

Feb. 27, 1945.

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2,370,511

STRIP-CONTROLLING DEVICES FOR SEWING MACHINES

Filed Sept. 17, 1943

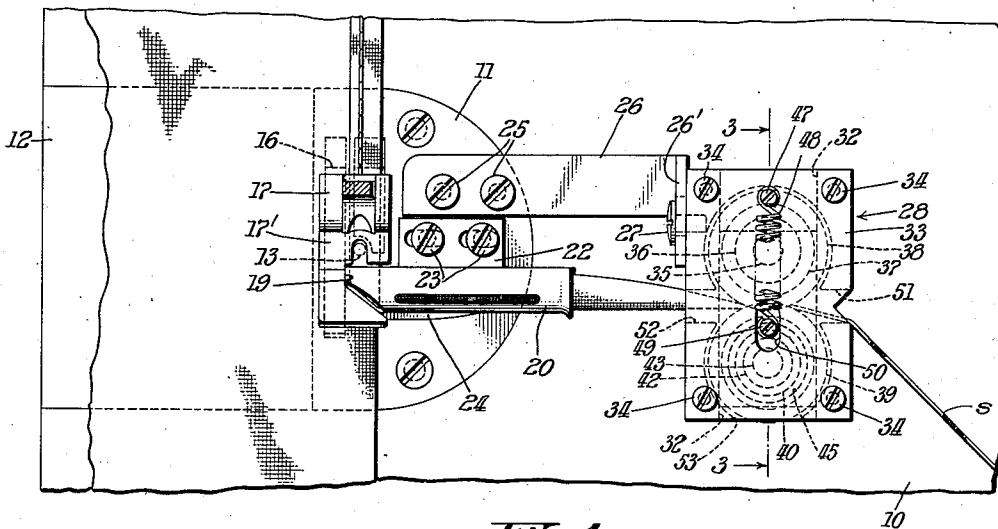


Fig. 1.

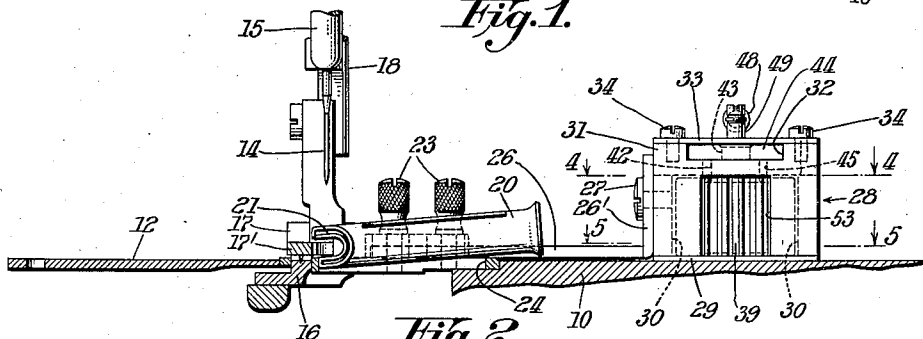


Fig. 2.

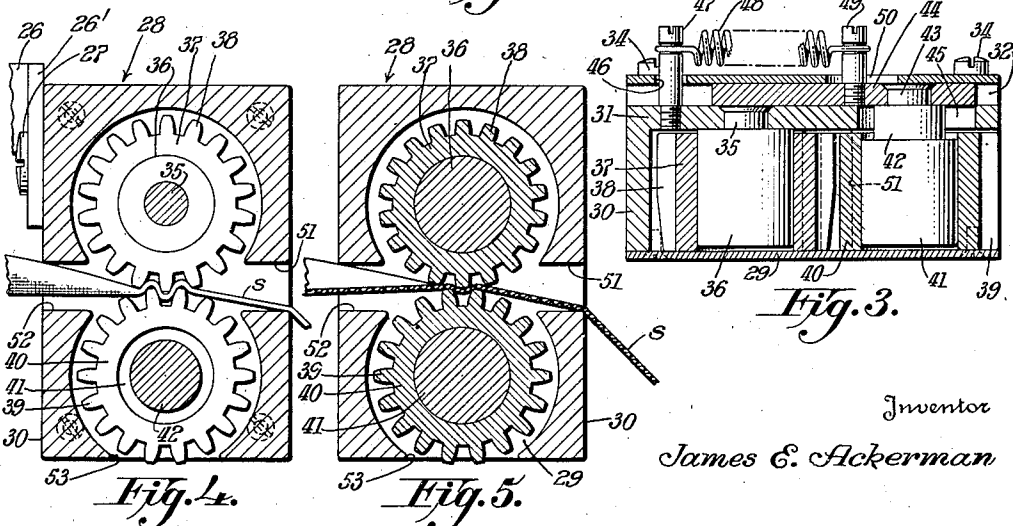


Fig. 3.

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UNITED STATES PATENT OFFICE

2,370,511

STRIP-CONTROLLING DEVICE FOR SEWING MACHINES

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Application September 17, 1943, Serial No. 502,730

8 Claims. (Cl. 112—203)

This invention relates to binding-strip controlling devices for use in connection with sewing machines and has for its primary object to provide means for applying a binding strip of open-mesh material evenly and in undistorted fashion to the margin of a body material.

In sewing machines having a conventional work-advancing feed-dog and a presser-foot yieldingly opposed to the feed-dog, the presser-foot imposes a drag upon the upper of superposed plies of which the under ply is engaged by the feed-dog during its work-advancing movement. As the drag imposed upon the upper work-ply by the presser-foot is in a direction opposite to that imposed upon the under work-ply by the feed-dog in its work-advancing movement, there is present a tendency to feed the under work-ply faster than the upper work-ply. This tendency results in distortion relatively of the plies. While this distortion may be negligible for certain types of materials, it may in certain cases be sufficient to interfere with the proper feeding of the work and to result in an undesirable appearance of the stitched article. This is particularly true when the upper and under work-plies comprise portions of the same strip of open-mesh material, as for example a binding-strip.

The present invention has for its specific object to provide means for controlling a binding-strip in its delivery to the stitch-forming mechanism of a sewing machine so as to compensate for the strip-distorting effects imposed by the conventional feed-dog and presser-foot of the sewing machine.

Other and still more specific objects of the invention will be apparent from the following description and claims.

The invention consists in the combinations and arrangements of parts comprising a binding-strip controlling device hereinafter described in connection with the accompanying drawing, which illustrates a preferred embodiment of the invention and in which:

Fig. 1 is a top plan view of a portion of a sewing machine work-support upon which is mounted a transverse binder and the improved strip-controlling device; the presser-foot of the machine being shown partly in top-plan and partly in section, and a fragment of the work being shown in top-plan. Fig. 2 is a front elevation, partly in section, of the mechanism shown in Fig. 1, and additionally including the sewing machine needle. Fig. 3 represents an enlarged vertical section, substantially on the line 3—3 of Fig. 1, of the strip-controlling device. Figs. 4 and 5 represent

enlarged horizontal sections of the strip-controlling device and taken substantially on the lines 4—4 and 5—5, respectively, of Fig. 2.

Referring to the drawing, the sewing machine shown in part has a horizontally disposed work-support 10, which includes a conventional throat-plate 11 and slide-plate 12. The throat-plate 11 has the usual needle-aperture 13 through which operates a needle 14 carried by the lower end of a vertically reciprocating needle-bar 15.

Also operating through suitable slots provided in the throat-plate 11 is a work-advancing feed-dog 16 of the lower four-motion type and which feed-dog may be actuated in any usual or suitable manner. Opposed to the feed-dog 16 is a presser-foot 17 attached to the lower end of a presser-bar 18 which may be yieldingly depressed toward the work-support in a conventional manner.

The sole-plate 17' of the presser-foot is cut away at one side and in advance of the path of needle-reciprocation to provide a clearance-notch 19 for receiving the strip-reversing delivery-head of a transverse or strip-reversing binder 20. The binder 20 extends crosswise of the line of seam-formation and has spaced inner and outer walls forming between them a substantially U-shaped strip-guiding passageway 21. The binder 20 has a shank 22 secured by screws 23 upon the throat-plate 11 for endwise adjustment of the binder toward and from the line of seam formation. The throat-plate 11 is preferably formed with a binder-clearance slot 24 elongated transversely of the line of seam formation.

The present invention relates more particularly to a device for controlling the binding-strip in its delivery to the binder 20. Secured by screws 25 upon the throat-plate 11 is an L-shaped supporting-plate 26 having an upturned arm 26'. Attached to the supporting-plate arm 26', by a screw 27 and for adjustment in a direction parallel to the line of seam formation is a substantially rectangular casing 28. The bottom-wall 29 of this casing is preferably detachably secured to the casing side-walls 30 in any suitable manner. The top-wall 31 of the casing 28 is longitudinally recessed in the upper face thereof to provide a rectangular guideway 32 closed at the top by a cover-plate 33; said cover-plate 33 being removably secured upon the casing top-wall by screws 34.

Secured in the top-wall 31 of the casing to depend vertically from said top-wall is a reduced stud 35 of a dead-axle 36. Rotatably journaled upon the axle 36 is a cylindrical toothed-member 37 having spur-teeth 38 which lengthwise extend

vertically substantially from the top wall 31 to the bottom wall 29 of the casing. The lengthwise upper half of the spur-teeth 38 are of substantially constant depth, while the lengthwise lower half of said spur-teeth 38 are beveled downwardly to decrease progressively in depth.

In mesh with the spur-teeth 38, substantially medianly of the length of the casing 28, are the spur-teeth 39 of a complementary shiftable-axis toothed-member 40 of cylindrical form. The spur-teeth 39 of the member 40 lengthwise also extend vertically substantially from the top wall 31 to the bottom wall 29 of the casing; said spur-teeth 39 being preferably of substantially constant depth throughout the lengths thereof. The cylindrical toothed-member 40 is rotatably journaled upon a vertically disposed and laterally shiftable dead-axle 41. The upper portion of the axle 41 is stepwise reduced to form a reduced hub 42 and a further reduced stud 43. The axle-stud 43 is fixedly secured in a slide-plate 44 shiftable disposed in the casing guideway 32 between the top-wall 31 and the cover-plate 33 of the casing. The hub 42 of the axle 41 extends through an opening 45 formed in the casing top-wall 31.

Threaded into the top-wall 31 of the casing and extending through an aperture 46 provided in the cover-plate 33 is a fixed post 47. Anchored to the post 47 is one end of a coil-spring 48, of which the opposite end is connected to a post 49. The post 49 is threaded into the slide-plate 44 and extends upwardly through a clearance-slot 50 in the cover-plate 33. The coil-spring 48 functions yieldingly to maintain the spur-teeth 38 and 39 of the rotary toothed members in mesh; thereby permitting said members to accommodate themselves to the binding-strip passed therebetween.

The opposed side walls 30 of the casing 28 are provided, medianly of the lengths of said walls, with vertical slots 51 and 52. The wall-slot 51, which is more remote from the binder 20, forms an entrance opening for the binding-strip s and the wall-slot 52 forms an exit opening for said strip; the two slots 51 and 52 being preferably aligned crosswise of the casing 28 and being preferably so located that the teeth 38 and 39 intermesh in a vertical plane passing through said slots 51 and 52.

To facilitate passing the beginning end of the binding strip s through the casing 28 and between the teeth 38 and 39, one end wall of said casing 28 is provided with an opening 53 through which the teeth 39 are accessible. The end of the binding-strip s is flat-wise introduced through the slot 51 to engage the teeth 38 and 39. By finger or thumb engagement with the teeth 39, the intermeshing toothed-members 37 and 40 may be caused to feed the strip s through the casing exit-slot 52 for introduction into the binder 20.

In passing between the toothed members 37 and 40, the binding strip is widthwise corrugated by the teeth 38 and 39. However, the upper half of the width of the strip is more deeply corrugated than the lower half of the width of the strip, by reason of the fact that the lower half of the teeth 38 are beveled downwardly. Consequently, in drawing the binding strip through the described strip-controlling device, the intermeshing teeth 38 and 39 feed a slightly greater length of the upper half of the binding-strip than of the lower half; thereby distorting the binding-strip widthwise to compensate for the subsequent contrary distortion of the strip at the stitching point due to the strip-feeding action of the feed-

dog 16 and the drag imposed upon the strip by the presser-foot 17. By thus nullifying the strip-distorting effects of the sewing machine feeding mechanism and presser-foot, the binding-strip s may be smoothly and evenly applied to the margin of a body-material m.

Having thus set forth the nature of the invention, what I claim herein is:

1. In a sewing machine, the combination with a reciprocating needle, work-feeding mechanism including a feed-dog, a presser-foot opposed to said feed-dog, and strip-guiding means disposed to direct superposed work-ply portions between said feed-dog and presser-foot, of work-ply controlling means comprising opposed rotary members disposed in advance of said strip-guiding means for delivering thereto a greater length of the presser-foot engaged work-ply portion than of the feed-dog engaged work-ply portion.

2. In a sewing machine, the combination with a reciprocating needle, a work-advancing feed-dog, and a presser-foot opposed to said feed-dog, of means for delivering between said presser-foot and feed-dog a plurality of ply-portions of work in superposed relation, said means including rotary members having intermeshing teeth between which the work-ply portions are passed in adjacent relation and which teeth are formed to more deeply corrugate one of the adjacent work-ply portions than the other.

3. In a sewing machine, the combination with a reciprocating needle, a work-advancing feed-dog, a presser-foot opposed to said feed-dog, and a strip-folding binder, of a binding-strip controlling device comprising intermeshing toothed members between which the binding strip is flat-wise introduced for delivery to said binder, said members having the teeth thereof formed to unevenly corrugate different widthwise portions of said strip.

4. In a sewing machine, the combination with a reciprocating needle, a work-advancing feed-dog, a presser-foot opposed to said feed-dog, and a strip-folding binder disposed to deliver a longitudinally doubled binding strip between said feed-dog and presser-foot in advance of said needle, of means disposed in advance of said binder for delivery thereto of uneven lengths of the respective binding-strip portions subsequently engaged by said feed-dog and presser-foot.

5. A strip-controlling device for sewing machines comprising, a casing having opposed side walls provided with aligned strip-guiding slots, a pair of rotary members journaled in said casing and having intermeshing strip-corrugating teeth varying in depth of intermesh lengthwise of said members, said teeth intermeshing in a plane extending lengthwise of said strip-guiding slots, and means yieldingly biasing said members into teeth-intermeshing relation.

6. A strip-controlling device for sewing machines comprising, a casing having a top wall provided with a guideway, a slide-plate shiftable disposed in said guideway, a fixed axis dead-axle depending from said top-wall, a laterally shiftable dead-axle depending from said slide-plate in parallel relation to said fixed axis dead-axle, intermeshing toothed-members rotatably journaled upon said axes, a spring yieldingly biasing said shiftable dead-axle toward said fixed axis dead-axle, said casing having opposed side walls thereof provided with strip-entrance and strip-exit slots disposed to direct a strip between said toothed-members.

7. A strip-controlling device for sewing ma-

chines comprising, a casing having an end wall thereof provided with an opening, said casing having opposed side walls provided with alined strip-entrance and strip-exit slots, intermeshing toothed-members rotatably disposed in said casing and having the teeth thereof intermeshing between said slots, one of said toothed members having the teeth thereof extending into the end wall opening of the casing.

8. In a sewing machine having a horizontally disposed work-support, in combination, a vertically reciprocatory needle, a work-advancing feed-dog operating through said work-support, a presser-foot opposed to said feed-dog, a strip

5 folding binder extending crosswise of the line of feed and having a strip-reversing delivery head disposed in front of said needle, and binding-strip controlling means disposed to direct the binding-strip to said binder, said controlling means comprising a casing having opposed side walls provided with alined strip-guiding slots, and a pair of intermeshing toothed members journaled in said casing for rotation about vertical axes at opposite sides of a vertical plane through said slots, said members having the teeth thereof lengthwise varying in depth of intermesh.

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