Oct. 26, 1948. J. E. ACKERMAN 2,452,419

STRIP REVERSING BINDER FOR SEWING MACHINES

Filed June 12, 1945 2 Sheets-Sheet 1

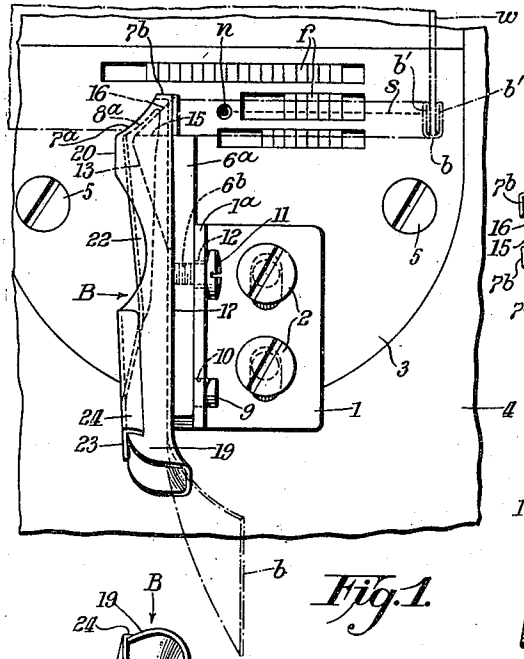


Fig. 1.

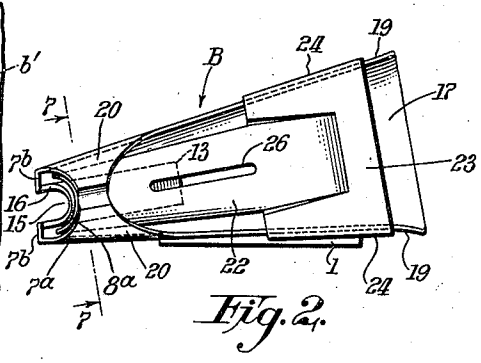


Fig. 2.

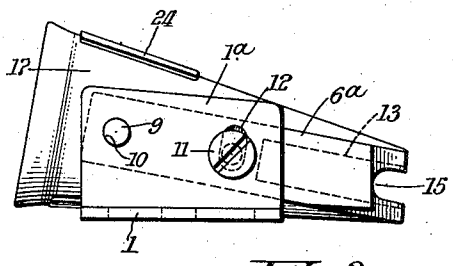


Fig. 3.

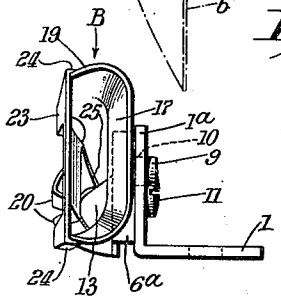


Fig. 4.

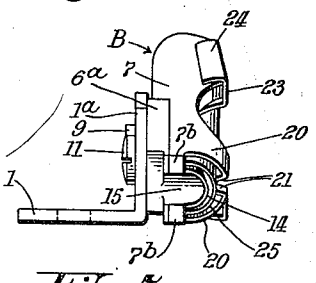


Fig. 5.

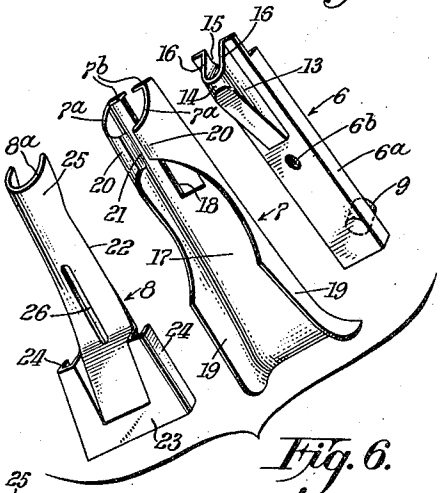


Fig. 6.

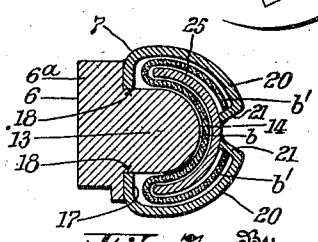


Fig. 7.

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STRIP REVERSING BINDER FOR SEWING MACHINES

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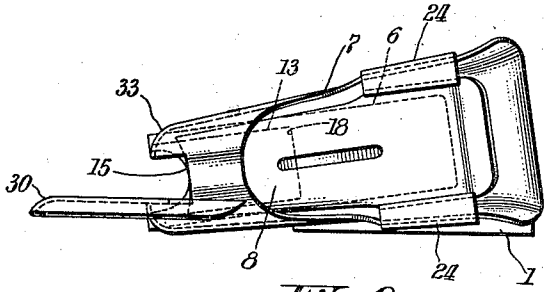


Fig. 9.

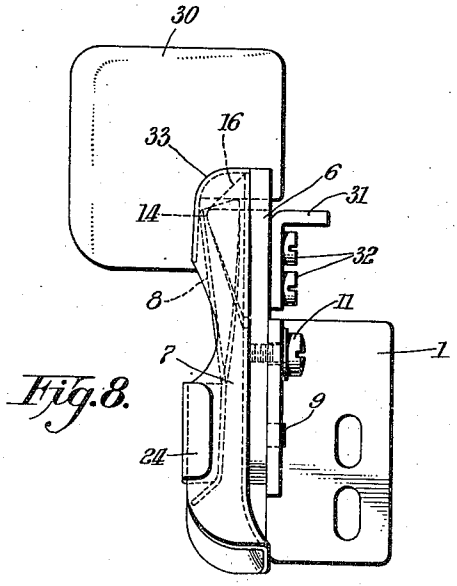


Fig. 8.

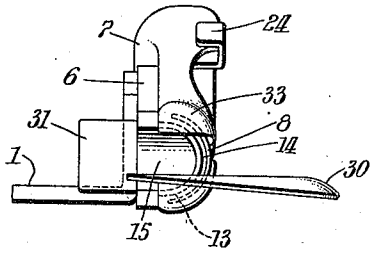


Fig. 10.

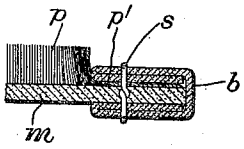


Fig. 12.

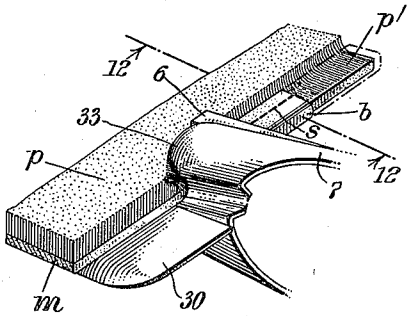


Fig. 11.

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UNITED STATES PATENT OFFICE

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STRIP REVERSING BINDER FOR SEWING MACHINES

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Application June 12, 1945, Serial No. 599,046

6 Claims. (Cl. 112—138)

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This invention relates to binders for sewing machines, and particularly to binders of the so-called "transverse" or "strip reversing" type, and it has as a primary object to provide an improved form of binder of which the parts may be very accurately manufactured and conveniently assembled at a minimum cost.

This binder, like others of its kind, is designed to fold a strip of binding material, to turn in the marginal portions of the strip and to place the folded binding strip about the edge of a workpiece to which it is attached by stitching.

Binders of this nature are secured to a sewing machine with the longitudinal axis of the binder arranged at approximately 90 degrees to the path of movement of the work through the machine. In its passage through the binder, the binding strip is folded into substantially W-shape, after which it is passed over and around a strip-inverting edge, arranged at an approximate angle of 45 degrees to the path of movement of the work. This changes the direction of movement of the binding strip, inverts the strip, thereby placing the folded marginal portions within the strip, and places the folded strip about the edge of the workpiece which is passed transversely through the open forward end of the binder.

The successful operation of a binder of this nature depends largely upon the construction of that portion thereof affording the strip-inverting edge. Heretofore it has been common to form this and other elements of such binders of bent sheet metal. Due to the difficulty in bending a considerable number of pieces of sheet metal uniformly and in accurately uniting the pieces, it has been impossible to manufacture such binders in quantities with the assurance that they will all perform uniformly and satisfactorily. In many instances the completed binders have to be altered, bent or otherwise tinkered with, in order to make them meet the exacting demands of the trade.

This invention has overcome the difficulties in manufacture of binders of this nature by constructing the critical element thereof (that is, the element which affords the strip-inverting edge) of a solid block of metal accurately made to gauges as by machining die-casting or by the sintering of powdered metal, so that all of such elements are identical in every respect. The other and less critical elements of the improved binder are made of sheet metal but are so constructed that they too may be made to a high degree of accuracy. The component parts of the

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binder also are so constructed that they may be assembled easily and accurately and at a minimum cost.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings, Fig. 1 is a plan view of a portion of the work-support and work-feeding mechanism of a sewing machine, and showing one form of the present improved strip-reversing binder secured to a throat-plate forming a part of the work-support.

Fig. 2 is a front side view of the binder shown in Fig. 1.

Fig. 3 is a rear side view thereof.

Fig. 4 is an end view of the intake end of the improved binder.

Fig. 5 is an end view of the delivery end thereof.

Fig. 6 is a disassembled perspective view of the three principal elements of the binder.

Fig. 7 is an enlarged transverse sectional view taken on the line 7—7, Fig. 2, and showing the binding-strip.

Fig. 8 is a plan view of a modified form of binder embodying the present invention and particularly adapted for binding pile fabric or similar material.

Fig. 9 is a front view of the binder shown in Fig. 8.

Fig. 10 is an end view of the delivery end of the binder shown in Fig. 8.

Fig. 11 is a detail perspective view of the delivery end of the binder disclosed in Figs. 8, 9 and 10, illustrating its action on pile fabric.

Fig. 12 is an enlarged transverse sectional view, taken on the line 12—12 of Fig. 11.

Referring more specifically to the drawings, and first to the form of the invention illustrated in Figs. 1 to 7, inclusive, the invention is disclosed as comprising an L-shaped supporting bracket 1 adapted to be adjustably secured, by screws 2, to some portion of the work-support of a sewing machine, as, for example, the throat-plate 3 which is secured to the cloth-plate 4 by screws 5.

A binder-head B is secured to the bracket 1 and comprises three principal elements viz. a core member 6, a strip folder element 7 and a guide

tongue member 8 separately illustrated in Fig. 6. The core member is made as a solid block of metal by conventional machining, casting or sintering operations and is made to conform to suitable gauges, whereby all of a plurality of such members are identical. This core member comprises a shank 6^a, from the rear side of which projects a stud 9 journaled in an aperture 10 in the upstanding wall 1^a of the bracket 1. A screw 11, passing through a slot 12 in the upstanding portion 1^a of the bracket and threaded into an aperture 6^b in the shank 6^a, permits adjustment of the binder head about the axis of the stud 9 and holds the head in its various positions of adjustment. Adjacent its forward end, the core member 6 is formed with a longitudinally tapered laterally projecting portion 13 constituting a center-fold-forming rib having a half-round extremity 14. Formed in the forward end of the member 6, at a right angle to the longitudinal axis thereof, is a channel 15 through which pass the binding strip *b* and the edge of the work-piece *w* to be bound. The forward end of the shank 6^a and the projecting portion 13 terminate in a U-shaped strip-inverting edge 16 which lies in a substantially vertical plane at an angle of approximately 45 degrees to the longitudinal axis of the core member.

Secured to the core member 6 is the sheet metal strip folder 7. This element comprises a vertically disposed wall 17 secured to the forward face of the core member as, for example, by soldering. The wall 17 is formed with a rectangular aperture 18 through which projects the fold-forming rib 13 of the core member 6. The rib 13 fits snugly within the aperture 18 and thus the two parts are accurately positioned for soldering. The upper and lower marginal portions of the wall 17 are bent forwardly, thereby affording side flanges 19 at the intake end of the binder. Adjacent the delivery end of the binder head, the wall 17 of the member 7 has its upper and lower marginal portions rolled forwardly, to form margin folders 20 for the binding strip passing therethrough, and are then bent inwardly to form edge guides 21 for the binding strip.

Cooperating with the members 6 and 7, in folding a binding strip passing through the binder head, is a strip-guiding tongue 22 having at one end a bridge portion 23 provided with flanges 24 which are fitted over and soldered to the outer faces of the flanges 19 of the strip folder 7. The other end of the tongue 22 is bent, at 25, into substantially C-shape and receives and is uniformly spaced from the half-round extremity 14 of the portion 13 of the core member 6. The inturned edges of the portions 20 of the member 7 abut the rounded outer face of the portion 25 as shown most clearly in Fig. 7, and are secured thereto as, for example, by soldering. The midportion of the tongue 22 is provided with the usual slot 26 to facilitate insertion of the binding strip into the binder.

As shown by Fig. 7, the portions 14, 25 and 20 of the members 6, 8 and 7, respectively, are so arranged that the concave surface of the portion 25 is spaced from the convex surface of the portion 14; the free edges of the portion 25 are spaced from the wall 17 of the member 7; and the convex surface of the portion 14 is spaced from the concave inner surface of the portions 20, so as to afford a substantially W-shaped passageway therebetween. Thus the binding strip which enters the receiving end of the binder in flat form is gradually bent or folded as it is passed through the binder until it has attained a substantially W-shape. As the binding strip reaches the delivery end of the binder it is fed rearwardly, at a right angle to its initial travel through the binder, by the work-feeding mechanism of the sewing machine, a portion of which is designated as *f*. This causes the folded binding strip to pass over the inclined strip-inverting edges 16 which places the folded marginal portions *b'* of the strip within the center folded portion thereof. As the folded binding strip is fed rearwardly through the channel 15, the edge of the work-piece is directed between the upper and lower folds of the strip, whereupon the stitch-forming mechanism, including a needle *n*, operating rearwardly of the delivery end of the binder, attaches the binding to the work-piece *w* by stitches as indicated at *s* in Fig. 1.

At the delivery end of the binder, the members 7 and 8 are beveled at 7^a and 8^a, respectively, similar to the end of the member 6, to permit introduction of the edge of the work-piece between the folded edges of the binding strip. The strip-folder 7 has its upper wall turned downwardly and its lower wall turned upwardly to form lips 7^b which serve as guides for the edges of the folded binding strip.

The embodiment of the invention illustrated in Figs. 9 to 11, inclusive, differs slightly from the embodiment above described and, although it is adapted to bind materials generally, it is particularly adapted to bind materials having a pile, woolly or similar upper surface.

This embodiment, like that first described, comprises an L-shaped supporting bracket 1, a core member 6 pivotally secured thereto by a stud 9 and held in adjusted position thereon by a screw 11. The core member is provided with a laterally projecting center-fold-forming rib 13 having a half-round extremity 14. At its forward end, the core member is formed with an inclined U-shaped strip-inverting edge 16 and a transverse channel 15. Secured upon the front face of the core member is a sheet metal strip folder element 7, to which is secured a guide tongue member 8, the flanges 24 of which are bent over and soldered to the element 7. The element 7 has an aperture 18 which receives the rib 13, as in the first described construction.

This modified construction includes, additionally, a conventional work-supporting apron 30, carried by the member 7, and an edge-guide 31 secured upon the rear face of the core member, by screws 32, and adapted to engage the outermost face of the binding strip as it emerges from the channel 15.

As above stated, this form of binder is adapted particularly for binding body material having a pile or woolly upper surface. To that end, the upper portion of the delivery end of the strip-folder is bent about and overhangs the strip inverting edge 16 to form a cheek portion 33 which, during the passage of the work-piece through the channel 15, engages the upstanding pile *p* and forces it outwardly and downwardly, as shown in Fig. 11, so that the folded binding strip *b* will be placed around the edge of the body material *m* and over the depressed pile *p'* and secured by stitches *s*, as shown in Fig. 12.

From the foregoing, it will be apparent that this invention has provided strip reversing binders which are easy and inexpensive to manufacture; which are uniformly accurate; which will not require any tinkering or adjusting after the parts

thereof have been assembled; and which will give entire satisfaction to the user.

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

1. A binding attachment for sewing machines comprising, a supporting bracket; an individually formed solid core member adjustably mounted on said bracket and having a laterally projecting center-fold-forming rib; an individually formed strip folder element secured to one face of said core member and having a flat body wall provided with an aperture through which said center-fold-forming rib projects, said element having strip guiding flanges and strip-margin folding means; and an individually formed tongue member having a portion of substantially C-shape in cross section located between said center-fold-forming rib and the strip-margin folding means to form a strip passageway of substantially W-shape in cross-section, said center-fold-forming rib affording, adjacent said passageway, a U-shaped strip-inverting edge about which the folded strip is passed, and a rearwardly extending channel for passage of the folded and inverted strip.

2. A binding attachment for sewing machines comprising, a supporting bracket; an individually formed solid core member comprising a block of metal pivotally mounted on said bracket and having a laterally projecting and longitudinally tapered center-fold-forming rib, an individually formed sheet metal strip folder element secured to one face of said core member and having a flat body wall provided with an aperture through which said center-fold-forming rib projects, said element having strip-guiding flanges and curved strip margin folding portions; and an individually formed sheet metal tongue member secured to the flanges of said strip folder element and having a portion substantially C-shape in cross section located between said center-fold-forming rib and the strip-margin folding portions to form a strip passageway of substantially W-shape in cross-section, said center-fold-forming rib affording, adjacent said passageway, a U-shaped strip-inverting edge about which the folded strip is passed, and a rearwardly extending channel for passage of the folded and inverted strip.

3. A binding attachment for sewing machines comprising, a supporting bracket; an individually formed solid core member mounted on said bracket and having a laterally projecting and longitudinally tapered center-fold-forming rib; an individually formed sheet metal strip folder element secured to one face of said core member and having a flat body wall provided with an aperture through which said center-fold-forming rib projects, said strip folder element having strip guiding flanges, strip-margin folding means, and opposed lips adapted to guide the edges of a folded binding strip; and an individually formed tongue member having a portion of substantially C-shape in cross section located between said center-fold-forming rib and the strip-margin folding means to form a strip passageway of substantially W-shape in cross-section, said center-fold-forming rib affording, adjacent said passageway, a U-shaped strip-inverting edge about which the folded strip is passed, and a rearwardly extending channel for passage of the folded and inverted strip.

4. A binding attachment for sewing machines comprising, a supporting bracket; an individually formed solid core member mounted on said bracket and having a laterally projecting center-fold-forming rib; an individually formed strip folder element secured to one face of said core member and having a flat body wall provided with an aperture through which said center-fold-forming rib projects, said element having strip guiding flanges, strip-margin folding means, and pile deflecting means; and an individually formed tongue member having a portion substantially C-shape in cross section located between said center-fold-forming rib and the strip-margin folding means to form a strip passageway of substantially W-shape in cross-section, said fold-forming rib affording, adjacent said passageway, a U-shaped strip-inverting edge about which the folded strip is passed, and a rearwardly extending channel for passage of the folded and inverted strip; said pile-deflecting means serving to depress the pile on one face of a work-piece as the edge of the work-piece passes into said channel.

5. A binding attachment for sewing machines comprising, a supporting bracket; an individually formed solid core member mounted on said bracket and having a laterally projecting center-fold-forming rib; an individually formed strip folder secured to one face of said core member and having a flat body wall provided with an aperture through which said center-fold-forming rib projects, said strip folder having strip guiding flanges, and upper and lower strip-margin folding walls; and an individually formed tongue member having a portion substantially C-shape in cross section located between said center-fold-forming rib and the strip-margin folding walls to form a strip passageway of substantially W-shape in cross-section; said fold-forming rib effording, adjacent said passageway, a U-shaped strip-inverting edge about which the folded strip is passed, and a rearwardly extending channel for passage of the folded and inverted strip; said upper margin-folding wall being extended beyond said strip passageway and turned downwardly in front of said channel and serving as a pile-deflector to deflect the pile on the upper face of a work-piece passed through said channel.

6. A binding attachment for sewing machines, comprising, an angular support bracket having an upstanding wall; an individually formed solid core member mounted on the upstanding wall of said bracket and having a flat wall portion the front end of which is provided with a solid block center-fold-forming rib tapered to increase in depth toward the work-delivery end of the attachment; an individually formed sheet metal strip folding element having a flat wall portion secured to the flat wall portion of said core member and having an aperture through which said center-fold-forming rib projects, said strip folding element having opposed mouth forming and strip guiding flanges at the strip-receiving end of the attachment and having reversely bent strip-margin folders terminating in opposed edge guides; and an individually formed tongue member having at one end a wide bridge portion provided with flanges which are fitted over and secured to said strip guiding flanges of said strip folding element, and said tongue member having at its other end a portion substantially C-shaped in cross section located between said center-fold-forming rib and the strip margin folding means to form a strip passageway of substantially W-shape in cross section, said center-fold-forming rib affording, adjacent said passageway, a U-shaped strip-inverting edge about which the folded strip is passed, and a rearwardly extending channel for passage of the folded and inverted strip, the binder being constructed and arranged from three individual

parts which when assembled form a W-shaped binder that does not require adjustment.

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