Oct. 26, 1943. H. PRINTZ 2,333,074

FABRIC DRAW-OFF MEANS FOR TEXTILE MACHINES

Filed Jan. 22, 1942 2 Sheets-Sheet 1

Fig. 1.

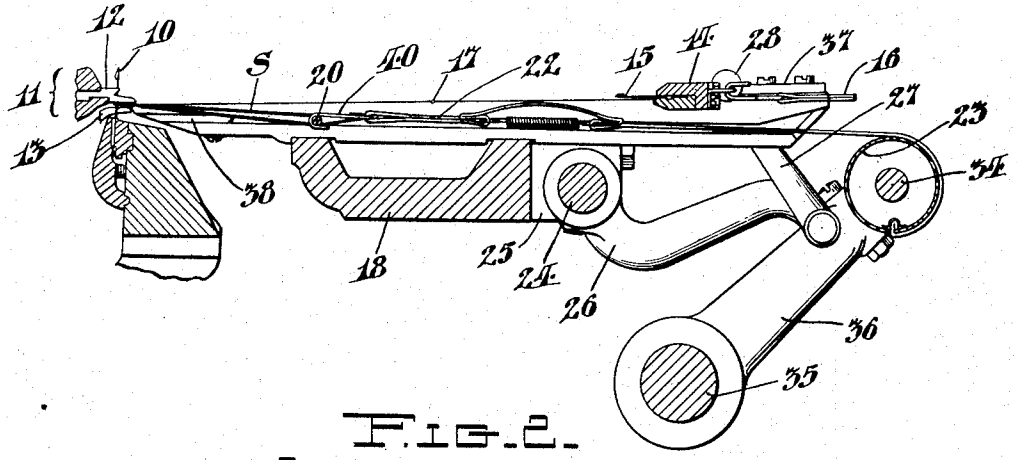


Fig. 2.

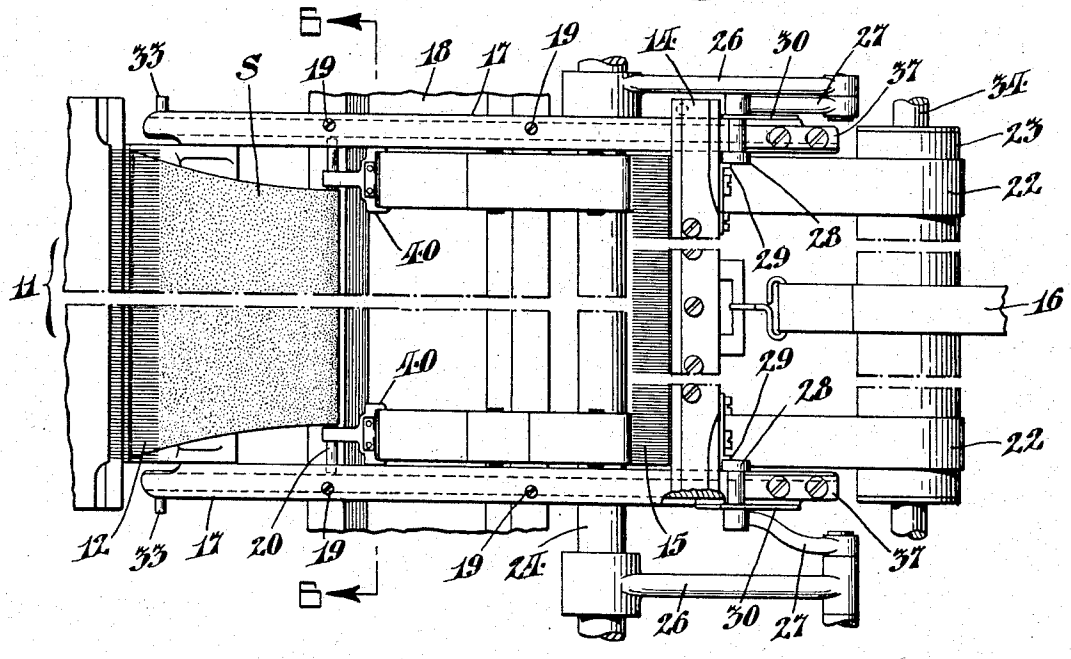


Fig. 3.

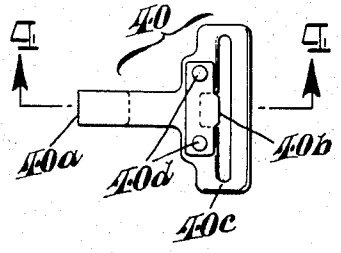


Fig. 4.

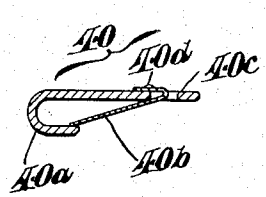
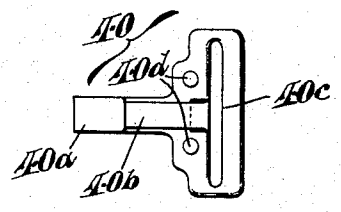


Fig. 5.



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FIG. 6.

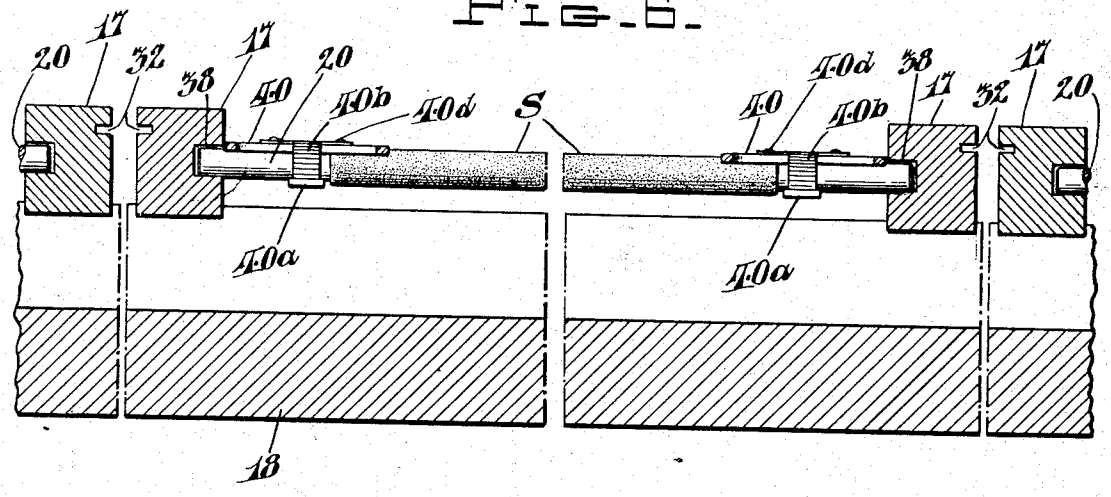
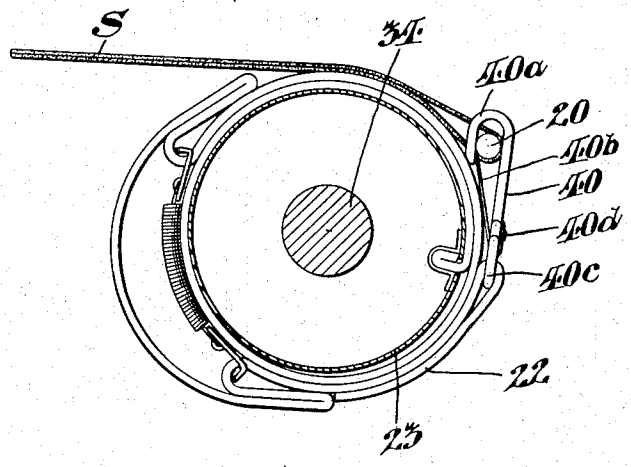


FIG. 7.



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FABRIC DRAWOFF MEANS FOR TEXTILE MACHINES

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Application January 22, 1942, Serial No. 427,716

2 Claims. (Cl. 66—149)

This invention relates to the fabric draw-off means of textile machines, and more particularly to means of this type associated with straight or full-fashioned knitting machines, to tension and take up the fabric as it comes from the needles.

The use of hooks to connect the fabric engaging elements, or welt rods, to the fabric draw-off means of straight or full-fashioned hosiery knitting machines, is well known, and although little or no trouble is ordinarily experienced in the utilization of such hooks on standard machines, it has been found that they are unsatisfactory when used on machines equipped with certain welt fabric draw-off mechanisms hereinafter referred to. A difficulty experienced in this connection is, that the usual hooks cannot be employed as ordinarily and when utilized in different manner become accidentally disengaged from the welt rod, for example, when the fabric is wound on the take-up reel. This difficulty makes the fabric draw-off means unreliable and ineffective.

It is an object of my invention to provide novel fabric draw-off means for textile machines, such as straight or full-fashioned knitting machines, which overcomes the mentioned and other difficulties.

Another object is to associate with such means a device which is adapted to connect the draw-off means with the fabric engaging element by a downward engaging movement, and which device is provided with means which will prevent it from becoming accidentally disconnected.

A further object is to associate with such means a device in the form of a spring-hook or snap-hook arrangement which will facilitate connection of the draw-off means with the fabric engaging element, under conditions where the present devices cannot be satisfactorily employed.

Another object is to provide such means in which the fabric engaging element and the actuating means therefor are connected by a device having a latch operable by said fabric engaging element.

With these and other objects in view, which will become apparent from the following detailed description of the illustrative embodiment of my invention shown in the accompanying drawings, the invention resides in the fabric take-up or tensioning means comprising the new elements, features of construction and arrangement of parts in cooperative relationship as herein disclosed, and hereinafter more particularly pointed out in the claims.

In the drawings:

Figure 1 is a cross-sectional view of a part of a single knitting section of a multi-section full-fashioned knitting machine having my invention applied thereto;

Fig. 2 is a top view of the mechanism of 1;

Fig. 3 is an enlarged top view of the welt rod connecting device which forms part of my invention;

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 3;

Fig. 5 is a bottom view of the said welt rod connecting device;

Fig. 6 is a sectional view taken substantially along the line 6—6 of Fig. 2, drawn to substantially full scale and showing parts of several sections knitting; and

Fig. 7 is a full size cross-sectional view of the fabric take-up roller mechanism of Figs. 1 and 2, and illustrates my device in the position which it occupies when the strap is wound upon said roller.

In the drawings and description, only those parts of a knitting machine necessary to a complete understanding of the invention, are presented; further information as to the construction and operation of other related, usual and well known knitting elements, mechanisms, etc., may be found in one or more of the following publications:

1. Pamphlet entitled — Full-Fashioned Knitting Machines—published and copyrighted by the Textile Machine Works, Reading, Pennsylvania, in 1920.

2. Three catalogues entitled—The "Reading" Full-Fashioned Knitting Machine Parts Catalog—published and copyrighted by the Textile Machine Works, in 1929, 1935 and 1940, respectively.

3. Booklet entitled—The "Reading" High Production Full-Fashioned Knitting Machine—which forms a supplement to the above noted 1940 Parts Catalog of the Textile Machine Works, and which booklet is a publication of the Textile Machine Works, and was copyrighted by the latter in 1940.

4. Pamphlet entitled—Knitting Machine Lectures—published by the Wyomissing Polytechnic Institute, Wyomissing, Pennsylvania, in 1935.

Figs. 1 and 2 of the drawings disclose certain well known elements present in each section of a straight, or full-fashioned "legger" knitting machine, which cooperate to produce the knitted fabric, such as the bank of needles 10, sinker-

head unit 11, sinkers and dividers 12, and knock-over bits 13.

It is the practice, when knitting full-fashioned leg blanks on such a machine, to first produce a certain length of welt fabric on each needle bank, which fabric is drawn from the needles by a welt bar 14, hooks 15 of which engage the loops of the first course knitted; the welt bar 14 being attached to a welt bar band or strap 16 which is operated by weight or spring means (not shown) to move the welt bar 14 on supports or bridges 17, in turn secured to front machine bed or table 18 as by screws 19. These welt fabrics are then folded, and the loops of the first course of each welt fabric are transferred from the welt hooks 15, of the welt bar 14, to the needles 10, in well known manner.

After the welt portion of each blank has been formed, a welt, or fabric draw-off rod 20, is inserted between the folds of each welt portion, and the ends of each welt rod protruding beyond the side edges of the fabric are placed on suitable supports provided therefor. Two bands or straps 22, of the usual fabric tensioning means, are then connected to the rod 20, intermediate each side edge of the welt fabric and the supported ends of the rod, which straps are connected to a reel 23, having rotary fabric take-up movement imparted to it in well known manner by spring or weight means, not shown.

In connection with the operation of standard legger machines, the welt bars 14 are individually and manually operated in each knitting section of the machine, and in such instances, the welt bars 14, and the welt rods 20, are usually supported, and moved along the upper surfaces of the bridges 17.

More recently, a certain type semi-automatic welt mechanism has been made available to simultaneously move all the welt bars 14 into operative position to receive the loops of the first course of loops formed on each needle bank. One such mechanism comprises a shaft 24, journalled in bearings 25, on the front bed or table 18 of the machine. The shaft 24 has secured thereto a series of arms or levers 26 pivotally connected to links 27. The links 27 carry studs or travellers 28 at their free ends in contact with wear plates 29 secured to the welt bars 14, which in turn are moved by means of draw-off bands or straps 16 in a direction away from the sinker-head 11, as previously indicated. The travellers 28 are guided along the rails or bridges 17, by members 30, the ends of which are slidably engaged in grooves or channels 32, (see Figs. 2 and 6).

At the proper time, the shaft 24 is turned in counterclockwise direction from the position of Fig. 1, and this motion is transmitted through the arms 36, links 27 and travellers 28, to the welt bars 14 of the machine which are thereby simultaneously moved towards the needles, along the top surface of the bridges 17, until stopped by pins 33, fastened to bridges 17. With the welt bars in this advanced position, the welt hooks 15 thereof are properly placed to receive the loops of the first course of the stocking blank S, as said loops are dropped from the noses of the sinkers and dividers 12, which action takes place when the sinkers and dividers are retracted and the needles are lowered between the knockover bits 13.

The reels 23 are all secured to a shaft 34, which extends along the front of the machine and is in turn supported by a presser shaft 35, as by arms 36. The take-up reels 23 are rotated in clockwise direction (Fig. 1) by usual means, to apply tensioning and draw-off action to the fabric as it is being knitted, and oscillation of the presser shaft 35 also moves the draw-off reels 23 toward and from the sinker-head 11, in timed relation with the needles 10, thereby to maintain a fixed distance between the needles and the reels at all times, all in accordance with the usual practice.

When a legger machine is provided with semi-automatic welt mechanism of the type referred to, the welt bars 14 are, after operation thereof, retained in inactive position on the bridges, against the studs 28 which rest against stop pieces 37. However, the inactive positioning of these bars on the top surfaces of the bridges 17 interferes with the use of these surfaces to also support and guide the welt rods 20. To avoid such interference, the bridges 17 are provided with grooved guide channels 38, for supporting and guiding the ends of the welt rods 20. With this arrangement, the fabric of each knitting section engaged by a welt rod 20, is, accordingly, moved in a plane intermediate the front bed or table 18 of the machine, and the welt bar 14, when being drawn from the knitting elements toward the reel 23.

When the welt rods 20 are moved in a plane intermediate the top surfaces of the bridges 17 and the front bed 18, as in conjunction with the draw-off means employed with semi-automatic welt mechanism referred to, it becomes difficult or even impracticable to engage the usual open ended hooks of the draw-off bands or straps 22 with the welt rods 20, from beneath, in accordance with the practice carried out in connection with standard machines. This is due to the fact that the welt fabric is usually of such length that when turned or folded the bight portion thereof is directly over one or the other of the raised wall portions of the table 18, as shown in Fig. 1. The limited space between the welt rod 20 and the table 18 therefore makes it difficult to engage the hooks from beneath, in accordance with the usual practice. If, on the other hand, such open ended hooks are connected from above, it has been found that they are subject to accidental disengagement from the welt rods during the winding of the straps 22 on the take-up reels 23, when the hooks and reels occupy a position substantially as shown in Fig. 7.

To overcome this difficulty, the welt rod operating mechanism of my invention is provided with novel connecting means designed to permit quick and easy connection of the draw-off straps 22, to the welt rods 20, from above, and to prevent accidental disengagement of these parts at all times.

Figs. 3, 4 and 5, disclose one embodiment of my novel connecting means in the form of a device 40, comprising an element, or welt rod receiving hook portion 40*a*, a spring latch or automatic hook closure means in the form of a leaf spring member 40*b*, which is arranged to prevent accidental disengagement of the welt rod 20 from the hook portion 40*a*, and a part 40*c* adapted to be engaged with the loop formed at the end of a fabric drawoff strap 22. The part 40*b* is fastened to the main body portion of the connecting device 40, in any practical manner, as by two rivets 40*d* which fixedly secure the widened end of the spring member 40*b* to one side of the device 40 in such manner that the free end thereof has spring action in biased

engagement with the hook portion **40***a*, as shown in Fig. 4. By pressing the device **40** down on a welt rod **20** in such manner that the rod contacts the spring member **40***b* adjacent the hook part **40***a*, the member **40***b* will readily recede to an extent permitting the rod to be engaged in the hook portion **40***a*. After the rod **20** passes beyond the free end of the spring member **40***b*, during movement of the rod to the position in the hook portion **40***a*, as illustrated in Fig. 1, the free end of the member **40***b* will automatically spring back to its initial position against the inside of the hook portion **40***a*, as clearly illustrated in Fig. 4. To release the rod **20**, it is merely necessary to manually depress the spring member **40***b* to an extent permitting the rod to pass between the member **40***b* and free end of the hook portion **40***a*. When the welt fabric and the rod **20** are wound on the reel **23**, the rod **20** can, of course, also be removed from the hook members **40** by withdrawing it lengthwise therefrom, as is customary when the knitting of the blanks has been completed.

By combining the connecting devices **40**, with the straps **22**, in a fabric take-up and tensioning means as herein disclosed, connection of such means with the welt rods is not only simplified and facilitated in that the devices can be engaged with, and disengaged from, the rods, from above, but the fabric take-up and tensioning means cannot become accidentally disengaged from the rods at any time.

Of course, my improved fabric take-up and tensioning means can be changed and modified in various ways without departing from the invention herein disclosed and hereinafter claimed.

I claim:

1. In a textile machine, the combination with a frame, a fabric engaging element, means arranged to actuate said element to draw off the fabric, and guide means for said element arranged to confine the element to a path above a portion of said frame of self-locking means associated with said actuating means and arranged to be connected with the element by a downward engaging movement without interference with said frame portion.

2. In a textile machine, the combination with a frame, a rod for engaging the fabric, means arranged to actuate said rod to draw off the fabric, and guide means for said rod comprising a pair of rails on said frame and arranged to confine the rod to a path above a portion or portions of said frame of a self-locking rod engaging means arranged to be connected to said rod by a downward engaging movement without interference with said frame.

HENRY PRINTZ.