

March 12, 1940.

A. N. CLOUTIER

2,193,311

YARN TAKE-UP

Filed Nov. 26, 1937

3 Sheets-Sheet 1

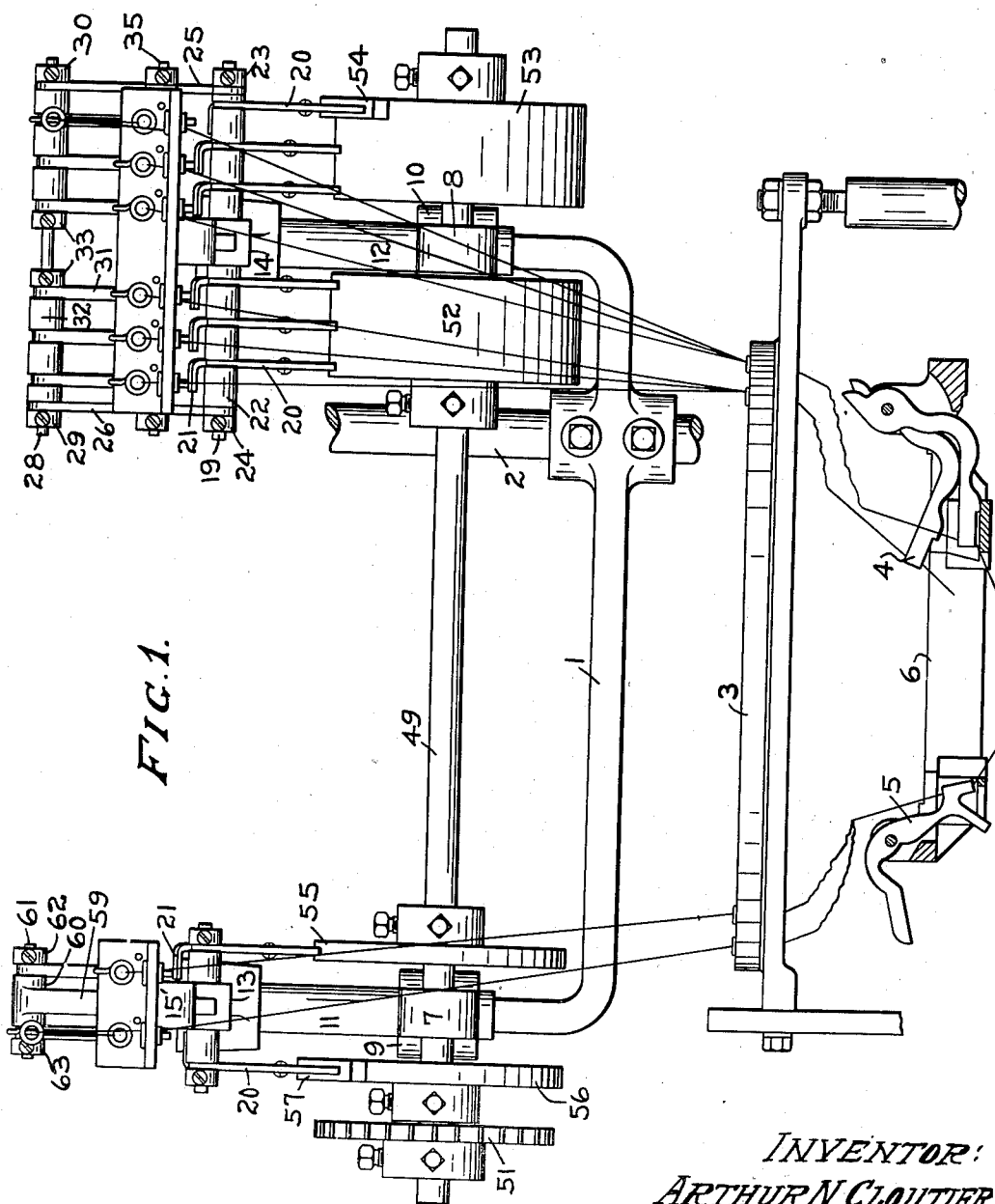


FIG. 1.

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FIG. 2.

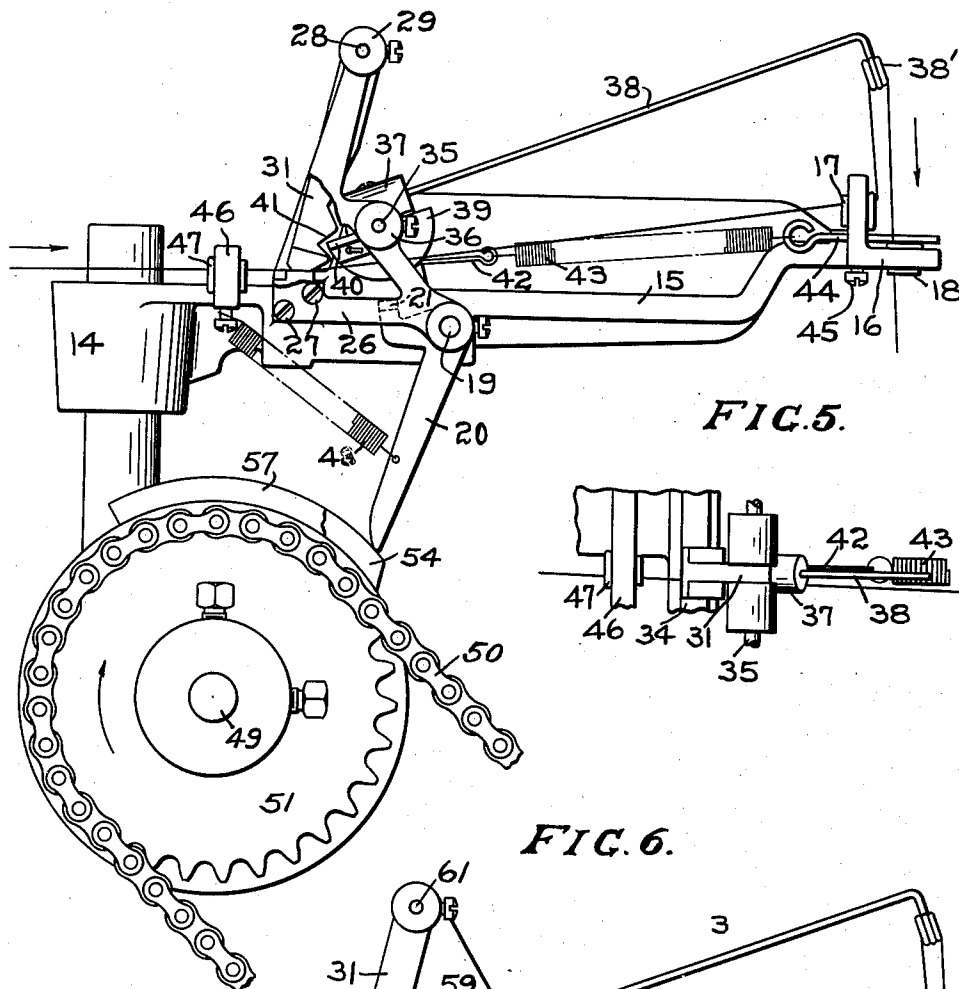


FIG. 5.

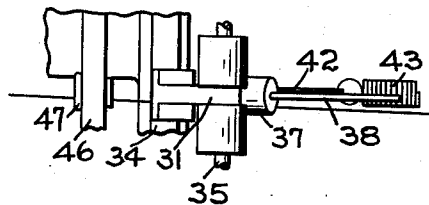
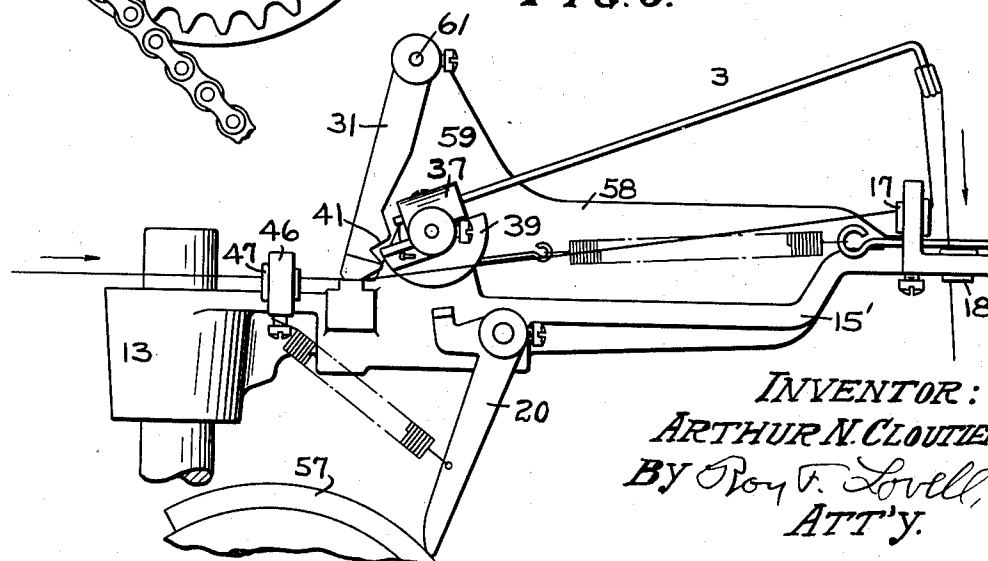


FIG. 6.



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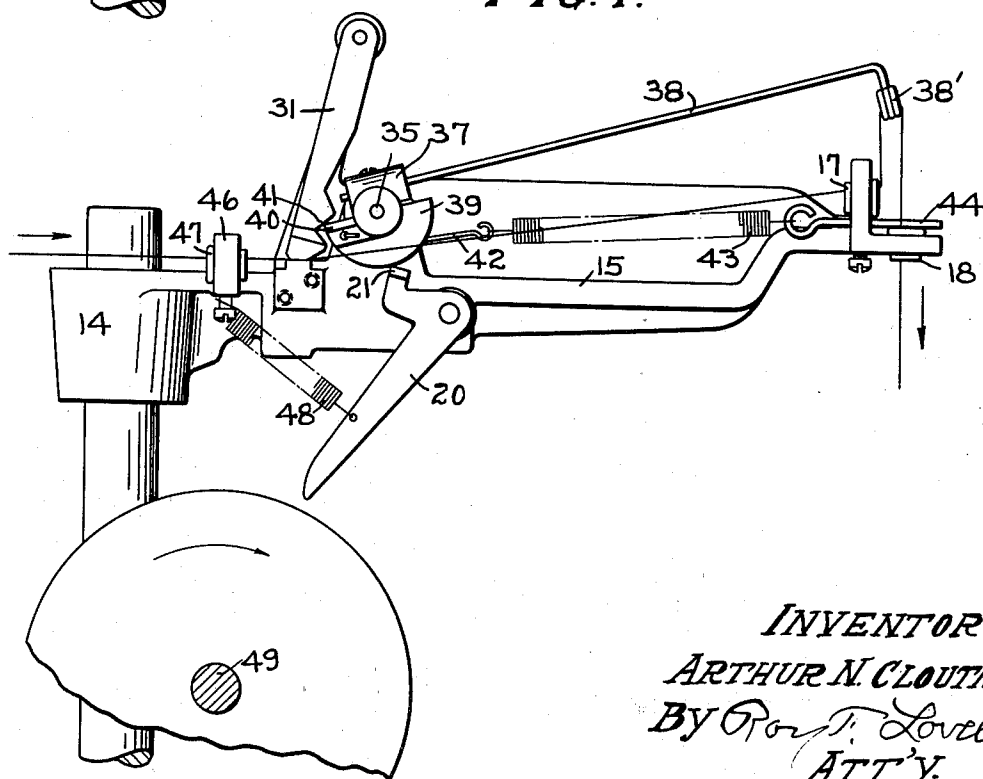
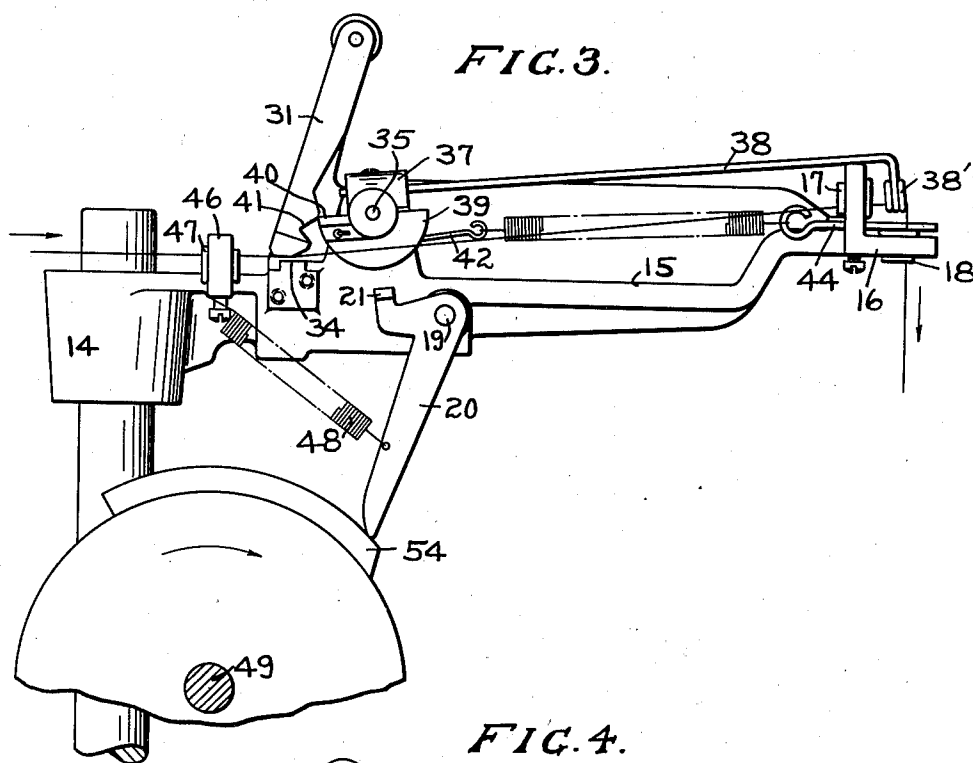
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3 Sheets-Sheet 3



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2,193,311

YARN TAKE-UP

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Application November 26, 1937, Serial No. 176,516

6 Claims. (Cl. 66—146)

This case concerns a take-up and controlling means therefor such as is used in knitting machines or other similar machinery. The device is illustrated and described with respect to one particular embodiment of the same as applied to a circular hosiery knitting machine.

In the figures of the drawings:

Fig. 1 is an elevation showing a plurality of take-ups and the attendant controlling mechanism as applied to a two-feed or split-foot type of hosiery knitting machine;

Fig. 2 is an elevation showing in detail one of the individual take-up devices and means for controlling the same;

Fig. 3 is a similar view showing the take-up in another position;

Fig. 4 is a similar view showing the parts in still another position;

Fig. 5 is a plan view showing certain parts of the device and how the yarn is threaded to pass through without interference; and

Fig. 6 is a view similar to Fig. 2 but showing a slight modification.

Take-up mechanisms of this general type have been known and applied to many types of knitting machines including Banner hosiery machines, however, certain improvements and advanced modes of operation are to be disclosed in this case. The yarn clamping device is much more positive in its action than that which has been employed heretofore. In this case I disclose for the first time mechanism for controlling and retaining the take-up arms in whatever position they occupy at a time when their respective yarns are withdrawn from feeding position. This is accomplished by a simple braking device operable by means of a pattern drum adjacent the take-up bracket. These improvements result in avoiding slack, since, when a yarn is withdrawn from action, appropriate cams on the drum will apply said brakes to their respective take-up arms to lock them in position. There will be no tendency for the take-up arms to draw back from the binder nor will there be any tendency to draw more yarn from the cone or other supply. Other advantages will appear as the disclosure continues.

Now referring to Fig. 1, a bracket generally indicated at 1 is fixed to the upper end of a post 2 which extends upwardly from the circular base of a machine. Beneath this bracket has been shown a ring 3 having guide openings therein through which several yarns are threaded, these yarns then being controlled to feed to needles by a plurality of yarn guides 4 or 5. The usual

latch ring 6 has been illustrated but other parts of the knitting machine are not shown since they play no important part in the present invention.

The ends of the bracket 1 have castings attached thereto which comprise the bearing lugs 7 and 8 and other enlarged portions 9 and 10 within which fit short vertical posts 11 and 12. These posts 11 and 12 carry at their upper ends brackets 13 and 14. The bracket 14 is of sufficient width to accommodate six separate yarn take-ups, guiding mechanism, yarn clamps and controlling levers for said clamps. Each of these six assemblies is adapted to control one feeding yarn, and since they are alike, a description of one will be sufficient. The bracket 14, as better illustrated in Fig. 2, extends forwardly in an arm 15 having at the forward end thereof an angular piece 16 with eyelets 17 and 18 through which the yarn is threaded. A shaft or spindle 19 extends crosswise of the bracket at about its midpoint. This spindle carries a plurality of bell crank levers 20 having offset ends 21, the function of which will be described in due course. Each of the levers 20 is held in proper position by a spacer 22 and by the collars 23 and 24 at the ends of spindle 19. End plates 25 and 26 also engage the ends of spindle 19 and are further held at the ends of the bracket by screws 27, Fig. 2.

These end plates 25 and 26 are somewhat triangular in shape and extend upwardly to terminate in bearing supports for a second spindle 28 which extends from one end of the assembly to the other. This spindle is also maintained in position by collars 29 and 30 and the usual set screws therein. A series of clamping levers 31, herein numbering six, are freely pivoted at their upper ends on this spindle. They are maintained in separated relationship by spacers 32 and collars 33. Each of these clamping levers is arranged to swing downwardly and to contact an anvil 34 which runs across the entire assembly and over which the yarn passes. The construction is such, as shown in Fig. 2, that the clamping lever 31 strikes the anvil 34 a few degrees before it would swing downwardly to a lowermost position. The result of this is that a yarn will be most effectively clamped between the two by the weight of the said lever, and further, the harder the yarn is drawn the tighter will be the clamping action.

A third spindle 35 engages within the bosses 36 about mid-way between the spindles 19 and 28. This spindle forms a suitable pivot for the blocks 37 within which the take-up arms 38 are clamped.

Each of these blocks 37 is formed with a semi-circular lower part 39 and with a widened part 40, the latter functioning in contact with a cam surface 41 on the corresponding lever 31 to lift the lever or cam it away from the anvil whenever the take-up arm 38 is pulled downwardly to approximately its horizontal position.

Each take-up arm 38 is bent downwardly at its outer end and is provided with an eyelet 38'. Each of the blocks has a wire hook 42 connected at the under side of the widened part 40 and to this wire hook is connected a spring 43 fixed at its other end to a second and adjustable hook 44. These hooks 44 are adjustable by clamping screws 45 so that the tension in springs 43 may be varied. Normally the spring 43 will pull the take-up arm upwardly. A cross-piece 46 has eyelets 47 aligning with each of the assemblies and through which the yarn is threaded just before it passes over the anvil and beneath the clamping lever. This yarn then passes to the side of spring 43 as shown in Fig. 5, through eyelet 17, then through the end of the take-up arm at eyelet 38' and down through eyelet 18 and thence to the yarn guides, etc.

Each of the bell crank levers 20 has a spring 48 under considerable tension running from a connected point in the lever to an attaching hook or screw at the underside of the cross-piece 46. These springs 48 tend to draw all the bell crank levers 20 into a position such as shown in Fig. 4 wherein the offset ends 21 will contact the arcuate surfaces or edges of semi-circular portions 39 of the blocks on which the take-up arms swing. When in the position of Fig. 4, the take-up arm will be maintained in that position by the frictional engagement or the braking action under the influence of the spring 48.

The bearing lugs 7 and 8 support a shaft 49 which is free to rotate therein but is driven by a chain 50 and sprocket 51, the said chain engaging a similar sprocket on the cam drum of the machine. This drive will be from the main cam drum or one of the main cam drums so that shaft 49 will rotate one turn for every complete turn of the main cam drum. That amounts to one rotation of the shaft 49 for each stocking knitted. The shaft adjacent its right hand end, Fig. 1, carries two drums 52 and 53 on which are arranged suitable cams for engaging the ends of levers 20. One of these cams is shown at 54, but it is to be understood that other cams would be used, the particular disposal of said cams being dependent upon the article knitted. When a cam 54 contacts a lever 20 the braking engagement of that lever with its particular take-up arm will be broken. This would occur whenever the yarn in question was moved to knitting position. Whenever that yarn was to be withdrawn, cam 54 would pass from beneath the lever 20 whereupon the take-up for that particular yarn would be locked and retained in position until the yarn was again introduced.

At the opposite or left hand side, Fig. 1, a modified form of bracket is shown for accommodating two take-ups. The take-ups themselves are the same as have been described above as are the levers for clamping the yarn and the control for those levers comprising the elements 20, etc. At this side of the machine there are two cam discs 55 and 56, disc 56 being shown with a cam 57 functioning upon the bell crank lever 20 at that side. Fig. 6 shows these elements in greater detail.

The bracket 13 and the arm 15' at this side are supplemented by a web 58 which extends upwardly at 59 and terminates in a sort of bearing hub 60. A short spindle 61 passes through this bearing and serves as a pivot for the upper ends of the clamping levers 31. Collars 62 and 63 are fixed to the spindle 61 to limit the movement of said levers 31 axially of the spindle.

In operation the yarn is threaded as before stated through eyelet 47, between the widened end of a lever 31 and the anvil 34, then through eyelets 17, 38' and 18 and to the knitting instrumentalities or other elements whereat the said yarn is to be knitted or treated. Whenever the yarn is drawn it will pull the take-up arm 38 downwardly to a position such as shown in Fig. 3. The widened portion 40 beneath the block 37 will then engage the inclined cam surface 41 or lever 31 to swing it away from the anvil 34 so that the yarn may run freely through the guides. At such time a cam 54, 57 or other similar cam will engage beneath lever 20 so that the offset portion 21 will not engage the braking surface 39. If the yarn is being knitted continuously the elements will remain in the position of Fig. 3 so long as the knitting continues. If the yarn is being knitted intermittently as for splicing, or the like, the take-up arm 38 will be swung upwardly by spring 43 to provide proper take-up action.

Now if the yarn is to be withdrawn at the needles or in some similar manner, the take-up arm 38 will move upwardly from the position of Fig. 3 to a position such as shown in Fig. 4. At that time the lever 31 will swing downwardly and will clamp or bind the yarn against the anvil 34. The movement of the drum and cams such as cam 54 will be so timed that just at this instant the lever 20 will be released by the cam so that spring 43 may draw the offset projection 21 into engagement with the braking surface 39. This assures that the take-up arm will be held in the position it occupied just as the yarn was withdrawn and clamped. This position will be maintained until the yarn is again to be fed to the needles or other instrumentalities. The illustration of Fig. 4 shows the parts in the position occupied quite some time after the yarn has been withdrawn.

If the yarn is withdrawn at a time when take-up arm 38 happened to be in some position above that of Figs. 3 and 4 the same method of operation would apply, that is, the cam would release lever 20 and the take-up arm would be locked in whatever position it happened to be in at the time lever 20 was released.

When the take-up ceases to act as at the end of a section of splicing, heel or toe, there has been a tendency for it to fly up too abruptly and for the yarn to catch about the end of the arm. This is entirely eliminated by use of the mechanism herein disclosed.

The invention has been described in more or less specific terms for the purpose of illustrating one specific embodiment of the same but the disclosure is not to be limited thereby since changes may be resorted to which fall within the original intent of the inventors and within the scope of the invention. The invention is defined in the appended claims.

I claim:

1. In a knitting machine, yarn take-up means movable to different positions including a swinging arm resiliently moved in one direction, means for retaining said arm in a plurality of its posi-

tions and pattern control for said retaining means.

2. In a knitting machine, yarn take-up mechanism including a swinging arm movable to different positions, resilient means for swinging said arm in one direction, friction means for retaining said take-up arm in a plurality of its several positions and pattern control means including a pattern drum and cams thereon for withdrawing said retaining means whenever yarn is to be fed and the take-up is to be effective.

3. In a knitting machine the combination of a yarn take-up movable to different positions, yarn clamping means releasable by said take-up, a braking surface on said take-up, spring pressed means for engaging said braking surface and retaining said take-up in a plurality of its several positions and pattern control means for disengaging said retaining means from the braking surface.

4. In a knitting machine the combination of a yarn take-up including a pivoted arm, a frictional braking surface functioning with said pivoted arm, restraining means operable on said braking surface, means for applying said re-

straining means to the braking surface and pattern control means for determining when said restraining means is to function on the braking surface and for withdrawing it from the surface as desired.

5. Yarn take-up means for a knitting machine or the like including a take-up arm, a block to which said arm is connected and upon which it may pivot, a braking surface associated with said block and braking means including a pivoted element having a portion for engagement with said braking surface, resilient means for moving said pivoted element in engagement with the braking surface and pattern control means for retaining it out of such engagement.

6. A take-up means for a knitting machine or the like including a take-up arm, means to which said arm is connected and upon which it may pivot, said means including a braking surface, braking means movable to and from engagement with said braking surface and pattern means operable to regulate the engagement of said braking means with said surface.

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