Feb. 28, 1961 P. L. ST. PIERRE 2,972,875

FABRIC DRAW-OFF MECHANISM

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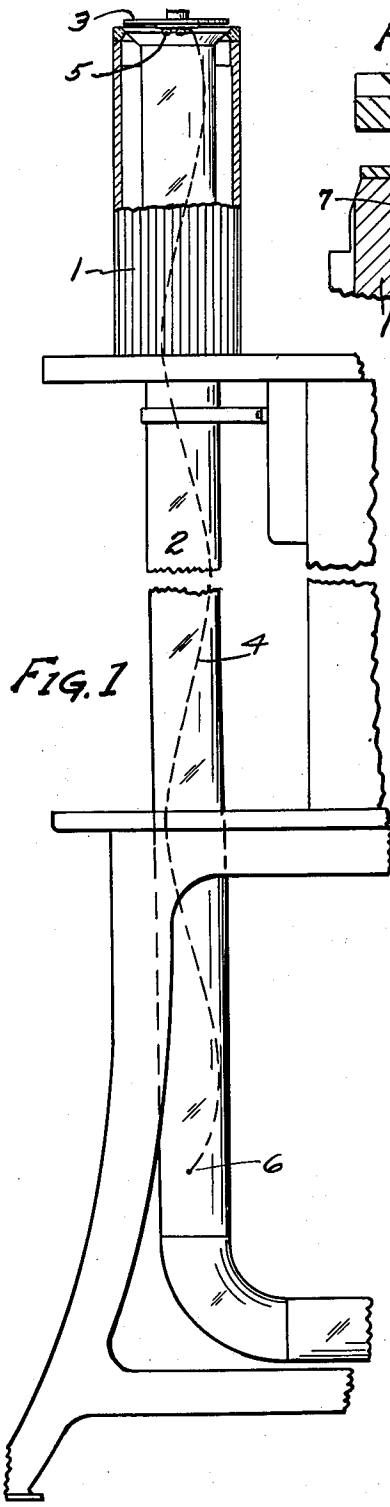


FIG. 1

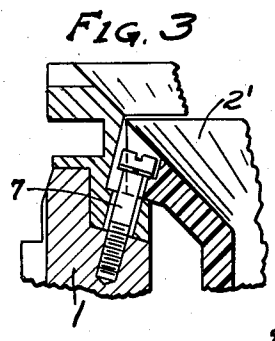


FIG. 3

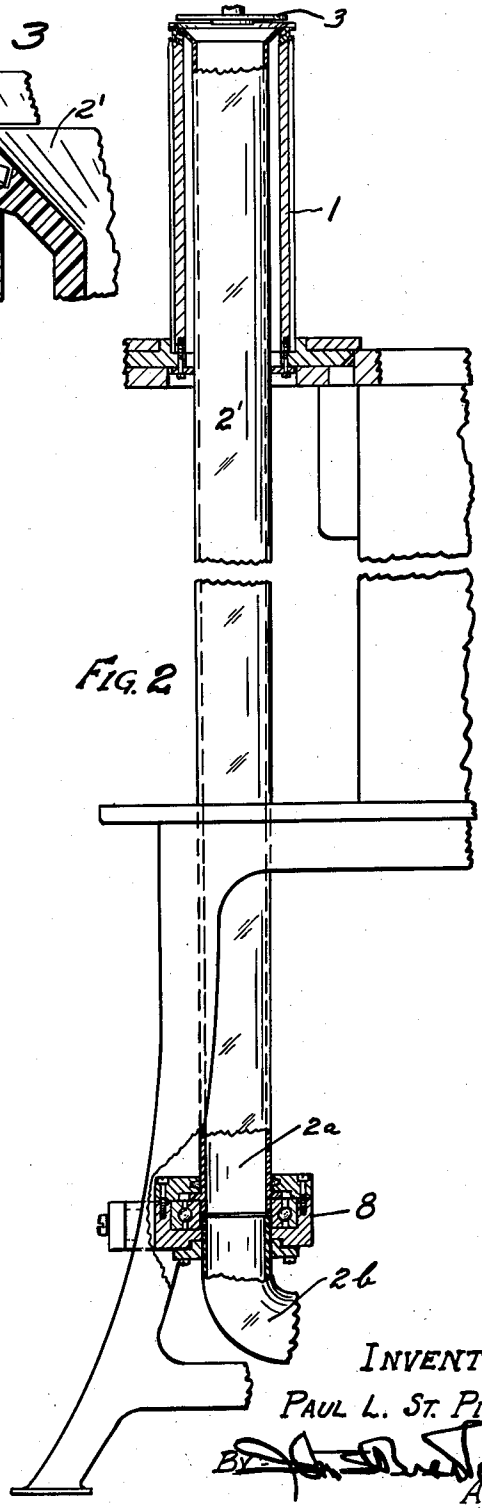


FIG. 2

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FABRIC DRAW-OFF MECHANISM

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9 Claims. (Cl. 66—150)

This invention concerns circular knitting machines and is particularly concerned with hosiery knitting machines having a pneumatic takeup or draw-off mechanism of the type described in co-pending U.S. application Serial No. 500,756, filed April 12, 1955.

The fabric draw-off mechanism described in the application referred to consists basically of a fabric work tube leading down through the cylinder to a suction fan. An air current drawn down through the tube by the fan entrains the fabric and tensions it during the knitting process.

The object of the present invention is to provide means for preventing fabric entrained by a current of air passing through a tube from twisting upon itself and possibly damaging its quality. Twisting upon itself is caused by one end of the fabric being held against the side of a stationary tube by static, friction, etc., while the other end of the fabric rotates with the cylinder.

The twisting is overcome, in one embodiment of the invention, by providing a fabric contacting member which extends down through the cylinder and into the work tube to engage and rotate with the fabric, the drag of the contacting member pulling the fabric around with it with sufficient force to overcome the retarding effect of static, etc.

In the accompanying drawings:

Figure 1 is a front view of part of a fabric takeup mechanism embodying the invention;

Figure 2 is a similar view of another modification of the invention; and

Figure 3 is a sectional detail part of the mechanism of Figure 2, showing how the work tube is attached to the cylinder.

Referring to Figure 1, a rotatable needle bearing cylinder 1 has leading down through it a fabric work tube 2. This tube may be made of clear plastic or other suitable material. At the top of the cylinder 1 is a dial 3. This dial is adapted to rotate with the cylinder in the usual manner of circular machines of the dial and cylinder type. In one particular application, the machine knits fine gauge ladies' hose with an inturned welt, and the dial carries transfer bits to operate in a manner well known in the art to turn the welt.

A cord or wire 4 is secured to the hub of the dial 3 by screws 5. The cord is long enough to hang down into the tube for a distance substantially equivalent to the length of the hosiery or other article to be knit. The cord, rotating with the dial, engages the fabric and urges it to turn with the cylinder. It exerts sufficient drag on the free end of the fabric to overcome resistance caused by static, friction, etc. with the inner surface of the tube and thus insures that the fabric will turn throughout its length at a substantially uniform rate instead of being retarded at its lower extremity while the upper portion turns with the cylinder.

Many different types of wires, strings and cords have been used successfully. A fine steel piano wire will coil

up within the tube to give itself sufficient lateral spread to engage the fabric in many places. If a wire is used, a smooth bead is fastened to its end, as shown at 6 in Figure 1, to prevent it from piercing and injuring the fabric. Window-sash cord, plastic clothesline, woven nylon cord, and tubular braids have all been used successfully. Any flexible linear element which will engage the fabric appears to be suitable.

In the modification shown in Figure 2, instead of passing a wire or cord down through the tube, the tube itself is rotated.

The cylinder 1 and the dial 3 are similar to those referred to above, and the tube 2' is the same as tube 2 except that it is secured, as shown in Figure 3, to the top of the cylinder by means of screws 7 or other suitable means.

At a point below the length of a completed stocking, the tube 2' is split into an upper portion 2*a* and a lower portion 2*b*. The lower portion 2*b* is fixed to the frame of the machine and the upper portion 2*a* is rotatably held by a bearing 8 which, if a suction takeup is being used, should be reasonably air-tight.

Since the tube 2' is fastened to the rotating cylinder, the upper length of tube will turn with the cylinder and thus will prevent the stocking, while it is being knit, from being held against twisting upon itself.

The modification shown in Figure 2 may itself be modified, in a manner not shown, by securing the top of the upper section of the tube 2*a* to the base of the cylinder instead of its top. This would make it possible to insert a stationary tube having fabric camming devices into the upper interior portion of the cylinder to assist in feeding the first courses of the fabric down into the tube.

I claim:

1. For a circular knitting machine of the rotatable dial and cylinder type, a fabric draw-off device which comprises a fabric work tube substantially concentric with the cylinder, means for producing through said tube a current of air adapted to entrain and tension fabric as it is knit, and a flexible, fabric engaging, linear member depending from the dial.

2. The invention according to claim 1, and wherein said linear member comprises a length of wire.

3. The invention according to claim 1, and wherein said linear member comprises a length of cord.

4. In a circular knitting machine of the rotatable cylinder and dial type a flexible, fabric engaging, linear member depending freely from the dial.

5. The invention according to claim 4 and wherein said flexible member comprises a length of cord.

6. In a circular knitting machine for knitting fine gauge fabric and having a rotatable needle cylinder and dial, a work tube extending from said cylinder in the direction of the fabric being knit, means for producing a current of air through said tube to entrain and tension said fabric, and a flexible linear element connected at one end to said dial for rotation therewith, said element extending longitudinally of said tube and adapted to engage said fabric substantially along its length upon rotation of said element.

7. The invention according to claim 6 and wherein said flexible linear element comprises a length of cord.

8. In a circular knitting machine for knitting fine gauge fabric and having a rotatable needle cylinder and means for producing a current of air to entrain and tension said fabric, the improvement comprising means extending longitudinally from said cylinder in the entraining direction of the fabric being knit for engaging said fabric substantially along its length, and means for causing rotation of said fabric engaging means with said needle cyl-

inder said fabric engaging means comprising a length of cord.

9. In or for a knitting machine having a rotatable needle bearing cylinder a fabric draw-off device which includes means for producing a current of air for entraining and tensioning said fabric and a longitudinal member adapted to engage the knitted fabric substantially along its length extending within and below the cylinder and rotatable therewith said longitudinal member comprising a length of cord.

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