No. 817,313. PATENTED APR. 10, 1906.

B. H. GLEDHILL.

METHOD OF TAPESTRY YARN PRINTING.

APPLICATION FILED OCT. 5, 1904.

Fig. 1.

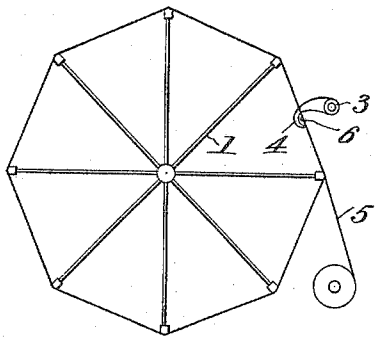


Fig. 2.

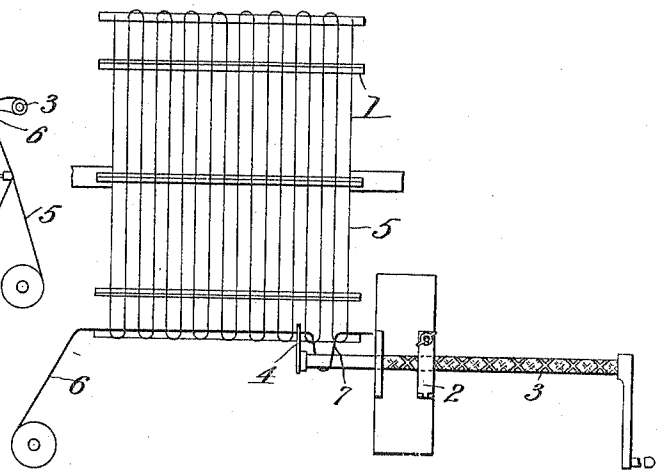


Fig. 3.

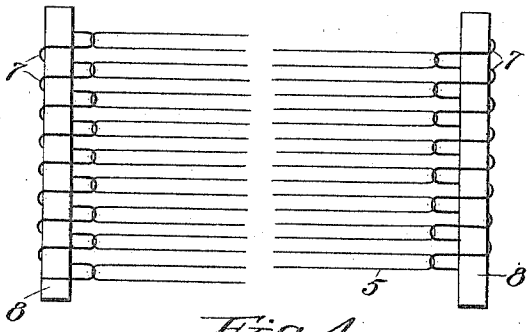


Fig. 4.

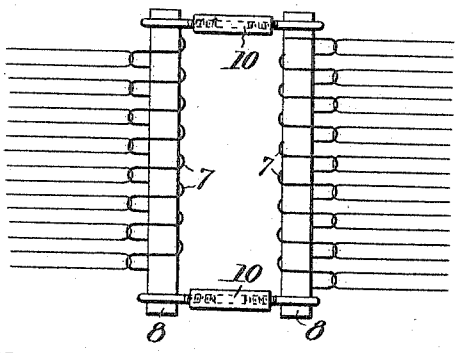


Fig. 5.

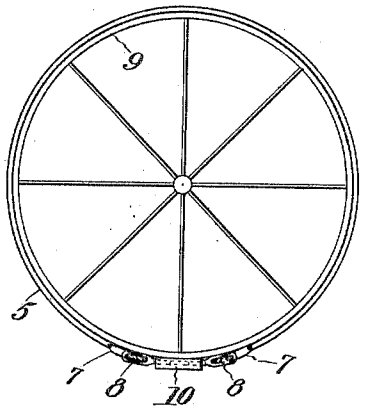
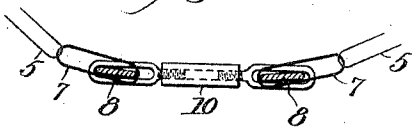


Fig. 6.



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METHOD OF TAPESTRY-YARN PRINTING.

No. 817,313. Specification of Letters Patent. Patented April 10, 1906.

Application filed October 5, 1904. Serial No. 227,318.

To all whom it may concern:

Be it known that I, BENJAMIN H. GLEDHILL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Methods of Tapestry-Yarn Printing, of which the following is a full, clear, and exact description.

This invention relates to the method of printing yarn on drums commonly known as "tapestry-yarn printing."

The invention consists in forming a skein of yarn of less length than the circumference of the printing-drum and providing it with looped threads passed through alternate bends at opposite ends and connecting these loops with a tension device by which the skein may be applied to a printing-drum to receive the colors in the selected design or pattern preparatory to weaving the yarn.

One form of apparatus is herein shown by which the invention may be practiced; but it is to be understood that the invention is not limited to this apparatus.

In the accompanying drawings, illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation of a reel for the preliminary forming of the skein. Fig. 2 is a plan view with a traverse-screw-looper hook for supplying the skein with fastening-thread loops. Fig. 3 is a plan view of the skein, partly broken away and removed from the reel and supplied with the rigid supports. Fig. 4 is a plan view of the adjacent ends of the skein as connected upon the printing-drum. Fig. 5 is a diagrammatic side elevation of the printing-drum with the skein applied in accordance with this invention. Fig. 6 is a sectional detail of the skein-ends-connecting device.

The skein-forming device 1 may be of any approved construction, comprising a single reel or a pair of connected reels. Adjacent the perimeter of the reel is arranged a bearing 2, having a traverse-screw 3, on the end of which is a hook 4. The yarn 5 to be wound in skeins is furnished by spools or other mediums and is wound around the reel in sufficient quantity to produce a skein of the desired length. When the desired skein is produced, a thread 6 is laid transversely through the reel under the yarn, and then the traverse-screw is operated so as to cause its hook to pull out the thread 6 in the form of a loop through each bend in the yarn, as shown at 7 in Figs. 2 to 6. When the skein is supplied with loops 7 at one point, the reel may be turned to bring a substantially diametrically opposite point adjacent the traverse-screw, and another thread 6 is introduced and similarly looped through the opposite alternating bends, and then when the skein is removed from the reel and laid out flat it will be found that there are loops 7 in every bend alternating at opposite points or ends of the skein, and thus the yarn in the skein will be laid in pairs of threads, each pair being sustained by a loop 7 in its bend. Rigid supports, such as boards or wires or metal strips 8, are introduced in the loops, and when the skein with its loops is laid upon the surface of the printing-drum 9 these supports 8 are connected by turnbuckles 10, whereby the skein may be applied to the drum with any desired degree of tension. When thus applied, the skein is ready to receive the colors in the ordinary way of printing tapestry-yarn by means of a printing-drum. It will be observed that the length of the skein is shorter than the circumference of the printing-drum.

In the ordinary process of tapestry-yarn printing spools containing the yarn are placed on pins in front of the printing-drum and the ends of the yarn are attached to the drum and the drum revolved the desired number of times to lay the yarn upon it. This method is objectionable, owing to the strain on the threads and speed of the revolution of the drum. It often occurs that one or more of the threads break and break several times in the operation of winding the yarn upon the drum, and when such breaks occur it is difficult to repair them and to replace the exact number of broken threads with the same tension as the unbroken threads. Further, owing to the fact that the yarn is wound entirely around the printing-drum patterns larger or smaller than the circumference of the drum cannot be printed on that particular drum, and hence it is necessary to install many sizes of drums to suit the various sizes of patterns, especially in the case of large patterns, such as are required in rugs. Moreover, if a very large-size drum is used to accommodate a large pattern then the output or product from one printing of a set is often larger than the trade demands for a rug of one pattern, color, and size. Again, it is difficult to han-

dle a printed skein of yarn when printed on the large-size drum without smearing it, owing to its great size and the fact of the color being wet. Whenever a thus-printed skein is touched before it is steamed, smearing almost invariably occurs. By my invention these objections are obviated, since the skein is wound on a reel with slight tension and the reel being light and easy to handle is readily stopped for repairing breaks and without material interference with the tension. Moreover, by forming the skein apart from the printing-drum it is possible to make a skein of any desired length less than the circumference of the drum, and this is especially true when a pair of reels is employed and the distance between the reels is variable. Further, by my invention I can produce a pattern nearly twice as large as the circumference of the drum, because the skein can be laid on the surface of the drum even if it be nearly as large as the circumference of the drum, the threads being in pairs, or, in other words, each thread doubled back upon itself. Thus by printing a rug pattern on a small drum from the end of the rug to the center when the skein is opened out the design is completed, because the returned portion of the thread has the duplicate half of the pattern upon it, while in the old method all of the rug pattern must necessarily be printed in full. Again, by my invention and the possibility of printing large patterns on small drums smearing is almost entirely avoided, and, finally, by this invention a large pattern may be produced with only half the quantity of output and at less than half the cost.

What I claim is—

1. The improvement in the method of tapestry-yarn printing, which consists in laying the yarn in a skein composed of pairs of parallel threads, looping connecting-threads through the bends of the pairs at opposite ends of the skein, laying the looped skein upon a printing-drum of greater circumference than the length of the skein and fastening the skein to the drum, and then applying the color in any usual way.

2. The improvement in the method of tapestry-yarn printing, which consists in reeling the yarn to form a skein, looping threads through the alternating bends of the skein at opposite points thereof, independently supporting the loops, laying the looped skein thus formed upon a printing-drum of greater circumference than the length of the skein, connecting the loops' supports under tension so as to hold the skein upon the printing-drum, and then applying color to the yarn in any usual way.

In testimony whereof I have hereunto set my hand this 4th day of October, A. D. 1904.

BENJAMIN H. GLEDHILL.

Witnesses:
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M. E. CARVER.