Jan. 10, 1933. H. A. FINE 1,893,582

ATTACHMENT FOR SEWING MACHINES

Filed May 7, 1929

Fig. 1.

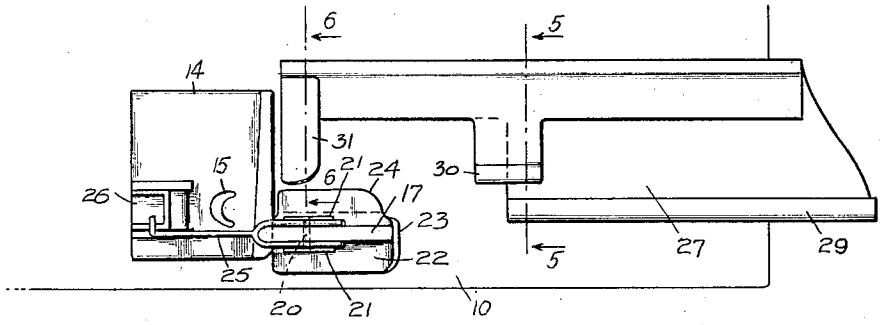


Fig. 2.

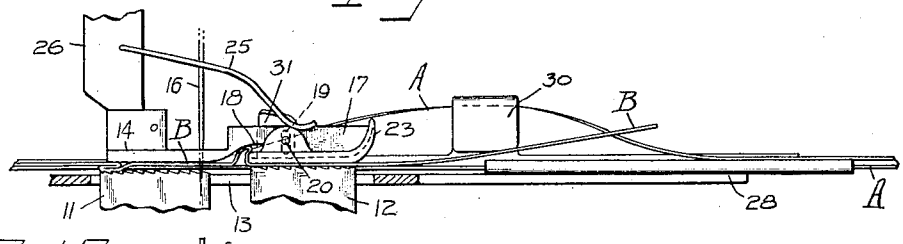


Fig. 3.

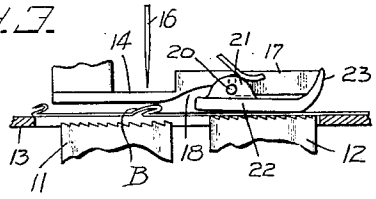


Fig. 5.

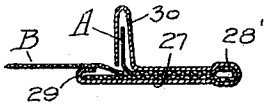


Fig. 4.

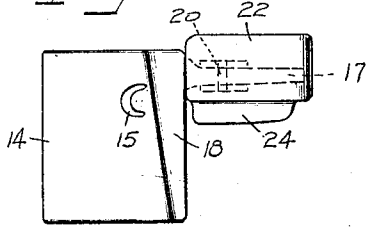
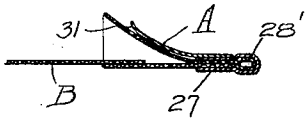


Fig. 6.



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UNITED STATES PATENT OFFICE

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ATTACHMENT FOR SEWING MACHINES

Application filed May 7, 1929. Serial No. 361,105.

This invention relates to an attachment for sewing machines and has reference particularly to a combination binding feed and gatherer, which in a single operation opens a folded elastic binding material, gathers and feeds a non-elastic material between the separated layers of the binding and thereafter closes the latter and runs a line of stitching through the layers of the binding and interposed gathered material to provide a resilient body or leg band in a garment.

Garments requiring resilient body and leg bands have heretofore been provided with the latter elements by various round about methods of manufacture, but so far as I am aware, the only successful handling of the problem has been to first gather the non-elastic material in one operation on a machine and thereafter attach the elastic binding either by hand or by means of a second machine. I shall not attempt to describe all of the various steps and machines used to produce a resilient body band on a garment; let it suffice to say that it has been the object of every manufacturer to reduce the number of operations to a minimum and at the same time to produce a uniform article wherein every garment may have a predetermined body opening.

It is then the principal object of my invention to provide an attachment for a sewing machine, which in a single operation of the sewing machine feeds and opens up a folded elastic binding, gathers the non-elastic material at its edge and feeds it between the layers of the binding, which are then permitted to close over the gathered material, and finally runs a row of stitching through the superimposed layers of the elastic and non-elastic material.

I accomplish the object by means of the arrangement and combination of parts hereinafter described and claimed and illustratively exemplified in the accompanying drawing, in which Figure 1 is a plan view of a work plate of a sewing machine showing my invention attached thereto; Figure 2 is a side elevational view of the same; Figure 3 is a view similar to Figure 2 with the parts in another advanced position; Figure 4 is a bottom plan view of the presser foot; and Figures 5 and 6, respectively are transverse sectional views of the binding guide taken on lines 5—5 and 6—6 of Figure 1.

Referring to the drawing, 10 denotes a portion of a machine which overlies the main feed dog 11 and differential sliding feed dog 12. The main feed dog 11 is attached to a feed bar, not shown, and operates in the usual manner and carries at its forward end the sliding feed dog 12, which as is common in this well known branch of the sewing machine art, may travel at the same speed as the main feed 11 or at a speed up to several times greater than that of the main feed. Arranged over the feed dogs and permitting operation thereof through its openings is a throat plate 13. A presser foot 14 operates over the feed dog 11 and is provided with opening 15 to accommodate the reciprocating upright needle or needles 16.

The present invention resides mainly in the construction and particular operation of the presser foot 14 which is provided with an extension 17 projecting forwardly thereof and on the outside of the path of the needle 16. The plate forming the presser foot proper is substantially rectangular and on its under surface a tapering channel 18 is provided which extends transversely of the plate and has its wider end under the inner end of the extension 17, as illustrated in Figures 2, 3 and 4. The extension 17 in the embodiment of the present invention alines itself directly over the differential feed dog 12 and about mid way of its length an upright slot 19 is provided to loosely accommodate a carrying pin 20 upon whose opposite ends beyond the sides of the extension 17 are supported the spaced upright ears 21 of a rocking shoe 22 adapted to control the gathering operations of the feed dogs. The shoe 22 comprises a member having a straight heel portion underlying the extension 17 and an upturned toe portion 23. The shoe 22 is further provided with an integral side extension or plate 24 which extends inwardly from the path of the needle 16, and acts as a guide to the open edges of the binding A. The shoe 22 is yieldably urged in a downward direction by a spring 25 which is fixed at one end in the

presser foot post 26 and at the other end is forked and bears on the ears 21 forward of the axis of the carrying pin 20.

Referring now to the binding guide, the latter comprises a plate 27 resting on the cloth plate 28 and projecting forwardly from the presser foot. The plate is substantially U-shaped along its inner side to accommodate and guide the fold of the binding material A, which along the open side has its under layer guided through a U-shaped guideway 29 and its upper side lifted to upright position as it passes under an inverted U-shaped finger piece 30, the latter being bent from a projecting portion of the plate 27 about mid way the length thereof. At the extreme inner end of the plate 27 a second curved finger 31 is mounted which guides the upturned side of the binding downwardly over the extension 24 of the shoe 22, the shoulder between the extension 24 and the main portion of the shoe being disposed in line with the guideway 29 so that the lower side of the binding A moves along the shoulder to come into the path of the needle, as illustrated particularly in Figure 1.

Having now described the several elements in detail which go to make up the present invention, I shall conclude with the operation of these elements in connection with the work for which they are designed to handle.

The binding A is first inserted in its guide by placing the end between the two guideways 28′ and 29 and with the upper layer above the guideway 29 and through the finger piece 30, as shown in Figure 5. The binding A is then advanced towards the presser foot 14 under which both layers are brought together on opposite sides of the gathered material B which is fed in on top of the lower layer of the binding and comes under the shoe 22 outside the edge of the binding. The feed dogs 11 and 12 pick up the material B under the presser foot and advance it towards the rear. According to the invention the differential feed dog 12 moves more rapidly than the main feed dog 11 and in doing so it rises higher than the latter and crowds the material against the shoe 22 which yields and allows the material to gather in the channel 18 at its wider end. During the movement of the differential feed dog 12 the needle 16 is in its lower position and the material B being barred by the needle gathers in the channel as just stated. Ordinarily the gathered material would spring backwardly away from the needle as the presser foot rises, but the spring 25 causes the shoe 22 to tilt forwardly and downwardly to continually exert a holding pressure on the material B. As the main feed dog 11 again rises against the presser foot the gather in the channel is fed with the material and the portion of the gather and material projecting under the extension 24 with the edges of the binding A on opposite sides thereof, all move into the path of the needle which drops and picks up its stitch through the two layers of the binding A and interposed gathered material B. This operation is of course repeated until the full length of the material at the body or leg opening of the garment has been gathered within the binding which is preferably of elastic material and may expand with the gathered material.

What I claim is:

1. In a sewing machine of the character embodying a main feed dog and a differential feed dog, the combination of a presser foot comprising a rectangular flat plate having a needle opening and a forwardly projecting extension outside of said needle opening and a tapered channel in its under surface projecting along its forward side just back of the extension and directly over the space between the dogs to accommodate the gather in material raised by the differential feed dog, a shoe mounted for upright and pivotal adjustment on said extension and having a projection in line with the needle opening, and a spring to yieldably exert downward pressure on the shoe forwardly of the pivotal axis thereof.

2. A presser foot for a sewing machine as claimed in claim 1, in which the wider end of the tapered channel is disposed at the side having the extension supporting the shoe and at a point where the maximum gather in the material takes place.

3. A shoe for a presser foot, as claimed in claim 1, in which the projection is raised from the under surface of the shoe, to provide a guide shoulder for material between the shoe proper and projection.

In testimony whereof he has affixed his signature.

HARRY A. FINE.