May 29, 1956 A. W. ALLEN 2,747,532

AUTOMATIC WARNING DEVICE FOR SEWING MACHINES

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Fig. 1

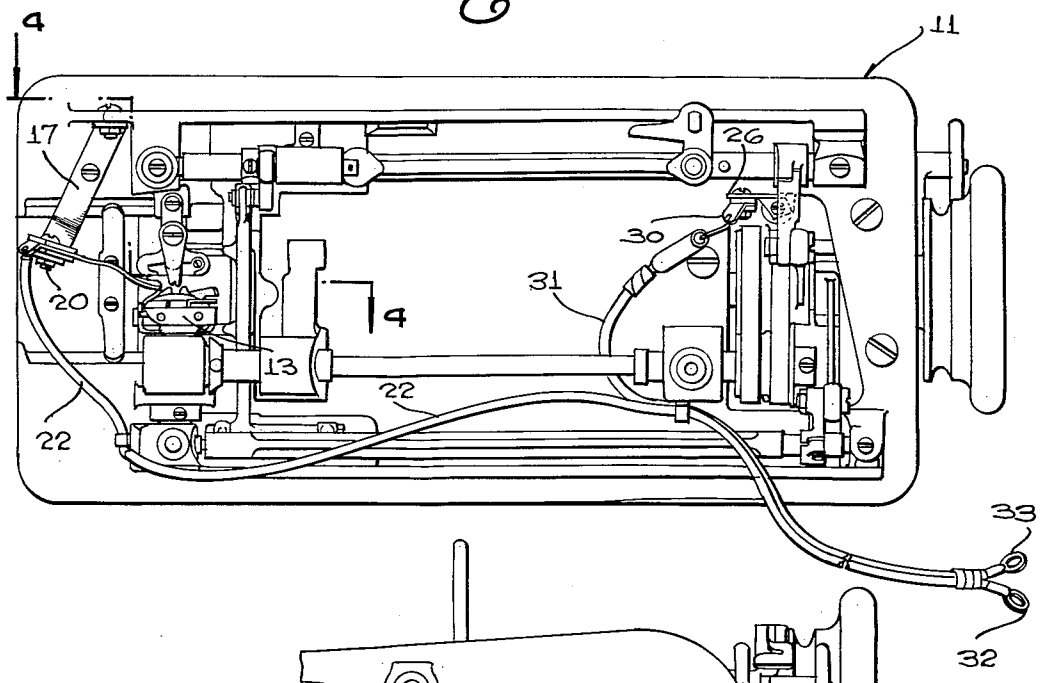
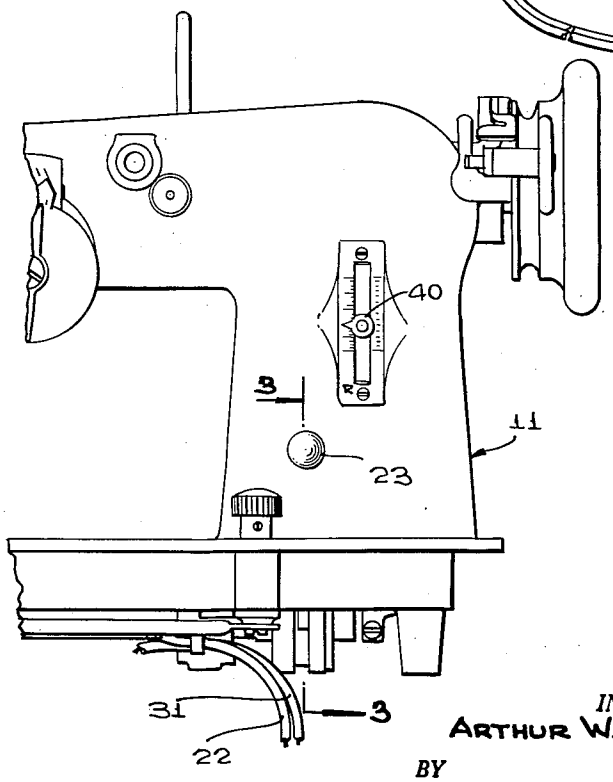


Fig. 2



INVENTOR.
ARTHUR W. ALLEN

BY

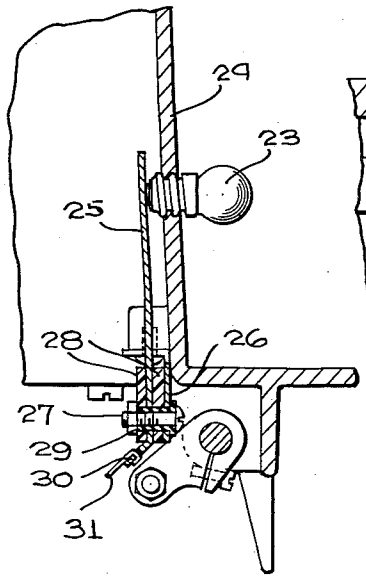
McMorrow, Berman & Davidson
ATTORNEYS

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Fig. 3



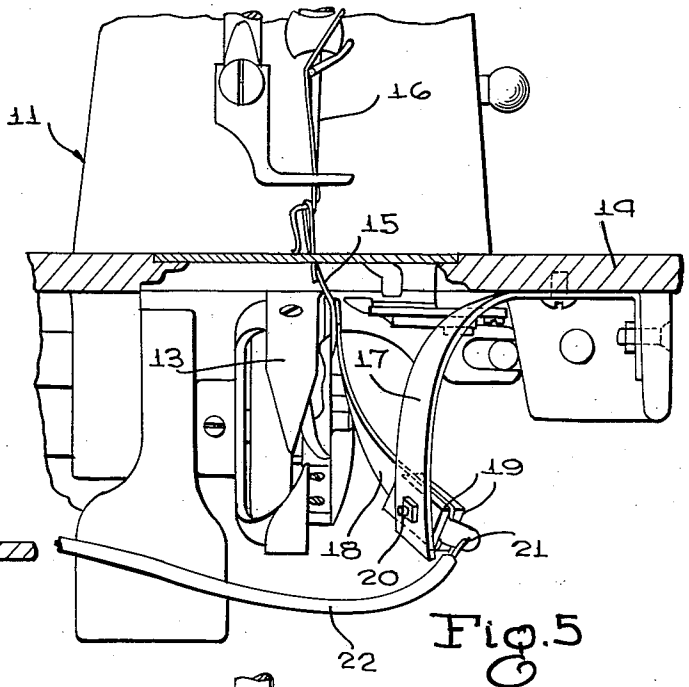
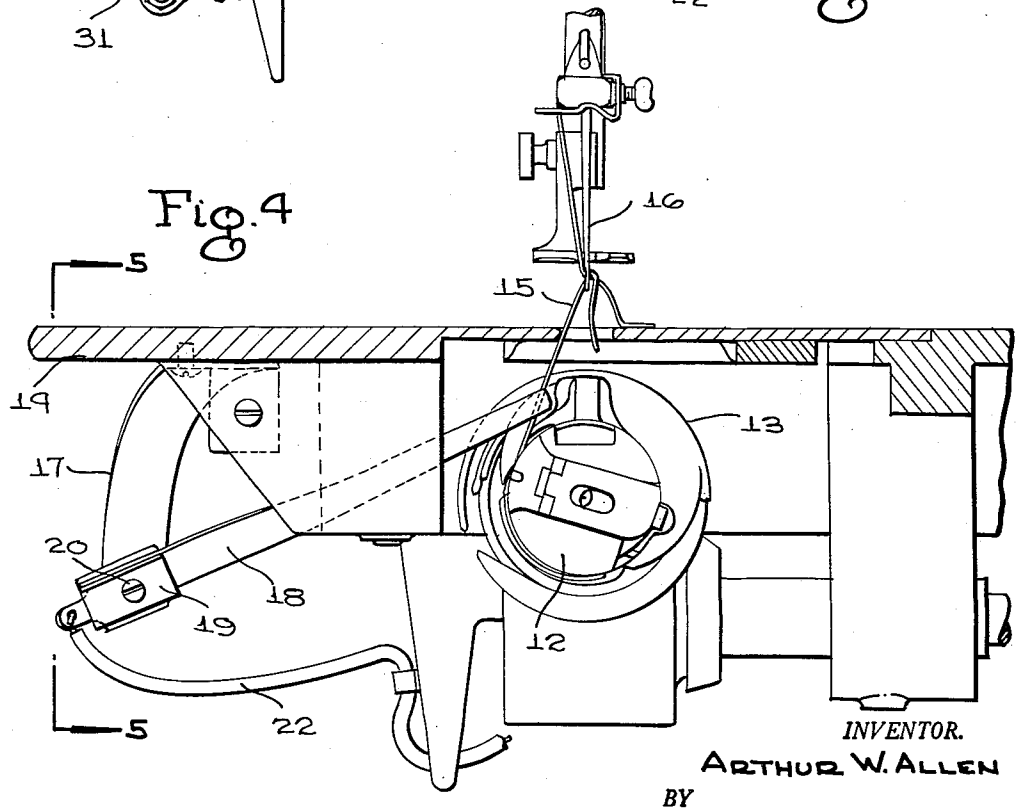


Fig. 5

Fig. 4



INVENTOR.
ARTHUR W. ALLEN
BY

McMorrow, Berman & Davidson
ATTORNEYS

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AUTOMATIC WARNING DEVICE FOR SEWING MACHINES

Arthur Wayne Allen, Marshalltown, Iowa

Application July 31,1953, Serial No. 371,541

2 Claims. (Cl. 112—218)

This invention relates to improvements in sewing machines, and more particularly to an automatic warning device to notify the user of a sewing machine when the thread has been completely removed from the bobbin of the machine.

The main object of the invention is to provide a novel and improved warning device to indicate an empty bobbin or lack of thread from the bobbin to the needle on a sewing machine, the improved device being simple in construction, being easy to install on existing sewing machines, and providing an immediate warning when the thread is exhausted from the bobbin of the machine.

A further object of the invention is to provide an improved electrical warning device for a sewing machine to indicate the absence of thread from the bobbin to the needle of the machine, the improved device involving inexpensive components, creating no interference with the normal movement of the thread and giving the operator of the sewing machine an immediate warning when the thread from the bobbin becomes exhausted so that the operator can immediately stop the machine and replenish the supply of thread on the bobbin.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a bottom view of a conventional sewing machine head provided with an improved warning device constructed in accordance with the present invention.

Figure 2 is a fragmentary elevational view of the sewing machine head illustrated in Figure 1.

Figure 3 is an enlarged cross sectional detail view taken on the line 3—3 of Figure 2.

Figure 4 is an enlarged vertical cross sectional view taken on the line 4—4 of Figure 1.

Figure 5 is a cross sectional view taken on the line 5—5 of Figure 4.

Referring to the drawings, 11 designates a conventional metallic sewing machine head rising above a metallic frame and having a bobbin 12 rotatably mounted in a bobbin case 13 beneath the top wall 14 of the frame. As is well known in the art, the thread 15 passes upwardly from the bobbin 12 to the needle 16 and is looped around the thread which passes through the eye of the needle, as is illustrated in Figure 4.

Designated at 17 is a relatively rigid depending bracket member which is secured to the top wall 14 of the sewing machine frame and depends downwardly therefrom, as shown in Figure 4. Designated at 18 is a diagonal resilient contact arm which is secured to the lower end of the bracket 17 and is insulated therefrom, as by insulating plates 19 of non-conducting material secured on opposite sides of the end portion of the resilient contact arm 18, as shown in Figure 5, and by a fastening bolt 20 which extends through the insulating plates 19 and through an aperture in the contact arm 18, suitable sleeving of insulating material, well known in the art, being provided between the bolt 20 and the aperture in the arm 18 to prevent the bolt from making metal-to-metal contact with the

edge of the aperture. Connected to the upper end of the contact arm 18 at 21 is a first energizing conductor 22.

The resilient contact arm 18 curves upwardly toward the bobbin case 13 and the thread 15 is disposed between the free end of the arm 18 and the bobbin case 13, whereby the thread normally insulates the contact arm 18 from the bobbin case. However, when the thread is completely unwound from the bobbin, or is absent for any reason from between the end of the arm 18 and the bobbin case 13, the arm 18 makes metal-to-metal contact with the bobbin case.

Designated at 23 is a flashlight bulb which is threadedly engaged in a suitably threaded aperture provided in the side wall 24 of the sewing machine head, as shown in Figure 3, the bulb 23 being preferably located adjacent the tension indicator 40 of the sewing machine, as shown in Figure 2. From Figure 3 it will be apparent that the shell of the flashlight bulb base is thus electrically connected to the frame of the sewing machine. Designated at 25 is a contact spring which is insulatingly secured to a bracket 26 fastened to the inside of the sewing machine frame, as by the bolts 27 and insulating plates 28, 28, the bolts being provided with insulating sleeving 29 which may be similar to that employed with the fastening bolt 20 for the contact arm 18. Connected to the lower end of the contact spring 25 at 30 is a second energizing conductor 31. The respective energizing conductors 22 and 31 are provided with the connection terminals 32 and 33, as shown in Figure 1, whereby the energizing conductors 22 and 31 may be connected to the terminals of a suitable current source, such as a dry cell or the secondary terminals of a step-down transformer providing a secondary voltage suitable for energizing the lamp bulb 23.

In operation, when the thread 15 is completely unwound from the bobbin 12 or is absent for any reason from between the free end of the resilient contact arm 18 and the bobbin case 13, the end of the contact arm 18 engages the bobbin case, completing a circuit to energize the lamp bulb 23, said circuit including the energizing conductor 22, the contact arm 18, the frame of the sewing machine head, the lamp bulb 23, the contact arm 25 and the second energizing conductor 31. Thus, the operator of the machine is immediately warned of the absence of the thread 15 from the bobbin 12 and can stop the sewing machine to replenish the supply of thread on the bobbin.

While the depending bracket member 17 may be of a rigid nature, it is also contemplated that the bracket 17 may be substantially resilient and that a substantial degree of adjustment of the contact member 18 may be provided at the connection between the bracket 17 and the contact arm 18 to insure that the end of the contact arm 18 will be properly positioned so that the thread 15 engages between said contact arm and the bobbin case 13 in the manner illustrated in Figures 4 and 5.

From the foregoing, it will be appreciated that the contact arm 18 along with the bobbin case 13 constitutes, in effect, a grounding switch which is held in an open position by the thread extending between the bobbin and the needle during sewing operation, and adapted to close in the absence of the bobbin thread. Thus, the electrical circuit includes the grounding switch, normally open during sewing operations, and the signalling device in the form of the light bulb 23 electrically grounded to the sewing machine head and connected to the switch arrangement in the same electrical circuit and in series therewith with the switch arm 18 adapted to close and be grounded in the absence of the bobbin thread to complete the circuit and actuate the signal device 23.

While a specific embodiment of an improved warning device for sewing machines has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to

those skilled in the art. Therefore, it is intended that no limitation be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In a metallic sewing machine of the type having a frame carrying a head thereon and a bobbin case dependingly carried by the frame with a thread extending between a bobbin in said case and a needle mounted in said head for reciprocatory movement, an automatic warning device for indicating the absence of a connected thread between the bobbin and the needle, said device comprising a grounding switch carried by said machine adjacent said bobbin and adapted to be held open by engaging the bobbin thread during sewing operation of the machine and to close in the absence of bobbin thread.

2. In a metallic sewing machine of the type having a frame carrying a head thereon and a bobbin case dependingly carried by the frame with a thread extending between a bobbin in said case and a needle mounted in said head for reciprocatory movement, an automatic warning device for indicating the absence of a connected thread

between the bobbin and the needle, said device comprising a resilient arm of electrically conductive material having a free end carried by and electrically isolated from said frame, said free end adapted to extend across and engage the bobbin thread adjacent said case during sewing operation to maintain said free end spaced from said case, and a signal device carried by and electrically grounded to said head connected to said switch in the same electrical circuit and in series therewith, said resilient arm adapted to close and be grounded by contact with the bobbin case in the absence of the bobbin thread to complete the circuit and actuate the signal device.

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