Jan. 8, 1963 P. L. ST. PIERRE 3,071,949

KNITTING MACHINE MECHANISM AND METHOD

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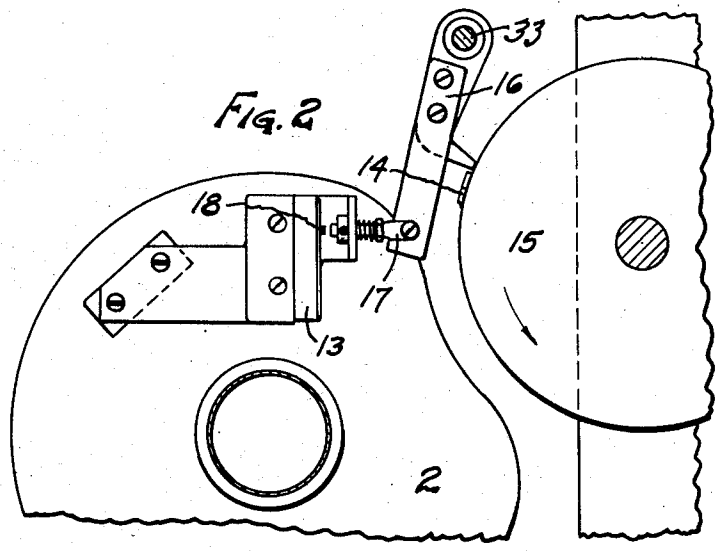


FIG. 2

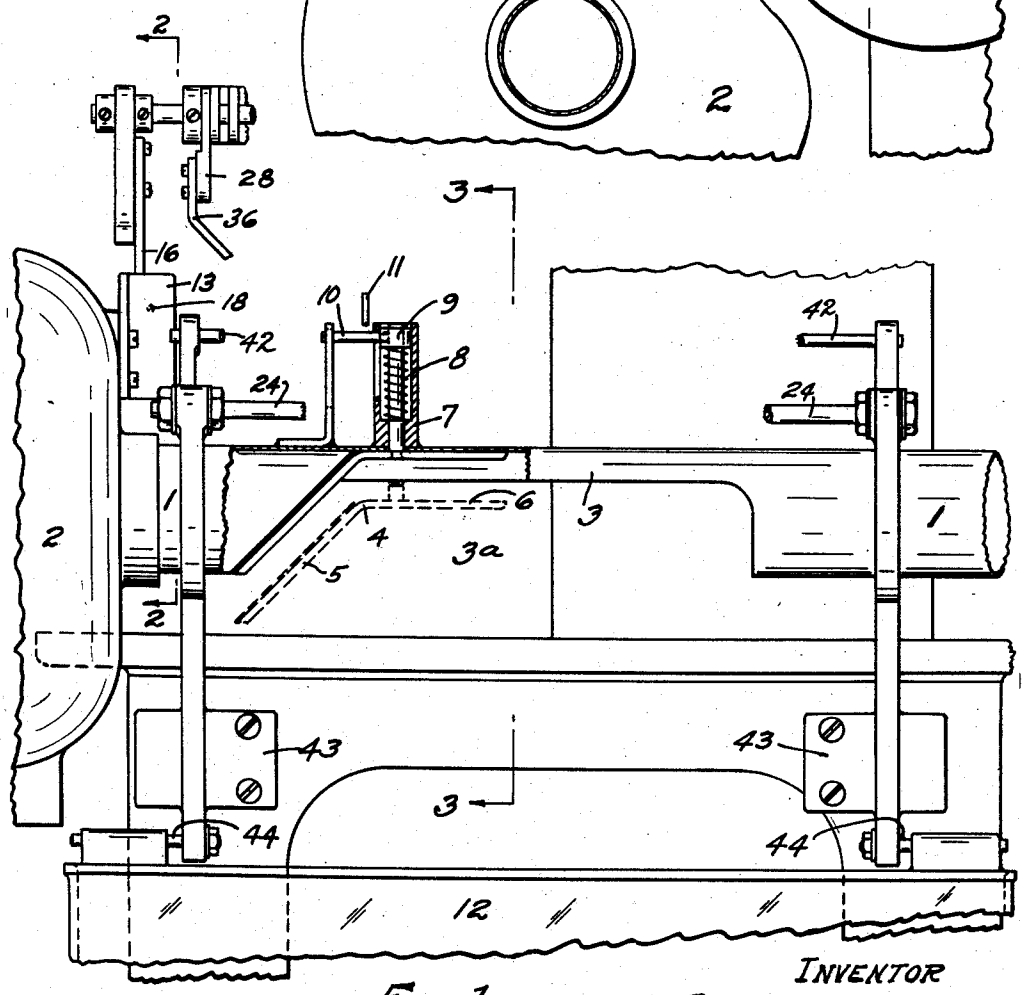


FIG. 1

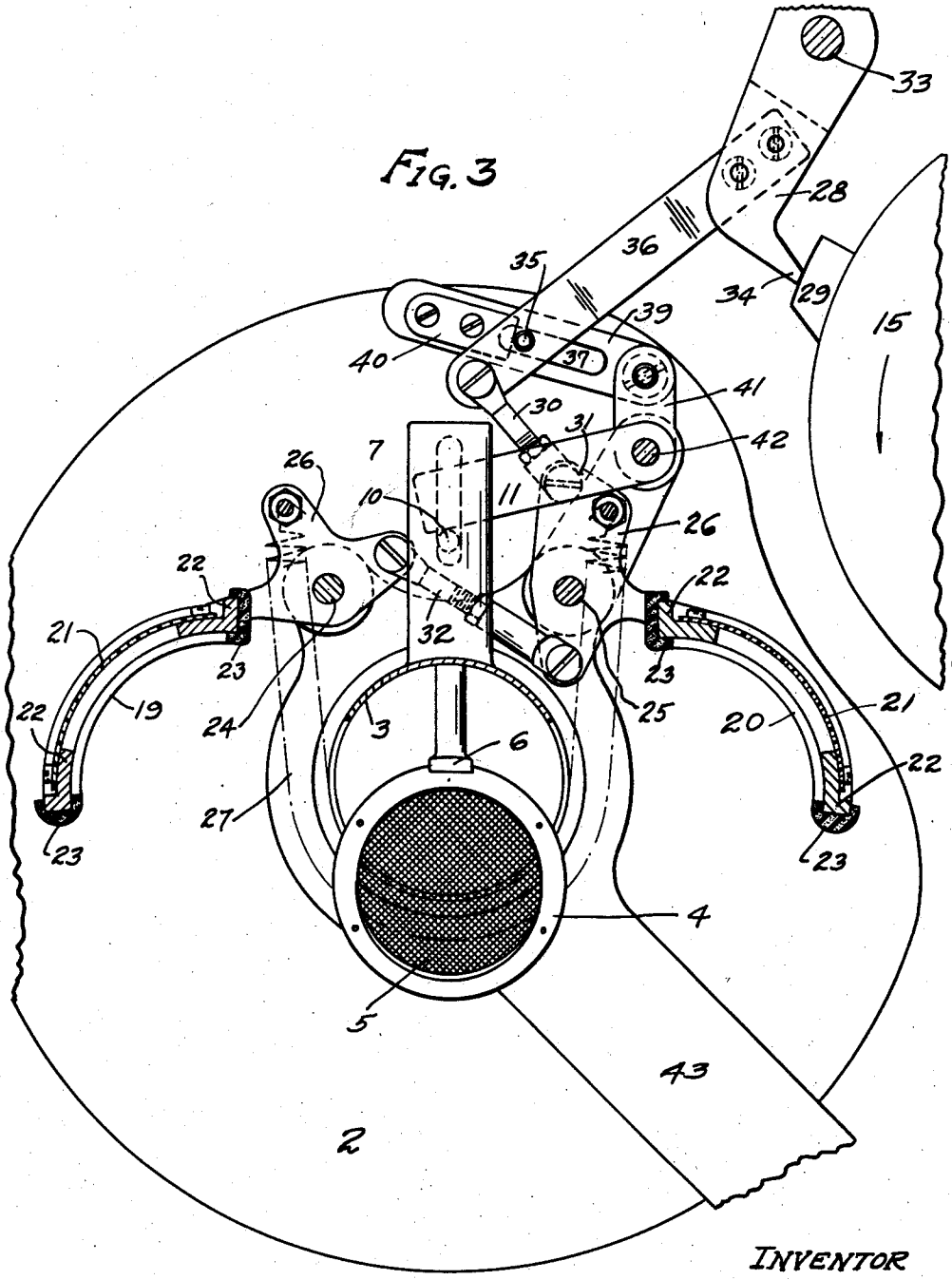
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FIG. 3



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KNITTING MACHINE MECHANISM AND METHOD

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Substitute for abandoned application Ser. No. 555,087, Dec. 23, 1955. This application Mar. 11, 1957, Ser. No. 645,374

5 Claims. (Cl. 66—150)

This invention concerns knitting machines and has particular reference to such machines employing pneumatic fabric takeup or draw-off mechanisms of the type described in co-pending U.S. application Serial No. 500,756, filed April 12, 1955.

That application describes a mechanism by which fabric is tensioned as it is knit by entraining it with a current of air produced by a vacuum blower. The completely knitted article is pressed off the needles and sucked through a fabric work tube into a fabric receiving chamber, or area of the tube, whence it is dropped through an aperture into a fabric receptacle.

The object of the present invention is to provide an improved method and mechanism for transferring the knitted article from the fabric receiving chamber or area into the receptacle. One embodiment, which comprises a combination fabric baffle and ejector adapted to push a knitted article through the aperture, is shown in the accompanying drawings in which:

FIGURE 1 is a front view of a fabric receiving chamber, fabric ejecting device, and associated mechanism;

FIGURE 2 is a section along the line 2—2 of FIG. 1; and

FIGURE 3 is a section along the line 3—3 of FIG. 1.

FIGURE 1 shows a plastic tube 1, the extension of which leads to the cylinder of a circular knitting machine. The other end is fitted into the housing of a suction fan 2, by which a suction or vacuum through the tube is produced. A fabric receiving chamber or discharge area 3 of tube 1 is provided with an aperture 3*a*. On the fan side of this area, there is an air permeable, fabric arresting baffle 4.

The baffle 4 comprises a screen portion 5 (see FIG. 3) and a fabric engaging arm 6. The arm 6 is attached to a spring loaded stud 7. Spring 8 pushes against a cap 9 on the top of the stud 7 to urge the assembly upward and hold the baffle within the confines of the tube 1. An arm 10 attached to the cap 9 underlies a lever 11 which is adapted to be moved downwards by a mechanism which will be described later. Lever 11, when it pushes the arm 10 downwards, also pushes the baffle 4 and arm 6 down into the aperture 3*a* (FIG. 1), thereby causing it to act as a fabric ejector adapted to push fabric through the aperture.

A fabric receptacle 12 in the form of an open-top box underlies aperture 3*a* to catch fabric which falls or is pushed through the aperture.

FIGURE 2 shows an electric switch 13 fastened on the housing of the suction device 2. This switch is in the electrical circuit of the fan of the suction device and is opened or closed by cams 14 on a pattern drum 15 which operate a lever 16 connected to a spring loaded plunger 17 in line with a contact button 18 on the switch 13. The purpose of this switch is to open the fan circuit and stop the suction at desired points in the operating cycle of the machine, e.g. during the transfer of the welt, during the make-up and press-off courses, etc., and when fabric is to be discharged through the aperture 3*a*.

FIGURE 3 shows a pair of doors 19 and 20 which are designed to cover the aperture 3*a*. The doors shown comprise plastic panels 21 mounted in metal frames 22

which are provided with sponge rubber edgings 23 to provide a substantially airtight closure. The doors 19 and 20 are pivotally supported on rods 24 and 25, respectively, by means of bell cranks 26. A spiral spring 27 secured to an arm of each of the cranks 26 and passing around and under the tube 1 serves to keep the doors normally closed. They are opened by a rocker 28 operated by cam 29 on the pattern drum 15.

Rocker 28 is connected by rod 30 to an extension 31 of one of the cranks 26 and the two cranks are interconnected by another rod 32. Rocker 28 is pivoted at 33 and when its cam-following nose 34 rides up on cam 29, the rocker is moved in an arc to the left as viewed in FIG. 3. This pulls the extension 31 of crank 26 in the same direction and causes the crank to rotate counter-clockwise about the rod 25, thereby swinging the door 20 outwards from the aperture 3*a*. When the door 20 swings counter-clockwise, the rod 32 pulls the crank which operates the door 19 in a clockwise direction around the rod 24; and, in this way, door 19 also opens away from the aperture 3*a* simultaneously with the door 20. The doors are shown in their open position in FIG. 3.

A stud 35 projecting from the arm 36 of rocker 28 engages a slot 37 in a lever 39. An adjustable stop 40 is secured to the lever 39 in a position where it overlaps a portion of the slot 37 and can be moved to increase or decrease the effective length of the slot.

When arm 36 of rocker 28 is pushed upward and to the left by cam 29, as viewed in FIG. 3, there is a certain lost motion while the stud 35 rides in the slot 37. When the stud engages the adjustable stop 40 it pulls on the lever 39 which, in turn, pulls a link 41 connected to it in a counter-clockwise arc. The link 41 is secured to a rod 42 which is turned through the same arc. Also secured to rod 42, is the lever 11 which overlies the stud 10 which operates the fabric ejecting member or baffle 4. When the rod 42 rotates in a counter-clockwise direction, the lever 11 is pushed downward against the stud 10, thereby pushing the baffle 4 into the aperture 3*a*.

After a stocking has been knit and pressed from the needles, it is pulled, by the suction coming from blower 2, against the baffle 4 where it is compressed into a relatively compacted wad by the air pressure.

At this time, the mechanism hitherto described goes into operation. The drum 15 is turned. Lever 16 is thereupon engaged by cam 14 and switch 13 is opened to interrupt the electrical circuit to the suction blower. Simultaneously, or immediately thereafter, lever 28 is engaged by cam 29 so that it opens the doors 19 and 20; and, as soon as the lost motion caused by the stud 35 travelling through the slot 37 is completed, the lever 39 rocks the rod 42 and causes the lever 11 to push the stud 10 and, consequently, the fabric ejecting mechanism downwards so that the stocking, which is still in a more or less compressed condition, is pushed through the aperture and falls into the receptacle 12. Baffle 4 and the fabric engaging arm 6 of the fabric pusher or ejecting mechanism form an obtuse angle having a lateral as well as a downward complement of motion which aids in the discharge of the fabric from the tube.

The operating cranks 26 and connecting rod 32, which are shown in FIG. 3 and have been described above, are located at the left hand side of the mechanism, as shown in FIG. 1. Rods 24, 25 and 42 extend beyond the aperture on either side, as shown in FIG. 1; and the cranks and connecting rods are repeated at the right hand side. The entire assembly is carried by a bracket 43 which is mounted on the frame of the machine, and the fabric receptacle 12 is mounted on pins 44 connected to this bracket.

I claim:

1. For a knitting machine, a fabric tensioning device

which comprises a fabric receiving chamber having an aperture, a closure for said aperture, a fabric ejector proximate said aperture, means for moving said closure to open said aperture, and means for moving said ejector to push fabric through said opened aperture.

2. For a knitting machine, a fabric draw-off device which comprises a fabric work tube, means for producing a current of air through said tube, a fabric discharge area in said tube, an air-permeable, fabric engaging baffle at said discharge area, an aperture in said tube at said discharge area, a closure for said aperture, means for temporarily stopping said current of air, means for moving said closure to open said aperture, and means for moving said baffle to push fabric through said aperture.

3. The invention according to claim 2 and wherein said baffle has a fabric engaging appendage.

4. The invention according to claim 2 and wherein said closure and said baffle are operated by a common mechanism having a lost motion device for delaying the pushing motion of said baffle with respect to the opening motion of said closure.

5. A method of drawing-off individual units of fabric from the needles of a knitting machine which includes the steps of pressing-off an article of knitted fabric from the needles, drawing said fabric through a conduit into a compacted mass against an air-permeable, fabric-engaging baffle by entraining it in an air current passing through said baffle, stopping the air current, and then pushing the fabric out of said conduit while it is still in a compacted condition.

No references cited.