METHOD AND APPARATUS FOR SEWING A BINDING ON A GARMENT

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The invention relates to a method for sewing a binding on a garment by means of a two needle sewing machine while using a blind stitch folding device that feeds a binding strip arranged rearwardly of the needles by means of which the folding edges of the binding strip are turned over upwardly.

In a method which is used in the sewing industry for sewing on a third onto a garment, the sewing in binding strip is disposed on the stitch plate of the machine below the prepared garment, the inner covering is placed upon the garment, and the parts thus disposed upon one another are sewn through, so that the lower part of the seam which normally is not of very attractive appearance is very in accordance with the invention, paperlike with the invention, the method of adapting the stitch position which is arranged in front of the stitch position of the needle. In this manner the feeding of the garment by the operator is impeded.

Heretofore several operations were necessary in order to produce a blindly sewn binding. First the upper edges of the binding strip and of the inner covering were sewn together and turned over with their sides placed against each other, then the lower edge of the binding strip and the border edge of the garment were likewise sewn together and turned over with their outer sides placed against each other, whereupon the turned over parts had to be pressed in order to form the binding satisfactorily. Then the inner covering was sewn on from the outside by means of a second seam extending between the binding and the garment. This seam, however, was not completely invisible.

Furthermore, an apparatus has become known in combination with a single needle zig-zag sewing machine for the blind sewing of binding strips onto materials. This device, however, is not suitable for producing bindings, because only small binding strips can be sewn on, and the seam produced with this device is not sufficiently durable for bindings.

It is an object of the invention to provide a method employing a two needle sewing machine, it is possible, while avoiding the aforementioned shortcomings, to make it possible in a single working operation to sew a binding onto a partly finished garment, and apparatus for practicing said method.

In accordance with the invention this problem is solved by a method whereby after insertion of the beginning of the binding strip below the stitch forming location, the turned over folding edges are first sewn onto the midportion of the binding strip along a predetermined length thereof while the sewing machine feeds backwardly, and then upon turning over the beginning of the binding strip manually and reversing the direction of feed of the sewing machine, to blindly sew on the turned over folding edges of the binding strip which follow by being pulled along, and subsequently to sew the binding strip already sewn onto a covering known per se which while abutting the beginning of the binding is fed along from the bottom, whereby after the desired length of the binding extension has been obtained the border edge of the garment is sewn along between the binding strip and the covering.

To enable the sewing of the beginning of the binding extension in proper form and to attain exact guidance of the same below the material presser foot, an insert plate is advantageously placed upon the previously stitched binding strip during the sewing on of the binding strip and after reversal of the direction of feed is carried along between both binding strip parts and is removed upon completion of the extension of the binding.

In order to avoid that the turned over corners extend over the edge of the binding, the corners of the binding strip part which is sewn on while the direction of feed is reversed are turned over upwardly about a pointed spring tongue provided on an abutment for the start of the binding strip which is accurately secured on the material support plate ahead of the needles and are held by the said insert plate.

It is furthermore very essential for the blind sewing of the binding that, on the one hand, the upper side of the binding strip cannot be pierced while, on the other hand, the turned over folding edges must definitely be pierced to attain a safe, durable connection between the binding, the garment and the covering. Therefore, in accordance with the invention, at least one guiding tongue which is adjustable horizontally and vertically is provided in the blind stitch folding device of the apparatus for carrying out the method described, which is arranged in the inner space between two adjustable folding plates which turn over the folding edges of the binding strip about the guiding tongue, so that the front edge of the guiding tongue extends up to the stitch location of the needles.

In the sewing machine with upper needle and bottom feed used for carrying out the method the blind stitch folding apparatus is suitably combined with the swinging top feeding foot. A machine including means for moving the presser foot and for moving a needle back and forth is described in U.S. Patent No. 3,069,445, owned by the assignees of the present application.

The method in accordance with the invention and the apparatus provided for carrying out the method are described hereinafter in connection with the explanation of the production of a trouser binding.

Further features and objects of the invention as well as details of the advantages obtained thereby will become apparent from the following description with reference to the device illustrated in the accompanying drawings and from the individual steps of the method shown therein, and in which:

FIG. 1 is a perspective illustration of the apparatus for carrying out the new method;

FIG. 2 is a perspective illustration of the top feed device of the sewing machine and of the blind stitch folding apparatus of the device arranged rearwardly thereof;

FIG. 3 is a view similar to FIG. 2 of a part of the apparatus with the inner covering which is fed into the folding device arranged ahead of the needles and which can be flapped over;

FIG. 4 is a perspective view of the binding part sewn on by reverse feeding;

FIG. 5 is a perspective view of the blind sewn turned over binding portion of the binding strip illustrated in FIG. 4 with the insertion plate in place;

FIG. 6 is a perspective illustration of this insertion plate;

FIG. 7 is an illustration similar to FIG. 5 where the border edge of the trouser part is placed between the binding portions;

FIG. 8 is an illustration similar to FIG. 7 with the inner covering;

FIG. 9 is an illustration similar to FIG. 8 with the strip lining inserted.
FIG. 10 shows a section through the blind stitch folding device taken along the line X—X of FIG. 2 which illustrates the feeding of the binding strip during the reverse sewing operation;

FIG. 11 is an illustration similar to FIG. 10 which illustrates the blind sewing of the binding strip carried along during forward sewing and the pre-sewn binding portion;

FIG. 12 is a section taken along the line XII—XII of FIG. 11;

FIG. 13 is a section taken along the line XIII—XIII of FIG. 11.

For carrying out the new method as illustrated in FIGS. 1 to 3, a two needle sewing machine is utilized having a take up lever 18 (FIG. 2) of the top feed foot 6 by means of screws 9 in elongated slots 10 of the angular members 8, as well as two horizontally and vertically adjustable guiding tongues 13 arranged in the inner space between the guiding plates 11 which are slidably secured on angular members 8 as well as the guiding tongues 13 of the guiding tongues 13 extend to the stitch location of the needles 15 secured to the needle support 14.

The mounting means for the guiding tongues 13 are provided with longitudinal slots 42 which are engaged by screws 12. After screws 12 have been loosened, the guiding tongues 13 can be displaced horizontally and vertically on the grooved guiding conformations of the top feed bar (FIGS. 2 and 3), and in this manner they may be adjusted with respect to the needles 15.

A possibility for vertical adjustment of the guiding tongues 13 is provided in that the top feed foot 6 together with the blind stitch folding device 7 may be displaced on the top feed bar by means of screws 40, 41 after these screws have been loosened.

Furthermore, a material presser frame 18 which has a recess 17 is secured to the material presser bar 16. The top feed foot 6 also has a recess 19.

A guide strip 21 (FIG. 1) is secured upon the material support plate 20 ahead of the needles 15 which has an adjustable abutment 22 and a pointed spring tongue 23. Parallel to and at a distance from the guide strip 21, a support 24 is secured upon the material support plate 20 which support has a horizontal bearing shaft 25 upon which a folding device 26 is pivotally supported, which device consists essentially of the lower folding plate 28 provided with a retaining lug 27 (FIG. 3), the adjustable guiding abutment 29 and the upper plate 30. The folding device 26 is pivotally movable about the bearing shaft 25 and is axially displaceable thereon. In this folding apparatus 26 a cover 31 is inserted. Furthermore an edge guiding strip 32 is secured to the material support plate 20. For reversing the feeding direction of the sewing machine a stitch lever 33 is provided on the front side of the machine.

In accordance with the new method for producing the trouser binding extension 34 (FIGS. 5, 11) the trouser binding strip 5 is fed through the edge folding device 3 and the blind stitch folding device 7 (FIG. 1) to the stitch location of the needles 15 in the direction of the arrow C (FIGS. 4, 10). The center part of the trouser binding strip 5 is identified at 5c, and the lateral folding edges at 5a, and a certain length of it is fed or guided by the strip or ruler 32 first rearwardly in the direction of the arrow A (FIGS. 4, 10) about the abutment 22 (FIG. 1), while the folding edges 5a which are turned over by the folding plates 11 about the guiding tongues 13 are sewn onto the center part 5c.

Suitably a part of the beginning or front end 5b which is approximately one inch long is turned over upwardly by hand so that the turned over edge 5d (FIG. 5) is formed. The front end 5b thus prepared is pushed by hand under the spring tongue 23 (FIG. 1). As soon as the turned over edge 5d touches the abutment 22 the machine is stopped.

Thereupon the corners 35, 36 (FIG. 5) are turned over upwardly by hand about the pointed spring tongue 23 (FIG. 5) in order to avoid that during the following blind sewing of the band strip 5 onto the pre-sewn beginning 5b the edges 35, 36 project beyond the border of the trouser binding.

For guiding the trouser binding extension 34 during the following sewing and for holding down the turned over corners 35, 36, the insert plate 37 is placed upon the front end 5b that has thus far been prepared. The insert plate 37 is narrower than the distance between the needles 15. It is guided in the recesses 17 of the material presser frame 18 and in the recesses 19 of the top feed foot 6 (FIGS. 2, 3).

Thereupon the setting of the direction of material feed 56 is carried out by pressing down the lever 33 so that subsequently the material feeding takes place in the direction of the arrow B (FIGS. 5, 11).

Now the machine is again started. The front end 5b which is covered by the insert plate 37 and which has been sewn in reverse direction (arrow A, FIGS. 4, 10) is now advanced under the material presser frame 18, the top feed foot 6 and the front edges 13a as well as the front edges 11a of the folding plate 11 about which the center part 5c is guided are located behind the needles 15. Merely the lateral folding edges 5a of the binding strip 5 are in the stitch area of the needles 15 because the edges 13a of the guiding tongues 13 which extend into the interior of the folding plates 11 extend up to the plane in which the needles 15 are disposed (FIG. 11). The needles 15 pierce the material of the lateral folding edges 5a in blind stitch manner and furthermore pierce the pre-sewn forward end 5b.

The insert plate 37 at the front end 5b which a transverse fold of the binding projection or extension 34 is formed as the direction of feed is reversed, is advanced as the binding strip 5 is drawn along from the roll 4 by means of the folding apparatus 3 and by the blind stitch folding device 7 provided in the reciprocating or rocking upper sewing foot 6 and is sewn onto the pre-sewn part 5b and upon completion of the trouser binding projection 34 (FIG. 7) the plate is withdrawn from the inside.

FIGS. 12 and 13 illustrate the form of the folding plates 11 as well as the folding of the binding strip 5 as it is fed to the stitch forming areas and to the position of the seam material layers of the trouser binding projection 34.

The next operation is the feeding in and sewing on of the waist portion of the trouser part 38 (FIG. 7) between the two binding portions 5 and 5b. It is, of course, possible to sew trouser bindings with the described type of binding projection 34 illustrated in connection with this embodiment by inserting and sewing on the trouser part 38 directly onto the forward edge of the trouser binding.

After that the inner covering or lining 31 which is placed in the folding device 26 ahead of the needles 15 is fed from the bottom to the stitching area with the edge turned over manually and held under the retaining lug 27 while it abuts the beginning of the binding 5b, and the sewing of the trouser binding is completed up to the closing strip.
In order to complete the description the known sewing of the closing strip is described. At the location provided therefor the strip lining 39 which is fed in by hand between the inner covering or lining 31 and the trouser binding strip 5 is sewn on, whereupon the end of the trouser part 38, the trouser binding strip 31 is cut off. The outer edge of the closure strip is then sewn through at the left on a normal straight stitch machine, the strip lining 39 is turned over and is sewn on parallel to and at a distance from the outer edge of the strip 39.

Having now described our invention with reference to the method and apparatus illustrated in the drawings, we do not wish to be limited thereto, but what we desire to protect by letters patent of the United States of America is set forth in the appended claims.

We claim:

1. Method for sewing a binding onto the waist portion of a garment by means of a two needle sewing machine utilizing a blind stitch folding device which feeds in a binding strip and is arranged rearwardly of the needles and through which the fold edges of the binding strip are introduced in upwardly turned over condition, said method comprising the steps of feeding the forward end of the binding strip under the stitch forming area, sewing the turned over fold edges onto the intermediate portion of a predetermined length of the binding strip while sewing in the reverse feeding direction of the machine, folding of the binding strip upon itself adjacent the stitch forming area, reversing the direction of sewing to forward feeding to blindly sew the turned over fold edges of the binding strip which is pulled along first onto the portion of binding strip already sewn, to form a binding projection, moving a covering known per se against the forward end of the binding and placing the waist portion of the garment between said binding and said covering and then blind sewing the binding strip onto said waist portion while sewing on the covering which is carried along underneat.

2. Method for sewing a binding onto the waist portion of a garment by means of a two needle sewing machine utilizing a blind stitch folding device which feeds in a binding strip and is arranged rearwardly of the needles and through which the fold edges of the binding strip are introduced in upwardly turned over condition, said method comprising the steps of feeding the forward end of the binding strip under the stitch forming area, sewing the turned over fold edges onto the intermediate portion of a predetermined length of the binding strip while sewing in the reverse feeding direction of the machine, folding of the binding strip upon itself adjacent the stitch forming area, reversing the direction of sewing to forward feeding to blindly sew the turned over fold edges of the binding strip which is pulled along first onto the portion of binding strip already sewn, to form a binding projection, moving a covering known per se against the forward end of the binding and placing the waist portion of the garment between said binding and said covering and then blind sewing the binding strip onto said waist portion while sewing on the covering which is carried along underneat.

3. Method for sewing a binding onto the waist portion of a garment by means of a two needle sewing machine utilizing a blind stitch folding device which feeds in a binding strip and is arranged rearwardly of the needles and through which the fold edges of the binding strip are introduced in upwardly turned over condition, said method comprising the steps of feeding the forward end of the binding strip under the stitch forming area, sewing the turned over fold edges onto the intermediate portion of a predetermined length of the binding strip while sewing in the reverse feeding direction of the machine, folding of the binding strip upon itself adjacent the stitch forming area, reversing the direction of sewing to forward feeding to blindly sew the turned over fold edges of the binding strip which is pulled along first onto the portion of binding strip already sewn, to form a binding projection, moving a covering known per se against the forward end of the binding and placing the waist portion of the garment between said binding and said covering and then blind sewing the binding strip onto said waist portion while sewing on the covering which is carried along underneat, said method further including the placing of an insert plate onto the sewn binding portion after reversing the direction of feed, carrying along said plate between the said portion of binding and the portion of binding strip being sewn onto the top thereof and removing said insert plate upon completion of the binding projection, said method further including turning over the forward portion of the binding strip sewn in reverse direction onto a pointed spring tongue provided on an abutment member for the forward end of the binding strip which said abutment is adjustably mounted forwardly of the needles and holding said corners down by means of said insert plate.

4. In a two needle sewing machine for sewing bindings onto garments, a needle bar supporting two needles, a presser foot supported rearwardly of said needles as viewed from the operator's station, a two part top feed foot, a stitch plate having needle apertures one for each needle and disposed below said needles, a blind stitch folding device including at least one guiding tongue, means permitting adjustment of said guiding tongue horizontally and a pair of folding members of channel form for the edges of a binding strip disposed laterally of said at least one guiding tongue for guiding the edges of the binding strip over said tongue, said tongue being arranged intermediate said pair of folding members and adapted to separate the edges of the binding strip from the center part of said strip and having a forward edge disposed proximate said stitch plate adjacent the plane of movement of said needles.

5. In a two needle sewing machine for sewing bindings onto garments, a needle bar supporting two needles, a presser foot supported rearwardly of said needles as viewed from the operator's station, a two part top feed foot, a stitch plate having needle apertures one for each needle and disposed below said needles, a blind stitch folding device including at least one guiding tongue, means permitting adjustment of said guiding tongue horizontally and a pair of folding members of channel form for the edges of a binding strip disposed laterally of said at least one guiding tongue for guiding the edges of the binding strip over said tongue, said tongue having a forward edge disposed proximate said stitch plate adjacent the plane of movement of said needles, said machine being of the compound feed type including means for moving said presser foot and for moving said needles back and forth, and said blind stitch folding device being connected to said two part top feed foot for movement therewith.

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