A. B. MORSE.

GO-THROUGH LACE MACHINE OR LOOM TAKE-UP ROLL.

APPLICATION FILED NOV. 4, 1912.

1,136,431. Patented Apr. 20, 1915.

Fig. 1.

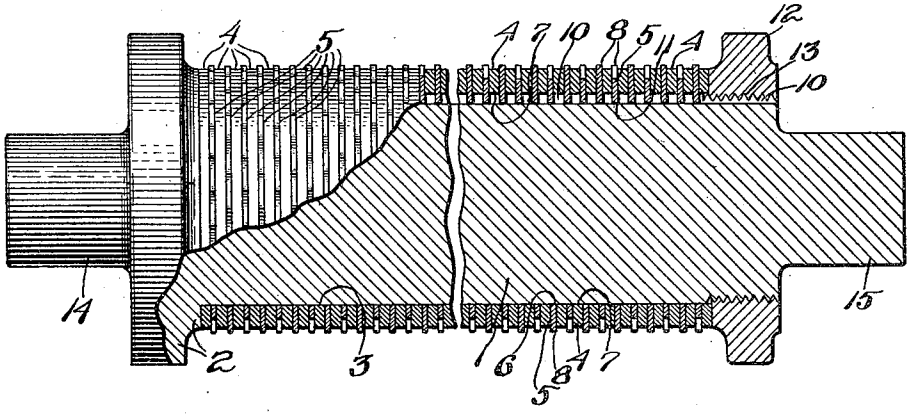


Fig. 2.

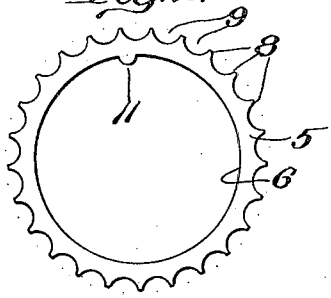


Fig. 3.

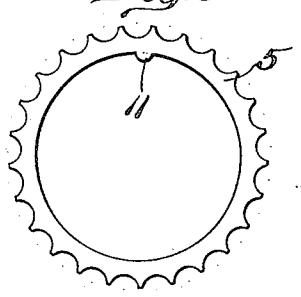


Fig. 4.

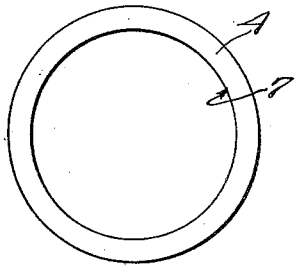
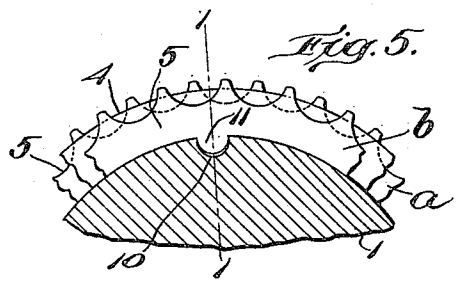


Fig. 5.



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UNITED STATES PATENT OFFICE.

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GO-THROUGH LACE-MACHINE OR LOOM TAKE-UP ROLL.

1,136,431. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed November 4, 1912. Serial No. 729,294.

To all whom it may concern:

Be it known that I, ALFRED B. MORSE, a citizen of the United States, and resident of South Easton, county of Bristol, State of Massachusetts, have invented an Improvement in Go-Through Lace-Machines or Loom Take-Up Rolls, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is a take-up roll for engaging the cloth or other fabric or material which it serves to pull along evenly and unremittingly, and while it is adapted for a wide range of uses, it is primarily intended for special and delicate work, such, for instance, as in connection with lace-making looms.

Take-up rolls are usually made by drilling a multitude of small holes in the desired order of arrangement radially into the brass shaft or roll and then driving into said small radial holes a corresponding multitude of fine sharpened pins, so that their points project slightly above the surface of the brass roll in position to engage the fabric which the roll is to take up or pull along. Such pins are liable to get bent over, in which case they operate like hooks to engage and cling to the fabric, so that when the latter leaves the rolls these injured pins cling to the fabric and tear it. Also when the pins get involved the entire roll is thereby rendered useless, while the pins are laboriously removed from the holes (frequently having to be drilled out) and replaced by others, and also the rolls are necessarily very expensive because of the great amount of labor required in their necessarily slow manufacture and the amount of the expensive material contained therein.

Accordingly my invention seeks to obviate all the foregoing objections and provide a simple, cheaply made, comparatively inexpensive roll, capable of being quickly repaired and not liable to have its points get involved so as to hook into the fabric. Instead of boring small radial holes and using pins, and instead of having a brass tube or solid shaft or roll, I provide a shaft or core or body support of iron, steel or any inexpensive material and on this mount a succession of brass rings which give the desired non-rusting receiving and supporting surface for the fabric, and interpose between said brass rings a series of thin rings or washers having their peripheries made up of a succession of points, suitable means being provided for either clamping or otherwise retaining these point-providing washers stationary or fixed against rotation with reference to the supporting body or shaft proper. It will thus be seen that the take-up roll has the desired brass surface and also the desired multitude of short projecting points, and yet the main body of the shaft is of inexpensive material, all drilling thereof is avoided, there are no pins required, and if any portion of the fabric engaging surface should be engaged, all that is necessary is to remove that point-carrying washer or that ring and close up the remaining rings and washers without losing any appreciable time or being obliged to substitute another roll in the loom. Also preferably the points provided on the rims of the washers are made more or less conical or A-shaped, so that they tend to free themselves from the fabric more readily than the usual pins, and moreover they have no liability to become bent into hook shape.

In the accompanying drawings, in which I have shown a preferred embodiment of my invention, Figure 1 is a view in side elevation, partly broken away, and partly in section (on the dotted line 1—1, Fig. 5) showing one preferred embodiment of my take-up roll; Fig. 2 is a side view of one of the point bearing washers or rings; Fig. 3 is a similar view of the same washer from the opposite side; Fig. 4 is a similar view of one of the intermediate brass rings; and Fig. 5 is an enlarged cross sectional view of a portion of a roll showing the relation of the various parts, and particularly the means whereby the successive points are arranged and held in staggered relation on the rolls.

The take-up roll will be of any desired length, size and end construction, said rolls being usually quite long and only a sufficient portion thereof being herein shown to make my invention properly understood. The body portion 1 of the roll is herein shown as formed in the form of a solid shaft or cylindrical body portion (although it need not be solid) having a shoulder 2 at one end and thence a reduced cylindrical portion 3 for receiving the desired surface providing parts which coöperate therewith to constitute my invention. This main supporting portion or body 1 may be of any material capable of providing the desired strength and support, preferably being iron

or steel. The desired non-rusting surface (usually, in the best practice, being brass) with its desired multitude of projecting fabric-gripping points is provided, according to my invention, by a series of rings, preferably stampings. I prefer this method of making the different members, because thereby they are uniform and inexpensive. The main surface-forming rings 4 may be of any suitable width and thickness, being herein shown as rectangular in cross section and having such width which it is desired the successive circumferential rows of points shall be spaced apart, and having such thickness as will properly economize the amount of brass used, and yet provide the desired stiffness for insuring the ready slipping of the rings along the cylindrical surface 3 of the core 1. The point-providing means is herein shown as a washer or thin ring 5 having an internal bearing surface 6 corresponding to the internal surface 7 of the ring 4 and to the diameter of the cylindrical body surface 3, this being preferred in order to automatically center and position the various points carried by said washer, said washer carrying on its periphery the desired series of points 8 to constitute one circumferential row of points required for the take-up roll. While these points 8 may be provided in or on the ring or washer 5 in any suitable manner and by any suitable means, and of any suitable shape, I have herein shown them as formed integrally with said washer or ring 5 and preferably simply stamped out therewith. To this end the washer itself is made of sufficiently thin material to insure that the point shall be of the right size. And in order that the points may have lateral strength and not be liable to get bent over circumferentially of the roll so as to form hooks (as is liable to be the case with the old pin construction as above explained) I make these points 8 with a general A-shape or tapering from a relatively sharp outer end to a broad or stocky base. Preferably these points 8 are formed by stamping out the periphery of the washer with a succession of flutings or in a series of contiguous concave depressions 9, whose meeting extremities constitute the points. The result is, as best shown in Fig. 5, that the main portion of the peripheral edge of the washers 5 is below the adjacent surface of the rings 4, which latter constitute the receiving and supporting surface for the fabric, and hence only the small point portion of the washer projects to engage the fabric. This makes it practicable to form the body of the washer 5 of very inexpensive material, such as thin sheet steel, both the body and the points being herein shown as formed of said material. While the point bearing medium (*i. e.*, as herein shown in the preferred construction, the washers 5) may be held in its proper place as a part of the take-up roll by any suitable means, as for instance, by simply being clamped with sufficient pressure by the adjacent rings 4, I prefer to provide other means for maintaining different parts in place and especially so while the roll is being assembled, and for this means I have shown the body 1 as provided with a longitudinal key way or groove 10, and each washer or ring 5 as provided with a key or tongue 11 adapted to fit with more or less snugness in said way or groove 10. Also as it is desirable, in order that the points may get such engagement with the fabric as is most suitable for the fabric, that the points should be in staggered relation to each other as shown in Figs. 1 and 5, I arrange this tongue or projection 11 not directly beneath the bottom of the hollow or groove 9, nor directly in the radial line of a point 8, but slightly at one side thereof, so that it will not be symmetrical with successive points of the washer. The result is that simply by reversing successive washers, the points of said successive washers are thereby staggered with relation to each other when slipped on to the body 1 with their tongues 11 in the groove 10. As a suitable means of holding the assembled surface members of the take-up roll in place and preferably clamping them in their proper positions, I provide a nut or flange 12 having threaded engagement with one end of the shaft or body 1, as shown at 13. The opposite ends of the roll are herein shown, for convenience of illustration, as reduced to provide bearings or hubs 14, 15, for a usual lace-machine although it will be understood that in practice they may have any other shape or construction for receiving or constituting gears or other suitable driving means in a loom.

Having provided the parts as above explained, the roll is built up or assembled very quickly and simply, with exceedingly slight expenditure of unskilled labor. Bearing in mind that the body supporting shaft or part 1 is stripped and without its nut 12 thereon, a ring 4 is slipped along the cylindrical body, and then a washer 5 and then another ring 4 and another washer 5, and then a third ring 4 and a third washer 5, and so on successive rings 4 and washers 5 until the entire space is occupied from one end of the roll to the other, whereupon the nut 12 is screwed tightly into place and the roll is complete. In order to have the successive circumferential series of points staggered or out of alinement with each other lengthwise of the roll, the first washer is placed on the shaft facing as shown in Fig. 2, and the next washer as shown in Fig. 3, whereby their respective tongues 11 bring their points as shown in Fig. 5. Notwith-

standing that all the washers are stamped with the same die, and hence are exactly alike, the foregoing staggering of the points results from the fact that the tongue 11 is not symmetrically located with reference to the nearest two peripheral points of the washer, but is so placed that when one washer is put on to the body 1 facing as shown in Fig. 2, its points will stand as shown by the ring *a* Fig. 5, and when the next ring is placed on the body reversed as shown in Fig. 3 its points will stand as shown by the ring *b* Fig. 5. In other words the key and keyway are off center with relation to the points, so that by simply putting on the washers or point bearing rings in successively reversed order the desired staggered arrangement of the points results.

While I prefer to make the points and their carrier portions or washer-like rings integral, I wish it understood that my invention is capable of a wide range of embodiments and includes the broad provision of any kind of a carrier for the points, provided a series thereof are connected together in or on a separate strip or carrier, so that the points may thereby be assembled (and preferably likewise removed) in a series or predetermined grouping. The sectional arrangement of the fabric receiving and engaging or gripping surface is advantageous, aside from the specific ring formation, in that it facilitates the making of the roll in the first place and the repair of the roll in the next place. I prefer that the sections of both the supporting part of the surface and also of the point providing part of the surface shall be in the form of rings or plates, and I prefer also that they shall extend entirely around the core or supporting body, but it will be understood that modifications and various other embodiments of the invention broadly considered are within the spirit and scope of the appended claims. The basic idea of the point carriers or point plates or strips, whatever their specific construction and designation, is the provision of a predetermined group or series or row of points in a segregable or separate section capable of being assembled as a group, series or row with other similar sections, thereby saving the expense of drilling holes and of making and securing the pins with a driving fit, and also the delay and inconvenience of repairing an injured take-up roll. Besides these principal objects and advantages, are the other advantages already mentioned, such as the economy of material, provision of specially shaped points, absolute uniformity of points, supporting surface, and the rolls in general, and the utilization of unskilled labor in making, handling and repairing the rolls.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A take-up roll, comprising a multiplicity of alternately arranged point carrying rings and spacing rings, each of said point carrying rings having a multitude of radial points projecting from the outer surface thereof for engaging the fabric, said points being substantially A-shaped for readily releasing the fabric during the operation of the roll.

2. A take-up roll, comprising a multiplicity of alternately arranged point carrying rings and spacing rings, said point carrying rings being of substantially the same thickness as said points, and the spacing rings being of greater diameter than the body of the point carrying rings, whereby the points are embraced by the spacing rings.

3. A take-up roll, comprising a multi-part fabric-supporting and engaging surface, including a plurality of iron rings each provided with a series of projecting points and intervening separating and positioning non-corrosive rings.

4. A take-up roll, having multi-part fabric supporting and engaging means, the supporting means being of non-corrosive material, and the engaging means comprising points formed in integrally connected series, the connection of said points being below the surface of the supporting means.

5. A take-up roll, having its fabric supporting surface composed of a plurality of non-corrosive rings, alternating with a plurality of engaging teeth-carrying rings, said carriers having the teeth formed substantially A-shaped to clear the fabric engaged thereby and to be kept clean and clear of rust, the carriers being depressed below the surface of the non-corrosive rings whereby rusting of the carriers will not contact with the fabric and discolor it.

6. In a take-up roll, a supporting body having a longitudinal groove, and a series of rings mounted thereon with positioning tongues to coöperate with said groove, said rings having points projecting radially therefrom, said tongues being arranged non-symmetrically with relation to the adjacent points, whereby, when successive rings are mounted in reversed order on said body, their points are thereby brought into staggered relation.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED B. MORSE.

Witnesses:
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W. R. JACQUES.