

(No Model.)

2 Sheets—Sheet 1.

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STOP MOTION FOR KNITTING MACHINES.

No. 565,134.

Patented Aug. 4, 1896.

FIG. 1.

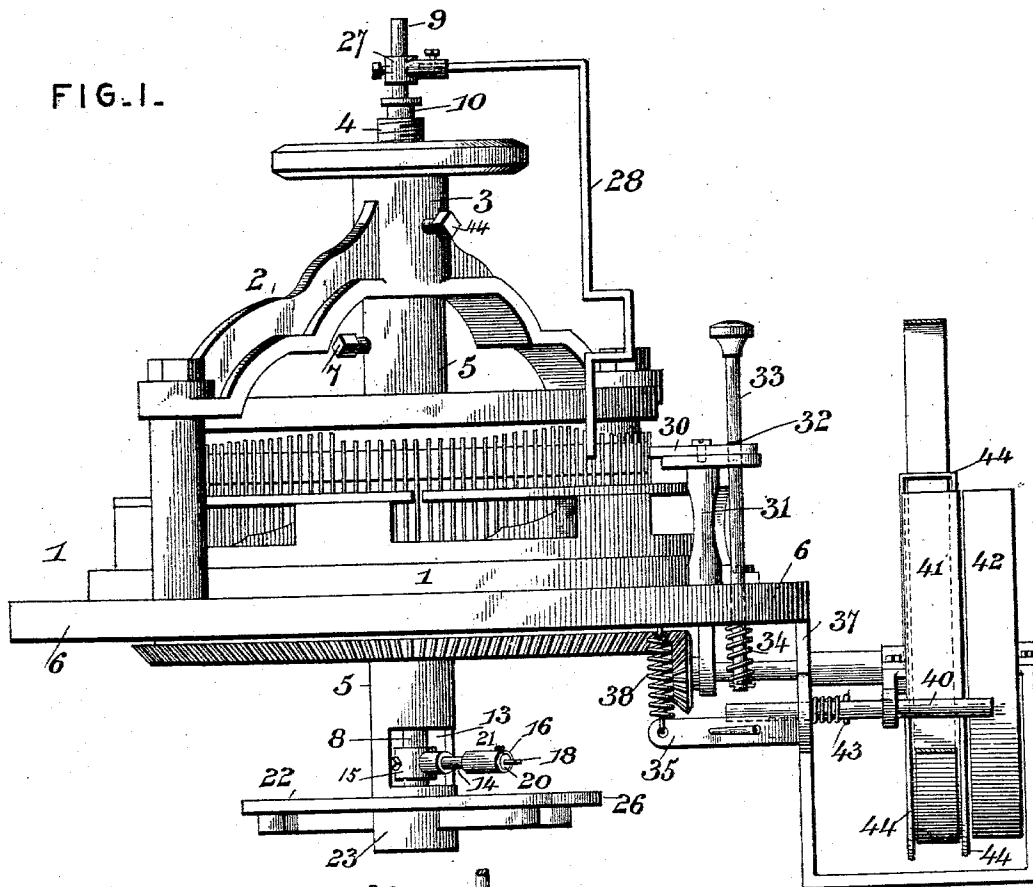
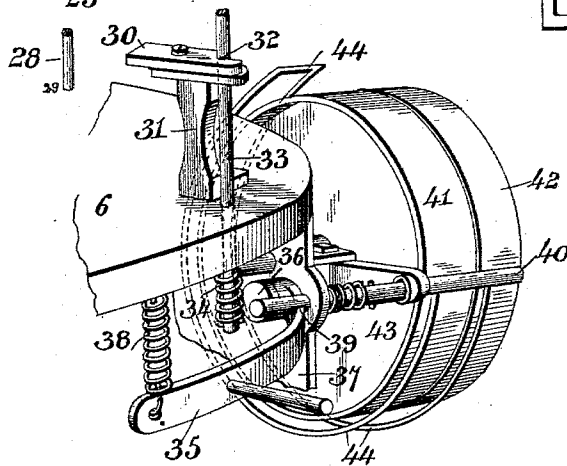


FIG. 5.



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# UNITED STATES PATENT OFFICE.

WILLIAM COBB AND AZOR P. RICKMYER, OF PERRY, NEW YORK.

## STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 565,134, dated August 4, 1896.

Application filed July 31, 1896. Serial No. 557,735. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM COBB and AZOR P. RICKMYER, citizens of the United States, residing at Perry, in the county of Wyoming and State of New York, have invented a new and useful Stop-Motion for Knitting-Machines, of which the following is a specification.

This invention relates to stop-motions for knitting-machines; and it has for its object to provide a simple and efficient motion of this character designed for use in connection with any circular-knitting machine having a cylinder and dial, and is adapted to provide positive means for stopping the machine when there are any drop-stitches, cuts, or run-downs in the fabric which are caused by rough or imperfect needles.

To this end the main and primary object of the invention is to provide a positively-operating stop motion or mechanism that can be fitted on any circular-knitting machine having a cylinder or dial without changing or modifying the belt-shifting mechanism of such machines, inasmuch as machines of this character are provided with a trip or needle-protector device controlling the belt-shifting mechanism, and which is ordinarily operated by any bunching which occurs on the needles.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangements of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a side elevation of a circular-knitting machine equipped with the herein-described stop-motion. Fig. 2 is a central vertical sectional view of the same. Fig. 3 is a detail in perspective of the spreading-ring. Fig. 4 is a detail sectional view at the outer end of the swinging feeler-arm. Fig. 5 is a detail perspective view of the belt-shifting mechanism of the machine.

Referring to the accompanying drawings, 1 designates a circular-knitting machine of that type employing a cylinder and a dial, and said knitting-machine is provided at the top with the usual arched cross bar or brace 2, which is provided with a central collar 3, that receives and holds by set-screw 44 the

upper end of the bearing-tube 4, which forms a part of the present invention.

The bearing-tube 4 is suitably fitted at its upper end in the collar of the cross bar or brace 2, and the lower end of said bearing-tube is fitted in the upper open end of the hollow cylindrical boxing 5, which is arranged centrally within the knitting-machine, and extends below the plane of the base-plate 6 of said machine. The upper end of the hollow cylindrical boxing 5 is held securely fastened on the lower end of the tube 4, which fits therein, by means of a set-screw 7, passed through the boxing 5 and impinging against the tube 4, which latter forms a bearing for the oscillating vertical stop-shaft 8.

The oscillating vertical stop-shaft 8 extends the entire length of the bearing-tube 4 and the boxing 5, and is suitably stepped at its lower end, as at 8<sup>a</sup>, on the lower closed end of the said boxing, so that the said shaft will be steadily supported in position in order that the same will freely oscillate back and forth during the operation of the stop mechanism. The upper end portion of the vertical oscillating stop-shaft 8 is reduced, as at 9, and extends through and above a relatively-fixed sleeve 10, fitted in the extreme upper end of the tube 4, and having attached thereto one end of a coiled spring 11, the other end of which spring is connected, as at 12, to the shaft 8 to provide for turning or rotating said shaft 8 in one direction, and thereby hold the same in the proper normal position.

The hollow cylindrical boxing 5, which accommodates therein the vertical stop-shaft 8, is provided at or near its lower end with a widened side opening 13, in which works the swinging feeler-arm 14. The swinging feeler-arm 14 is connected at its inner end to the shaft-collar 15, adjustably fitted on the lower end of the shaft 8, and at its outer end the feeler-arm 14 is provided with the spring-barrel 16, in which is arranged the adjusting-spring 17. The adjusting-spring 17 is arranged to bear against the inner end of the feeler-finger 18, the outer end of which projects beyond the outer open end of the barrel 16 and is loosely fitted in the longitudinal opening in the tension-block 20. The tension-block 20 is fitted in the outer open end of the

barrel 16 and is adjustably secured in position within the barrel by means of the set-screw 21, to provide means for properly adjusting the tension of the spring 17, so that the finger 18 will be held projected a proper distance beyond the outer end of the barrel 16, carried by the swinging feeler-arm 14.

The knitted fabric passes below the base-plate of the knitting-machine and over a spreading-ring 22, which is arranged in a position below the plane of the movement of the swinging feeler-arm 14. The said spreading-ring 22 is provided with a central hub or collar 23, which is detachably and adjustably fitted by means of the set-screw 24 on the short supporting-post 25, projected from the lower end of the boxing 5. The ring 22 is arranged so that the feeler-finger 18 follows the peripheral edge thereof in its swinging movement, and at a suitable point the said ring 22 is provided with a peripheral cam-releasing projection 26, which provides for releasing or disengaging the fabric from the feeler-finger 18 when the mechanism is operated to stop the machine, as will be more particularly referred to.

The upper end of the vertical stop-shaft 8 has fitted thereto a shaft-collar 27, to which is suitably connected one end of an angled stop-rod 28, the vertical portion 29 of which plays in a plane outside of the plane of the needles of the machine and is adapted to work against a short trip-lever 30. The short trip-lever 30 is commonly known on circular-knitting machines having the cylinder and dial as the "needle-protector" and is arranged in its usual position in proximity to the needles, so that if any bunching or imperfection occurs near the needles the bunch will catch against the trip-lever or needle-protector, and thereby provide for automatically stopping the machine.

The trip-lever or needle-protector 30 is pivotally mounted on the upper side of an upright supporting-bracket 31, fastened on the base-plate or table 6 of the knitting-machine, and normally engages in the notch 32, formed in one side of a vertically-moving spring-actuated trip-rod 33. The vertically-moving trip-rod 33 is arranged to work through guide-openings in the bracket 31 and the base-plate or table of the machine, and has arranged thereon, below the base-plate or table of the machine, an actuating-spring 34, which tends to normally move the rod downward and against the upper side of a latch-arm 35.

The latch-arm 35 is pivotally supported at one end, as at 36, on one of the supporting-uprights 37 of the machine, and the free end of the said latch-arm has connected thereto one end of a spring 38, which is weaker than the spring 34, and the other end of which spring 38 is fastened to the underside of the base-plate or table of the machine to provide for normally holding the arm 35 in an elevated position, so that the same will engage

in a catch-notch 39, formed in the inner end of the shifting-rod 40. The shifting-rod 40 is suitably supported at one side of the fast and loose pulleys 41 and 42, respectively, which are mounted on the usual drive-shaft which imparts motion to the knitting-machine, and the said rod 40 is normally moved in one direction by an actuating-spring 43 arranged thereon. At a suitable point the rod 40 has connected thereto the usual looped shifting-wire 44, which engages the drive-belt of the machine to provide for shifting the same from the fast to the loose pulley, and thereby provide means for stopping the machine. At this point it will be noted that while the wire 44 is the belt-shifter proper the belt-shifting mechanism comprises the group of parts 30, 33, 35, 40, and 44.

In operation the fabric passes over the spreading-ring 22, and in the event of the fabric being provided with drop-stitches, cuts, or run-downs caused by imperfect needles, the feeler-finger 18, which "feels" against the inner side of the fabric, will catch in such places and will thereby become engaged with the fabric. As the fabric continues to move around with the feeler-finger 18, engaged therewith, the arm 14 will be swung in one direction, so as to partially rotate the shaft 8 in a direction that carries the vertical portion of the rod 28 against the trip-lever or needle-protector 30. This movement of the rod 28 causes the lever 30 to become disengaged from the rod 33, which is forced down against the latch-arm 35, which becomes disengaged from the rod 40 and allows the same to be forced in a direction which shifts the belt from the fast to the loose pulley of the machine, thereby immediately stopping the latter until the imperfection in the fabric has been repaired. It will also be noted that at the time the rod 28 engages the trip-lever 30 the part of the fabric engaged by the feeler-finger will pass over the cam-releasing projection 26, which will throw the fabric away from the feeler-finger, so as to disengage it from the same, thereby allowing the spring 11 to turn the shaft 8 and swing the feeler-arm back to its normal position.

The many advantages of the herein-described stop motion or mechanism will be readily apparent to those skilled in the art, and it will be understood that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a stop-motion for knitting-machines, the combination with belt-shifting mechanism having a suitable trip, of a vertical stop-shaft carrying at its lower end a feeler-finger to engage imperfections in the fabric and at its upper end a swinging stop-rod to engage the trip of the belt-shifting mechanism, a

fixed cam projection supported outside of the path of the feeler-finger, and means for turning the stop-shaft in a direction to carry the feeler-finger away from the cam projection after the disengagement of the fabric from said finger, substantially as set forth.

2. In a stop-motion for knitting-machines, the combination with belt-shifting mechanism having a suitable trip, of a vertically-arranged oscillating stop-shaft, a swinging feeler-arm connected with the lower end of the shaft and carrying a feeler-finger to engage imperfections in the fabric, a fabric-spreading cam projection disposed outside of the path of the feeler-finger, and a swinging stop-rod connected with the upper end of the shaft and adapted to engage the trip of the belt-shifting mechanism, substantially as set forth.

3. In a stop-motion for knitting-machines, the combination with belt-shifting mechanism having a suitable trip, of a vertically-arranged oscillating stop-shaft, a feeler-arm adjustably connected with the lower end of the stop-shaft, a feeler-finger yieldingly supported at the outer end of the feeler-arm and adapted to engage imperfections in the fabric, a spreading-ring supported in a plane parallel with the feeler-arm and having a peripheral cam projection, and a stop-rod adjustably connected with the upper end of the shaft and adapted to engage the trip of the belt-shifting mechanism, substantially as set forth.

4. In a stop-motion for knitting-machines, the combination with belt-shifting mechanism having a suitable trip, of an upright cylindrical boxing having a closed lower end, a vertical oscillating stop-shaft arranged within the boxing and stepped at its lower extremity on the closed lower end of said boxing, a feeler-arm adjustably connected with the lower end of the stop-shaft and projecting through an opening in one side of the boxing, said feeler-arm being provided at its outer

end with a spring-barrel, a spring arranged in said barrel, a tension-block mounted for longitudinal adjustment in the outer end of the barrel and provided with a longitudinal opening, a feeler-finger slidably fitted in the opening of the tension-block and engaged at its inner end by said spring, and a stop-rod adjustably connected with the upper end of the stop-shaft and adapted to engage the trip of the belt-shifting mechanism substantially as set forth.

5. In a stop-motion for knitting-machines, the combination with belt-shifting mechanism having a suitable trip, and the top cross bar or brace of a circular-knitting machine; of a bearing-tube fitted at its upper end centrally to said top cross bar or brace, a hollow cylindrical boxing suspended from the lower end of the bearing-tube and provided in one side at its lower end with a widened side opening and with a short supporting-post projected therefrom, a vertical stop-shaft arranged in the bearing-tube and the cylindrical boxing, a swinging feeler-arm connected with the lower end of the shaft and working in the side opening of the boxing, said feeler-arm carrying at its outer end a feeler-finger, a stop-rod connected with the upper end of the shaft and adapted to engage against the trip of the belt-shifting mechanism, a spreading-ring fitted on the short post at the lower end of the boxing below the feeler-arm and provided with a peripheral cam-releasing projection, and a spring connected with the shaft to turn the same in one direction, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

WILLIAM COBB.  
AZOR P. RICKMYER.

Witnesses:

C. S. READ,  
A. H. TALLMAN.