Machinery and Appliances.

Another Improved Patent Section Warping Machine.

Messrs. Robert Hall and Sons, Bury.

We have so recently written at length upon the subject of warping, and upon section warping as a particular branch of this process of manufacturing, that it will be quite unnecessary to go over the ground again in any detail. As before stated, warping is the process of arranging in parallel order the longitudinal threads that enter into the construction of woven fabrics. The varying conditions upon which manufacturing is carried on have led to a divergence in the methods used, the separation taking place about 40 years ago, when the invention of the tape-sizing machine, and subsequently the "shaker" type of the same, caused the old ball-warping system to be abandoned in the plain grey cloth trade. This system, however, was not adopted for the coloured goods branch, as it interfered too seriously with the dyes with which the yarns had been impregnated, to permit its use. The old ball system was therefore retained, until manufacturers grew thoroughly tired of its disadvantages. The demand for improvements existing, they were not long in forthcoming; hence the invention of the section warping machine. Though a comparatively new machine, this has, like all others, already engaged the inventive abilities of quite a number of persons. Amongst these it will be remembered that Mr. W. A. Booth, of Walsden, near Bolton, last year made his appearance as the patentee of a new anti-friction presser bowl, which was described and illustrated in these columns on Nov. 15th last. This gentleman is again to the front with several further improvements, which in their total entitle the improved machine to a careful examination on the part of those interested. We give two illustrations of the machine shewing it from opposite aspects.

In section warping machines it is usual to mount a section block on a shaft against a flange of larger diameter, afterwards placing another flange on the shaft, until it is against the block, and then securing it in that position. The yarn is then fastened by suitable means to the block, and the shaft revolved, the yarn being thus drawn off the bobbins and wound on the block until the required length has been wound. The number of revolutions of the section shaft whilst doing this is recorded by a counter, and the other sections, considerable, and the waste becomes serious. It is also obvious that if less or more ends were warped on the second section than on the first, the result would be the production of a smaller or larger section, or if the counts of yarn were altered to coarser or finer ones the result in such cases would be similar. Another fault that would be developed would be that the surface of the yarn on the section would not be flat, but would show ridges in accordance with the half-beam.

The method adopted to prevent these faults has been the application of a presser bowl to the face of the yarn on the section, such presser bowl being presumably drawn out by mechanism at a certain rate for each revolution of the section shaft, corresponding to the count of yarn or number of ends to be warped. It is obvious that if sufficient pressure is put upon the yarn of the first section to be warped by means of this presser bowl, then subsequent sections will be all of one size, although as before mentioned the tension on the yarn is greater, owing to the yarn on the bobbins being less.

The means hitherto used for positively drawing out the presser bowl have been the combination of two slotted levers, placed parallel to each other and connected by a bar, or placed opposite each other, with a stud to connect them through the slots, one lever receiving its motion from the section shaft and transferring the movement so obtained to the other lever, which is fixed on the same shaft as that on which the bracket holding the presser holder and bowl is fixed. These levers are so arranged that the bar or stud connecting the levers can be moved farther from the centre of one lever, and nearer the centre of the other, or vice versa, thus increasing or diminishing the outward movement of the presser bowl.
Some arrangement of this kind is necessary in order that the presser bowl may move at a quick speed for coarse yarns or a considerable number of ends, or at a slow rate for fine yarns or a small number of ends. It will, however, be apparent that these arrangements of levers move in a curvilinear direction and describe arcs of circles, their effect upon the presser bowl gradually decreases, with the result that as the winding of the section proceeds the outward movement of the presser bowl diminishes, so that by the time the section is filled the yarn is unduly pressed, the friction in some cases being so great that considerable power is required to work the machine. The number of joints, etc., is also a drawback to its efficiency. It is also impossible with this arrangement to put a dozen ends more in one section than another, without the production of a slightly larger and consequently longer section (because the additional ends spring the presser and levers acting in their almost equal distance for each revolution of the section shaft).

It will be seen that with this arrangement the presser is drawn out at a uniform rate, and the yarn is pressed equally until the required length is wound. It will also be noticed that there are no links, levers, nor bell cranks in this arrangement, but that the presser is fixed direct on the screwed spindle, which draws it out. This being so, the machine will admit of too ends being warped on one section more than another and yet bring them both out exactly the same size and length for an equal number of revolutions.

A glance at the arrangement will show that it is impossible for the section on which more ends are warped to come out longer, unless the pressure of the yarn were to bend out the back of the machine—a contingency utterly impossible. This good feature will be greatly appreciated by warpers of coloured goods, as it will save them the trouble of calculating a method whereby the number of ends in each section shall be the same and yet have the pattern complete.

It might at first sight be thought that the result of warping too ends in one section and compressing them into the same space that had been allowed for only 400 ends, the previous section, would be that the yarn would be impoverished by the friction of the presser bowl, and that if dyed a glance would be put upon it. With the old style of presser this would no doubt occur. This machine, however, is fitted up with Mr. Booth's patent Anti-friction Presser Holder (illustrated and described in our issue of November 15th, 1890), which allows the presser bowl to rotate at the same speed as the yarn being warped, thus obviating the rubbing action, etc., before mentioned.

The machine with the revolving presser bowl only requires half the power to drive, and is consequently much easier to handle than machines in which the bowl does not revolve. The method of varying the outward movement of the presser for coarser or finer yarns relative to the section shaft is very simple. Looking at Fig. 4, it will be seen that if the friction pulley on the cross shaft be fixed near the centre of the friction disc, then the disc and worm shaft will be rotated at a quick rate, and by means of the worm shaft and brass nut the screwed spindle and presser will be drawn out at a quick rate, suitable for an exceedingly coarse yarn or a considerable number of ends. If, however, the friction pulley be fixed opposite the edge of the disc, the disc and worm shaft will only revolve at one-sixth the previous rate, suitable for an exceedingly fine yarn or a small number of ends. The method of running a trial section for the purpose of ascertaining in what position to place the friction pulley opposite the disc is also simple. For this purpose the bell crank arrangement with the presser under the section is used (Fig. 1), the positive arrangement being put out of gear. The presser bowl with this auxiliary arrangement is free to move downwards, with the exception of a weight on the bell crank for the purpose of holding the presser bowl against the yarn on the section at a moderate pressure. The section is then filled with yarn until a mark turned on the flanges (3 in. from block) is reached. The machine is then stopped, and, according to the registered number of revolutions it has taken to reach this mark, the position in which to place the friction pulley on the cross shaft is known.

For instance, if the yarn is very coarse it may take say only 150 revolutions to fill the yarn up to the mark; if, however, the yarn is very fine it may have taken 900 revolutions to fill the yarn up to it. If the latter be the case, the friction pulley is set at number 900 (opposite the edge of the friction disc), and the positive arrangement is used to finish the section, as well as for the succeeding sections. If the former be the case, the friction pulley would be set at 150 (near the centre of the friction disc), thus ensuring that in either case the presser shall be positively drawn out at exactly the same rate as the presser on the auxiliary arrangement was moved.

One of the machines, worked by a girl 16 years of age, is in daily use at Bridgewater Mill, Walkden, near Bolton, and Mr. Booth will be pleased to show the machine at work to any interested parties.
Bleaching, Dyeing, Printing, etc.

(Continued from page 244.)

YARN AND THREAD BLEACHING.

In this paper it is proposed to deal with the bleaching of yarns and threads, for in the sense in which the word is generally understood there is no difference between the bleaching of yarn and, say, cloth, or of cloth and a bank of yarn. Whatever modifications are adopted, they are due to the difference in the mechanical condition of the respective kinds of goods. It is obvious that a piece of cotton cloth needs to be washed and pressed more easily than, and in a different manner from, a bank of yarn; consequently while from a chemical point of view the main operations of yarn bleaching are those same as those of piece bleaching, yet the machinery has to be modified to suit the different way in which yarn must be handled.

Yarn is supplied to the bleacher in two forms: (1) wet, or being made up into yarn, in the length of the threads, which may vary from a little as 50 to as much as 5,000 yards; these can be dealt with in much the same manner as pieces of cloth. That is, a continuous system can be adopted, in which tanks, which are too well-known to require description. Sometimes yarn is bleached in the form of cops, but as the results of cop bleaching are not very satisfactory, it is done as little as possible.

Piece Bleaching.—The warp, if very long, is doubled two, three, or four times, to suit the size of the machinery, so as to reduce its length; care being taken that the ends of the warp are tied together to prevent any chance of entangling, which would very likely happen if the ends were left loose to float about. The same rule applies to the filling, but the application of this principle would assist the bleaching. In outline, warp bleaching consists of the following operations:

1. Hot pickling with 10 per cent. of sulphuric acid at 25° C., washing and drying with 10 per cent. of sulphuric acid.
2. Washing with 10 per cent. of sulphuric acid.
3. Drying.

Chemical Bleaching. Bleaching powder liquor at 8° C., followed by a wash with 2° C. and washing with 10 per cent. of sulphuric acid.

About 2,000 to 3,000 lbs. of warps are usually treated at one time.

The machinery used may be the same as that used in the cloth bleach, and each operation may be conducted on the same principle. In some warp bleach works, the layers are made in the same way, and the machinery is made different. The bleaching and souring is done in stone cylinders, provided with a false bottom, in which the warps are allowed to remain for about two hours. A more complicated form of chemical treatment is also in use; this is made of stone, and is provided with a false bottom; above is a tank or reservoir, as it is called, having a perforated bottom, through which the liquor flows on the warps in the cylinder below. Under the chemical system, the warps are placed in the cylinder, and the liquor flows from the cylinders into the chemicallime and acid, and from which it is pumped up into the steel cylinders, which are used for the purpose. The process is continued until the liquor has been washed and the warps are ready for the next stage of treatment, which is again the same as that just described.

The machine claims, moreover, that it will drift a key-way at the same time as it is drilling the bush of a pulley. With such advantages as have been enumerated, there can be little doubt that the machine is destined to have important effects on the bleaching trade, and as there can be no doubt that square holes possess many advantages, which would bring about their general adoption, the advantage are not for their coldness, and as many as over 100 different kinds are constantly employed in drilling round holes (a large number of which are used in the manufacture of bolts), and the advantages of the elaborate and tedious processes of marking the boards by hand in this case must be universally adopted.

In conclusion, we may add that Mr. Wehrmeyer is to shew it to all interested.

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The balance-sheets of the Angora-Department in the US and Canada show a very prosperous year with them. It was lately announced that the American Electric Lighting Company has declared a dividend of 7 1/2 per cent. for the last year, against 4 1/2 per cent. for 1859, and 1 1/2 per cent. for 1858.

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