Technical Information

Oil Stains on Cotton Fabrics.

Inquiry No. 868. How can stains be removed from cotton cloth which have occurred in process of manufacture and have been caused either by the machinery itself, by drippings from the shafting, or by carelessness on the part of the operatives?

Replies. 1. There are no certain means of removing old mineral oil stains from fabrics. For this reason many weaving mills use saponifiable lubricating oils, being mixtures of mineral oil with fatty oils, such as castor oil, rape oil, or olive oil. Mixtures of this nature are fairly saponifiable and are therefore easier to remove. Ordinary oil stains withstand even high pressure boiling with caustic soda and the addition of emulsifiying agents to the lye, within the limits imposed by their cost, has no effect. On the other hand, soaps or products similar to Turkey red oil, which contain solvents such as benzene, chloroform, methyl-hexalin, etc., can be used to advantage. They can be had from any firm dealing in special products for the textile industry. It is most effective to apply the agent in a high concentration, but even stains that have been removed remain visible after the fabric has been dyed. Dr. G.

2. It is a well known fact unfortunately that cloth fresh from the weaving shed is often stained with oil from the machinery. Besides this, the oil is not always pure, but may contain particles of iron, graphite, or similar substances, which makes the removal of the stains all the more difficult. A number of chemical works manufacture special agents for the removal of such stains and we ourselves have tested quite a number of them and found that the best is *Esdeform*. If the oil is clean, Esdeform itself will remove it simply by spotting; the oil in the stain evaporates together with the Esdeform. The matter is rather more difficult if the oil has been dirtied by graphite, rust, or the like and Esdeform M must be used in such a case, moistening the stains by means of a bottle with a spray cork and then washing them out with a sponge. Ordinary Esdeform is insoluble in water, while Esdeform M is soluble forming a dense foam which emulsifies the particles of the stain. If the goods are to be wet processed later on, the moistening with Esdeform M is sufficient, the emulsified particles being removed by the water during the scouring. The product is manufactured by Messrs. J. Simon & Dürkheim, Offenbach-on-Main. R. B.

3. The problem of the removal of oil stains from cotton fabrics is old and has up to the present day not been satisfactorily solved. In proof of this it might be mentioned that the considerable prize set more than twenty years ago by the Industrielle Gesellschaft in Mulhausen in Alsace has not yet been presented. The nature of the oil decides whether the stain can readily be removed or not. If it is a saponifiable oil or a compound oil (a mixture of a saponifiable oil with a mineral oil), it will be more readily removed than if the stain is due to a non-saponifiable dark lubricating oil or a tar oil which contains particles of asphalt and coal. The age of the stain is also of particular importance, because dried up oil tends to become resinous and is much more obstinately attached to the fibres than fresh stains. The removal is also made more difficult when the stains have been practically burnt into the fabric, as is more or less the case when the goods are singed. Stains in bleached goods can be removed to a certain extent, depending upon the nature of the oil, by the usual kier boil, especially if a fat solvent soap (such as Verapol, manufactured by the Chemische Fabrik Stockhausen & Co., Crefeld, Rhineland) has been added to the lye. If the stains are very obstinate, there is nothing for it but to remove them from the finished goods, which is best done by lightly brushing them over with concentrated solutions of a fat solvent soap (or with an undiluted special soap such as Verapol) and then rubbing it out with water after a short time. It is also advantageous to let the goods lie over night after the stains have been dabbed with soap, so as to prolong the action of the fat solvent and the soap. In certain special cases (e. g. stains due to thick black lignite tar oils and the like) it is of advantage to give the goods an afterbleach with chlorine, but the bleaching bath should not contain more than one half gram active chlorine per litre at the utmost. Often, however, nothing will serve but the ultimate, radical means of a pair of scissors. M. K.

Milling Overcoatings.

Inquiry No. 863. Is there any method of milling overcoatings of coarse, long-haired wool with from 15 to 20 per cent. recovered wool so as to lose as little flue as possible?

Replies. 1. In order to mill overcoatings composed of long-haired wool and recovered wool on the milling machine so as to lose as little flue as possible, care must be taken not to mill it either too dry. or too moist. The best plan is to give it a preliminary washing in the washing machine, then mill it, and afterwards finish the washing. It all depends upon the material used, the adjustment of the milling machine, and the lubricant used. Wash the goods with soap and Verapol (Chemische Fabrik Stockhausen & Co., Crefeld) beforehand, mill them on the cylinder with soap, or with Verapol soap, and then finish them as usual by washing them with soda. ERJ.

2. The Farb- und Gerbstoff-Werke Carl Flesch jr., Frankfurt-on-Main, Brentanostr. 18, who manufacture Eufullon H and Eufullon extra, are able to place at your disposal a process for which patent protection has been applied for, according to which coarse long-fibred wools of the type mentioned mixed with from 15 to 20 per cent. recovered wool can be milled so well that the loss of material is reduced to a minimum. We would ask you to communicate with the firm mentioned, because the special process is not suitable for reproduction in the inquiry columns of this paper. O. J.

Bobbin Battery for Automatic Looms.

Inquiry No. 848. Which weft-supply mechanism for automatic looms has proved to be best in actual practice, the Northrop system or the box system?

Replies. 1. Several decades ago the Northrop loom brought us the revolver battery for a limited number of bobbins. The Maschinenfabrik Rüti, vorm. Caspar Honegger, Rüti, Switzerland, and a number of other loom builders have spent particular pains on further perfecting this automatic loom. The loom built by them on Stein's principle is fitted with a box magazine, and no weaving mill that has made the acquaintance of this arrangement is likely to revert to the other system, especially in view of the fact that the boxes can hold the requirements of yarn for days at a time, according to the count. The Northrop battery must be filled at the loom, which is not necessary with the boxes. G.

2. It should be remarked, before passing any decision upon the two types of automatic looms, that the Northrop loom works more economically in small to medium-sized mills than the Stein loom, which has proved to be advantageous chiefly in large mills. In order to reap the full benefit of Stein's automatic loom a compressed air plant is required, such as can pay for itself only in large mills.

As far as reliability is concerned, the Northrop magazine is to be preferred, for the bobbins are led better, and faulty changes occur less often. The ends of the picks are stretched over a special thread disc, so that it is impossible not to thread in the changed bobbin in the shuttle.

On the other hand Stein's loom offers the great advantage of a large reserve of bobbins. Consequently they do not need to be renewed so often, so that great economies in wages can be made by rationalizing the work.

For a number of years past the Maschinenfabrik Rüti vorm. Caspar Honegger, Rüti, has made a speciality of automatic looms on both Northrop's and Stein's system, which they build of the highest quality. All bearing surfaces ot their looms are milled, and they have also introduced a number of improvements and simplifications. F.F.

What is to be Understood by the Expression "Weaving Coloured Cotton Goods"?

Inquiry No. 844. The question relates to a fine cotton weaving mill which weaves articles with coloured yarn on jacquard, dobby, and plain looms, as well as circular and change looms.

Replies. 1. As the name itself indicates, the cotton coloured weaving mill produces mainly plain coloured cotton fabrics (staple articles) which arise by arranging coloured warp and weft threads according to a pattern. It begins, that is to say, where cotton white weaving stops, but its boundary in the other direction cannot be sharply defined owing to the differences in the nature of the fabrics. In my opinion a boundary line can only be drawn when special articles are manufactured in which the character of the fabric is mainly determined by the nature of the weave, that is to say, where an arrangement of coloured warp and weft threads according to pattern is more or less lost sight of, such, for instance, as lenos, plushes, covers, and so on. As a general rule weaving mills call themselves after the special articles which they mainly manufacture. Articles which they have taken up as a side line and are of less importance do not play much part in designating the branch of weaving. S. L.

2. A power weaving mill becomes a mill for coloured goods when it works mainly with coloured warp and weft yarn and the preparatory machinerey and looms are no longer sufficient for weaving gray cloth. The term coloured weaving mill has lost its significance when only white or gray warps are woven with a coloured pick. A mill of this type is neither a gray mill nor a coloured mill. A coloured weaving mill in the real sense of the term handles fabrics with warp and weft which are both coloured. N.

Shedding in Jacquard Machines.

Inquiry No. 847. For what jacquard fabrics particularly are the various jacquard sheds used, that is to say, open shed, upper shed, lower shed, centre shed, clear shed? What are their advantages and disadvantages?

Replies. 1.The upper shed jacquard lifts the shed out of the lower shed, and is practically good up to a pitch of 400, or 600 at the outside. It is the cheapest machine and is used for cotton, linen, and woollen fabrics. It permits of up to 140 picks, at the utmost 150 picks per minute. It has the disadvantage that the cross-bars and the goods are raised and lowered upon opening and closing the shed, whereby the cross-bars are shaken and the warp is treated roughly.

The lower shed jacquard machine is used, for instance, beside an upper shed machine on upholstery velvet looms.

The centre shed opens the shed from the middle yarn position upwards and downwards and permits of up to 180 picks per minute, whereby yarn and goods remain quiet. It is necessary for artificial silk, silk, and fine cotton counts, and is most used for upholsteries.

The straight shed jacquard can only be used for small machines up to 600 pitch with low depth of harness, whereby an uneven shed is formed. By specially equalizing the healds, or slanting the knife frame and the bottom board, a clear shed can approximately be made.

The clear shed jacquard machine has slanting knife frame and bottom board, so that the healds can have a greater lift increasing backwards.

The upper shed, lower shed, and clear shed jacquard machine is the most perfect, but also the most expensive.

The jacquard machines mentioned can be either single-lift, allowing of from 150 to 180 picks per minute, or double-lift machines permitting of 200 picks per minute. The latter are generally used for narrow cotton and linen looms with small patterns up to a pitch of 400 or 600. They contain twice as many hooks as given.

The double-lift jacquard machine with two cylinders permits of 220 picks per minute, and has also twice as many hooks as given.

The double-lift machines work with half-open shed, that is to say, the opening and the closing shed meet half-way, which tends to treat the warp gently.

Besides the sheds mentioned, there are other types for special purposes.

When purchasing new machines the cost must be taken into consideration as well as the technical requirements, for a mill will not work with most profit if its equipment includes unnecessarily expensive machines. It would therefore be a mistake. for example, to purchase an upper shed, lower shed, and clear-shed jacquard machine for cotton damask with a small design.

The small brochure entitled "Die verschiedenen Jacquard-Maschinen-Systeme und deren Anwendung" (The various systems of jacquard machines and their use), which can be had from the Hausmeister der Webschule, Crefeld, contains details illustrated by drawings of most types of jacquard machines. U.

2. Lower shed machines are not to be spoken of at all in jacquard weaving. Upper shed machines are mostly used for plain cloths which are also of special width, because they are generally strongly built and run slowly, and thus support a heavy weight. Clear shed machines are used in making very dense fabrics, so that the shed must be as small as possible. They run very slowly too. The number of cords in a single cross row of the comber board must equal the number of hooks in a cross row. Only the cords and hooks of the back rows make the greatest rise with their healds, and consequently the warp in the other healds suffers less. In centre shed machines the front healds must unnecessarily make just as big a lift as the back healds. Centre shed machines are used when a large shed is required. The warp needs to make only one movement in order to reach half the height of the shed and when the slay beats up is all stretched in one plane, which is of advantage for closely woven goods. By open shed machines are probably meant here the double-lift machines which are used for rapid looms. The slower movement of the hooks and knives tends to treat the machine parts gently. They are not suitable for heavy, closely woven goods, because the threads in the lower shed sag and therefore yield when the slay beats up, while those in the upper shed sink when the slay beats up and those rising with the next pick rise up and form a partial closing of the shed, but are slack just like those coming down and therefore offer the beat-up of the slay little resistance. Those that remain below must chiefly bear the blow, whereby they are very liable to be broken. Kertess.

The Sizing of Bump Yarn.

Inquiry No. 820. It has been found when sizing bump yarn with potato starch, either hot or cold, that the size very soon decomposes and becomes unfit for use, so that yarn cannot be made as stiff as necessary. When the wet yarn is squeezed out, the spinning oil in the yarn is also squeezed out, which is probably the cause of the trouble. Are there any means of preventing this, or what is the best size for bump yarn?

Replies. 1. The spinning oil in the yarn is not likely to be the cause of the trouble, but

rather the nature of the size used itself. The starch must be well broken up, that is, it must be in soluble form. Two processes for breaking up the starch granules are used, the diastatic process and the oxidizing process. The trouble described often occurs with starch treated by the first process, especially if instructions have not been followed exactly, for the starch molecule, which is capable of swelling up strongly, is broken down to form bodies of lower molecular weight, such as dextrin, maltose, and glucose, the two latter being sugars which are soluble in water. As the break-up proceeds the size becomes thinner and thinner. Diastatic products are excellently suited for desizing fabrics, but less so for the preparation of size. For this purpose the oxidixing process is more suitable. This causes the starch molecule to break down without, however, permitting the formation of the products of decomposition mentioned above, so that the preparation of the size is not confined to a definite temperature.

Adhesive power and viscosity are of importance for your size. Viscosity is necessary to enable the size to penetrate the yarn well and not merely clog up its outer surface. I recommend you, therefore to use for the preparation of the farina either Therhyd (supplied by R. Bernheim, Augsburg-Pfersee), or Aktivin (supplied by the Chemische Fabrik Pyrgos G. m. b. H., Dresden-Radebeul), or also Biolase (supplied by Kalle & Co., A.-G., Biebrich a. Rh.). I have used the two first-mentioned products myself and imagine that there is no great difference between them. I am of the opinion, however, that I must advise you to use Therhyd, because the aim must be to make a size of permanent consistence which undergoes no change in use or on standing. After having broken up the starch granules Therhyd is entirely used up or destroyed and has no after-effect in the bath. That is to say, there is no further breakdown and the quality of the size undergoes no change. I use one and one-half per cent. Therhyd calculated upon the weight of the farina, but one per cent. is also sufficient. H.

Winding Egyptian Cotton Yarn.

Inquiry No. 829. Is there any advantage in winding fine Egyptian yarn, say 50's to 80's, on the quick traverse winder, or is it necessary to wind fine counts like this on light wooden or paper tubes on ordinary winding machines?

Replies. 1. Yes, it is better to wind also fine Egyptian yarn of 50's to 80's on the quick traverse winder, because the output is higher than when flanged bobbins are used, which also leads to trouble later on when the other yarns are wound in cheeses, Particularly good results are obtained by winding fine counts on the split drum quick traverse winding frame. H. B.

2. It all depends upon how the spinning room is equipped. If quick traverse winders are used, then the thread guide with cam is to be preferred. The speed of the frame must be adapted to the quality of the yarn. If bobbin winding machines are used for such fine counts, the bearings of the shafts and of the bobbins must show no traces of wear, because otherwise the bobbins will wobble and ruin the yarn. If everything is in the best condition, then one method is as good as another, and the machines are used that happen to be present. L.

The Formation of Weals on Piece Goods Dyed on the Jigger.

Inquiry No. 872. We are custom dyers of cotton, linen, and half-linen fabrics, and fabric combinations of the most diverse type from different mills pass through our hands. It very often happens, when dyeing the goods on the jigger, whereby a large number of pieces are sewn together to form one lot, that some of the warp threads draw together and form lumps. These lumps are often found only on one piece and stop at the end seam. They often appear only at one spot in the width, and at other times at several places, sometimes also on a number of pieces. But even if the fault occurs only in one piece in the middle of the lot, the other pieces are bound to suffer too, because pieces which do not show the fault are liable to be distorted gradually when wound upon the piece which has this blemish. The drawbacks which thereby ensure for the piece dyer are very unpleasant, leading as they do to uneven dyeings and even to the goods being torn through the strain placed upon them by large weals or lumps. On the other hand, the nature of the defect seems to indicate that it is not due to any faults in the treatment on the jigger, but that they are due to faults in weaving. Where is the fault to be looked for?

Replies. 1. The faults described are due to the weaving. Irregularities in the yarn and in its tension during weaving lead to the formation of such weals at isolated places only. It is true that irregularities in the jigger itself, such as knots in the guide rollers, can lead to the formation of such weals, but then the fault appears in all the pieces. If it proceeds from the seam, the method of sewing the pieces together may be the cause, for each longitudinal fold, as you yourself have noticed, causes trouble throughout the whole lot. The best plan in this case is to sew the ends of the pieces regularly together, so that the seams cannot cause folds, and to keep the jigger in proper condition, that is to say, the guide and

draft rollers must be absolutely round and run lightly, while lying absolutely parallel and horizontal. Finally the use of open-width holders during the passage of the goods keeps them free of folds. Different types of these holders are supplied by a large number of machine works. Dr. S.

2. The troubles that you describe would seem to confirm your supposition that they are due to carelessness in the weaving shed, e. g. the use of irregular warps, or the warp may have been badly beamed, or the warp beam brake is not in order, and the like. But before complaining at the weaving mill, I would advise you carefully to look over the whole of your own equipment. For instance, in sewing the pieces together, great care must be taken to keep the seams as straight as possible at right angles to the selvedge, leaving sufficient play for the thread. Too tight seams pull the fabric together and might cause weals. The troubles that you mention might also be caused if the upper and lower rollers of the jigger are no longer parallel, either through the bearings being worn out or through the foundation of the machine having slightly sagged. Even slight irregularities in the rollers, which only an experienced machine repairer can put right, can be the cause of very unpleasant distortions in large dye lots. In my opinion you should always try to place only the same or related qualities together. K. F.

The Finishing of Fine Shirtings.

Inquiry No. 856. I have light fine shirting to finish 18/4 36/42 — 18/16 36/42 — 15/14 36/42, and so on. I am unable to get good results on these light goods with the ordinary back filling mangle and should be glad to learn whether there are special machines for this purpose.

Replies. 1. Light calicos and fine shirtings cannot be given a good finish on an ordinary machine, because the filling is uneven and the weave cannot be completely closed, as is required for shirtings, and so on.

In order to secure a handsome closed filling, a special machine is requisite. I could give the inquirer further details; it would occupy too much space to go into the matter here. Hm.

2. A special machine is not absolutely essential for the finishing of light fine shirtings of the weaves 16/14 — 18/16 — 36/42. Care must merely be taken to fit each operation accurately to suit such light goods.

First of all the doctor must be set very lightly, that is to say, both the pressure of the doctor on the dipping roller as well as the distance between the two must be capable of accurate adjustment. The doctor must be exactly horizontal and tle dipping roller must not show the slightest irregularities. Apart from this, the composition of the sizing bath is of the greatest importance. Since a comparatively large quantity of China clay and talc is required for this finish, it is imperative to add a good binding agent to the farina so as to retain the fillers sufficiently in the fabric and not let them dust out of the finished goods later on. The well-known "Original Quellin Sch" is very well adapted for this purpose, owing to its very high adhesive power. The following recipe may be given, which has proved in actual working practice to be very well adapted for such finishings.

200 litres water
8 kilos farina
2 kilos Original Quellin Sch (Kantorowicz & Co., Breslau 6)
36 grams China clay
14 grams talc
4 grams sapolin
3 litres finishing oil
500 grams soap
about 100 grams ultramarine blue.

After this filler has been spread on the goods by means of the doctor, it is the best plan to put the fabric at once in a stenter with a drying arrangement, so that the pretty thick layer of size has no time to penetrate to the face of the goods. But if the cloth is to be dried on the cans or in the festoon dryer, it must not be rolled up under any circumstances, but must be cuttled by the finishing machine in folds.

If these points are strictly paid attention to, the light fine shirtings the subject of the inquiry, can be finished quite well on the ordinary back filling mangle. A. S.

The Purification of the Oil Recovered from the Milling Operation.

Inquiry No. 827. From the milling effluents we recover about 3000 kilos of oil monthly which contains a large amount of impurities in the way of unsaponifiable fats and resins, together with about 70% oleic acid. We should be glad to learn how this oil can be purified by a suitable distilling apparatus or plant, so that Oleine can be recovered which is fully up to type and can be used in our works without further treatment.

Replies. 1. In order to indicate to you a suitable method of purifying the oleines recovered from the milling effluent it is necessary to know how you extract them from the milling baths, a point which you do not mention. It is not advisable to use an extraction apparatus for the purification, because the unsaponifiable oils and resins, on the one hand, are more or less soluble in organic solvents, and the first cost of an extraction plant, on the other hand would be too expensive for the quantities coming into question. Besides

this, the fire hazard represented by a plant of this nature must not be neglected. There is only one way of simply and cheaply purifying the oleines and that consists in saponifying them several times and salting out the residue containing the oil. The equipment required is very simple and no expensive apparatus is necessary. The method has proved its worth splendidly in large scale working and many thousand kilos of oleine have been recovered by it for the mills. Ho.

2. It would not pay erect a distilling plant for such small quantities of oil, besides which the oleine, even in an impure state, can be used for the manufacture of cheap soaps, so that it is advisable to sell the oil to soap factories. Dr. S.

3. The purification of only 3000 kilos of oil monthly can be done in the ordinary course of manufacture and it would not seem to be of any advantage to erect an expensive apparatus for the purpose. A distillation plant, it is true, gives good results for the purpose in view, but it requires careful operation, so that it can hardly be attended to by an ordinary workman, and would probably be too expensive for the small monthly quantity. Besides this it must not be overlooked that any mineral oil found in the extraction oil is less often due to the lubrication (for it is to be hoped that large works nowadays add no mineral oil) than to chance drops and the like, and goes over, at least partly, when distilled. The object aimed at can be secured, so far as that is possible, better by purifying the extraction oil with oxidizing agents and filtering it thoroughly. A simple apparatus is sufficient. The whole quantity coming into consideration can be worked up in lots of about 1000 kilos in a few days each month with an apparatus which is not affected by acids and can be designed and made in the mill itself. The extraction oil cannot be made as valuable as it was before either by distillation or by bleaching, but it can be so far purified that it can be used without any further preparation for lubricating lower-grade goods. But of course no one, even if he is acquainted with this process, can express a definite opinion unless he has had a chance to examine a good average sample of the extraction oil recovered in the mill making the inquiry. Schw.

Take-up Motion for Automatic Looms.

Inquiry No. 823. Who can give us here a description with a sketch of the take-up motions of automatic looms which enable the weaver, without stopping the loom, to remove the whole piece together with the beam from the loom and set in an empty beam again?

Replies. 1. The sketch given below shows a take-up motion for removing the cloth without stopping the loom.

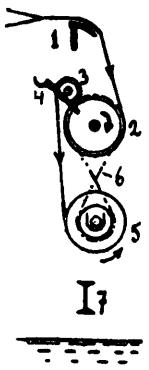


Fig. 7

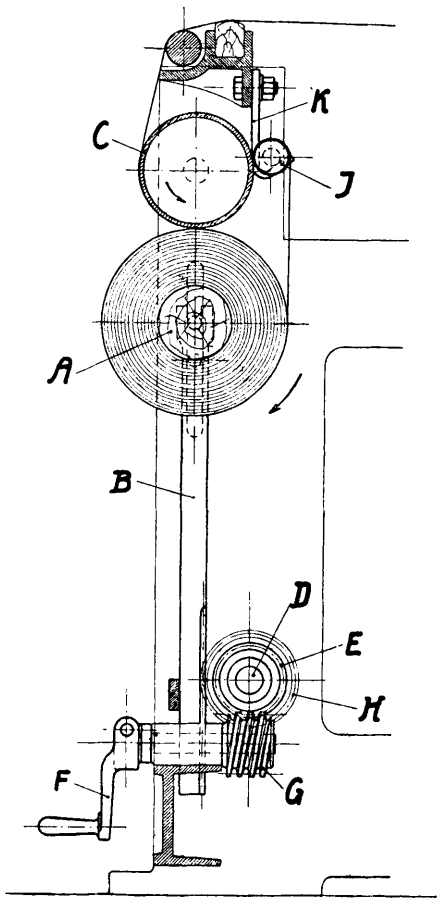
The usual sand roller 2 is driven by the regulator. A cylindrical iron rod 3 of from 3 to 4 centimetres thickness lies with its journals on the slanting bearing faces 4 which are provided at the upper end with depressions for the reception of the iron rod, so as easily to introduce the cloth. The wooden cloth beam is from 6 to 8 centimetres in diameter and has a through-going iron core in wide looms, but inserted iron journals are sufficient for narrow looms. The journals lie in open bearings so that the beam can easily be lifted out. It is driven by a small belt 6 (such as is used for sewing-machines), or by a stout cord. In order to prevent the driving cord 6 from slipping off the roller 2 a few staples (such as are used for attaching barbed wire to a fence) are knocked into the edge of the roller all round, if it is made of wood. For the same purpose an iron roller is furnished with a ring of thick wire at the edges. When the weaver wishes to remove the cloth, he lays the full cloth beam 5 upon the floor (if necessary, upon a protective cloth) in front of the loom and inserts a new empty roller which he has kept ready in the bearings. He then cuts off the cloth and wraps the end of the new piece round the empty beam, while the full beam is removed. There are thus a number of spare cloth beams 5 necessary, according to the nature of the cloth, the length of the piece, and so on. U.

2. The cloth beam must not be mounted in the side frame of the loom if it is to be removed from the loom during weaving when full. It must be mounted in a weight lever which is provided with a sufficiently deep depression where the beam rests on it. The lower end of the lever has a slot with a bolt passing through it. A flat iron hook is hung upon this and the hook must be of such a length that it can be hooked on the lower loom bar when the full cloth beam is pressed

down. If the inquirer will get into communication with a loom manufacturer who produces automatic looms he will get the necessary parts all ready for use. The parts to be found on an ordinary loom are unusable anyhow. N.

3. An approved take-up motion for automatic looms is that with spring pressure on the cloth beam, the action of which can be seen from the sketch appended. The cloth beam A is pressed by means of a rack B on the sand beam C and made to revolve through the friction. The necessary pressure is exerted through a through-going shaft D by means of a toothed piston E on both sides on the rack B. This shaft is driven by a hand crank F, a worm G, and a worm wheel H, which is mounted free to rotate on the shaft E with the interposition of a torsion spring which acts upon a driving pin attached to the shaft D. As the cloth-beam fills up the spring is tensioned more and more and the pressure on the sand roller becomes greater. In order to prevent the projection of parts, the hand crank F is provided with a hinge. When the weaver desires to set in a new cloth beam, he loosens the torsion spring by means of the worm drive, so that the cloth-beam retires from the sand beam. A tension beam I lying upon the sand-beam prevents the cloth from slipping back when exchanging the cloth-beam, so that the loom is continually kept in action. The tension beam is normally of from 40 to 45 millimetres in diameter, and it is often covered with felt so that it lies on the sand beam with its whole length. The tension beam is mounted by means of the hook J which is screwed to the breast beam. If there is room enough, the necessary pressure to be exerted by the cloth beam can also be arranged for in a simpler way. In this case the cloth-beam is mounted in two-armed rotatable levers, upon the other ends of which weights or springs act.

Another solution is the indirect take-up motion, according to which the cloth-beam is fixed in its bearings, and is made to revolve by a spur wheel drive from the sand beam. In order to take care of the slower rate of revolution of the cloth beam as it fills up, a friction coupling must be inserted in the transmission gearing.



It is a disadvantage of this arrangement that the cloth is often irregularly wound upon the cloth-beam beyond its length. H. H.