P. C. KLINGLER.

STOP MOTION FOR CIRCULAR KNITTING MACHINES.

APPLICATION FILED AUG. 24, 1918.

1,292,803. Patented Jan. 28, 1919.

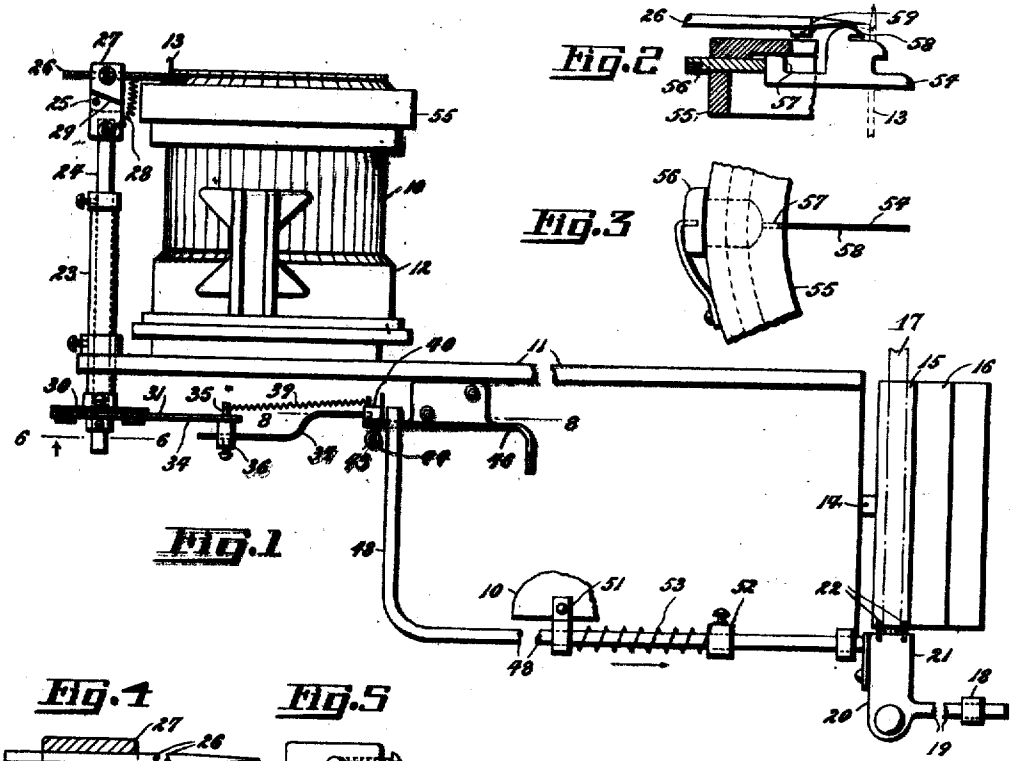


Fig. 1

Fig. 2

Fig. 3

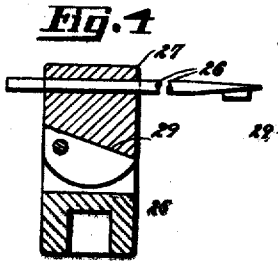


Fig. 4

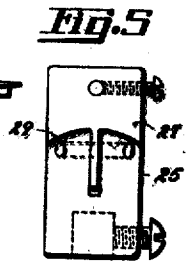


Fig. 5

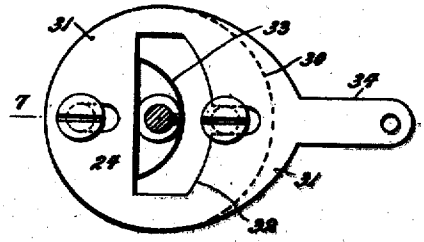


Fig. 6

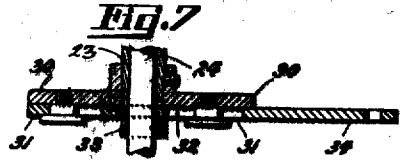


Fig. 7

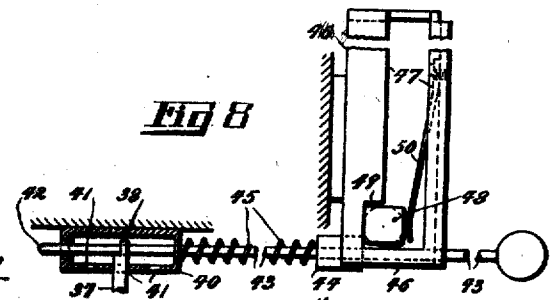


Fig. 8

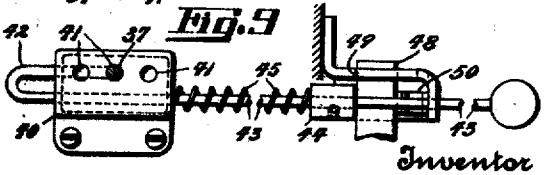


Fig. 9

Witness.
Alfred H. Bratton

Inventor
Paul C. Klingler

By Victor J. Evans
Attorney.

UNITED STATES PATENT OFFICE.

PAUL C. KLINGLER, OF TRENTON, NEW JERSEY.

STOP-MOTION FOR CIRCULAR-KNITTING MACHINES.

1,292,803. Specification of Letters Patent. Patented Jan. 28, 1919.

Application filed April 24, 1918. Serial No. 230,520.

To all whom it may concern:

Be it known that I, PAUL C. KLINGLER, a citizen of United States, residing at 146 Randall avenue, Trenton, in the county of Mercer and State of New Jersey, have invented new and useful Improvements in Stop-Motions for Circular-Knitting Machines, of which the following is a specification.

The invention relates to knitting machines and more particularly to the stop motion of a knitting machine, and has for an object to provide a stop motion for stopping the operation of the machine in the event of the breaking of a needle, or when the machine is stopped through some other cause, and it is desired that the operator's attention be called to the machine.

Among other features, the invention comprehends a stop motion for a knitting machine, in which the operation of the machine will be brought to a stop upon the breaking of the head of a needle, when a stocking or the goods being manufactured on the machine is pressed off, or in the event that a stocking is being made, when the heel or toe is cast off, the stop motion being so arranged that it will work on the forward or reverse stroke of the machine, and also stop the machine in the event that one of the sinkers breaks or becomes dislodged, the stopping of the machine being accomplished through the medium of suitable mechanism, which is actuated to move the belt of driving element from the driven pulley to the loose or idling pulley.

In the further disclosure of the invention, reference is to be had to the accompanying drawings, constituting a part of this specification, in which similar characters denote corresponding parts in all the views, and in which—

Figure 1 is a fragmentary side elevation of a knitting machine showing my device applied thereto.

Fig. 2 is a fragmentary enlarged sectional view through the frame of the machine, showing the normal position of one of the sinkers, and the prime moving element or rod.

Fig. 3 is a fragmentary plan view of the structure shown in Fig. 2 with the rod left out.

Fig. 4 is a fragmentary enlarged sectional longitudinal sectional view taken through the rod and support.

Fig. 5 is an end elevation of the structure shown in Fig. 4.

Fig. 6 is a horizontal sectional view taken on the line 6—6 looking in the direction of the arrow.

Fig. 7 is a vertical sectional view taken on the line 7—7 in Fig. 6.

Fig. 8 is a fragmentary sectional view taken on the line 8—8, in Fig. 1, and

Fig. 9 is a fragmentary plan view of the structure shown in Fig. 8.

Referring more particularly to the views, 10 indicates a knitting machine in its entirety, which is arranged to repose on a suitable frame 11 and includes the usual drum 12, one of the needles 13 thereof being shown projected from the upper end of the drum, and which position the needle will assume when it is broken, the driven shaft of the machine being indicated by the numeral 14, with the usual driven pulley 15 and idler pulley 16. A belt 17 is shown passing around one of the pulleys, namely, the driven pulley 15, and it will of course be understood that the pulley has connection with a suitable driving element, whereby the machine will be operated. Mounted to slide in a bearing 18 secured to the frame, is a stem or shaft 19 carrying a pulley-operating element 20, formed with a head 21 from which project a plurality of fingers 22 which straddle the belt 17, so that when the pulley-actuating element is moved, it will remove the belt 17 from the pulley 15 on to the idler pulley 16, and vice versa, as the case may be.

A tubular support 23 is suitably secured to the frame 11, and mounted to turn therein is an upstanding shaft 24, the upper end of which carries a rod support 25 for a rod 26, the rod 26 being horizontally arranged to project from a pivoted portion 27 of the support, and extending into the path of the broken needle 13 of the drum 12, so that as the drum rotates the broken needle will impart a horizontal turning movement to the rod 26, and by providing a connecting spring 28, the shaft 24 will of course be subjected to a torsional action. The pivoted portion 27 for supporting the rod 26, is provided in order that the rod can be swung into a position out of the plane of the drum when desired, and by having inclined abutting faces 29, the rod 26 will normally be held from moving downwardly beyond its normal horizontal plane.

The tubular support 23 depends below the

main part of the frame 11 and secured thereto is a supporting disk 30, on the under side of which is mounted to slide a plate 31, having a segmental opening 32 therein, and in which segmental opening is arranged to lie a semi-elliptical actuator 33 keyed to the shaft 24. An extension 34 of the plate 31 has pivotal connection with a stud 35, the lower part of which forms a coupling 36 for securing one end of a rod 37, which I preferably term a latch rod or bar, and which at its free end is formed with a notched portion 38, a suitable contractile spring 39 being connected to the stud 35 and to a housing 40 on the frame of the machine, so as to normally exert a pull on the plate 31 and hold the flat side of the semi-elliptical actuator 33 against the flat face of the plate formed by the segmental opening 32. The notched portion 38 of the latch bar 37 projects through one of the plurality of openings 41 in the housing 40, and engages a U-shaped end 42 of a bar 43 which extends outwardly from the housing, and at its free end carries a head 44, a suitable expansible helical spring 45 being arranged to encircle the bar 43, with one end abutting against the head 44, and one end abutting against the housing 40. A second housing 46 secured to the frame, and forming in fact a part of the housing 40, is provided with a longitudinal slot 47 in which is arranged to slide the end of an operating bar 48, which normally projects into a notched portion 49 in the housing, said notched portion forming a continuation of the slot 47, a suitable flat spring 50 being arranged to normally bear against the free end of the operating bar 48 to hold the same in the notched portion 49, and at which point the head 44 of the rod 43 will be in juxtaposition to the free end of the operating bar 48, as shown in Figs. 8 and 9. The operating bar 48 is mounted to slide in a suitable bearing 51 on the frame, and a collar 52 is secured on the operating bar, with an expansible helical spring 53 encircling the operating bar and having one end abutting against the bearing 51, and the other end abutting against and connected to the collar 52, so as to impart a movement to the bar 48 in the direction of the indicated arrow, which will be hereinafter more fully disclosed, thereby causing the other end of the operating bar 48, connected to the belt-actuator 20, to move said belt-actuator, and thus through the medium of the fingers 22 guide the belt 17 from the pulley 15 to the idler pulley 16.

Now assuming that the device is in the position shown in Fig. 1, and that either through the breaking of a needle head, such as the needle head 13, or the dislodgment or breaking of a sinker, such as the sinker 54, shown in Fig. 2, the needle or sinker is moved into the path of the horizontal rod 26, and it will be clear that a turning movement will be imparted to the rod in the continued rotation of the machine, and that thus the shaft 24 will be rotated, as has been described heretofore. This, it will be seen by referring to Figs. 1 and 6, will operate the semi-elliptical actuator 33, causing its flat face to bear against the flat face of the plate 31 and thereby slide the plate 31 on the disk 30. This horizontal pull imparted to the plate 31 will of course exert a pull toward the left on the latch bar 37, said pull being against the contractile action of the spring 39, and then, as shown in Figs. 8 and 9, the notched portion 38 of the latch bar will be removed from engagement with the U-shaped portion 42 of the bar 43, thereby permitting the spring 45 to act, and which spring pushing on the head 44, will move the head against the end of the bar 48 so as to move the latter against the action of the spring 50, bringing the free end of the bar 48 out of the notched portion 49 and into the main slot 47. At the moment the free end of the bar 48 is brought into the slot 47, it will be clear that the action of the spring 53 will impart a pull on that end of the rod to slide the same in along the slot 47 to the rear end thereof, and in so doing, the other end of the bar, connected to the belt-actuator 20, will cause the belt-actuator to be slid across from the positive or driven pulley 15 to the idler pulley 16, carrying the belt 17 with it, so that the belt will be removed to the idler pulley, and thus the machine will be brought to a stop.

From the foregoing description it will be seen that the operation of the mechanism of my stop motion is brought about normally by the horizontal rod 26, and that the movement of this rod is brought about by either the breaking of a needle head, or a sinker, or any other cause which will bring some part of the knitting machine or mechanism thereof, into the path of the rod, whereby the continued rotation of the drum will cause the part brought into the path of the rod, to engage and actuate the rod and impart a turning movement to it, which will bring about the rotation of the vertically disposed shaft 24, and it in turn will operate the semi-elliptical actuater 33 and so on, as described heretofore, to the point where the belt-actuator 20 will remove the belt from the positive or driven pulley 15 to the idler pulley 16. The mechanism described can of course be made very sensitive, and an adjustment of various parts thereof to insure proper operation of the stop motion, can be brought about by means of different forms and strengths of springs employed, and as an instance in Fig. 8, it will be seen that the latch bar 37 may be trained to pass through one of the other openings 41 rather than through the central openings, as shown, and

that this will of course change the tension or pull upon the rod 43, the adjustment of the mechanism depending entirely upon the amount of effort necessary to guide the belt over the driven pulley to the idler.

It is to be noted that the sinker ring 55, Figs. 2 and 3, is provided with a spring-controlled cam 56 over which the heel 57 of the sinkers 54 normally ride as the cylinder rotates, but in the event of said heel 57 breaking off, the sinker will be projected to the left of Fig. 2, and cause the head 58 thereof to actuate the rod 26, as hereinbefore explained. Furthermore, it is to be noted that I provide the rod 26 with a depending tooth 59 which will contact with the latch of the needle in the event of the heel breaking, or when a needle clogs up.

Although I have shown a particular form of my invention, it will be understood that I do not limit myself to the precise construction and description set forth; that various slight changes may be made from the disclosure without departing from the spirit of the invention, the scope of which is defined in the appended claims.

I claim:

1. A stop motion for a knitting machine, comprising in combination with an actuator associated with a driving or driven part of the machine, of a vertically disposed rotatable shaft, a rod-like finger supported on the shaft to be actuated by a part of the machine coming into the path of the finger and engaging the same whereby to turn said shaft, a plate, an operating element on the shaft to impart movement to said plate, a housing, a latch bar having connection with the plate to be actuated by the movement of the plate, said latch bar normally extending into said housing, a spring-engaged rod normally held against the action of the spring by the latch bar, a movable operating bar connected to the actuator to operate the same, said bar normally being locked against movement, and a head on the spring-engaged rod to engage the operating bar and move the same into unlocked position, when said spring-engaged rod is released by the movement of said latch bar.

2. A stop motion for a knitting machine, comprising in combination with an actuator associated with a driving or driven part of the machine, of a vertically disposed rotatable shaft, a rod-like finger supported on the shaft to be actuated by a part of the machine coming into the path of the finger and engaging the same whereby to turn said shaft, a plate, an operating element on the shaft to impart movement to said plate, a housing, a latch bar having connection with the plate to be actuated by the movement of the plate, said latch bar normally extending into said housing, a spring-engaged rod normally held against the action of the spring by the latch bar, a movable operating bar connected to the actuator to operate the same, said bar normally being locked against movement, a head on the spring-engaged rod to engage the operating bar and move the same into unlocked position, when said spring-engaged rod is released by the movement of said latch bar, and means connecting said finger with the shaft, for insuring the normal holding of the finger in position to be operated to impart rotation to the shaft.

3. A stop motion for a knitting machine, comprising in combination with an actuator associated with a driving or driven part of the machine, of a vertically disposed rotatable shaft, a rod-like finger supported on the shaft to be actuated by a part of the machine coming into the path of the finger and engaging the same whereby to turn said shaft, a plate, an operating element on the shaft to impart movement to said plate, a housing, a latch bar having connection with the plate to be actuated by the movement of the plate, said latch bar normally extending into said housing, a spring-engaged rod normally held against the action of the spring by the latch bar, a movable operating bar connected to the actuator to operate the same, said bar normally being locked against movement, a head on the spring-engaged rod to engage the operating bar and move the same into unlocked position, when said spring-engaged rod is released by the movement of said latch bar, and a spring connecting said finger with the shaft, for insuring the normal holding of the finger in position to be operated to impart rotation to the shaft.

In testimony whereof I affix my signature.

PAUL C. KLINGLER.