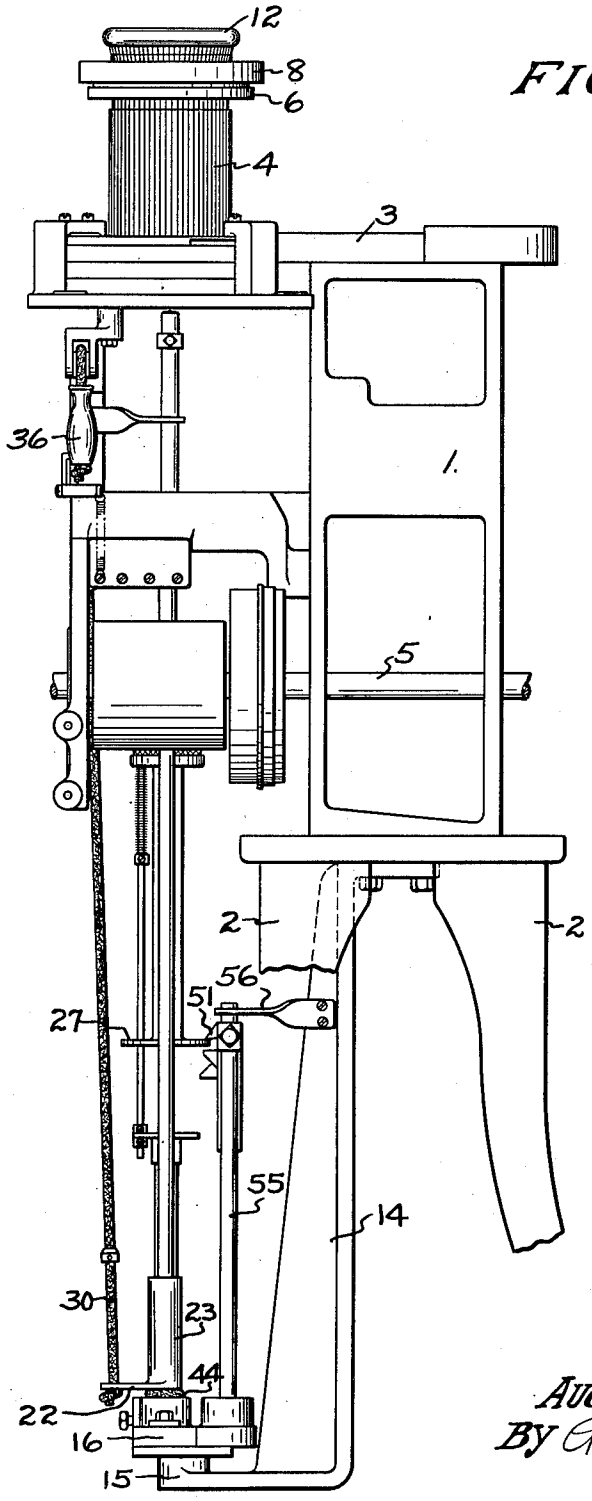
Feb. 4, 1941. A. GAGNE 2,230,974

FABRIC TAKE-UP

Filed March 8, 1939 5 Sheets-Sheet 1

FIG. 1.



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FABRIC TAKE-UP

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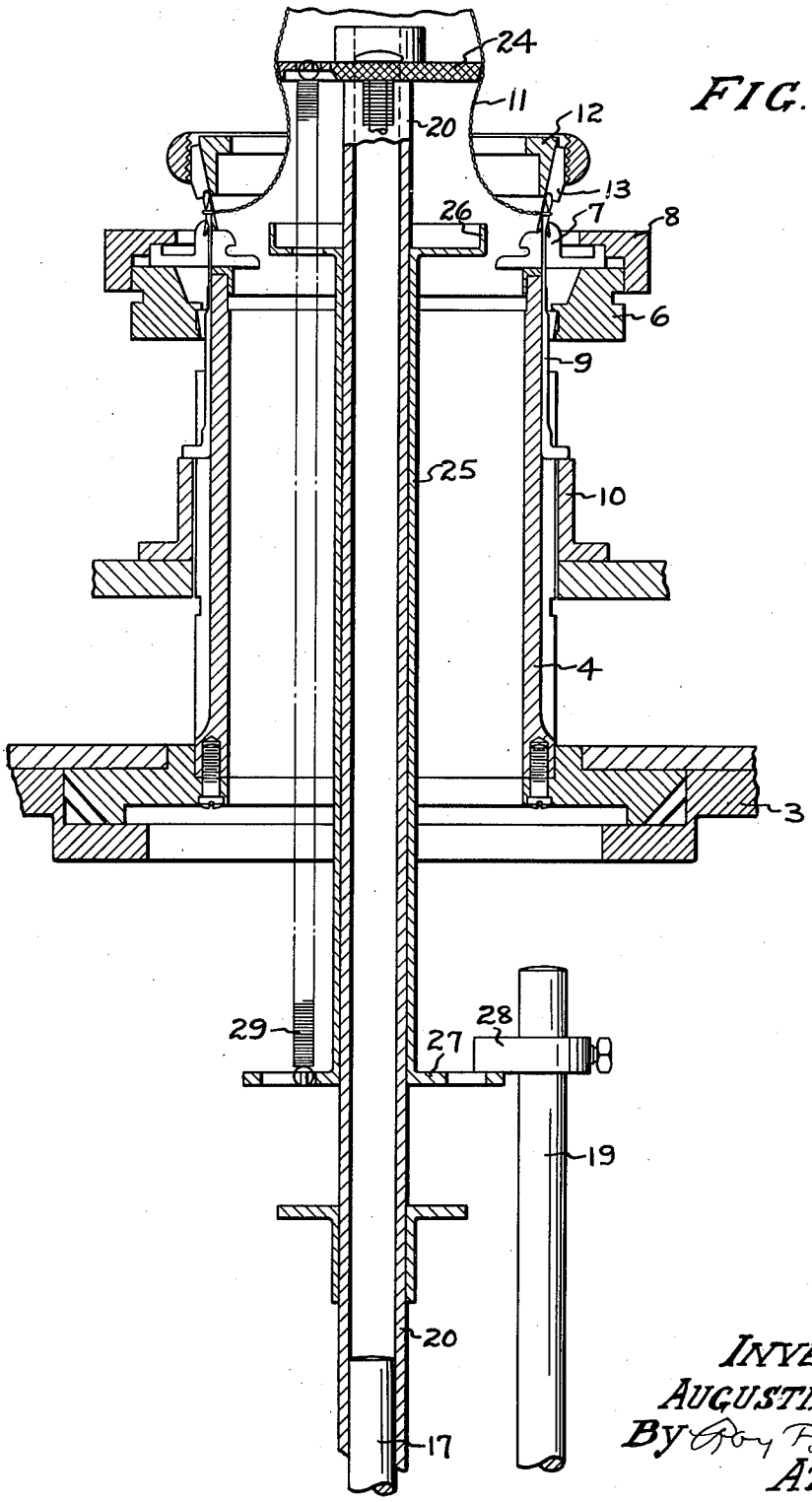


FIG. 2.

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FABRIC TAKE-UP

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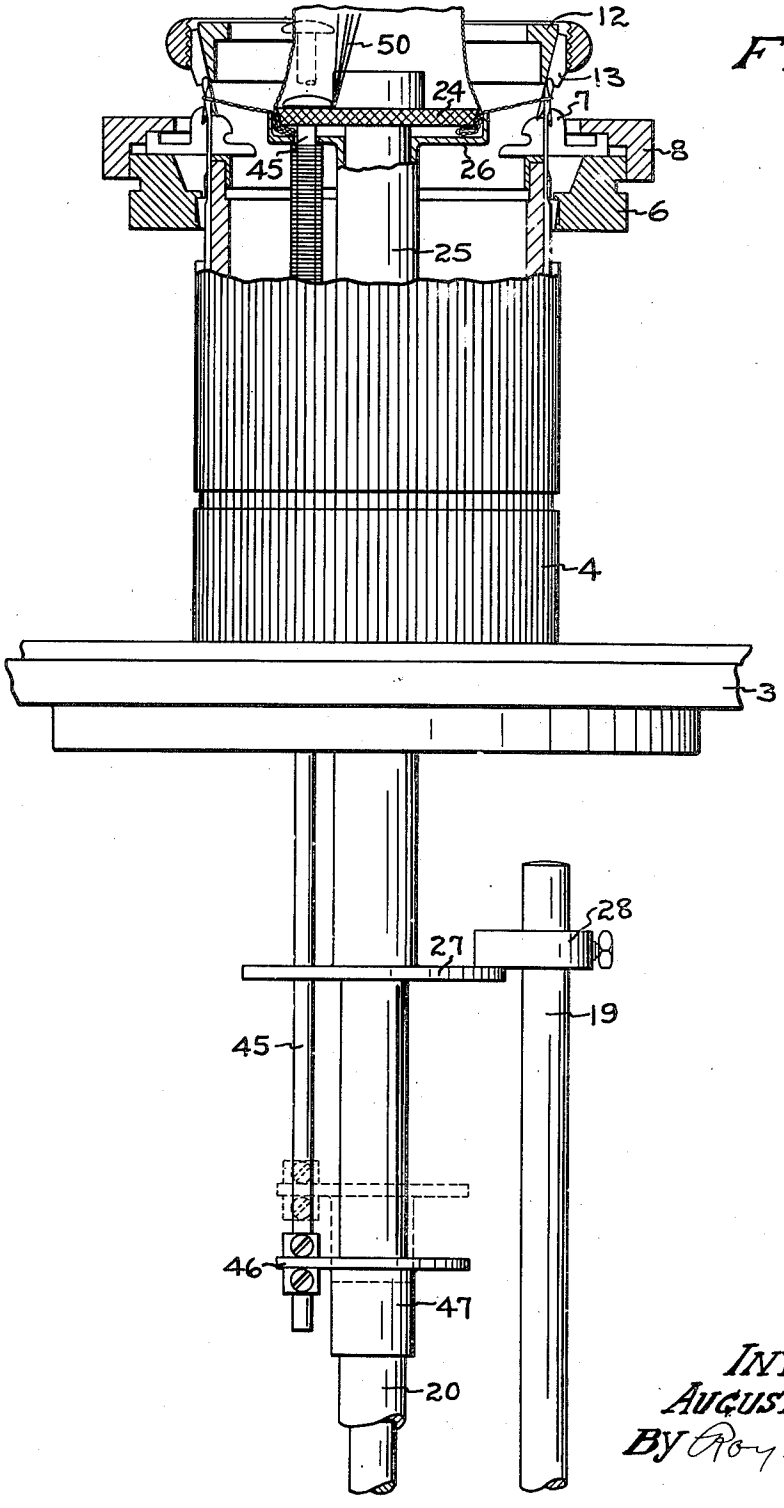


FIG. 3.

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FABRIC TAKE-UP

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FIG. 4.

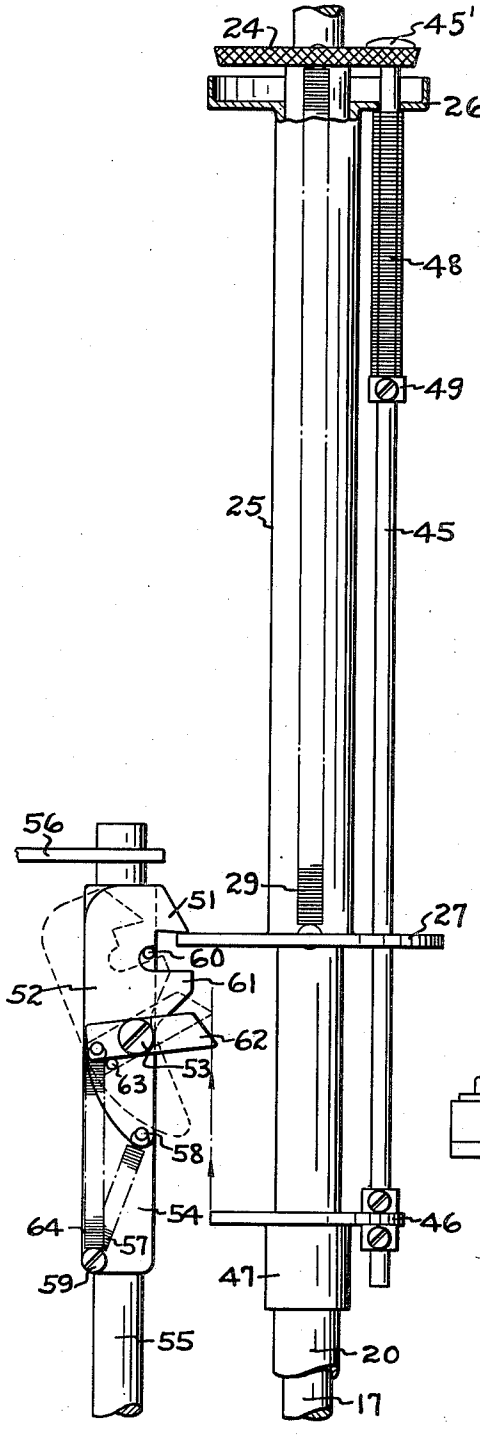
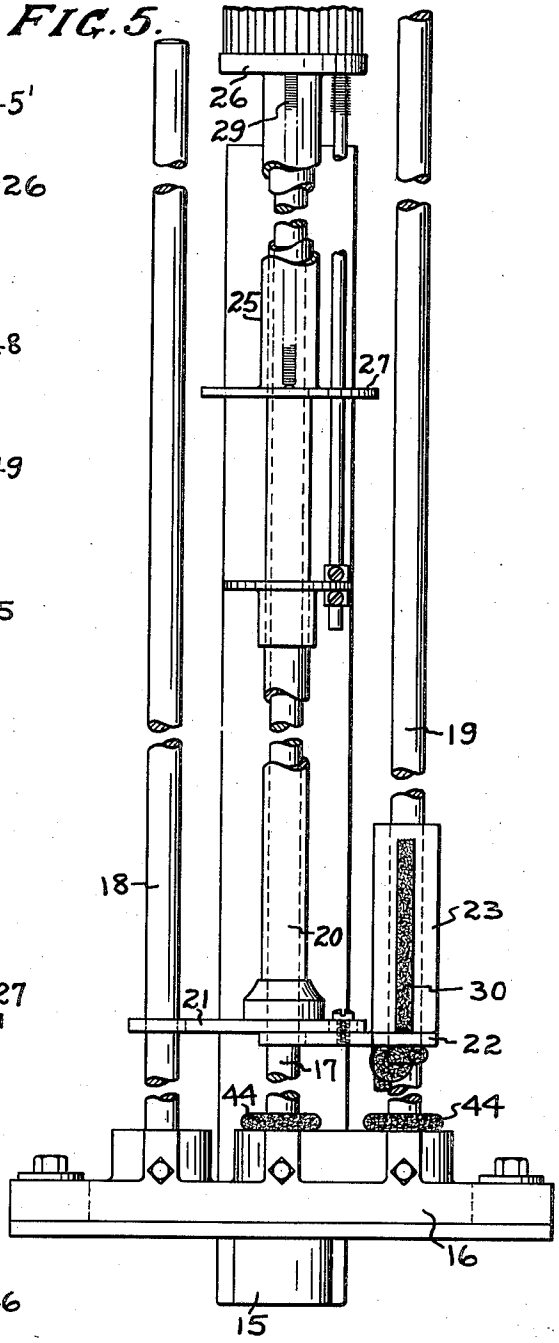


FIG. 5.



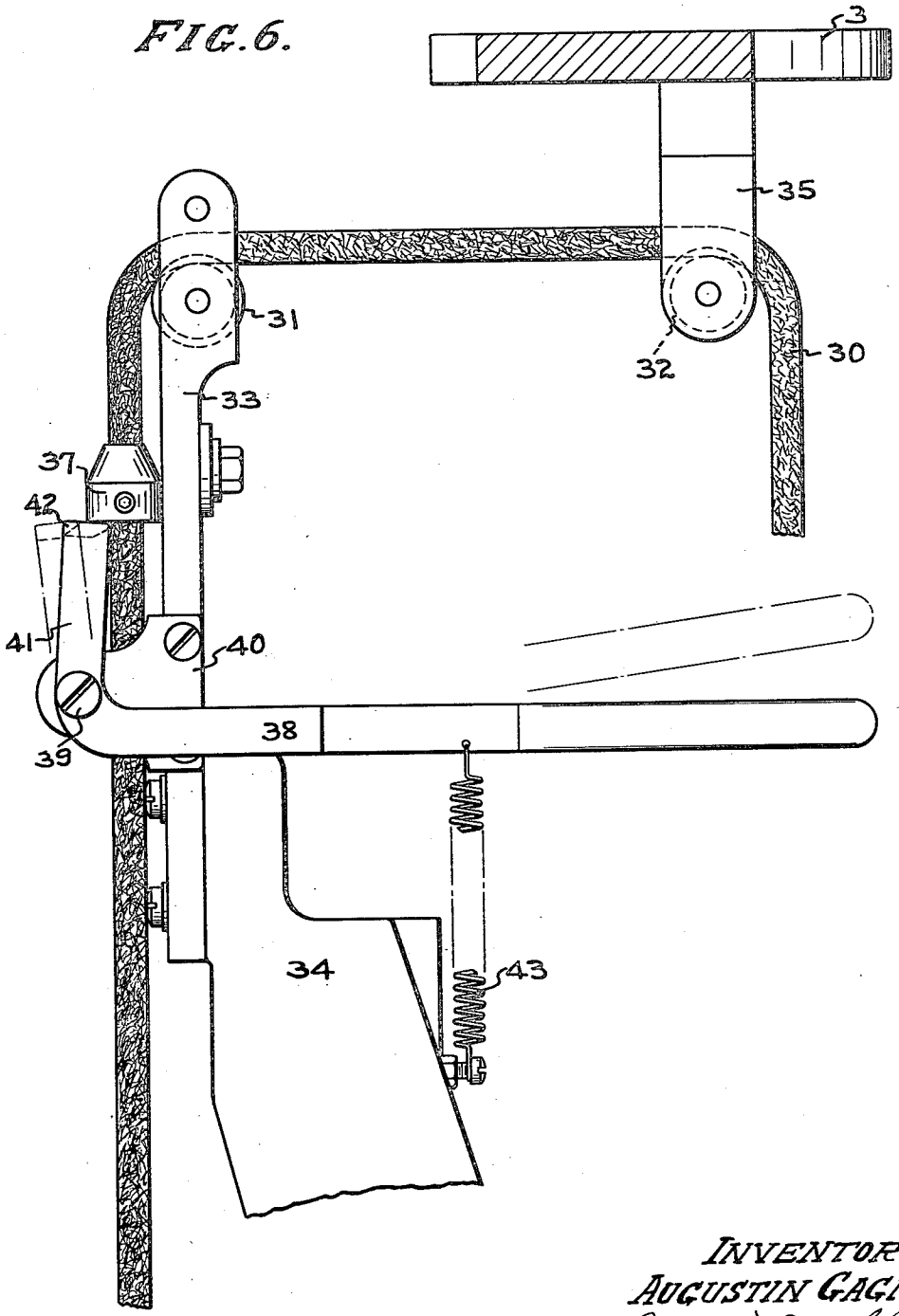
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FABRIC TAKE-UP

Filed March 8, 1939 5 Sheets-Sheet 5

FIG. 6.



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Patented Feb. 4, 1941

2,230,974

UNITED STATES PATENT OFFICE

2,230,974

FABRIC TAKE-UP

Augustin Gagne, Central Falls, R. I., assignor to Hemphill Company, Central Falls, R. I., a corporation of Massachusetts

Application March 8, 1939, Serial No. 260,602

11 Claims. (Cl. 66—149)

This case concerns fabric take-up means for use in circular type hosiery machines or other similar knitting machines.

In the figures of drawings:

Fig. 1 is an elevation showing the take-up mechanism as applied to a hosiery knitting frame;

Fig. 2 is a sectional view illustrating essential parts of the fabric take-up as it is about to be engaged with a stocking top, the needle cylinder and adjacent parts also being present;

Fig. 3 is a view wherein certain parts are in section and illustrate the fabric take-up as it has engaged the stocking top and about when the same is to be drawn down on to the needles from the transfer comb;

Fig. 4 is an elevation of part of the mechanism illustrating the manner in which the fabric is freed after being cast from the needles;

Fig. 5 is an elevation showing parts of the take-up means and guiding devices functioning therewith; and

Fig. 6 is an elevation showing the manner in which the take-up is to be held in uppermost position until the machine operator releases it.

Fabric take-up means have been employed which may be projected up within the needle cylinder and arranged automatically to grip a fabric top and to tension the same as the stocking is knitted and as the fabric is drawn down through the cylinder, one such device being the subject matter of United States Patent #2,013,563. The take-up means of this case is particularly adapted for engaging fabric tops transferred to needles and which are too short to be engaged by the means of said United States patent and otherwise difficult to control. Another distinguishing feature is that the take-up means herein disclosed and claimed grips a stocking top evenly about the entire circumference and applies an even tension thereto without any tendency whatever to damage the fabric.

Referring to the figures of drawings, a knitting machine of Banner type is illustrated in Fig. 1 wherein is shown a frame 1 having legs 2, a circular base 3, cylinder 4 and a main cam shaft 5. The usual sinker ring 6 has sinkers 7 actuated by the usual cam in a sinker cap 8, Fig. 2. The needle cylinder is slotted in the common manner to carry needles 9 which are actuated by cam 10 and other cams not necessary to be shown in this case. A stocking top generally indicated at 11 and preferably knitted on a ribber will be transferred to the needles prior to starting knitting the stocking or other article of hosiery. A transfer ring 12 has a plurality of teeth or points 13 equal in number to the number of needles in the machine. In a manner known to those skilled in the art, the top is first placed on these points; the ring is then applied to the needles in such a manner that a point will engage each needle and the top will be in a position to be transferred from the ring to the needles.

A special brace 14, Fig. 1, is bolted to the bottom of the machine frame and has a foot portion 15 which rests upon a support on the floor. This foot portion also carries a bracket 16 which is adjustable by means of certain adjusting screws to be tilted in such a manner that the take-up mechanism slidable vertically of certain spindles projecting upwardly from this bracket, will be capable of being arranged centrally of the cylinder so that the take-up means may be projected upwardly therethrough without interference and for engaging the fabric evenly. This bracket 16 has a central spindle or post 17 and supplementary spindles 18 and 19 which serve as guides in a manner which will appear as the disclosure progresses. Directly slidable upon this central spindle 17 is a tube 20 fixed at its lower end to plates 21 and 22, plate 22 having projecting upwardly therefrom a guide 23. This guide 23 slides vertically along the spindle on post 19. The opposite plate 21 is slotted so as to be guided by the spindle or post 18. For certain purposes of adjustment cam plates 21 and 22 have been made separately, but it is to be understood that a single plate might be used if desired.

Now referring to Figs. 2, 3, 4 and 5, the tube 20 projects upwardly for a considerable distance carrying at its topmost end an inner clamp 24. The outer periphery of the clamp is knurled so as to form a gripping surface and is tapered to fit snugly in an outer clamp. A second tubular element 25 is in turn freely slidable on the tube 20 and is formed at its upper end in a manner to constitute an outer clamp 26. These clamps are shown in Fig. 2 as the upper clamp 24 has been pushed upwardly through the stocking top 11 and before being drawn down to the position of Fig. 3 in which the stocking top will be securely held between the inner and outer elements. At the lower end of the tube 25 a flange 27 is so positioned as to engage an adjustable stop 28 at the upper end of the post or spindle 19. This stops the tube 25 and thus the outer clamp 26 in about the position shown in Fig. 2. The tube 20 is stopped by another adjustable stop (not shown) on spindle 19 in a position to engage the guide 23.

A spring 29 connects to the inner clamp 24,

passes through an opening in the outer clamp 26 and connects to flange 27. This spring is under considerable tension and normally draws both clamps together so that they hold or retain the stocking top 11 as shown in Fig. 3. Now referring to Figs. 1, 5 and 6, a cord 30 is connected to an extension of the plate 22 and is then carried upwardly over small pulleys 31 and 32. The pulley 31 is pivoted in a bracket 33 which is in turn fixed to an extension 34 from the frame of the machine. The outer pulley 32 rotates in a forked piece 35 which is adjustably bolted to the underside of the circular base or parts attached thereto. The cord 30 has a handle 36 at its free end by means of which the machine operator moves the clamp from lowermost position to its uppermost position. This cord also has an adjustable stop 37 which is conical in its general form being flat at the bottom. A lever 38 is pivoted at 39 to a short extension 40 on the bracket 33. This lever has an upwardly extending arm 41 which projects horizontally at 42. The horizontal part 42 engages beneath the stop 37 so that when the clamp is pulled to the position of Fig. 2 it will be maintained there since lever 38 is held in the full line position, Fig. 6, by a tension spring 43. When the machine operator desires to engage the clamp so that a stocking top will be firmly held and to start the take-up action, he merely trips the lever 38 so that the stop 37 is released.

Rubber washers 44, Figs. 1 and 5, serve to lessen the shock with which the parts strike when the take-up is dropped to its extreme lowermost position by releasing the same or when the stocking is cast from the needles.

In addition to the function of clamping the stocking top and drawing the same down within the needle cylinder, this mechanism further serves to engage the ends of wrap yarns if the stocking being knitted is to be patterned in this manner. A rod 45 has a head or button 45' at its upper end which engages against the top surface of the inner clamp. This rod projects downwardly through the inner clamp, outer clamp, the flange 27, and is adjustably attached to a flange 46 integral with a hub 47, the latter being slidable on the tube 20. A spring 48 bears against the lower side of the outer clamp flange and is adjustable by means of collar 49 on the rod 45. This spring is weak relatively to the spring 29, but has sufficient compressive strength to hold the head or button 45' downwardly with a force which will maintain the ends of wrap yarns generally indicated at 50, Fig. 3. To engage these wrap yarns, it is only necessary when the device is in the position of Fig. 2, to lift upwardly on the flange 46 so that the mechanism is moved from the full line position to the dotted line position, Fig. 3, and to take a turn with the ends of these wrap yarns about the rod 45 so that when released, they would be held as in Fig. 3.

When the mechanism has been released by disengaging the stop 37, the top will be clamped and the take-up action will start. Prior to this engagement, especially when the inner clamp was moved upwardly through the fabric, the operator must hold the transfer ring downwardly on the needles. As the mechanism moves to the position of Fig. 3, the transfer ring may be removed. At that time the loops which were on the points will be held within the hooks of the needles. Thereafter the knitting may be started, and of course, as the same progresses, the movable parts of the take-up will slide downwardly on spindle 17 until the stocking is released as it is cast from the needles, or by any other method. Then the mechanism will drop until it reaches a lowermost position such as shown in Fig. 1. Mechanism will now be described wherein the take-up will automatically open and be held open until the stocking is withdrawn and another top is to be engaged. When the plate 22 strikes the rubber washers 44, the tube 25, outer clamp 26 and flange 27 have sufficient inertia to move further downwardly against the tension of spring 29. In other words, there is sufficient weight to these parts and they drop far enough so that the tube 25 and other elements integral therewith move a slight additional distance against the tension of the spring 29, this extra movement serving to carry the said flange 27 beneath the latch 51. Latch 51 is part of a plate 52 pivoted at 53 on a bracket 54 which is in turn fixed adjacent the upper end of a post 55, Figs. 1 and 4. This post 55 is held at its lower end in the bracket 16 and at its upper end by a guide 56. A spring 57 attaches to a pin 58 on the plate and to a screw 59 on a fixed part of the mechanism so that there is normally a tendency for the plate to be moved to the position of Fig. 4. In that position a pin 60 limits movement of the plate under the influence of the spring. A shouldered extension 61 beneath the latch 51 limits downward movement of flange 27. Thus when the mechanism drops as before stated the flange 27 will be caught by the latch 51 so that the parts will be held in the position of Fig. 4 wherein the outer clamp is disengaged from the inner. At that time the stocking or other knitted article can be easily withdrawn, it merely being necessary for the operator to pull the same over the top of spindle 17.

When the mechanism is to be moved upwardly again for engaging another top, latch 51 must be disengaged from flange 27. This is accomplished as the flange 46 moves upwardly along with tube 20. At that time the spring 29 will merely be elongated until flange 46 strikes a short latch 62 also pivoted at 53. Latch 62 contacts a pin 63 projecting from plate 52 and thus movement from the full line to the dotted line position for latch 62 brings about a swinging of the plate 52 with its latch 51 to its dotted line position whereupon flange 27 will be released. A spring 64 is attached to one end of latch 62 and to the screw 59. This spring 64 is relatively weak compared to spring 57 and merely serves to hold the latch in a position so that it will be contacted by the flange 46.

Operation

A brief description will now be given of the manner of operating the mechanism herein described and the way in which the same would be employed during the knitting of a stocking or half-hose on the common type of hosiery knitting machine. Assuming the previous stocking has been dropped from the needles and has been removed, the parts will be in the position illustrated in Figs. 1 and 4. At that time the clamping members 24 and 26 are separated and flange 27 is caught and held by the latch 51. The needles will be levelled in the usual way and a transfer ring having thereon a suitable rib or other top will be moved to position on said needles. Thereupon the operator will grip handle 36 and by means of cord 30 will raise the entire mechanism to the position of Fig. 2. The first thing that happens as this cord 30 is pulled is that

the tube 20 is lifted thus moving the hub 47 and flange 46 along with it. Due to the fact latch 51 holds the flange 27 as in Figs. 1 and 4, tube 25 and its integral members will not move but spring 29 will be longated until flange 46 strikes latch 62 whereupon the plate 52 will be moved so that latch 51 will disengage said flange 27. Immediately spring 29 will move the tube 25 so that the outer clamp 26 will engage the inner clamp 24.

Then the entire mechanism will move up as a unit until flange 27 strikes stop 28, Fig. 2. Thereafter tube 20 and mechanism moved therewith will rise to the position in which the inner clamp 24 is forced upwardly within the transferred top 11. At this time the operator will hold the ring 12 down on to the needles so that the action of the clamp will not lift the top and ring from the needles. Extreme upward movement is limited by a second stop against which the upper end of the guide 23 strikes as previously explained. All of these stops are adjustable to a considerable extent so that any desired limits of movement may be obtained.

As the complete upper position is reached, the stop 37 will be held by projection 42 on lever 38 until that lever is tripped by the operator at which time the inner clamp 24, tube 20, etc. will start to fall and the fabric which has a tendency to draw inwardly will pucker or fold itself as illustrated in Fig. 3 to be engaged between the knurled, tapered outer surface of inner clamp 24 and the outer flange of clamp 26. In that position the top will be evenly tensioned and weight of the parts will draw downwardly to take up the fabric as knitting progresses. After lever 38 is tripped to release stop 37 the spring 43 immediately moves that horizontal upper projection 42 into engagement with the cord 30 and will serve to some extent as a brake or drag on the cord to slow up downward movement of those parts of the take-up which hang upon the fabric.

When the fabric runs off or is otherwise released from the needles, parts will be in an elevated position, at least enough above the lowermost position of Fig. 1 so that the entire movable mechanism will drop until plate 22 strikes washers 44, Figs. 1 and 5. As before explained the inertia of tube 25 and parts integral therewith will cause those parts to move downwardly just enough against the tension of spring 29 so that the flange 27 will be caught beneath latch 51. Thereupon the stocking may be removed by the operator and the cycle again repeated.

Operation of the wrap yarn holding means has been described previously and when parts are in uppermost position, Fig. 3, and when the transfer has been removed, these yarns may be engaged so that they will be retained, this mechanism serving instead of the usual weight which is attached for the purpose. When the stocking is taken after completion, these yarns will not be held so hard that they may not be disengaged from beneath the button 45' as the stocking is pulled away from the take-up. The invention is defined in the appended claims.

I claim:

1. A take-up for knitting machines including a vertical guiding means projecting upwardly and centrally of a cylinder, means slidable on said guiding means and engageable with fabric held at the needles, said slidable means including an inner and an outer clamp, spring means for drawing said clamp together, means for limiting the upward movement of the outer clamp so that the inner clamp may be projected into the fabric and thereafter drawn downwardly for the purpose described.

2. Take-up means for knitting machines including in combination guiding means for maintaining said take-up means substantially central of a needle cylinder, slidable means on said guiding means including tubular elements separately movable, one tubular element having at its upper end an inner fabric clamp and the second tubular element having an outer fabric clamp disposed to be engaged by a tapering surface of said inner clamp, resilient means for bringing said clamps into fabric engaging relationship, stops for limiting the upward movement of said clamps, the construction being such that the outer clamp reaches its uppermost position in advance of a time when said inner clamp engages a stop whereby its uppermost position is limited.

3. A take-up for knitting machines having in combination guiding means for maintaining the take-up means substantially central of the needle cylinder, slidable means on said guiding means, one such sliding means having at its upper end an inner fabric clamp, the other sliding means having a complementary fabric clamping element, spring means for bringing said inner clamp and outer clamp into fabric engaging relationship, means for raising said sliding means and stops arranged to limit the upward movement of said outer clamp so that its upward movement will be discontinued before upward movement of the inner clamp is complete, stopping means for retaining the inner clamp in its uppermost position but releasable by the machine operator so that said inner clamp may be dropped to engage the fabric against the outer clamp.

4. In a fabric take-up means of the type described, a circular inner clamp and an outer clamp resiliently urged toward each other, the inner clamp having a fabric engaging surface which is roughened and tapered to engage within an upstanding circular flange of the said outer clamp.

5. In a fabric take-up means of the type described, an inner clamp and an outer clamp resiliently urged toward each other, the inner clamp being annular in form and having an outer fabric engaging surface tapered and roughened, and the outer clamp within which the tapered, annular, inner clamp engages being constructed with an upstanding flange.

6. Fabric take-up means for knitting machines including clamping members resiliently urged to fabric engaging position and slidable upon guiding means, the construction being such that when the fabric is released the take-up will drop to a lowermost position and upon striking said lowermost position will open, and means for retaining said take-up in open position so that the knitted article may be withdrawn.

7. Fabric take-up means for knitting machines including in combination guiding means, slidable means on said guiding means having fabric engaging members resiliently urged together so that said fabric is clamped between them, means for raising said take-up means until the clamp is engaged with the fabric and for releasing it so that it may move downwardly as the fabric is knitted and thereby draw the same from the needles, the construction being such that movement of the take-up means is not complete when the fabric is released from the nee-

dles, and a latch means for engagement with a portion of one of the clamping means which is separable from the other due to inertia of the falling parts, to maintain the clamp disengaged until the fabric is withdrawn.

8. Take-up means for knitting machines including in combination complementary clamping elements movable upon a guiding means for engagement with a fabric, resilient means tending to retaining said clamping means in such engagement, the construction being such that as fabric is knitted the take-up means moves downwardly on said guiding means but does not reach the ultimate extent of its travel until after the fabric has been released from the needles, a latching device engageable with a part of the mechanism integral with one of the clamping means for maintaining that clamping means slightly opened from the opposed clamping member after it has moved to such opened position due to inertia acquired in falling after fabric has been released, and a tripping means for said latching device engageable upon subsequent raising of the take-up means to withdraw said latch thereby to allow the said clamping means to be released.

9. In a take-up means for knitting machines, clamping elements centrally arranged with respect to the cylinder and engageable with a fabric, wrap yarn retaining means including a button spring pressed against part of the clamping means and beneath which wrap yarns may be held substantially as described.

10. Fabric take-up means for use in circular knitting machines adapted to knit wrap yarn patterns for ornamentation of a fabric having in combination means for engaging fabric to be drawn from knitting instrumentalities as it is knitted by them and means functioning therewith for engagement of wrap yarns so that movement of fabric take-up means downwardly will impart to the wrap yarns a corresponding downward movement.

11. A take-up for knitting machines having in combination fabric engaging means including circular inner and outer fabric clamping members, one of the said members being tapered to engage the other and frictionally retain the fabric between them.

AUGUSTIN GAGNE.