R. W. SCOTT & H. SWINGLEHURST.

TAKE-UP MECHANISM FOR KNITTING MACHINES.

APPLICATION FILED MAY 27, 1907.

920,671.

Patented May 4, 1909.

3 SHEETS—SHEET 1.

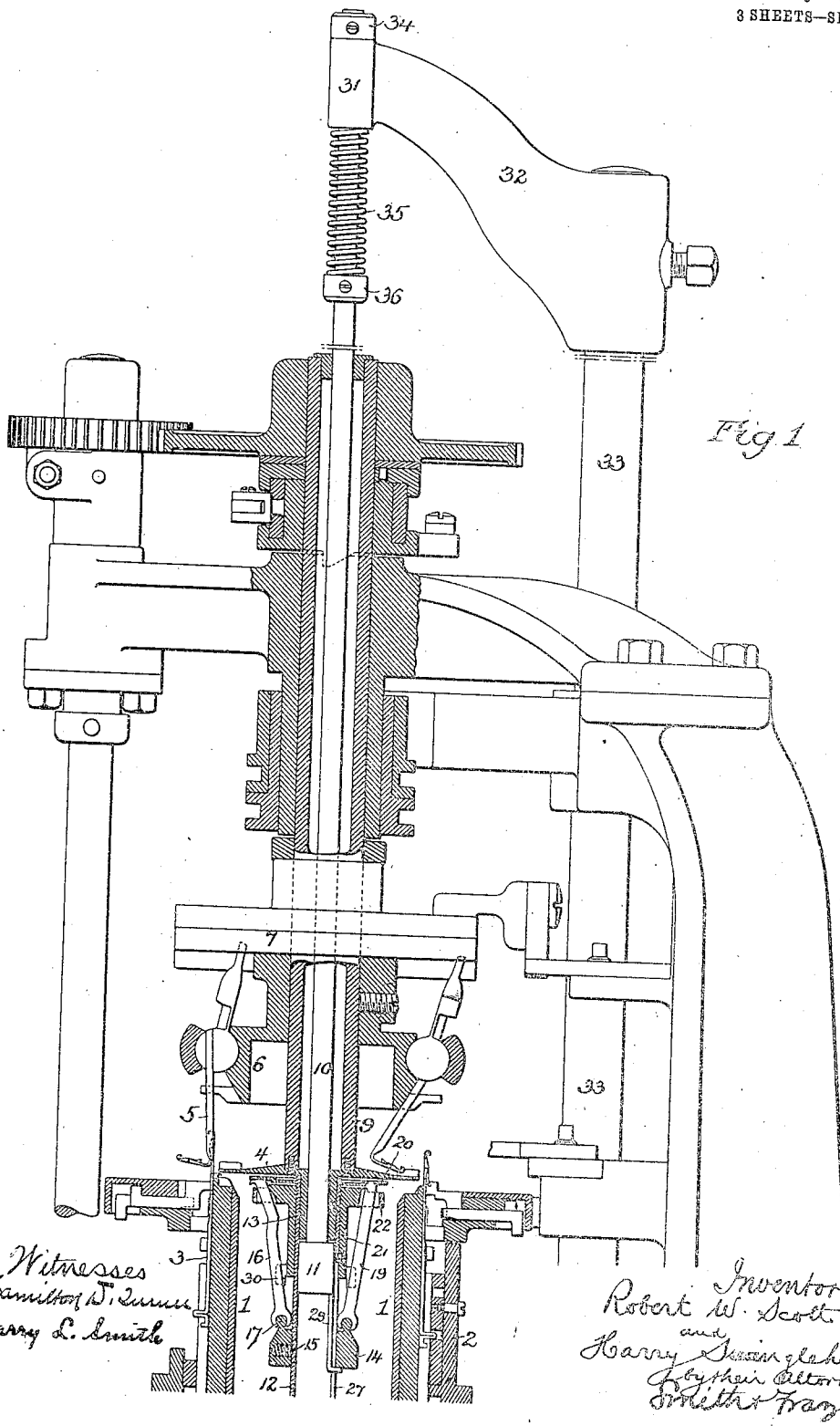


Fig 1

Witnesses
Hamilton D. Lunn
Harry L. Smith

Inventors
Robert W. Scott
and
Harry Swinglehurst
by their Attorneys
Smith & Frazier

R. W. SCOTT & H. SWINGLEHURST.

TAKE-UP MECHANISM FOR KNITTING MACHINES.

APPLICATION FILED MAY 27, 1907.

920,671.

Patented May 4, 1909.

3 SHEETS—SHEET 2.

Fig. 2.

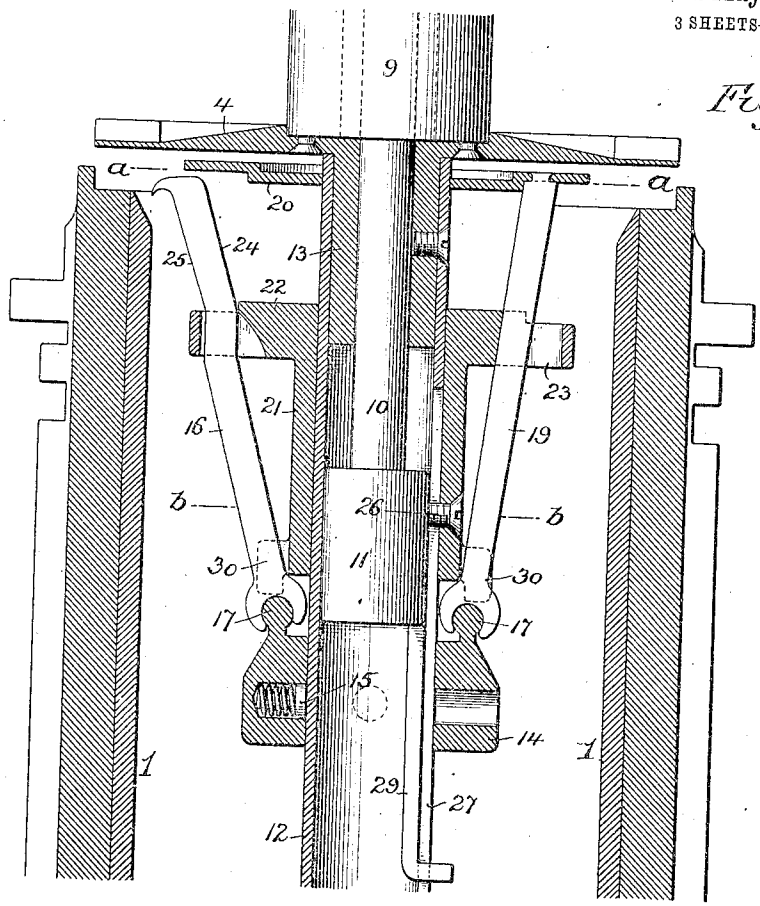


Fig. 3.

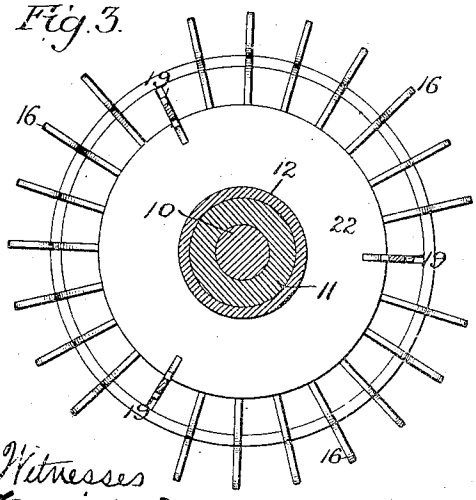
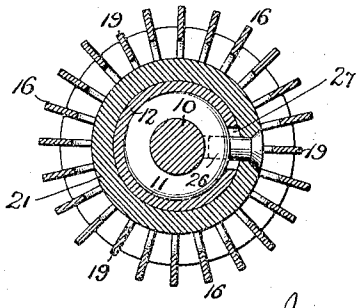


Fig. 4.



Witnesses
Hamilton D. Turner
Harry L. Smith

Inventors
Robert W. Scott
and
Harry Swinglehurst
by their Attorneys
Smith & Frazier

R. W. SCOTT & H. SWINGLEHURST.

TAKE-UP MECHANISM FOR KNITTING MACHINES.

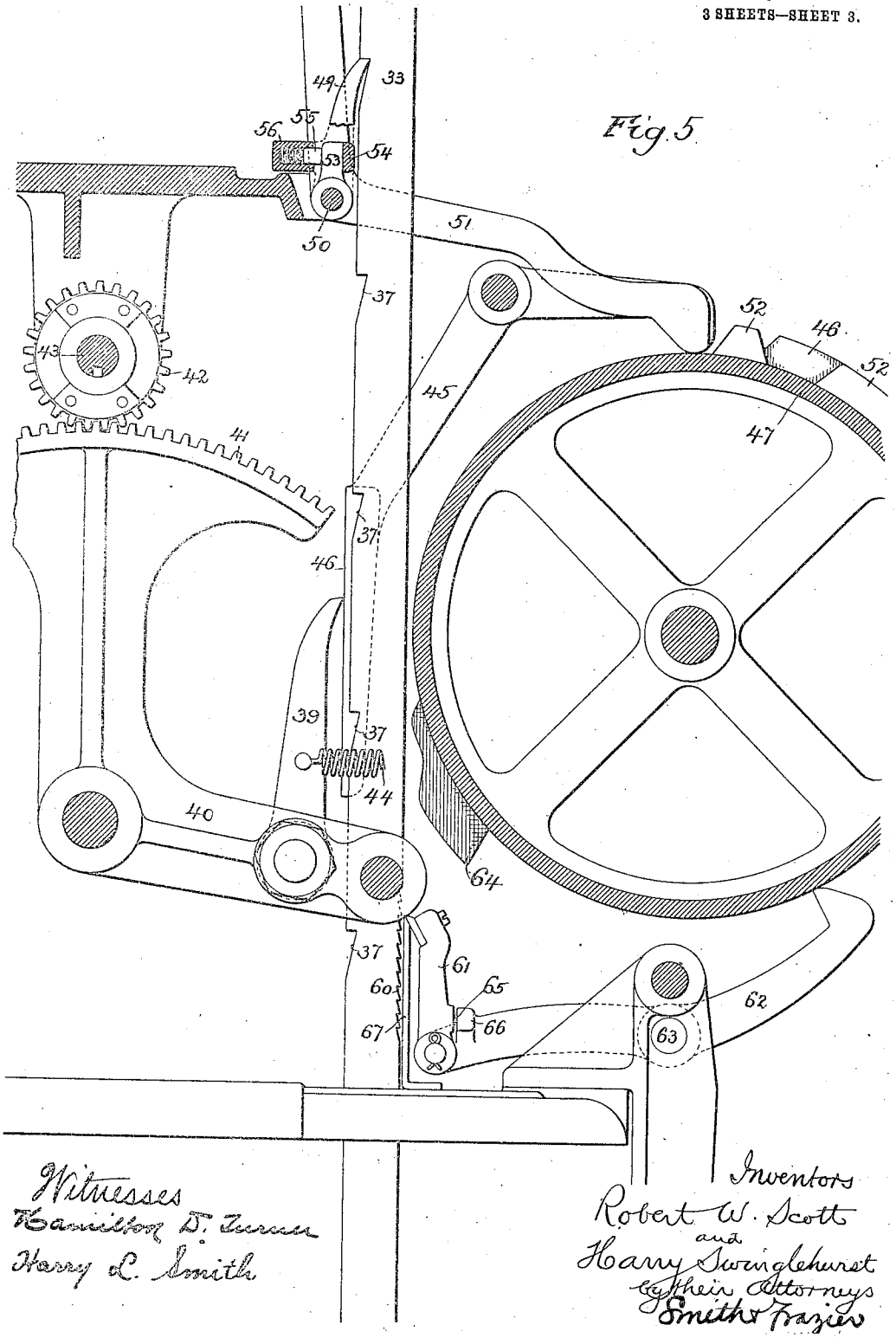
APPLICATION FILED MAY 27, 1907.

920,671.

Patented May 4, 1909.

3 SHEETS—SHEET 3.

Fig. 5



Witnesses
Hamilton D. Turner
Harry C. Smith

Inventors
Robert W. Scott
and
Harry Swinglehurst
by their Attorneys
Smith & Frazier

UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF LEEDS POINT, NEW JERSEY, AND HARRY SWINGLEHURST, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO SAID SCOTT AND LOUIS N. D. WILLIAMS, OF OGONTZ, PENNSYLVANIA, A FIRM.

TAKE-UP MECHANISM FOR KNITTING-MACHINES.

No. 920,671. Specification of Letters Patent. Patented May 4, 1909.

Application filed May 27, 1907. Serial No. 375,659.

To all whom it may concern:

Be it known that we, ROBERT W. SCOTT and HARRY SWINGLEHURST, citizens of the United States, and residing, respectively, in Leeds Point, Atlantic county, New Jersey, and Philadelphia, Pennsylvania, have invented certain Improvements in Take-Up Mechanism for Knitting-Machines, of which the following is a specification.

Our invention consists of a supplemental take-up device, which, while of general application, has been devised mainly for use in connection with that class of knitting machines in which the formation of ribbed web follows the formation of web with a pocket upon one side of the same. In knitting webs of this character the usual positive take-up which engages the web at a point below the needle cylinder cannot impart any tension to the rib stitches in that portion of the web which follows the pocket, since the latter is so slack that it provides no means for transmitting tension from a portion of the web in advance of it to the portion of the web which follows it. Our improved supplementary take-up, however, provides for imparting tension to the web following the pocket, the action of said supplementary take-up being independent of any tension imparted by the ordinary take-up mechanism of the machine.

In the accompanying drawings—Figure 1 is a side view partly in section of sufficient of a rib knitting machine to illustrate our invention; Fig. 2 is a sectional view on an enlarged scale of part of the take-up mechanism; Fig. 3 is a sectional plan view on the line *a*—*a*, Fig. 2; Fig. 4 is a sectional plan view on the line *b*—*b*, Fig. 2; and Fig. 5 is a view, partly in elevation and partly in section, upon the same scale as Fig. 1, and illustrating certain mechanism for effecting the automatic lift and release of the supplementary take-up device.

Referring in the first instance to Fig. 1 of the drawings, 1 represents the needle cylinder of a circular knitting machine, 2 the cam ring or cylinder surrounding said needle cylinder, 3 the cylinder needles, 4 a needle dial above the cylinder, 5 the ribbing needles cooperating with said dial, 6 a ring to which said ribbing needles are pivoted and 7 a cam ring whereby the ribbing needles are actuated. Neither of these features constitutes any part of our invention, nor is the latter limited in its application to a machine of this type, being applicable as well to rib knitting machines of other construction, but in which a supplementary take-up is required. We have not considered it necessary to illustrate the ordinary positive take-up device which is located below the cylinder of the machine, as this also forms no part of our invention and may be similar to any of the devices now used for the purpose.

Passing down through a hollow spindle 9 which carries the ribbing needle dial 4 is a rod 10, having, at its lower end, a head 11, which can slide freely in a tube 12, secured to and depending from the downwardly projecting hub 13 of the dial 4, and surrounding this tube 12 is a ring 14 provided with a spring actuated friction plug 15 which bears upon the tube 12 and prevents any slipping of the ring 14 thereon except when it is subjected to pressure sufficient to overcome the frictional hold of said plug 15 upon the tube 12.

To the ring 14 are pivoted a series of web-engaging hooks 16, such pivotal engagement being effected in the present instance by forking the lower end of each hook and fitting the same upon a segmental rib 17 formed on the upper portion of the ring 14, said rib having likewise mounted upon it a series of struts 19 whose upper ends support an annular plate 20 located just above the tops of the hooks 16, as shown in Fig. 2.

Free to slide on the tube 12 is a sleeve 21 having, at the top, a flange 22 in which are formed slots 23 for the passage of the web-holding hooks 16 and struts 19, the slots for the reception of the latter being so formed that vertical movement of the sleeve 21 and its flange 22 will not exert any pressure upon the struts. Such vertical movement, will, however, effect expansion and contraction of the series of web-holding hooks 16, the inner walls of the slots acting upon the inclined backs 24 of the hooks to cause projection of the latter when the sleeve 21 is depressed and the outer walls of the slots acting upon the inclined outer faces 25 of the hooks to cause

retraction of the same when the sleeve 21 is raised on the tube 12.

The head 11 of the rod 10 is connected to the sleeve 21 by means of a set screw 26 passing through a slot 27 in the tube 12, and through said slot also passes the hooked lower end of a gib or key 29 which is attached to the head 11, the length of this gib or key being such that a certain amount of vertical movement of the sleeve 21 is permitted independently of any like movement of the ring 14, downward movement of said ring on the tube 12 being effected by contact of a slotted flange 30 on the sleeve with the segmental rib 17 of the ring, and vertical movement of said ring being caused by contact therewith of the hooked lower end of the gib 29.

The parts are normally in the position shown in Fig. 1, the web-engaging hooks 16 being retracted and the sleeve 21 being raised to a point some distance above the ring 14 which is in contact with the hooked lower end of the gib 29. The first effect of the downward movement of the rod 10 therefore is to cause depression of the sleeve 21 and its slotted flange 22, thereby causing projection of the upper ends of the web-engaging hooks 16 so as to cause the same to engage with the web, the hooks then descending with the flanged sleeve so as to impart the desired tension to the web. When it is desired to release the web from this tension the rod 10 is lifted, the first portion of this movement being imparted to the flanged sleeve 21 only, so as to cause the retraction of the web-engaging hooks 16, and the hooked lower end of the gib 29 then engaging with the ring 14 so as to cause the web-engaging hooks to partake of any further lifting movement of the sleeve.

The upper end of the lifter rod 10 passes through a tubular boss 31 on an arm 32, which projects from the upper end of a lifter post 33 at one side of the machine, said boss 31 engaging with a collar 34 at the upper end of the lifter rod 10 and also bearing upon a coiled spring 35 interposed between the boss and a collar 36, secured to the rod 10 some distance below its upper end, whereby downward movement of the post 33 is transmitted to the rod 10 through the medium of this coiled spring 35, and any sudden downward strain upon the web, when the hooks 16 first engage with the same, is thereby prevented.

The lifter post 33 has, in its lower portion, side notches or teeth 37 for engagement with a pawl 39 pivotally mounted upon a swinging lever 40 which has a toothed segment 41 engaging with a pinion 42 on the shaft 43 which drives the cam cylinder or needle cylinder, depending upon which of these elements of the machine is the moving element, this lever 41 being an ordinary member of a machine of that type in which the needle cylinder or cam cylinder has both rotating and reciprocating or to-and-fro movement.

The pawl 39 is drawn into engagement with the toothed portion of the post 33 by means of a coiled spring 44, which may be attached to any convenient fixed part of the machine, and when it is in engagement it imparts lifting movement to the post and hence to the lifter rod 10 of the take-up device, but when the desired amount of lift has been imparted to the post 33 the pawl is moved out of engagement with the toothed portion of the same by means of a lever 45 having a face 46 in contact with which the point of the pawl travels when it is thus inoperative, said lever 45 being controlled by a suitable cam 46 on the pattern drum 47 of the machine.

When the pawl 39 is out of engagement with the toothed portion of the lifter post 33 the latter is supported upon a catch pawl 49 loosely hung upon a rock shaft 50 to which is secured a lever 51 acted upon by lugs 52 on the pattern drum 47, said shaft 50 having an arm 53 which is confined between a lug 54 on the pawl 49 and a spring-actuated plug 55 guided in a socket 56 on said pawl, as shown in Fig. 5. When, therefore, it is desired to release the post 33, in order to permit descent of the supplementary take-up device, the lever 51 is lifted by means of the lug 52 on the pattern drum, and this causes the arm 53 to depress the plug 55 and thus, through the medium of the spring which backs the plug, impart pressure to the socket 56 and withdraw the pawl 49 from engagement with the tooth of the post 33, the latter being then free to descend by gravity with the knitted web which is engaged by the hooks 16 of the take-up device. When the take-up has descended to the proper extent the lever 45 is withdrawn from engagement with the pawl 39 and lifting movement is then again imparted to the post 33, which lifting movement continues until the lever 45 again renders the pawl 39 inoperative, whereupon the catch pawl 49 comes into play to retain the post 33 in its raised position, the lever 51 having meantime passed from under control of its lug 52.

In order to temporarily arrest the descent of the supplementary take-up, as may be necessary in certain stages of the production of the web, the lifter post 33 has a second set of teeth 60 formed thereon, which teeth are adapted to be engaged by a pawl 61 pivotally mounted upon a lever 62 which is hung to a fixed fulcrum 63 on the frame of the machine and is acted upon by a lug 64 on the pattern drum 47, said pawl 61 being normally pressed forwardly or into position to engage with the teeth 60 by means of a

spiral spring 65 interposed between a socket on the pawl and a lug 66 on the lever 62. Normally, however, that is to say, during all that time when the lever 62 is not under the influence of the lug 64, the pawl 61 is held out of engagement with the lifter post 33 by the action of a deflector bar 67 which presses upon the tooth at the upper end of the pawl 61 and forces the same out of engagement with the teeth 60.

The lug 64 shown in Fig. 5 has two rises, so that the pawl 61 not only arrests the descent of the supplementary take-up device but also backs off the same, the second rise of the lug serving to impart lifting movement to the pawl 61 after it has engaged the teeth 60.

The function of the disk 20 at the top of the web-engaging hooks 16 is to prevent the loose or pocketed portion of the web from passing behind the hooks or otherwise so disposing itself as to prevent said hooks from properly engaging with the web when they are projected after the formation of said pocket has been completed.

We claim:—

1. The combination of a rib knitting machine having a needle dial with tubular stem with a supplementary take-up device and automatic means for raising and releasing the same, said means including a connection passing through said tubular stem.

2. The combination of a rib knitting machine having a needle dial with tubular stem with a supplementary take-up device, and automatic means for raising and releasing the same, said take-up device being free to descend by gravity when thus released, and its raising means including a connection passing through the tubular stem of the needle dial.

3. The combination of a rib knitting machine with a supplementary take-up device, and means for raising and releasing the same, said device comprising two members with an interposed spring.

4. The combination of a rib knitting machine with a supplementary take-up device, and means for raising and releasing the same, said device comprising two members, both free to descend by gravity when thus released, and an interposed spring through which the force of one descending member is exerted upon the other.

5. A supplementary take-up device for knitting machines comprising web-engaging hooks, a member to which said hooks are pivoted, and expanding an contracting member for said hooks having movement independent of the pivotal member, and means whereby one of said members is caused to impart movement to the other in both directions.

6. A take-up device for knitting machines comprising a vertical support, a series of web-engaging hooks, a pivotal member for the latter frictionally mounted upon said support, and an expanding and contracting member for the hooks movable on said support independently of the pivotal member.

7. A take-up device for knitting machines comprising a vertical support, a series of web-engaging hooks, a pivotal member for the latter frictionally mounted upon said support, and an expanding and contracting member for the hooks movable on said support independently of the pivotal member but engaging said pivotal member to cause joint movement in both directions.

8. A take-up device for knitting machines comprising a series of web-engaging hooks, means for raising and lowering the same, means for expanding and contracting the hooks, and a guard plate or shield above the hooks.

9. A take-up device for knitting machines comprising a vertical support, a series of web-engaging hooks, a pivotal member and an expanding and contracting member for said hooks movably mounted upon said support, and a gravity rod for effecting such movement.

10. A take-up device for knitting machines comprising a vertical support, a series of web-engaging hooks, a pivotal member and an expanding and contracting member for said hooks movably mounted upon said support, a gravity rod for effecting such movement, and automatic means for raising and releasing said rod.

11. The combination of a supplementary take-up device for knitting machines, means for automatically raising and releasing the same, and supplementary means for arresting its descent, and imparting an independent lift to it.

12. The combination in a supplementary take-up device for knitting machines, of a toothed rod forming one of the elements of said take-up device, a vibrating member of the machine carrying a pawl for engaging said toothed rod, and means for rendering said pawl operative or inoperative.

13. The combination in a supplementary take-up device for knitting machines, of a toothed rod forming one of the elements of said take-up device, a vibrating member of the machine carrying a pawl for engaging said toothed rod, means for rendering said pawl operative or inoperative, and a catch pawl for retaining the rod in the elevated position.

14. The combination in a supplementary take-up device for knitting machines, of a toothed rod forming one of the elements of said take-up device, a vibrating member of the machine carrying a pawl for engaging said toothed rod, means for rendering said

pawl operative or inoperative, a catch pawl for retaining the rod in the elevated position, and means acting through the medium of a spring for throwing said pawl out of engaging position.

15. The combination in a supplementary take-up device for knitting machines, of a rod forming part of said device, means for raising and releasing said rod, and a supplementary support for said rod comprising a pawl for engaging the rod, and means for automatically releasing said pawl from engagement with the rod.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

ROBERT W. SCOTT.
HARRY SWINGLEHURST.

Witnesses:
HAMILTON D. TURNER,
KATE A. BEADLE.