of seed cotton, lint percentage, weight of 100 seeds, and time to mature. In 1927 only lint percentage and time to mature appeared of importance. Of the five characters in 1926 and nine in 1927 which were important in their associations with number of bolls per pound of seed cotton, the height to first branch, area of largest leaf, weight of 100 seeds, and number of locks per boll were significant in their correlations in both years. The multiple correlation coefficient with the five variables and number of bolls per pound was 0·9936±0·0019 and with the nine variables 0·9272±0·0224. Scatter diagrams for the inter-relations of the characters yield of seed cotton, lint percentage, lint length, and number of bolls per pound for 1927 suggested that these characters are not associated closely except for lint length and lint percentage. In advancing the lint length beyond 1$\frac{1}{16}$ in., evidently a reduction in the lint percentage must be expected. C.

Cotton: Cultivation in India. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 20-27.

The average yields of seed cotton at the Khanewal Farm for 1930 were appreciably better than those of the previous four years. The improved yields are attributed mainly to the decreased intensity of White Fly, and, in part, to the measures adopted to combat the pest on a limited area. The bulk crop during the year was comprised of 289F Punjab-American and the indigenous Mollisoni in the proportion of 84% to 16%. A few hundred acres of 4F Punjab-American were grown for seed purposes. The experiments which in 1929 gave strong indications that cotton yields could be increased by a few hundred pounds per acre both by giving nitrogenous manure to the plants when in full flower and by spraying the plants in the early stage with a rosin-soda solution were confirmed in 1930. In an experiment to determine the maximum yield which might be obtained from a plot of 2$\frac{1}{2}$ acres, irrespective of costs, it was found that by ploughing a crop of Berseem green manure into the land and applying artificial manures at a cost of Rs. 40 per acre, an average yield of 1,804 lb. of seed cotton per acre was obtained, as compared with the farm average of 938 lb. per acre. Under the conditions obtaining at Khanewal in the 1930 season it was found that (1) The percentage of bad opening of bolls in the Punjab-American varieties depended partly on the date of sowing and partly on the natural characteristics of the variety. (2) All American types sown after 15th June were seriously affected by Jassids, but that 4F and 289F were least affected. (3) Some varieties indigenous to India (including Verum, Banilla, and Bani) were unaffected by Jassids and continued to yield heavily, even when sown as late as 3rd July. (4) "U" types from South Africa and "Mesowhite" types from Iraq are so susceptible to White Fly attack that they produced no viable seed from any sowings. C.

Cotton: Cultivation in Uganda. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 35-39.

Owing to adverse weather conditions, jassid, and blackarm, the crop was a poor one, totalling some 125,978 bales on an area which should have yielded, by analogy with the previous year, some 193,855 bales. Work on the multiplication of the strain S.G.29, for which many advantages are claimed, is continuing. C.

Cotton: Cultivation in Fiji. Fiji Legislative Council. *Fiji Agric. Dept. Annl. Rep.*, 1930, pp. 29-35, 1931.

A detailed report of the conditions and crops in Fiji in 1930, and the work of the cotton experiment station. C.

Cotton: Cultivation in Italian Colonies. G. Mylius. *Intern. Cotton Bull.*, 1931, 9, 665-668.

The development of cotton cultivation in the Italian colonies of Eritrea and Somaliland is described. The cotton grown is of the Sakellaridis type and the total crop is estimated at 600-700 tons of lint. C.

Egyptian Cotton: Contamination. W. L. Balls and C. H. Brown. *Intern. Cotton Bull.*, 1931, 9, 700-721.

The improvement in Egyptian cotton produced by the introduction of new varieties and the operation of the seed control law is briefly discussed. The use of the Hindi cotton content as an idea of the degree of contamination of a seed stock is described and curves are given showing the Hindi content of different varieties and the changes in this content in recent years. Target diagrams for lint length and ginning out-turn are also given to show the degree of contamination of various varieties. The usual rate of contamination-increase from one year to the next appears to be of the order of 50%. The problem of the preservation of varieties is discussed and it is pointed out that it is impossible to keep any variety alive in a reasonably uncontaminated condition after the lapse of ten years since its introduction without seed renewal. The choice of new varieties and the justification of varieties are discussed. C.

Cotton Plant: Spacing Trials in Barbados. *Rep. Dept. Sci. Agric., Barbados*, 1930-1931, pp. 52-53.

Double spacing gave a 12% higher yield than single spacing (12 plants instead of 6 per cane hole in a 5 ft. × 5 ft. lining) and a greater proportion ripe in the first two pickings. The yield of seed cotton reached about 1,200 lb. per acre. C.

Cotton Seeds: Disinfection. E. Tilemans. *Chem. Abs.*, 1931, **25**, 3763 (from *Bull. Agr. Congo Belge*, 1930, **21**, 833-837).

A general discussion is given of the causes and effects of cotton diseases. Moist treatment with disinfectants shows that Uspulun and Abavit work positively and Kalmit negatively against sore shin. In the United States the moist methods of treatment are giving way to dusting methods and the use of Ceresan. When Uspulun is used the seeds are soaked in a 0·25% solution of the disinfectant for 4-6 hours. The treated seeds have a more rapid germination and give stronger plants and a more homogeneous growth. To powder seeds with Ceresan, 50 kg. of seeds are shaken with 200 g. of disinfectant. This immunises the seeds against diseases and outside contagions. C.

Internal Boll Disease: Occurrence in South Africa. Enid S. Moore. *Rev. Appld. Mycol.*, 1931, **10**, 519 (from *South Africa Dept. Agric. Sci. Bull.*, 94, pp. 11-18, 1930.

The internal boll disease of cotton associated with *Nematospora gossypii* and *N. coryli* was first observed in South Africa during 1925-1926. Subsequently it was reported from several parts of the Union and from Portugese East Africa. *N. gossypii* is far more common than *N. coryli*, which was found only in one field in the North Transvaal. Four of the ochre or yellowish-green bacterial strains frequently found in unopened decayed bolls, either as a sequel to *Nematospora* infection or independently, were shown by inocculation tests to be capable of attacking both cut and growing bolls and discolouring the lint. Field observations have conclusively established that internal boll disease arises as a result of infestation by the two cotton stainers *Dysdercus fasciatus* and *D. nigrofasciatus*. The insects usually appear in March or April; bolls maturing before this time escape the *Nematospora* infection which becomes increasingly severe on those developing in May and June. Confirmation of the connection between the stainers and the fungus was obtained by experiments on caged plants, and further by the demonstration of *Nematospora* in a living condition within the mouth parts and digestive tract of stainers feeding on infected cotton plants. Seeds of a number of bean varieties, *Bauchinia galpini* and *Sterculia platinifolia* are hosts of the fungi. C.

Old and New World Cotton Hybrids: Sterility. S. Nakatomi. *Japanese J. Bot.*, 1931, 5, 371-383.

Experiments on interspecific hybridisation between Old World and New World cotton are described. Although no work has hitherto been reported regarding the F_1 hybrid when a New World cotton was used as the female parent in the species hybridisation of cotton, crosses were obtained using a New World cotton as the female parent. Development of the F_1 hybrid was much more vigorous than that of the parents, but perfect sterility was observed in the case of its self-fertilisation, and even in that of back crosses or in that of fertilisation with pollen of other varieties. Cytological studies of pollen mother-cells of F_1 hybrid were made and it was found that the chromosome behaviour in meiotic division was quite

irregular. The perfect sterility of the F_1 hybrid was found to depend on the formation of abortive germ cells. C.

American Cotton Crop: Forecasting. *See* Section 10.

Cotton: Cultivation in Fiji. *See* Section 10.

Cotton: Cultivation in Iraq. *See* Section 10.

Cotton: Cultivation in Nigeria (Northern Provinces). *See* Section 10.

Cotton: Cultivation in Nigeria (Southern Provinces). *See* Section 10.

Cotton: Cultivation in Nyassaland. *See* Section 10.

(D)—ARTIFICIAL

Cellulose Acetate Rayon: Wet Spinning. F. Ohl. *Rayon Rec.*, 1931, **5**, 443-447.

A general review is given of the development of baths and methods for the wet-spinning of cellulose acetate rayon. The extensibility of the wet-spun product is usually much less than that of the dry-spun rayon, but it can be improved by the addition of cyclohexanol, etc., to the bath. On the other hand, the wet-spun thread is much more truly elastic. C.

Breda Rayon Package. N. V. Hollandsche Kunstzijde Industrie, Breda. *Textilber.*, 1931, **12**, 515-516.

Further details and illustrations are given of the new "Spulkranz" method of packaging rayon. The "Spulkranz" or cross-wound cake, is removed from the spinning pot, washed, desulphurised, bleached, dried, and further processed without being converted into hank form. A special winding device of simple construction is supplied for winding from this type of package. Each package contains about 125 g. of rayon in continuous, knotless length; for 75 denier rayon the length is 15,000 m., for 120 deniers, 9,000 m., and for 150 denier, 7,500 m. The thread-breakage in winding is less than one-tenth of that experienced in winding from hanks. C.

Cellulose Acetate Rayon: Production. F. Ohl. *RUSSA*, 1931, **6**, 1097-1105.

The processes involved in the production of cellulose acetate rayon are outlined and various simplifications and improvements which provide reductions in the number of operatives and in costs of production, together with increases in the quantity and quality of the product are described. C.

Rayon Spinning Frame. C. Hamel A.-G. *RUSSA*, 1931, **6**, 1105-1107.

In the usual type of rayon spinning frame with two rows of bobbins one above the other, and one bath for the two jets, differences in the two threads are caused by differences between the distance from jet to bobbin in the two cases. In the new frame a separate spinning bath is used for each jet and these are arranged so that the depth of the jet below the liquid surface and the distance between the jet and the bobbin are the same for both sets. Reserve bobbins are attached to the supports and are brought into position when required by rotating the supports. C.

Cellulose Acetate Rayon: Production. F. Ohl. *Kunststoffe*, 1931, **21**, 198-201.

The production of cellulose acetate rayon of reduced lustre, the disadvantages of the stretch-spinning process for this type of rayon, and the production of hollow-filament cellulose acetate rayon are discussed and the related patent literature is reviewed. C.

Cellulose Acetate Rayon Spinning Solution: Effects on Properties of the Filament. F. Ohl. *Seide*, 1931, **36**, 320-324.

Various substances were added to acetone solutions of cellulose acetate rayon before spinning and the strength, total extension and elastic constituent of the extension of the resulting rayon were determined. Additions of ethyl ether, methylene chloride and benzene produced increases in strength and decreases in total and elastic extensions. With other volatile organic substances decreases in strength and elastic extension constituent and increases in total extension were observed, the effects being more marked the higher the boiling point of the added substance. The effect was also proportional to the amount of solvent mixture remaining in the rayon. Removal of the residual solvent material by drying in a vacuum produced an increase in strength in all cases and restored the extension figures practically to the values for rayon produced without additions to the spinning solution. The additions were found to affect the shape of the rayon cross-sections. In the case of water-soluble additions it was found that

ferrous sulphate, sodium and ammonium chlorides had an unfavourable influence on the properties of the rayon while calcium lactate, lithium chloride, ammonium acetate and calcium chloride had advantageous effects. Zinc chloride, ammonium thiocyanate and calcium thiocyanate produce reductions in strength. Calcium lactate, calcium chloride and lithium chloride increase the stability of the rayon to boiling. The addition of oils to the spinning solution produces a small reduction in strength, an increase in total extension with very little influence on the elastic constituent, increase in resistance to boiling and decrease in the lustre of the rayon. Softening agents have a greater effect on the strength but no effect on the lustre of the rayon. Additions of insoluble salts and resins produce considerable decreases in the strength and extension, and also in the lustre and resistance to boiling of the rayon. C.

Cuprammonium Rayon Spinning Apparatus. Société Cuprum. *RUSSA*, 1931, 6, 1251-1255.

In the usual stretch-spinning process the thread emerging from the spinning funnel is surrounded by a jet of coagulating liquid which mixes with the hardening bath unless the thread is caused to change its direction before entering the latter. This difficulty may be avoided by surrounding the funnel orifice by a funnel-shaped tube with a narrower orifice at the lower end and a side tube at the level of the spinning funnel orifice. This arrangement acts as a syphon and the liquid is drawn down the side tube. The thread from the tube can then be passed directly to the hardening bath. Various arrangements are shown diagrammatically. C.

Rayon Spinning Pot: Optimum Rate of Revolution. *See* Section 10.

Patents

Cellulose Acetate Rayon Spinning Machine Bobbin Changing Device. Firma Scientifil. *Kunstseide*, 1931, 13, 253-254 (from G.P.521,566 of 31/7/1928).

The device has been designed for use in the dry spinning of acetone solutions of cellulose acetate. For each spinning nozzle there are supplied a fixed thread guide, a roller to drive the bobbin by friction, and a rod around which swing two bobbin carriers. One bobbin is brought into position against the driving roller and the two are moved to and fro below the thread guide to obtain regular winding over the whole length of the bobbin. When the first bobbin is full the second is swung into position against the driving roller and the full bobbin is swung back and replaced by an empty bobbin. The spinning process thus continues without the reduction in speed which is required when the bobbins are changed by hand. C.

Fine-filament Cellulose Acetate Rayon: Production. H. Suter. *RUSSA*, 1931, 6, 1325-1329 (from F.P.696,306).

The fineness of cellulose acetate rayon may be increased by subjecting it to a drawing process while passing through a bath of swelling agents such as methylene chloride, chloroform, tetrachloroethane or mixtures of these substances. Rayon with filaments of 1 or 0·5 denier can be obtained by stretching that with filaments of 2 to 10 deniers in this way, and filaments of 10-20 deniers can be stretched to 5 to 2 deniers. The stretching is accompanied by an increase in tensile strength and a certain reduction in extensibility. The cross-section becomes more regular and the rayon acquires an appearance more nearly resembling that of silk. The process does not cause any sticking together of the filaments. C.

Nitro Rayon: Spinning. J. Delpech and C. Heinrich. *Chem. Abs.*, 1931, **25**, 3168 (from F.P.698,423 of 5/7/1930).

A rayon of very fine strand is made by partially dehydrating nitrocellulose by means of 70% methyl alcohol, dissolving the partially dehydrated nitrocellulose in methyl alcohol, and spinning this collodion into 10-40° methyl alcohol at a temperature not below 25°. C.

Rayon Cakes Wet Treatment Apparatus. M. Schoenfeld. *RUSSA*, 1931, 6, 1321-1325 (from F.P.700,062).

The rayon cakes are placed over a central rod, one above the other, in a bath of the liquid with which the rayon is to be treated. The rod is provided with adjustable radial arms which hold the cake in such a way as to leave an annular space between the rod and the rayon. A cover is placed over the top cake and this space is connected to a suction tube so that the liquid is drawn through the rayon cakes from the outside. Alternatively, the central rod may be perforated

and hollow and connected with a suction tube. In another form the cakes are supported by a system of rods arranged octagonally and the liquid is drawn through the rayon to the central space as before. C.

Viscose: Continuous Production. L. E. Barbisan. *RUSSA*, 1931, 6, 1319-1321 (from F.P.700,710).

The cellulose in the form of a ribbon unwinds from a bobbin and passes through mercerising alkali to sets of rollers which press out the excess liquid and then break up the material into pieces. The pieces fall into a rotating cylinder containing sharp bodies where they are reduced in size. From the cylinder the alkali cellulose falls on to an endless band which carries it through a chamber containing carbon disulphide vapour. C.

Artificial Bristles, Horsehair, and Heavy Filaments. British Celanese Ltd. (London). E.P.342,340 of 29/10/1929.

Artificial bristles, horsehair, and similar heavy filaments are produced by extrusion of solutions containing organic derivative of cellulose and a resin either by the dry or wet spinning processes. Specifications 317,456/7, 318,630/1, and 318,643 are referred to. T.

Cellulose Ethers. A. Wacker Ges. fur Elektrochemische Industrie Ges. (Munich). E.P.342,391 of 8/11/1929.

The viscosity of cellulose ethers is diminished without degradation or change of solubility by heating with dilute aqueous mineral acid or with an aqueous solution of an acid salt, with exclusion of swelling agents or solvents, or by heating with dilute or concentrated aqueous acetic acid in the absence of a hydrolysing, depolymerising or degrading agent. T.

Cuprammonium Rayon: Manufacture. Heberlein & Co. A.-G. (Wattwil, Switzerland). E.P.347,810 of 7/3/1929.

Artificial fibres are produced by spinning a cuprammonium solution of cellulose into a precipitating bath consisting of a solution of a caustic alkali of concentration usual for mercerisation (i.e. a solution of at least 15° Bé.) cooled to a temperature substantially below 0° C., for example —5° C. According to a modification of the process, the above precipitating bath is used as the first or second bath in a two-stage process, the other bath comprising a dilute alkali solution. C.

Rayon Spinning Apparatus. Novaseta A.-G. Arbon (Arbon, Switzerland). E.P.347,878 of 11/7/1929.

Artificial threads are made by a stretch-spinning process in which the threads pass in a substantially vertical direction through a vessel supplied with liquid which causes preliminary coagulation, and subsequently in a substantially vertical direction through at least one other vessel supplied with a coagulating liquid different from that supplied to the first vessel, and so arranged with respect to the outlet of the first vessel that liquid flowing through this outlet does not enter the further vessel. In the production of cuprammonium rayon, for instance, the first liquid may be alkaline and the second liquid acid in reaction. The coagulated thread may also travel vertically through one or more vessels through which washing liquid flows. The vertical direction of the threads leads to considerable saving of space, especially if the several treatment vessels are placed one above another. The axis of the draft roller may be placed normal to a row of spinning vessels. C.

Coloured Artificial Fibres: Manufacture. C. Baillod (Basle, Switzerland). E.P. 348,094 of 3/11/1928.

Artificial textile fibres coloured fast to light are obtained by preparing by dispersing means, a suspension of a pigment in a solution of a product capable of being spun, the grains of pigment being made sufficiently small to be embedded in the fibre to be obtained, and then subjecting the coloured solution to the spinning operation. The dispersion is preferably obtained by means of a colloid mill or super-crusher. Organic dyestuffs fast to light, such as vat dyestuffs, may be used instead of mineral pigments. C.

Rayon Spinning Apparatus. S. Wild (Basle, Switzerland). E.P.348,168 of 9/1/1929.

In the production of rayon by the dry-spinning method, the temperature of the spinning solution up to the time that it leaves the spinning nozzles is controlled by means of a heat exchanger through which cooling fluid is caused to flow in

relatively large quantities and at a constant initial temperature which is not more than 2° C. below the desired temperature of the spinning solution. The cooling fluid may be water or brine. The apparatus is described. C.

Matt Viscose Rayon: Manufacture. Breda-Visada Ltd. (Littleborough) and R. O. Jones. E.P.348,743 of 27/2/1930.

Rayon of reduced lustre is obtained by adding to the viscose to be spun a non-glyceridic ester of animal or vegetable origin which is resistant to saponification by the alkali contained in the viscose. Suitable esters are lanoline, sperm oil, carnauba wax or beeswax, and these may be added in a proportion of 1% or less calculated on the viscose. The addition may be made either to the viscose just before spinning or to the carbon disulphide used for xanthating. The use of blown oils is excluded. C.

Matt Viscose Rayon: Manufacture. Naamlooze Vennootschap Hollandsche Kunstzijde Industrie (Breda, Holland). E.P.348,910 of 25/10/1929.

In the manufacture of rayon of reduced lustre by spinning viscose in which an immiscible dulling agent, which undergoes little or no saponification, has been emulsified, the emulsifying agents employed are the derivatives obtainable from saturated or unsaturated hydroxy fatty acids by the elimination of water. A suitable emulsifying agent is prepared by heating ricinoleic acid to 100° C. or more, preferably in the presence of sulphuric acid. The dulling agent, which may be an unsaponifiable oil or wax or a hydrocarbon, may be emulsified in the viscose or added to it as a preformed emulsion. The use of paraffin oils, hydro-aromatic hydrocarbons and chlorobenzene as dulling agents is referred to. C.

Cellulose Carboxylates: Manufacture. I.G. Farbenindustrie A.-G. (Frankfort, Germany). E.P.348,931 of 11/7/1929, 348,959 of 18/7/1929, and 348,960 of 19/7/1929.

The solutions obtained by esterifying cellulose in liquid sulphur dioxide, as described in E.P.301,036, are worked up into artificial fibres or films (1) by dry or wet spinning or extrusion processes without first isolating the celluolse ester, or (2) by a combined dry and wet spinning or extrusion process without first isolating the ester. The process of E.P.301,036 is modified in that the reaction is carried out under an increased pressure above that due to the use of the liquid sulphur dioxide. The additional pressure may be obtained by the introduction of an inert gas, such as compressed air or nitrogen, and a limited quantity of an oxidising agent, such as is described in E.P.343,655 may be present if desired. C.

Artificial Fibres. I.G. Farbenindustrie A.-G. (Frankfort-on-Main). E.P.348,959 of 18/7/1930.

The solutions obtained by esterifying cellulose in liquid sulphur dioxide are worked up into artificial fibres by a combined dry and wet spinning or extrusion process, without first isolating the cellulose ester. An example is given in which the coagulation of the more or less swollen threads, comprising cellulose acetate 50, acetic acid 33, water 12, and a catalyst 5% is then completed in a bath of water or a salt solution or an organic coagulant, and the threads are wound, bleached, washed, and dried. T.

Albuminoid Rayon: Manufacture. British Celanese Ltd. (London). E.P. 349,220 of 19/4/1929.

Filaments, threads, yarns, bristles, and other articles are formed by dissolving natural silk in an acid, imparting to the solution the desired shape and subjecting the solution to the action of a precipitating agent comprising one or more alcohols, e.g. methyl or ethyl alcohol. A strong acid is preferably employed, but not sufficiently strong to impair the silk at the temperature employed. Sulphuric acid of 25-75%, syrupy ortho-phosphoric acid, and hydrochloric acid are specified. C.

Rayon Spinning Apparatus. Barmer Maschinenfabrik A.-G. (Barmen, Germany). E.P.349,236 of 29/4/1929.

Rayon is collected in a centrifugal spinning pot in the form of a uniform conical cake having a constant degree of conicity. For the subsequent after-treatment, the cakes may be supported on rigid conical bobbins, or the wet treatments may be carried out whilst the cakes are in the spinning pots and other treatments such as drying and further twisting may be performed with the cakes supported on the conical bobbins. The conical cakes are obtained by employing spinning pots of

considerable conicity and a thread guide-tube which moves up and down with a speed adjusted so that the conicity of the interior and surface of the cake formed remains constant however thickly the cake is wound. C.

Viscose Rayon: Desulphurising and Bleaching. W. H. Francke (Aarau, Switzerland). E.P.349,367 of 22/7/1929.

The rayon is treated in a bath or baths containing available oxygen. It may be desulphurised and partly bleached in a partly spent bath and the bleaching be completed in a fresh bath. In an example, the rayon is treated at 60-70° C. in a partly spent bath containing hydrogen peroxide and sodium silicate, rinsed, and treated at the same temperature in a fresh bath containing the same reagents; the bleached product is weakly acidified and washed again. C.

Albuminoid Rayon. I.G. Farbenindustrie A.-G. (Frankfort, Germany). E.P. 349,387 of 31/8/1929.

The patent refers to E.P.339,089 and consists in spinning a phosphoric acid solution of silk fibroin into two successive coagulating baths, the first having a slower action than the second. The first bath contains chiefly alkali salts of mineral acids, whilst the second bath contains one or more alkali salts of lower fatty acids. Alkali salts of hydroxy or keto acids may be added to one or both baths. After leaving the second bath, the filaments are given a long air travel without stretch and are then stretched 5-8 times and afterwards washed on the spool, soaped, and dried. C.

Matt Viscose Rayon: Preparation. Lustrafil Ltd. (Nelson) and S. W. Barker. E.P.349,658 of 6/3/1930.

Filaments of reduced lustre are prepared from viscose which is mixed with a preformed emulsion of a chlorinated aliphatic hydrocarbon without any difficultly soluble or insoluble substance. The emulsion is prepared with the aid of soluble protective colloids as emulsifiers, e.g. agar-agar, gelatins, or gum arabic with or without a wetting agent such as soap or a sulphonated oil; alternatively, the chlorinated aliphatic hydrocarbon is taken up in dry starch and the mixture obtained is suspended in water. C.

Rayon Dry-spinning Apparatus. I.G. Farbenindustrie A.-G. (Frankfort, Germany). E.P.349,793 of 13/6/1929.

Apparatus in which a ring of spinning orifices is employed comprises means for guiding the evaporative medium into or from the cylindrical bundle of filaments in a direction radially across the filaments. This prevents the space in the interior of the ring of filaments from being saturated with solvent vapour and enables the evaporative medium to be led between the filaments in close proximity to the places where they leave the nozzle. C.

Artificial Fibre Preparing and Spinning Machinery: Coating with Cellulose Acetate. British Celanese Ltd. (London), W. A. Dickie, and F. C. Hale. E.P.349,990 of 3/1/1930.

In preparing or spinning yarns from artificial fibres, the machine parts over or near to which the material passes whilst in a substantially untwisted state are made of or covered with cellulose acetate or other cellulose derivative to prevent attraction towards these parts of the fibres which have become electrified during the preparing or spinning operation. The machine parts specified for treatment in this way are the calender rollers and guide funnel of a carding engine, gill box, or drawing frame and the top of the can into which the sliver is coiled, the doffer-knife shaft in a carding engine, and the lower roller of the last pair of drawing rollers in a drawing or slubbing frame. Whilst constructing or coating the other parts with cellulose acetate as described, the difficulty may be removed in the case of the doffer-knife shaft by applying a neutralising charge to it. C.

Coalesced Filament Rayon Yarns: Spinning. British Celanese Ltd. (London) and W. I. Taylor. E.P.349,999 of 26/1/1930.

In order to cause the individual filaments of a bundle of artificial filaments to merge together to form a single filament of larger cross section, the associated filaments either before or after the initial association or adherence, while they are still in a sticky or tacky condition, are subjected to stretching. The resulting filament has in general a round cross section and a smooth or comparatively smooth surface, although these may vary somewhat depending on the condition of stickiness and the extent of the stretching. Details of the method and apparatus are given. C.

Matt Viscose Rayon: Manufacture. A. König (Munich, Germany). E.P.350,391 of 30/11/1928.

Viscose rayon exhibiting a dull gloss similar to that of natural silk is made by the addition of alkaline-earth sulphates in a finely divided state either to the spinning solution or to the raw materials from which it is made. Barium and strontium sulphates are suitable. C.

Viscose: Preparation. I.G. Farbenindustrie A.-G. (Frankfort, Germany). E.P.350,397 of 3/12/1928.

A mixture of alkalised cellulose and excess lye containing at most 25% of cellulose is sulphidised without previously removing the excess lye and the sulphidised mass is diluted, if desired, to the required cellulose content and viscosity. It is stated that a completely clear viscose may be obtained in a few hours, and by selecting the concentration of lye at the beginning of the process, the viscosity of the product may be varied within wide limits without the usual step of ripening the alkali cellulose. C.

Viscose: Continuous Preparation. F. G. C. Klein (Frankfort, Germany). E.P. 350,515 of 14/2/1929.

The materials, starting with cellulose, are led in continuous uninterrupted working operation through apparatus in which the steps, consisting first in the preparation of alkali cellulose, then in sulphidising, and finally in obtaining filtered and deaerated viscose, are carried out continuously and in sequence on the moving materials. C.

Centrifugal Spinning Pots. British Thomson-Houston Co. Ltd. (London). E.P.350,840 of 13/9/1929.

The upper portion of a centrifugal spinning pot is made of twisted spinnable fibres, such as hard twisted cotton or linen cord, extending circumferentially and united by a resinous compound which is converted by heat or heat and pressure into an infusible, insoluble material. The lower portion is moulded from a resinous compound and a filling substance; it may be reinforced by cord material. The lower part is shaped so that the moment of inertia about the vertical axis is greater than that about the horizontal axis through the centre of gravity. C.

Centrifugal Spinning. Compagnie Generale d'Electricité (Paris). E.P.350,855 of 24/10/1929.

Centrifugal boxes or pots for rayon are formed from a mixture of natural or synthetic rubber, sulphur, and synthetic resins. The resin is introduced into the mixture of rubber and sulphur on a hot rolling mill and the paste thus obtained is moulded and vulcanised. C.

Crimped Viscose Rayon: Preparation. Algemeene Kunstzijde Unie N.V. (Arnhem, Holland). E.P.350,863 of 12/11/1929.

Viscose rayon in the form of strands having a curled or crimped appearance is obtained by uniting two or more bundles of freshly spun filaments which shrink unequally. Thus, two or more varieties of viscose may be spun into the same spinning bath and the coagulated threads introduced together into a spinning pot. Alternatively, two or more different spinning baths may be employed with the same varieties of viscose. When different viscoses are employed these may be of different degrees of ripeness or of different composition. When different spinning baths are employed they may be of different composition, length, or temperature. Different varieties of viscose may further be associated with baths of different length. C.

Coloured Cellulose Esters and Ethers: Preparation. L. Clement and C. Rivière (Pantin, France). E.P.350,894 of 12/2/1930 and 350,924 of 11/2/1930.

(1) For the direct production of coloured artificial fibres, filaments, and threads having a basis of organic esters of cellulose or of cellulose ethers there is employed for the preparation of the spinning solution a cellulose ester or ether which has been previously coloured by intimate contact with a mineral pigment reduced to powder in the presence of a liquid which is capable of being absorbed by the cellulose ester or ether to an extent insufficient to produce any material change of state in the latter. The cellulose derivative, pigment, and liquid are stirred together, after which the cellulose derivative is washed and dried. The coloured materials are fast to washing, light, etc. (2) Water-insoluble organic cellulose esters and ethers are coloured by mixing or stirring the powdered ester or ether and a powdered preformed pigment together in a liquid comprising a solvent for the ester

or ether with a substantially equal volume of water. The coloured ester or ether may be filtered, washed, and dried, and dissolved in an organic solvent to produce coloured solutions suitable for making filaments, etc. C.

Viscose Rayon: Swelling in the Presence of Copper. Heberlein & Co. A.-G. (Wattwil, Switzerland). E.P.350,902 of 8/3/1929.

Viscose rayon is subjected in the presence of a copper compound to a swelling operation by means of a caustic alkali solution of a concentration usual in mercerisation but not exceeding 18%. Viscose may be spun into any known acid precipitating bath to which a copper salt has been added, and the freshly formed threads are then treated with the caustic alkali solution. The viscose may be spun into any known precipitating bath and the threads are passed first through an aqueous solution of a copper salt and then through the caustic alkali solution, or the threads may be passed into a solution of a copper salt in the caustic alkali. The alkali treatment may be carried out at normal or lowered temperatures, or even below 0° C. The threads are subsequently washed and acidified in the usual way and collected in centrifugal boxes or on bobbins. The process is also applicable to finished threads or fabrics made by the viscose process. C.

Rayon Stretch-spinning Apparatus. O. F. von Kohorn (O. Kohorn & Co.) and A. Perl (Vienna). E.P.350,974 of 12/4/1929.

In apparatus of the type described in E.P.317,442 and 319,658, the arrangement is such that the delivery speed of the positively-driven roller exceeds that of the thread collector on which the threads are wound after leaving the bath, so as to compensate for the contraction of the thread in the hardening bath. C.

Rayon Dry-spinning Apparatus. Cellulose Acetate Silk Co. Ltd. (Lancaster) and P. C. Chaumeton. E.P.351,091 of 25/3/1930.

The apparatus comprises a cell of rectangular shape divided longitudinally into two chambers, viz., a heating chamber which may occupy a portion only of the length of the cell, and a spinning chamber which may contain more than one spinning die. The gaseous atmosphere passes through the heating chamber and then into the spinning chamber, in which it travels downwardly in the same direction as the filaments and from which it is withdrawn through a small chamber into a main common to all the cells, and thence to a solvent recovery plant. C

Matt Viscose Rayon: Spinning. Glanzstoff-Courtaulds Ges. (Merheim, Germany). E.P.351,395 of 22/2/1929.

To a viscose containing finely divided insoluble substances, for use in the preparation of matt rayon, there is added a sulphonated fatty acid, such as Turkey red oil, whereby the spinning properties of the viscose are enhanced. In an example, Turkey red oil is added to viscose containing paraffin oil. Such viscose is spun more satisfactorily than viscose containing paraffin oil alone, and the extensibility of the silk produced from it is increased 2·5 to 3 fold. C.

Viscose: Preparation. Vereinigte Glanzstoff-Fabriken A.-G. (Elberfeld, Germany). E.P.351,401 of 26/3/1929.

Viscose is prepared from a low-polymerised cellulose, substantially free from hemicellulose, by a process in which expression, disintegration, and ripening of the alkali cellulose are omitted, the cellulose being treated with all or a part of the necessary caustic soda at mercerising concentration, and the mixture being treated with carbon disulphide and then with water or, if all the caustic soda was not added at the first stage, with caustic soda solution. The cellulose employed has a copper viscosity, determined by a method and apparatus described, of less than 10, preferably of less than 5, and may be obtained by particularly energetic boiling in the manufacture of sulphite pulp, or by particularly powerful bleaching of sulphite pulp or cotton, or from various kinds of grass and straw; cellulose hydrate is also suitable. In any event, the cellulose must be freed substantially from hemicellulose, e.g. by alkaline treatment. The viscometer is of the capillary flow type. C.

Cuprammonium Rayon: Manufacture. O. F. von Kohorn (O. Kohorn & Co.) and A. G. Perl (Vienna). E.P.351,429 of 21/1/1929.

In the cuprammonium process of rayon manufacture, in which the thread is passed from the spinning funnel to a hardening bath comprising acid and salt solutions, deleterious after-effects of the hardening bath are prevented by subjecting the thread to a washing process either directly on coming out or during its

winding on spools or reels, or during its collection in spinning boxes. The nature of the washing liquid is varied with the nature of the hardening liquid, but in general consists of water, salt solutions, or weak alkaline solutions. The washing treatment may be carried out at raised temperatures. The liquid flowing out of the spinning funnel and containing small quantities of ammonia may be employed as the washing liquid. C.

Rayon Spinning Apparatus Thread-guide. O. F. von Kohorn (O. Kohorn & Co.) and A. G. Perl (Vienna). E.P.351,437 of 22/1/1929.

A thread-guide for use in a trough-shaped receptacle containing treating liquid such as the hardening liquid used in the cuprammonium stretch-spinning process, comprises two small plates which are inserted in a base frame or rail and spaced at a definite and preferably adjustable distance apart and preferably so as to be interchangeable. Calibrated distance pieces may be inserted between the plates if desired. The upper ends of the plates may be rounded and bent outwards so as to avoid chafing of the threads. As in general a common acid trough is provided for a whole series of spinning apparatus, the base frame, in order to regulate simultaneously the distance apart of all the thread-guides from the wall of the trough, can be formed as a rail passing through the entire length of the trough, crossways to the direction of the thread. C.

Cellulose Ester Rayon: Manufacture. I.G. Farbenindustrie A.-G. (Frankfort, Germany). E.P.351,438 of 20/12/1928.

Cellulose ester rayons stable to boiling, soaping, and alkali are obtained by spinning an ester containing in addition to acetic acid about 0·2 mol. or more of a fatty acid of molecular weight higher than acetic per molecule of cellulose ester. The rayon is capable of being dyed in a boiling bath. C.

Rayon: Treatment to Modify Elasticity and Strength. W. Harrison (Kilmacolm, Scotland). E.P.351,527 of 25/3/1930.

In order to obtain modified elasticity and strength, a filament or thread formed from cellulose or a derivative or compound is treated so as to change the nature of the outer layers whilst leaving an unchanged or only partially changed core, and then subjected to the action of a medium adapted to swell the core more than the outer layers and thus produce an expanding pressure which will cause the crystallites of the outer layer to be rearranged with their long axes substantially transverse to the axis of the thread. Stretching may be applied before, during, or after this treatment. Viscose may be spun into 20% sulphuric acid, with or without neutral salts such as sodium sulphate, under such conditions as to leave a core of xanthate in the threads, which are subjected to the action of a base such as sodium carbonate or acetate, but not caustic alkali or ammonia. The neutralised threads are washed and passed through a caustic alkali solution not exceeding 20° Tw., or a 1-20% ammonia solution, whereby the core is caused to swell. The threads are then carried through an acid bath and finished in the usual way. Cellulose nitrate or acetate solution may be spun into threads which are converted superficially into cellulose by treating the nitrate with a sulphide solution of more than 10% strength or the acetate with caustic soda lye of similar strength; not more than 50% of the acetate should be converted. A solvent, partial solvent, or swelling agent is then applied, for instance, an aqueous solution of acetone of more than 40% strength. Solvents soluble in water are preferred, e.g. acetone, formic, acetic or lactic acid, or formalin. After the treatment the threads may be insolubilised and purified. The provisional specification states that the invention is applicable to filaments of cellulose ethers or of the compounds described in E.P.264,261, 286,331, and 286,332. C.

Rayon Dry Spinning Cell. British Celanese Ltd. (London). E.P.351,718 of 17/6/1929.

In the production of rayon, ribbons, bristles or the like by the upward dry spinning process, the spinning operation is initiated by spinning the solution into a liquid coagulating bath. Suitable spinning solutions comprise cellulose nitrate, organic esters of cellulose, or cellulose ethers in solution in a volatile solvent such as acetone, mixtures of acetone with water or methyl or ethyl alcohol, or mixtures of methylene chloride with methyl or ethyl alcohol. The coagulating bath used to initiate spinning consists of a non-solvent for the cellulose derivative employed and is preferably of low surface tension. The spinning operation may be carried out in an atmosphere of hot air or other heated inert gas such as nitrogen

or carbon dioxide. For carrying out the invention a spinning cell containing an evaporative medium has at its lower end a spinning nozzle surrounded by a cup-shaped member containing a coagulating bath. After spinning has commenced the coagulating bath is withdrawn, for example, by draining off the liquid by means of a pipe, or by lowering the cup-shaped member by means of a screw until the level of the liquid is below that of the spinning nozzle. C.

Macarthy Gin Knives: Mounting. Sir W. G. Armstrong, Whitworth & Co. (Engineers) Ltd. (Newcastle-on-Tyne) and B. M. Middleton. E.P.352,197 of 2/6/1930.

In a double-roller Macarthy gin, each moving knife is mounted on arms at each end of the beater shaft, the arms being angularly adjustable with respect to the shaft to permit separate adjustment of each knife. C.

Matt Rayon: Spinning. Courtauld's Ltd. (London) and C. Diamond. E.P. 352,412 of 7/4/1930.

Artificial threads or filaments of reduced lustre are obtained by dry-spinning a solution of an organic ester of cellulose containing a small proportion of a monohydric aliphatic ester of a higher fatty acid such as stearic, palmitic, or oleic acid and subsequently treating the threads or filaments with an aqueous soap solution at or near the boiling point. In an example, a cloth woven from filaments produced by dry-spinning a solution of cellulose acetate to which a small amount of amyl stearate has been added, is boiled in a green olive oil soap solution, washed and dried. C.

Artificial Horsehair, Strips, and Ribbons: Manufacture. G. B. Ellis, London (Soc. pour la Fabrication de la Soie Rhodiaseta, Paris). E.P.352,414 of 7/4/1930.

Artificial horsehair, strips or ribbons of high flexibility are produced by leading a large number of elementary filaments through a solvent or swelling agent at such speed that the thread is softened at the outer surface only, so that a welding of the filaments takes place through a small thickness of the thread, the filaments within the sheath so formed retaining their individuality. The process may be combined with the spinning of the threads themselves, the agglomeration being carried out on the threads, which may be twisted or not, after they have been completely freed from solvent. In the production of strips or ribbons, a bundle of untwisted filaments may be assembled in the desired form prior to agglomeration, or a number of twisted threads may be placed side by side and subjected to the agglomeration process. The solvent or swelling agent may contain substances in the state of solution or emulsion, such as gums, resin, copal, colouring matter, or small quantities of the cellulosic product which constitutes the fibre or other cellulosic product, and it may be varied to obtain particular effects such as matt or lustrous effects. Bronze or aluminium powder or other pigments may be introduced into the yarn before agglomeration and preferably after a preliminary passage of the yarn through a bath consisting of a suitable gum, resin, varnish, or the like. If desired, these pigments may be fixed to the surface of the horsehair after the agglomeration of the yarn and when the yarn still contains a small quantity of the solvent or swelling agent. A pigmented product may also be obtained by emulsifying the pigment with the solvent or swelling agent and, if desired, a binding agent such as copal or resin. C.

Cellulose Ester and Ether Rayon: Treatment to Improve Strength. K. Weissenberg and B. Rabinowitsch (Berlin). E.P.352,445 of 18/2/1929.

The tensile strength of artificial threads and films made from cellulose esters or ethers is improved by treatment of the finished threads, etc., with a neutral organic swelling medium capable of producing a highly swollen condition of the thread, etc., and a high degree of plasticity therein, and whilst maintaining contact with the swelling medium applying a gradual stretch to the thread or film until its length is increased to 200% up to several thousands per cent. of its original length. In addition to the increase of tensile strength which is evidenced by an improved X-ray structure, the threads, etc., are simultaneously fined, and by reason of this it is possible to make fine strong threads from relatively coarse and cheap intermediate products. A suitable swelling medium for cellulose acetate rayon is 50% aqueous dioxane and the treatment may be applied to such rayon as prepared from spinning solutions containing dioxane. The improvement in the threads is assisted by the application of lateral pressure

before, during, or after the simultaneous swelling and stretching operations. The gloss and feel of the threads depend on the character of the after-treatment, for example, according as they are washed with hot or cold water, methyl alcohol, or sodium sulphate solution. The process may be applied to single threads, twisted thread bundles, threads in the form of hanks, or even to fabrics without any sticking together of the individual filaments taking place. C.

Artificial Mineral Fibres and Threads. W. Ludke (Stettin, Germany). E.P. 352,681 of 13/6/1930.

Artificial asbestos-like mineral fibres are obtained from water glass, ammonium silicate and similar soluble silicates and silicate mixtures by spinning into suitable coagulating liquids and gases. The devices and processes used are such as are employed in the artificial silk industry. T.

Imitation Wool: Manufacture. M. J. Dassonville (Vérien, France). E.P.352,692 of 26/6/1929.

Artificial filaments resembling natural wool are obtained by performing in substantially immediate sequence a process which produces nodules in a filament issuing from a spinneret and a process which waves or crimps the noduled filament after the initial coagulation. The nodules or variations in the section of the thread are obtained by rapidly varying the supply or pressure of the cellulosic solution fed to the spinneret. Spinning solution passes from a pump through a pulsation device to the spinneret. The thread is coagulated and passed round a wheel to a waving device which comprises a milled wheel rotating tangentially to a rubber wheel, and is then received in a container, after which it may be submitted to washing, bleaching, or dyeing operations. If desired, the milled wheel may be internally heated. Instead of employing a milled wheel for the crimping process, the thread may be passed from a large smooth wheel to a small wheel arranged tangentially to the first wheel but not touching it, the adjacent parts of the two wheels turning in opposite directions. The waved effect may also be produced by means of two blades rotating in opposite directions and intermittently striking the filament. C.

Rayon Spinning Apparatus. M. Hölken Ges. (Wuppertal, Germany). E.P. 352,761 of 30/7/1929.

Constancy of pressure at the spinning jets is ensured by interposing between the main supply pipe for the spinning solution and the separate spinning machine a pressure-reducing valve such as will reduce the pressure to a degree slightly above atmospheric pressure and preferably such as to correspond with the pressure drop in the filter. To ensure greater uniformity in titre, the solution is preferably circulated in a closed cycle past a number of spinning points by means of a pump situated beyond the pressure-reducing valve and associated with a loaded release valve. As shown, the spinning solution supplied under a pressure of several atmospheres through a main pipe passes to a reducing valve of the double diaphragm type, and is then circulated by a pump through a closed circuit past the spinning points. The release valve in this circuit comprises a cone valve loaded with a dead weight, the valve spindle being secured to a diaphragm. C.

Rayon Stretch-spinning Apparatus. British Bemberg Ltd. (London). E.P. 352,862 of 7/11/1929.

Apparatus for stretch-spinning rayon by the flowing precipitating liquor method comprises a jacket in which is arranged a smooth conical insertion ending in the outlet tube and provided with apertures which put the interior of the insertion into communication with the interior of the jacket. C.

Centrifugal Spinning Apparatus. International General Electric Co. Inc. (New York). E.P.352,866 of 12/11/1929.

The rotor of the motor of a centrifugal spinning apparatus is arranged so that it can oscillate about a ball-and-socket joint in the geometrical centre of the rotor assemblage, and is guided by two yielding bearings arranged outside the rotor on one side of it. The ball member of the joint is formed on a fixed member and the socket is formed by a hood carrying the inner races of the bearings and separated from the fixed member by a rubber ring. The latter may be replaced by two rubber rings of different degrees of hardness, the softer ring functioning for speeds above the critical speed, and both rings functioning at the critical speed. C.

Artificial Threads and Films: Strengthening. K. Weissenberg and B. Rabinowitsch (Berlin). E.P.352,909 of 7/3/1929.

All kinds of artificial threads and films, whether they be made from solutions of cellulose, cellulose esters or ethers, glue, or albuminous substances, are improved in strength by subjecting the threads and films during the process of spinning, after being brought to a suitably swollen state, to an extensive stretching or drawing. By suitable choice of conditions it is possible to obtain threads having a strength of 500-700 g. per 100 denier and in the use of cellulose esters or ethers to obtain threads exhibiting a crystalline structure. It is also possible to influence the lustre of the products. The swelling agent contained in the threads may be converted into vapour by heat or by vacuum treatment in order to produce "air silk," the expansion which takes place during this process producing an improvement in the extensibility of the threads. C.

Rayon Spinning Apparatus. British Celanese Ltd. and H. Dreyfus (London), E. Kinsella, J. Bower, and W. I. Taylor. E.P.352,922 of 1/1/1930.

The evaporative medium is constrained to pass the vicinity of the spinning orifices solely by means of suction applied to withdraw the medium from the cell, e.g. a draw-off device of the type described in E.P.300,998 and 326,232 serves as a collector device. Additional evaporative medium may be introduced in the vicinity of the nozzle as in E.P.325,233; further, the draw-off device may be combined with the nozzle body and the additional evaporative medium may be introduced through the face of the nozzle in a manner similar to that described in E.P.341,075. The draw-off device comprises a perforated or slitted pipe arranged round the nozzle and corresponding to it in form. C.

Hollow Cellulose Ester or Ether Rayon: Manufacture. Cellulose Acetate Silk Co. Ltd. (Lancaster) and H. C. Curtis. E.P.353,041 of 19/3/1930.

Hollow artificial filaments are produced by dry-spinning solutions of cellulose esters or ethers using spinning dies the holes of which are conical in shape and taper to a greater diameter on the outside face of the die. Suitable dimensions of the dies are 0·05-0·07 mm. in diameter on the inside and 0·09-0·11 mm. on the outside, the thickness of the metal being from 0·4-0·5 mm. The temperature of the gaseous atmosphere in the spinning chamber varies according to the denier of the filament to be spun and according to the spinning speed, the temperature being higher when spinning a filament of high denier and when using a high spinning speed. A preferred spinning solution comprises a 12-35% solution of cellulose acetate in acetone, with or without the addition of diluents such as water or alcohol. C.

Cotton Seed Defibrating Apparatus. A. G. Murdoch and British Cottonseed Products Ltd. (London). E.P.353,358 of 26/5/1930.

In apparatus for defibrating cotton or other fibre-bearing seeds, the defibrating members are streamlined or approximately streamlined in the direction of their motion and are formed or provided with teeth or serrations. The term streamlined or approximately streamlined refers not only to a perfect streamline formation but also to elliptical or oval formations. C.

Rayon Spinning Machine. C. Hamel A.-G. and E. Hamel (Schönau, near Chemnitz, Germany). E.P.353,803 of 5/11/1930.

In machines in which the bobbins upon which the material is wound are arranged in superposed rows, separate spinning troughs are provided for each row and are arranged so that the distance from each nozzle to the level of the liquid and from each nozzle to the axis of the winding bobbins is the same. C.

Cotton Boll Sorting and Cleaning Machine. Société Alsacienne de Constructions Mecaniques (Mulhouse, France). E.P.355,855 of 11/6/1929 and 355,934/5/6 of 5/2/1930.

(1) The patent relates to a machine for separating, prior to ginning, the more or less completely ripened or developed cotton bolls so as ultimately to obtain several homogeneous qualities of fibre, and for effecting preliminary loosening and cleaning of the bolls to facilitate the work and increase the efficiency of the gins. The apparatus comprises essentially an apertured drum rotatable in one direction, a beater within the drum rotating in the reverse direction, means for supplying raw cotton to the drum, means for causing cotton to travel along the length of the drum, and means disposed along the drum for collecting cotton bolls separately

according to their size. The apparatus also includes a duct extending from the outlet of the drum, with means for stirring the cotton within the duct, a grating below the duct allowing the escape of sand, leaves or other impurities. (2) An improvement in the above apparatus comprises forming the drum of spaced rims or pulleys connected by longitudinal members to which are secured strips between which and the pulleys the wooden bars forming the grating are adjustably clamped. (3) In improved driving means for the beater and its rotating drum, the drum and beater are driven in opposite directions by means of a chain and a sprocket wheel keyed on the shaft of one of them, driving through chain and sprocket a sleeve freely rotatable on the shaft and carrying the end of the other member. (4) The drum is provided with two series of independent bars extending in the direction of its length, the two series being differently spaced. The bars of the first half of the drum are of a greater section over a part of their length, this part allowing only sand, leaves, stalks, and other impurities of small size to pass. Further, the drum is enclosed in a metal casing and connected with a hopper divided by a separator permitting the impurities to be collected separately. C.

Cellulose Solution Supply and Storage Apparatus. Société Industrielle de Moy (Paris). E.P.356,182 of 24/6/1929.

Improved apparatus is described for the supply, delivery and storage of colloidal cellulose solutions for the manufacture of rayon, in which use is made of endless collectors in which the colloidal solution travels in a closed circuit for supplying the vats and the mixers and for the delivery from the latter to the filter presses. The apparatus obviates accumulation at any point and subsequent lack of homogeneity of the cellulose solution consequent on the re-entry into the mass of these old accumulated parts. C.

Seed Disinfectant. J. Guillissen and Union Chimique Belge Soc. Anon. (Brussels). E.P.357,443 of 18/12/1930.

The fungicidal effect of insoluble copper salts in the dry state, particularly of the basic carbonate, is increased by the addition of alkaline fluosilicate, particularly sodium fluosilicate. C.

2—CONVERSION OF FIBRES INTO FINISHED YARNS

(A)—Preparatory Processes

Scutcher Room: Rationalisation. M. Mohr. *Leipziger Monats. Text. Ind.*, 1931, 46, 230-232.

Some points from a time study of the manual operations in connection with cotton scutchers are discussed and practical suggestions are made for rationalising the procedure of lap removal, weighing, and disposal, with consequent increase of production and possible reduction of labour. C.

Carding Engine Individual Electric Drive: Application. R. H. Wilmot (for Metropolitan Vickers Electrical Co. Ltd.). *Text. Rec.*, 1931, 49, No. 580, 39-40.

The conditions of speed, inertia, and so forth to be met in driving a card are outlined and the advantages of individual motors are stressed. The power required is about 0·9 to 1·2 h.p., but the inertia of the cylinder is great and although the cylinder speed is not great (160-170 r.p.m.) it is essential to reach full speed in 15 to 20 secs. To meet these conditions, it is frequently the custom to use a motor of 2-2½ h.p. if a belt drive is used, but more recent practice is to use a 1¼ h.p. motor running at 960 r.p.m., with a spur gear drive combined with an automatic centrifugal clutch, or with the somewhat cheaper chain drive. C.

Carding Systems: Modifications to Increase Dirt Removal. (1) L. Schorsch. *Spinn. u. Web.*, 1931, 49, No. 9, pp. 10-16. (2) J. Gilljam. *Ibid.*, No. 26, pp. 1-3; No. 27, pp. 1-3; No. 30, pp. 1-4; No. 31, pp. 1-3; No. 32, pp. 1-4; No. 33, pp. 4-5.

(1) A criticism of Gilljam's references to the rate of carding by the Schorsch-Rieter system and his claims for his own system. (2) A reply and theoretical discussion. C.

Comber Waste Moistening Device. J. Knechtel (Galt Knitting Co. Ltd.). *Text. World*, 1931, 80, 765.

To assist the spinning of comber waste, the author has fixed a spraying device on the intake side of the fan in the trunks conveying the waste to the cards. The device consists of a $\frac{1}{2}$-in. pipe connected by means of a cloth filter to two $\frac{1}{4}$-in. pipes ending in acetylene burner tips. C.

Card Clothing: Manufacture in Belgium. *Revue Text.*, 1931, 29, 1005-1017.

An outline is given of the history of the manufacture of card clothing in Belgium from the end of the eighteenth century. C.

Card Feed Mechanism. Société Châlonnaise Schlumberger. *Revue Text.*, 1931, 29, 1023-1027.

Breaker cards are frequently equipped with a hopper feeder arrangement with a weighing device which stops the feed lattice when a certain weight of material has been deposited in the receptacle. The receptacle is opened at regular intervals and its contents dropped on to the lattice feeding the card. The weight deposited in the receptacle is never exactly equal to the standard and, in order to avoid irregularities in the resulting sliver, the device has been modified in such a way that the time between successive discharges of the receptacle varies according to the excess of the actual amount delivered over the standard, so that the actual amount received by the card in unit time remains constant. The mechanical arrangements are shown in diagrams and explained. C.

Draw Frame: Setting. L. Studer. *Revue Text.*, 1931, 29, 459-461, 597-601, 737-741, and 887-889.

The function of the draw frame is outlined and directions for its erection and setting are given. The causes and prevention of various faults and the general care of the machines are briefly discussed. C.

Draw Frame Sliver Guide. A. Viramont. *Revue Text.*, 1931, 29, 1029-1031.

The guides are provided with funnel-shaped channels equal in number to the number of ends being doubled. The slivers are compressed in their passage through these channels and as they emerge, parallel to each other, a slight lateral compression is exerted to bring them into contact so that the drawing rollers receive a sheet of fibres of uniform thickness. C.

Centrifugal Blowroom Trunk Extractor. J. O. Whitaker (Accrington). *Text. Merc.*, 1931, 85, 399.

A new self-acting nep, leaf, and sand extractor is shown that dispenses with long dust trunks and can be fitted in a small space to horizontal or vertical trunks. The action is centrifugal and the impurities pass through a semi-circular cage that can be set for different kinds of cotton, and fall into a "vacuum space." C.

Spinning Machinery: Improvements. G. H. A. Sington. *Intern. Cotton Bull.*, 1931, 9, 746-752.

A review of recent improvements in the methods and equipment of spinning mills. References are made to the Shirley cage and card. C.

(B)—Spinning and Doubling

Fine Plied Yarns: Twisting. *Cotton (U.S.)*, 1931, 95, 866-867.

Details of the equipments, speeds, productions, cleaning, and oiling schedules, etc., are given for a room of 16 twisters, 224 spindles each, running on 2/36's, 2/50's, and 2/60's combed yarns and a twister room of 12 twisters, 252 spindles each, running 2/30's, 3/30's, 2/36's, and 2/40's combed yarns. C.

Le Blan-Roth Spinning System. H. Langen. *Spinn. u. Web.*, 1931, 49, No. 6, pp. 1-6; No. 7, pp. 1-3.

The author calls attention to the fact that there is no improvement in regularity after the second head of drawing. In the Le Blan-Roth spinning system, fourteen slivers from the card are made into a lap and this is given a single process of high drafting. The subsequent sliver is at least as regular as that obtained by three heads of drawing with $6 \times 6 \times 6 = 216$ doublings. (Figures are given.) In further processing, it is part of the Le Blan-Roth scheme to drop the slubber and roving frames and perform the drafting on an intermediate frame with five lines of rollers. Most high draft spinning systems are capable of completing the spinning, but special reference is made to two Weco systems, one with an elastic roller riding between the middle and back rollers and another with four lines of rollers. Some

suggested layouts and costings are supplied. It is claimed that the reorganisation for a 40,000-spindle mill would pay for itself in about 1¼ years. C.

Rings and Travellers: Selection. A. Viramont. *Revue Text.*, 1931, 29, 455-457, 607-613, 743-745.

The selection of rings and travellers for the spinning of different cottons is discussed and the various types and sizes available are indicated. The fixing and care of rings, and causes and effects of worn rings, are outlined. The advantages of use of separators are pointed out and a device for raising the thread guide automatically is briefly described. C.

Rayon Waste and Staple Fibre: Spinning. *Cotton* (U.S.), 1931, 95, 911-915.

Practical hints are given on the processing of rayon waste or cut fibre. Waste is best converted by a wool comber into a top (the machine being cleaned of grease) and then cut to length. The grid bars of the scutchers should be closed or covered over and the beater speed reduced to 400-500 r.p.m. The laps should be rolled up in brown paper to retain moisture and prevent damage. The mote knives on the card should be covered, the flats set farther away than for cotton, and the front plate set to take out as little flat waste as possible. The cardroom requires more humidity than for cotton (not less than 60%). Short drafts are advocated from scutching to spinning. On the speed frames it is best to keep the twists as low as possible. If old bobbins are used, they should be sandpapered and enamelled; rayon easily "draws out" oil from old bobbins. Mills not equipped for long staple cotton may find it necessary to take all weight off the middle rollers. Double roving should be used. Twist factors as for cotton are satisfactory. The spinning of cut rayon mixed with cotton is also discussed. The cotton should first be carded, the sliver being collected on the floor or in hoppers instead of in the cans. Mixing is then done on the floor or from the hoppers. As an alternative, blending may be done by mixing laps in the finisher scutcher, but a mill with sufficient processes of drawing is recommended to perform the operation at the draw frames. C.

Ring Frame: Power Consumption. G. Wrigley (of J. E. Sirrine & Co., Greenville, S.C., U.S.A.). *Text. World*, 1930, 80, 946-947.

Some tests on the power consumed by the tin-roller shaft, rollers and building motion, spindles, and tapes at different speeds are described and graphed. A calibrated motor was used in most of the experiments but the results are regarded as approximate indications only. In one experiment, different lubricants were tried in adjacent spindle bolsters but without showing any appreciable difference in load between spindle oils of comparable densities. In another test, a brass bobbin was made of the dimensions of an ordinary bobbin, but as heavy as a full bobbin. The extra power required to drive it was only of the order of 1%, from which the conclusion is drawn that if full bobbins do require more power than empty ones, it is because of the friction of the yarn against the air. Certain rough approximations are also made as to the power required by travellers on rings of different diameters. The author calculates that the power loss of the driving motor in a mill is of the order of 12% and that a further 87% is lost as heat on the frames. C.

Ring Frame Cop Building Motion. H. Houot. *Revue Text.*, 1931, 29, 461-463, 615-619, 747-749, and 881-885.

The building of the cop on ring spinning machines and the mechanisms controlling this operation are described in detail. C.

Taine-Burkard-Grün Mule Differential Motion. *Revue Text.*, 1931, 29, 893-897.

This system comprises only one pulley, stopped by drag pieces, for the backing-off, in such a way as to give the desired motion to the tin roller shaft. The differential does not operate during the twisting period as a clutch connects the roller shaft to the rope pulley, which drives it in the same way as on a mule without differential. Diagrams are given and the advantages of the system are discussed. C.

Ring Doubling Frame for Cones. *Kunstseide*, 1931, 13, 297.

The ring doubling frame may be adapted to work with conical cheeses by the addition of suitable thread guide and brake devices. The yarn unwinds over the end of the cheese and passes round a brake or tension device consisting essentially of two glass discs supported on an axis and pressed together by spiral springs.

These devices are mounted on supports which are attached to the upper and lower edges of the creel. C.

Twisting Frame Band Drive. Etablissements Ryo-Catteau. *Revue Text.*, 1931, **29**, 903-905.

A system is described in which one band is provided for each spindle. The arcs of contact made by the band with the tin roller and with the spindle wharve are each 180°. The tension in each band is regulated by a pulley which is controlled by a counterpoise. C.

Durand and Masson Double-twist Twisting or Doubling Frame. D. de Prat. *Text. Mfr.*, 1931, **57**, 326-327.

The insertion of two twists into a thread for one revolution of a spindle is accomplished by the use of a hollow spindle which rotates and is provided with a bobbin or cheese carrier which is kept stationary. The thread is drawn from the package through the axis of the spindle and away from the centre on an arm, then through a fixed thread guide, and so on to a take-up bobbin. In the Durand and Masson frame the spindle holds the stationary yarn carrier by a swivel bearing which allows it to oscillate slightly. The yarn carrier is kept stationary by a simple permanent magnet which is arranged to fall and stop the spindle in the event of any turning of the yarn carrier. The tension of the yarn is regulated by a device above the yarn carrier. The flyer is pivoted on the yarn carrier and its rotation is regulated by a brake and spring. The spindles are of the self-contained gravity type and are driven at opposite sides by the same endless belt. The machine is made in two-tier form with separate control for twist at each stage. The change wheels allow any twist from 1·5 to 108 turns per inch. It is claimed that the frame gives 100 to 150% increased production per spindle, with better quality of thread. Examples of productions are given. C.

Rayon Staple Fibre: Spinning. F. Holden. *Text. World*, 1931, **80**, 1200-1201.

A suggested layout for the spinning of rayon staple fibre on cotton spinning machinery is described and details are given of the arrangements actually used in a series of tests. Curves are given showing the effect of twist on the strength, count, and strength × count product of 24's staple-rayon yarn made from 2·20 hank in the creel, using two doublings and a draft of 21·8. The highest breaking strength was obtained with the twist factors of from 3 to 3·25. In the running of this staple a fairly light feed is required at the opener and a split-lap preventer is essential. Humidity is important. Slackness between the doffer and the calender rollers on the card can be overcome by raising the position of the doffer comb. On the slubber and intermediate, spindle speeds should be lower than those considered normal for cotton. No difficulty was experienced with the rayon at the spinning frame. C.

Bare Spindle; Spinning on——. —. Laurency and MacLean. *Revue Text.*, 1931, **29**, 1151-1157.

A detailed description is given of an arrangement for spinning on the bare spindle in which an alternating vertical motion is given to the spindles in order to distribute the yarn in very elongated spirals on the bobbin. The motion is retarded during the ascent of the spindles and accelerated during descent, and the change from descending to ascending is made without pause or slowing down. The amplitude of this motion of the spindles remains constant but the height and thickness of the layers of yarn which it distributes on the bobbin vary constantly during the formation of the base of the bobbin as a result of a temporary and variable displacement of the rings. The motion producing this displacement ceases to act as soon as the base of the bobbin is finished. The rings, however, continue to receive another rapid displacement of feeble amplitude to accelerate the angular transformation of the yarn when the movement of the spindles changes in direction at the summit of the cone. C.

Le Blan Roth Spinning System: Costing. *See* Section 10.

(D)—Yarns and Cords

Rayon Violin Bow Strings. R. A. Kratochwill (Greeneville, Tenn., U.S.A.). *Text. World*, 1931, **80**, 959.

It is claimed that bows strung with rayon are more durable, require less rubbing with rosin, and give a sweeter tone than horsehair bows. Single or 2- or 3-ply 150 den. Bemberg rayon is used, twisted, and treated with a special solution. C.

Elastic Shoe Lace. C. K. Everett. *Text. World*, 1931, 80, 958.
A recent introduction by the "New Uses" Section of the U.S. Cotton-Textile Institute is a cotton-covered elastic lace for shoes and the like. A special fastening dispenses with knots, bows, or loose ends. C.

PATENTS

Effect Threads : Preparation. I.G. Farbenindustrie A.-G. *Leipzig. Monats. Text. Ind.*, 1931, 46, 217; G.P.496,321.
Effect threads immune to substantive dyes and stable to ironing and to the action of alkalis are obtained by treating alkali cellulose with aromatic acid halides containing a basic or similarly acting group. The fibre, after treatment with alkali, is treated with a solution of the basic sulphonic acid chloride in an organic solvent. Quinone-, dialkylaniline-, alkylaralkylaniline-, dialkylnaphthylamine-, and dialkylbenzylamine sulphonic chlorides are examples of substances particularly suitable for the process. C.

Warping Creel. Constructions Mécaniques du Fresnoy. *Revue Text.*, 1931, **29**, 813-815 (from F.P.694,691).
Two spindles are provided for each tensioning device and thread guide. These are arranged on opposite sides of a rotatable support. When one bobbin is exhausted the support is rotated to bring the full bobbin on the other spindle into position and the ends are joined by the operative. The warping frame is only stopped for a short time for this operation and the empty bobbins are replaced by full ones while the frame is working. In contrast to other types of creel with two spindles to each thread guide, this creel occupies practically the same space as an ordinary creel. C.

Winding Frame Stop Motion. V. A. Pain. *RUSSA*, 1931, 6, 1059-1063 (from F.P.696,662).
An automatic stop motion for winding, reeling, and similar frames is described. When an end breaks or the bobbin or reel from which the yarn is unwinding becomes empty the corresponding eyelet falls, liberating a counterpoise which in turn puts into operation a system of levers that lifts the bobbin from contact with its driving roller and stops its rotation. Diagrams and constructional details are given. C.

Pirn Cleaning Device. J. Staul. *Revue Text.*, 1931, **29**, 819-821 (from F.P. 700,579).
The device is designed to remove the ends of weft from pirns after they are ejected from the shuttle and before they fall into the receiver on looms fitted with automatic changing devices. It consists essentially of a rotating roller provided with projecting needles. C.

Winding Frame Band Brake. Ateliers Schweiter. *Revue Text.*, 1931, **29**, 1165-1167 (from F.P.707,291).
A band supported by a steel foil exerts a braking action on a pulley attached to the axis of the bobbin from which the yarn is unwinding. The foil is connected to a rod over which the yarn passes in such a way that any reduction in the tension of the yarn causes the foil to bend round the pulley and to increase the surface of contact between the band and pulley. C.

Sliver Regularity Tester. M. W. Sadow. *Revue Text.*, 1931, **29**, 1161-1163 (from F.P.707,500).
The sliver or roving to be tested passes between two rollers, one of which is fixed while the other moves vertically according to the thickness of the material between them. The latter roller is connected by means of a lever with a pen which moves over a band of paper carried by a revolving drum and produces a continuous record. C.

Yarn Tensioning Device. H. E. Lietaert. *Revue Text.*, 1931, **29**, 1223-1225 (from F.P.707,564).
The device consists essentially of a cylindrical piece of glass or porcelain provided with a channel extending from the centre of the top to a point half way down one side. The yarn passes through this channel. The device is fixed to the creel by means of a screw and spring in such a way that it can be turned round its axis and set at any desired position. The tension in the yarn varies according to the position of the device. A similar arrangement may be used

inside a shuttle to control the tension of yarn unwinding from the pirn, but in this case the inclined channel is replaced by a slot across the top to avoid threading difficulties. C.

Scutcher Lap Moisture Content Measuring Device. Gherzi Textile Development Co. Ltd. *Revue Text.*, 1931, **29**, 1159-1161 (from F.P.707,846).

In order to obtain regular laps in scutching and similar processes it is necessary to adjust the weight of material treated according to the moisture content. The moisture content is determined by means of a balance. A sample of the material is dried and placed in a basket suspended from one end of the beam and the pointer is brought to the zero position by adjusting a slider on the other end of the beam. The sample absorbs moisture from the atmosphere and the pointer moves over a scale graduated to read percentage moisture content directly. C.

Spindle Elastic Mounting. E. Plantrou. *Revue Text.*, 1931, **29**, 1163-1165 (from F.P.707,981).

Various forms of elastic mounting for spindles are described. The arrangements allow the foot of the spindle to oscillate in the guide tube when any exceptional pressure is exerted on the spindle, and to return to its normal position when the pressure is removed. C.

Combing Machines. P. Clough and H. Proctor. E.P.340,686 of 4/11/1929.

In a Noble's combing machine all the comb balls receive an intermittent partial rotation about their own axes to vary the tension on the slivers alternately and coincidentally with the operation of the feed knives or the drawing-off rollers to secure uniformity of feed. The ball rests upon wooden rollers, one or both of which is provided centrally with a toothed wheel engaged by a rack reciprocated radially of the machine by fixed cam surfaces thereon, as the rack is carried round with the large comb circle. The inward movement, which causes the ball to pay out sliver, coincides with the action of the feeding knives and the rack is subsequently moved outwards to put tension on the sliver. When the ball becomes small it rests on a friction plate which prevents excessive withdrawals of the sliver. W.

Bast Fibres. D. W. Dron (Belfast) and Dron Engineering Co. Ltd. (London). E.P.342,672 of 25/10/1929.

Fibre is obtained from stems of plants having a fibrous bark or bast by separating the inner part of the stem prior to removal of the fibre from the covering, the separation being effected by splitting each stem into two segments which are turned in opposite directions substantially through a right angle and passing them through rollers. The machine for the process is described. T.

Curling Yarns. J. Roberts and W. Micklethwaite (Huddersfield). E.P.342,727 of 6/11/1929.

The yarns are curled on a frame which is rotatable about a longitudinal axis and carries a bobbin-driving drum. When the fibres to be curled are in the form of a sliver the bobbin may be replaced by a cam from which the sliver is withdrawn by rollers. T.

Decorticating Sisal, Hemp, etc. G. E. Cookson (Marlow). E.P.342,759 of 6/11/1929.

The machine employs a number of conical rollers which are mounted so as to exert a crushing action upon the fibrous material as it passes between them, but are arranged in any manner not claimed in Specification 328,757. T.

Carding Engines. A. Thibeau (Tourcoing). E.P.343,330 of 27/2/1930.

The orifice in the cover or casing of a burr-beater in a carding engine is rendered variable and adjustable by a moving screen. The patent covers the various movements of the screen. T.

Scutching Flax and Hemp. Robey & Co. Ltd. and R. S. McGaughey (Lincoln). E.P.343,351 of 18/3/1930.

In the machine the stricks are scutched along one side only during one operation by being carried by a travelling holder axially along a cylindrical beater drum and by the tails of the stricks being held in contact with the beater bars by an air blast provided independently of the beater drums. The other side of the stricks is similarly treated. T.

Preparing and Spinning: Drawing Apparatus. Etablissements Motte-Dewavrin (Tourcoing). E.P.345,971 of 26/9/1929.

Feed press, floating or dabbing rollers for pressing slivers or tufts of fibres into the circular comb of drawing apparatus for wool spinning and preparing machines, are formed by sleeves which are independent of their axles so that the weight of the sleeve only is operative on the fibres. T.

"Linenised" Cotton Yarn: Preparation. D. Hunter and Linium Products Syndicate Ltd. (Nottingham). E.P.348,305 of 25/3/1930.

A yarn resembling linen is obtained from cotton or other vegetable fibres or derivatives thereof by treating with a solution of cellulose, removing the solution from the exterior of the yarn by scrapers, then coagulating the cellulose so that the solution remaining in the cavities between the fibres welds the fibres together. A solution containing an excess of solvent may be used, the fibres being then attacked superficially to form a solution by which the fibres are welded together. A cuprammonium solution of cellulose may be used, the cellulose being coagulated by an alkali hydroxide of mercerising strength, and undesirable bye-products may be eliminated by washing and/or acidification. C.

Decorticating Apparatus. R. Niau (Senegal, French West Africa). E.P.348,621 of 8/11/1929.

Leaves of the agave and like plants are decorticated in a machine comprising a system of feed belts by which the leaves are conveyed to gripping plates which have co-operating grooves to hold the leaves during scutching by the beater drum. T.

Decorticating Apparatus. Krupp Grusonwerk A.-G. (Magdeburg, Germany). E.P.349,343 of 19/6/1930.

The apparatus has two sets of endless rope conveyers arranged in staggered relationship. To facilitate the mounting or replacement of the rope conveyers, the adjacent driving sheaves are mounted upon the free projecting ends of separate co-axial shafts, and means are provided for coupling the sheaves. T.

Cap Spinning Frames. C. G. Tankard (Bradford). E.P.349,389 of 27/8/1930.

The spindles and the caps are driven in the same direction as the bobbin tubes, but at a lower speed, preferably less than half that of the bobbin tubes. The two drives are independent and regulable but do not vary during spinning. T.

Roving Drawing Frame. Deutsche Spinnerei-Maschinenbau A.-G. (Ingolstadt, Germany). E.P.349,533 of 24/11/1928.

Cotton and like slivers from the last drawing frame are treated in a "roving drawing frame" comprising a drawing apparatus, a twist tube, a condensing apparatus such as rubbers or calender rollers, and are wound into rolls by means of a traverse guide or are delivered into cans, whereby the usual flyer frames which impart a permanent twist are dispensed with and the material may be directly spun in a spinning frame provided, for the production of fine yarn, with a high draft drawing apparatus. C.

Flyer Frame Bobbin and Spindle Driving Mechanism. J. S. Sio (Barcelona, Spain). E.P.349,552 of 27/3/1929.

In a flyer frame having two rows of spindles in which the spindles and bobbins are each driven by a single shaft, the spindle and bobbin rails are in the form of substantially enclosed one-piece casings having oil wells. C.

Spinning Frame Flyer. H. A. Boyd and J. & T. Boyd Ltd. (Glasgow). E.P. 349,810 of 26/6/1930.

The legs of overhead-driven flyers are socketed into the flange eccentrically, thus increasing the distance between the flyer legs and permitting the use of a larger bobbin. C.

Cross-wound Bobbins. Parcofil A.-G. (Zurich, Switzerland). E.P.349,840 of 3/8/1929.

In cross-wound spools or bobbins suitable for the wet treatment of rayon, the ends of each layer of thread project outwardly in a direction parallel to the axis of the spool over the next inner layer and the outwardly projecting ends are unsupported by the bobbin. The ends of the spool may be conical or curved outwards, and the widening may be provided at only one end of the sleeve or omitted entirely, so that the ends of the spool are built up in exposed position. C.

Spinning Frame Rings. C. F. Hofmann (Schönau, near Chemnitz, Germany). E.P.349,969 of 28/1/1930.

A ring for spinning and doubling frames has a storage chamber for lubricant, the ring being in two parts held by an external ring so that the joint between the parts serves for the passage of the lubricant. Slots may be provided to allow lubricant to reach the lower race. An aperture serves for connecting a Stauffer lubricator, an oil spray, or an oil pipe. More than one ring may be supplied from a central oil pipe so that all the rings of a ring rail may be lubricated together. C.

Medium and Long Staple Fibre Drawing Mechanism. Sächsische Maschinenfabrik vorm. R. Hartmann A.-G. (Chemnitz, Germany). E.P.350,606 of 5/4/1929.

In a drawing apparatus of the pull-through type, suitable for rayon, having an endless conveyer band running over lower intermediate rollers and arranged between a pair of feed rollers and a pair of delivery rollers, two non-gripping rollers are arranged to co-operate with an additional intermediate roller so as to cause the band to follow a curved path. C.

Yarn Twisting Machines. Barmer Maschinenfabrik A.-G. (Oberbarmen, Germany). E.P.350,730 of 13/7/1929.

Double-sided twisting machines are arranged with the twisting spindles in staggered formation and the winding means, comprising bobbins and driving drums, vertically beneath each other on a frame. The twisting spindles are preferably driven by individual electric motors. C.

Electrically-driven-flyer Spinning Frame. L. Mellersh-Jackson, London (Siemens-Schuckertwerke A.-G., Berlin). E.P.350,747 of 27/6/1930.

In a spinning machine with individually electrically-driven flyers, the bearing housings of the motor and flyer shaft, which also carry the stator packets, are detachably inserted from beneath in a rail of U-section which is closed at the front by a cover plate, thus forming a continuous enclosure allowing ventilation of the motors. The bus-bars and, if necessary, the motor switches, are also enclosed, the switch handles projecting. The rail is of cast-iron and the interior is protected by packing rings, ball bearings for the shaft being carried at the lower part of the housings. The drawing roller framework is directly mounted on the rail and may carry bobbin supports. C.

Drawing and Twisting Apparatus Combined. S. Dean (Dewsbury). E.P.351,100 of 27/3/1930.

In combined drawing and twisting apparatus for drawing, roving, spinning, twisting and doubling, of the kind comprising draft rollers carried by a rotary-driven member and gearing with a coaxial independently-driven member, the rollers are mounted in co-operating driven cup-shaped members and at opposite ends gear with a driven wheel. Springs serve to press the rollers towards each other and to act as scrapers. The material is protected from oil by flanges. T.

Twisting Frame Roller-driving Gear. J. Sykes & Sons Ltd. and E. Sykes (Huddersfield). E.P.352,212 of 19/6/1930.

Variegated yarns are produced by increasing the speed of one or more delivery rollers above the normal rate which gives an evenly twisted yarn, the rate and duration of increase being governed by cams. The mechanism is described. Knopping blades are provided. When a knop is to be formed, the rate of delivery of the yarn concerned is accelerated and the knopping blades raised. At the desired time the blades are lowered and the rate of delivery is reduced to normal, whereby the blades act to consolidate the turns of yarn which have been wrapped about the other, thus producing a knop. C.

Rayon Tearing Device. M. Dassonville (Paris). E.P.352,535 of 21/12/1929.

In a process of drafting slivers of endless textile fibres, the slivers are passed between feed and delivery roller points so heavily weighted that the pressure and pull exerted on the fibres overcome their natural elasticity. The term endless fibre is used to indicate any material which has been formed in a continuous and desired length, e.g. rayon or the materials produced by the processes described in E.P.263,727 and 336,763. The slivers are passed through a drafting apparatus comprising feed rollers and delivery rollers both weighted sufficiently to effect the necessary tearing of the fibres. The feed rollers are loaded by a weight adjustable on a lever which is supported by a knife-edge on a spindle

attached to the hook of the weighting saddle. The delivery rollers are similarly loaded by a saddle through a lever. Nuts adjustable on the spindle are provided to allow the weighting system to rest on a bracket when the feed-rollers are dismounted. C.

Breaking Fibrous Leaves. W. Kohler (Bad Durrenberg, Germany). E.P. 352,784 of 22/8/1930.

A mill for crushing the leaves of plants, such as the agave, consists of a large roller with several smaller rollers arranged round its periphery, the spacing of the smaller rollers from the larger decreasing from the feed point to the delivery point. T.

Spinning Frame Roller Leather: Manufacture. C. Nitta (Osaka, Japan). E.P. 353,098 of 29/4/1930.

An animal skin of low price, such as ox skin, can be used instead of sheepskin for making spinning frame roller leather if the tanned, hair-free, skin is treated in water with rice bran, dried, rubbed to soften it, the rough upper layer of the hair side is removed with an emery grinder, the ground surface is calendered with a smooth surface, the flesh side is shaved till the skin is of a required thickness, the shaved side is roughened to adhere easily to the woollen cloth forming the roller surface, and the hair side is calendered by electrical heating means. C.

Cap-spinning Spindle. Berlin-Karlsruher Industriewerke A.-G. (Berlin). E.P. 353,116 of 3/2/1930.

A sleeve rotatably mounted on the spindle carries the cap on which is arranged a fly-wheel mass to prevent vibration. C.

Sliver Can Filling Mechanism. Fairbairn, Lawson, Combe, Barbour Ltd. and W. S. Suffern (Belfast). E.P.353,166 of 31/5/1930.

Two sliver cans are used in conjunction with each delivery roller or pair of delivery rollers and a conductor or guide-spout carried by an arm is pivotally mounted on a stud and formed with an arm connected to the mechanism of a bell or other measuring motion which will automatically rock the conductor to change the delivery of the sliver from one can to the other when the first has been filled or when a predetermined length has been delivered to it. C.

Cotton Scutching and Cleaning Machine. J. F. Schenck, jun. (Shelley, N. Carolina, U.S.A.). E.P.353,217 of 2/7/1930.

The patent relates to apparatus for use in connection with cotton scutching and cleaning machines for effectively separating impurities, particularly dried leaf, from the cotton. The machine comprises a roller, preferably clothed with wire, which rotates against the periphery of the beater casing between the uppermost grid bars (those first swept by the beater) and the lowermost, together with a partition of which the upper edge is in close proximity to the roller and a brush rotatable against the roller on the opposite side of the partition from the beater casing. The roller and partition thus form partition means to prevent the particles of dirt which are driven by the air blast created by the beater between the uppermost grid bars and removed by the roller from being drawn back into the beater casing by the suction created by the beater between the lower grid bars. C.

Cloth Unravelling Machine. G. F. McDougall (Portland, Oregon, U.S.A.). E.P. 353,256 of 27/7/1929.

A machine for opening or unravelling woven fabrics comprises a toothed disintegrating cylinder having teeth in longitudinally spaced circumferential rows, co-operating with a comb plate having grooves between curved points, in which the teeth are adapted to operate, so that a thread engaged by the teeth is kept in contact with them and pulled out from the weave. C.

Spinning Spindle Belt-driving Wharl. H. Pferdmenges (Giesenkirchen, Germany). E.P.353,612 of 10/8/1929.

A wharl for a spinning spindle comprises a flanged drum adapted to fit over a cylindrical portion of a wharl and to co-operate with a cylindrical portion to form a track for a belt, the cylindrical portions being formed by turning the flange

and the adjacent part of a wharl shaped for a driving cord, whereby the change from cord driving to belt driving in spinning machines may be effected by utilising the existing spindles. C.

Cotton Waste Opener Lags. W. F. Lucey and W. Pouncey (Leeds). E.P. 353,668 of 11/7/1930.

In metal-faced wooden lags for rag-tearing machines and cotton waste openers, etc., the countersunk holes for securing the metal facing and the countersunk holes through which pass the screws for securing the lags to the cylinders are formed by pressing or punching the metal round the holes into the wood or into recesses in it. C.

Sliver Can. J. A. Sutcliffe and A. A. Thompson (Blackpool). E.P.353,985 of 27/5/1930.

The plate on which the coiled sliver is supported is provided with a number of guides on its periphery so that whilst being free to tilt it remains substantially horizontal at all points in its vertical traverse. C.

Spinning Frame Underclearers. Fine Cotton Spinners' and Doublers' Association Ltd. and J. Hindley (Manchester). E.P.354,053 of 2/8/1930.

An underclearer for the bottom drawing rollers of mules, ring frames, and flyer frames comprises a series of discs of wool or other material of alternately large and small diameters threaded on to a shaft and arranged just below the roller to be cleared. C.

Cotton Scutching and Opening Machines. F. Quinn and L. Wild (Bolton). E.P. 354,316 of 7/5/1930.

The mixed sand, leaf, stalk, neps, and like impurities which are associated with a certain amount of fibre are collected after delivery through the usual grid by means of a slow motion lattice and delivered through feed rollers on to a high speed saw tooth roller or cylinder in conjunction with which is arranged a suction chute having a blade or blades at its entrance end adjacent to the periphery of the saw tooth roll or cylinder as described in E.P.218,877. In this way a very thorough separation of the fibrous material from the impurities is effected, the separated fibre being subsequently returned at the surface of the bottom dust cage of the machine to the main stream of fibre passing through the machine. C.

Cleaning Machinery Dust Trunks. J. Hetherington & Sons Ltd. and L. Hemsley (Manchester) E.P.354,938 of 30/6/1930.

In dust trunks of the type placed between a porcupine feeder and an exhaust opener there is provided a series of dust chambers the floor of which is constituted by a portion of the bottom grid of the trunk, one of the walls of each chamber being constituted by a grid of bars projecting into the path of the fibres as they pass through the trunk. The impurities passing through a grid fall within a chamber and can pass immediately through the bottom grid within that chamber, it being impossible for the impurities to fall amongst the rest of the fibres passing through the trunk or to remain under the air stream influence. Cleaning doors may be provided to the chambers, and these doors may be opened to remove impurities which have not fallen through the bottom grid without disturbing the air stream to any extent. C.

Wet Doubling Frame. W. Cowperthwaite and Preston Tyre Fabric Manufacturing Co. Ltd. (Preston). E.P.355,025 of 15/8/1930.

A single trough extends centrally of the frame, means being provided for guiding yarns through the trough for delivery rollers on both sides of the frame. C.

Mule Frame Individual Electric Drive. Siemens-Schuckertwerke A.-G. (Berlin-Siemensstadt, Germany). E.P.355,156 of 10/12/1929.

The motor is secured on a frame placed with its feet on the headstock of the mule, and an intermediate transmission shaft is mounted in the frame. The coupling between the drive and the main shaft of the mule is controlled electrically by a switch actuated by the machine. C.

Spinning Frame Doffing Mechanism. M. Hain (Montclair, New Jersey, U.S.A.). E.P.355,312 of 23/4/1930.

Mechanism is described by which, in spinning and like machines, the change of position of the bobbin rail, or the relative change of position of the rails where a plurality of rails is provided, may be quickly and reliably accomplished by an operation easily performed by the operative. C.

Spindle Mounting and Drag Device. J. F. Low & Co. Ltd. and J. Hargrove (Monifieth, Scotland). E.P.355,786 of 30/4/1930.

An improved spindle mounting and drag arrangement for spinning, twisting, winding, and other textile frames in which the bobbin is rotated by the pull of yarn comprises, in combination, a spindle with which the bobbin is mechanically coupled so that the bobbin and the spindle rotate at exactly the same speed, the spindle being mounted in ball bearings, and an eddy current brake device comprising a disc or the equivalent of non-ferrous metal fixed to the spindle below the bobbin rail, and an electro-magnet, the upper face of the upper pole branch of which is disposed substantially at the level of the upper face of the rail and the lower pole branch of which is suspended from the upper pole branch so as to leave a gap in which the disc or the equivalent rotates. C.

Ring Frame Cop Building Mechanism. J. L. Rushton (of Dobson & Barlow Ltd., Bolton) and H. Hill. E.P.355,994 of 1/10/1930.

The patent relates to ring spinning frames having a cop building motion of the type comprising a rotatable spindle which drives a substantially vertical shaft from which a building motion cam is rotated for actuating a rocking lever which is operatively connected to the ring rail by a system of chains and chain blocks, whereby supports for supporting and actuating the ring rail are operated. According to the invention, there is combined with the cop building motion a bunching motion comprising a builder motion cam driven from the rotatable spindle, an operative connection between this cam and one of the chain blocks whereby the chain block is oscillated to effect the traverse of the ring rail to wind the bunch, clutch mechanism whereby the building and bunching motion cams are alternatively driven from the spindle, and a clutch-operating device arranged to actuate the clutch mechanism automatically when the winding of the bunch is completed so as to render the bunching motion inoperative and the cop building motion operative. Details are given. C.

Yarn Detwisting Apparatus. A. E. Meyer (Paris). E.P.356,564 of 7/11/1929.

Apparatus for detwisting twisted, gummed yarn comprises a grooved roller which is engaged by and centres the yarn with respect to the detwisting mechansim of the apparatus, the roller and spindle of the detwisting mechanism defining the length of the yarn strand in which substantial detwisting occurs. The detwisting mechanism maintains the yarn strand engaged by the roller under tension, and a cleaning member is disposed within the groove of the roller to collect material deposited by the yarn strand within the groove, the cleaning member being movable out of the groove so that the collected material may be removed from it. C.

Yarn Tensioning Mechanism. British Celanese Ltd. (London). E.P.356,792 of 5/6/1929.

Substantially uniform tension is maintained on yarn which is being passed from package to package, by means of a brake acting on the supply package and operated by a member which is controlled both by the yarn in its passage from the supply package in such a way that slackening or tightening of the yarn results in an increase or decrease in brakage, and also by the size of the supply package in such a way as to cause a decrease in brakage as the quantity of yarn on the supply package diminishes. C.

Hopper Feeding Machine and Bale Breaker. J. Forkin (Bury). E.P.357,727 of 18/8/1930.

A hopper feeding machine and bale breaker comprises a horizontal travelling spiked lattice on to which the fibrous material is fed from a hopper, a spiked cylinder arranged to rotate above the spiked feed lattice and adapted to remove lumps of material from it, an inclined travelling spiked lattice arranged at the delivery end of the horizontal feed lattice to receive the material from it and also the material thrown off from the spiked cylinder, a second inclined travelling spiked lattice co-operating with the first inclined lattice but moving at a different speed, and a wire-covered stripping roller mounted at or near the top of the first inclined lattice to remove the fibre from it and deliver it to a reserve box or other device from which it may be fed to the feeding mechanism of a machine for any subsequent treatment. C.

3—CONVERSION OF YARNS INTO FABRICS

(A)—Preparatory Processes

Bobbin Winding Device. —. Corpelet and —. Brès. *Revue Text.*, 1931, 29, 783-785.

Breaks may be caused in knitting if the yarn in unwinding rubs against that still on the bobbin and catches on a knot. This trouble may be avoided by arranging for the knots in the yarn to occupy the lowest position on the bobbin. A simple device which places the knots in the lowest course of the bobbin during the winding process is described. The yarn passes through grooves in two rods placed at right angles and then over a thread guide on to the bobbin. When a knot passes through the grooves the additional tension produced lifts one of the rods slightly and operates an arrangement for stopping the spindle carrying the bobbin. The thread guide continues its motion and on reaching the lowest point of its path sets the bobbin in motion again so that winding is continued. C.

Rayon Yarn: Winding Twist. W. English. *Text. Weekly*, 1931, 8, 37-39.

As yarn is wound off a package, each coil becomes a twist and the number of turns per inch in the yarn will be greater or less than the original. The difference, called "winding twist," is greater the smaller the diameter of the package. In rayon yarn, because the initial turns are few, the effect may be considerable, and especially the variations due to changing diameter. The author has calculated the possible variations as follows: *Pirns*—A typical pirn may have a twist variation of 7·6% every 12 in. and 14 in. consecutively throughout the length of the yarn. *Bottle Bobbins*—With slow traverse, 4·6% every 72 and 216 in. consecutively; with quick traverse 3% every 36 in. *Cones*—Data for Universal Winding Co.'s cones are—

Model	Bare cone	Full cone	Extreme variation
12 E.X.	2·04% in 12·5 in.	0·107% in 37·5 in	5·5%
3° 30′	1·03% in 15·2 in.	0·072% in 42 in.	4·18%
Jumbo	1·05% in 22 in.	0·285% in 37 in.	2·1%

The "extreme variation" is that from beginning to end of a cone, that is, over about 30,000 yds of 150 den. rayon. C.

Bobbins: Standardisation. —. Bernhardi. *Kunstseide*, 1931, 13, 292-293.

The advantages that would result from the use of bobbins of standard sizes and materials are outlined, and the most suitable dimensions for double flanged bobbins, pirns, and cheeses are discussed. C.

Constant Speed Bobbin Winding Device. Etablissements Ryo-Catteau. *Revue Text.*, 1931, 29, 889-893.

An arrangement for winding cross-wound bobbins, at a constant linear velocity of winding is described and diagrams are given. C.

Spindleless Weft Winding Frame. *Kunstseide*, 1931, 13, 298-299.

A new weft winding frame without spindles for use with rayon, cotton, and other textiles is described. Soft rayon pirns and very hard pirns of cotton may be produced on this frame and a high speed of winding is possible. The machine was shown at the Leipzig Fair running at 5,000 revs. and pirns holding 11 g. of 120 den. rayon were wound in $3\frac{1}{2}$ minutes. One winder tended 14 sides at this speed. At 3,000 revs., one winder would mind 24 sides and reach an output of 19 kilos. per day of eight hours, allowing for 5% of lost time. The use of long pirns (17 cm. long) holding about twice as much yarn as the ordinary type is also briefly discussed. C.

Dyed Cheeses: Warping. *Text. Mfr.*, 1931, 57, 327.

The application of cheese dyeing in the preparation of short-length warps has been made economical by the development of a new system of warping in which the cheeses deliver from the creel over end instead of by rotation, and the warp is built up by running a series of sections on to a reel and afterwards on to a section beam, instead of running all the ends at once direct to a section beam. The advantage is due to the fact that the warping is conducted at a high speed. The yarn runs from the packages to the reel at about 300 yards per minute. In running from the reel to the section beam the speed is reduced to approximately 80 to 100 yards per minute. This method eliminates the necessity of splitting

packages as was formerly necessary, and uses practically all the yarn. A working example is described. C.

Rayon: Twisting, Winding, and Warping. S. H. Gilston. *Text. World*, 1931, 80, 1186-1187.

Various refinements in methods and apparatus for oiling, twisting, winding, and warping rayon are described and practical hints are given. C.

Rayon Circular Winding Machine. A. Becker. *Text. Rec.*, 1931, 49, No. 582, p. 43.

The new circular winding machine for rayon comprises 15 or 20 spindles uniformly spaced about a common centre around which they rotate at a uniform speed. The attendant remains seated and a normal speed brings a spindle opposite her once every ten seconds. With a machine possessing 20 spindles the ideal winding speed would be for each spindle to fill its bobbin in 200 seconds —that is, in one round of the machine, whence each spindle would be doffed and donned every time it passed the operator. This cannot, however, be realised in all cases. The machines can be disposed in groups of two or three, so that when winding finer materials one operator can serve several machines adjusted to run at different speeds. The machine is fitted with patent SRP spindles and SVA7 running-off devices. The machine keeps the operator fully employed and at the same time free from the exhaustion produced by walking about a winding frame alley. C.

(B)—Sizing

Maize Flour Size: Application. M. A. Hermann. *Chim. et Ind.*, 1931, **25**, 1499-1500 (from *Izv. Tekstiln. Promychl.*, 1930, 9, Nos. 8-9, pp. 101-103).

The following recipes have been compared—(1) 72 g. maize flour mixed with 1 l. of water and heated to 30° C., to which is added 0·2 g. oxalic acid, the mixture being then brought to the boil during a period of 8 minutes, boiled for 15 to 20 minutes and neutralised with sodium carbonate; (2) 76 g. maize flour added gradually to 1 l. of water containing 0·4 g. 96% sulphuric acid, the mixture boiled for 10 minutes and then neutralised with caustic soda. The viscosity of the second preparation is greater than that of the first and, while this size may not be as transparent as that of potato starch, it remains homogeneous in contrast to the first from which a liquid separates rapidly. The first size gives a red colouration with iodine which indicates the presence of dextrin; the second gives a blue-violet colouration and therefore contains soluble starch which is formed before dextrin. Owing to its soluble starch content the second size is regular and does not stick to the doubler while the first size degenerates rapidly on cotton warp and sticks to the doubler. Although maize flour sizes are not as good as potato starch size they may be applied with advantage in the following modified formula: 1 l. water; 85 g. maize flour; 0·4 g. sulphuric acid 66°; 10 g. glycerin; sodium hydroxide to produce neutrality. C.

Tape Frame Self-releasing Device. Saco-Lowell Shops. *Cotton (U.S.)*, 1931, 95, 849.

At times there is a tendency for the speed of the yarn on tape frames to increase to an amount equivalent to a fraction of a tooth on the gear drive. When this condition arises the yarn has a tendency to draw the cylinder against the gear drives with the result that the yarn and at times the gearing are damaged. A ratchet attachment has been devised for gear-driven frames to remedy this condition. The cylinders are driven by the usual gear device through a pawl and ratchet. When there is any tendency for the yarn to drag the cylinder faster than the speed of the gear drive the pawl slips over the ratchet and disengages the gear drive, leaving the cylinder free to revolve with the yarn. C.

"Tugendhat" Sized Warp Drying Chamber. R. G. Tugendhat. *Leipzig. Monats. Text. Ind.*, 1931, 46, 239-240.

An improved drying chamber for warp sizing machines is described in which the stream of hot dry air coming from the heating units is divided by a pair of metal plates into two parts, one of which flows upwards and counter to the warp which is introduced at the top of the chamber whilst the other flows downwards in the same direction as the warp. The upward stream of air passes out of the chamber on reaching the top, whilst the downward current returns to the suction side of the main ventilator. C.

"Wunderbar" Tape Frame Warp Divider. J. Maier and Fabrik W. Schabel (Geislingen, Germany). *Spinn. u. Web.*, 1931, 49, No. 34, pp. 8-9.

The device shown consists of eleven rods mounted end to end symmetrically on two wheel-like castings, thus forming a cylindrical cage somewhat greater in diameter than the squeezing rollers. The rods span the warp just behind the squeezing rollers and the wet threads are divided into four paths, two sets going outside the bars and two at different levels through the bars. In this way, the threads receive some degree of smoothing before arriving at the drying cylinder and sticking together is prevented. C.

Rayon Sizes: Identification and Removal. K. Walter. *Kunstseide*, 1931, 13, 302-303.

Methods of determining the type of size on rayon and appropriáte methods of desizing are described. C.

Warp Yarns: Size Penetration. A. H. Grimshaw. *Melliand Text. Monthly*, 1931, 3, 293-295 and 393-395.

Photomicrographs are reproduced showing the penetration by size of samples of warp yarn collected from a number of mills during the regular run of the tape frame. The sizing formulas for the yarns are given. The sections were made by the method previously described for sectioning rayon mounted in a cork stopper and by the use of a chromium-plated brass plate with a series of holes through which bundles of fibres can be drawn and cut off evenly for micro-examination. A time factor test tended to prove that there is some penetration due to the time factor, independent of the squeezing which takes place in the sow box. C.

(C)—Weaving

Cotton Duck Selvedges: Construction. Messrs. Marsh & Wright. *M/cr Guard. Comm.*, 1931, 23, 250.

The firm complains that satisfactory cloth for the blind, marquee, and tent trade is not readily obtainable in England. In particular, it appears to be difficult to get the right selvedges. These should be solid, unstretchable, straight, and clean. C.

Cotton King Automatic Loom. Crompton & Knowles Loom Works and Hutchinson, Hollingworth & Co., Dobcross. *Text. Merc.*, 1931, 85, 299.

A comparison is reported of the productive capacity of this loom with a non-automatic dobby loom on clip spot lenos, using 12 automatic against 4 ordinary looms per weaver. C.

Diederichs Rayon Loom. G. A. Bennett (for Ateliers de Construction G. Diederichs). *Rayon Rec.*, 1931, 5, 449-453.

The loom incorporates the following features, partly covered by recent patents—(1) A weft feeler, (2) a large pirn, (3) a compensated picking motion to accommodate larger shuttles and pirns, (4) a new breast beam which reduces the trouble of setting-on places, and (5) a new take-up motion C.

Ribbon Loom: Shed Formation. *Kunstseide*, 1931, 13, 226-228 and 260-261.

The formation of the shed on ribbon looms by means of shafts and eccentrics is discussed in detail. C.

Semi-automatic Circular Box Loom. G. Keighley Ltd. (Burnley). *Text. Mfr.*, 1931, 57, 289.

A means whereby ordinary looms can be made semi-automatic consists in replacing the ordinary shuttle box by a circular box unit and fitting a weft feeler. Details are given. C.

Viscose Rayon Crêpe-de-Chine: Weaving. *RUSSA*, 1931, 6, 1005-1007.

A discussion of various precautions which are necessary in the winding, beaming, and weaving processes for the production of crêpe-de-chine having a viscose rayon weft. C.

Warp Pile Fabrics: Weaving. Société Lorthiois-Leurent et Fils. *Revue Text.*, 1931, 29, 809-811.

A method of weaving warp pile fabrics, such as moquettes and carpets, showing the design on the back is explained with the aid of diagrams. The parts of the pile threads which are not used in the formation of the design are not woven into the ground or arranged to float on the back of the fabric but are removed after the removal of the pile wires. C.

Loom Parts: Nomenclature. *Textilber.*, 1931, **12**, 552-553.
A continuation of the proposed standard nomenclature for loom parts. This section deals with the ratchet gearing and cloth take-up motion, and the warp beam mechanism. C.

Loom Production Nomograph: Application. L. Trompier. *Revue Text.*, 1931, **29**, 1063-1073.
A system of graphical solution of formulæ is explained and the method is applied to textile calculations. Examples showing the methods for the determination of the production of a loom and the production of a silk spinning machine are given. C.

Rayon: Shrinkage in Weaving. *Kunstseide*, 1931, **13**, 335-337.
A discussion of the contraction in the warp and weft that occurs in weaving rayon fabrics, the influence of the nature of the weave and the strength and size of the yarn on the contraction, and the method of allowing for it in practice. C.

Rayon Loom Electric Drive: Advantages. C. J. Centmaier. *Kunstseide*, 1931, **13**, 333-335.
The advantages of individual electric drives for rayon looms are outlined and the great superiority of belt drives as compared with cog-wheel drives is pointed out. C.

Ribbon Loom Warp Tensioning Device. *Revue Text.*, 1931, **29**, 953-955.
The new tension device is designed for application to looms weaving broad ribbons. The brake lever consists of two parts connected by a pivot and each carrying a roller round which the warp passes. The whole acts as a single lever when the loom is running normally, but when the weft has been exhausted and the warp requires to be turned back one part of the lever swings about the pivot, varying the distance between the two rollers in order to take up the extra warp and equalise the tension. C.

Cellulose Acetate Rayon: Weaving. *RUSSA*, 1931, **6**, 1291-1295.
A discussion of the causes of irregularities in the weaving of cellulose acetate rayon fabrics and the modifications and adjustments of different parts of the loom necessary for the prevention of such faults. C.

Circular Box Loom Loose Reed. *Text. Merc.*, 1931, **85**, 354.
Circular box looms used for dress goods cannot well be fitted with stop rod tongues and frogs to stop the loom when the shuttle is caught in the shed. This is provided for by a loose reed, the construction and mode of action of which are described in detail. C.

Loom Pickers and Picker Straps. R. Hünlich. *Melliand Text. Monthly*, 1931, **3**, 390-392.
Attempts to improve pickers and picker straps with a view to increasing their life are discussed, with reference to Continental patents. C.

Reed Ribs and Harness Drop Wires: Specification. *Textilber.*, 1931, **12**, 612-614.
Tolerances for the thickness and depth of reed ribs, and revised specifications for harness drop wires are put forward for comment. C.

Static Electricity: Removal from Rayon during Weaving. Elsberg and Gompertz A.-G. *Text. Rec.*, 1931, **49**, No. 582, p. 47.
Breakages due to static electricity are avoided by replacing the wooden lease rods used hitherto by rods made of special metal and connecting these to the earth. Tests of this method carried out in a weaving room, in which 50% of the looms were working cellulose acetate warps and 50% viscose warps, showed a decrease of 80% to 90% in the breakages of the warp threads. The number of warp breakages recorded per day of eight hours was 0 to 1 to 2. The production was increased by 4% to 6% and the cloth was improved from the technical point of view. Application of the same principle to the twisting-in machine makes it possible to twist-in both viscose and cellulose acetate rayon warps at the highest speed. C.

(D)—KNITTING

Cotton's Knitting Frame Individual Electrical Drive: Application. W. Hildebrandt. *Spinn. u. Web.*, 1931, **49**, No. 3, pp. 8-12; No. 7, pp. 6-8; No. 9, pp. 32-38; No. 11, pp. 12-14; No. 13, pp. 11-14.
A complete review of the development of various electric drives. Arguments are advanced in favour of the A.C., shunt-wound, commutator motor as giving the best knitting and highest efficiency. C.

Hosiery: Knitting on Flat Frames. Etablissements Poron. *Revue* Text., 1931, 29, 823-825.

A method of knitting stockings and socks on flat knitting machines, using only one machine for the production of the complete article, is briefly described. In this method the leg portion is knitted as usual and the central needles are then put out of action while two strips for the heel are knitted on the needles at the sides. When these have been cast off, the central needles are again put into operation and a strip of the desired width is knitted for the foot. Various stages in the production are shown diagrammatically. C.

Interlock Fabric Knitting Machines. J. B. Lancashire. *Text. Mfr.*, 1931, 57, 280-281.

The recent expiration of the patents has given great impetus to the manufacture of interlock fabrics such as "Meridian," "Vedonis," and "Velvetex." The mechanism of existing types of machines for their production is briefly indicated. The fabrics are sometimes said to be ladderproof. If made of a smooth yarn like rayon, however, unless plated over wool or cotton, the stitches run easily towards the end of the fabric that was knitted first once a hole is formed C.

Seamless Wale-fashioned Hose: Knitting. J. Chamberlain. *Text. Weekly*, 1931, 8, 90-91.

"Fashioned" is a description that is now loosely applied. Seamless hose may be knitted on the same number of needles throughout and shaped by altering the stitch length and by boarding. When the number of stitches is varied, the term "wale fashioned" gives a closer description. Four ways of making wale fashioned hose on circular machines are outlined and machines constructed on the different systems are specified. C.

Loop Wheel Knitting Frame. *Kunstseide*, 1931, 13, 304-308.

The knitting action of the loop wheel frame is compared with that of other circular knitting machines and its advantages are pointed out. The suitability of the loop wheel machine for knitting rayon is discussed and its fineness and pattern possibilities are indicated. C.

Cotton's Knitting Frames: Knitted Texture Factors. W. Davis. *Text. Mfr.*, 1931, 57, 315.

The texture of knitted goods is closely connected with the proportions of space allotted to the needles, sinkers and yarn on the knitting frame. Measurements of these proportions on machines from coarse to fine gauges are given. In the finer gauges the sinkers and needles show a tendency to occupy a larger percentage of the available space and thus leave relatively less room for yarn. The relationship between the yarn counts and the space available for yarn is discussed and suitable yarn counts for various gauges are calculated. C.

Knitting Terms: Standardisation. J. Chamberlain. *J. Text. Inst.*, 1931, **22**, P141-P144.

Plated Patterned Knitted Fabrics: Knitting. C. Aberle. *Textilber.*, 1931, **12**, 159-162, 388-390, 514-515, and 574-575.

A general article on modern plating technique in relation to the production of coloured designs in knitted goods. C.

(F)—Subsequent Processes

Butted Seams: Advantages. J. M. Washburn. *Melliand Text. Monthly*, 1931, 3, 396-399.

The inherent properties of the butted seam for joining pieces prior to processing and the advantages to be gained by its use are discussed. Either a one or two-thread type of overedge stitch is used for making the seam and the stitch is applied loosely to the edges of the goods so that subsequent processing opens the seams and the pieces lie end to end with the overedge threads uniting them, thus producing a flat join. In making the seam, the ends of pieces are usually placed face to face and passed through a machine which trims and feeds the goods simultaneously with the stitching operation. C.

(G)—Fabrics

Cotton Shoe Fabrics. T. Nelson. *Text. World*, 1931, 80, 763.

Illustrations are given of several fabrics used in the U.S.A. for shoe uppers. One is composed of a cotton crepe outside, a middle layer of drill and a bottom

layer of twill, slightly raised. Another is a combination of a basket weave, made from mercerised 2-ply warp and 3-ply weft, backed by a coutil. Others are based on leno weaves. C.

Distorted Weave Fabrics: Designing. J. Henriess *Text. Rec.*, 1931, 49, No. 581, p. 40-41.

Weaving particulars and diagrams are given of some novelty cloths with open-work and mock leno effects. C.

Fancy Crêpe Fabric: Weaving. *RUSSA*, 1931, 6, 1021-1023.

Directions are given for the weaving of a novelty crêpe fabric with a silk warp and rayon weft and with check effects produced by metal threads. C.

"Flexwood" Cotton-backed Wood Veneer Panelling. Flexwood Co., Chicago. *Text. World*, 1931, 80, 767.

A new wall covering consists of wood veneer backed by cotton fabric, made in strips 8 to 36 in. wide and 8 to 10 ft. long. The wall is first covered with a lining cloth and sized and the "flexwood" is fixed by a special "flexing" process. C.

Repp Collar Fabrics: Designing. A. Hamann. *Spinn. u. Web.*, 1931, 49, No. 35, pp. 7-14.

Weaving particulars and diagrams are given of a number of novelty collar fabrics. C.

Spun Rayon Fabrics. *Rayon Rec.*, 1931, 5, 515-516.

Brief descriptions are given of Rodier's "Sinellic" range of fabrics and imitations that are popular in the United States. A typical analysis is as follows—warp and weft 3/32's silk counts, 14-16 turns per inch; reed width 43½ in., cloth width 38⅛ in.; 34 reed, 2 ends per dent; 68 ends, 58 picks per inch; no weighting. C.

Rayon Mixture Fabrics: Structure and Weaving. *RUSSA*, 1931, 6, 1165-1173.

Details of the structure of reps, figured materials and linings, consisting of mixtures of different types of rayon or rayon in combination with wool, cotton, or silk, are given, together with notes on the weaving of such fabrics. C.

Rayon Fabrics: Development. C. C. Mattmann, jun. *Text. World*, 1931, 80, 1182-1184.

Manufacturers are advised to set aside looms in their own plant for experimental purposes. For a mill of 1,000 looms or more, ten looms should suffice for this work. Precautions to be observed in the routine handling of rayon yarns are outlined. Illustrations are given of several novel fabrics together with the weaving particulars. C.

Reinforced Fabrics: Weaving. A. Schirdewan. *Leipzig. Monats. Text. Ind.*, 1931, 46, 274-275.

The method of determining draft and card cutting plan previously described for dobby-woven, weft-reinforced fabrics is now described as applied to warp-reinforced fabrics. C.

Wool: Textile Properties. S. G. Barker. *Text. Merc.*, 1931, 85, 352 and 365.

The virtues of wool as a clothing material are listed under 11 heads. New applications are suggested, including that of electrical insulation for which the high resistance and relative non-inflammability of wool are stressed. C.

Patents

Automatic Loom Weft-cutting Device. J. Picanol-Camps. *Revue Text.*, 1931, 29, 815-817 (from F.P.691,418).

A brief description is given of a device for cutting the weft from exhausted pirns on looms fitted with automatic pirn-changing mechanisms. The cutting device forms part of the mechanism that controls the position of the shuttle. The cutting action takes place at the beginning of the change and the end of weft hanging from the exhausted pirn is ejected with the pirn. C.

Weft Feeler Mechanism. Ateliers Diederichs. *Revue Text.*, 1931, 29, 817-819 (from F.P.699,118).

The shuttle peg is provided with a bent spring that fits in a slot in the tube. The spring is held in position by the yarn on the tube but when this is exhausted the bent portion of the spring projects from the tube and, as the slay moves forward, comes into contact with a projecting piece connected with the stop

motion or shuttle-changing motion. In this way delicate fibres are protected from the type of damage that occurs with feelers which come into contact with the weft at each blow of the slay. C.

Weft Feeler. J. Julien. *Revue Text.*, 1931, **29**, 965-967 (from F.P.701,626).

A support fixed to the breast beam carries a finger which is pushed in the direction of the slay. The finger passes through a hole in the slay and a hole in the side of the shuttle at each alternate pick. The pirn is provided with a groove into which the finger penetrates when the weft is exhausted. When this occurs a disc in the middle of the finger comes into contact with two plates carried by the slay and thus completes an electric circuit and actuates the stop motion. C.

Reed Wire: Mounting. A. Loeby. *Revue Text.*, 1931, **29**, 967-969 (from F.P. 702,566).

Diagrams are given to show a method of fixing reed wires to the rods. The reed wires are bound near their ends to rods by means of wire in such a way that the distance between the reed wires is determined by the size of the binding wire. The spaces between the ends are filled with solder. In order to change the count of the reed the solder is melted and the binding wire is removed and replaced by one of a different thickness. C.

Shuttle Checking Device. J. Mathieu. *Revue Text.*, 1931, **29**, 1219 (from F.P.705,165).

Diagrams are given of a device for stopping the shuttle which eliminates the use of the leather strap of the picker. The mode of operation is outlined. The device gives the shuttle a normal position in the box, prevents breaking or damaging of the shuttle, and prolongs the life of the picker. C.

Silk Loom Regulators. Soc. Alsacienne de Construction Mécaniques. *RUSSA*, 1931, 6, 1199-1201 (from F.P.705,678).

The improvements are designed to eliminate the play in the drive of the rollers and the possibility of vibration of the entry roller. The entry and exit rollers of the regulator are driven, through a system of gear wheels, by an independent shaft which is driven by the loom drive, while the cloth beam and the principal roller of the regulator are driven by a system of chain and pinions, the driving pinion of which is keyed to the shaft of the exit roller. Diagrams are given. C.

Loom Take-up Motion. Ateliers de Constructions Guillaume Diederichs. *Revue Text.*, 1931, **29**, 1215-1217 (from F.P.705,804).

The mechanism consists of two take-up rollers, driven separately and turning in the same direction, and two pressure rollers. The fabric passes from the breast beam round the first take-up roller, the first pressure roller, the second take-up roller, the second pressure roller, and over a bar to the cloth beam. The rollers are arranged so that lengths of contact with the cloth are as long as possible and slipping of the cloth is avoided. C.

Loom Crankshaft Drive. F. Leroux. *Revue Text.*, 1931, **29**, 1219-1221 (from F.P.705,957).

The patent refers to a method of driving the crankshaft of a loom in such a way as to increase the period during which the shed is open. Diagrams are given. C.

Automatic Cop-changing Loom Shuttle. Ateliers Diederichs. *Revue Text.*, 1931, **29**, 1217 (from F.P.707,016).

The shuttle on looms with cop-changing mechanisms of the type in which the cop is placed in a holder is provided with a clip at each end to keep the ends of the holder in position. C.

Fashioned Heel and Method of Knitting. W. S. Parker. U.S.P.1,798,804 of 31/3/1931.

The primary purpose of the invention is to produce a gore in each side of the heel or heel pocket as it is commonly known, to give greater fullness to the heel. Another purpose is to knit the heel by narrowing and widening in such manner as to produce at each side of the heel a suture commencing near the point of the greatest widening and diverging so as to define between the diverging sutures the gore above-mentioned, the diverging sutures also providing reinforcements in the lines of greatest strain on the heel portion imposed especially when pulling a sock or stocking on. W.

Circular Knitting Machines. T. Grieve & Co. Ltd. and T. S. Grieve (Leicester). E.P.342,409 of 15/11/1929.

Relates to the production of patterned fabric on a circular knitting machine. A predetermined number of courses are knitted with one or more yarns and, during such action, knitting is suspended on selected needles. The yarns are then changed and the selected needles clear the loops and knit the other yarns. T.

Pile-fabric Looms. J. Morton (Cramond Bridge) and F. H. Oldroyd (Bradford). E.P.342,421 of 21/11/1929.

In looms for weaving tufted fabrics such as Oriental carpets, the tufts are introduced to a web of warps by means of a pair of gripper arms mounted side by side on a shaft which is moved bodily to carry the arms backwards and forwards towards the fell of the fabric and is oscillated to move arms between tuft seizing and tuft releasing positions. T.

Packing Materials. C. H. Baddeley (Bradford). E.P.342,508 of 24/1/1930.

A wool or like baling material comprises a fabric partly or wholly woven from strong vegetable (except cotton) or animal fibres covered with paper with or without a removable lining of wool. T.

Automatic Bobbin Changing in Loom Shuttles. Crompton & Knowles' Loom Works (Worcester, Mass.). E.P.343,189 of 22/11/1929.

The tip of the bobbin in the transfer position is supported by two flexible cylindrical supports. The supports engage the conical end of a bobbin moving to transfer position and thereby position it longitudinally. Also the supports may bend at the lower ends and be displaced forwardly, or rearwardly, by a misplaced bobbin. T.

Warping and Beaming Yarns. F. B. Dehn (London). E.P.343,333 of 28/2/1930.

In spool winders for winding several yarns on to a single spool for use with the tube frames of Axminster looms, and of the type in which three parallel rollers all driven in the same direction, fit between the heads of the spool, the upper roller is pressed downwards on the spool by means of weights on levers connected by lever mechanism to the lower portions of the uprights, the upper pivoted portions of which carry a roller. T.

Pile Fabrics. G. Straub (Deventer, Holland). E.P.344,463 of 4/9/1929.

Carpets or other pile fabrics provided with uncut pile are woven with two or more weft layers and have weft threads formed on their surfaces with uncut loops projecting in helical form bound by binding threads so spaced as to be embedded in the helices between the loops, thus giving the fabric the outward appearance of a Brussels carpet. The warp threads may be so shed as to cause different looped wefts to appear at intervals on the surface of the fabric, a figured or unfigured one-sided or two-sided reversible fabric being produced. The looped wefts may be in the raw, bleached, or coloured condition. T.

Winding Tuft Yarn Spools for Looms. Tomkinsons Ltd. and G. H. Cartwright (Kidderminster). E.P.344,605 of 23/1/1930.

To facilitate the "setting up" tuft yarn spools used in Axminster carpets, spools are wound from bobbins on a longitudinally-divided creel of which the sections are transversely displaceable. Thus two sets of creel sections transversely interchangeable may be brought into use. T.

Pile-fabric Looms. Hutchinson, Hollingworth & Co. Ltd., A. E. Wood, and W. V. Lowe (Dobcross). E.P.344,879 of 11/11/1929.

In tuft gripping mechanism for conveying yarn from a supply to the fell of the fabric for incorporation, a constantly rotating cam, coaxial with the gripper shaft, is adapted to operate the movable members of the grippers, means also being provided for balancing the torque on the gripper shaft and for enabling the shaft to be disconnected from the rest of the cam drive. T.

Looms: Beat-up Mechanism for Pile Fabrics. W. H. Dutfield (Kidderminster). E.P.345,384 of 11/1/1930.

In looms for weaving tufted pile carpets, in which a number of previously inserted weft threads are divided for the insertion of the tufts, a supplementary comb is provided for straightening up the front weft thread and providing a clearance for the insertion of the tuft tube frame between the wefts. The wide spacing of placers allows the weft to sag towards the centre of the warp, thereby

restricting the area between the divided wefts and the supplementary comb is brought into operation to beat up the front weft threads to the fell of the cloth and permit the free insertion of the next tuft. T.

Carpet Looms. A. Smith & Sons Carpet Co. (New York). E.P.345,473 of 10/3/1930.

Relates to the threading of the tuft-yarn tubes by air pressure in the production of Axminster carpets. T.

Chenille. H. D. Fitzpatrick (Glasgow). E.P.346,047 of 11/1/1930.

In manufacturing chenille for use subsequently in the production of pile fabrics such as carpets, rugs, etc., pile yarns and ground warp yarns are knitted together in a warp machine to make strips one or more needle spaces wide. The pile loops are drawn out by hooks and cut as required. T.

Pile Fabrics. J. Girmes & Co. A.-G. (Oedt, near Krefeld). E.P.346,107 of 24/2/1930.

Pile fabrics with tufts of unequal length to imitate animal skins are woven in double plush looms by using fluctuating pile threads crossing from one web to the other. These threads are bound firmly in the webs by several wefts. T.

Shuttleless Looms. G. G. Barker (London). E.P.346,306 of 7/1/1930.

To straighten the weft it is blown against the healds and straightened by jets of air from nozzles. The loom described is one for making stake and strand fabrics, the stakes being inserted by rollers at one side of the machine and loosely gripped and thus prevented from rebounding by spring leaves at the other side of the machine. T.

Looms for Stake and Strand Fabrics. G. G. Barker (London). E.P.346,347 of 7/1/1930.

In a loom for weaving stake and strand fabrics, the heddles are flat plates diagonally cut across at the passage for the warps, the cuts being bridged by side lugs which move in recesses in the adjacent heddles. T.

Braiding Machines. Etablissements C. Faure-Roux (St. Chamond, France). E.P.346,570 of 9/4/1930.

Skeins of elastic thread formed upon a winding machine are secured upon a belt. The length of the belt is adjustable and can be reciprocated slowly to enable a covering to be braided upon the skein to form an elastic cord for use as a shock absorber. T.

Carpet Looms. Platt Bros. & Co. Ltd. and F. W. Austin (Oldham). E.P. 346,741 of 14/10/1929.

In weaving Royal Axminster carpets, the carrier or block supporting one or more weft-inserting needles is reciprocated along guideways on a rail by means of a connecting rod connected by a stud to a carrier block on an endless chain which passes round adjustably mounted sprocket wheels. By varying the sizes of the sprocket wheels used and their positions and/or varying the gearing for driving the wheel the extent of the needle movements may be varied. T.

Circular Knitting Machines. E. Sallis (Basford). E.P.347,881 of 30/4/1930.

Relates to a device for regulating the feed of rubber thread in the production of elastic fabric or garments. T.

Looms: Gearing. F. J. Healey (London). E.P.348,854 of 25/4/1930.

The patent deals with a variable velocity ratio gearing used to compensate for different qualities of cloth woven, or different grades of cotton, wool, jute, silk, etc., in looms and spinning frames respectively. T.

Pile Fabric Looms. R. Eibuschitz and H. Schreiber (Jagendorf, Czechoslovakia). E.P.348,880 of 15/5/1930.

In knotting pile threads into the warp of a carpet, the pile thread is coiled in one or more turns round a pair of warp threads shifted out of the plane of the warp and when thus coiled into a ring is seized by a pair of nippers passing between the two shifted warp threads. Thus the running pile thread is severed from the ring which is pulled through between the two warp threads and is cut through at the place seized by a head knife on the nippers. T.

Pile Fabric: Manufacture. Mechanical Rubber Co. (Cleveland, Ohio, U.S.A.). E.P.349,141 of 7/3/1929.

A pile fabric of the type comprising a base and strands, cords, yarns or rovings, etc., with free or looped end portions forming the pile has the medial portions anchored to the base by a deposit *in situ* of a water dispersion of rubber which does not substantially penetrate the base fabric. The strands may be introduced by needles and the base material may be a woven, knitted, or felted fabric. C.

Weft Beating-up Mechanism. J. Morton (Cramond Bridge). E.P.349,152 of 4/3/1930.

The weft is slackened into sinuous form near the fell of the fabric and is beaten up after the shed has been changed and whilst it is held by the warps. In operation, a weft is inserted with the lay in the rearward position, the cam-operated lay advances near to the fell, the weft is slackened into sinuous form so as to bear slightly against the fell, the shed is changed, and the lay is again advanced to beat up the weft. C.

Jacquard Card Cylinder Slide Bar. W. Armstrong (Belfast). E.P.349,218 of 4/4/1930.

The card cylinder slide bar is reciprocated by levers and cams or eccentrics on an oscillating shaft which may be the one which effects the lifting or shedding motion. C.

Pile-fabric Looms. Carpet Manufacturing Co. and T. Cooper (Kidderminster). E.P.349,302 of 26/5/1930.

The tuft-tube frame of an Axminster carpet loom, when detached from the chains and resting on the transferrer is locked thereto by one or more sliding or pivoted catches not at the ends of the frame and automatically operated by a spring and a connection to a lever on one of the shafts operating the bobbin clutches. T.

Weft Pile Velvet: Weaving. R. Haworth & Co. Ltd. and L. Hayes (Manchester). E.P.349,309 of 29/5/1930.

A non-pattern fast-bound weft pile velvet which is apparently of a twill-less character and has the appearance of a warp pile velvet is made by forming twill formations of comparatively short lengths, the directions of which are frequently changed, ground picks dividing these reverse formations. The ground picks may form a twill back. C.

Circular Knitting Machine Fabric Starting Means. Hemphill Co. (Central Falls, Rhode Island, U.S.A.). E.P.349,394 of 14/5/1930.

The patent relates to means for starting to knit a fabric, especially hosiery, on a circular knitting machine. The mechanism is such that in the first three courses of the terminal structure, alternate or other needles raised by jacks under them take two yarns and cast off old loops, whilst the remainder take one yarn and do not cast off. One yarn is thus floated behind the jackless needles, which cast off in the next course, forming tuck stitches. This yarn is then withdrawn, another yarn being substituted if desired, and knitting proceeds as usual. C.

Cords: Knitting. W. J. Wesseler (East Cleveland, Ohio, U.S.A.). E.P.349,428 of 22/11/1929.

A cord or web is made on a miniature knitting machine in which the size of the loops made is independent of the size of the needles or pins which form them and the loops can be tightened up into knots. The knitting method consists in using more yarns than needles and in substituting on the needles forming the loops the extra yarns so as to leave the yarn of the cast-off loop free to be tightened up. C.

Knitting Machine Plating Mechanism. Hemphill Co. (Central Falls, Rhode Island, U.S.A.). E.P.349,443 of 5/3/1929.

The patent relates to the production of plated and reverse plated effects in stockings, etc., from several yarns. Two yarn feeds are provided. By feeding, say, a black and a white yarn in plating relation at the main feed and a black and a red yarn at the auxiliary feed, the black yarn may be used as the plain plating yarn at both feeds and either or both body yarns may be used for reverse plating. C.

Carpet Looms: Jacquards. F. Greenwood & Sons Ltd. and H. Wrigley (Rochdale). E.P.349,662 of 7/3/1930.

The guides for the selector pins in a carpet loom Jacquard are parts of the bar itself, e.g. stamped out instead of being in a separate piece of metal attached to the bar. T.

Double-walled Fabric: Knitting. Mellor Bromley & Co. Ltd., T. C. Bromley, and A. Shortland (Leicester). E.P.349,728 of 17/4/1930.

A double-walled fabric is made in which one or each wall is characterised by variations from normal plain loop formation, e.g. tuck stitches, miss-stitches, etc., which occur elsewhere than at the places where the two webs are connected together. An all-over cross tuck effect in both webs is shown. The joining may be achieved by the yarn of one web being knitted into or merely engaging the loops of the other. The invention may be carried out on an eight-feeder machine with a cylinder and dial, in which slide bearded or latch needles having butts of three different lengths. C.

Drop-box Loom Shuttle-positioning Mechanism. J. M. Badia (Barcelona, Spain). E.P.350,027 of 8/3/1930.

In a loom provided with a plurality of shuttles, an improperly positioned shuttle is pushed completely into its compartment as the drop-box descends by an angular thrusting member which is pivoted on the loom frame and is normally held in a substantially horizontal position by a spring-controlled rod, the rocking of the angular thrusting member by the projecting shuttle being finally overcome by the spring. A groove is provided in the thrusting member to accommodate the weft from the cop and prevent entanglement. C.

Shuttle Peg. W. Openshaw, V. Bancroft, and J. W. Bancroft (Bancroft & Co.) (Blackburn). E.P.350,034 of 11/3/1930.

A shuttle peg of tubular or solid construction is formed with a diametrical slot to receive a centrally pivoted member that is provided at one or both sides of its pivot with teeth or other gripping surfaces which are moved automatically from a gripping to a non-gripping position by movement of the peg. As the peg is turned outwardly to effect a change of tube or bobbin, a portion of the pivoted member engages a projection on the shuttle and causes the gripping surfaces to lie within the surface of the peg, but when the latter is returned to weaving position another portion by its engagement with an abutment gives a turning movement to the pivoted member and causes the gripping surfaces to engage the interior of the tube. C.

Elastic: Manufacture. Tubbs, Lewis & Co. Ltd. and Sir S. W. Tubbs (London). E.P.350,125 of 5/4/1930.

Woven or braided elastic webbing has the central elastic strands thicker than the outer ones so that the strip will lie flat. The fabric may comprise threads of silk, cotton, or rayon. C.

Bobbins. Wilson & Co., Barnsley, Ltd., W. B. Wilson, A. Greenwood, and W. Brown (Barnsley). E.P.350,191 of 13/5/1930.

Bobbins are provided with metal liners made by contracting a length of metal tube on a mandrel so that it forms radial folds which are forced into the bobbin or into recesses formed therein, so securing the liner against turning in the bobbin bore. The liner may be secured against longitudinal displacement by having tongues punched outwardly and forced into the bobbin. The liner may be constructed of brass, copper, steel, or other suitable metal. C.

Braiding Machine Driving Gear. J. and A. Reich (A. Reich es Fiai) and L. Mayerhofer (Budapest). E.P.350,226 of 18/2/1930.

A resilient coupling incorporated in the driving gear of a braiding machine to permit of high-speed running consists of a bevel wheel on the hub of which a flat wheel is mounted, the two wheels being connected together by a spring. One end of the spring is fixed to the bevel, whilst the other end normally rests against a roller on the flat wheel. Under excessive driving pressure the free end of the spring escapes past the roller and runs up an inclined guide fixed to the flat wheel, which is thus pushed forward until a spring plunger drops into a circumferential groove in the hub. The bevel wheel and the flat wheel are thus thrown out of mesh. C.

Knitting Machine Patterning Mechanism. Scott & Williams Inc. (New York). E.P.350,231 of 7/6/1929.

To produce patterned fabric, preferably by reverse plating, in a machine with push-out jacks located behind each needle, both jacks and needles have flexible upper portions which enable selected needles to be sprung outwards without their movement releasing the unselected needles from the pressure of the spring band. C.

Pirns. Felten & Guilleaume Carlswerk A.-G. (Cologne, Germany) E.P.350,295 of 16/7/1929.

In a pirn for use in automatic looms, comprising a metal shell and a head secured by driving the bush into the interior of the shell, the bush is conically recessed to facilitate entrance of the spindle. A second bush is secured near the top of the pirn by indentations or grooves and is similarly recessed. The exterior of the shell is roughened or grooved to prevent the windings from slipping. C.

Braiding Machines. J. Austin & Sons Ltd. (Manchester). E.P.350,347 of 18/9/1930.

The machine described is for making braided cord or rope. General details are given. T.

Braiding Machine Bobbin Carrier Tension Device. J. and A. Reich (A. Reich es Fiai) and L. Mayerhofer (Budapest). E.P.350,377 of 2/6/1930.

An adjustable tension for use in bobbin carriers of braiding machines comprises a U-shaped head carrying a roller round which the thread is passed, and a shaft round which a spring is coiled. The spring is secured and tensioned by cross-pins passing through holes in the shaft. C.

Bobbins. H. Müller (Zurich, Switzerland). E.P.350,424 of 5/2/1930.

Bobbins for cross-wound and other cops comprising a paper or like tube and detachable heads are provided with fixed or removable vanes which serve to retard the motion of the bobbin when the pull on the yarn slackens. The vanes may be inclined, or perforated, and may be formed on a separate sleeve coupled to the boss on the head by means of dogs. Rotation of the heads on the tube may be prevented by means of longitudinal ribs engaging grooves in the tube. C.

Creel. H. Zloczower (Vienna). E.P.350,439 of 15/1/1929.

Each set of bobbins is arranged in a vertical plane and is divided into upper and lower groups, the threads from the upper groups passing downwards in substantially vertical planes to guiding bars and thence through combs and over a bar to the warp beam, and the threads from the lower groups passing upwards in substantially vertical planes and similarly to the beam. Each row of bobbins in one set may be in the same plane as a row of bobbins in another set or staggered relatively thereto. C.

Loom Shedding Mechanism. W. W. Triggs (London) (Crompton & Knowles Loom Works, Worcester, Mass., U.S.A.). E.P.350,533 of 11/3/1930.

In order to accommodate on a loom different sizes of harness motions, the drive necessary to effect the shedding is transmitted from the crankshaft through an intermediate gear unit carried by a pivotally mounted arm which may be adjusted in any angular position relative to the crankshaft. The mechanism as applied to the dobby, and an adaptation to a Knowles head motion, are described. C.

Knitted Fabrics. J. Rompler A.-G. (Thuringia, Germany). E.P.350,535 of 11/3/1930.

Surgical stockings are knitted by a cardigan stitch or a royal stitch with two threads of different materials—e.g. cotton or wool and artificial silk respectively—so that the two materials appear on opposite sides of the fabric. Elastic threads are inserted at intervals. T.

Weft Feeler Mechanism. W. W. Triggs (London) (Crompton & Knowles Loom Works, Worcester, Mass., U.S.A.). E.P.350,624 of 31/3/1930.

In weft detector mechanism for giving indication of weft exhaustion to mechanism effective to bring about a change in the operation of the loom, an arm provided with a resilient or resiliently-mounted weft feeler, is mounted so as to be able to rotate and slide linearly to and from the lay under the control of a single spring acting on a projection thereon. The weft feeler comprises a resilient wire shaped and arranged to bend on impact with the weft, and formed with a vertical weft-engaging portion or provided with a grooved block to contact with the yarn.

The arm is supported by a stud on a carrier slidably mounted on a bracket carried by the loom frame, and when the feeler is moved sidewise consequent on weft exhaustion, a forwardly extending finger of the arm tilts a controller into the path of an actuator to effect the change. C.

Winding Frame Bobbin Holder. L. Schärer (née Nussbaumer) and K. J. Schärer (Schärer-Nussbaumer & Co., Erlenbach, near Zurich, Switzerland). E.P. 350,633 of 25/7/1929.

The bobbin is received on an axial spindle, and a spring-pressed sleeve axially movable on the spindle has an internally coned surface actuating radially guided gripping members which engage an external surface of the bobbin, thus allowing the wound bobbins to be removed by axially displacing the sleeve without damage to the windings. C.

Automatic Bobbin-changing Mechanism. J. P. Camps (Sabadell, Spain). E.P. 350,637 of 8/4/1930.

In automatic weft replenishing mechanism, in which a fresh bobbin or weft carrier is transferred from a rotary magazine to the shuttle during the advance of the sley, the magazine is positively oscillated during the transfer in order that the bobbin guides will remain parallel to the lateral parts of the shuttle from the commencement of transfer till the end of its movement, which is synchronous with the movement of the transfer hammer. C.

Loom Shuttle. T. Powell (Stanley, Perthshire). E.P.350,668 of 30/4/1930.

The front wall of a shuttle for use in looms in which threading is effected automatically is provided with a plate to act as a guide for the weft and to permit the weft to be delivered from the centre of the shuttle. At the first pick after replenishment the yarn from the fresh cop is drawn through the ordinary guide, where it is held by a tension spring, whilst the second pick causes the yarn to be drawn between pins mounted on the plate and shuttle wall respectively. Additional tension devices comprising leather flaps and elastic strands are provided inside the shuttle. C.

Yarn Swift. E. Gegauf (Steckborn, Switzerland). E.P.350,740 of 24/6/1930.

The staves of a reel or swift for winding yarns are constructed of thin-walled metal tubes formed of or covered with acid-resisting steel. The covering may comprise a sheath fixed to the stave by having the edges pressed into grooves in the stave. The end of the sheath is turned over the end of the tube, the tubes being preferably bent inwards at the ends. The staves are secured to the arms by screws or bolts which pass through flanges at the ends of the arms and into shaped clamping pieces in the staves. A plane through the grooves is approximately midway between the axis and the outer face of the stave, so that a minimum amount of rustless material is required to cover the bearing surfaces and yet give sufficient stability. C.

Modified Rib Interlock Fabric: Knitting. J. A. Mills (East Kirkby) E.P. 350,821 of 28/8/1930.

A modified rib interlock fabric in which the alternate wales on one face are composed of different yarns whilst the other face shows a third yarn is made by causing alternate rib needles to take and knit a yarn at one feeder whilst the remainder take a second yarn at the next feeder. The cylinder needles knit a third yarn at the third feeder and take in the runs of yarn supplied at previous feeders. The fabric is made on a one-and-one rib interlock machine with three, or a multiple of three, feeders and modified as to the cams so as to present the needles at the various feeders in the described manner. A splicing or plating yarn may be knitted on the cylinder needles. C.

Knitting Machine Patterning Mechanism. Hemphill Co. (Central Falls, Rhode Island, U.S.A.). E.P.350,830 of 16/9/1929.

Mechanism is described for selecting sinkers or web holders and/or needles for patterning, e.g. by reverse plating, drop stitch effects or design in pile loop fabric C

Cloth Beam. J. G. Larmor and Ulster Weaving Co. Ltd. (Belfast). E.P. 350,861 of 9/10/1930.

To permit of the removal of a roll of cloth from a beam, etc., a collapsible device is fitted round the beam, etc., before the cloth is wound thereon and afterwards the beam is withdrawn and the device is collapsed and withdrawn. The device comprises a number of connected slats and a binding cover, one of the end slats being extended to facilitate collapsing the device. C.

Cloth Roller Collapsible Device. J. G. Larmor and Ulster Weaving Co. Ltd. (Belfast). E.P.350,886 of 10/2/1931.

The collapsible device described in E.P.350,861 now consists of arcuate slats all hinged together. C.

Circular Knitting Machine Patterning Mechanism. W. Spiers Ltd., E. Spiers, and J. C. Hurd (Leicester). E.P.351,046 of 20/3/1930.

The needles of a multi-feeder circular machine are selected for patterning at one feeder by a pattern wheel or the like, and at a subsequent feeder or feeders are reselected by means which function permanently in opposition to the pattern wheel. C.

Metal-plated Tubes and Bobbins: Manufacture. British Celanese Ltd. (London), W. A. Dickie, and F. C. Hale. E.P.351,074 of 22/10/1929.

Tubes and bobbins which have been metallised by spraying as described in E.P.334,174 are given a second coating of metal by electrodeposition. A paper or cardboard pirn tube or wooden bobbin, which may be impregnated or varnished, is coated with copper by the Schoop process and the coating is polished. A coating of chromium is then formed by electrodeposition and the coating buffed and polished. The sprayed metal may be zinc, nickel, copper, aluminium, tin, lead or alloys, and the electro-plated metal nickel, chromium, or alloys. C.

Shuttle Peg Clips. G. Newsome (Bradford). E.P.351,200 of 23/5/1930.

In peg clips comprising spring-actuated members co-operating with a fixed flange having a depending web for securing the peg, the flange is secured by a screw or bolt passing through an aperture in the shuttle and engaging with a non-rotatable nut inserted from the underside of the shuttle through a hole which is subsequently closed by a wooden plug. C.

Fabric Thread-drawing Machine. N. Deutsch (Budapest). E.P.351,237 of 18/6/1930.

In a thread-drawing machine for producing openwork effects, provided with a swinging cutter and in which the fabric is stretched whilst being fed over parallel ribs on the throat plate, the ribs are inclined upwardly on each side of the opening for the thread-depressing needle whilst the cutter blade is pivotally or loosely mounted in a slot in the spring-pressed cutter head so that it can move laterally with respect to the circular underside of the throat plate. An additional presser foot holds the tensioned fabric in position as the needle descends. C.

Hosiery: Knitting. P. Schönfeld (Chemnitz, Germany). E.P.351,342 of 22/5/1930.

A method of producing hosiery provided with tops consists of transferring a piece of knitted fabric to the needles at a distance from its edge. The portion of the fabric lying in front of the needle points is then turned back so that the top fabric is penetrated twice by the needles to make a tubular edge. The leg portion is then knitted on. A solid rubber band may be enclosed in the tubular edge. C.

Chenille Fur Sewing Machine. J. Morton (Cramond Bridge). E.P.351,404 of 20/3/1930.

A sewing machine for making chenille fur by sewing tufts of pile-forming threads to a core of yarn, string, etc., is described. C.

Carpet Weaving. G. J. Gilhet (Paris). E.P.351,447 of 21/2/1930.

In producing a carpet or fabric resembling tapestry with the same design on both sides and with looped stitches, a weft is inserted in the loom beneath a selected pile warp. These are crossed under the ground warps by means of hooked needles. Is an addition to E.P.306,509. T.

Weft-feeler Device. Maschinenfabrik Rüti vorm. C. Honegger (Rüti, Switzerland). E.P.351,595 of 13/4/1929.

A weft-feeler device for indicating exhaustion of weft in the shuttle and for initiating weft replenishment, comprises a feeler wire formed with a triangular contacting portion surrounded by a helical spring, and a circular part, the latter being slidably accommodated within a box on the breast beam and yieldingly held against an abutment on it by means of a spring. The feeler wire is also formed with a bent portion located adjacent to a loosely-mounted pin which on

being displaced engages a spring-mounted member and makes an operative connection between a reciprocating member on the lay and a member associated with the cop-changing mechanism. During the normal working of the loom and while there is sufficient weft on the cop, the feeler receives a longitudinal movement in the box with the advance and return of the lay, but on weft exhaustion the feeler receives two distinct movements, the weft replenishing mechanism being operated only after completion of the second movement. At the first step the feeler is deflected laterally by the head coming into contact with the denuded bobbin to bring the bent portion just into contact with the pin and the subsequent advance of the lay causes the feeler to be moved forward and to displace the pin which in turn pushes the spring-mounted member between the reciprocating member on the lay and the member associated with the cop changing mechanism. C.

Fabric-covered Shuttles. A. & A. Christoph (trading as G. Christoph) (Leutersdorf, Germany). E.P.351,627 of 13/4/1929.

Shuttles are covered with strips or layers of fabric or fibre which is impregnated with artificial resin and is applied under heat and pressure. C.

Beat-up Mechanism for Carpet Looms. Platt Bros. & Co. Ltd. and I. B. Bassindale (Oldham). E.P.351,654 of 3/5/1930.

The weft threads inserted in Royal Axminster or moquette carpet looms by three or more needles are beaten up by two reeds which are both mounted on a sley rocked by adjustable cam-controlled lever mechanism. The reed is permanently in engagement with the warp threads, whilst the reed is moved up and down in the sley. After the insertion and wetting of the tufts, the reeds recoil a short distance and tuft yarns are again inserted. T.

Bobbins. Wilson & Co. (Barnsley) Ltd., W. B. Wilson, A. Greenwood, and W. Brown (Barnsley). E.P.351,668 of 13/5/1930.

Positively-driven bobbins are provided with rubber or raw hide insertions in which the driving slots are formed. The rubber or raw hide may be reinforced by metal or other powder or by brass or copper wire. C.

Hosiery Knitting Machine Splicing Mechanism. R. Haddan, London (Scott and Williams Inc., New York, U.S.A.). E.P.351,714 of 4/6/1930.

Means are provided for engaging a withdrawn splicing yarn with the fabric formed on the needles which do not receive the splicing yarn. The invention is particularly applicable to machines for knitting spliced stockings having contiguous ribbed and plain portions. C.

Braided Fabric: Manufacture. Shepshed Lace Manufacturing Co. Ltd. and W. H. Price (Loughborough). E.P.351,764 of 15/7/1930.

A fabric which tends to remain in any shape to which it is distorted is composed of base or ground threads extending diagonally to the selvedges and crossing each other and of surface threads also extending diagonally and crossing each other, the base and surface threads being interwoven. The fabric may be made on a braiding machine, a lace machine of the plain-net type, or on a loom with a traversing warp or warps. C.

Loom Warp-damping Device. E. A. Colombo (Shanghai, China). E.P.351,796 of 7/8/1930.

A wooden warp damping roller is mounted in a wooden, brass or other metal water-trough supported by carriers carried by rods acted on by weighted ropes whereby the roller is kept in contact with the warp on the beam as this empties. In a modification, the carriers are supported by levers connected to a counterweighted lever. C.

Braiding Machine. A. Zehnder (Birmenstorf, Switzerland). E.P.351,900 of 9/1/1930.

Each bobbin carrier shoe carries two balls which run in tracks of semicircular section. When a crossing point is reached a roller mounted above the shoe engages a cam nose on the centre plate and causes the shoe to swing on the trailing ball until the leading ball is safely in the other track. A guard is ribbed and shaped to act as an air brake and to keep it as low as possible. If the guard falls owing to the bobbin thread breaking, a system of levers is set in motion whereby a rod unclutches the driving gear. C.

Warp Stop Motion. T. C. Wagner (Chemnitz, Germany). E.P.351,901 of 13/1/1931.

The patent relates to electric warp stop motions of the kind in which end loops on the healds are supported in the upper shed on insulated rails, but are lifted by intact warp threads in the lower shed, while current is supplied to the rails for stopping the loom on the occurrence of a broken warp, and consists in a rotary distributing drum connected to the source of current and provided with a circumferential row of apertures for the reception of contact studs for each set of healds, a spring connected to the healds for any particular shed being arranged to contact with the studs which are inserted in the drum in accordance with the particular binding. An addititional spring connected to one pole of the current supply makes permanent connection with the drum, whilst all the springs are connected to an insulating plate. C.

Superposed Fabrics Loom. L. Olivier (Roubaix, France). E.P.351,918 of 29/3/1929.

In looms for weaving two superposed fabrics, a single shuttle is used in conjunction with two single-cell shuttle boxes disposed one on each side of the lay, the boxes being moved, at the same time, into line with the upper and lower sheds alternately. C.

Straight Bar Knitting Machine Welt-turning Device. Hosiery Machine Corporation (Cumberland, Rhode Island, U.S.A.). E.P.351,969 of 2/4/1929.

The patent relates to an automatic welt-turning device applicable to machines of the Cotton type, comprising a carriage having sliding elements which take from and return to the needles the initial welt course and co-operate with pairs of fixed transfer elements mounted in the same slots of the carriage. C.

Warp Beam. British Celanese Ltd. (London), S. M. Fulton, and W. B. McVeigh. E.P.351,995 of 1/4/1930.

An adjustable flange for a warp beam is provided with a boss which is internally threaded to engage the externally threaded end of the barrel and is formed with a reduced portion having a number of slots which enable it to be compressed so as to press the threads of the flange on to those of the barrel. The flange is locked in position by means of a collar and a bolt, or by the application of a nut, to a tapered external thread on the boss. Holes are provided at intervals along the barrel to facilitate the fastening of the warp on the beam. C.

Lace Machine Picot Mechanism. F. W. and J. W. Pare (J. Pare & Son) and J. W. Butterworth (Nottingham). E.P.352,081 of 5/4/1930.

A pure, picot or similar object is made on lace in the course of manufacture in a Lever's go-through or other lace machine by shogging one or more warp spool or beam threads under reduced tension across a number of warp threads and of bobbin threads pillaring with them. On account of the greater tension of the warp and bobbin threads, the outside single gait pillars subsequently draw inwardly by sliding over the shogged thread the loops of which thus project. Before and after the picot-forming motions the warps, bobbins, and the thick thread are all nipped together. C.

Weft Feeler Mechanism. J. P. Camps (Sabadell, Spain). E.P.352,107 of 11/4/1930.

Indication of weft failure is communicated to means for effecting replenishment by the relative movement of weft and shuttle feelers, the latter being slidably mounted on the former and provided with a hook-like member which, upon predetermined exhaustion of weft, engages a projection and partially rotates a shaft associated with the changing mechanism. The hook-like member is pivoted to the shuttle feeler by means of an axle pin and is formed with a downwardly extending toe disposed in a slot in the weft feeler, whilst both feelers are urged towards the lay by independent springs. Normally the engagement of the weft feeler with the weft causes the combined feeler unit to move and the hook to pass idly under the projection, but, when the bobbin is substantially denuded, the shuttle feeler is engaged by the shuttle, whereupon the toe, being brought into contact with the wall of the slot, causes the hook member to pivot so that the hook engages with the projection. A cover is provided for the device. C.

Crêpe Fabrics: Manufacture. British Celanese Ltd. (London). E.P.352,113 of 12/4/1929.

In making fabrics exhibiting crêpe effects, highly twisted yarns of degummed silk are incorporated and the fabrics are subjected to the action of an aqueous

reagent. Prior to weaving, the silk yarns are treated with size readily removable by water or other aqueous liquids and are then associated with yarns of organic derivatives of cellulose liable to lose lustre when treated with hot aqueous liquids. C.

Automatic Shuttle Changing Mechanism. V. Hildebrand (Mulhouse, France). E.P.352,263 of 25/7/1929.

The hammer or transferrer, instead of being operated by a bunter on the lay, is provided with a nose adapted to be brought into the path of a rotating cam. The nose is formed on a dog pivoted to the hammer and having a slotted extension engaged by a lever which is operated on call for bobbin change. C.

Winding Machine Measuring Stop Motion. J. L. Rushton (Bolton). E.P. 352,299 of 15/8/1930.

In a measuring device for winding or reeling machines comprising a measuring disc provided with a slot which is engaged by a feeler, the movement of the feeler disconnecting the drive, the disc is rotated by a resilient drive which causes it to advance slightly on withdrawal of the feeler, thus preventing re-entry of the feeler into the slot when the machine is restarted. By the use of interchangeable worm wheels, different lengths of yarn can be measured using the same disc. C.

Fringing Fabrics. G. F. McDougall (Portland, Oregon). E.P.352,356 of 4/11/1930.

Each part of the fabric to be fringed is divided into bundles by the teeth of a comb which is lowered to force the bundles into the twisters at the bottoms of the grooves in a lower comb, each bundle being pierced by a pin in the twister, all of which are intergeared and simultaneously rotated by pinions and a lever to twist each bundle in a groove partly in an upper and partly in a lower jaw. T.

Loom Picker. International General Electric Co. Inc. (New York). E.P. 352,361 of 8/11/1929 and 352,522 of 19/3/1929.

(1) Pickers are made of superposed layers or pieces of leather and woven material treated with raw rubber adherently united by an artificial resin capable of hardening, such as phenol formaldehyde condensation product. The pickers may also contain textile fabrics or fibrous materials and wadding-like felted fibres and be of the shape shown in E.P.352,522. (2) Pickers are made of alternate layers of woven fabric such as cotton duck or canvas impregnated respectively with artificial resin and raw rubber. The layers may be wound together and pressed to shape as described in E.P.286,916, preferably at about 160° C. and under a pressure of 150 kg./sq. cm., whereby the rubber is vulcanised and the resin hardened simultaneously. C.

Warp Stop Motion. W. W. Triggs, London (Maschinenfabrik Rüti vorm. C. Honegger, Rüti, Switzerland). E.P.352,395 of 1/4/1930.

The fall of a heald due to warp breakage stops the relative displacement of oppositely toothed bars and causes the loom to be stopped before the beat-up and with the lay at a distance from its foremost point. The relative displacement of the bars is produced by mechanism which is independent of the heald movements, so that the stop motion may be used in looms in which groups of heald staves remain in the lower shed for several picks. C.

Inextensible Towelling: Knitting. G. Spencer Ltd. and J. A. Elliman (Nottingham). E.P.352,396 of 2/4/1930.

A weft yarn is laid in by the use of burrs such as are described in E.P.238,009 and 238,289 at each course of a tuck pile fabric as made on the machines described in E.P.239,572 and 241,438. The product is intended primarily for use as towelling, etc., being practically inextensible in all directions. C.

Non-laddering Hosiery: Manufacture. E. Wildt, H. H. Holmes, and Wildt & Co. Ltd. (Leicester). E.P.352,418 of 7/4/1930.

Knitted articles are made from a flat length or a tube of fabric having non-laddering properties and made as described in E.P.327,958, 327,987, 327,988, or 328,026, cutting the tube, etc., to the shape required and joining the parts to form the complete article. The foot bottom, heel, toe, and high splice may be made separately and attached. C.

Cotton Knitting Machine Sinker Operating Means. A. C. and E. Hilscher (trading as G. Hilscher, Chemnitz, Germany). E.P.352,439 of 21/11/1929.

Cotton machines are provided with sinker operating means consisting of two bars which are separately actuated by levers from cams to move the sinkers in opposite directions. C.

Crêpe Fabrics: Manufacture. H. Dreyfus (London). E.P.352,451 of 5/3/1930.

Fabrics exhibiting crêpe effects are produced by incorporating highly twisted yarns sized with a material consisting of or containing a polymerised vinyl compound or other polymerised or condensed organic product and subjecting the fabric to a scouring bath. The crêpe yarns may consist of cellulose esters or ethers, regenerated cellulose, silk, or mixtures thereof, whilst the size may be applied as described in E.P.346,267 and consist of any of the sizes there mentioned. The polymerised organic compounds may be formed on the material or may be further polymerised on it. Substances may be applied to effect the swelling of the size as described in E.P.348,589. The scouring bath may cause the filaments of the crêpe threads to swell to enhance the crêpe effects, as described in E.P.352,000. C.

Winding Frame Yarn Feeding Mechanism. A. H. Junkers (Rheydt, Germany). E.P.352,454 of 27/3/1930.

In apparatus for winding yarns or threads and for the formation of a stock or supply of yarn in which the thread runs in at one end and can be drawn off axially from the running-off end independently of the winding device, the thread is wound on to one or a number of rotating cores containing a device for axially displacing the yarn towards the running-off position. The thread is guided from a bobbin by a slotted drum on to a supply device from which it is wound more slowly on to a reel so that there is always a reserve of yarn on the device. The device consists of two sets of four rollers supported at the upper and lower ends of a carrier rotatable on a spindle, each pair of rollers supporting an endless belt on which the thread is wound, and the rollers of both sets or of the lower set being coupled by toothed wheels. At each revolution of the spindle a driving star on the axle of one of the lower rollers engages a lever to displace the belts upwards, i.e. to the running-off position. Other forms of the device are described. C.

Loom Dobbies. H., H., R., and H. Staübli (Staübli & Co., Geb., Horgen, Switzerland). E.P.352,458 of 27/7/1929 and 352,502 of 6/11/1929.

The patents relate to loom dobbies with hooks controlled through relay arrangements from a paper pattern. C.

Knitting Machine Needle Control Mechanism. H. H. Holmes, L. H. Leedham, and Wildt & Co. (Leicester). E.P.352,543 of 11/4/1930.

To increase the space available for the passage of a wale thread guide between adjacent needles, the heads of alternate needles are separated more widely in a radial and circumferential direction than when in the knitting position. One method of doing this is to crank the stems of the respective needles either forwardly or backwardly. Certain sinkers may be provided with lateral projections which deflect the respective needles. Alternatively, certain needles may be pressed out of line by a notched wheel or the bottom of certain needle tricks may be out of line with others, so that when the needles are elevated their heads are not in line. C.

Coloured Figured Fabrics: Weaving. C. W. Harvey (Belfast). E.P.352,762 of 30/7/1930.

In weaving damasks, etc., two warps of different colours, say, blue and yellow, and a weft of a third colour, say, red, are so interwoven as to cause different proportions of the warps and weft to appear at the surface at various points so that, as in the three-colour printing process, combined colour effects resembling the natural colours of objects result. Two wefts and one warp may be used. C.

Heald Frame. T. Lund & Son Ltd. and W. Todd (Bingley). E.P.352,792 of 1/9/1930.

A heald frame comprises wooden shafts and side members tenoned together and stayed by U-shaped iron or like strips. The sides are perforated to receive the slider bars for wire or like healds. C.

Weft Feeler Mechanism. Ateliers de Construction Guillaume Diederichs (Ste-Colombe-les-Vienne, France). E.P.352,861 of 24/9/1930.

A forked weft feeler is mounted on a spring-pressed slide mounted on a bracket and having a stop for a lever which is adapted to be engaged by the shuttle and has a pin movable in a slot in the bracket. When there is sufficient weft on the tube the feeler is moved back so that the stop engages the lever which is pressed back by the shuttle against the action of a spring. When the weft is exhausted the feeler straddles the tube and the stop is not moved into position to prevent the lever from sliding to the right on the shuttle to move a rod for putting the shuttle-changing mechanism into operation. C.

Radial Warp Thread Circular Weft Loom. R. Brownlow and Latent Laboratories Ltd. (London). E.P.352,927 of 14/1/1930.

The patent relates to an improved loom for the production of fabric and articles, such as hats and the like, of woven construction having radially disposed warp threads and a circular or spirally disposed weft, of the kind having a pair of circular frame members adapted to carry the radially disposed warp threads mounted so as to rotate about axes inclined one with the other and driven by spur gearing from a camshaft which is located adjacent to the contact zone of the circular frame members, and cam-operated means for imparting adjacent to the point at which the two frame members are in proximity shedding motion to the radially disposed warp threads consecutively or successively as distinguished from imparting shedding motion to the alternately arranged warp threads simultaneously. According to the invention, each of the frame members is provided with a plurality of radially extending saw-cuts or grooves adapted to accommodate pivotally-mounted transfer levers or cams which have an inclined face adapted to be moved across the grooves to impart a shedding motion to the warps. C.

Winding Frame Reciprocating Thread Guide. Courtauld's Ltd. (London) and H. Biddulph. E.P.352,952 of 14/4/1930.

A reciprocating thread guide for leading the thread on to a pirn or tube which merely rotates, comprises two spaced grooved wheels over which the thread passes, the axes of the wheels being parallel and their common plane being at right angles to the axis of the pirn or tube. C.

Shuttleless Loom. W. W. Triggs, London (Wonder Weave Inc., Boston, U.S.A.). E.P.353,063 of 16/4/1930.

Details are given of the eyed-arm weft-inserting mechanism, selvedge protecting and selvedge forming mechanism, and the beat-up, take-up, let-off, and shedding motions. C.

Cloth Measuring Machine. V. Mazzucchelli (Milan, Italy). E.P.353,142 of 17/5/1930.

A linear measuring apparatus for strip material and comprising a revolution counter is provided with devices for showing simultaneously the length that has been unwound from the winding-off roll and that which remains to be unwound to complete a predetermined length, with devices for actuating a signal device when the predetermined length is near completion and for stopping the machine when the length is completed, and with zeroising means for the several devices. C.

Warp Sizing Machine. J. L. V. Paillet (Wignehies, France). E.P.353,285 of 21/8/1929.

After leaving the sizing rollers, the sheet of warp is split into two parts, each of which proceeds to a pair of cylinders provided with brass ribs extending helically in the same direction. Each pair of cylinders is pivotally mounted in such a way that the plane common to the axes of both cylinders of a pair can be moved angularly. As the warp passes round a pair of cylinders, such angular movement of the plane of the axes, adjustable in amplitude, causes it to be brought into contact with itself at certain points, thus producing friction and uniform dressing, since all the fibres will be pressed upon the cores of the threads. C.

Automatic Loom Weft-feeler Mechanism. A. F. Jamin (Petit Quevilly, France). E.P.353,297 of 29/8/1929.

In weft-feeler mechanism for automatic shuttle-changing looms, the pivoting feeler finger remains entirely free on its pivot, the bobbin changing mechanism being connected only to the movable member upon which the feeler finger is pivoted. As a result of the freedom left to the feeler finger, the operation of the weft feeler becomes extremely sensitive. C.

Warp Knitting Machine. E. Wirth (Hartmannsdorf, Germany). E.P.353,317 of 19/9/1930.

A machine that knits a combined warp and frame-knitted fabric, there being a loop of each kind on each needle, comprises essentially a row of bearded needles, a set of warp guides, an ordinary yarn guide, jack and dividing sinkers and a presser. Loops are sunk after the warp guides and yarn guide have arrived to the front of the needles but before the warps are laid in the needles. C.

Cop Winding Machine. Maschinenfabrik Schweiter A.-G. (Horgen, Switzerland). E.P.353,321 of 5/11/1929.

A cop or pirn winding machine with a rotating spool spindle traversed by a main cam, has a supplementary cam imparting reciprocating movement to the thread guide for producing a variation of the position of successive layers of winding at the tip of the cop. C.

Pile Fabric Loom. J. Morton (Cramond Bridge, Scotland). E.P.353,687 of 21/7/1930.

In weaving plain or patterned tufted or pile fabrics in which the pile is supplied in strip form such as chenille fur, the pile is positively opened out as tufts, for example, by means of pointed blades and of a tuft separator, and the catcher warps are introduced into the spaces between the tufts. C.

Shuttleless Looms. Teeag Textil Finanz A.-G. (Zurich, Switzerland) E.P. 353,764/5 of 23/9/1929.

(1) In looms with gripper devices for carrying weft from stationary weft spools and in which a plurality of weft spools is in use, the different weft threads are led from the spools by way of guiding and tensioning members to a corresponding number of rocking feeding levers, which can be independently controlled in accordance with the pattern and which are also provided with thread clamping means to take hold of the ends of the weft threads. During the rocking movement of any one of the feeding levers the end of the particular weft thread is transferred to the gripping means of the shuttle with the simultaneous release of the clamp provided on the feeding means, so that the weft thread is free to move through the clamping means whilst the thread is introduced into the fabric. (2) Mechanism is described by which, in looms with nipper devices drawing weft from stationary weft spools, the inserted weft threads are cut off to a length somewhat greater than that required by the breadth of the fabric and the projecting ends are held till they are beaten up by the reed and the shed is opened again, when they are bent into the next shed and beaten up with the succeeding weft thread. C.

Braiding Machine. F. Billard (Lyons, France). E.P.353,767 of 12/10/1929.

Each carrier comprises a hollow central tube to which are attached plates and shoulders for engagement with the raceways, a creel frame and a let-off device. The arrangement of the creel frame and let-off device on opposite sides of the plates and shoulders tends to reduce top-heaviness. The yarns pass through the central tubes and through a funnel with impregnating material to the braiding point. Four or more bobbins or caps are mounted in each frame, and yarn can be drawn off them simultaneously. C.

Loom Pattern Mechanism and Take-up Control Mechanism. A. E. Wood (Dobcross Loom Works, Dobcross). E.P.353,825 of 16/1/1931.

In a loom of the type in which the head motion or dobby is driven by an upright shaft, control means is provided whereby, through a single operating member the pattern mechanism may be disconnected and the lower take-up drive reversed, sub-control means being provided whereby, if desired, the pattern mechanism may be disconnected without reversing the pattern chain or the take-up drive. In a practical form of the invention the upright shaft is provided with a clutch adapted to connect the shaft with a driving element and with a vertically slidable sleeve carrying gear wheels either of which may be placed into mesh with a gear operatively connected with the take-up, a pivoted yoke lever being operable to move the sleeve vertically and being connected to a manually-operable control lever, whilst a second connection is provided for the yoke lever to a clutch lever designed to control a clutch adapted to connect the upright shaft with the pattern mechanism. A manually-operable sub-control lever is connected to the lever controlling the pattern mechanism drive clutch and a lost-motion connection is provided between the clutch lever and the yoke lever controlling the movements of the take-up drive sleeve. The yoke lever controlling the take-up drive is formed as a two-part lever having its members operatively connected by a give-way connection. C.

Loom Warp-sizing Apparatus. J. J. M. Chirat (Lyons, France). E.P.353,850 of 21/3/1929.

In apparatus for sizing rayon and other yarns directly on the loom, the warp in its passage from the beam passes through a sizing trough, upwards over guide

rollers and thence to the loom proper, one of the guide rollers being braked by a weighted cord to prevent the tension imparted to the threads during weaving from being transmitted to the wet portion of the warp. A similar braking device may also be applied to the warp beam. The drying action may be assisted by the provision of a fan adapted to be driven from the low shaft of the loom. C.

Warp Pile Fabrics: Weaving. Drey, Simpson & Co. Ltd., O. Drey, and H. L. Byrd (Stockport). E.P.353,860 of 25/1/1930.

In weaving warp pile fabrics in a double plush loom, two or more pile warps are drawn through one dent of the reed and when the warps do not actually form pile one or more of them is or are woven "fast pile" or W weave in the top cloth whilst the other or others are woven in like manner in the bottom cloth. C.

Loom Picker. P. J. Dilworth (Burnley). E.P.353,953 of 4/4/1930.

Pickers are made with a portion formed with rounded corners and having extending wholly or partly round it an intermediate projection or abutment. The abutment may be integral or formed from wire or metal in other form. The picker is attached to the picking strap by two tugger straps passed round the part with rounded corners one on each side of the abutment and prevented from contacting with the picking spindle by ledges. C.

Loom Picker. T. Greenwood (Todmorden). E.P.354,011 of 23/6/1930.

Layers of woven fabric such as balata are placed on a layer of buffalo hide and the composite material is folded to produce a picker having layers of hide and fabric sandwiched together. C.

Warp Drawing-in Frame. J. Robinson and J. Dobson (Blackburn). E.P. 354,023 of 4/7/1930.

The patent relates to an improved heald carrier and heald tensioning means comprising a portable, adjustable frame adapted for use with various drawing-in frames, without alteration, to which are connected separate heald stave supporting and tensioning devices, the whole forming a self-contained unit. A further object of the patent is the provision of improved means for supporting the warp beam near to the floor, instead of at the top of the drawing-in frame, with consequent advantages in the handling and positioning of heavy beams, and also the provision of an improved two-part bar clamp for the warp at a point between the healds and warp beam, which, whilst firmly clamping the warp, is easier to separate and less liable to break than the known make of clamp. C.

Winding Frame Spindle Band-braking Means. O. Hibbert (Hyde). E.P. 354,042 of 24/7/1930.

In band-braking means for the spindles of yarn winding frames, in which the band passes over an inclined portion of the spindle and the spindle is capable of a movement of oscillation about a horizontal axis as well as a movement of revolution, fine adjustment means are provided for moving one end of the band in a direction parallel to the axis of the spindle to allow of slight variation in the amount of the braking force applied. C.

Loom Change-box Motion. W. B. White & Sons Ltd., W. P. White, and J. Shepherd (Colne). E.P.354,060 of 8/8/1930.

The patent relates to change-box mechanism particularly applicable to two-shuttle rotary, oscillatory or drop boxes, in which a toothed segment of a mutilated wheel on the tappet shaft is normally in position for engagement with a mutilated pinion connected to a crank for operating the shuttle boxes, the segment being capable of being moved laterally by hand, by the weft fork, or by the dobby or other shedding mechanism to travel past the mutilated pinion to allow the boxes to remain stationary whilst the loom is moved forwardly or backwardly to find the pick. C.

Automatic Shuttle-changing Mechanism. W. Pollard (1923) Ltd. and H. Williams (Nelson). E.P.354,065 of 14/8/1930.

A weft feeler slidably mounted on guides and maintained in the forward position by a spring, is provided with a pivotally mounted shuttle feeler the longer arm of which is connected to a rod slidably supported at its outer end by an arm of a finger rod. When the weft is exhausted to a predetermined extent, the shuttle strikes an adjustable stud on the shuttle feeler causing it to rotate and push the slidably-supported rod in front of the weft hammer, thereby establishing a connection between the latter and the arm of the finger rod and giving a

rocking movement of the finger rod, which effects the engagement of the usual catch lever with a cam-operated lever and operates the rotary box. A bent plate on the weft hammer engages the end of the slidably supported rod on the return movement and returns it, with the shuttle feeler, to normal position. C.

Knitting Machine Stitch-forming Mechanism. Hemphill Co. (Central Falls, Rhode Island, U.S.A.). E.P.354,135 of 31/12/1929.

The sinkers are moved upwards during stitch drawing, and to prevent loops in process of formation from being rubbed by more completely formed loops two or more adjacent sinkers are successively maintained at substantially the stitch-drawing level. The invention is described as applied to a multi-feed machine with rotating needle cylinder. C.

Circular. Knitting Machine Shogging Motion. Standard-Trump Bros. Machine Co. (Wilmington, Delaware, U.S.A.). E.P.354,144 of 23/1/1930.

The patent relates to ratchet means for controlling the shogging movements of a wrap finger or fingers in relation to a circular series of needles. C.

Rayon Ribbons: Manufacture. British Celanese Ltd. (London). E.P.354,233 of 9/5/1929.

The process of E.P.328,312 is modified by the employment of heat as well as pressure in the production of flattened products from a number of filaments of thermoplastic cellulose compounds such as cellulose acetate, after they have been treated with a liquid having a solvent or softening action. Another modification comprises the addition to the solvent or softening liquid of a high boiling solvent or plastifier, the treated filaments being then transformed by pressure into flattened products, the application of heat being optional. C.

Knitting Machine Web Transferring Mechanism. Scott & Williams Inc. (New York). E.P.354,237/40 of 8/5/1929.

(1) In mechanism such as is described in E.P.316,333 for transferring knitted webs to the needles of a circular knitting machine, a pin is provided for locking the needle cylinder against rotation and means are provided for locking the transfer mechanism in inoperative position until the locking pin is in locking position. (2) A device for transferring ribbed, etc., fabric to the needles of a circular knitting machine comprises a non-rotatable mounting plate, a rotatable transfer ring carrying quills, and a rotatable stripper ring carrying individual stripper members. The plate is mounted on an arm, for swinging into operative and inoperative positions, by means of screws so that it can be adjusted with respect to the axis of the needle cylinder, and is provided with a sleeve for supporting the stripper ring. The transfer ring is mounted on the plate so as to have limited axial movement by means of stops and screws, a shoulder being provided on the ring to engage with the stops. The loops are stripped off the quills manually, the stripper ring being moved bodily by arms passing through slots in the sleeve when a handle is pressed inwardly. The transfer ring is held against rotation when in the inverted position by keys on the mounting plate, the keys being of such depth that the transfer ring is free to rotate when placed over the needles of the knitting machine. C.

Straight Bar Knitting Machines. T. H. Jones and R. K. Mills (Nottingham). E.P.354,374 of 9/5/1930.

A machine of the Cotton type is provided with needles having double or multiple latches, whereby the non-laddering fabric described in E.P.329,098 can be made. The hooks may be made springy to facilitate transfer of loops. Locked or tied stitches are made at predetermined intervals, the needles being raised for this purpose to a greater extent than for making plain stitches so that the yarn can be fed between the latches. C.

Rubber Solution Size: Application and Removal. J. M. Lyonnet (Lyons, France). E.P.354,819 of 15/5/1929.

Textile yarns are sized with a solution of rubber in benzine or carbon disulphide and scoured in slightly alkaline or ammoniacal hot liquor. Yarns sized in this way are pliable, strong, elastic, smooth, and are protected against the action of exterior agents such as cold or warm water, heat, rain, acid, or the like, and are superior to those sized with known sizes. All trace of the size is removed from the yarn before dyeing takes place. C.

Weft Straightening Device. J. J. Lyth (Valleyfield, Canada). E.P.355,980 of 12/12/1929.

The patent relates to apparatus for correcting the lie of displaced weft threads in cloth, in which the cloth is passed over a number of normally parallel rollers comprising two sets arranged in parallel relation within two frames pivotally connected together, for adjustment of the relative position of the planes of the two sets of rollers, on an axis midway between the ends of the frames and transverse to the length of the rollers. Improved means for adjusting the relative position of the frames about their common axis comprise a threaded member or block pivoted to one frame, a bearing pivoted to the other frame, a screw co-operating with the threaded member and journalled in the bearing, and means for rotating the screw. In a convenient means for rotating the screw there may be provided on the screw a chain wheel round the periphery of which passes a manually operable and preferably endless chain that is guided by being passed over suitable guide rollers mounted on one of the frames. C.

Loom Take-up Mechanism. G. E. Stuttard (Nelson). E.P.356,281 of 7/6/1930.

To avoid the risk of turning back a fabric too far or too little, loom take-up mechanism has an extra take-up wheel mounted on the outside of the end frame of the loom to afford ready access for the weaver and to be within her view, so that she may operate the wheel by one hand whilst with the other hand she may remove all the pawls from engaging with the ratchet wheels. C.

Rayon Tracing Cloth: Manufacture. R. Schwickert A.-G. and O. Huber (Freiburg i. Breisgau, Germany). E.P.357,068 of 11/7/1930.

A homogeneous tracing cloth is obtained by using silk or rayon fabric as the foundation instead of cotton. C.

Automatic Weft-replenishing Loom. British Celanese Ltd. (London). W. A. Dickie, F. C. Hale, and W. Howarth. E.P.357,161 of 12/6/1930.

Details are given of a loom comprising a change-box motion, a shuttle magazine adapted to contain as many kinds of weft as there are shuttle boxes, means for stopping the loom on exhaustion of a shuttle, means for replacing a spent shuttle by a shuttle containing the same kind of weft whilst the loom is at rest, and means for restarting the loom after replacing the exhausted shuttle. C.

4—CHEMICAL AND FINISHING PROCESSES

(A)—Preparatory Processes

Dyed Cellulose Acetate Rayon: Stripping. *Rayon Rec.*, 1931, 5, 463.

An effective method involves the use of decolourising charcoal. The fabric is treated at 180° F. in an ordinary beck with a 0·5% soap solution and 2 g. of the charcoal per litre. To aid in the subsequent washing, gelatin is added as a protective colloid, about 10-20 g. per litre. C.

Organic Persulphonate Wetting and Bleaching Agents. —. Patard. *TIBA*, 1931, 9, 867 and 869.

Attention is drawn to a new class of products, organic persulphonates, which have, according to their composition, wetting, detergent, emulsifying and softening properties on the one hand and appreciable oxidising power on the other. All the compounds have a high stability. Experiments with sodium isopropyl naphthalene persulphonate are discussed. In addition to complete elimination of starch from cotton cloth allowed to remain overnight in a bath prepared by heating to 80-90° C. water containing 2 g. of the persulphonate and 2-3 g. of sodium carbonate per litre and rinsing thoroughly, a preliminary bleach, sufficient in many cases to allow the goods to be dyed without further preliminary treatment is effected. In further tests, cotton was scoured with 2% caustic soda, 2% caustic soda containing 2 kg. of toluene sulphochloramide, and 1% caustic soda containing 2 kg. of sodium isopropyl naphthalene persulphonate. Although less than half the quantity of caustic soda was used in the third case the results were conclusive; the goods were whiter and the loss of strength was insignificant. Sodium isopropyl naphthalene persulphonate is also a starch solubilising agent, sizes and finishes prepared with it having an appreciable wetting power and easily and rapidly penetrating the goods. Experiments were also made with the sodium salt of an aliphatic persulphonic acid. This product completely desizes rayon,

whatever the nature of the size, and simultaneously softens and bleaches the goods. C.

(B)—Boiling, Scouring, Degumming, and Washing

Cotton Cloth: Scouring Without Pressure. M. Romanov and P. M. Bogatyrev. *Chim. et Ind.*, 1931, **25**, 1499 (from *Izv. Tekstiln. Promychl.*, 1930, 9, Nos. 8-9, pp. 91-93).

After the usual treatment with hot water the goods are washed and placed in a Stepanov kier with an opening of 70 cm. without being compressed. For 100 pieces of calico weighing 300 kg. the following mixture is used: 36 kg. of sodium hydroxide, 9 kg. sodium carbonate, 9 kg. sodium silicate 37°, 9 kg. sodium bisulphite 35°, 9 kg. "Contact T." This lye is driven through the superheater to the top of the kier and is kept in circulation. The goods are boiled in this way for an hour at 80-95° C. The lye is then poured off and the goods are washed in the same kier with 2,000 l. of warm water and then cold water. The goods are treated with a solution of sodium hypochlorite containing 0·75 g. of active chlorine per litre at 15° C., put in heaps for three hours and washed, soured in sulphuric acid of 0·5° Bé and washed. When a better white is required the hypochlorite treatment is followed by a second boiling with a lye containing 18 kg. sodium hydroxide and 9 kg. sodium carbonate for an hour at 81°. The goods treated in this way have good capillarity with a Kauffmann index not exceeding the normal; no alteration of the fibre is observed. Tests with coverings with a base of very coarse and dirty cotton confirm the claims made for the method. C.

Cotton Goods: Scouring. A. V. Jouschkoff. *Rev. Gén. Mat. Col.*, 1931, **35**, 256-258 and 291-294.

A general discussion of the parts played by absorption, neutralisation, hydrolysis, emulsification, and oxidation in the scouring of cotton cloth improvements in apparatus and in methods of circulation, the alkali requirements and the optimum temperature, pressure and time for the process, the use of solvents and assistants, and the regeneration of lyes. C.

Kier Assistants: Application. C. D. Brandt. *Melliand*, 1931, 3, 409-410.

Kier boiling tests to determine the relative values of various kier assistants are described. Five different compounds were used and the results were judged as to shade or colour and softness of feel. The most efficient assistant was also the most expensive, whilst the second best assistant was the cheapest. In the experimental runs the improved results obtained warranted the slight additional cost and use of the most expensive assistant. In drawing conclusions from the tests it is emphasised that whilst some kier assistants are of actual value others are not, and the only method of determining is by actual plant tests under conditions similar to those in everyday use. C.

(C)—Weighting

Rayon: Weighting. K. Swoboda. *Kunstseide*, 1931, **13**, 300-302.

Methods of weighting rayon with tin phosphate and barium sulphate are described and the properties of the weighted rayon are discussed. An increase in weight of 25-30% is generally obtained by a double treatment with tin phosphate whilst the strength and extensibility of the rayon are not affected to any appreciable extent. The barium sulphate process only produces a small increase in weight and serves more as a delustring process. It is suitable for yarns and hosiery, but not for piece goods. The use of silicate is not recommended for the weighting of rayon. C.

(E)—Drying and Conditioning

Hygrolit M.D.K. Conditioning Agent: Application. *Text. Weekly*, 1931, 8, 40-41.

Some tests are described in support of a claim that a 1% solution of Hygrolit M.D.K. is an efficient antiseptic and non-staining conditioning agent. In the tests, the conditioning fluid was made up with infected water but the cops of conditioned yarn were kept in closed bottles instead of freely exposed to the air. C.

Shirlan NA. Antiseptic Conditioning Solution: Application on Wool. *Text. Merc.*, 1931, 85, 278.

Experiments are described on the use of Shirlan NA in conditioning crossbred and botany yarns. Adequate protection against mildew was given by a solution that put about 0·12% of Shirlan on the wool. C.

Bucketless Drying Cylinder. Rigby & Mellor Ltd. (Bury). *Text. Rec.*, 1931, **49**, No. 581, pp. 45 and 47.

A new method for ejecting condensed water from the interior of drying cylinders is described. A pipe passes through the doll-head bearing and dips down almost to the bottom of the cylinder at its middle. The other ends of all the pipes from the complete range of cylinders are connected to a drain and a reservoir unit fitted with a cam-operated valve. This valve is regulated to open automatically, at and for predetermined intervals. When open the steam pressure in the cylinder forces the condensed water into the pipe and this continues to siphon off even if the valve shuts before the cylinder is empty. C.

Knitting Yarn Conditioning Apparatus. K. Trissler *Kunstseide*, 1931, **13**, 340-341.

The conditioning apparatus consists of a box containing six independent chambers, one above the other, into which the bobbins of yarn are placed. Water circulates through the chambers but does not come into actual contact with the yarn. The apparatus is placed near the knitting machine and the different sections are emptied and filled up again in strict rotation so that a continuous supply of uniformly conditioned yarn is available. C.

(G)—BLEACHING

Bleach Liquor Wetting Agents: Application. E. Baur. *Spinn. u. Web.*, 1931, **49**, No. 35, pp. 18-23.

(1) The author has examined the effect of added wetting agents on the stability of hypochlorite liquors. The agents chosen were (*a*) sulphonated oils, represented by 50% Turkey red oil, Humectol C, and Geneucol M, (*b*) aromatic sulphonic acids, represented by Nekal BX, and (*c*) agents with added fat solvents, represented by Perpentol BT and Perlano. Liquors were made up with 0·5, 1, 2, and 5 g. per litre of wetting agent in a chemic of 6·5 g. available chlorine per litre. One set was neutral, another had 1 g. of caustic soda per litre, and a third 1 g. of sulphuric acid per litre. The active chlorine was measured after 1, 2, and 3 hours. All the wetting agents consumed some chlorine, the effect being least in the alkaline liquor and greatest in the acid. The results are tabulated.

(2) Further experiments describe the effect of alkalinity or acidity on the wetting power (measured as sinking times) of 0·2% solutions of Humectol, Geneucol, Nekal, and Perpentol. Nekal BX was the most active agent; it was somewhat restrained in alkaline solutions and considerably so in acid. Humectol was almost independent of the reaction. Geneucol was more active in strongly alkaline solutions but useless in acid. Perpentol gave poor and variable results.

(3) Experiments are also recorded on the bleaching of 2/24's American yarn in hank form in a chemic of original strength, 5 g. Cl. per litre. The yarn was previously boiled out with 10 times its bulk of (*a*) water for 6 hours, (*b*) caustic soda, 2 g. per litre, for 6 hours, (*c*) soda ash, 2 g. per litre, for 6 hours, or wetted out with (*d*, *e*, *f*) Humectol, Geneucol, and Perpentol, respectively, 2 g. per litre for 2 hours. The bleach liquor used was rendered alkaline (2 g. NaOH per litre), neutral, and acid (2 g. H_2SO_4 per litre) and in each experiment the volume was 10 times the bulk of the yarn. The amount of active chlorine was determined after $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 3, and 5 hours, and the resulting 18 yarns were placed in order of whiteness. With the exception of the yarn that was boiled out with water only, the neutral chemic gave the best white in every set of three experiments. Previous boiling with alkali led to somewhat better whites than the use of wetting agents alone and, of course, the chemic maintained its strength better.

(4) The final series of experiments relates to the use of wetting agents in the bleaching of yarn in cross-wound packages with or without paper tubes. The data recorded relate mainly to the increase in weight of the spools after $\frac{1}{4}$, $\frac{1}{2}$, 1, etc., hours in solutions of Humectol or Nekal alone, or in chemic containing wetting agent, or in water or alkali alone. Nekal BX, 2 g. per litre, caused rapid penetration and the addition of alkali increased the speed. Chemic containing Nekal was almost as fast. C.

Continuous Rapid Bleaching Process. N. V. Fillipov and B. S. Voronkov. *Chim. et Ind.*, 1931, **25**, 1498 (from *Izv. Tekstiln. Promychl.*, 1930, **9**, Nos. 8-9, pp. 84-90).

The method depends on the use of a bleaching liquor of superior activity and increased emulsifying power. Continuity of operation is provided by suitable

arrangement of apparatus in series. The complete process of bleaching is reduced to 1½-1¾ hours, of which 30-40 minutes are devoted to treatment at 85-90° C. in open receivers with a solution of the following composition—15-35 g. sodium hydroxide, 5-15 g. "Contact T," 12·5-25 g. potassium sulphite 38° Bé, and 7·5-10 g. of 39° sodium silicate per litre. The goods are washed with warm water and then with cold, treated with a solution of sodium hypochlorite of 0·2-0·5° Bé for 30 minutes, washed, soured with a very dilute solution of sulphuric acid, washed, and dried in the usual way. C.

Hydrogen Peroxide; Bleaching with——. D. S. Quern (Buffalo Electro-Chemical Co.). *Amer. Dyes. Rep.*, 1931, **20**, 529-531.

The advantages of the 100-volume product sold as "Becco" are discussed. This is made by the steam distillation of potassium persulphate and the only impurity is a trace of phosphoric acid, added to stabilise the solution. C.

Organic Persulphonate Wetting and Bleaching Agents. *See* Section 4A.

(H)—MERCERISING

Caustic Soda Recovery Plant. E. R. Chrystall. *Ind. Chemist*, 1931, 7, 372-373.

The disadvantages of oxidation methods and the advantages of the dialysis method for the recovery of caustic soda are pointed out. By the dialysis method it is possible to recover 90-95% of the soda lye in the form of an 8% solution, to all intents and purposes free from organic matter and with very little carbonate in solution. Two types of plant are at present in use on a large scale. The "Cerini" employs open rectangular tanks and the porous membranes take the form of parchmentised flat cloth bags which are kept in a vertical position in the tanks by means of spiral wire mats. Thirty or 50 of the membranes are installed in each machine. The "Heibig" dialyser is built in the form of a double-ended filter press in which the ordinary filter cloth is replaced by a sheet of parchment paper, and the plates of the press are cast with a specially designed arrangement of ribs and channels to give the requisite support to the parchment and at the same time to ensure a regular flow of the liquids and as large as possible contact with the dialysing surface. The advantages and disadvantages of each are briefly discussed. C.

Mercerisation; Effects of Tension in——. J. H. Skinkle and R. E. Hale. *Amer. Dyes. Rep.*, 1931, **20**, 547-556.

The mercerisation process is described and previous work on the effects of the time, temperature, and tension is reviewed. The results of tests of the influence of tension in the mercerisation of 2/20's cotton yarn are tabulated and shown graphically. These results show that the tension applied has considerable effect upon the rate of absorption of the caustic soda and the rate of washing of the yarn. The amount of shrinkage recovered upon washing is directly proportional to the tension applied. Any tension above that necessary to regain completely the shrinkage of the yarn in the caustic alkali gives no appreciable advantage in the properties of the finished yarn. C.

(I)—DYEING

Aloes and Chrysamic Acid: Application. *TIBA*, 1931, 9, 711 and 713.

Aloes, obtained from the fleshy leaves of a number of tropical plants, gives, on treatment with boiling nitric acid, a number of nitro-acids of which chrysamic and aloetic acids are the chief. Chrysamic acid is the richest of the natural colouring matters and the shades derived from it are remarkable for their brilliance. The use of aloes in dyeing was first proposed in 1840, and some fourteen years later it was shown that aloes gave a wide variety of shades, such as rose, hortensia, Corinth, violet, grey, puce, maroon, cinnamon, wood, olive, myrtle, orange, yellow, etc., on cotton, silk, and wool. By printing cotton with gum water containing 2 g. of chrysamic acid per litre, rose shades are obtained which change to violet on exposure to steam. On dyeing in a weak aqueous solution of the acid, silk is dyed a Corinth shade and wool a deep maroon whilst cotton takes no colour. Aluminium-mordanted cotton gives a violet colour whilst iron-mordanted cotton takes no colour. Ammonium and sodium chrysamates give grey shades with the aid of metallic reducing salts, and a wide variety of colours with non-reducing salts. Chrysamic acid has the further advantage of fixing certain badly-dyeing colours, for example, by adding 250 g. of chrysamic acid in solution in caustic soda for 5 kg. of orchil, an orchil colour insensitive to air and light is obtained. C.

Indigo Vats: Dispersion, and Adsorption by Yarn. V. J. Minaev and P. V. Moryganov. *Chim. et Ind.*, 1931, **25**, 1499 (from *Izv. Tekstiln. Promychl.*, 1930, 9, Nos. 8-9, pp. 93, 97).

Tests made on hydrosulphite, zinc, and ferrous sulphate indigo vats with various compositions, periods of immersion, and alkalinities show—(1) That the degree of dispersion decreases from the hydrosulphite to the ferrous sulphate vat. (2) That the quantity of leuco-derivative of indigo increases with the degree of dispersion. (3) In order to increase the degree of adsorption of the leuco-derivative it is important to increase the number of immersions in the vat and to submit the goods to regreening after each immersion; the effect is better with higher dispersion of the vat. (4) Increase in alkalinity of the indigo vat produces a decrease in the degree of dispersion. (5) The adsorption of the leuco-derivative of indigo decreases with increase in the stability of the vat. On comparing these results with the effects of similar conditions on the adsorption of direct dyes it is seen that if the dispersion and stability of the dye bath play analogous parts in the two cases, the role of electrolytes in the case of direct dyes and that of soda for the leuco-derivative of indigo are very different. C.

Multicoloured and Shaded Yarns: Dyeing. R. Levé. *TIBA*, 1931, 9, 713-717.

An account is given of the methods of obtaining fancy dyeing effects described as bariolé, dégradé, and fondu. Bariolé or variegated dyeing is the production on yarns of several colours each of equal intensity throughout its zone, dégradé dyeing is dyeing in one colour shaded to white, and fondu dyeing is a combination in which two consecutive colours merge gradually into each other. C.

Worn Garments: Dyeing. M. K. Abramov. *Chim. et. Ind.*, 1931, **25**, 1498 (from *Niti*, 1930, **1**, Nos. 6-9, pp. 5-6).

Worn garments are usually cleaned and then dyed separately. The two processes may be combined by the use of "tinctorial soaps" consisting of olein soap, prepared from 35 parts of cottonseed oil and 14·8 parts of caustic soda of 38° Bé, with additions of 5 to 15% of a direct dye. The only objection to this procedure is the low fastness of the dyeings obtained. The fastness is improved by subsequent treatment with metal salts, with formaldehyde, or by diazotisation and coupling. Fabrics redyed in this way may be made waterproof by passing through a bath of aluminium acetate. With 6% tinctorial soap, calculated on the weight of the cloth, a solution of aluminium acetate of 1·5 to 6° Bé is used. This treatment produces impermeability to water, whilst treatment with copper salt increases that to light. C.

Alizarin Red Prints: Steaming. N. K. Mokrochev and V. G. Vorobiev *Chim. et Ind.*, 1931, **25**, 1501 (from *Izv. Tekstiln. Promychl.*, 1930, 9, Nos. 10-11, pp. 90-93).

Determinations of the temperature and humidity in the Mather-Platt ager showed that the vapour was far from being saturated and that it contained air and sometimes acid vapours. Tests were also made with a small laboratory apparatus in which the temperature, humidity and duration of steaming could be modified independently or simultaneously. The results were expressed in the form of curves. Comparison of the curves leads to the following conclusions—(1) The colour effect of steaming (without pressure) alizarin red in medium and small cuts is a function of the temperature and the humidity; (2) the best results in regard to shade and fastness to soap are obtained with saturated steam; (3) superheated steam gives rise to mediocre colours. C.

Bleaching, Dyeing, Printing, and Finishing Machinery. P. Urmston. *J. Soc. Dyers and Col.*, 1931, 47, 215-221.

A report of a lecture on the various processes involved in the bleaching, dyeing, printing, and finishing of cotton goods with special reference to plant and machinery. The possibility of using solid vulcanite or Staybrite steel for dyeing machines and of securing a metal for the lining of pressure kiers is discussed. C.

Vistra-Aceta Rayon Mixed Yarns: Dyeing. *Textilber.*, 1931, **12**, 519-520.

Soft, woolly yarns of silky lustre are obtained by twisting together yarns of Vistra and Aceta rayon. The average twist is 800 turns per metre. Directions are given for dyeing such mixed yarns, and samples are provided showing respectively dyed Vistra and white Aceta, dyed Aceta and white Vistra, and both fibres dyed in a one-bath process. C.

Wool-cellulose Mixtures; Production of Two-colour Effects on——. S. R. Trotman and J. E. Bateman. *J. Soc. Dyers and Col.*, 1931, 47, 231-232.

It is possible to obtain two-colour effects on mixtures of wool with cotton or viscose rayon by dyeing in a bath containing a mixture of acid and basic dyes if the *p*H is greater than 5·5. For wool and viscose rayon the dyebath is made up with the selected acid dye, 10% Glauber's salt, and 1·5 g. tartaric acid per litre of liquor. The fabric is introduced at about 40° C., and the temperature raised to 80° C. and kept at this height until the wool is dyed to shade. The temperature is then allowed to fall to 60° C. and a small quantity of the previously dissolved basic dye is added. Dyeing is continued at 60° C. for 30 minutes, small quantities of the basic dye solution being added from time to time if necessary. Suitable dyes are mentioned. C.

Cellulose Acetate Rayon: Saponification. A. J. Hall. *Amer. Dyes. Rep.*, 1931, **22**, 583-586 and 607.

Experiments are described on the effect of various degrees of saponification on the affinity of cellulose acetate rayon for direct dyes, Aniline Black, and S.R.A. colours and on its resistance to hot ironing. Caustic potash is said to act more rapidly than caustic soda, but baryta gives the most regular results, especially when the mixture is not continuously shaken. After saponification to the extent of 10%, the rayon has as great an affinity for Chlorazol Fast Red K as cotton. This affinity rises to a maximum at about 90% saponification. Somewhat similar results have been obtained with Aniline Black on the large scale. Conversely, saponification must be nearly complete before the material loses its affinity for S.R.A. colours. The fusion point is raised from about 215-220° C. to about 275° C. on saponification to the extent of 10%. C.

Constant-speed Dyeing Machine. J. Downham & Co. Ltd. *Text. Rec.*, 1931, 49, No. 582, p. 42.

The improved constant-speed dyeing machine is of the jigger type and is specially suitable for the dyeing of delicate silk and rayon fabrics. An important feature of this machine is that all alterations and corrections of speed and tension required are performed automatically by the cloth itself. A compensating roller at the bottom of the dye tank is carried in bearings which are fitted in slides. The weight of the roller is only slightly heavier than the weight of the liquid displaced by it. The cloth passes under it and the slightest tension of the cloth between the two draw rollers raises the compensating roller. The constant-speed control of the fabric passing through the dye liquor is ensured by means of this roller working in conjunction with P.I.V. variable gears, which drive both the draw roller and receiving roller. C.

Dyeing and Finishing Creaseproof Rayon Fabrics. O. Pennenkamp. *Melliand Text. Monthly*, 1931, 3, 490-493.

The part played by multifilament yarns, that is yarns with individual filaments of 1-1½ denier or less, and by fabric structure, in the promotion of creaselessness in rayon fabrics is discussed. In finishing and dyeing rayon materials in rope form the natural elasticity of the yarns and fabrics must be preserved and unnecessary creasing avoided; chemical change or alteration of the rayon structure must be prevented and treatment with acids must therefore be cautious. Rayon piece goods should be stored in temperature-regulated rooms and goods sensitive to the pressure due to high-stacking should be stored separately. C.

Rayon Waste Fabrics: Dyeing. C. E. Mullin. *Cotton* (U.S.), 1931, 95, 1024-1025 and 1103.

A discussion of some of the problems encountered in the dyeing of yarns and fabrics made from rayon waste, specially cut rayon and cotton and rayon mixtures. C.

Staple Fibre Fabrics: Dyeing and Finishing. R. Cottrell. *Text. World*, 1931, 80, 1179-1181.

A discussion of the methods of dyeing and finishing cloths woven from staple fibre or staple fibre in combination with cotton and continuous filament rayon. References are made to the following fabrics—(1) A dress material with 2/60's staple fibre warp and weft; (2) a print with 20's staple fibre warp and weft; (3) a poplin with 2/60's staple fibre warp and 100 denier continuous viscose weft; (4) a shantung crepe with 150 denier viscose warp and 2/60's staple fibre weft; (5) a velour with 2/20's staple fibre pile; and (6) a blanket cloth with cotton warp and 2/10's staple fibre weft. C.

(J)—PRINTING

Indanthrene and Indigosol Dyes: Application. *RUSSA*, 1931, 6, 1127.

Formulæ are given for direct printing with indanthrene dyes and indigosols, padding and over-printing with indanthrene dyes, and discharge printing with indanthrene dyes. The methods of procedure are outlined. C.

Madagascar Gums: Properties. La Compagnie Lyonnaise de Madagascar. *TIBA*, 1931, 9, 863, 865, and 867.

Madagascar gums, obtained from the exudation of a tree widely distributed in the island, appeared on the market at the end of 1929 and immediately attracted the interest of a number of calico printers. The gums are readily soluble in hot or cold water and have excellent thickening properties. Their viscosity is much higher than that of the gums hitherto known, so that where 500 g. of gum Senegal, 250-270 g. of Chiraz gum, and 170-180 g. of Karaya gum would be required in printing, only 150 g. of Madagascar gum are necessary. This reduction in the quantity of dry matter per kilo of thickener is of advantage from the point of view of penetration of the fibre by the colouring matter. The properties of the gums and the preparation of thickeners from them are discussed. C.

Variamine Blue: Application. W. Krostewitz and O. la Dous. *Textilber.*, 1931, 12, 584-586.

Practical advice is given on the production of reserve effects with Variamine Blue and a suitable continuous dyeing machine is shown. Two patterns illustrating the effects obtained are supplied and details are given of the printing colours employed. C.

(K)—FINISHING

Worsted Effect Cotton Fabrics: Production. *Cotton (U.S.)*, 1931, 95, 864.

Popular effects have been produced by the combination of cotton having a long silky fibre with cotton or waste having a short, harsh fibre. Cut silk or rayon waste and dyed cotton waste have also been employed. Weaves bordering on the basket or sateen effects lend themselves to the "limp" finish and various twills have been found effective. Where a very soft "limp" fabric is desired the goods are first desized, run through warm water containing a very small quantity of softening oil, tentered, and then run through sand brushing rollers attached to the back of the calender. A much less expensive process which is used for cheaper fabrics consists in passing the cloth through a small steam chest where it is treated with live steam before it proceeds to the tenter frame and sand rollers. The cloth has a "crisp" feel after brushing. C.

Stained Piece Goods: Cleaning after Soaping. O. Metzger and L. M. Granderye. Refereed by M. Bader. *Bull. Soc. Ind. Mulhouse*, 1931, 97, 371-372. *Pli cacheté* No. 2225 of 24/2/1913.

In a mill which was obliged to use river water contaminated with print works effluent the goods had a pink or cream colour after soaping. The colour was not removed by treatment with chlorine but treatment with sodium bisulphite solution was found to be effective. C.

Rayon Crêpes: Processing. C. A. Jennings. *Text. World*, 1931, 80, 1206-1207.

Very light crêpes, such as chiffons and georgettes, are given the preliminary crêpeing treatment by the so-called stick method. The cloth is entered into cold water which is gradually brought near to the boil. It is then treated for $\frac{1}{2}$ to 3 hours in a desizing solution, washed, and scoured for about an hour in a solution containing neutral soap, an emulsifying agent, and sometimes a small percentage of soda ash. The pieces are then washed, hydro-extracted, sewn end to end, and transferred in rope form to reel dyeing machines where they are scoured, bleached, and dyed. Some grades of the heavier crêpes, especially cotton-rayon fabrics, are treated with cold water, desized and scoured in the dashwheel and then dyed in rope form on the reel dyeing machine. Goods which are not too delicate and which give an even crêpeing without too many operations can be given all the treatments on one reel dyeing machine or run continuously through a number of reel dyeing machines arranged in series. The addition of 2% caustic soda to the cold water of the first reel machine gives a more even crepeing action. A cold water wash must be introduced to remove the caustic soda before the cloth passes to the hot scouring bath. Fabrics handled by the stick method show the best results when treated in the first tank for 30 min. in a 2% solution of caustic soda at room temperature. C.

"Tube-tex" Tubular Knitted Fabric Wet Finishing Machine. Tubular Textile Machinery Corporation. *Melliand Text. Monthly*, 1931, 3, 425-426.

A small compact machine which functions as an additional dyehouse unit is described. A feature of the machine is the "propeller spreader" which propels the opened tube of fabric entirely by rolling contact, with complete control of the tube or fabric in all its dimensions. In this position the fabric is impregnated, uniformly extracted, and wound on a roll or folded so that it passes to the drier uniform in width and in flat form essential to even drying. The machine is adaptable for all types of knitted fabric such as rayon, cotton, wool, and mixtures in all weights ranging from light to heavy. Any of the finishes can be accompanied by an increase in yardage of from 6% on rayon to 15% on cotton, the fabric being "set" in its state of increased yardage and therefore not subject to increased shrinkability. C.

Cellulose Acetate Fabrics: Delustring. J. Sterling. *Text. World*, 1931, 80, 1202-1203.

A method of delustring is described which, when applied to crepe-back satins with cellulose acetate rayon warps and silk wefts, serves the double purpose of delustring the rayon and degumming the silk. The fabric is first hooked off into 36-in. folds, tied with strings and suspended from sticks arranged so that the loops hang in a tub. The fabric is treated with water at about 100° F. and the temperature is raised gradually to 120° F. The fabric is then laid up at the end of the trough and 8-10% of olive-oil soap (based on the weight of the goods) and 1 oz. soda ash per 30 gallons of liquor are added to the water. The goods are then run back into this soap bath at 120° F., and the temperature is raised gradually to at least 175° F. At the end of the first hour the degumming of the silk should be almost complete. A quick test of this is to take a silk thread and untwist it. If the filaments separate, the degumming is complete. When a satisfactory boil-off has been obtained the temperature of the bath is raised to 185 to 195° F. Treatment for about 30 minutes at this temperature will usually give sufficient delustring. The goods should be removed on the first signs of saponification which is indicated by the appearance of affinity for direct dyes. If a batch shows signs of saponification and the silk is degummed but the lustre still too high, a fresh bath of water alone heated to the required temperature will serve to delustre without risk of further saponification. After the delustring treatment the goods are rinsed and dyed in the usual way. C.

Dyeing and Finishing Creaseproof Rayon Fabrics. *See* Section 4I.

Staple Fibre Fabrics: Dyeing and Finishing. *See* Section 4I.

(L)—Proofing

Clothing Fabrics: Waterproofing. P. Krais and R. Buchheim. *Leipzig. Monats. Text. Ind.*, 1931, 46, 249-250.

Experiments on the comparative values of a number of waterproofing processes are described. Strips of a closely woven navy-blue cotton twill, a black wool poplin, and a black crêpe with acetate rayon warp and viscose weft were waterproofed by four two-bath soap-alumina processes, twelve single and two-bath processes with proprietary compounds (unspecified), and four Impregnol processes. Of the four best methods, three were single-bath treatments with Impregnol, namely, with Impregnol M in the proportions of 20 and 50 g. per litre and with Impregnol SE. Repetition of the experiments with Impregnol M in the two concentrations indicated showed that there is no important difference and that for almost all purposes a concentration of 20 g. per litre is sufficient. In the soap-alumina processes sodium stearate proved to be considerably better than sodium oleate or Marseilles soap. C.

Patents

Mothproofing Fur, Wool, etc. I.G. Farbenindustrie A.-G. (M. Weiler, B. Wenk, and K. Berres, inventors). G.P.513,387 of 13/7/1929 and 513,388 of 18/7/1929. Additions to 503,256.

The materials are treated with asymmetrical hydroxydi- or tri-arylmethane derivatives obtainable by condensing *p*-chloro- or *p*-bromo-phenol (or their substitution products having one *o*-position to the OH group unsubstituted) with aromatic hydroxy alcohols or hydroxyhydrols or their anhydrides or derivatives, which are themselves obtainable by condensing an aldehyde with

one of the phenols mentioned. A suitable reagent is pentachlorodihydroxytriphenylmethanesulphonic acid, prepared by condensing 2, 4-dichlorophenol with the hydrol anhydride obtainable from *o*-sulphobenzaldehyde and 2, 4, 5-trichlorophenol (513,387). Alternatively, the materials may be treated (1) with bis (hydroxybenzylated) aromatic hydroxy compounds having halogen in the *p*-position to the OH groups, but free from COOH or SO_3H groups, or (2) with nuclearly mono- or di-benzylated *p*-halophenols free from COOH or SO_3H groups and containing no OH groups in the benzyl nucleus, or (3) with halogenation products of hydroxydi- or tri-arylmethanes not containing COOH or SO_3H groups (513,388). W.

Bleaching Animal and Vegetable Fibres and Materials. Österreichische Chemische Werke G.m.b.H. G.P.516,531 of 6/7/1927.

Feathers, hair, fur, bristles, etc., are bleached by the action of gaseous H_2O_2. The materials are kept at about 50°. In the case of furs, etc., the skin is given a protective coating of fat, etc., before bleaching the fur, etc. W.

Shading Yarns. O. Hoffmann. G.P.518,509 of 6/3/1928.

The warp is wound parallel and the weft spirally, on the same cylinder and the mass dyed in various shades. Apparatus for dyeing in which the liquor is fed to the hollow centre of the mass, is described. W.

Impregnating Cotton, Wool, Yarn, etc. W. Költzsch. G.P.520,843 of 14/8/1925.

Industrial material for linings, packings, etc., of cotton wool, etc., is impregnated by treatment with an aqueous solution of oak bark extract to render the material more effective in preventing leakage. H_2CrO_4 may be added to the extract. W.

Moothproofing Agent. I.G. Farbenindustrie A.-G. (M. Hardtmann and P. Backes, inventors). G.P.522,824 of 7/12/1929.

Wool, furs, hair, skins, etc., are made mothproof by treatment with an aqueous solution of thiuronium salts. Thus, wool is treated with a solution of the salt formed by phenylthiourea and $C_2H_4Br_2$ or with the salt $PhNHC(:NH\cdot HCl)SCH_2C_6H_3Cl_2$ from phenylthiourea and 2, 6-dichlorobenzyl chloride. Further examples are given. W.

Treating Animal Fibres. I.G. Farbenindustrie A.-G. (R. Haynn, inventor). G.P.524,215 of 10/1/1928).

To enhance their capacity for felting, animal hairs are treated with solutions of HF or H_2SiF_6 or their salts. A solution containing 4 g. of $(NH_4)_2SiF_6$ per litre is specified. W.

Treating Textile Fibres and Leather. Oranienburger Chem. Fab. A.-G. (K. Lindner, inventor). G.P.524,349 of 13/7/1927.

For the sizing, smoothing, oiling, greasing and like treatment of textile fibres and leather, use is made of aqueous solutions of the neutralised sulphonation products of mixtures of linseed oil with fatty substances consisting mainly of oleic acid or its glycerides. Thus, a mixture of linseed oil and olein may be sulphonated at a temperature not above 35°, and the sulphonation product salted out and neutralised with NaOH. Appropriate additions may be made to the solutions. W.

Washing Wool. E C. Duhamel and Comp. Générale des Industries Textiles. G.P.526,351 of 30/3/1928.

Wool is washed in a cold bath containing suint, and then in a hot bath, also containing suint. W.

Spirally-coloured Yarn: Dyeing. C. Kloeters. *Deut. Färber-Zeit.*, 1931, **67**, 638; G.P.530,889.

Coarse yarns showing a spiral dyeing effect are obtained by means of apparatus in which the yarn is led over one or more rollers which supply dye to the underside, is wound on a bobbin and is subsequently withdrawn over-end from the bobbin. C.

Electric Cloth Singeing Apparatus. Société l'Electro Textile and M. Ripoche. *Revue Text.*, 1931, **29**, 1079 (from F.P.665,215).

A cloth singeing device with an electrically-heated plate is briefly described. Diagrams are given. C.

Waterproofing Textiles. A. Nathansohn. F.P.693,803 of 12/4/1930.
Textiles are made waterproof by incorporating in them, by a gentle treatment with esterifying derivatives of higher fatty acids, the corresponding radicals of fatty acids in amounts which do not notably pass the content of the natural fibres in these radicals. Examples are given of the treatment of textiles with stearyl anhydride, stearyl chloride, etc., in benzine, $C_6H_6CCl_4$, etc. W.

Dyeing Textiles. H. Dreyfus. F.P.698,915 of 15/7/1930.
The formation of permanent creases in dyeing textile materials in the folded state is avoided by perfectly wetting the materials in the unfolded state and afterward dyeing them folded. Wetting agents are used. W.

Mothproofing Textiles. E. Davrain. F.P.699,410 of 12/10/1929.
Textiles, etc., are made mothproof by oiling with a product containing fatty acids, vegetable oils, a lye of NaOH, KOH, and NH_3, to which is added a solution from the maceration of pyrethrum leaves or pyrethrum powder. W.

Treating Textiles. H. Dreyfus. F.P.700,711 of 18/8/1930.
Textiles, threads, etc., are sized or finished by the application of esters or ethers of cellulose in solution or aqueous dispersion. W.

Mothproofing Textiles. I.G. Farbenindustrie A.-G. F.P.700,870 of 19/8/1930.
Textiles, etc., are preserved against the attack of insects by Se compounds such as seleniates, selenious acid, dichloroselenoacetophenone or the product of reaction of $C_6H_5CH_2Cl$ or monophenyl selenide. W.

Cellulose Ester Rayons: Dyeing and Printing. Société Durand et Huguenin. *RUSSA*, 1931, 6, 975-977 (from F.P.701,852).
Methods of dyeing and printing cellulose ester rayons with dyes of the gallocyanine series is described. The dyes are applied in the form of leuco-derivatives and are then steamed and developed on the fibre by the action of a suitable oxidising agent. The procedures are illustrated by examples. C.

Cleaning Wool. H. Haakh. F.P.703,379 of 7/10/1930.
Markings on wool are removed by treating it with tar oil or petroleum distillates of high b.p., to which substances which increased their viscosity are added. Such substances include Turkey-red oil, wool fat, sulphonated vegetable oil, oleic acid and glycerol. W

Degreasing of Textile Materials. W. Pfaffendorf, Assr. to Gen. Aniline Works. U.S.P.1,780,885 of 4/11/1930.
The materials are washed with ethylene chloride at 0-80°. W.

Dyeing Carpets or Rugs in situ. K. Condon. U.S.P.1,800,509 of 14th April.
Material to be dyed is saturated with water containing a small proportion of soap, and a dye solution of greater concentration than desired is applied so that desired dilution will be effected by the water present in the material and the latter is finally dried. W.

Aniline Black on Textile Fibres. F. Scholefield (to Manchester Oxide Co. Ltd.). U.S.P.1,801,177 of 14th April.
Solutions of an aniline salt, $NaClO_3$, and carbonylferrocyanide are mixed together and the fabric is treated with the mixture thus formed. W.

Wetting Agents for Treating Textile and other Materials. O. Jaeck (to Soc. anon. pour l'ind. chim. à Bâle). U.S.P.1,802,258 of 21st April.
In carbonising wool or other processes of treating textile materials, leather, straw, etc., wetting and penetration of the treating compositions is facilitated by use of salts such as the acetate or hydrochloride of oleyldiethylethylenediamine or various compounds of the general formula $RR_1NC_nH_{2n}—NR_2R_3R_4X$ where R means H, acyl or a hydrocarbon radical, R_1 means acyl, R_2 and R_3 mean hydrocarbon radicals, R_4 means a H atom or a hydrocarbon radical, X any anion, and n a whole number. Examples are given, with details of procedure, relating to wool carbonising, dyeing wool or fur-felt hat bodies, bleaching straw plait, and tanning and wetting-out skins and leathers. W.

Rubber Coating Apparatus. Gummiwerke Fulda A.-G. (Fulda, Germany). E.P. 342,012 of 6/11/1929.
Apparatus for coating fabric with rubber comprises a chamber divided by horizontal partitions into compartments through which the fabric is passed in

succession from top to bottom of the chamber. Containers for rubber, through which the fabric is passed, or other coating means are located at different positions in the apparatus. T.

Treating Fibres with Liquids. J. A. Duff (Befast). E.P.342,298 of 26/10/1929.

Leaf fibre of caroa, sisal, palma blanca, and the like preferably matted under pressure into parallel bands is mechanically pressed and wiped, whilst immersed in a solvent or washing or other fluid, by resilient devices such as flexible suction cups which are moved to and from the fibre being fed through the machine, thus thoroughly washing the fibre, after a prior treatment in a boiling kier, without damage to or disturbance of the fibres. The appliance may also be used for ensuring the thorough impregnation of fibre with dyes, or with preserving, stiffening, fire resisting or other liquids. T.

Cloth Drying Machine. W. T. Armstrong (Gravesend). E.P.342,316 of 26/7/1929.

In automatic guides for the travelling bands of a cloth-drying machine in which a web of material passes freely between rollers, an electric motor operating the guide is started in the required direction by displacement of the band actuating gravity switches carried by pivoted spades and is stopped when the normal course is resumed. T.

Scouring and Carbonising Wool. L. A. Bowler and A. E. Bowler (Geelong, Australia). E.P.343,120 of 5/11/1929.

The material is fed between endless conveyers adapted to pass it through a bowl containing the treating solution. The conveyers are formed of perforated slats with bevelled edges, which abut and prevent the wool from dropping between them. T.

Fabric Drying. Proctor & Schwartz (Philadelphia). E.P.343,208 of 30/11/1929.

The material to be dried is formed into loops supported by poles and carrying rollers pressing down the material between the poles in a drying chamber. The poles and rods move in separate cycles. Rollers are fed at intervals from an inclined rack on to the material between the poles. T.

Reinforcing Rubber. H. Suter (Zurich). E.P.343,617 of 29/11/1929.

Belts, tyres, etc., are reinforced by embedding therein an artificial silk having a tensile strength of at least 200 g., preferably 300 g. per 100 deniers, and an extensibility of at most 10% and preferably less than 6%. In addition the silk should have a thread titre of below 2 dens., and a wet strength of at least 100 g. per 100 den. Impregnating materials may be employed to increase flexibility. When viscose silk is used it should not be desulphurised. T.

Fibre Lubricants. I.G. Farbenindustrie A.-G. (Frankfort-on-Main). E.P.343,948 of 11/9/1929.

Unsaturated hydroxy derivatives of hydrocarbons obtained by treating halogenated technical mixtures of paraffin hydrocarbons containing more than eight carbon atoms and at least two halogen atoms in the molecule, in an aqueous medium, with caustic alkalis, alkali carbonates or alkaline earths may be used as lubricating and greasing agents for fibres. Examples are given. T.

Cutting Chenille. A. Bechtold (Wurzen, Germany). E.P.344,746 of 25/6/1930.

In a machine for cutting chenille strips, cutting discs on a rotating drum co-operate with stationary cutters. The cutters are secured to brackets by bolts. Each bolt is provided with a spring washer and a numbered detent disc. To rotate the disc a nut is slackened and the disc turned to expose a fresh portion of the cutting edge. T.

Preventing Damage to Animal Fibres during Finishing. S. W. Wilkinson (Brighton). E.P.345,406 of 27/1/1930.

To prevent damage to the medulla or core of animal fibres due to the ozone treatments in dyeing and finishing processes, such fibres or fabrics containing them are subjected to the action of gaseous or liquid solutions of formaldehyde alone or in the presence of alkaline or acid solutions or gases such as are usually employed in the preliminary processes for purifying the fibres. T.

Protecting Wool, Fur, Hair, etc., against Textile Pests. I.G. Farbenindustrie A.-G. E.P.346,039 of 9/1/1930.

Water-soluble thiouronium salts, e.g. the product from equimolecular proportions of phenyl-thiourea and ethylene bromide, are absorbed by animal fibres from cold or moderately heated neutral solutions and are not removed by rinsing. Animal fibres so treated are not attacked by textile pests. W.

Protective Treatment of Animal Fibre. Deuts. Gold-u. Silber-Scheideanstalt vorm. Roessler. E.P.347,292 of 27/1/1930.

Wool, hair, bristles, etc., are purified and rendered resistant to attack by bacteria and fungi by treatment with a solution of H_2O_2 followed by drying at 10-80° subsequent to a washing treatment sufficient to remove only a part of the H_2O_2 from the fibres. W.

Wetting Agents: Preparation. Naamlooze Vennootschap Chemische Fabriek Servo and M. D. Rozenbroek (Twente, Holland). E.P.347,592 of 22/1/1929.

Aliphatic carboxylic acids containing at least twelve carbon atoms in the molecule, or their derivatives, are sulphonated in the presence of aliphatic oxysulphonic acids, sulphuric esters or salts thereof, "carbyl sulphate," or mixtures of the same. The products are fat-splitting agents and may also be used in the textile and leather industries. C.

Bleaching and Washing Wool. H. Haakh (Vienna). E.P.347,649 of 21/10/1929.

In treating wool and other animal fibres with organic solvents for extraction purposes, water is added to water-soluble solvents to depress more or less their solvent action on the wool fat. If the solvent solution is saturated with wool fat, it may be used to extract specks of tar, etc., from the wool. T.

Vat Dyes: Application. British Celanese Ltd. (London) and G. H. Ellis. E.P. 347,682 of 28/1/1930.

In colouring textile materials by vatting methods the vats are maintained at temperatures below the atmospheric, e.g. at 0-10° C. The process is particularly suitable for colouring materials liable to be damaged by alkaline media, e.g. materials made of or containing organic derivatives of cellulose, regenerated cellulose, or animal fibres. It is applicable, for example, to the dyeing of cellulose acetate with indigoid dyes, or with other vat dyes having affinity for it. A list is given of vat dyes having affinity for cellulose esters but little affinity for cellulose fibres. Mixed materials may be coloured in contrasting or uniform shades in a single or in successive baths, and a list is given of vat dyes suitable for colouring the cotton or other cellulosic component of such a mixed material. C.

Cellulose Effect Threads: Preparation. Soc. of Chemical Industsy in Basle (Basle, Switzerland). E.P.347,926 of 27/7/1929.

Cellulose derivatives obtained according to the process of E.P. 342,167 by treatment of cellulose pretreated with alkali with a heterocyclic compound containing one or more N:C-halogen groups, are further treated with a compound that contains an NH, OH, or SH group, or a salt of such compound, for example, with water, alkali, alkali sulphides, and amines. As compared with cellulose, the products are more or less immune to the usual cotton dyestuffs, whilst the strong affinity to basic dyes exhibited by the products of the parent case may be more or less replaced by a pronounced affinity to acid dyestuffs. C.

Wetting Agents: Preparation. J. Y. Johnson (London) (I.G. Farbenindustrie A.-G., Frankfort, Germany). E.P.348,040 of 26/10/1929.

Wetting, cleansing, and dispersing agents are obtained by esterification by means of alcohols or their sulphuric esters containing at least six carbon atoms and being free from nitrogen, of aliphatic carboxylic acids, their salts, halides or glycerides, containing less than 10 carbon atoms and at least one double bond or hydroxy group in the molecule, before, during, or after their conversion to sulphuric esters by treatment in the usual way with sulphonating agents. C.

Azo Dyes: Application. I.G. Farbenindustrie A.-G. (Frankfort, Germany). E.P.348,269 of 6/3/1929.

Insoluble azo dyes are formed on cellulose ester or ether rayon by impregnating the material with an arylide of 2:3-oxynaphthoic acid in an alkaline bath containing an organic solvent, miscible with water, which is a solvent or swelling

agent for the materials, and is also capable of dissolving the arylides or their alkali salts, and developing with a diazo-compound. Specified solvents are pyridine, alcohol, acetone and ketonic alcohols, such as diacetone alcohol. To avoid saponification of cellulose esters, the content of alkali in the grounding liquor should be as small as possible; part of the strong alkali may therefore be replaced by ammonia. Protective colloids, such as glue, may be present in the grounding bath. C.

Drying Fabrics in Long Lengths. International General Electric Co. (New York). E.P.348,381 of 13/5/1930.

In an apparatus for waterproofing, etc., between the impregnating and cutting arrangements, a drying device is interposed. This is made up of a number of nozzles which direct streams of air on to the fabric, and suction nozzles which draw off the vapour of the solvent used in the impregnating composition. T.

Thread Wetting Device. Aceta Ges. (Berlin). E.P.348,407 of 23/5/1929.

The patent relates to a process for the uniform wetting of threads, particularly artificial threads, in which the wetting liquid issues under pressure from a narrow orifice of a nozzle, and the thread passes directly over the orifice or over an edge below the orifice. The rate of transmission of the liquid to the thread is controlled either by varying the pressure at which the liquid is supplied or by adjusting the resistance to the flow of the liquid through the nozzle. C.

Azo Dyes on Cotton. I.G. Farbenindustrie A.-G. (Frankfort-on-Main). E.P. 348,680 of 11/2/1930.

Azo dyes are made by coupling diazo compounds containing mordanting groups—e.g. an hydroxy or carboxy group in *o*-position to the diazo group or the salicylic group with an aminophenyl pyrazolone derivative and converting the aminoazo dyestuff into the urea derivative by treating with phosgene or thiophosgene. Cotton dyed with these dyestuffs is rendered fast to washing and light by treatment with heavy metal salts. T.

Cellulose Acetate Fabrics: Printing. Calico Printers' Association Ltd. (Manchester) and J. R. Whinfield. E.P.348,715 of 21/2/1930.

Decorative effects are produced on fabrics made of or containing cellulose acetate by applying one or more dyestuffs having an affinity for cellulose acetate and capable of forming insoluble complexes with metallic salts or oxides, before or after the local application of a metallic salt and/or oxide capable of forming an insoluble complex with the dyestuff or dyestuffs, steaming or ageing, and applying a reagent, such as a dilute acid, to remove the insoluble complex where formed. C.

Finishing Fabrics. Imperial Chemical Industries Ltd. (London) and D. Carter (Manchester). E.P.348,786 of 21/3/1930.

Carpets, rugs, etc., are given a lustrous finish by the application of an emulsion of wax followed by brushing. In an example, a carpet is sprayed with an emulsion of paraffin or carnauba wax in an aqueous solution of Turkey red oil or ammonium stearate and is then, with or without partial dyeing, subjected to a vigorous brushing. T.

Cloth Piling Apparatus. Bleachers' Association Ltd. (Manchester) and R. Darbyshire. E.P.348,795 of 26/3/1930.

Cloth piling apparatus is described of the type in which textile fabrics in rope form are treated by being passed down trunks arranged over a kier, etc., with a stream of bleach, etc., liquor, the trunks being connected to brackets on the ends of a shaft and receiving oscillations in two directions at right angles to each other. C.

Fabric Fulling and Washing Machine. D. Gessner (Worcester, Mass.). E.P. 349,223 of 7/4/1930.

Describes an apparatus for fulling and washing fabric in which automatic sprayers and squeezers are employed. T.

Azo Dyes: Application. Soc. of Chemical Industry in Basle (Basle, Switzerland). E.P.349,304 of 25/5/1929.

Azo dyes containing metal are produced by treating with one or more agents yielding metal and with a nitrosating agent, in either order, an azo dyestuff

obtainable by coupling in an alkaline medium an *o*-oxydiazo or *o*-carboxydiazo compound with an *N*-substituted 2:5:7-aminonaphtholsulphonic acid. The nitrosation of the metal compounds of the dyestuffs may be effected in the dye-bath or on the fibre. Dyeings are obtainable on animal, vegetable, and re-generated cellulose fibres. C.

Sulphur-free Cellulose Esters: Preparation. Society of Chemical Industry in Basle (Basle, Switzerland). E.P.349,322 of 1/6/1929.

Cellulose esters free from sulphur are formed by treating a cellulose xanthate or cellulose xanthic acid at a raised temperature with an organic acid anhydride in the presence or absence of a solvent and, if desired, in the presence of a catalyst. The process may be applied to unformed material or to formed products, e.g. threads, films, webs, etc., whereby they may be rendered stable against water and also immunised to substantive dyestuffs, wholly or in selected areas. Modifications in lustre may also be produced by varying the conditions. C.

Stable Diazo Preparations: Application. Soc. of Chemical Industry in Basle (Basle, Switzerland). E.P.349,339 of 17/6/1929.

Stable diazo preparations are made by precipitating diazo solutions by means of aromatic sulphonic acids in the presence of salts of metals of the second group of the periodic system, advantageously salts of magnesium. They are suitable for ice colours and printing. Benzene, toluene, chlorobenzene, chlorotoluene, and naphthalene sulphonic acids are specified. C.

Wetting Agents: Preparation. Chemische Fabriek Servo N.V. and M. D. Rozenbroek (Holland). E.P.349,527 of 22/1/1929.

Aliphatic carboxylic acids containing at least 12 carbon atoms in the molecule, or their derivatives, e.g. esters, acid chlorides, anhydrides, polymerisation products and oxy or chloro derivatives, are sulphonated in the presence of mixed anhydrides of acetic acids or homologues thereof with inorganic oxyacids, except sulphuric acid. The products are fat-splitting agents and assistants in the textile and leather industries. C.

Wetting Agents and Spinning Oils: Preparation. H. T. Böhme A.-G. (Chemnitz, Germany). E.P.349,586 of 29/12/1928.

The wetting, dispersion, penetration, and conveyance of effective substances in liquid or plastic preparations used in the textile and leather industries is improved by the addition of aqueous dispersions of alkyl and cycloalkyl esters of aromatic sulphonic acids. Aromatic sulphonic acids or their salts, sulphonated oils, soaps or fat solvents, e.g. hydrocarbons, chlorohydrocarbons, alcohols, or ketones, may also be present. The esters may be prepared by treating the aromatic sulphonic acids with phosphorus pentachloride and treating the resulting sulphonyl chlorides with the appropriate alcohol. The dispersions of the esters may be used in foam dyeing and in the treatment of textile fibres with any neutral, acid, or alkaline liquid, fats, sizes, and impurities, when present, being emulsified. Aqueous dispersions of the esters, especially in conjunction with oils or fatty substances may be used as spinning oils. C.

Washing and Dyeing Apparatus. E. S. Eymeric (Tunis). E.P.349,674 of 3/4/1929.

The fabric to be treated are laid on a jointed table which is then wrapped round the periphery of a drum so that the fabrics are held between the table and the drum surface. The drum is rotated within a stationary casing containing the washing, dyeing or other treating liquids, vapours or gases. C.

Rayon Cakes Washing Apparatus. I.G. Farbenindustrie A.-G. (Frankfort, Germany). E.P.349,681 of 16/3/1929.

Rayon cakes are removed from the centrifugal boxes and placed in series on a horizontal perforated tube connected to a supply of washing or other treatment liquid which is caused to flow under pressure outwardly through the cakes. Means for rotating the perforated tube during the liquid treatments may be provided. C.

Cellulose Ester and Ether Fabrics: Dyeing. British Celanese Ltd. (London). E.P.349,683 of 15/3/1929.

Colourations or coloured pattern effects are produced on textile materials made of or containing cellulose esters or ethers by applying to or removing from the

materials colouring matters in volatilised form. Thus, volatile colouring matters may be applied, uniformly or through a stencil, in a current of steam or other hot vapour or gas or may be applied uniformly or locally by the use of a transfer sheet subjected to heat and pressure, with or without a simultaneous embossing operation as described in E.P.293,022. Alternatively, the materials may be coloured uniformly or otherwise with a volatile colouring matter, volatilisation of the colour from selected portions of the material being subsequently effected by the local application, for example, through a stencil, of a hot gas or vapour. C.

Vat Dye Printing Pastes: Application. A. Carpmael, London (I.G. Farbenindustrie A.-G., Frankfort, Germany). E.P.349,955 of 30/11/1929.

The strength and speed of fixation of printings on cotton with vat dyes are increased by incorporating in the printing pastes hydroxy-anthraquinones or their substitution, e.g. halogen-substituted, products, or reduction products which still retain oxygen in the *ms*-position, or mixtures of compounds of these types, e.g. the technical mixture of 2:6- and 2:7-dihydroxy anthraquinones. The further addition of anthraquinone or reduction products containing oxygen is advantageous. The hydroxyanthraquinones, anthraquinone, and reduction products are employed in a finely divided state. C.

Degumming Silk. Twitchell Process Co. (Cincinnati, Ohio). E.P.349,961 of 3/2/1930.

Natural silk is degummed by treating with an alkaline solution of a mineral oil sulphonate, preferably mahogany sulphonate. Subsequent dyeing operations are facilitated by the fact that both the mahogany soap and the mahogany acid to which it is converted by the acid dyebath are soluble, uneven dyeing thus being avoided. T.

Mahogany Sulphonate Rayon Lubricant. L. Mellersh-Jackson (London) (Twitchell Process Co., Cincinnati, Ohio, U.S.A.). E.P.349,962 of 3/2/1930.

Rayon yarns and fibres are lubricated to form a protective coat during weaving and knitting by means of a mixture of a chemically inert mineral oil and a true mahogany sulphonate. The latter is obtained from the sulphonated product of the fuming sulphuric acid treatment of lubricating stocks, which is known as the mahogany sulphonates of commerce and contains entrained oil, by separating the entrained oil with high-proof alcohol. The true mahogany sulphonate remaining, mixed with an inert mineral oil, produces a highly water-soluble combination. Suitable mixtures contain 15-25% of the true mahogany sulphonate, and these can be readily removed from the rayon at any time prior to the dyeing and finishing operations without the customary severe scouring with fatty acid soaps or the like and the incidental abrasion and chemical action on the rayon. As suitable inert mineral oils, paraffin oil or a light-coloured technical oil with or without aromatic chlorinated solvents or low-viscosity mineral oil spirits may be used. C.

Delustred Cellulose Ester and Ether Materials: Relustring. British Celanese Ltd. (London), G. H. Ellis, and H C. Olpin. E.P.349,980 of 5/3/1930.

The lustre of cellulose ester or ether materials which have been wholly or partly delustred by the action of hot aqueous media, is increased or rendered more uniform by subjecting the materials to the action of steam superheated about 20° C. or more. The steam is preferably at super atmospheric pressure and the degree of superheat may vary up to 100° C. C.

Yarn Identifying and Lubricating Device. British Celanese Ltd. (London). E.P.350,056 of 14/3/1929.

Yarns or filaments are subjected to successive treatments comprising the application for identification purposes of a liquid containing a fugitive colouring matter, and the application of a lubricating liquid. The treatments may be effected in either order. The invention is particularly applicable to yarns or filaments made of cellulose esters or ethers and to yarns containing such cellulose derivative fibres in association with other fibres, and includes application to filaments of the cellulose derivatives continuously with their production, i.e. during their transmission from the spinning cabinet to a winding or winding and twisting device. The treatment may be applied to yarn passing from one package to another, in which case the yarn may pass over successive rollers or wicks

dipping into the liquids. The liquids may be dripped on to the yarns in transit, or the travelling yarn may dip into the liquids successively. C.

Coated Fabrics: Manufacture. Dunlop Rubber Co. Ltd. (London), Anode Rubber Co. (Guernsey), D. F. Twiss, and R. G. James. E.P.350,106 of 31/3/1930.

Semi-permeable materials such as fabric are coated on both sides with rubber by deposition from aqueous dispersions, by applying to one side a dispersion having a *p*H less than 7, preferably containing particles carrying electro-positive charges, and to the other side an alkaline dispersion having a *p*H value of 7 or more. Deposition may be aided by electrophoretic means by introducing an anode in the acid dispersion and a cathode into the alkaline dispersion. The dispersions may be natural or artificial dispersions of rubber, gutta, balata, to which may be added oils, cellulose esters, proteins, reclaim, compounding, and vulcanising ingredients. C.

Acetylated Cellulose Fibre: Preparation. Soc. of Chemical Industry in Basle (Basle, Switzerland). E.P.350,137 of 13/4/1929.

Cellulosic fibres are converted without loss of structure and mechanical properties into cellulose derivatives immune to dyeing with direct dyes by treatment first with a solution of a salt which has a swelling action on cellulose and then, with or without intermediate drying, with liquid acetic anhydride in the absence of a diluent. In examples, cotton is treated with solutions of potassium thiocyanate, calcium chloride neutralised if necessary with acetic acid, or magnesium chloride, and after such treatment acted on with hot or boiling acetic anhydride. C.

Fabric Flocking Apparatus. A. Delarue (Paris). E.P.350,183 of 7/5/1930.

In a machine for coating fabrics with adhesive and then with finely divided fibrous material, of the type in which the material is deposited by sifting upon the fabric which is afterwards operated upon by rotary beaters, a closed casing is provided through which the fabric is passed during the sifting and beating operations. Preferably, dust catching means are provided at the outlet end of the casing. The fabric may be coated on both sides by winding it on a roller and passing it again through the apparatus. C.

Wetting Agents: Preparation. G. B. Ellis, London (Chemische-Fabrik vorm. Sandoz, Basle, Switzerland). E.P.350,379 of 6/12/1929.

Mono aryl ethers of glycerol or glycol are mixed with aliphatic, aromatic, or hydro-aromatic carboxylic or sulphonic acids or salts or substitution products of them to form water-soluble preparations utilisable as wetting agents in the textile or dyeing industries, e.g. as additions to dye baths, printing pastes or bowking solutions. Suitable ethers are commercial mono-tolyl-glycerol or glycol ether, and commercial mono-xylenyl-glycerol ether. Suitable added substances are soaps, fats, fatty oils, fatty acids, salicylic acid, sulphonated oils, naphthalene and other aromatic sulphonic acids and their salts, for example the sodium salts of benzyl-aniline sulphonic acid, benzyl-*p*-amido-benzyl-aniline sulphonic acid, and benzyl anthranilic acid. C.

Methylated Cellulose Finishing Solution: Application. H. T. Böhme A.-G. (Chemnitz, Germany). E.P.350,409 of 18/12/1928.

A size and finish for fibrous materials comprises a solution of a methylated cellulose. It is unattacked by micro-organisms and is suitable for simultaneously sizing and dyeing cotton and rayon. Softening agents and hygroscopic substances may be added. C.

Wetting Agents: Preparation. H. T. Böhme A.-G. (Chemnitz, Germany). E.P. 350,425 of 6/2/1929 and 350,432 of 6/3/1929.

(1) Alkyl, aralkyl, and aryl esters of sulphonated carboxylic acids are prepared (*a*) by treating aralkyl or aryl esters of fatty acids containing at least 9 carbon atoms, or alkyl, aralkyl or aryl esters of cyclic carboxylic acids not containing hydroxy groups with *per se* intensive sulphonating agents, namely, oleum, sulphur trioxide, bromsulphonic or chlorsulphonic acid, or with mixtures of anhydrous lower fatty acids, their anhydrides or chlorides with any sulphonating agent, and (*b*) by treating alkyl esters of fatty acids containing at least 9 carbon atoms with the said *per se* intensive sulphonating agents. In a further modification, the carboxylic acids themselves are treated with *per se* intensive sulphonating agents or with the mixture of sulphonating agents and lower fatty

acids, etc., and an alcohol or phenol is added to the reaction mixture or to one of the components before, during, or after the sulphonation. The sulphonating agents may also be allowed to react with the lower fatty acids and the products, e.g. acetylsulphuric acid, be used to sulphonate the carboxylic esters. The products may be used as wetting, penetrating, foaming and dispersing agents in the textile industry. (2) Sulphonated lauryl or myristyl alcohol, prepared by treating the alcohol with sulphonating agents under the usual conditions, is added to dyebaths prepared with hard water, calcium chloride containing bleach baths, and also to liquid and plastic preparations used in glazing and softening fibres. The sulphonated products are wetting, dispersing, penetrating, and foaming agents having water-soluble calcium salts. The use of the products in foam dyeing, and also E.P.317,039 are referred to. C.

Compound Fabrics. International General Electric Co. (New York). E.P. 350,429 of 4/3/1930.

Insulating bodies are formed by winding under heat and pressure strips or webbings of fibrous material, such as paper, linen, silk or asbestos impregnated with artificial resin and coated on one side with an adhesive material. The impregnated strips are heat-treated prior to the application of the adhesive in order to convert the artificial resin into the hard and insoluble form. T.

Hank Wet-treatment Apparatus. F. H. Rogers (London) (Smith, Drum & Co., Philadelphia, U.S.A.). E.P.350,556 of 14/3/1930.

In apparatus in which hanks, skeins, etc., are suspended over a tank of treating liquid by means of a hollow tubular support formed with an outlet opening or perforations through which the liquor delivered to the support by a pump is discharged against the hanks or skeins, the support is maintained in a fixed position whilst a movable device is provided for changing the position of the hanks or skeins relatively to the support. C.

Wetting Agents: Preparation. H. T. Böhme A.-G. (Chemnitz, Germany). E.P. 350,595 of 20/3/1929.

Alkyl and cycloalkyl esters of sulphonic acids derived from aromatic carboxylic acids containing more than one benzene ring, in view of their wetting, penetrating, and dispersing qualities, are used for the dispersion of powders such as dyes and pigments, and may also be added to liquid and plastic preparations used in treating textiles, e.g. foam dyebaths and spinning preparations. C.

Cement for Lining Bleach Vessels. H. O. Kauffmann. E.P.350,726 of 18/6/1930.

A method of coating the interior of iron vessels so as to make them suitable for use in the bleaching of textiles with hydrogen peroxide is described in this patent. Ordinary iron vessels are unsuitable for peroxide bleaching, because the metal accelerates the decomposition of the peroxide, especially when heat is applied. W.

Calender Driving Mechanism. J. and W. Kleinewefers (J. Kleinewefers Söhne), Crefeld, Germany. E.P.350,877 of 30/11/1929.

The smooth friction roller of a calendering machine is driven by an electric motor and the elastic roller is retarded by a dynamo which returns energy to the electric mains. C.

Vat Dyes: Application. A. Carpmael (London) (I.G. Farbenindustrie A.-G., Frankfort, Germany). E.P.350,963 of 17/3/1930.

In printing cotton with vat dyes, an aminoanthraquinone or reduction product thereof containing oxygen, or a mixture of compounds of these types, is incorporated in the printing paste. The pastes may also contain anthraquinone or hydroxyanthraquinones or their reduction products containing oxygen, glycerine, or other water-soluble alcohols and hydrotropic agents as described in E.P. 349,955. C.

Cellulose Ester and Ether Fabrics: Printing. Imperial Chemical Industries Ltd. (London), A. Shepherdson, and L. Smith. E.P.351,056 of 21/3/1930.

In printing fabrics containing cellulose esters or ethers with water-insoluble azo and nitro-substituted diphenylamine dyes, hydroxyethylamines, particularly triethanolamine, are added to the printing pastes. C.

Rayon Conditioning Fluid: Preparation. British Celanese Ltd. (London). E.P. 351,084 of 25/3/1929.

A conditioning fluid for filaments or yarns composed wholly or partly of cellulose acetate or other esters or ethers of cellulose contains as its effective ingredients a

softening agent and a lubricant. Suitable substances are indicated. The treated yarns are flexible and especially adapted for knitting since they enable fabric of closer construction than that obtained with untreated yarns to be made. C.

Moiré Pressing Machine. F. Pastor (Crefeld, Germany). E.P.351,128 of 7/4/1930.

Moiré effects are produced on fabrics by intermittently feeding the fabric, folded on itself in the usual way, through a press in the warp direction so that a piece of the fabric corresponding to the width of the press is pressed at each operation. The folded fabric is unwound from a roll and passes over guide rollers between an upper and a lower pile of press-boards mounted on press members and is rewound on a second roll. Heating elements are situated at the back of the boards and are suitably insulated. The upper press member is fixed and the lower one is carried by a hydraulic ram. C.

Dyeing Cellulose Pulp or Cloth. G. E. Coblens (New York) and A. W. Morris (Philadelphia). E.P.351,170 of 6/5/1930.

The material is dried between two perforated plates or wire grids embedded in the material and heated by electric currents which do not pass through the material. The heating currents are alternating currents received from a transformer. The transformer also passes alternating current from a secondary through the material for the purpose of producing electric osmosis. T.

Drying and Carbonising Fabrics. H. Krantz (Aachen, Germany). E.P.351,212 of 2/6/1930.

The machine is for drying and carbonising acid-soaked textile materials. The material travels through a series of chambers whilst a counter-current of heated air is passed through them. The air is passed straight through the chambers at a high speed and the number of chambers is such that the air current cools down in regular steps to the temperature appropriate for the material as it enters the machine. T.

Cloth Cuttling Machine Guard. J., S., H., & J. Cooper (Radcliffe). E.P.351,218 of 6/6/1930.

A guard is arranged over the front holding down rail of a cuttling machine and connected by rods, etc., to a finger which acts in conjunction with a stop on the belt-shifter rod to prevent the machine from being started unless the guard is in its operative position, and vice versa. C.

Wetting Agents: Preparation. H. T. Böhme A.-G. (Chemnitz, Germany) E.P. 351,403 of 5/4/1929 and 351,452 of 20/3/1929.

(1) Sulphonated lauryl alcohol, prepared by sulphonation of the alcohol under the usual conditions, is added to liquid and plastic preparations used for cleansing vegetable, animal, or other fibrous materials, whereby the wetting, dispersing, and penetrating properties of the preparations are improved. Washing, scouring, and bleaching agents commonly employed may be used in addition. (2) Sulphonated alcohols suitable as wetting, penetrating, emulsifying, cleansing, and foaming agents are obtained by sulphonation of the mixture of higher alcohols prepared from the higher fatty acids of coco-nut or palm kernel oil by esterification with lower aliphatic alcohols and reduction. Concentrated or fuming sulphuric acid, sulphur trioxide, or chlorsulphonic acid may be used as sulphonating agents, with or without the addition of inorganic or organic dehydrating agents. C.

Cellulose Ester Materials: Saponification. British Celanese Ltd. (London), and S. M. Fulton. E.P.351,417 of 24/3/1930.

The saponification process described in E.P.316,521 and 318,468 is carried out in the case of filaments, threads, yarns, ribbons, etc., by applying the saponifying agent to the travelling materials and immediately drying the same under the application of heat. The application of the saponifying agent is discussed. The saponified materials wet out more quickly, are less liable to crease, and have an improved safe-ironing point. C.

Azo Dyes: Application. I.G. Farbenindustrie A.-G. (Frankfort, Germany). E.P.351,431 of 17/12/1928.

Azo dyes are made in substance or on the fibre by coupling the diazo- or tetrazo-compound of an arylaminonaphthalene of the type Y·aryl·NH·$C_{10}H_6$·NH·Aryl·NH_2 in which Y=hydrogen or an amino group, with a 2:3-oxynaphthoylarylamine. They yield colour lakes and give fast blue to bluish-black shades on the fibre. C.

Cellulose Ester and Ether Materials: Printing. British Celanese Ltd. (London) and G. H. Ellis. E.P.351,457 of 20/3/1930.

Coloured resist or discharge effects are obtained on materials made of or containing cellulose esters or ethers by applying locally, before or after applying a dischargeable colouring matter, a preparation containing a stannous compound and an unreduced anthraquinone colouring matter having affinity for cellulose esters or ethers. Suitable stannous compounds and anthraquinone colouring matters are specified. C.

Mixed Cellulose Ester or Ether Materials: Dyeing with Aniline Black. British Celanese Ltd. (London), A. Mellor, and D. T. McLellan. E.P.351,577 of 2/4/1930.

Black colourations are obtained on mixed materials containing cellulose derivatives and vegetable or animals fibres by first causing the cellulose derivative to absorb *p*-aminodiphenylamine or a derivative thereof, padding, spraying, or otherwise mechanically impregnating the material with aniline or its homologues, or compounds thereof, and subjecting it to the action of an oxidising agent. C.

Yarn Dyeing Machine. J. T. Lancaster (Blackburn). E.P.351,593 of 4/4/1930.

A machine for dyeing yarn in transverse stripes comprises a series of supports or wheels over which the yarn passes, dye vats above and intermediate of the supports and capable of being lowered into contact with the yarn, compartments below the vats, and a pump or pumps to draw the dye liquor from the vats into the compartments and return the surplus liquor to the vats. Tensioning means for the yarn are provided. A modification is described in which the yarn passes round two large wheels, and this arrangement can also be employed for dyeing beams when the yarn is wound from one beam to another. The provisional specification describes the dyeing of yarn on a beam having a fluted surface. A vat containing dye liquor is lowered on to the beam, the liquor passing from the vat through the yarn and into the channels between the flutings. After each stripe is dyed the beam is rotated to bring the succeeding channel below the vat and the process is repeated. C.

Dyeing Machine Beam. J. T. Lancaster (Blackburn). E.P.351,594 of 4/4/1930.

In dye beams of the type in which the yarn is wound on a perforated or slotted drum, staves or rods extending longitudinally between the end flanges of the beam are provided to keep the yarn out of contact with the surface of the drum and thus obtain more even dyeing. C.

Wetting Agents: Preparation. H. T. Böhme A.-G. (Chemnitz, Germany). E.P. 351,456 of 3/4/1929 and 351,911 of 24/12/1928.

(1) Alkyloxyalkyl esters of sulphonated aromatic carboxylic acids and of higher aliphatic sulphonated carboxylic acids, containing at least nine carbon atoms, which are wetting, penetrating, foaming, and dispersing agents, are prepared by adding an alkyl ether of a polyhydric alcohol containing at least one free hydroxy group, before, during, or after treatment of the carboxylic acids with sulphonating agents. (2) Oils, fats, or fatty acids consisting essentially of unsaturated compounds are sulphonated with concentrated sulphuric acid in the presence of the products obtained by treating aliphatic mono- or polyvalent alcohols containing up to six carbon atoms in the molecule, or their organic or inorganic esters, ethers, or hydroxyalkylised derivatives with excess of sulphuric acid. The resulting sulphonated oils, etc., are wetting agents which are stable to inorganic or organic acids, and solutions containing alkalis, alkaline salts and magnesium sulphate. C.

Crêpe Fabrics: Manufacture. British Celanese Ltd. and H. Dreyfus (London) and W. A. Dickie. E.P.351,999 and 352,000 of 24/12/1929.

Crêpe effects are produced on fabrics comprising highly twisted crêpe threads, particularly threads of cotton or other natural cellulose, regenerated cellulose, or cellulose esters and ethers (1) by treating the threads before or after twisting with an agent capable of swelling the material of the threads, so that crêping is effected on scouring the fabric, or (2) by first treating the fabrics with an agent capable of swelling the material of the threads and then subjecting them to the action of a liquid adapted to cause the agent to exert its swelling effect. Brocade or similar effects may be obtained by effecting the swelling of selected portions by printing or stencilling, suitable thickeners being used if necessary. C.

Non-scorch Cellulose Ester and Ether Materials. British Celanese Ltd. (London). E.P.352,058 of 2/4/1929.

To give ample warning of the safe ironing temperature, yarn, fabrics, etc., composed of or containing organic derivatives of cellulose have incorporated therewith an organic substance, other than an animal or vegetable oil, which causes scorching at a temperature below that at which the cellulose derivative begins to melt. Suitable substances include fatty acids, e.g. oleic and stearic acids and their sodium and potassium salts, sodium, potassium and aluminium acetates, waxes, e.g. spermaceti and beeswax, and proteins, e.g. albumen and gelatins. Waxes, etc., are incorporated in the spinning solution but soluble substances such as sodium acetate are applied to the yarn and fixed therein by a coagulant such as egg albumin. C.

Drying Textile Materials. Soc. Anon. des Etablissements Neu. (Lille). E.P. 352,363 of 13/11/1930.

A continuously operating drying apparatus has wheeled trays attached by the spindles of one pair of wheels only to endless chains by which they are drawn along an upper track and returned by pushing along a lower track, entry and exit being at the same end of the chamber. Drying air is circulated by a fan and passes through a heating radiator. Damp air is exhausted by a fan or flue. T.

Moiré Finishing Machine. F. Pastor (Krefeld, Germany). E.P.352,410 of 7/4/1930.

Special moiré effects are produced on a long length of fabric folded longitudinally by a pressing member which moves across the fabric in the direction of the weft. On its way from the supply roller to the rewinding roller the fabric passes between two heated pressure rollers arranged parallel to its direction of feed. The forward feed is intermittent and during the periods of rest the supply and receiving rollers are moved axially and the heated pressure rollers are correspondingly rotated so that the material situated between them has a moiré effect produced on it. During the return movement of the supply and delivery rollers the pressure rollers may be separated or given a reverse rotation so as to impart a second pressing to the material. The fabric is then fed forward a distance slightly less than the length of the rollers and the operation is repeated. The supply and delivery rollers may be fixed and the pressure rollers given a transverse movement across the fabric. In a modification of this form either of the rollers may be replaced by a flat plate. C.

Matt Cellulose Ester Rayon: Manufacture. Courtaulds Ltd. (London), C. Diamond, and W. H. Glover. E.P.352,610/1 of 5/5/1930.

(1) Artificial threads and filaments of reduced lustre are obtained by treating with an aqueous soap solution at or near boiling point threads, etc., obtained by dry-spinning a solution of an organic ester of cellulose containing a small proportion of an organic acid ester of a saccharide which is soluble in organic solvents. In an example, cloth woven from threads spun from an acetone solution of cellulose acetate containing 1% of glucose pentacetate is immersed for half an hour in a 1·5% green olive oil soap solution at the boiling point. (2) Artificial threads and filaments of reduced lustre are obtained by dry-spinning a solution of an organic ester of cellulose in a volatile solvent, which solution also contains a small proportion of titanium oxide and either a monohydric aliphatic ester of a higher fatty acid, as described in E.P.352,412, or an organic ester of a saccharide as described above. Cellulose acetate threads so obtained are duller than ordinary cellulose acetate rayon and readily lose their lustre when treated with a hot soap solution; also, they show less tendency to regain lustre when treated in the wet state with a hot iron. C.

Stentering Machine. G. and C. L. Durrant (G. Durrant & Son, Stockport). E.P.352,670 of 4/6/1930.

One or both of the heads carrying the stentering clips is attached to an endless chain or cable extending across the machine and operable to adjust the distance between the heads to suit cloth of different widths. The stentering heads are mounted similarly to the cloth-guiding heads, being attached respectively to the upper and lower runs of an endless chain passing round sprocket wheels on shafts, one of which is provided with a hand-wheel. C.

Weft Pile Cutting Machine Stop Motion. E. Carmichael and United Velvet Cutters' Association Ltd. (Manchester). E.P.352,689 of 18/6/1930.

In a weft pile cutting machine in which the knife is pivotally mounted on an arm which is itself pivoted on a tube or rod, an armature, carried directly by the arm, is adapted to be attracted by an electro-magnet so long as cutting proceeds normally and to be released, on any abnormality in the cutting, to permit the knife arm to be swung out of cutting position by the usual spring. The magnet circuit is maintained unbroken by the contact of a plate with a blade mounted on an intermediate knife-supporting lever, but, when the pressure on the knife is increased or diminished the blade is caused by the action of a spring to move clear of the plate and break the circuit. Stoppage of the machine on movement of the knife arm out of cutting position is conveniently effected by connecting a lead from the magnet to a magnet circuit controlling stop mechanism in which circuit the plate is included, whilst the usual stop motion, operative at the end of each race, may also be included in the circuit so as to raise the knife to inoperative position when the end of a race is reached. C.

Rayon Treatment Apparatus. M. Schoenfeld (Zurich, Switzerland). E.P. 352,771 of 9/8/1929.

Coiled annular masses of rayon obtained in a spinning can or on a spool of adjustable diameter are removed from the can or spool and mounted for liquid or gaseous treatment round a column having outwardly extensible parts and disposed inside a container. The extensible parts are expanded outwardly to secure the coil. The hollow column or hollow space between the column and the coil is put in communication with a suction or pressure conduit and the liquids or gases required for the treatment are passed through the windings of the coil by suction or pressure. C.

Cellulose Ester Rayon: Dyeing. Durand & Huguenin A.-G. (Basle, Switzerland). E.P.352,808 of 14/9/1929.

Cellulose ester materials are dyed or printed by causing them to absorb a leuco compound of a gallocyanine dye and developing the colour by oxidation. C.

Cellulose Films: Dyeing. J. N. Goldsmith, T. T. Baker, C. Bonamico, and Spicers Ltd. (London). E.P.352,949 of 14/4/1930.

In a process for the production of a multicolour screen on a film of cellulose or an ester or ether of cellulose, one constituent of a dyestuff or colouring matter is applied to the whole surface and one or more media capable of reacting with the first constituent to form different colouring matters are successively applied in lines or other geometrical patterns. The third colour may be produced by subsequently dyeing the whole film or may be applied previously, resist lines being ruled on the surface and the dye bleached from between them to provide spaces for the other colours. Mixed colours are produced at the intersection of the lines by using excess of the first constituent or by applying the second dye-forming compound before the first reaction is complete. C.

Detergents: Preparation. J. Y. Johnson, London (I.G. Farbenindustrie A.-G., Frankfort, Germany). E.P.352,989 of 9/4/1930.

Cleansing or fulling agents for wool, cotton, and other textiles consist of sulphuric esters, or their neutral water-soluble salts, of aliphatic, aliphatic-aromatic, or cyclo-aliphatic alcohols, or olefines, containing at least eight carbon atoms, mixed with alkali metal, magnesium, ammonium or amine water-soluble salts of acids capable of displacing carbonic acid from alkali metal carbonates. Solvents, soaps, or other wetting agents, bleaching agents, protective colloids, or other usual agents may be added. When magnesium salts are used the treated goods may be considerably weighted, e.g. 5-500% of salts relative to esters or salts thereof may be employed. Salts specified are sodium and magnesium sulphate and bisulphate, borax, water glass, and sodium phosphate, chloride, acetate, tartrate and benzoate. C.

Dye Beck. T. Lee (Stockport). E.P.353,027 of 17/4/1930.

A dye beck for hats, etc., is divided by baffles, etc., comprising perforated elements into a dyeing chamber and a chamber below it having a sloping base and communicating at its lower end with a propeller chamber from which another chamber tapers upwardly and outwardly at one end of the dyeing chamber, the

inclined walls and partitions accelerating the flow of liquid in either direction through the beck. C.

Pile-cutting Machine Cloth Tensioning Device. Velvet Machines and Tools Ltd. and A. Roger (Barnsley). E.P.353,790 of 15/10/1930.

To maintain a uniform cloth tension a spider on the shaft of the driving drum carries pinions which gear with a pinion and an annular wheel, both loose on the shaft, the pinion being driven by a belt and the wheel connected by a belt to a pulley mounted on the shaft of the drag drum and connected to it by a friction clutch. C.

Lecithin: Application. H. Bollmann and B. Rewald (Hamburg, Germany). E.P.353,873 of 11/1/1930.

The addition of lecithin to the dye liquor in the dyeing of textile materials of animal or vegetable origin, in loose form or when woven into fabrics, gives greater brilliancy to the dye, a softer feel to the material, and better penetration of hard threads and thick fabrics. The fibres are protected against the adverse influence of the liquor and the materials so dyed show a great resistance to rubbing and a high gloss, properties which are also visible in the fabrics produced from them. C.

Calender Bed. J. Heynssens (Ghent, Belgium). E.P.353,943 of 28/4/1930.

The table or bed of a machine for ironing, calendering and finishing fabrics and other materials in long lengths is made of sheet metal and is heated or cooled by the circulation of a hot or cold medium through passages formed by soldering or welding section irons to the outer surface, the irons being covered with heat-insulating material. C.

Rayon Knitted Fabric Tentering Machine. C. G. Haubold A.-G. (Chemnitz, Germany). E.P.354,110 of 22/10/1929.

In a machine for stretching, tentering, and drying rayon knitted fabric, in which a feeler for adjusting the position of each chain engages the edge of the material, a feed roll rotating at a definite speed and a pair of discs for rolling out the edge of the material are situated in front of the feeler and a tensioning roller behind the feeler. The roller is driven by variable speed gearing at a speed greater than that of the fabric. C.

Textile Lubricating Oil: Preparation. L. Mellersh-Jackson (London) (Twitchell Process Co., Cincinnati, Ohio, U.S.A.). E.P.354,297 of 3/2/1930.

A lubricant for spinning, weaving, and knitting operations that is readily removed by immersion in water comprises the sulphonated and unsulphonated components of mineral oil resulting from the treatment of the oil with fuming sulphuric acid or sulphur trioxide, the sulphonates dissolved in the oil being first separated from the oil, freed from entrained oil, and then recombined therewith. Between 97·5% and 75% of the unsulphonated component is mixed with 2·5 to 25% of the sulphonated component. The absence of the entrained oil makes available the true emulsifying power of the mahogany sulphonates which their remixture with oil does not lower. Naphtha may be combined with the mineral oil employed in order to provide a textile oil of any desired viscosity. C.

Mahogany Sulphonate Kier Assistants: Application. L. Mellersh-Jackson (London) (Twitchell Process Co., Cincinnati, Ohio, U.S.A.). E.P.354,303 of 3/3/1930.

The natural impurities are removed from cotton and other vegetable fibre materials by boiling with alkaline solutions in the presence of mahogany sulphonates or true mahogany sulphonates derived from the treatment of mineral oils with strong sulphuric acid, fuming sulphuric acid, or sulphur trioxide. The process is sufficiently rapid and simple to permit continuous treatment as opposed to batch boiling. C.

Cotton Fabrics: Mercerisation. A. Nitsche (Chemnitz, Germany). E.P.354,312 of 5/3/1930.

Fabrics are impregnated prior to mercerisation with the wash lye obtained from washing the mercerised goods in countercourse to their movement after mercerisation. Apparatus for carrying out the method is described; the vat for impregnation of the goods to be mercerised is stepped off to enable the wash lye to form cascades, and is so positioned relatively to a guiding appliance for the cloth that the flow of the lye is opposed to the direction of travel of the goods. C.

Textile Materials: Waterproofing. J. Y. Johnson, London (I.G. Farbenindustrie A.-G., Frankfort, Germany). E.P.354,443 of 29/5/1930.

Textile materials are waterproofed by superficially impregnating them with (1) salts of polyvalent metals with water-soluble acid sulphuric esters of aliphatic, cyclo-aliphatic or mixed aliphatic-aromatic compounds which contain at least 10 carbon atoms and at least one olefinic double linkage or hydroxyl group, or both, or at least one group which is readily converted into a double linkage or hydroxyl group, such as aldehydes, ketones, alcohols, or halogen compounds or with (2) metal salts of true sulphonic acids of saturated or unsaturated aliphatic or cycloaliphatic compounds containing at least 10 carbon atoms in their molecule. Examples describe the treatment of fabrics of wool, cotton, acetate rayon and viscose rayon with the aluminium salts of the acid sulphuric esters of cetyl alcohol and ethyl hexanol, the copper salt of the acid sulphuric ester of octodecyl alcohol, the copper and aluminium salts of acid acetyl sulphuric ester and other products. C.

Tenter Chain Adjustment Mechanism. G. and C. L. Durrant (G. Durrant & Son, Stockport). E.P.354,465 of 12/6/1930.

A tenter chain is adjusted laterally to suit the width of the cloth by mechanism which is driven in one or the other direction by bevel wheels and a constantly running clutch under the control of a feeler in contact with the selvedge of the cloth. C.

Mercerising Lye Wetting Agent: Application. J. Y. Johnson (London) (I.G. Farbenindustrie A.-G., Frankfort, Germany). E.P.354,946 of 5/7/1930.

Acid sulphuric esters of aliphatic monohydric alcohols having from 4-8 carbon atoms in their molecule, or their water-soluble salts, especially alkali-metal salts, are added to mercerising lyes in the proportion of 3-10 g. of ester per litre. Organic water-soluble hydroxyl-bearing compounds may also be added if desired. Mercerising lyes prepared in this way wet the material very rapidly and have an excellent mercerising effect. C.

Textile Materials: Waterproofing. A. Nathansohn (Berlin-Wilmersdorf, Germany). E.P.355,256 of 19/4/1929.

Scoured cotton, washed wool, rayon, etc., are rendered water-repellant by treating them with esterifying agents under such mild conditions that the amounts of higher fatty acid radicles introduced do not substantially exceed, or at the most are equal, to about twice the amounts in which they existed in the natural fibres prior to scouring or other treatment. The esterification is carried out with acid chlorides or acid anhydrides under specified conditions. C.

Cellulose Ester and Ether Lustre Finishing Solutions: Application. L. Lilienfeld (Vienna). E.P.357,120 and 357,190 of 14/3/1930.

(1) Vegetable textile materials coated or impregnated with a solution in one or more volatile organic solvents of a cellulose ether, cellulose xanthic acid ester, or an N-substituted thiourethane of cellulose acquire a very attractive lustre and do not lose or lose only part of their original softness if treated with a shrinking agent such as caustic soda. Pyridine or aqueous pyridine may be employed as solvent for the cellulose compounds, and suitable softening agents or plasticisers may be incorporated in the solutions or pastes. (2) The loss of softness is also prevented by using pyridine solutions of the cellulose derivatives to which one or more mercaptans or sulphides of di- or poly-valent alcohols, for example, one or more of the sulphur derivatives obtainable according to the directions of E.P. 25,246 of 1911, are added. C.

Gaseous Disinfectants: Application. R. M. Cabrera (Buenos Ayres) E.P. 357,127/357,200 of 16/5/1930.

(1) A method for disinfecting fruit, provisions, food, leather, wool, and the like by means of carbon disulphide consists in the circulation through the materials of a current comprising a permanent gas, such as air, as carrier, the gas stream being supplied with carbon disulphide to the point of saturation by the provision at an intermediate point of the circuit of a quantity of carbon disulphide, the whole being conducted in a gas-tight plant. (2) Hydrocyanic acid gas, sulphuretted hydrogen or carbon tetrachloride may be used instead of carbon disulphide. C.

5—ANALYSIS, TESTING, GRADING, AND DEFECTS

(A)—Fibres

Cotton: Moisture Relations. H. H. Willis. *Cotton (U.S.)*, 1931, 95, 821-826.

Reference is made to a large series of tests of moisture content of raw cotton at various stages in the mill and to laboratory tests. The factors discussed with the help of curves are (1) influence of type, (2) influence of bleaching and heating, and (3) rate of regain. Reference is also made to regain as a factor in tensile testing. C

Indian Cottons: Spinning Tests. N. Ahmad. *Indian Centr. Cotton Ctte., Techn. Circs.* Nos. 53, 54, 56, 57, 58, 1931.

Spinning test reports of the usual form are provided on Nandyal cotton, Surat, Navsari, and Cambodia cottons, A.R. Kampala, A.R. Busoga, and A.R. Jinja cottons, Kalagin, Bijapore, and Bhagalkote cottons, and Upland and Karunganni cottons for the season 1930-31. C.

Textile Microscopes. —. Walther (for W. & H. Seibert, Wetzlar) *Spinn. u. Web.*, 1931, 49, No. 25, pp. 3-5.

Illustrations are given of some special devices. The "Promi" microscope can be used in the usual way or as a projection instrument ("Seibert-Propol"). Another instrument combines two microscopes in one. The two stages and tubes are side by side but the fields are brought together in one ocular The instrument is recommended for the comparison of rayon cross sections. C.

Cotton Hair: Oxidation and Structure. —. Haller. *Textilber.*, 1931, 12, 517-518.

An account is given of a study of the structure of the cotton hair through the formation of oxycellulose and subsequent examination of the fibre for its location. Six methods of oxidation were used, namely, (1) warming with bromine water in the presence of calcium carbonate, (2) impregnation with sodium hypochlorite and subsequent drying in a drying cupboard, (3) cold 30% hydrogen peroxide, (4) 1% potassium permanganate, (5) cold chlorine water, and (6) 1% chromium trioxide. Of these reagents, bromine water had the greatest effect. Evidence for the lamellar structure of the hair was obtained. The purple of Cassius reaction showed the oxidation products to be formed pre-eminently on the surface of the fibre, but deeper layers also seem to be attacked since the colour appeared frequently in the form of concentric rings separated by a colourless layer. Clearly the action of oxidising agents is selective, the attack being directed primarily at the binding substance of the lamellæ. The hair is also attacked in a direction perpendicular to its length, since in many cases it breaks into pieces; there must, therefore, in this direction also, be certain strata which are pre-eminently subject to attack by the oxidising agent, but the author regards it as improbable that transverse cleavage takes place at those points at which constrictions appear on treatment of the normal hair with cuprammonium solution. It is undoubtedly to its characteristic structure of a series of lamellæ with intermediate binding layers that cotton owes its extremely high tensile strength. C.

Indian Cottons: Spinning Tests. N. Ahmad. *Indian Centr. Cotton Ctte., Techn. Circ.* No. 59, 1931.

A spinning test report of the usual form on samples of Kadi/Viramgam and Tinnevelly (Tuticorin) cottons of the 1930-31 season. C.

Rayons: Properties. E. Viviani. 10*e Conf. Union Internat. de Chimie: Rapports sur les Hydrates de Carbone*, 1930, pp. 238-286.

A report on the physical properties of rayons in relation to the raw material and the methods of preparation. The scope of the report is indicated by the section headings which are as follows—The real and apparent specific gravity and the covering power of rayons, the breaking load, extension and elasticity of the artificial fibres, the interpretation of the graphs obtained with the recording serimeter, the rules of the Bureau International pour la Standardisation des Fibres Artificielles for testing viscose rayon, rayon cross-sections, the variations of rayon characteristics in relation to the raw material and the processes of manufacture, counts regularity in rayons, the determination of the viscosity of cellulose, the determination of the viscosity of cuprammonium solutions of cotton by a modification of the Hercules method, and the maturing of alkali cellulose. C.

Swollen Cellulose: Preferential Absorption of Caustic Soda. S. M. Neale. *J. Text. Inst.*, 1931, 22, T320-T338.

Swollen Cellulose: Preferential Absorption of Baryta. S. M. Neale. *J. Text. Inst.*, 1931, **22**, T349-T356.

Swollen Cellulose: Preferential Absorption of Copper from Cuprammonium Solution. T. Brownsett, F. D. Farrow, and S. M. Neale. *J. Text. Inst.*, 1931, **22**, T357-T364.

Cotton Materials: Frictional Properties. J. A. Morrow. *J. Text. Inst.*, 1931, **22**, T425-T440.

Hairy Viscose Rayon: Causes. V. Cosne. *RUSSA*, 1931, 6, 197-203, 455-459, 611-615, 783-789, 935-941, 1089-1097, and 1237-1241.

The hairy appearance of certain samples of viscose rayon is due to the presence of broken filaments. The cause of the breaks may lie in irregularity of operation of the spinning machine, irregularities in the composition of the spinning solution giving rise to filaments of reduced strength and elasticity which are easily broken in subsequent processing, careless handling, and the use of unsuitable methods and apparatus for the processing of the rayon. The author discusses the spinning, desulphurising, bleaching, washing, and dyeing processes and indicates the causes of faults in each. C.

Oxycellulose: Determination. H. Tatu. *RUSSA*, 1931, 6, 1083-1087 and 1227-1237.

A review of known methods for the determination of the oxycellulose content of rayons. C.

Rayon: Standardisation. W. F. Edwards. *Text. World*, 1931, 80, 1188-1189.

Photo-micrographs of rayon cross-sections are given and their use for identification purposes is discussed. The need for standardisation of methods of testing, count systems, and quality, acidity, sulphur content, immunisation, delustring, etc., is indicated. C.

(B)—YARNS

Cellulose Acetate Rayons: Resistance to Boiling. W. Fermazin. *Kunststoffe*, 1931, **21**, 153-155.

Experiments on the effect of boiling on acetate rayon are described in which skeins weighing 10 g. were ether-extracted, suspended in distilled water, and boiled for one hour. The skeins were dried by hanging in a protected place at ordinary temperature. Strength and extension tests on a Schopper tester, dye tests with Picrocarmine K and Textiltest H, and lustre tests were then made. The lustre tests were made by Kempf's method in which a beam of light is directed at an angle of 45° on to the experimental object, the reflected light falling on to a semi-circular strip of film. According to the intensity of the lustre the developed film shows a more or less sharply defined spot of light surrounded by a shorter or longer diffuse brightness. The breadth of the diffuse field, photometrically measured, gives the lustre of the textile material under examination. Acetate rayons treated with pine oil or boiled in calcium chloride solution were found to be particularly resistant to boiling. C.

Cellulose Acetate Rayon: Resistance to Hot Solutions. F. Ohl. *Seide*, 1931, 36, 239-244 and 280-283.

Samples of cellulose acetate rayon were treated with hot water and with alkali solutions at different temperatures and the influence of the characteristics of the rayon on its resistance to such treatments was studied. It was found that the wet strength of the rayon and the resistance of the rayon to the treatment increases with increasing acetic acid content of the cellulose acetate. The action of hot solutions results in a surface saponification of the cellulose acetate which is accompanied by decreases in strength and lustre and by curling and felting of the fibres. The effect increases with the temperature and also with the *p*H of the hot solution. The influence of the acetic acid content on the resistance of the rayon is only observed in solutions of *p*H below a certain value. The resistance is also found to increase with decreasing sulphuric acid and ash contents of the cellulose acetate. Increase in denier, fuller cross-sections, freedom from air bubbles, arrangement of the fibre crystallites parallel to the fibre axis and high twist of the fibres also increase the resistance of the rayon to hot solutions. C.

Maschinenspinne 8103 Strength Tester. W. Schroeder. *Seide*, 1931, 36, 300-308.

The "Maschinenspinne 8103" apparatus for the determination of the strength, extension, elasticity, and wear of fibres and yarns records load-extension diagrams

automatically and stops instantaneously when a break occurs. Gradual increases and decreases in load are obtained by the use of chains of different weights. The possible loads vary from a few milligrams to 500 g. The use of the instrument is illustrated by a detailed description of tests made on a sample of 10 denier viscose rayon. The results are tabulated and the load-extension curves are reproduced. C.

Yarn Regularity Tester: Application. G. R. Stanbury. *J. Text. Inst.*, 1931, **22**, T385-T399.

Rayon Threads: Water Content Determination. E. Einecke. *Z. anal. Chem.*, 1931, 85, 45-50.

A rapid method for the determination of the water of adhesion of textile fibres depends on measurement of the changes in length of stretched fibres on evaporation of the water. A simple form of apparatus is described. The dehydration corresponds to a shrinking and decrease in extensibility tests on viscose rayon thread show that, up to water contents of 20%, the change in length produced by dehydration is approximately proportional to the water content. The time required for a determination by this method is about six minutes. C.

Rayon Thread Regularity Testing Devices. E. Viviani. *Kunstseide*, 1931, **13**, 281-284 and 321-324.

The factors influencing the regularity of rayon thread from the spinning machine are discussed and three methods of testing are described. In the first method the thread passes before a slit somewhat wider than the diameter of the thread. Light passing the slit falls on a photo-electric cell which is arranged to give a continuous record of the variations in the light and hence in the diameter of the rayon thread. In the second method the thread is drawn through a glass capillary filled with mercury and variations in the resistance due to variations in the thread volume are automatically recorded. In the third method the thread passes through a capillary tube which is connected to a constant gas supply, and the variations in the rate of outflow of the gas are measured. Diagrams of the apparatus are given and records are reproduced. C.

Viscose Rayon: Moisture Relations. L. Meunier and R. Guyot. *Chim. et Ind.*, 1929, **21**, *Spec. No., 8e Cong. Chim. Ind.*, pp. 585-591.

The variation of the moisture regain of a viscose rayon with humidity and temperature has been examined. At any one temperature the curves illustrating the relation between regain and relative humidity are of exactly the same form as those given by cotton, but the actual regains of viscose rayon are considerably higher. Hysteresis is observed. The regain at constant relative humidity decreases as the temperature increases between 0° and 37° C. The effects of heating and of "sthenosizing" the viscose rayon were also examined. Both processes result in a reduction of the hygroscopicity of the material with possible concomitant changes in the degree of swelling and the amount of dye taken up from a solution. C.

Rayon Yarns: Dimensions. E. J. Gibbons. *Text. World*, 1931, 80, 1191.

A table is given showing the yards per pound, weight of 120 yards, threads per inch, diameters, cotton, worsted, and linen equivalents, etc., of rayon yarns of different sizes. C.

Yarn: Strength Testing. E. M. Gray. *Text. Weekly*, 1931, 8, 117-120.

The following rules should be observed—(1) State the length of the test specimen. (2) The lea must be reef-knotted at the ends, lie in a straight tape form on the hooks, and not be allowed to curl during transfer from the wrap reel. (3) The atmospheric conditions should be stated. (4) The make of tester should be stated and the rate of movement of the bottom jaw. Results of strength tests are quoted to demonstrate the importance of these factors. C.

(C)—FABRICS

Knitted Fabrics: Bulk and Weight. W. Davis. *Text. Mfr.*, 1931, 57, 279.

A table is given that summarises analyses of 21 fabrics knitted from worsted, cotton, and rayon. The particulars include counts, take-up ratio, stitches and courses per inch, weight per square yard, thickness (test not described), and the ratio of thickness in hundredth's of an inch to weight per square yard in ounces. This last figure is called the "bulk-weight" index and is put forward as a measure

of that property of knitted fabrics expressed in the term "bulk without weight." The index varies from 0·41 for a plain fabric knitted from 2/24's worsted to 1·03 for half-cardigans. In the one-and-one rib stitch, a value as high as 0·94 is given by 11½'s cotton. The index for 15 plain woven fabrics, on the other hand, ranged from 0·24 to 0·42. C.

Stereoscopic Photomicrographs: Preparation. E. R. Schwarz. *Amer. Dyes. Rept.*, 1931, **20**, 451-455.

A general account, with many practical suggestions. C.

Zeiss Optical Instruments for Textile Testing. C. J. Centmaier. *Kunstseide*, 1931, **13**, 269-271.

An illustrated description of various special microscopes and photometers. C

Cuprammonium Cellulose Solution: Viscosity. R. W. Kinkhead. *J. Text. Inst.*, 1931, **22**, T411-T415.

Doped Fabrics: Effect of Atmospheric Action on Mechanical Properties. I. F. Andrew. *Chem. Abs.*, 1931, **25**, 3500-3501 (from *1st Communications New Intern. Assoc. Testing Materials, Zurich*, 1930C, pp. 126-135).

A study was made of the deterioration in mechanical properties of 15 kinds of linen and cotton fabrics from Russia and France when exposed to the weather with and without protective coatings of lacquer. The fabrics were stretched on the upper and lower sides of frames 72 × 72 cm., resting in an inclined position. Exposures began in June; removals for test were made monthly up to six months. The clear lacquer used was composed of nitrocellulose 10, acetone and ethyl acetate 81, ammonium acetate 8, castor oil 1%. This lacquer was used both with and without pigmentation. The conclusions are—(1) Application of lacquer up to three or four coats increases the strength of the fabric. The increase is greater if the sizing is removed from the fabric by washing before lacquering; it is greater for those fabrics that are weaker originally; it is greater for those fabrics whose distensibility is less than that of the lacquer (8-10%). (2) The chief factor in deterioration of both fabric and coating is direct action of sun, rain and snow (3) Application of clear lacquer alone does not protect fabrics against deterioration from weathering. On the upper side of the frames the fabric loses all the increased strength resulting from lacquering within one or two months and is greatly weakened after six months. On the underside of the frames the fabric remains stronger after six months than the initial strength of the fabric alone. (4) The rate of deterioration diminishes as the number of coats of lacquer is increased up to five coats. (5) Best protection of the fabric is obtained when coatings of pigmented lacquer are applied over coatings of clear lacquer. Even after six months the fabric on the upper side of the frames when so protected remains stronger than was the fabric alone before treatment. C.

Faulty Rayon Crepe: Causes and Examination. W. Weltzein, W. Coordt, and A. Brunner. *Seide*, 1931, **36**, 194-199, 245-251, and 274-280.

A discussion of the manufacture of rayon crepe, various difficulties and faults which may arise in the weaving, dyeing and finishing processes, and depend on the nature of the weft yarn, methods of testing the yarns and fabrics, and the examination of faults. C.

Modified Cellulose: Alkali Solubility Number Determination. C. R. Nodder. *J. Text. Inst.*, 1931, **22**, T416-T424.

"Blancometer" Photo-electric Whiteness Measurer. A. Hilger Ltd. *Text. Rec.*, 1931, **49**, No. 582, pp. 46-47.

The Blancometer has been designed for the determination of small colour differences between nearly-white specimens. Light is reflected into a photo-electric cell alternatively from the test surface after passing through two fixed photometric wedges, and from a standard white magnesium oxide surface after passing through two adjustable wedges. The adjustable wedges enable equal deflections to be obtained in an electrometer operating in conjunction with the photo-electric cell, in the two cases. A similar determination using two magnesium oxide surfaces gives the zero position of the adjustable wedges. Equal deflection is obtained when the response-intensities of the reflected light are equal. When the gradation constant of the wedges is known, the ratio of the response-intensities of the reflected light from the test surface and standard white surface can be found. Colour screens adjusted to give definite spectral transmissions are

inserted in the path of the light and enable readings to be taken for red, green, and blue as well as for white light. The optical system of the instrument and the method of operation are described. C.

Dyed Textiles: Determination of Fastness to Light. H. Sommer. *Leipzig. Monats. Text. Ind.*, 1931, 46, 25-28, 64-66, 99-102, 134-135, 177-179, 215-217, 250-253, and 287-289.

The author deals first with the effect of source of light, atmospheric conditions and duration of illumination, the practical difficulties of judging fading subjectively by comparison with the Fastness Commission's standard types, the importance of replacing such subjective methods by objective methods, and the progress represented by the "degree of fading" method of Ziersch and the "half value time of fading" of Jost and Flütsch. The adoption of objective methods demands more uniform conditions of test than hitherto and in order that reproducible results may be obtained the following standard conditions of exposure are proposed. The test pieces shall be exposed out of doors in a box allowing free access of air and atmospheric moisture and having a cover of U-V New Glass 2 mm. thick. The box shall be arranged east to west and inclined at an angle of 45° so that the test samples face directly south. Krais' Victoria Blue paper, exposed under the same conditions as the test samples, is a suitable means of determining the number of hours of illumination if the paper is prepared under standard conditions and standardised with reference to a particular place. Only under these conditions are the degree of fading values and half value times of fading obtained at different places comparable. Accordingly, a "standard fading hour" curve has been prepared by making careful measurements with Victoria Blue paper of the intensity of sunlight at Berlin-Dahlem over a period of one year. With the aid of this curve the "standard fading hours" of paper illuminated at any other place can be evaluated from step photometer measurements, and a formula is also given for calculating the life of a colour at a given place from the half value time of fading, referred to standard fading hours, and the fading coefficient for Victoria Blue paper for the summer months at that place. The author next deals with the practical difficulties of the Ziersch and Jost and Flütsch methods, namely, that in the former a definite number of standard fading hours must be accurately achieved, whilst in the latter very long periods of exposure are necessary, and shows how these difficulties may be overcome by the use of the general fading formula $A = n\sqrt{t}$ in which A is the percentage degree of fading, t the number of active "standard fading hours" and n the fading coefficient of the dyeing. The fading coefficient is an absolute value for the fastness of a dyeing independent of the period of illumination and from which the half value time of fading can be calculated. It bears a definite relationship to depth of colour expressed by $n = N(\log c - \log f)$, in which the fading constant N is characteristic for the behaviour of the dye in all depths of shade on the same substrate. (The work described in this section of the paper has been dealt with in a previous abstract.) The relationship between fading coefficient and degree of fading, period of illumination and depth of colour makes it possible to standardise degrees of fastness to light, and preliminary proposals are made on the basis of experiments on cotton and wool type dyeings of the Fastness Commission for the establishment of six fastness classes. Finally, experiments with a number of sources of artificial light have shown that none of these can replace sunlight in testing for fastness to light. C.

(D)—Other Materials

Dyes: Fastness to Light. Canon J. Pinte. *Bull. Lab d'Analyses et Recherches Industr., Roubaix*, 1931, No. 11, pp. 6-23.

A report of a lecture on the use of the Toussaint photo-colorimeter in fastness tests. The ground covered is similar to that abstracted previously but the article contains examples of actual colour curves reproduced from laboratory records, with colours appended. C.

Patents

Apparatus for Testing the Tensile Strength of Flexible Materials. A. Schopper. U.S.P.1,797,734 of 8/3/1929.

An apparatus for testing the tensile strength of flexible materials by inflation comprising means for supplying gas under pressure to one side of the part under

test, and exchangeable means of geometrically similar configuration for holding said part. W.

Twist Gauge. A. K. Beldovsky and E. A. Griliches (Leningrad). E.P.354,439 of 27/5/1930.

A "balanced twist gauge" for determining the twist in yarns, in which the number of turns given to a doubled length of yarn to untwist it from the balanced to the undoubled condition is determined, comprises a support carrying a clamp in which the ends of the length of yarn are gripped, whilst a weight is suspended from a hook at the loop. A scale is provided for measuring the length of the doubled specimen before and after twisting, and a dial indicator shows the number of turns when the twisted specimen is untwisted by rotating a handle. A number of twist gauges may be arranged in line on a single frame. C.

Photo-electric Colour Comparator. Sheldon Electric Corporation (New York). E.P. 356,017 of 28/10/1929.

Apparatus for comparing colours, illuminated surfaces, dyes in solution, the clarity of oils, shade and lustre of coloured textiles, and, in general, any two similar light intensities or colours is described. The apparatus comprises essentially a pair of light-sensitive cells, a balanced amplifier connected with the cells, and a bridge circuit connected to the amplifiers and including an indicating device. The unbalance of the bridge circuit caused by changes taking place in the reflection or transmission of light reaching the comparison apparatus may be made to serve as an actuating means for the control of other devices. C.

7—LAUNDERING AND DRY-CLEANING

(A)—Cleaning

Cotton and Linen Fabrics: Laundering. R. Smit. *Med. Rijksvoorlichtingsdienst, Delft,* 1931, No. 26, pp. 20.

Comparative laundry tests have been made with water of zero hardness and of 5° and 13° (German) hardness on test-pieces of cotton and linen cloths soiled with the dirt and fat remaining when benzene which had been used for dry-cleaning purposes was distilled off. The test-pieces were soiled and washed 25 times. The tests were made in a washing machine of the usual type and the cloths were boiled with soap and soda and bleached with sodium hypochlorite as is usual in Holland. Washing with water of 13° hardness had a very bad effect on the colour of the fabrics. The cloths were white after washing with water of zero hardness, but the best results were obtained with water of about 5° hardness. There was no important difference in tensile strength between the cloths after washing with water of the three different hardnesses. C.

Dry Cleaning Equipment. Achille Serre Ltd. *Ind. Chemist,* 1931, 7, 325-329.

An illustrated description of the works of this firm, including the solvent-recovery plant. C.

Dry-cleaning Soaps: Solubility. C. L. Bird. *J. Soc. Dyers and Col.,* 1931, 47, 254-258.

Determinations were made of the solubility of potassium and sodium soaps of oleic, stearic, and palmitic acids in White Spirit, in presence of (*a*) free fatty acid, (*b*) industrial methylated spirit, and (*c*) water. The results show that potassium soaps are more soluble than sodium soaps, and that the oleates are the most suitable for soluble dry-cleaning soaps. The order of solubility is—potassium, oleate, potassium stearate, sodium oleate, potassium palmitate, sodium stearate, sodium palmitate. Potassium oleate is the most soluble soap of the series, and only the solutions of potassium oleate and, to a limited extent, potassium stearate, are able to take up an excess of methylated spirit when this is used as the solvent. Sodium stearate and sodium palmitate appear to be definitely unsuitable for use as dry-cleaning soaps, owing to their insolubility and the liability of their solutions to set to jellies. The solvent order is (1) water, (2) methylated spirit, (3) free fatty acid; but the three types of solution differ from one another. Water is only suitable in the case of potassium oleate, and even then unstable solutions are obtained. The efficiency of methylated spirit is due to its water content and the solutions obtained with it are fairly stable in presence of moisture.

Oleic acid produces stable solutions of potassium oleate in White Spirit, but acid potassium stearate appears to be only very slightly soluble at ordinary temperatures. When the solvents consist either of methylated spirit or free fatty acid, the ratio solvent/soap increases greatly as the soap concentration falls. In the case of potassium oleate solutions using water as the solvent, the increase is much smaller. Some indication is given that the lower fractions of petroleum are rather better solvents than the higher fractions, e.g. White Spirit. C.

Laundry Cleansing Agents: Effect on Strength of Cloth. E. J. Simola. *Chem. Abs.*, 1931, **25**, 2001 (from *Acta. Chem. Fennica*, 1930, **3**, 89-94).

Miscellaneous results are reported of experiments on the effect of the following on the strength of cotton and linen—Chloramine-T (1 g. per l.), sodium perborate (0·5 g. per l.), soap and soda, soda alone, and various soaps in waters of various degrees of hardness. C.

Patents

Steaming and Drying Garments. H. A. Shields (Grand Rapids, Michigan). E.P. 342,252 of 16/10/1929.

This power-driven machine has a plurality of garment holding members carried by a rotatable support which is geared to turn at predetermined intervals through part of a revolution to carry a holding member from a garment applying and removing station to a steaming chamber and then, after a further interval, to a drying station. T.

Ironing Machines. A. F. Tullis (Clydebank, Dumbarton). E.P.343,247 of 20/12/1929.

The goods are passed between rollers and concave beds and then between an apron and heated roller, a series of relatively wide conveyer bands are provided around the rollers. These bands are continuous from one side of the machine bed to the other except for very narrow gaps in which doctoring blades are accommodated. T.

Rotary Drying Apparatus. Troy Laundry Machinery Co. (Chicago). E.P. 345,687 of 2/1/1930.

The connection between the drive shaft and the clothes receptacle of the machine is arranged intermediately along the length of the receptacle. The receptacle is provided with a central transversely arranged spider of which the hub is keyed to the shaft extending axially through the receptacle and driven through reduction gear from an electric motor. T.

Washing Machines. J. E. Pointon and Baker Perkins Ltd. (Peterborough). E.P.346,036 of 9/1/1930.

The clothes section of this washing machine is rotatably mounted within a liquid container which itself is mounted so as to be rotatable within limits whereby it may be moved manually or by power to a position for the washing operation. T.

Drying Presses. National Laundry Machinery Co. (New York). E.P.347,286 of 27/1/1930 and E.P.348,150 of 7/2/1930.

An exhauster is provided to withdraw air from the perforated hollow buck of an ironing press and pass it through a heater back to the perforated hollow head. A continuous circulation of heated air is maintained to dry the articles being treated simultaneously with the ironing process. The second patent is for a similar apparatus provided with a blower for blowing heated air through a portion of the work supported on the buck. For this purpose the buck is divided by a partition. T.

Laundry Presses. American Laundry Machinery Co. (Cincinnati). E.P.347,656 E.P.347,662. Both of 23/10/1929.

In a laundry press which is closed by the action of fluid pressure on a piston mechanically connected to the toggle links which move the press head, the exhaust valve of the cylinder in which the piston works is automatically maintained open when the press is open, and the control means for the exhaust valve cannot be operated to close the valve until after movement of the control for the fluid-pressure inlet valve in the valve opening direction to initiate the supply of fluid to the cylinder for the press-closing operation. The second specification is for the same machine as the first but relates to the operating of one of the valves. T.

Ironing Machines. T. Wardrop (Manchester). E.P.347,822 of 13/3/1930.

Relates to a collar-blocking machine in which the articles are supported on a board adjustably carried by a table reciprocated along stationary guides by an automatically reversed friction drum. A finger guard is provided in front of the ironing roller beneath which the collars pass, which controls the traverse motion of the table. T.

Dry-cleaning Apparatus. A. Burt Ltd. and T. S. Street (Dunedin, New Zealand). E.P.347,896 of 12/5/1930.

This apparatus comprises a unitary structure consisting of washing and distilling chambers and a condenser with means for supplying solvent to the washing chamber and discharging it to the still. T.

Dry-cleaning Apparatus. R. Fabre (Marseilles). E.P.352,503 of 10/4/1930.

This apparatus is for use with a non-combustible solvent and has a vacuum chamber rotatable at low or high speed and connected through a three-way cock to the reservoir of a condenser, and to a pump, by which solvent is drawn into the chamber and after use is evacuated therefrom into the still. Extraction of the clothes is effected without the aid of heat and when complete, a pump forces the used solvent from the extractor. T.

Dry-cleaning Apparatus. British American Laundry Machinery Co. Ltd. (London). E.P.352,666 of 29/5/1930.

In a dry-cleaning plant in which carbon tetrachloride is used, comprising an extractor, a still and a condenser, the rectified solvent is passed through traps to remove the water. A suitable trap is placed between the condenser and extractor to prevent the passage of supernatant water. In addition, filters containing cotton waste or calcium chloride may be provided. T.

8—BUILDING AND ENGINEERING

(A)—Construction of Buildings

"Ferrocell" Vibration Damping Material: Application. P. Beckers. *Leipzig. Monats. Text. Ind.*, 1931, 46, 207-208, 245-246.

The origin and prevention of vibration in machinery is discussed and reference is made to the use of Ferrocell, a vibration-damping material made by subjecting to heat and pressure a fabric impregnated with a phenol-aldehyde resin. Ferrocell can be sawn, turned, bored, and otherwise worked. Its specific gravity is approximately one-sixth that of steel or bronze and its tensile strength 800 kg. per sq. cm. It is scarcely attacked by acids and alkalis. C.

(D)—Power Transmission

Anti-friction Bearings: Uses and Advantages. *Cotton* (*U.S.*), 1931, 95, 733-736, 827-830.

Types of bearings applicable to textile machinery are briefly described and the advantages of anti-friction bearings are discussed. C.

Ring Frame: Power Consumption. *See* Section 2B.

(I)—Waste Disposal

Finishing Works Waste Liquors: Disposal. W. E. Hadley. *Text. World*, 1931, 80, 1038-1039.

An account is given of the installation of a clarifying plant to treat waste liquors from bleaching, mercerising, dyeing, and zeolite water-softening in a works in New Jersey having to dispose of 500,000 gals. per day. The bleach liquors are treated with lime and alum in a Dorr clarifier. Some of the alkaline mercerising liquor is used to precipitate the magnesium chloride from the zeolite regeneration. The remainder is neutralised by sulphuric acid of 66° Bé. Dyes are destroyed in the concentrated dye liquor before entering the raw waste. C.

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Patents

Treating Wool Washing Waters. C. v. Overstraeten. G.P.520,170; *Chem. Abst.* (U.S.), 1931, 25, 2861.

Precipitation of all suspended or dissolved substances derived from wool is effected by the addition of calcium chloride or an acid. The precipitate is dried, for example, by centrifuging, and treated with sodium carbonate to convert the calcium soaps or free fatty acids into sodium soaps. The product is diluted with soap solution and the emulsion obtained is resolved by centrifuging into sludge, soap solution, and wool fat. T.

Ventilating Factories. B. Bauer (Vienna). E.P.347,411 of 17/3/1930.

The apparatus deals with dispersing steam in factory workshops of the kind in which heated air is delivered to various points of the building by conduits extend-along the roof. Such conduits are constructed as glazed chambers through which light is admitted. Air delivery chambers at the side of a vapour flue have outlets controlled by flaps. The chambers are insulated from the outer air by two upper glass walls. The lower boundary walls are also of glass. T.

Ventilating Systems. Carrier Engineering Co. Ltd. (London). E.P.348,720 of 21/2/1930.

In a method of ventilating an enclosure in which air having desired characteristics is supplied to the enclosure in volumes depending upon various atmospheric conditions, the total volume supplied is maintained constant by the addition of a complemental volume of air withdrawn from the enclosure. T.

Purifying Wool Fat. Nord-deutsche Wollkammerei & Kammgarnspinnerei (Bremen, Germany). E.P.352,279 of 28/7/1930.

In a process for disinfecting wool and similar raw materials such as camel hair, alpaca, and mohair previous to sorting, the material is treated with an organic solvent such as trichlorethylene. The extract is treated to remove the solvent and the wool fat is refined with hot dilute sulphuric acid. T.

Humidifying Plant. B. F. Sturtevant Co. (Boston, Mass., U.S.A.) and S. M. Anderson. E.P.354,924 of 24/6/1929.

In air-conditioning apparatus comprising a chamber through which the air flows and in which is a water tube across the mouth of which a blast of air may be directed to form a water spray, the water tube is connected to a tank to which water is supplied under low pressure from a reservoir and in which the water level can be varied to control the head of water with regard to the mouth of the tube. Means for varying the water level in the tank are controlled by an indicator sensitive to the humidity of the conditioned air. C.

9—PURE SCIENCE

Lignin: Determination. A. Noll and F. Hölder. *Papier-Fabrikant*, 1931, 29, *Ver. Zellst. Ing.*, 485-490.

Methods for determining the lignin content of cellulose are critically discussed and a method depending on saccharification of the cellulose is described in detail. The cellulose material is first reduced to powder form in a special rasp and the saccharification is produced by 78% sulphuric acid in the presence of a tertiary amine or base. The time required for saccharification of the cellulose is in this way reduced to about four minutes. The lignin can be separated in the form of coarse flakes on an ordinary filter paper and washed free from chlorine, nitrogen, and sulphur. C.

Cellulose; Action of Caustic Alkalis on——. F. Bogoyavlenski and S. Novikof. *Chim. et Ind.*, 1931, **25**, 1487-1488 (from *Boumajn. Promychl.*, 1930, 9, No. 7, pp. 23-28).

Bleached aspen cellulose was treated for about 2 hours at ordinary temperature by caustic alkalis at different concentrations and the elimination of β- and γ-cellulose studied. The former was determined gravimetrically by neutralisation, filtration, drying, and weighing. Analysis showed the β-cellulose to consist of 81·4% of pentosans. Curves showing the percentages of sodium hydroxide and potassium hydroxide absorbed from solutions of different concentrations by cotton and aspen cellulose are given. The results indicate that celluloses of different

origin are isomeric. The maximum solubility of β-cellulose is found in concentrations of 2 *N*-3 *N* (8-12% sodium hydroxide and 11-16% potassium hydroxide). In the case of sodium hydroxide, the solubility curve falls rapidly with increasing concentration after passing the maximum; the solubility in 10 *N* sodium hydroxide is practically zero. For potassium hydroxide the solubility curve falls slowly between 2 *N* and 7 *N* and then rapidly from 7 *N* to 10 *N*. C.

Cellulose: Acetylation. D. Krueger and E. Tschirch. *Ber. deut. chem Ges.*, 1931, 64, 1874-1878.

The action of catalysts in the acetylation of cellulose with acetic anhydride is discussed and it is shown that perchloric acid has a greater catalytic effect than sulphuric acid. An addition of 15 mg. of perchloric acid to a mixture of 20 c.c. acetic anhydride and 20 c.c. acetic acid is sufficient to produce acetylation of 5 g. cotton linters practically to the triacetate stage in 24 hours at 32°. The acetylation may also be carried out at 0° with a mixture of acetic anhydride and benzene containing perchloric acid. Tests with methylene blue show that the primary acetate is free from combined perchloric acid. C.

Cellulose and Oxidised Cellulose: Treatment with Acetic-Sulphuric Acid Mixtures. R. H. Van Dyke, C. J. Staud, and H. LeB. Gray. *J. Amer. Chem. Soc.*, 1931, 53, 2725-2732.

Cotton linters were oxidised with chromic oxide in amounts of one-half and two available oxygen atoms per $C_6H_{10}O_5$ group and with potassium permanganate at concentrations of one-half and one available oxygen atom per $C_6H_{10}O_5$ group in *N*-phosphoric acid. The yield of oxidised cellulose is an inverse function of the severity of the oxidising solutions employed. The unoxidised and oxidised celluloses were treated with acetic-sulphuric acid mixtures, with the removal of samples at intervals during a period of approximately 330 hours. The products were analysed for acetyl content by a modified Knoevenagel method and by a method for determining acetic acid in the presence of other acidic groups ("distillation method"). When unoxidised cellulose is treated with acetic-sulphuric acid mixtures, the acetyl content after 330 and 335 hours approximates to that obtained by Malm and Clarke by the action of boiling acetic acid on cellulose. With the oxidised celluloses the acetyl content, after 330 and 335 hours, as determined by the modified Knoevenagel method, of the materials which had been oxidised with chromic acid, approximates more closely to that of the unoxidised cellulose. The most vigorously oxidised celluloses show the least acetyl content. When the distillation method was used in the analysis of the products the values were much nearer zero and there was a much greater divergence between the acetyl content of the unoxidised and oxidised celluloses. The values for the acetyl content of the unoxidised cellulose after treatment with acetic-sulphuric acid mixture again approximate to that of $C_{24}H_{39}O_{19}OAc$. Esterification is in inverse ratio to the severity of the oxidising conditions employed in the preparation of the oxidised cellulose; this leads to the tentative conclusion that the hydroxyl group which is most readily acetylated is also probably the most easily oxidised. The data obtained by the modified Knoevenagel method offer possible evidence that the acidic groups produced by the oxidation of cellulose are partially converted to non-acidic form by the action of the acetic-sulphuric acid mixture as indicated by the decreased values obtained after 44 hours of treatment as compared with the apparent acetyl content of the starting materials. C.

Cellulose Ester Solutions: Influence of Water on Viscosity. J. Duclaux and J. Barbière. *J. Chim. Phys.*, 1931, 28, 313-315.

The addition of a small quantity of water to an acetone solution of dinitrocellulose or cellulose acetate produces a decrease in the viscosity of the solution. The viscosity passes through a minimum at a water content of about 5% and then increases continuously with increasing water content until coagulation is produced. The difference in the action of the water is attributed to differences in the state of the water. The water appears to have a solvent action when in the simple molecular state and a coagulating action when present in the associated state. It is suggested that the plasticising effect of the water is due to the action of its hydroxyl groups on the hydroxyl groups of the ester. The effect would then be destroyed if the hydroxyl groups of the water were blocked by association or the hydroxyl groups of the ester were blocked by more complete esterification In the case of trinitrocellulose solutions it is found that small quantities of water do

not decrease the viscosity but on the contrary the viscosity increases continuously with increasing water content. C.

Colour Measuring Apparatus. K. Fischer. *Z. Instrumentenkunde,* 1931, **51**, 347-360.

A spectral photometer is described in which the optical system is such that the beam of light is bent at right angles several times on its passage through the instrument which is, therefore, of handier form than those hitherto known. The use of the apparatus for determining a colour in terms of full colour, black, and white, for spectrum analysis, colorimetry, photography of the visible spectrum and as an ordinary photometer is discussed. C.

Amylase: Occurrence and Properties. Th. Sabalitschka. *Abderhalden's Handb. biol. Arbeitsmethoden,* Abt. IV, Teil 1, Heft 6, pp. 891-1070.

A comprehensive review under the following heads—(1) Occurrence of amylases; (2) amylolytic degradation of starch; (3) effect of special factors on amylase activity; (4) determination of activity; (5) extraction and purification; (6) properties. C.

Malt Amylase and Potato Amylase: Preparation and Composition. H. Borchardt and H. Pringshiem. *Biochem. Z.*, 1931, **239**, 193-200.

The malt amylase obtained by extraction of malt with pure glycerin is not entirely free from maltase. It can be further purified by treatment with aluminium hydroxide at *p*H 5-6. The amylase is adsorbed by the hydroxide and may later be recovered by washing with phosphate buffer and ammonia. In this way 90% of the malt amylase can be obtained free from maltase and substances which reduce Fehling's solution. In studies of the composition of aqueous green malt extract the results obtained were similar to those of Ohlsson. The purification process described above does not produce a separation of the α- and β-amylases, although the proportions of the two are displaced to favour the dextrinogen amylase. In aqueous malt extract and also in potato amylase the saccharogen amylase exceeds the dextrinogen amylase. C.

***Penicillium Glaucum* Saccharase; Action of Ions on——.** E. Fehér. *Chem. Abs.*, 1931, **25**, 3029 (from *Mezögazdasági Kutatások*, 1930, **3**, 292-315).

The quantity of saccharase in well-nourished *P. glaucum* is almost proportional to the quantity of added sugar. Scarcity of calcium has no influence, but that of magnesium or phosphate ions decreases the saccharase quantity. The optimum *p*H is 4·5. The number obtained by multiplying dry-matter content and saccharase quantity of a mould culture is a constant value which is characteristic of the respective cultures. Dialysis at first increases enzyme action. The action is strengthened by the presence of chloride, sulphate and nitrate ions. The enzyme action is, however, diminished by long dialysis and cannot be reactivated with salts. The *p*H optimum is 4·3 after dialysis. The presence of salts has no influence on this value. The action of saccharase cannot be increased by autolysis. C.

Cellulose Acetates: Analysis. T. F. Murray, jun., C. J. Staud, and H. LeB. Gray. *Ind. Eng. Chem.* (*Anal. Edn.*), 1931, **3**, 269-273.

Methods for the determination of the acetyl value of acetylated compounds are critically reviewed. The Ebestad method, in which a preliminary swelling of the acetate in aqueous alcohol is used to facilitate saponification, is best suited for work with acetylated cellulose. A modified procedure developed with a view to economy of material and time is described. A method is described for the determination of acetic acid and formic acid in the presence of each other and in the presence of other acids. The method depends on separation by steam distillation and determination of the formic acid with standard potassium permanganate and oxalic acid. A rapid method for the analysis of cellulose acetate is also described. In this method the cellulose acetate is treated for 15 minutes at 53° C. with pyridine and then saponified for half an hour with sodium hydroxide. Suggestions are made for a method of precipitating the cellulose acetate in a finely divided form readily soluble in pyridine. Some of the limitations of the pyridine method are indicated. C.

Fats: Rancidity Test. D. P. Grettie and R. C. Newton. *Oil and Fat Ind.*, 1931, **8**, 291-294.

The usual accelerated rancidity tests for fats and oils are criticised and a method of measuring the rate of formation of oxidative decomposition products is described. In this method the fat is dispersed on filter paper and maintained

at a specified elevated temperature. A stream of air is drawn over the fat and then through a standard solution of acid permanganate, which is maintained at a temperature of 25° C. to condense any decomposition product picked up from the fat. This solution is then titrated against oxalic acid. The apparatus and procedure are described in detail. C.

Cellulose and Starch: Constitution and Hydrolysis. K. Freudenberg. *J. Soc. Chem. Ind.*, 1931, pp. 287T-294T.

A report of two lectures giving a useful review of the configuration of carbohydrates, the molecular dimensions of polysaccharides, the kinetics of the hydrolysis of starch and cellulose, and theories of the structure of these substances. C.

Nitrocellulose; Action of Solvents on——. E. Clayton and C. O. Clark. *J. Soc. Dyers and Col.*, 1931, 47, 185-188.

The stability and solubility of nitrocelluloses of different nitrogen contents are discussed on the micellar hypothesis and on the basis of a new type of five-ring chelated compound derived from an anhydroglucosidic unit. C.

Cellulose and Cellulose Derivatives: Colloidal Properties. J. Duclaux. 10*e Conf. Union Internat. de Chimie: Rapports sur les Hydrates de Carbone*, 1930, pp. 214-237.

A report on the colloidal state of cellulose and its derivatives, dealing with viscosity and specific consistency, solubility of cellulose derivatives, fractionation of cellulose products, and the part played by nitrocellulose plastifiers. A bibliography of 108 references is appended. C.

Cellulose Nitrate Solutions: Viscosity. K. Atsuki and M. Ishiwara. *J. Cellulose Inst., Tokyo*, 1931, 7, (43)-(45).

Equations are given showing the relations between the viscosity of solutions of cellulose nitrate in a mixed solvent and the composition of the solvent and concentration of the solute. The equations are confirmed by experimental results. C.

Viscous Liquid; Motion of a Sphere through——. C. E. Lemin. *Phil. Mag.*, 1931, **12**, 589-596.

Stokes's formula for the motion of a sphere through a viscous liquid and various modifications of this formula are discussed. Experiments with steel spheres of 0·0625 inch diameter falling in glycerin in glass tubes varying in internal radii from 0·280 cm. to 4·840 cm. are described. The results show that Ladenburg's modification breaks down when $r/R = 0{\cdot}06$. C.

Cellulose Derivatives: X-ray Fibre Period. K. Hess and C. Trogus. *Z. physikal. Chem.*, 1931, *Bodenstein-Festband*, 385-391.

Röntgen studies of cellulose and various cellulose derivatives show that the fibre period is a multiple of 5·15 Å. The factor may be 2, 3, 4, or 5. The value 5·15 corresponds to the length dimension of a glucose group. It is therefore concluded that this dimension has a closer relation to the constitution of cellulose than the dimension 10·3 Å, corresponding to a cellobiose group, which has previously been considered in this connection. C.

Mercerised Cotton: X-ray Structure. W. Schramek. *Z. physik. Chem.*, 1931, B13, 462-474.

Röntgen diagrams of mercerised cotton show that the ordinary industrial mercerisation processes do not produce a complete conversion of the fibre diagram of native cellulose into that of cellulose hydrate. The results of investigations of the Röntgen diagrams of mixtures of various proportions of native and mercerised cellulose indicate the possibility of obtaining an approximate estimate of the degree of mercerisation from intensity measurements on the fibre diagrams. C.

***Aspergillus Flavus*: Effect of Metal Salts on Growth.** J. S. McHargue and R. K. Calfee. *Brit. Chem. Abs.* **A**, 1931, 876 (from *Bot. Gaz.*, 1931, **91**, 183-193).

The rate and extent of growth of *Aspergillus* cultures were increased by manganese, copper, and zinc salts, the optimum concentrations of these metals being 2·5, 5·0, and 1·0 p.p.m., respectively. Combinations of optimum concentrations of the respective metals produced qualitative additive effects. The assimilation of mineral nutrients was increased by copper and zinc and diminished by manganese. All three metals increased the fat content of *Aspergillus* and decreased its nitrogen content. C.

***Aspergillus Niger;* Formation of a Growth Regulator by——.** P. Boysen-Jensen. *Biochem. Z.*, 1931, 239, 243-249.

A growth regulator is produced in considerable amounts by cultures of *Aspergillus niger* on solutions of peptone or hæmoglobin and also on liquid substrates. A growth regulator unit is defined. C.

Malt Amylases: Action on Starch. G. A. van Klinkenberg. *K. Akad. Wetensch., Amsterdam*, 1931, 34, 893-905.

The two amylases of malt were prepared by the methods described by Wijsman and their activities determined by the saccharification method. The effects of *p*H, enzyme concentration, and the presence of maltose were investigated. The β-amylase shows its highest activity at *p*H values between 4·55 and 5·15 and the α-amylose is most active between *p*H 5·65 and *p*H 5·85. A mixture of equal weights of α- and β-maltose has a greater checking action than β-maltose on the activity of α-malt amylase, while the checking action on β-amylase is greater with β-maltose than with the mixture. Only 64% of the theoretical amount of maltose is formed by the action of β-amylase on soluble starch. The residual substance, erythro-granulose, can be freed from maltose by precipitation with alcohol. It gives an opalescent solution with water and a blue or purple reaction with iodine. With α-amylase it is very difficult to obtain more than 36% of the theoretical maltose from starch. The blue reaction of starch with iodine is destroyed by the action of α-amylase on the starch. It is suggested that starch is composed of 64% β-starch and 36% α-starch which are decomposed by β- and α-malt amylases respectively. Apparently in animals and fungi only α-starch is formed and this is the glycogen found in them. Tests of glycogen show that it behaves in the same way as the erythro-granulose of starch. It is not attacked by β-malt amylase but is converted to maltose by the α-amylase and, therefore, like erythro-granulose, is assumed to have an α-structure. C.

Sodium Hypochlorite: Decomposition. W. F. Underwood and E. Mack, jun. *J. Phys. Chem.*, 1931, 35, 2650-2657.

The rate of decomposition of aqueous sodium hypochlorite solutions practically free from traces of heavy metals was determined at 45° in the presence of various salts by measuring the oxygen evolved. The results show that there is a positive salt effect and the slope of the plot of log k_o against $\sqrt{\mu}$ is +1, as predicted from Brönsted's theory, on the assumption that the chemical reaction is $2ClO^- \rightarrow 2Cl^- + O_2$ (k_o = the ordinary velocity constant and μ = the ionic strength of the solution). The velocity data show that the reaction is kinetically bimolecular in strong salt solutions. It is suggested that the drastic effect of sodium hypochlorite upon cotton cellulose in neutral or nearly neutral buffered solutions, observed by Clibbens and Ridge, is due, at least partially, to a salt effect. C.

Cellulose: Structure. K. H. Meyer and H. Mark. *Ber. deut. chem. Ges.*, 1931, 64, 1999-2002.

The authors discuss the differences between their own views of the structure of cellulose and the views of Staudinger. C.

Acid Dyes: Adsorption by Cotton. A. Lottermoser and A. Csallner. *Kolloid Z.*, 1931, 56, 324-334.

The amount of Naphthol Yellow, Crystal Ponceau, and Congo Red taken up from aqueous solutions by cotton was determined from the difference in concentration of the dye solutions before and after contact with cotton. The desorption curves were determined from concentration changes produced by successive dilutions of the dye solutions in which the samples were immersed. With Naphthol Yellow and Crystal Ponceau, the adsorption was found to be negative and the desorption positive. This result is explained by the adsorption of water and swelling of the cotton. The adsorption of Congo Red is only partially reversible. Salt additions increase the adsorption of dyes by cotton. C.

Cellulose Acetate Solutions: Structure Viscosity. Y. Nisizawa. *Kolloid Z.*, 1931, 56, 317-324.

The influence of various inorganic and organic additions on the viscosity of solutions of cellulose acetate in acetone and benzyl alcohol was investigated at different concentrations. Water produces an increase in viscosity, with a strengthening of the structure region, and later causes coagulation. The addition of benzine produces gelatinisation of the system. The jelly shows rapid syneresis.

The liquid separating during syneresis shows structure viscosity, thus indicating that it is not the pure dispersing agent. Glacial acetic acid and nitric acid lower the viscosity of cellulose acetate solutions. Softening agents such as camphor and triphenyl phosphate lower the viscosity but widen the region of structure viscosity. Cellulose acetate dissolves in a mixture of chloroform and ethyl alcohol but not in the pure components. The structure viscosity depends on the composition of the solvent mixture. C.

Nitrocellulose and Cellulose Acetate: Solvation and Viscosity. A. J. Drinberg. *Chem. Zentr.*, 1931, **ii**, 985 (from *Chimitscheskii Shurnal. Sser. B. Shurnal prikladnoi Chimii*, 1931, **1** (4), 87-116).

The dependence of viscosity and solvation of nitrocellulose and cellulose acetate on the concentration, the degree of depolymerisation, the dispersion media and the temperature was tested. Although the degree of specific solvation decreases with increasing concentration the total volume taken up by the solvated phase increases, the more so the less the degree of depolymerisation of the cellulose ester. The relative length of the molecular chains decreases with the depolymerisation of the cellulose ester. The viscosity and degree of solvation increase with increasing molecular volume of the peptising agent. Sols containing alcohol show minimum viscosity and solvation at concentrations which are higher the higher the molecular weight of the peptising agent. The viscosity of the sol increases with increase in the molecular weight of the acid radical of the ester used as the peptising agent. The viscosity and degree of solvation in sols containing a peptising agent and in sols containing a smaller proportion of coagulating agent to peptising agent than the peptisation number, fall with increasing temperature. In sols where the relation is equal to the peptisation number, increase in temperature produces coagulation. This phenomenon is related to the disturbance of sol structure and reduction of the hysteresis of peptisation associated with increasing temperature. C.

Natural Cellulose: Structure. F. Luft. *Ver. Wiss. Zentral-Lab. Agfa*, 1931, **2**, 169-178.

Well-developed cactus spines give clear Röntgen diagrams of native cellulose; needle-shaped spines have a simple band-like double fibre structure. Lignite preparations give the interference lines of native cellulose. Most of the micelles appear to be arranged in parallel layers in two directions, making an angle of 20° with the natural fibre direction. These layers are parallel to the surfaces of the sheets into which the preparation falls on mechanical treatment. *B*-Cellulose gives the Röntgen diagram of an amorphous body in the swollen state; when dried it gives the diagram of native cellulose. C.

A Circulating Pump for Liquids. D. R. Barber. *J. Sci. Instr.*, 1931, 8, 183.

A non-metal pump is described, which was designed primarily for the circulation of electrolytes. The principle is that, if there are two vertically placed drop valves in the pump circuit and the space between them is subject to an alternating pressure, the valves will operate alternately and the liquid will flow upwards. A periodic pressure fluctuation is provided in the instrument described; by successive compression and release of a rubber bulb, an eccentric wheel and piston being used to provide the motion. L.

An Electric Time Marker for Self-recording Instruments. H. G. Dines. *J. Sci. Instr.*, 1931, 8, 199-200.

The apparatus is designed to make time marks on self-recording instruments in which the pen moves in a circular arc. An electromagnetically controlled hammer gives a small periodic deflection to the pen. L.

10—ECONOMICS

American Cotton Crop: Forecasting. J. A. Todd. *Text. Weekly*, 1931, 8, 56-58.

A review is given of recent history of crop reporting methods in the U.S.A. and the present "boll count" system is explained. This is used to check the "crop condition" opinions sent to the Department of Agriculture by their 14,000 reporters. Similarly, the acreage reports are checked by data obtained by measuring from motor cars the frontage of the fields to the highways. Illustrations of the improved precision in the Department's forecasts since 1924 are given. C.

Rayon Spinning Pot: Optimum Rate of Revolution. J. Schneider. *Kunstseide*, 1931, 13, 244-248.

The part of rayon production costs due to wages and fixed and overhead charges may be reduced by increasing the rate of spinning. On the other hand, the power costs increase with increasing rate of revolution of the spinning pot. For a given set of conditions there exists an optimum rate of revolution which will give the lowest production costs. The determination of this optimum rate is illustrated by an example. Technological difficulties which prevent the use of the optimum value in practice are outlined and the influence of the dimensions of the spinning pot on its power consumption are briefly discussed. The optimum rate of revolution is lower for piece rate than for time rate wage systems. C.

American Cotton Prices: Forecasting. W. H. Slater. *Text. Rec.*, 1931, 49, No. 581, p. 38.

A table is given that attempts to forecast the season's average price of futures in Liverpool from August 1931 to August 1932, for crops ranging from 9 to 16 million bales. The table is calculated on the theory of the correlation of percentage changes between related variables. To use the table, the crop figure issued at any month by the U.S. Dept. of Agriculture is added to the carry-over (9 million bales) and the corresponding price is read from one of three columns headed pence per lb. based on (*a*) current wholesale prices, (*b*) 1913 gold values, or (*c*) 1928 gold values. The author recommends the last basis, which is that advised by the Macmillan Report. C.

Cotton: Cultivation in Fiji. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 55-57.

The exact return of the crop picked in 1929 was 84 bales of 400 lb. each of Sea Island and 188 bales of the Kidney variety. The conditions with which the 1930 crop had to contend were the worst on record for wind, drought, and cold. The Sea Island crop amounted to 171 bales, and it is estimated that the entire Kidney crop will total 220 bales. The Sea Island districts were planted with a selection known as S17 and the Sigatoka district with a Kidney selection known as K/3/2. The yield from this selection has been very high, in some cases being well above 1,000 lb. to the acre. C.

Cotton: Cultivation in Iraq. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 51-55.

The large quantity of seed issued indicated a crop of some 7,500 bales, but the yield was only 3,300 bales. The abnormally low summer water supply, the difficult financial position of many of the farmers which handicapped them in carrying out essential work, and, mainly, the Najdi locust were factors responsible for this low production. C.

Cotton: Cultivation in Nigeria (Northern Provinces). *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 32-35.

A production of 29,208 bales of 400 lb., as compared with 23,458 bales in 1929, was recorded. The quality was uniformly good, fully 96% of the production offered for sale being classed as first grade. C.

Cotton: Cultivation in Nigeria (Southern Provinces). *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp, 31-32.

A total of 8,673 bales of cotton, comprising 5,649 of Improved Ishan and 3,024 of Native was produced, this being an increase of 1,453 bales on the 1929 figures. Ishan has a strong but rather harsh fibre and at a competitive price should appeal to users of Peruvian. On the Moor Plantation of the Government Agricultural Department yields of Ishan ranging from 883 to 1,140 lb. of seed cotton per acre were recorded. Experiments in cross-straining are being made in the attempt to obtain a finer fibred lint than the general run of Ishan cotton. C.

Cotton: Cultivation in Nyasaland. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 41-43.

An increase of 1,882 tons, or 53·69%, in the production of native-grown seed cotton over the 1929 crop is reported. The improvement in the production of cotton classed as first grade, which commenced with the 1928 crop, has been more than maintained. C.

Cotton: Cultivation in South Africa. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 43-45.

The total crop amounted to 16,213 bales of 400 lb. each, showing an increase of 6,440 bales over the previous season. C.

Cotton: Cultivation in Southern Rhodesia. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 45-47.

A yield of 1,600 bales of 400 lb. each is recorded. Whilst the average yield per acre leaves much to be desired, it is a distinct advance on former years with the exception of the 1923-24 season when cotton did so well. Reselections from U4 have been made and distributed to farmers throughout the country; these have maintained their superior yielding qualities when grown in the districts. C.

Cotton: Cultivation in the Sudan. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 47-51.

The total estimated crop of the 1929/30 season was 168,500 bales of 400 lb., comprising 138,750 bales of Sakellarides and 12,750 bales of American cotton grown under irrigation, and 17,000 bales of rain-grown cotton, this being entirely of the American type. C.

Cotton: Cultivation in Tanganyika Territory. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 39-40.

The production is not expected to exceed 25,000 bales. The jassid-resistant U4 type of cotton from South Africa has been introduced and the experiment has given very promising results. Successful results have been obtained by inter-planting cotton between young sisal. C.

Cotton: Cultivation in the West Indies. *British Cotton Growing Assoc., 26th Ann. Rep.*, 1931, pp. 27-31.

The extreme drought and the comparative scarcity of losses from disease and insect pests are the outstanding features of the year. The production of Sea Island cotton in the Islands during the year amounted to 4,560 bales of 400 lb. each, in addition to which 1,110 bales of Marie Galante were produced in Grenada and St. Vincent. Steps have been taken to improve the quality of seed planted. C.

Cotton: Production in British Empire. J. A. Todd. *Tropic. Agric.*, 1931, 8, 240-244.

The author reviews the development of cotton growing in the Empire and gives statistics of production from 1914 on, for the whole world, for India, and for new fields, classified as (1) W. Africa, (2) E. Africa, (3) Rhodesia and S. Africa, (4) Sudan, (5) W. Indies, (6) Australia, Iraq and sundries, and (7) Malta and Cyprus. Statistics of consumption from 1922 are also given. Production in India and the new fields is estimated to be for 1930-1931, 17·7% and 1·17% of the world's total. The latest consumption figures are American 47·3% of total, Egyptian 3·53%, Indian 27%, and new fields in the Empire 1·44%. C.

Rayons: Production Comparisons. H. Wilbert. *Kunstseide*, 1931, **13**, 248-252 and 285-291.

The author compares the raw material, steam, and power consumptions and the corresponding costs, and also the time requirements in the production of the different types of rayon. For equal weights produced the raw material costs increase in the order viscose rayon, cuprammonium rayon, cellulose acetate rayon, nitro-rayon; the total energy requirements increase in the order nitro-rayon, cellulose acetate rayon, viscose rayon, cuprammonium rayon, and the time required increases in the order cellulose acetate rayon, nitro-rayon, cuprammonium rayon, viscose rayon. C.

Le Blan Roth Spinning System: Costing. H. Langen. *Spinn. u. Web.*, 1931, 49, No. 38, pp. 1-2.

The costs are worked out for the production of 24's yarn on (1) the ordinary low draft system, (2) a high draft system without roving frames, and (3) the Le Blan Roth system. It is claimed that system (3) shows a saving in power and labour costs of 0·039 mark per kilo. over system (1), and 0·017 mark over system (2). The conversion of a mill from system (1) to (3) is calculated to cost 3·75 marks per spindle, and from system (2) to (3), 1·75 marks. (Any high draft system on the ring frames may be incorporated in the Le Blan Roth scheme). C.

American Cotton: Supply and Consumption. G. W. Fooshe. *M/cr. Guard. Comm.*, 1931, **23**, 276-278.

The causes of the persistent price falls in American cotton during the 1930-1931 season are analysed and the influence of Government participation in the cotton market on the merchanting element is discussed. Monthly consumption figures are given and it is pointed out that the position of American manufacturers has been improved as a result of drastic efforts to bring production more in line with offtake. This improved position of textile manufacturers in the United States, coupled with the small stocks of cotton they are now carrying and the lowness of prices, suggests the probability of mounting consumption during 1931-2 compared with that in the previous season. Foreign consumption of American cotton was lighter in the closing months of 1930-31 than during the corresponding period of 1929-30. The trend was upwards in some countries, notably China, and downward in others, particularly those of Continental Europe, which were adversely affected by the financial and economic crisis. The heavy decrease in Russia is explained by the enormous increase in Russia's production of cotton. Price relationships and the excellence of the staple of the current crop in the United States suggest less substitution of American by foreign growths during the current season. C.

American Cotton: Supply and Consumption. A. H. Garside. *M/cr. Guard. Comm.*, 1931, **23**, 279.

The changes in cotton values during the last two years are outlined and the influence of efforts to maintain the price of cotton on the adjustment of supply to demand is pointed out. In the past season the world used only about 11,100,000 bales of American cotton, against 13,021,000 in the 1929-30 season and 15,748,000 in the peak season of 1926-27. About 11,700,000 equivalent 500-pound bales of other growths were used in the past season compared with only about 9,800,000 to 10,000,000 bales five or six years ago. The world has carried over from last season into the current season about 9,000,000 bales of American cotton and 5,000,000 bales of other kinds. In spite of cuts in acreage and fertiliser, the favourable conditions have produced a crop which is estimated at 15,584,000 bales. If the total carryover should prove to be 14,000,000 bales and the American crop should turn out to be 15,600,000 and if the production of cotton in other countries should be the same as last season, at about 11,700,000, the world's total supply of cotton for the coming season would be around 41,300,000 bales. The largest total supply ever recorded before was 37,145,000 bales in 1926-27. Last season the world supply was about 36,800,000 bales, and it seems likely that the consumption was about 22,800,000 bales. The world would have to increase its consumption this season by 4,500,000 bales, to a total of 27,300,000, to keep world supplies of cotton from being larger next summer than they were this. The largest consumption on record is 27,865,000 bales, in 1926-27.

American Cotton: Supply. C. T. Revere. *M/cr. Guard. Comm.*, 1931, **23**, 280-282.

In spite of reductions in acreage and fertilisation the forecast of the United States Crop Reporting Board places the American cotton crop at 15,584,000 bales. This high figure is traced to the effects of exceptional weather conditions, which have favoured the development of the plant and checked weevil damage, and also to the effects of the residue of fertiliser left in the soil from last season as a result of the drought. The crop will be characterised by unusual excellence in body and staple. Details by States are tabulated. C.

Cotton: Production Forecasts. *Intern. Rev. Agric.*, 1931, **22**, S468-469.

The first estimate of the United States Department of Agriculture for the 1931-32 crop places the average unit yield on the basis of crop condition on 1st August at 185·8 lb. per acre, on an area of 40,129,000 acres expected to be harvested. Total production is placed at 15,584,000 bales of lint against an actual production in 1930 of 13,932,000 bales forecast on 8th August 1930 at 14,362,000. Information received from the U.S.S.R. indicates a crop probably over 13 million centals of lint, an increase of 80% on that of last year, due to the expansion of area (50%) and the improved methods of cultivation. At this rate the Soviet Union will become a cotton producing country second only to the United States. The first estimate of area cultivated to cotton in India indicates a decrease of 6·4% on the corresponding estimate of last year and of 9·6% on the

average of the five seasons ending 1929-30. The Egyptian Ministry of Agriculture's estimate of area actually cultivated to cotton is about 20% less than the record area of last year. C.

Cotton: Production and Price Records. J. A. Todd. *M/cr. Guard. Comm:*, 1931, **23**, 261.

The price variations of raw cotton are discussed and it is shown that all the low levels coincide with record crops. When the relative purchasing power of money at different dates is taken into consideration and the 1900 values taken as 100%, the recent price of American cotton is actually lower than the record of 1894, but not so low as that of 1921. The new prices for Egyptian and Indian, however, are the lowest on record. Supply and consumption figures are given. In the second half of 1929-30 and in 1930-31 the consumption of outside growths has exceeded that of American cotton. The consumption of Egyptian cotton has varied in a way similar to that of American cotton. The similarity is probably connected with the fact that Government intervention was confined to these two crops, and that other growths, of which the price was left to follow its natural course, gained in competition with the artificial prices of American and Egyptian. In July 1929 the world's carry-over of American cotton was quite normal. The fall of consumption, however, in the second half of 1929-30 raised the figure to 6,249,000 bales, and the past season has raised it still further to 8,809,000, which, however, is still short of the record. The carry-over of Egyptian has reached a new high record. The position both in American and Egyptian is briefly that the world supplies for the coming season, meaning the prospective crop and the carry-over at the end of last season, are well above two years' consumption at last season's rate. C.

Cotton Piece Goods: U.K. Exports. *Board of Trade J.*, 1931, **127**, 376-378.

Details of the exports of different classes of cotton piece-goods to various overseas markets for 1930 are tabulated, together with particulars for 1913, 1928, and 1929. The aggregate exports of piece goods in 1930 amounted to 2,491 million linear yards compared with 3,765 million in 1929, 3,968 million in 1928, and 7,075 million in 1913. Whilst all classes of piece-goods shared in the decline of 1930 as compared with 1929, it was heaviest in unbleached goods, this being the category of which India takes the largest proportion. India, which was our principal market in 1913, still held first place in 1930, though with a much lower percentage. C.

Cotton Prices; Factors Affecting Normal Trend of——. M. Serruys. *Intern. Cotton Bull.*, 1931, 9, 611-620.

The commercial methods used in attempts to solve the problem of valorisation or stabilisation of prices include establishment of valorisation stocks, pegging prices, reduction in the number of sellers, advances to producers, levies and premiums and institutes for valorisation. A study of recent events in the case of cotton shows that such methods of intervention with the free play of supply and demand often result in damaging the industry which they were intended to help. Commercial operations for valorisation are fated to be ineffective if the restriction of the market is not accompanied by a limitation of production. Without having recourse to a policy of intervention, it appears that a statistical and economical estimation of the world's requirements, by means of organisations capable of keeping the production down in accordance with the actual needs, and by technical improvements tending to improve the prices, it should be possible to give at one and the same time a just remuneration to producers for their work, and to consumers the stability which they desire. C.

Cotton Prices: Factors Affecting Normal Trend of——. A. Zucker. *Intern. Cotton Bull.*, 1931, 9, 621-624.

Cotton prices in New York from November 1929 to July 1930 are tabulated and the effects of the action of the Federal Farm Board are discussed. It is pointed out that a declaration of policy by the American Government, similar to that made by the Egyptian Government, would help the market considerably. C.

Cotton Trade: Causes of Depression. E. de Moreau d'Andoy. *Intern. Cotton Bull.*, 1931, 9, 522-546.

The depression in the cotton trade is shown in two differing but closely allied aspects, (1) the slump in cotton prices, (2) the depression in the cotton manufacturing trades. Consumption, production, sales index (determined from the percentage

of the crop which has actually been consumed during each year) and price figures since 1914 are analysed and it is shown that the present depression is the consequence of several years of over-production—a circumstance rendered still more grave by the decline in consumption. It is suggested that the cotton trade is entering upon a period of depression characterised by (*a*) prices remaining low, with slight tendency to rise, (*b*) crops restricted, probably to be still further restricted, (*c*) consumption stationary or slowly expanding. Consumption figures are compared with machinery figures and the recent increases in consumptive capacity are discussed. The development of the depression is analysed and the influence of the appearance of new competitors particularly of Japan, the development of the Chinese and Indian cotton industries, and the expansion of the American cotton industry on the English cotton trade is emphasised. It is pointed out that since 1921, an average of 25% of the English spindles and looms have been at a standstill and that these 15,000,000 idle spindles and 200,000 idle looms almost exactly balance the world's increase in equipment since 1914, that is 15,826,000 spindles and 265,000 looms. It is suggested that if a quarter of the equipment of Great Britain were deducted from the world's active equipment, the world's effective equipment would fall back to its pre-war level and not much more would be required to enable the cotton industry, suitably equipped for the struggle, to return to a satisfactory degree of activity. It is probable that the coming period of depression will be characterised by (*a*) a relatively low industrial production curve, horizontal or very slightly tending towards a rise, (*b*) fierce competition and as a consequence, reduced profits and the gradual elimination of the less efficient machinery. Japan does not seem to suffer from any depression. The United States will no doubt recover very quickly. For the industry in England there does not seem to be any reason to hope for a return to better times unless through some exceptional circumstance, or through a radical reform of its methods of production. The Belgian cotton industry appears justified in expecting some mitigation of the depression from which it has suffered for more than two years. C.

Cotton Trade: Causes of Depression and Remedies. Federation of Master Cotton Spinners' Associations Ltd. *Intern. Cotton Bull.*, 1931, 9, 547-560.

The more evident factors in the depression are listed as follows—(1) Decline in demand for cotton goods. (2) Falling prices of basic commodities. (3) Dearness of finished cotton goods in comparison with the prices of basic commodities. (4) Dearness of cotton goods, as retailed to consumers, in comparison with the prices received for wholesale manufacturers. (5) Costs of manufacture and distribution not reduced in proportion with the falling values in basic commodities. (6) Universal depression in industry and agriculture. (7) More especially, impoverishment of agricultural peoples in the tropics, who are the largest consumers of cotton goods. (8) Interference of international debts with world trade. (9) Increase of tariff barriers, of boycotts and prohibitions. (10) Political unrest in the principal cotton-consuming markets. (11) Lack of confidence. (12) Decline of foreign investment. (13) Maldistribution of gold. (14) Competition of other fabrics and fashion changes. The severity of the depression is illustrated by a comparison of the post-war trade of the United Kingdom with the pre-war trade. The general decline in purchasing power, the disparity between costs of production and world prices for cotton goods, and the influence of the decline in silver on purchasing power and competitive power, particularly in the case of China, are discussed and shown to be due essentially to the adoption of the gold standard. It is pointed out that prosperity for the world's cotton industry depends—(1) Upon at least as good service to their customers in the way of quality relative to price, as the service which originally brought the present equipment for cotton manufacturing into being. (2) Upon the consumers of cotton goods enjoying at least as high remuneration for their services and produce as they originally enjoyed when they called for increased manufacturing equipment to satisfy their needs in the form of cotton goods. In order to restore the balance between purchasing power and the prices of cotton goods, the cotton industry must either contrive to reduce costs to the level of purchasing power, or raise purchasing power to the level of costs. The former is less likely to be effective than the latter. The key to the restoration of purchasing power is the abandonment of the gold standard policy. C.

Cotton Trade: Causes of Depression. A. S. Pearse. *Intern. Cotton Bull.*, 1931, 9, 598-605.

The causes for the present state of affairs of prices of cotton below cost of production are fundamental and mental. The mental aspect depends on Stock Exchange movements. The New York crisis of 1929 affected the whole world and has resulted in an absence of speculative enterprise. Of the fundamental reasons, the intervention of the American Government in the cotton market is one of the most important. Political circumstances, the rapid rationalisation of the cotton industry, the almost universal introduction of the eight-hour day, double-shift systems, tariffs and currency questions have also had great influence on the general depression. Lancashire, in particular, is very seriously handicapped by heavy local and imperial taxation and by trade union restrictions. Consideration of all these complexities leads to the conclusion that for some years to come the prospects of the industry cannot be bright. As a basis for constructive remedial measures it is suggested that the U.S. Federal Farm Board should be requested to make a definite declaration as to its future cotton policy and that every increase of output occasioned through the erection of new machinery or the introduction of double shifts should be compensated by the breaking up of corresponding old machinery. The attention of the world should be drawn to the fact that the investment of capital in new cotton mills for some years to come is likely to be unremunerative and an attempt should be made to find new uses for cotton goods and to popularise methodically the broader use of existing ones. C.

Scutcher Room: Rationalisation. *See* Section II.

11—INDUSTRIAL WELFARE, INDUSTRIAL PSYCHOLOGY, AND EDUCATION

Occupational Dust Diseases. E. L. Collins. *Bull. Hygiene*, 1931, 6, 663-670.

A discussion of the occupational diseases produced by different types of organic and inorganic dust. Outbreaks of an unusual cough occurring among weavers of cotton cloth have been found to be associated with the presence of mildew. Cases, at first, have suggested pulmonary tuberculosis; but eventual complete recovery has not justified the diagnosis. The exact mould at fault has not been determined, but *Aspergilli* have been suspected. Asthma occurs among cotton strippers who are exposed to dust from cotton husk and debris thrown into the air in the stripping process. These operatives experience a very heavy mortality from diseases of the respiratory system, including pneumonia and bronchitis, in comparison with the general male population. It has been suggested that the asthma is a reaction to sensitisation by some protein in the cotton dust. No definite evidence has been brought to light that any form of fibrosis comparable with that seen in cases of either silicosis or asbestosis occurs among these operatives. Sickness rates of cardroom workers are compared with those of ringroom and warehouse workers and standardised mortality figures are given for pulmonary diseases in various occupations. C.

ABSTRACTS

LIST OF SECTIONS

1—FIBRES AND THEIR PRODUCTION
(Including constitution and substance)

(A) Mineral.
(B) Animal.
(C) Vegetable.
(D) Artificial.

2—CONVERSION OF FIBRES INTO FINISHED YARNS

(A) Preparatory processes.
(B) Spinning and Doubling.
(C) Subsequent processes.
(D) Yarns and Cords.

3—CONVERSION OF YARNS INTO FABRICS

(A) Preparatory processes.
(B) Sizing.
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(D) Knitting.
(E) Lacemaking and Embroidering.
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4—CHEMICAL AND FINISHING PROCESSES

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(C) Weighting.
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(B) Yarns.
(C) Fabrics.
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6—DESIGN

(A) Textile Decoration.
(B) Structure of Fabrics.

7—LAUNDERING AND DRY-CLEANING

(A) Cleaning.
(B) Drying.
(C) Finishing.

8—BUILDING AND ENGINEERING

(A) Construction of Buildings.
(B) Fire Prevention.
(C) Steam Raising and Power Supply.
(D) Power Transmission.
(E) Transport.
(F) Lighting.
(G) Heating, Ventilation, and Humidification.
(H) Water Purification.
(I) Waste Disposal.

9—PURE SCIENCE

10—ECONOMICS

11—INDUSTRIAL WELFARE, INDUSTRIAL PSYCHOLOGY, AND EDUCATION

PUBLICATIONS ABSTRACTED from JANUARY to DECEMBER 1931

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*Agricultural Journal of India.
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*Wool Record.

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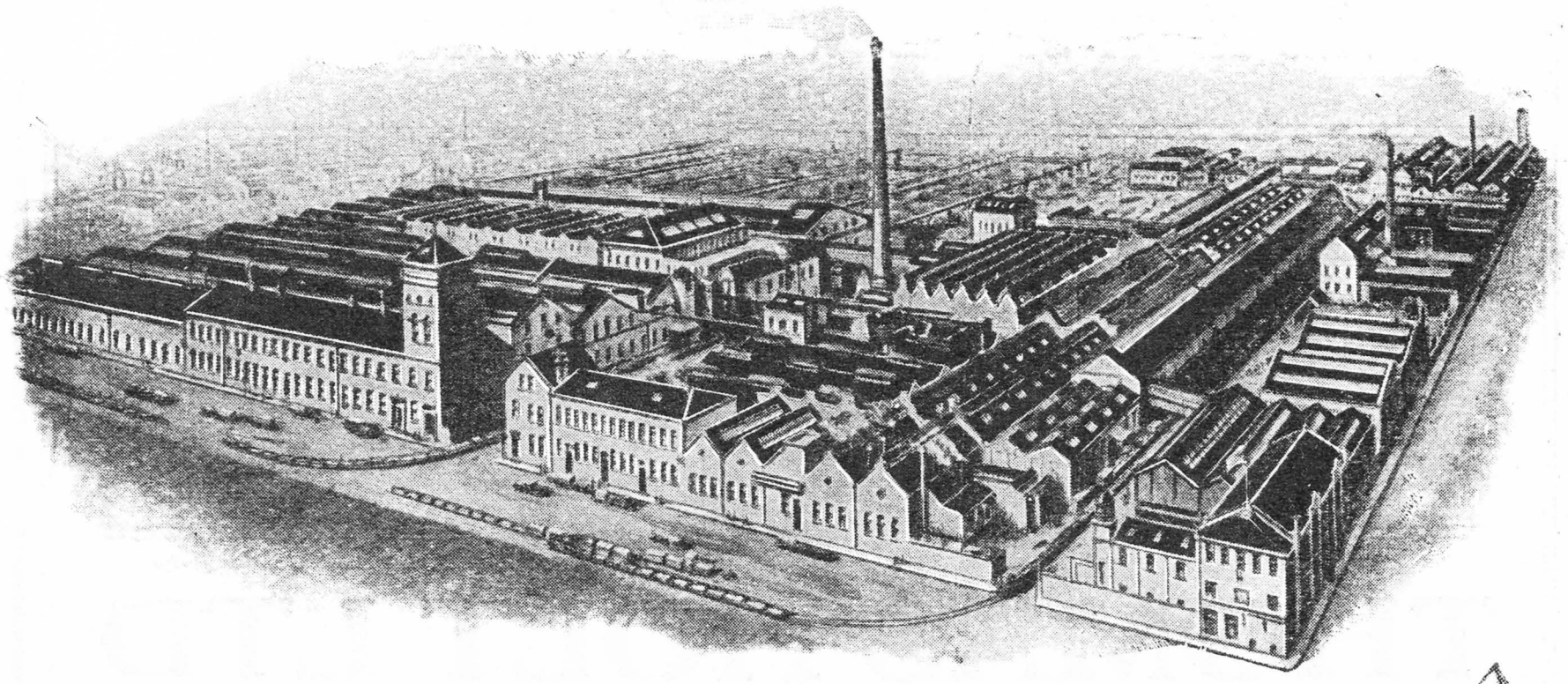

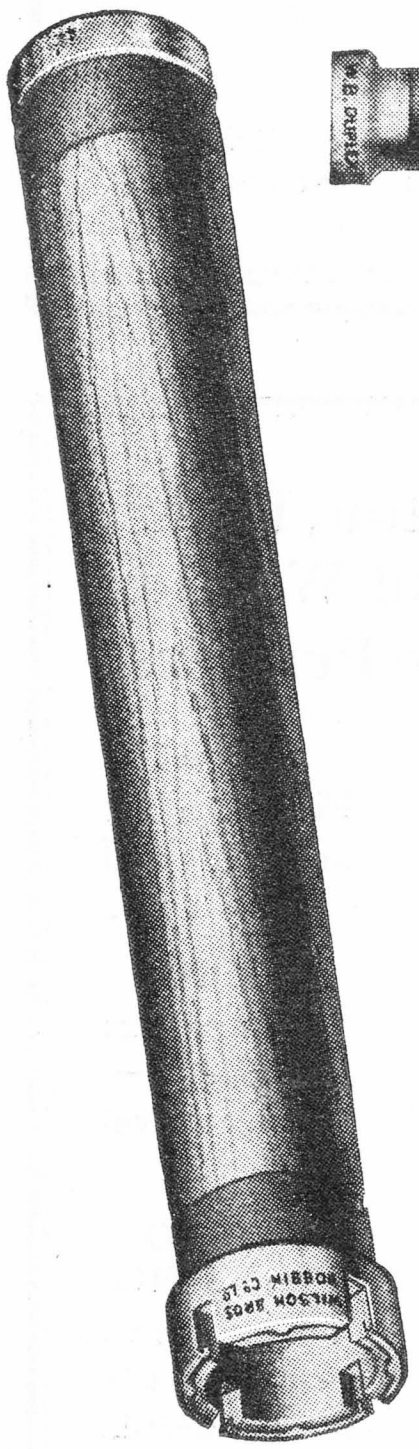

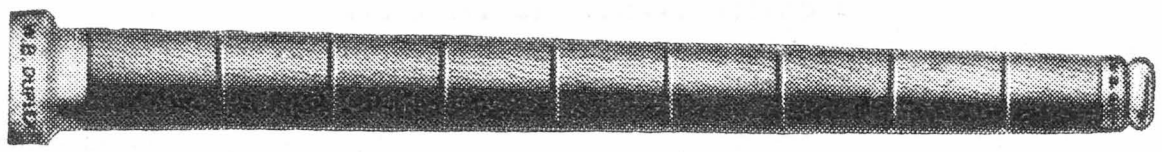

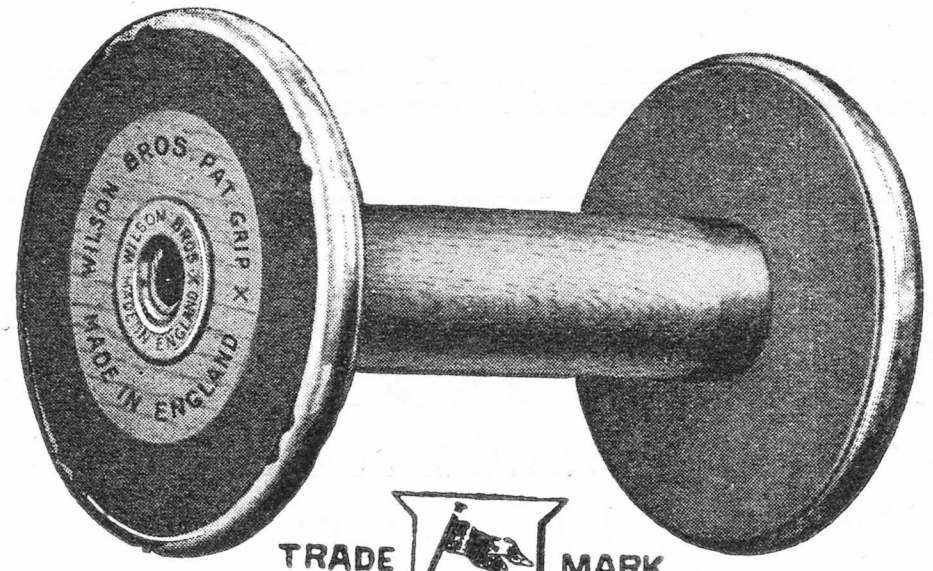

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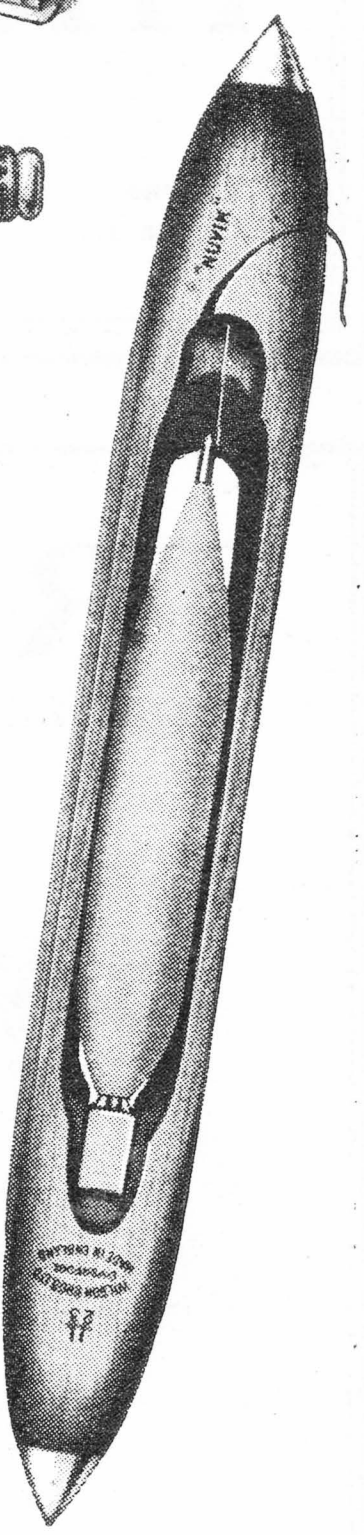

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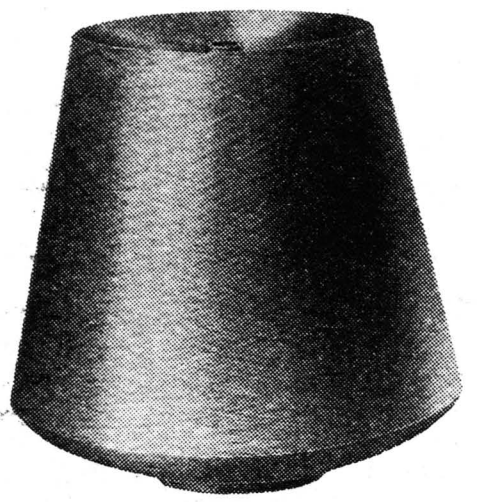

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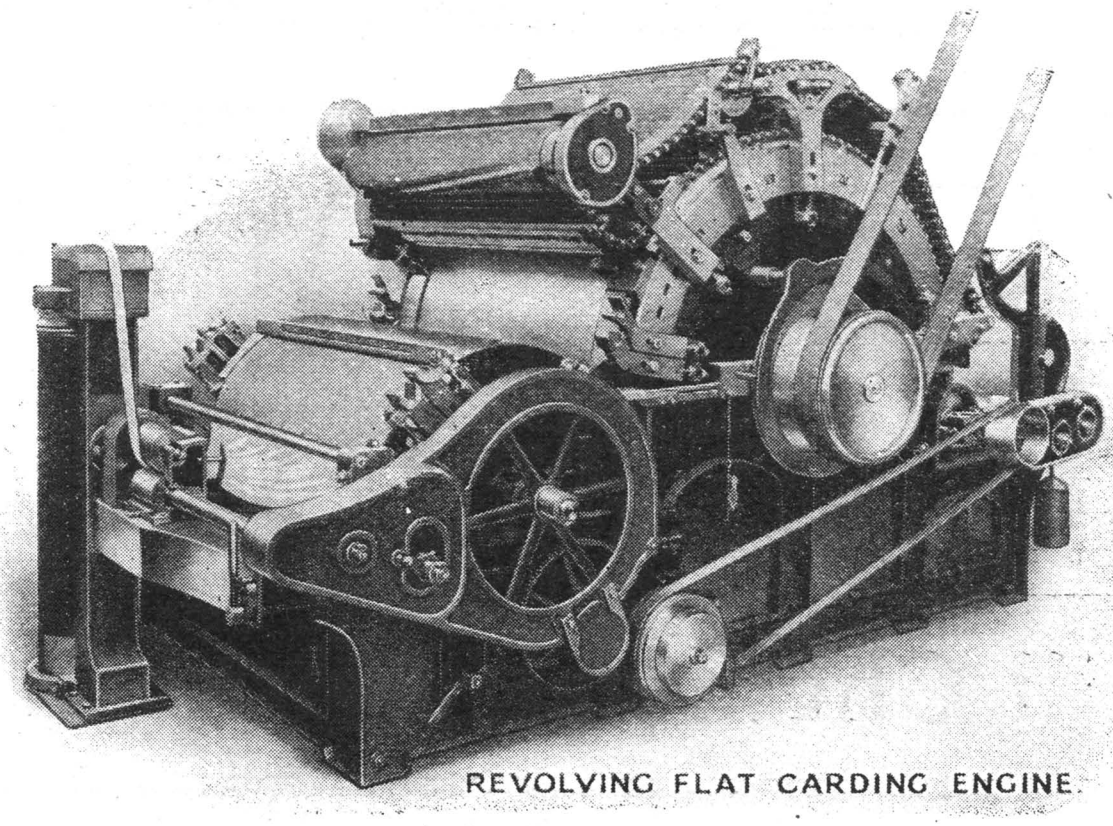

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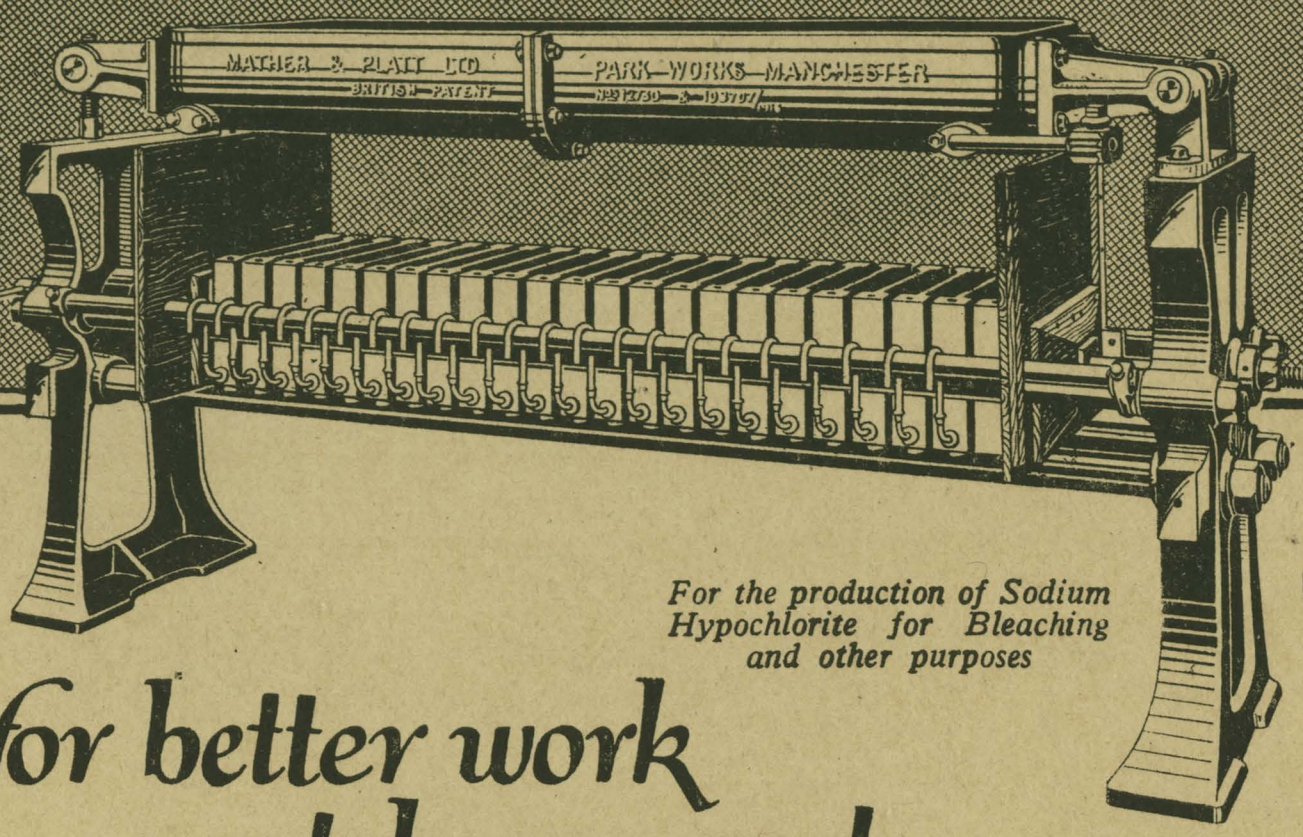

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1/1 Horizontal Stripe Leg and Foot.
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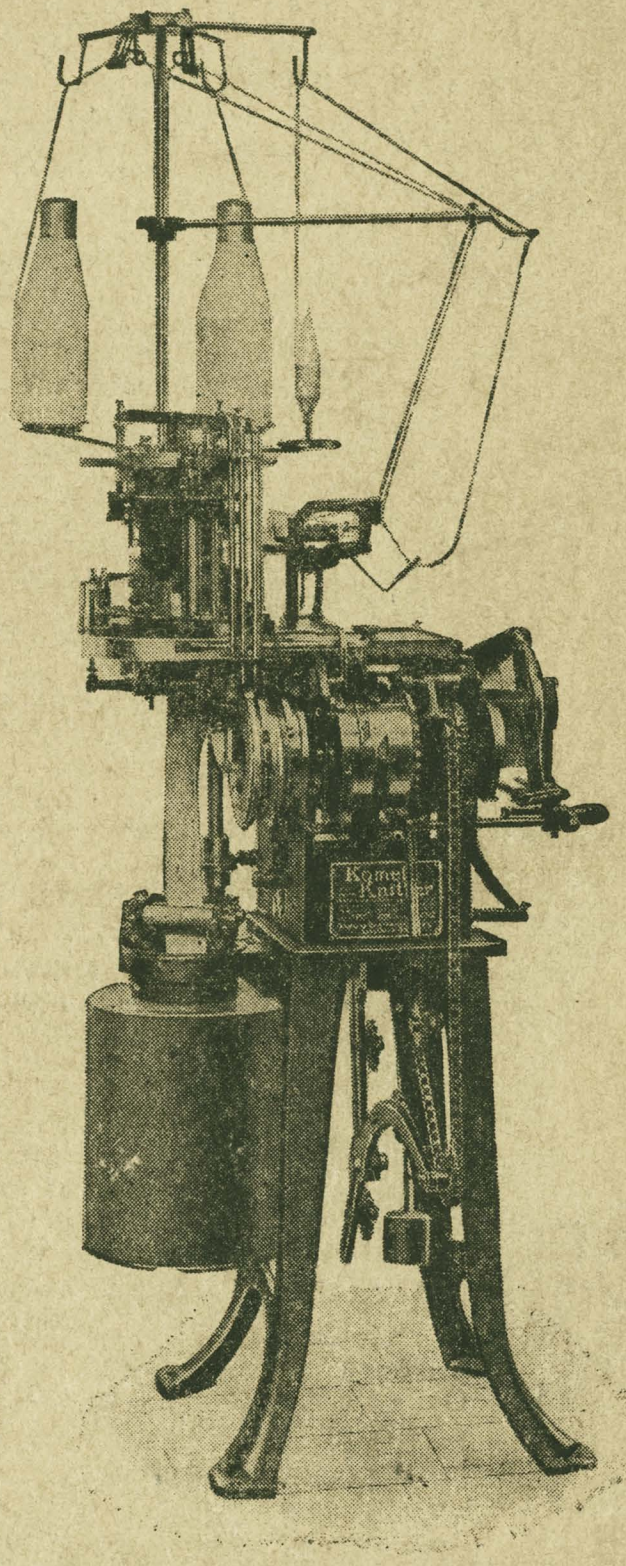

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