Aug. 4, 1953 R. C. CAMPBELL 2,647,482

BOBBIN SIGNAL

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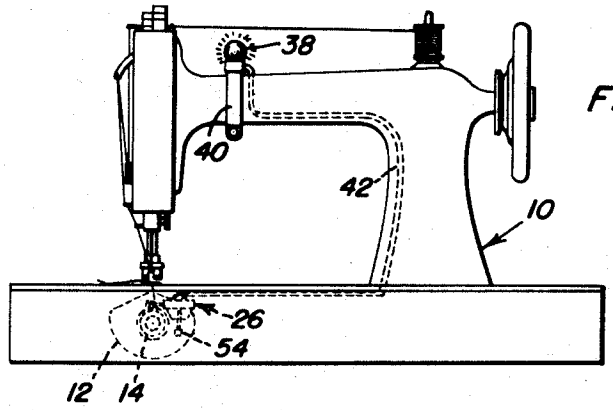


Fig. 1.

Fig. 2.

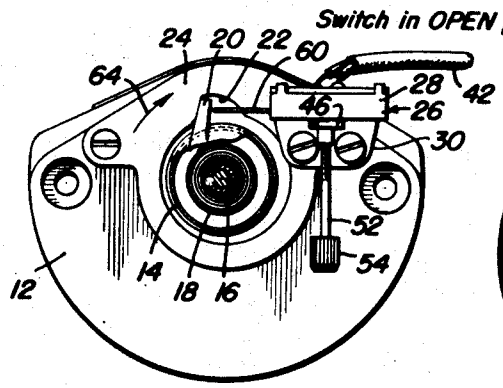


Fig. 5.

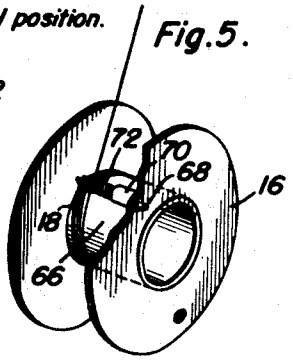


Fig. 3.

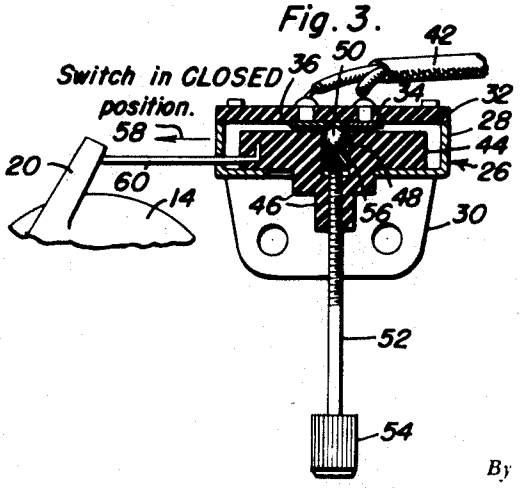
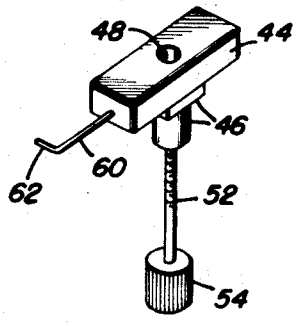


Fig. 4.



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BOBBIN SIGNAL

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9 Claims. (Cl. 112—218)

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This invention relates to new and useful improvements and structural refinements in signals for sewing machines, and the principal object of the invention is to provide a device of the character herein described, such as may be conveniently and effectively employed for warning the operator of a sewing machine when the supply of thread on the bobbin is nearly exhausted.

This object is achieved by the provision of an electric switch in circuit with a suitable warning device, and means for operatively connecting the switch to the bobbin holder so that as long as the supply of thread on the bobbin is adequate, the switch remains open and the warning device inactive, but so that when the thread supply is nearly exhausted, the bobbin holder is subjected to oscillation or "jerking" and the electric switch is accordingly closed, thus energizing the warning means.

Some of the advantages of the invention reside in its simplicity of construction, in its efficient and dependable operation, and in its adaptability for use on sewing machines of different sizes and types.

With the above more important objects and features in view, and such other objects and features as may become apparent as this specification proceeds, the invention consists essentially of the arrangement and construction of parts as illustrated in the accompanying drawings, in which:

Figure 1 is an elevational view of a sewing machine showing the invention embodied therein.

Figure 2 is an elevational view of a bobbin race having the electric switch mounted thereon.

Figure 3 is a sectional view of the electric switch and the switch actuating means.

Figure 4 is a perspective view of a slidable keeper and adjusting means used in the switch, and

Figure 5 is a perspective view of the bobbin such as may be used in connection with the invention.

Like characters of reference are employed to designate like parts in the specification and throughout the several views.

Referring now to the accompanying drawings in detail, the general reference character 10 designates a conventional sewing machine including, inter alia, a conventional bobbin race 12 containing an oscillatory bobbin holder 14 which, in turn, accommodates a rotatable bobbin 16 on which is a length of thread 18.

The bobbin holder 14 is also provided with laterally projecting stop finger 20 which is adapted for oscillatory movement in a recess 22 formed in a stop plate 24, the latter being suitably secured to the bobbin race 12 in the conventional manner.

The invention resides in the provision of an electric switch designated generally by the reference character 26 including a housing 28 provided with a bracket 30 whereby the entire switch may be secured to the race 12 or to the stop plate 24, as desired.

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A wall 32 of the housing 28 is formed from insulating material and is provided with a pair of contact points 34, 36 which are spaced apart and are electrically connected in series to a suitable warning device, such as for example, an electrical lamp 38 mounted on the machine 10 by a bracket 40. The electrical conductor between the lamp and the switch is indicated at 42.

An elongated keeper 44 is slidable in the housing 28 and projects outwardly therefrom as indicated at 46, this keeper being provided with a recess or socket 48 accommodating a contact element 50 which is engageable with the contact points 34, 36. The projection portion 46 of the keeper 44 accommodates a screw threaded adjusting element 52 extending downwardly from the switch and carrying a knurled knob 54, while its upper end portion enters the recess or socket 48 and bears against the underside of a resilient pressure pad 56. This pad, in turn, bears against the contact element 50 and urges the same upwardly in engagement with the contact points 34, 36, it being understood that when the element contacts both the points 34, 36 as shown in Figure 3, the switch is closed, while sliding of the keeper 44 in the direction of the arrow 58 will cause the element 50 to contact only the point 36, in which event the switch will be opened. Moreover, by simply tightening or loosening the adjusting element 52, the pressure of the resilient pad 56 against the element 50 and, consequently, the pressure of that element against the contact points 34, 36 may be varied, thus correspondingly varying the amount of effort which is required to slide the keeper 44 in the switch housing 28 to close the switch.

The switch actuating member assumes the form of a rod or stem 60 which has one end thereof embedded in the keeper 44 and projects outwardly from the housing 28, the outer end portion of this rod being angulated as at 62 for engagement with the stop finger 20 of the bobbin holder 14.

When the invention is placed in use and the supply of thread on the bobbin 16 is adequate, the bobbin rotates freely and the bobbin holder 14 is stationary in the race 12, while the stop finger 20 does not contact the angulated portion 62 of the rod 16 and, consequently, the switch 26 is in its open position (see Figure 2).

However, when the supply of thread on the bobbin 16 is exhausted, the inner end of the thread which is usually anchored to the bobbin will cause the bobbin and the entire holder 14 to violently "jerk" in the direction of the arrow 64 in Figure 2, under which circumstances the stop

finger 20 will engage the rod 60 and will slide the keeper 44 to the position shown in Figure 3, thus automatically closing the switch 26 and energizing the signalling or warning device 38. It will be found that by simply tightening or loosening the adjusting means 52, the amount of force required to close the switch may be increased or decreased accordingly, in proportion to the strength of the particular thread being used, thus safeguarding against undue actuation of the warning device and against breakage of the thread.

If it is desired to energize the warning device 38 somewhat in advance, that is, before the supply of thread on the bobbin is actually exhausted, the bobbin 16 may be provided adjacent the core 66 thereof with a transverse pin 68 (see Figure 5) carrying a boss 70 to which is secured a helical spring 72, the first few turns of the thread 18 around the core 66 being wound between the coils of the spring 72 so that the inner end portion of the thread is frictionally held between the coils of the spring for the purpose of creating the "jerking" action necessary for the actuation of the switch before the supply of thread on the bobbin is actually exhausted.

It is believed that the advantages and use of the invention will be clearly apparent from the foregoing disclosure and accordingly, further description thereof at this point is deemed unnecessary.

Having described the invention, what is claimed as new is:

1. In a sewing machine including a bobbin race and an oscillatory bobbin holder including a projecting stop finger, an electric switch mounted adjacent said holder and supported directly upon said race, an actuating member provided on the switch and positioned behind and disposed in the path of movement of said finger to be urged by the finger to a circuit closing position, a bobbin rotatable in said holder, and means on said bobbin for anchoring an end portion of a thread thereto.

2. In a sewing machine including a bobbin race and an oscillatory bobbin holder including a projecting stop finger, an electric switch mounted adjacent said holder and supported directly upon said race, an actuating member provided on the switch and positioned behind and disposed in the path of movement of said finger to be urged by the finger to a circuit closing position, and adjustable frictional means for resisting actuation of said switch.

3. In a sewing machine including, a bobbin race and a stop plate provided with a notch having an extended part, an oscillatory bobbin holder positioned in said race and having a projecting stop finger movable in said notch, an electric switch mounted directly on said plate, said switch including spaced contact points, a slidable keeper, and a contact element provided in said keeper and engageable with said points, and a switch actuating member secured to said keeper and extending into the extended part of said notch, said member being engageable by said finger whereby said switch may be closed.

4. The device as defined in claim 3 together with adjustable means provided on said keeper for urging said element in frictional engagement with said points.

5. For use with the bobbin casing rotating restraining finger of a sewing machine, a signal switch comprising a switch casing having an insulated wall and a slot facing the wall, an insulated keeper slidably received in the casing and having a portion slidably received in the slot, a pair of spaced contacts on said wall facing the keeper, said keeper also having a recess facing the wall, a contact-bridging element in the recess for engaging and bridging the space between the contacts as the keeper is moved to a circuit closing position, and an actuator arm secured to the keeper for movement therewith and extending outwardly from the switch casing and disposed in the path of the finger of the bobbin casing.

6. The combination of claim 5 and means threadingly secured to the portion of said keeper and received in the recess for adjusting the element in the recess to vary the frictional contact of the element with the contacts.

7. The combination of claim 6 and a resilient pad interposed between the element and the means threadingly secured to the portion of said keeper for yieldingly retaining the element in contact with said pair of contacts.

8. A signal switch attachment for bobbins, said attachment comprising a casing having an upper insulated wall and a lower wall with a slot therein, a bracket secured to the casing and having fastener receiving openings, whereby the casing may be secured to a bobbin race, an insulated operator slidably received in the casing between the upper and lower walls thereof and having a depending sleeve portion received in the slot for sliding movement, a pair of spaced contacts held on the upper wall and facing the operator, said operator having a recess in its upper face, a contact element vertically movable in the recess, said sleeve portion having a threaded bore entering the recess, a resilient plug in the recess under the contact element, an operating rod having an upper portion threaded in the bore and engaging the pad to selectively raise and lower the pad and contact element and thereby urge the contact element and said contacts, and an actuating arm fixed to the operator and projecting outwardly from the casing to be disposed in the path of a bobbin casing restraining finger, whereby the bobbin casing restraining finger will engage and urge the operator to a circuit closing position with the contact element riding against the contacts.

9. In a sewing machine including a wound bobbin thread which is unwound during operation of said machine and a bobbin case having a stop finger thereon which will be moved beyond its normal thread feeding position as the thread is unwound a predetermined amount from the bobbin, a switch supported adjacent said holder and having a sliding circuit making and breaking element, and an actuating arm attached to the element and disposed in the path of movement of the finger to be engaged by the finger when the finger is moved beyond its normal thread feeding position.

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