

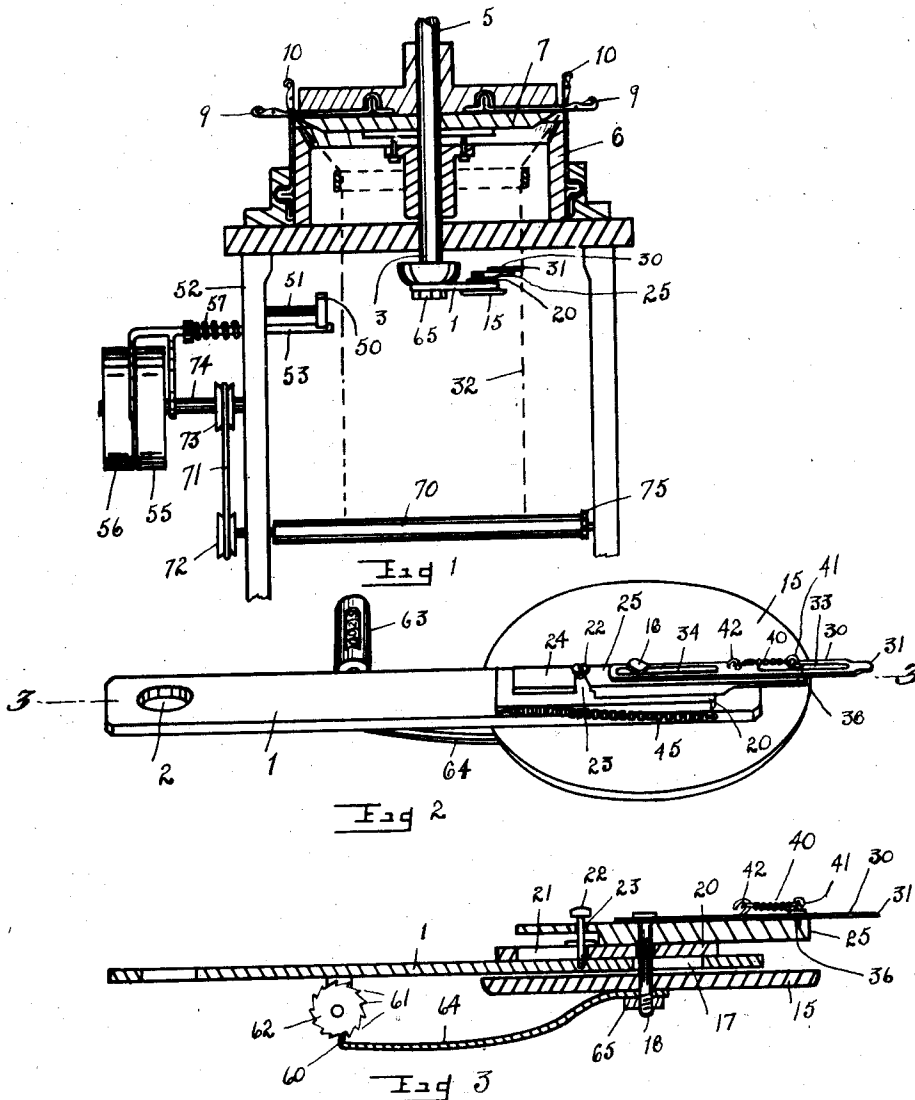
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STOPPING DEVICE FOR KNITTING MACHINES

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STOPPING DEVICE FOR KNITTING MACHINES.

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To all whom it may concern:

Be it known that I, HENRY W. NIERMEYER, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Stopping Devices for Knitting Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to a stopping device for knitting machines, and I declare the following to be a full, clear, concise and exact description thereof sufficient to enable anyone skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings in which like reference characters refer to like parts throughout the specification.

The object of the invention is to provide a device adapted to be used on knitting machines where the cylinder, dial and cloth revolve or on knitting machines where the cylinder, dial and cloth are stationary and head revolves, whereby to stop the knitting machine when a drop stitch or other imperfection occurs in the fabric.

Furthermore, the device is adapted to indicate the location of the imperfect needle that was the cause of the drop stitch or other imperfection.

Moreover, there is also a meter operated in connection with the other parts for registering the number of times the knitting machine stops, whereby conclusions may be drawn as to the quality of the yarn, the degree of perfection of the knitting machine, the consistency with which the employee works et cetera.

The object will be understood by referring to the drawings in which:

Fig. 1 is a central vertical section of a knitting machine, showing the stopping device attached, parts also being broken away;

Fig. 2 is an enlarged perspective view of the stopping device;

Fig. 3 is a side elevation of the device, enlarged, showing a central vertical section taken on the line 3—3 of Fig. 2.

Referring more particularly to the drawings, the device embodies an arm 1 that has an aperture 2 adapted to permit the arm 1 to be bolted to the lower end 3 of the main shaft 5 of the knitting machine. Said arm 1 is adapted to turn with the revolving shaft 5 in those knitting machines where said shaft 5 revolves to turn the needle actuating

cams to operate the dial needles 9 and cylinder needles 10 and the needle cylinder 6, dial 7 and cloth are stationary. Arm 5 will remain stationary, however, in this instance, where the cloth revolves with the dial and cylinders and the cams are stationary.

Arm 1 carries on its outer end a disk 15 mounted to turn upon shaft 16. Shaft 16 projects up through an elongated recess 17 made in arm 1, whereby the disk 15 might move longitudinally with respect to arm 1.

Shaft 16 projects up also through an aperture in the longitudinal movable member 20, which is equipped with an elongated recess 21 to allow said member 20 to move longitudinally with respect to arm 1 on which it is mounted. A headed bolt 22 projects through the recess 21 and is secured in a threaded recess in arm 1.

The upper part of the shank of headed bolt 22 projects through an open recess 23 made in the reduced rear end 24 of latch member 25. Latch member 25 is mounted also to shaft 16 upon which it turns as a fulcrum and will move in a longitudinal manner with said shaft 16, when the bolt 22 is disengaged from the recess 23 of latch member 25.

A finding member or finder 30 is supported in a sliding manner upon latch member 25 and is equipped with a rather narrow rounded end 31 adapted to make contact with the inside surface of the fabric 32, as it comes down from the dial and cylinder needles 9, and 10 respectively.

Finding member 30 has two elongated recesses 33 and 34 through which project the shanks of headed bolts 16 and 36. Bolt 36 is mounted in a threaded bearing made in latch member 25. This bolt together with arm 1, which aids in holding the latch 25 and member 20 in position, is adapted to limit the actuation of finder 30 to a longitudinal movement with respect to latch member 25.

Finder 30 is held normally at its extreme outward position allowed by recesses 33 and 34 by a coiled spring 40 that is fastened at one end to a member 41 projecting upward from bolt 36 and at the other to a member 42 fixed to the upper surface of finder 30. Normally the finder will be pushed back against the tension of spring 40 by the surface of the fabric 32.

A coiled spring 45 attached at one end to the edge of movable member 20 and at the

other to the edge of arm 1 near its outer end, is adapted to exert a pull on member 20, whereby to draw the same and disk 15 connected thereto by shaft 16, outward, when latch member 25 is released. In such extended position, disk 15 will make contact with the upper beveled surface of rock arm 50 to, thereby, rock arm 50 to stop the operation of the knitting machine.

Rock arm 50 is fulcrumed upon the reduced outer end of an arm 51 that projects laterally from the frame 52 of the knitting machine. The opposite end of arm 50 lies normally in a recess made in belt shifter 53 adapted to move the belt, not here shown, from tight pulley 55 to loose pulley 56. Belt shifter 53 is actuated by a coiled spring 57, whereby to shift the belt from the tight to the loose pulleys 55 and 56, respectively.

Pawl 60 is adapted to engage successively the several teeth 61 of the ratchet wheel 62 used in turning the numbering wheels of a meter 63 for registering the number of stops of the knitting machine. Meter 63 is attached to arm 1. Pawl 60 has a long arm 64 that forms a spring for holding the pawl 60 yielding into mesh with the teeth 61 of ratchet 62. Arm 64 has an aperture, whereby it can be mounted to the lower end of shaft 16 and held thereto by nut 65.

The turning of ratchet 62 will actuate, as stated, the mechanism of the meter, which may be of any well known construction, whereby to register the number of times the knitting machine is stopped automatically by the stopping device.

The operation of the device is effected in the manner following: When the knitting machine is operating and shaft 5 is revolving to turn the cams that actuate the needles 9 and 10 of the dial 7 and cylinder 6, the knitted fabric 32 will be fed downward gradually between rollers 70, 70, which are employed to draw the fabric 32 in this direction. One of the rollers 70 is rotated by a belt 71 connecting grooved pulleys 72 and 73, pulley 73 being connected to the main shaft 74 and pulley 72 being fastened to turn with the reduced extended end of the roller 70. The other roller 70 is turned by a gear in mesh with the first roller 70. Gears 75 and 75 being thus employed one of which is back of the other and in the same horizontal plane, as shown in Fig. 1, and of well known construction.

As shaft 5 revolves, arm 1 carrying the finder 30 and other parts will revolve also. The end 31 of finder 30 will be in contact at all times with the inner surface of the fabric 32, which holds the finder 30 back against the tension of its spring 40. Should a drop stitch occur leaving a small hole in the fabric 32, the end 31 of finder 30 will be thrust therein by the tension of spring 40. Finder 30 thus caught in the fabric 32 will be

held and as the arm 1 continues to move, the resultant force will be sufficient to rock the latch 25 connected thereto, in such manner as to disengage bolt 22 from recess 23 of latch 25. Immediately latch 25 is disengaged, member 20 carrying said latch 25 will be free to go forward in a longitudinal direction with respect to arm 1 and will carry shaft 16 that supports disk 15, therewith. This movement of latch 25 will be effected by the tension of spring 45.

In the extended position of disk 15 it will on its next passage come in contact with the upper beveled surface of rock arm 50, to, thereby, turn the same upon its fulcrum, whereby to withdraw the opposite end of arm 50 from its recess in the belt shifter 53. Coiled spring 57 will actuate belt shifter 53, thereupon, whereby to move the belt from the tight pulley 55 to the loose pulley 56 to stop the knitting machine.

As shaft 16 and disk 15 go forward under tension of spring 45, said shaft 16 will carry the pawl 60 therealong. Pawl 60 will revolve the ratchet 62 through the space of one tooth, whereby to cause a corresponding movement in the meter 63 for registering the stopping of the knitting machine. When disk 15 is pushed back again against the tension of spring 45, whereby open recess 23 of latch 25 will engage bolt 22 to lock the parts in cocked position, the pawl 60 will ride over the next succeeding tooth 61 of ratchet 62 to be in position to turn the ratchet 62 when it again goes forward.

It will be noted that the machine cannot be started permanently, until the hole in the fabric is mended.

In those machines, where the fabric 32 turns and the stopping mechanism is stationary, the stopping mechanism will be located directly over the rock arm 50, whereby the tripping of latch 25, will cause the disk 15 to move outward and over rock arm 50, the free end of which rock arm 50 will be pushed downward, whereby to rock said arm 50 upon its fulcrum to stop the operation of the knitting machine.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a stopping device for knitting machines, a shaft, a spring pressed finder adapted to make contact with the knitted fabric, a bolt, a latch supporting said finder, and having an open recess for engaging said bolt, a disk mounted on said shaft adjacent said latch, and means, whereby an imperfection in said fabric will cause the tripping of the latch to move the disk to stop the operation of the knitting machine.

2. In a stopping device for knitting machines, a shaft, a spring pressed finder adapted to make contact with the inside surface of a tubular fabric, a bolt, a latch

adapted to support said finder in a sliding manner and having an open recess for engaging said bolt, a movable member mounted below and carrying said latch, a disk 5 mounted on said shaft located adjacent said movable member, and spring means, whereby an imperfection in the fabric will cause the tripping of the latch to allow the disk to move forward to stop the operation of 10 the knitting machine.

3. In a stopping device for knitting machines, a shaft, a spring pressed finder adapted to make contact with the inside surface of a tubular fabric, a latch having an 15 open recess and adapted to support said finder in a sliding manner, a bolt for engaging said recess, whereby to hold said latch normally in given position, a movable member carrying said latch and 20 bolt, a disk mounted on said shaft located adjacent said movable member, and spring means, whereby an imperfection in the fabric will cause the tripping of the latch to allow the disk to move forward to 25 stop the operation of the knitting machine.

4. In a stopping device for knitting machines, a shaft, an arm carrying a movable disk mounted on said shaft, a member adapted to slide with said disk in a longitudinal 30 manner upon said arm, a latch pivotally mounted upon said member and adapted to move in a longitudinal manner with said disk and member, an open recess formed in said latch, a bolt carried by said arm and 35 adapted to engage the recess in said latch, a spring pressed finder carried by said latch, means permitting said finder to move relative to said latch, whereby to engage a hole occurring in said fabric, and a spring for 40 forcing said disk forward, whereby to stop the operation of the machine, when said finder engages a hole in the fabric.

5. In a stopping device for knitting machines, a shaft, an arm carrying a movable 45 disk mounted on said shaft, a member mounted on said arm and adapted to move in a longitudinal manner with respect thereto, a latch pivotally mounted upon said

member, a recess formed in said latch, a 50 bolt attached to said arm and adapted to engage said recess, whereby to hold said latch in normal position, a finder supported upon said latch, elongated recesses in 55 said finder, whereby to permit said finder to move in a longitudinal manner with respect to said latch, a spring attached at one end to said finder and at the other to said latch, whereby to hold said finder normally in contact 60 with the fabric, whereby a hole occurring in the fabric will effect a tripping of the latch and a spring for actuating said disk and the member carrying the latch and 65 finder when said latch member is tripped, whereby said disk will stop the operation of the knitting machine.

6. In a stopping device for knitting machines, a rotary shaft, an arm carrying a 70 movable disk mounted on the lower end of said shaft, a member mounted on said arm and adapted to move in a longitudinal manner with respect thereto, a latch pivotally 75 mounted upon said member, an open recess formed in said latch, a bolt attached to said arm and adapted to engage said open recess, whereby to hold said latch in normal position, a finder having a rounded end supported 80 upon said latch, elongated recesses made in said finder, whereby to permit said finder to move in a longitudinal manner with respect to said latch, a spring attached 85 at one end to said finder and at the other end to said latch, whereby to hold said finder normally in contact with the fabric, whereby a hole occurring in the fabric will effect a tripping of the latch, a spring for 90 actuating said disk and the member carrying the latch and finder, when said latch is tripped, whereby said disk will stop the operation of the knitting machine, a meter for registering the number of stops of the knitting machine and a pawl actuated simultaneously with said disk, whereby to operate said meter.

In testimony whereof I have affixed my signature.

HENRY W. NIERMEYER.