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CYLINDER STOPPING MECHANISM FOR DIAL LOOPERS

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Figure 4

Figure 5

Figure 6

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This invention relates to an attachment for dial loopers and more especially to a cylinder stopping mechanism which is adapted to automatically stop the cylinder of the looper when waste material is left upon the points.

It is a well known fact that a full-fashioned stocking is knitted in a flat single blank and subsequently the edges of the blank are trimmed together to form a stocking. When a looper is employed for uniting two edges of the blank, two courses are selected which are located near their respective edges, and these courses are placed upon the looper points, the loops of each course being matched, so that they will coincide with each other. The edge material between the selected courses on the points and the edges, projects above the points and must be removed by any suitable means such as shearing, so that the seam at the junction of the edges will be as small and as inconspicuous as possible. When all of the edge material has been removed, leaving bare loops upon the looper points, a suitable looper needle is adapted to successively penetrate the matched loops on the points and unite them with a strand. If by poor brushing or defective shearing of the excess portion from the edges, some of the waste material is left upon the points, there is danger that the points may become broken when this material reaches the looper needle, and at least a defective stocking will result.

It is therefore an object of this invention to provide a cylinder stopping mechanism for dial loopers which will readily detect any waste material on the looper points and automatically stop the machine before the material reaches the looper needle.

Specifically, the invention comprises a lever pivoted intermediate its ends, one end of the lever being disposed in close proximity to the moving looper points and the other end engaging the conventional thread controlled cylinder stopping mechanism, whereby any waste material on the points will rotate the lever, which, in turn, will actuate conventional thread controlled cylinder stopping mechanism in the same manner as if a thread becomes broken.

It is another object of this invention to provide a mechanical cylinder stopping mechanism for protecting the looper points and needles, which mechanism is simple in construction, low in cost, easy to remove or install and very efficient in operation. The simplicity of the present device is a particularly attractive feature. There are only a few operating parts, and the cost of upkeep is lower and the ease of operation greater than that of devices heretofore designed for this purpose.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figure 1 is a plan view of a portion of a dial looper embodying the present invention;

Figure 2 is a vertical sectional view taken along the line 2—2 in Figure 1;

Figure 3 is an isometric view of the lever which is employed for actuating the conventional dial looper cylinder stopping mechanism when a piece of waste material is left upon the looper points;

Figure 4 is a vertical sectional view taken along the line 4—4 in Figure 1;

Figure 5 is an elevation looking along the lines 5—5 in Figures 1 and 4, showing in section the looper point cylinder and also showing two layers of material supported by the points;

Figure 6 is a plan view taken along the line 6—6 in Figure 4, said plan view being identical to the central portion of Figure 1, but on an enlarged scale.

Referring more specifically to the drawings, the numeral 10 denotes a suitable looper bed plate having integral therewith a cantilevered arm 11. The outer end of arm 11 has a shaft 12 extending downwardly therefrom which supports a dial plate 14. A suitable point cylinder 15 is adapted to rotate in a well known manner around the dial plate, said cylinder having a plurality of points 16 secured therein in the manner shown in the lower portion of Figure 5.

During normal operation of the looper, layers of knit fabric, such as designated by reference characters 17 and 18 are placed upon the points 16 as shown in Figure 5. Any surplus amount of material which may be disposed above the points 16 is adapted to be sheared therefrom by a conventional shearing mechanism, not shown, leaving the bare loops upon the points 16. The point cylinder 15, together with the sheared layers of knit fabric 17 and 18 are advanced at a uniform rate past the conventional oscillating looper needle 20. This needle 20 is mounted in the lower end of an arm 21 which in turn, has its upper end mounted for oscillation upon a shaft 22 said shaft extending laterally from the side of arm 11, previously described (Figure 4). The needle 20 has a suitable thread 24 leading therethrough, which is inserted into the matched loops on the upper edges of layers 17 and 18 to unite the two edges while they are dis-
posed upon the points 16. This loop operating

the thread or strand 24 is drawn through a take-up wire 26 prior to the end thereof passing through the end of needle 28. This wire 26 is likewise conventional and serves to take up the unnecessary slack in the strand during the oscillation of arm 21. Strand 24 extends upwardly from wire 26 and is supported by a notch 27 in the Z-shaped bracket 20 which bracket is secured as at 25 to the upper end of another bracket 30. Bracket 30 is supported by the outer end of the shaft 22 but by any suitable means such as a screw 32. This screw penetrates the lower portion of the bracket 30 and has its end threadably embedded in the end of shaft 22.

The strand 24 extends in a substantially horizontal direction from the notch 27 and then between tension disks 34 and 35. The tension disc 35 is resiliently pressed against the tension disc 34 by means of a suitable compression spring 37 (Figures 4, 5 and 6). A suitable nut 38 is threadably secured on the end of a shaft 39 for normally pressing the compression spring 37 against the disc 35 so that proper amount of friction will be exerted on strand 24. The shaft 39 also serves as a mounting for the discs 34 and 35.

The strand 24 extends downwardly from disks 34 and 35 through an eyelet 40 and then again horizontally through an opening or eyelet 41 in a thread deflecting member 42, said member 42 having a pair of upstanding ears 43 integral with the central portion thereof which are mounted for oscillation around the shaft 39. The end of the thread deflecting member 42, which is remote from the eyelet 41, has an upstanding pointed portion 44, said portion 44 having an inclined edge 45 (see Figure 4) which is adapted to engage one side of that portion of the strand 24 which is disposed between tension members 34 and 35, and the notch 27 (Figures 5 and 6). The contact of this inclined edge 45 with the thread normally serves to hold the deflector member 42 in the position shown in Figure 5. In other words, the inclined edge 45 prevents counterclockwise rotation of member 42 (Figure 5) which rotation ordinarily would occur as a result of the pull of thread 24 as it passes through eyelet 41; for example, when thread 24 breaks between disks 34 and 35, and notch 27, slight counterclockwise rotation of member 42 will result. It is therefore seen that during a loop operating the strand 24 is fed through eyelet 41 then through eyelet 40, between tension disks 34 and 35, then alongside inclined edge 45, through notch 27 then downwardly through take-up wire 26 and through the oscillating needie 20, which deposits the end of the thread through the uppermost loops of layers 17 and 18 which are disposed on the points 16.

In order to provide means for automatically stopping the looper when the strand 24 becomes broken, and the free end of wire 50 has been so mounted that it will normally rest by gravity upon that portion of the thread which is disposed between tension disks 34 and 35 and the notch 27 (see Figures 4, 5 and 6). The other end of the wire 50 is secured to a rod 51 which, in turn, is rotatably mounted in a bracket 52. It will be noted referring to Figures 1, 2 and 4 that the intermediate portion of the rod 51 has a U-shaped bow 53 therein for supporting the free end of a rod 54, which rod 54 has its other end secured to another rod 55, said rod 55 being journaled in brackets 52 and 57. The right hand end of the rod 55 (Figures 1 and 2) has a downwardly extending projection 56 which is disposed near the drive shaft 58. Disposed on the drive shaft 58 is a cam disk 59 having a radially extending pin 60 therein. During the rotation of the shaft 58, the pin 60 will barely clear the end 56 of the rod 55, but when this rod 55 is rotated slightly in a clockwise manner in Figure 4, the end portion 60 will be rotated in the path of the pin 56 and consequently, the projection 56 as well as the rod 55 will be moved to the right in Figures 1 and 2. Of course, upon this movement to the right of the rod 55, the associated rod 54 will likewise be moved to the right.

It should be borne in mind, however, that the free end of the rod 54 is held in elevated position as shown in Figure 4, during the loop operating, but upon the breakage of a strand, the wire 50 will fall downwardly thus rotating the rod 51 and the bowed portion 53 in a counter-clockwise manner, to allow the pin 54 to fall and to cause the downward pin 60 to be disposed in the path of rotating pin 60 as heretofore described.

It will also be seen by referring to Figures 1 and 2 and 4 that the free end of the pin 54 has the upper end of a vertically disposed pin 55 resting thereagainst, the lower end of said pin 55 being secured to the intermediate portion of stop rod 66. The stop rod 66 has its intermediate portion slidably mounted in a lug 67 and has on its extreme left-hand end a button 66 (Figures 1 and 2) which is grasped between a collar 70 and 71 when it is desired to manually start or stop the machine. A collar 70 is employed to limit the distance to which the rod 66 may be pushed to the right in Figure 2.

The right hand end of the rod 56 has pivoted thereto as at 80, one end of a lever 81, which lever has its intermediate portion pivoted as at 82 to bearings 83. The other end of the lever 81 normally engages a cone disk 84 which is keyed for sliding movement on the shaft 58. It will be noted that the cone disk 84 is adapted to fit on the interior of a loose pulley 87 and is also adapted to normally pushed away from the observer in Figure 1, by means of a compression spring 88.

Upon the breaking of strand 24, the wire 50 falls thus causing projection 56 to be rotated into the path of pin 56. When the pin 55 engages the lower end portion 56 to cause the rod 55, pin 54, pin 55 and push rod 66 to be moved to the right in Figures 1 and 2, the lever 81 is caused to rotate in a clockwise manner about pivot point 82 thereby releasing the cone pulley 84 from engagement with the lose pulley 87 to cause the drive shaft 58 to cease rotation, and of course the machine will stop at this time.

The above described mechanism has been used heretofore on dial loopers for stopping the machine upon the breakage of the thread and in some instances for stopping the machine in case a knot in the thread or strand passes through the deflector member 42. The purpose of this invention, as heretofore stated, is to provide a mechanical means for operating the thread deflector mechanism when waste material is allowed to remain in the looper points so that the machine will be stopped in ample time to prevent this waste material from reaching the conventional looper needle and causing a smash-up.

In order to effect this result, the bolt 82, pre-
viously described has pivotally mounted thereon a lever 65 at a point intermediate its ends. The lower end of the lever 65 has a serrated foot 86 adjustable mounted therein by means of a suitable set screw 85, said serrated foot being parallel to the surface of the point cylinder 15 and to be disposed a slight distance thereabove so that any waste material on the points 16 will engage this foot and cause the lever to be rotated. The upper end of this lever 65 has a curved cam surface 99 which is adopted to engage portion 44 of deflector 42 in the manner shown in Figures 4, 5 and 6. Of course, upon the rotation of the lower portion of the lever 65 by any waste material on the points 16, the upper end of the lever will likewise be rotated thereby causing the cam surface 99 to move the thread deflector 42 in a counter-clockwise manner (Figure 5). This will move that portion of the thread 24 which is disposed between notch 27 and the tension disks 34 and 35 toward the observer in Figure 5, or to the left in Figure 6, thereby allowing the free end of wire 50 to fall downwardly to cause the stopping mechanism of the machine to be actuated in a manner previously described. The lever 65 is confined on the end of the screw 22 by means of a suitable collar 54 and a set screw 95 which holds the collar in place.

It is therefore seen that I have provided a simple actuating means for a stopping mechanism which has a minimum number of parts and which can be easily installed or dismantled from many types of loomers. It is also adapted to work in conjunction with the conventional stopping mechanism which is present on many types of loomers. In addition to the above advantages, the distance that the serrated foot of the lever is disposed above the point cylinder and the points 16 can be adjusted to suit various conditions. For example, if it is desired that very small amount of waste material actuate the present stopping mechanism, it will be necessary only to lower the serrated foot portion 86; whereas, if the work is not so particular and it is not necessary for a small amount of waste material to operate the stopping mechanism, the foot portion may be raised.

In the drawings and specification, there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. The combination with a looping machine including a rotatable point cylinder and a cylinder stopping mechanism normally operated by a strand deflector, of a substantially vertically disposed lever pivoted intermediate its ends, said lever having the lower end thereof disposed in close proximity to said points and having its upper end slidably engaging said strand deflector whereby waste material on the points will engage one end of the lever and impart rotation thereto to cause said strand deflector to be operated.

2. The combination with a looping machine including a rotatable point cylinder and a cylinder stopping mechanism normally operated by a strand deflector, of a substantially vertically disposed lever pivoted intermediate its ends, a toothed foot mounted in the lower end thereof and disposed in close proximity to said points, and a cam surface on the upper end of said lever for slidably engaging said strand deflector whereby waste material on the points will engage one end of a lever and impart rotation thereto to cause said strand deflector to be operated.

3. The combination with a looping machine including a rotatable point cylinder and a cylinder stopping mechanism normally operated by a pivotally mounted strand deflector, of a vertically disposed lever pivoted intermediate its ends, a toothed foot mounted in the lower end of the lever for vertical adjustment relative to said points and being disposed in close proximity to said points, and a cam surface on the upper end of said lever for engaging said strand deflector whereby waste material on the points will engage one end of the lever and impart rotation thereto to cause said strand deflector to be operated.

4. The combination with a looping machine including a rotatable point cylinder and a cylinder stopping mechanism normally operated by a strand deflector, of a substantially vertically disposed lever pivoted intermediate its ends, a toothed foot mounted on the lower end thereof and disposed in close proximity to said points, and a cam surface on the upper end of said lever for slidably engaging said strand deflector whereby waste material on the points will engage one end of the lever and impart rotation thereto to cause said strand deflector to be operated, and means for vertically adjusting the toothed foot relative to the points to regulate the degree of waste necessary on the points to move the lever.

5. In a looper having a rotary cylinder carrying a plurality of needle points onto which parts of knitted articles are placed for looping the same together, a cylinder stopping mechanism normally operated by a strand deflector, a substantially vertically disposed lever pivoted intermediate its ends and having its lower end provided with a waste catching device and having a cam surface on its upper end whereby when sufficient waste has collected on the waste catching device, the lever will be swung on its pivot by force applied by the rotation of the needle points to move the strand deflector to actuate the cylinder stopping mechanism to stop the machine.

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