Dec. 24, 1946. J. W. MURPHY ET AL 2,413,064

SEWING-MACHINE ACCESSORY

Filed Dec. 4, 1945

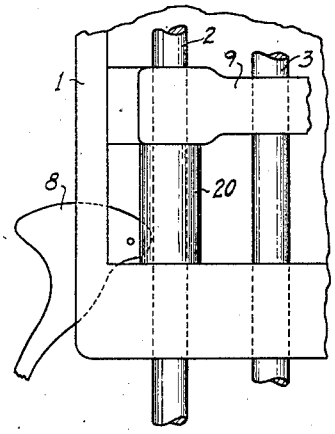


Fig. 2

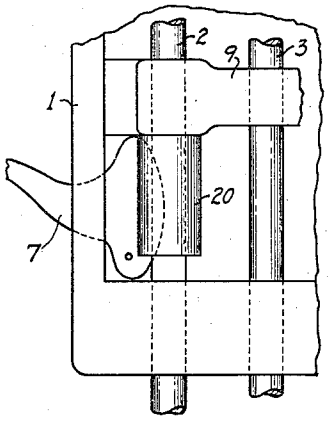


Fig. 3

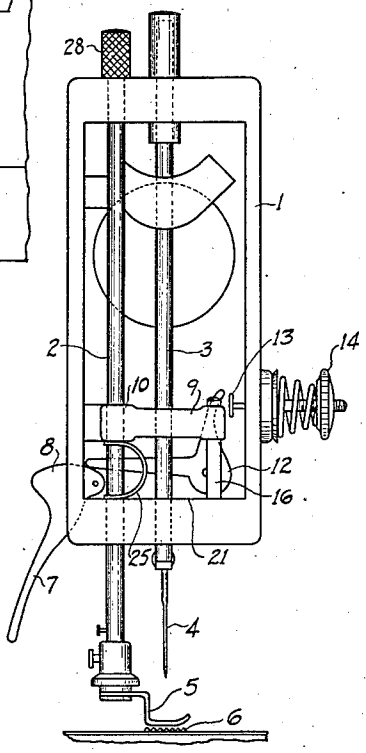


Fig. 1

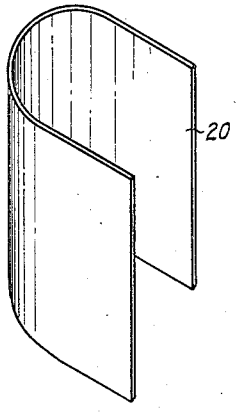


Fig. 4

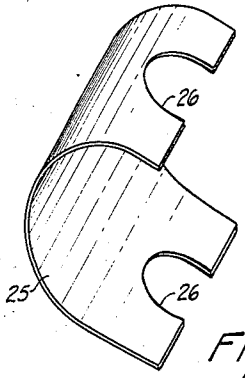


Fig. 5

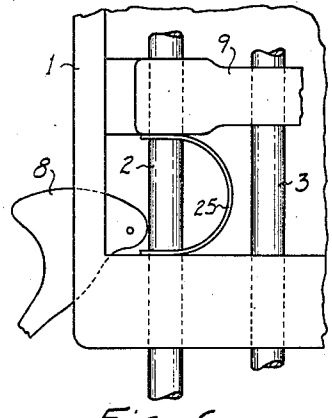


Fig. 6

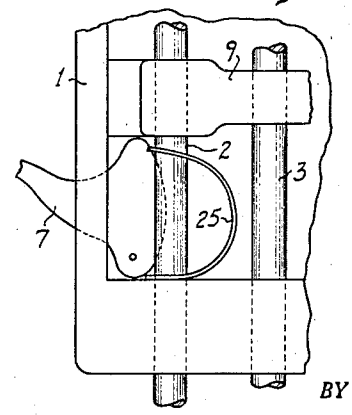


Fig. 7

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SEWING-MACHINE ACCESSORY

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5 Claims. (Cl. 112—236)

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This invention relates to a sewing-machine accessory and, more particularly, a stop for controlling the extent of the downward movement of the presser-foot shaft of a sewing machine so as to permit the sewing machine to be used for darning, mending, quilting, overcasting, embroidering, and the like. The adjustment of this invention which makes possible such operations does not interfere with ordinary sewing. It permits the locking of a stitch at the end of a seam or hem. Furthermore, no change or adjustment is required in switching from one type of operation to another. The stop for controlling the extent of the downward movement of the presser-foot shaft is preferably a cushioning or equalizing stop, as will be explained more clearly in what follows.

Various schemes have been devised for adapting a sewing machine so that it may be used for darning. All of these have been quite unsatisfactory for one reason or another.

According to this invention a suitable stop is provided for use with the presser-foot shaft to limit its downward movement and thus reduce the pressure of the presser foot against the automatic feed which is located directly beneath it. The use of the stop does not require removal of the head as is necessary with many of the attachments which adapt a sewing machine for darning, etc. This is an advantage because when the head is removed, stitches of irregular length are formed; whereas while the head is in place, as is contemplated in the adjustment of this invention, the stitches are even. The stop is preferably adjusted so as to limit this downward movement of the presser foot in such a predetermined way as to cause the material being sewed to be moved forward but with such slight pressure of the presser foot that it may be moved from side to side as desired, as is required in darning, etc. The automatic feed continues to function and operates as usual in ordinary sewing and seam locking, etc.

The invention will be further described in connection with the accompanying drawing, in which:

Fig. 1 is an end view of the housing of a standard sewing machine with the end plate removed, equipped with a stop of the type herein claimed;

Figs. 2 and 3 are enlarged details of the housing with the end plate removed, showing one type of stop herein claimed, with the cam of the presser foot in different positions;

Figs. 4 and 5 are views in perspective of different types of stops; and

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Figs. 6 and 7 are enlarged details of the housing with the end plate removed, illustrating the use of the stop shown in Fig. 5, with the cam of the presser foot in different positions.

In the various figures the housing 1 is of the usual type, and passing through this housing is the presser-foot shaft 2 and the needle shaft 3. The needle 4 is fastened in the needle shaft 3 in any usual manner. The presser foot 5 operates against the automatic feed 6. The presser-foot lever 7 comprises the cam 8 which operates in the usual manner to raise and lower the bar 9 which is fastened to the presser-foot shaft 2 by the collar 10. The projection 12 which is connected in the usual way with the cam 8 operates against the knob 13 to loosen the tension of the thread-tensioning device 14. The post 16 is a guide post for the arm 9 which curves around the needle shaft 3. These parts are the same in all of the views.

The sleeve 20 (Figs. 2–4) which is one form of stop device which may be used in carrying out the invention, is preferably made of spring steel or the like and is designed to clip around the presser-foot shaft 2 under the arm 9. It is just long enough so that by resting on the floor 21 of the housing, it limits the downward movement of the presser-foot shaft 2 as clearly illustrated in Figs. 2 and 3. It fastens snugly around the presser-foot shaft, and when the presser-foot lever 7 is raised by moving the cam 8 and thus raising the arm 9, the stop will ordinarily adhere to the presser-foot shaft 2 and move upward with it as shown in Fig. 3. When the presser-foot lever 7 is lowered and the cam is swung out as shown in Fig. 2, the downward movement of the presser-foot shaft is limited by the pressure of the arm 9 against the stop 20. This is shown in Fig. 2.

By limiting the downward movement of the presser-foot shaft so as to provide a clearance of about .015 inch between the presser foot 5 and the automatic feed 6, the pressure of the presser foot against the feed when the feed is operating is so slight that stocking or other material inserted between the two is moved forward by the automatic feed 6, but it is still possible for the operator to slide the stocking material from left to right between the presser foot and the feeder. Thus, it is possible to darn stockings and the like on a standard sewing machine without any adjustment other than the insertion of the stop 20. The presence of this stop does not interfere with the use of the machine for ordinary sewing.

The stop **20** provides a definite and unchangeable lower limit to the movement of the arm **9**. It may be of standard length, and by the use of shims the lower limit may be raised to any desired level. A disadvantage of this arrangement is that the lower limit is definitely fixed and is not at all flexible. To provide a flexible limit, the improved stop **25** may be used to advantage. This stop is formed of stiff, spring steel or the like, and the arc portions **26** are cut away to provide for fitting the stop around the presser-foot shaft **2** as shown in Figs. 6 and 7. The arcs **26** are each over 180° and are sprung around the shaft **2** and encircle it sufficiently to hold the stop on the shaft. The arcs are somewhat larger than the circumference of the shaft so that the stop rests on the bottom of the housing at all times, even when the cam **8** is raised as shown in Fig. 7. If preferred, one of the arcs may be small enough to fit tight around the shaft and hold the stop to the shaft at all times; but unless one of the arcs is sufficiently large to move freely over the shaft, it is impossible to take advantage of the springiness of the stop.

The machine is adjusted for use of this preferred stop as follows: Raise the needle shaft **3** to the top of its stroke. (When the needle shaft is at the top of its stroke, the automatic feed **6** is necessarily at full height.) Insert a gauge between the presser foot **5** and automatic feed **6**. For ordinary sewing, darning, and mending of cotton material, a .015 gauge should be used; so for most operations this size gauge will give the most satisfactory adjustment. Then adjust the top tension cap **28** to give just sufficient clearance between the presser foot and automatic feed to permit the gauge to be moved freely between them. If material thicker or thinner than ordinary cotton material is to be operated upon, the top tension cap must be adjusted accordingly. This gives the cushioning effect desired from use of the spring stop **25** without interfering with the normal operation of the automatic feed.

Changes in the construction and operation may be made without departing from the scope of the invention as defined in the appended claims.

What we claim is:

1. In a sewing machine which comprises a presser foot, an automatic work feed, a cam and lever for operating the presser foot, and a housing which encases at least a large part of the upper portion of the presser-foot shaft, a stop member between the bottom of the housing and a member fastened to the presser-foot shaft near the bottom of the housing, which stop member is ineffective when the presser-foot lever cam is raised but limits the downward movement of the presser-foot shaft when the presser-foot lever cam is lowered so that the pressure of the presser foot against the automatic feed is reduced.

2. The sewing-machine mechanism of claim 1 in which the stop consists of means held in engagement with the presser-foot shaft so as to move with it and limit its downward movement.

3. The sewing-machine mechanism of claim 1 in which the stop is a sleeve clipped around the presser-foot shaft.

4. The sewing-machine mechanism of claim 1 in which the stop is a stiff vertical spring fitted to the presser-foot shaft so as to move in engagement with it.

5. In a sewing machine which comprises a presser foot, a tension cap on the top of the presser foot, a cam and lever for operating the presser foot, an automatic work feed, and a housing which encases at least a large part of the upper portion of the presser-foot shaft, a vertically elastic stop member between the bottom of the housing and a member fastened to the presser-foot shaft near the bottom of the housing which is ineffective when the presser-foot lever cam is raised but limits the downward movement of the presser-foot shaft when the presser-foot lever cam is lowered, whereby as the tension cap is adjusted, the tension on the stop member is affected, and the clearance between the presser foot and the automatic feed is thus controlled.

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