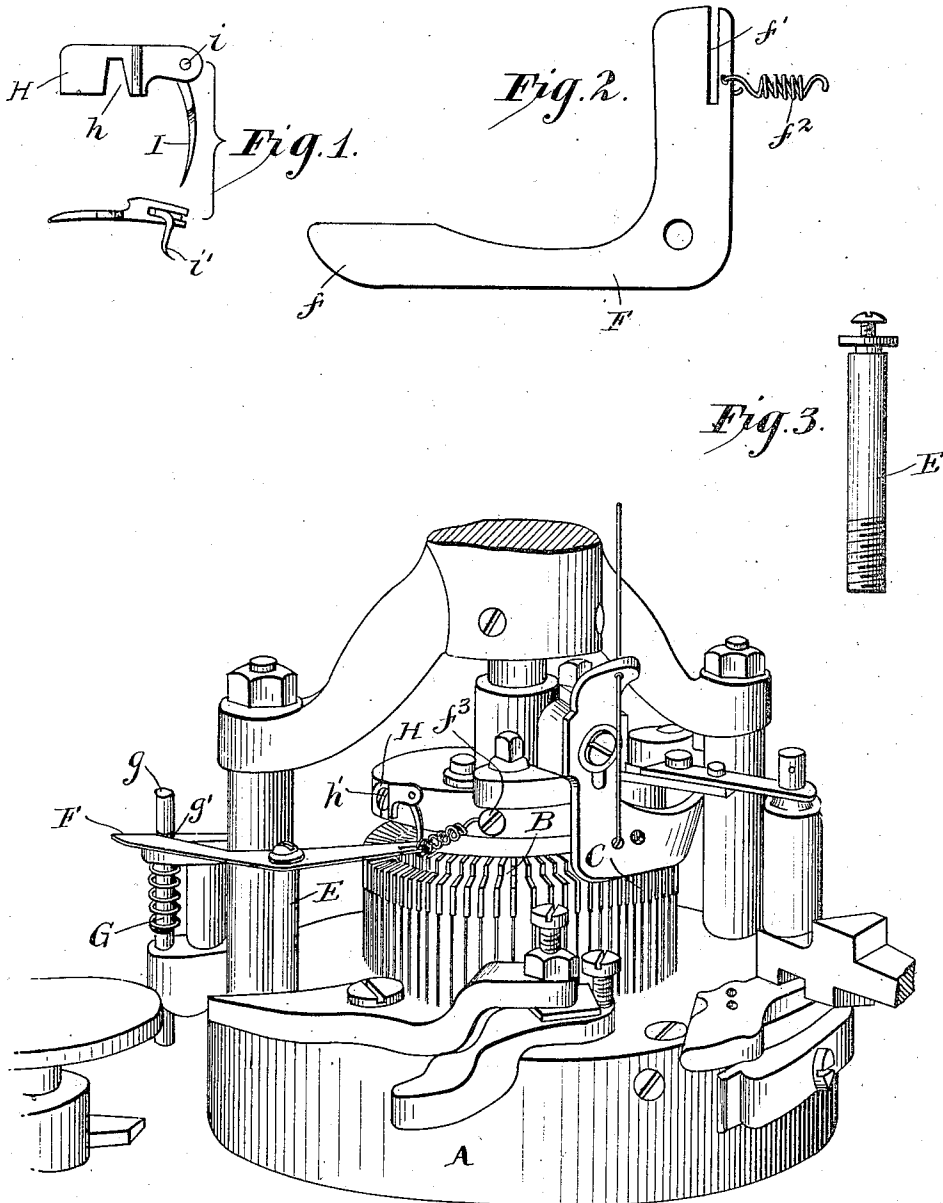


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STOP MOTION FOR KNITTING MACHINES.
APPLICATION FILED JULY 8, 1911.

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Patented Mar. 11, 1913.



Witnesses:

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Fig. 4.

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UNITED STATES PATENT OFFICE.

JOSEPH HEPPELER, OF ST. JOSEPH, MICHIGAN.

STOP-MOTION FOR KNITTING-MACHINES.

1,055,460.

Specification of Letters Patent.

Patented Mar. 11, 1913.

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To all whom it may concern:

Be it known that I, JOSEPH HEPPELER, a citizen of the United States of America, and resident of St. Joseph, Berrien county, Michigan, have invented a certain new and useful Improvement in Stop-Motions for Knitting-Machines, of which the following is a specification.

My invention contemplates a device for automatically stopping a knitting machine when a needle breaks or the yarn, for any reason, becomes snarled or clogged in the needles. Prior to my invention it was a common occurrence for knitting machines of this kind to cause considerable trouble in this manner. This is particularly true of what are called the ribbed top knitting machines, as in such case obstructions are very often encountered as a result of broken needles, lumps of yarn, big knots, etc. When an accident of this kind occurs, it is possible for a large quantity of yarn to almost instantly accumulate in the form of a mass or snarl. This necessitates an expenditure of time and labor in clearing out the machine, after an irregularity of this character, and a consequent loss of labor and material. There is not only a waste of yarn when accidents of this kind happen, but there is also liable to be a large loss of needles as well—that is to say, many needles will be broken. Moreover, accidents of this character result very often, even where the operatives are careful, in irregularities or imperfections in the fabric. Prior to my invention some effort has been made to correct this trouble. I do not, however, regard these efforts as being entirely satisfactory.

The object of my invention is, therefore, to provide a novel and improved device which will automatically stop the knitting machine as soon as anything occurs which, should the machine continue running, would result in breakage of the needles, snarling up of the yarn, and a consequent loss of time and labor.

To these and other useful ends, my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings—Figure 1 shows two views of the finger portion of

the attachable safety device, the first view being a front elevation, and the second view being a bottom plan. Fig. 2 is a plan view of the arm or bell crank which serves as a medium of communication between the finger of Fig. 1 and the power transmitting connection for the machine. Fig. 3 is a side elevation of the post upon which the member shown in Fig. 2 is mounted. Fig. 4 is a perspective of the upper portion of a knitting machine, showing the arrangement of the needles in two rows, which arrangement is characteristic of ribbed top knitting machines, and showing also the method of attaching my said safety device in position to automatically stop the machine as soon as anything occurs which is liable to make serious trouble, such as snarling up of the yarn, breakage of the needles, etc.

As thus illustrated, the knitting machine is of the kind commonly known as a rib top machine, and can be of any suitable, known or approved character. As shown, it comprises the ordinary rotary head A and has the customary or usual inner and outer needles, the inner needles B being horizontal and radial and surrounded by the outer vertical needles C, the usual dial plate D being disposed above. The balance of the machine proper is of the ordinary and well known form, and will not require further description.

The post E is not found in the ordinary machine, and is provided as a support for the bell crank shaped lever F, this lever being pivoted at the top of the post at its elbow, whereby it is free to move or swing in a horizontal plane. The power transmitting connection can be of any suitable, known or approved form, and as shown is controlled in any suitable manner, by a vertically movable pin G having its upper end *g* provided with a notch *g'* in the side thereof. This notch *g'* is normally engaged by the end portion *f* of the bell crank lever F, as shown in Fig. 4.

The metal holder or bracket H is mounted upon the periphery or side of the dial plate D, being provided with a vertical slot *h* for the fastening screw *h'* which enters the dial plate. This holder or bracket is

provided with a depending finger I which is pivoted at its upper end at *i* and provided at its lower end with a curved portion *i'*, in the manner shown in Fig. 1. This finger
 5 I hangs in the space between the outer and inner needles, and works in the slot *f'* of the bell crank lever F, whereby any movement of the finger, when it strikes an obstruction, will cause the bell crank lever to
 10 disengage itself from the notch *g'* in the said post of the power transmitting connection. The curved or slightly hooked lower end of said finger enables it to more readily engage and hold on to the knot or
 15 snarl in the needles, and more readily detect a broken needle. A spring *f*² is hitched to the slotted arm of the bell crank lever at one end, and has its other end secured to a screw *f*³ inserted in the side or periphery of the dial. The said spring, by this
 20 arrangement, tends to keep the portion *f* of the bell crank lever in engagement with the slot of the said pin. But when an abnormal obstruction, such as a knot or snarl
 25 occurs in the space between the two concentric rows of needles, and this obstruction strikes the finger I, the portion *f* of the bell crank lever is thereby disengaged from the notch *g'*, which permits the pin G to move
 30 downward and open the power transmitting connection in any suitable or desired manner. Thus any accident will serve automatically to stop the machine and thereby prevent the breakage of the needles and the
 35 clogging of the yarn which usually follow an accident of this kind.

From the foregoing it will be seen that I make provision for curing what has heretofore been a serious trouble in the actual
 40 use of knitting machines of this kind, by a very simple and sensitive device. A very slight mishap would often instantly develop, by the continued operation of the machine, into a large sized trouble—that is to say,
 45 the yarn would begin to pile up, and the continued operation of the machine would result in breakage of the needles. Thus there was a considerable loss incident to the use of machines of this kind, by reason of
 50 the breakage of large quantities of needles, the spoiling of large quantities of yarn, and the expenditure of time and labor in straightening out the trouble and getting the machine back in condition to continue
 55 with the work. Efforts have been made to overcome this trouble, but without entire satisfaction. By my invention, however, I obviate this trouble, and make it possible to operate a machine of this kind on a much
 60 more economical basis than heretofore. With my invention, which is applied as an attachment to a machine of this kind, the machine is automatically stopped before a small trouble can develop into a large and

serious trouble. In this way a considerable 65 saving is accomplished.

The object of my invention is, therefore, to protect the needles in a more satisfactory manner than heretofore. Moreover, it will be seen that the support H is adjustable up 70 and down to bring the finger I as near the needles as possible or desirable. The finger I works close to the needles, and with its end actually between the ends of the inner and outer needles, whereby it is always in 75 readiness to act quickly and instantly as soon as anything abnormal occurs, and whereby it will immediately stop the machine and thereby prevent further trouble. The device restores itself automatically, 80 when the pin G is returned to normal position. By means of the spring the lever F is held positively in engagement with the notch in the pin G, and the device cannot be released by jarring of the machine. A 85 slight movement of the finger or trouble detector will release the lever F from the pin G, and raising and lowering of the finger does not change its length. This serves also to improve the quality of the fabric, as knots 90 and similar imperfections will not be so frequent as before. Furthermore, the attachment is of such a simple character that the cost thereof is comparatively small.

What I claim as my invention is: 95

1. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said 100 finger is pivoted, means whereby said mounting is adjustable up and down on the side of said dial cap, and mechanism including an element overlying the said needles, mounted to operate in a horizontal plane, controlled by said finger for stopping the 105 machine.

2. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said 110 finger is pivoted, means whereby said mounting is adjustable up and down on the side of said dial cap, and mechanism controlled by said finger for stopping the machine, said mechanism comprising a lever 115 overlying said needles, having a loose sliding connection with said finger, and means disengaged by said lever when said finger is operated.

3. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said 120 finger is pivoted, means whereby said mounting is adjustable up and down on the side of said dial cap, and mechanism controlled by said finger for stopping the machine, said mechanism comprising a spring 125

post having a notch, and a lever for engaging said notch to hold the post in normal position, said lever pivoted to swing about a vertical axis and having engagement with said finger.

4. In a knitting machine and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said finger is pivoted, means whereby said mounting is adjustable up and down on the side of said dial cap, and mechanism controlled by said finger for stopping the machine, said mechanism comprising a lever engaging said finger, a member engaged by the other end of said lever, and a spring for restoring both said lever and finger to normal position.

5. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said finger is pivoted, means whereby said mounting is adjustable up and down on the side of said dial cap, mechanism controlled by said finger for stopping the machine, and means including a spring for yieldingly holding both said finger and mechanism against movement, operative to restore the finger to normal position.

6. In a knitting machine, and in combination with the needles thereof, a snarl or broken needle detector finger, means revolving with the machine for pivoting the finger, a pivoted lever having a loose sliding engagement with said finger, the lever and finger having axes disposed at an angle to each other, and means released by pivotal movement of said lever to stop the machine.

7. In a knitting machine, and in combination with the needles thereof, a snarl or broken needle detector, and means including a spring for yieldingly holding said finger, said spring being tensioned to move the finger back to normal position, together with means including two elements for stopping said machine when the said finger is operated, said spring normally forcing one element against the other.

8. In a knitting machine, and in combination with the needles thereof, a snarl or broken needle detector finger, a revolving mounting on which the finger is pivoted, and means whereby said mounting and pivot are adjustable to thereby raise and lower the said finger, said pivot forming an axis which is fixed relative to said finger.

9. A knitting machine provided with a snarl or broken needle detector finger, a support on which said finger is pivoted, and means whereby said support and pivot are adjustable to thereby raise and lower said finger, said pivot forming an axis which is fixed relative to said finger.

10. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said finger is pivoted, mechanism controlled by said finger for stopping the machine, and means on the dial whereby said mounting is adjustable up and down thereon, without disturbing or changing the position of any part of said mechanism, said mechanism including an element operating in a horizontal plane and overlying the said needles to engage said finger.

11. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said finger is pivoted, mechanism controlled by said finger for stopping the machine, said mechanism comprising a lever having loose sliding connection with said finger, said lever overlying the said needles to loosely engage said finger, means on the lever for keeping the finger in engagement therewith, and means on the dial whereby said mounting is adjustable up and down thereon, without disturbing or changing the position of any part of said mechanism.

12. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said finger is pivoted, mechanism controlled by said finger for stopping the machine, said mechanism comprising a spring post having an engaging portion, and a lever for engaging said portion to hold the post in normal position, said lever pivoted to swing about a vertical axis and having engagement with said finger, and means on the dial whereby said mounting is adjustable up and down thereon, without disturbing or changing the position of any part of said mechanism.

13. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said finger is pivoted, mechanism controlled by said finger for stopping the machine, said mechanism comprising a lever engaging said finger, a member engaged by the other end of said lever, a spring for restoring both said lever and finger to normal position mounted on the dial, and means on the dial whereby said mounting is adjustable up and down thereon, without disturbing or changing the position of any part of said mechanism.

14. In a knitting machine, and in combination with the dial cap and needles thereof, a snarl or broken needle detector finger, a mounting upon which the upper end of said finger is pivoted, mechanism controlled

by said finger for stopping the machine, means including a spring for yieldingly holding both said finger and mechanism against movement, operative to restore the
5 finger to normal position, and means on the dial whereby said mounting is adjustable up and down thereon without disturbing or changing the position of any part of said mechanism, said mechanism comprising two elements normally held together by said 10 spring.

Signed by me at St. Joseph, Michigan,
this 30th day of June 1911.

JOSEPH HEPPELER.

Witnesses:

CHAS. W. STRATTON,
HELEN C. CLARKE.