A. H. DE VOE.

SEWING MACHINE ATTACHMENT.

APPLICATION FILED JUNE 8, 1909.

991,429.

Patented May 2, 1911.

Fig. 1.

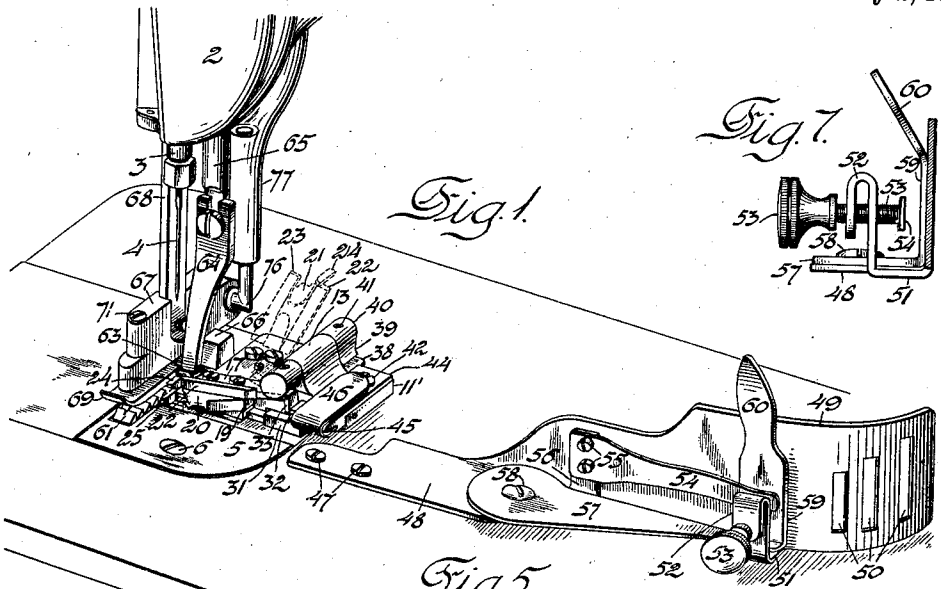


Fig. 7.

Fig. 5.

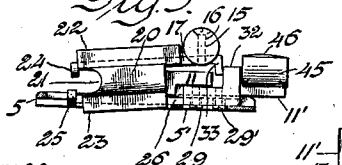


Fig. 2.

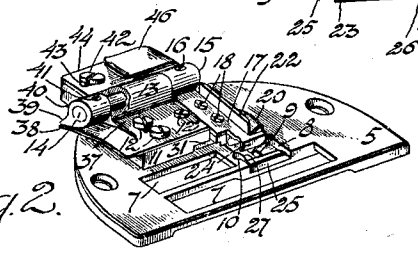


Fig. 3.

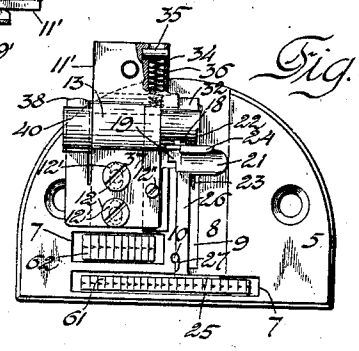


Fig. 6.

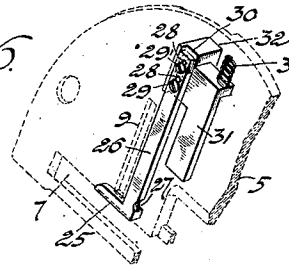


Fig. 8.

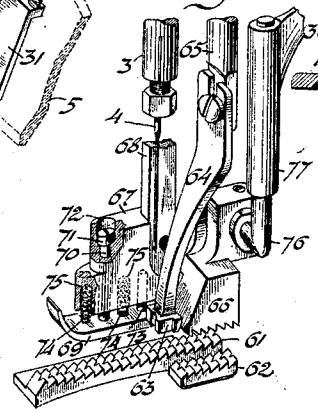
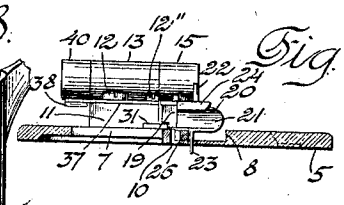


Fig. 4.



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SEWING-MACHINE ATTACHMENT.

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Application filed June 8, 1909. Serial No. 500,837.

To all whom it may concern:

Be it known that I, ALBERT H. DE VOE, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machine Attachments, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in what are commonly known as "English binders", as instanced in the United States Patent to Pretty No. 273,602, of March 6, 1883; and it has for its object to provide a binder of this class which will accommodate itself to the many conditions under which such attachments are commonly employed while maintaining its effectiveness of operation.

As preferably constructed, the body of the binder is formed with a laterally unobstructed convex forming portion and an angularly disposed concave portion intersecting the same and arranged substantially within the line of seam, a self-threading tape-folding guide being arranged in register with the same for normally presenting the binding tape to the binding guide, but from which the tape may be readily disengaged and cut off and its end folded under by hand in finishing off a seam. The binding guide is provided with certain other advantageous features and is adjustably mounted upon a carrier which is fulcrumed materially above the surface of the sewing machine throat-plate which latter is recessed to receive the lower portion of the binder which is yieldingly maintained therein by a spring also acting to retain the binder in inoperative position when forcibly raised upon its pivotal support to permit plain stitching to be done.

The invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a portion of a sewing machine provided with the present improvement. Fig. 2 is a perspective view of the binder with the throat-plate detached from the machine, and Fig. 3 a plan view of the same with the binding guide in retracted or inoperative position. Fig. 4 is a transverse section of the throat-plate showing the binding guide in end view and Fig. 5 a similar view at right angles to the preceding figure and showing the binder in front side view. Fig. 6 is a perspective view of certain portions of the attachment with the throat-plate represented partially in dotted lines. Fig. 7 is a transverse section of the tape-guide and tension device. Fig. 8 is a perspective view of the feeding devices coöperating with the binder.

In Fig. 1, only a portion of the sewing machine bed-plate 1 and head 2 of the overhanging bracket-arm are shown, the latter having journaled therein the vertically reciprocating needle-bar 3 carrying the needle 4. The throat-plate 5, which is secured to the bed-plate by the usual fastening screws 6, is formed with the parallel feed apertures 7 and has in its upper face the recess or cavity 8 in the bottom of which is the slot 9 but being arranged transversely of the feed-dog apertures 7 and thus transversely of the direction of seam formation. The throat-plate is also provided with the needle-hole 10 at one edge of the recess 8 and extending partly through the same.

The binder comprises a base plate 11 secured adjustably upon the top of the throat-plate at the right of the feed-dog apertures 7 by means of fastening screws 12 passing through slots 12′, and is provided with a bearing lug 13 in which is journaled the fulcrum-pin 14 arranged parallel with the feed-dog apertures 7 and having at one end a head 15 formed upon its under side with a seat to which is secured by means of the screw 16 an arm 17 having fixed to its under side by means of screws 18 a block 19 which is formed upon its forward edge with the laterally exposed convex projection 20 extending transversely of the feed-dog apertures 7 and intersected at its end adjacent to and at an acute angle with the latter by the concave guiding portion 21, serving to divide the delivery end portion into spaced work-engaging members embracing the margins of the body-fabric and binding tape. The plane of intersection of the convex and concave guiding portions of the block 19 has the customary acute angular relation to the line of seam, the binding tape being drawn over the convex portion in arched cross-section and led over such angular intersection of the two guiding surfaces and within the concave portion where its curvature is reversed for presentation to the margin of the fabric embraced by such

concave portion. At the base of the binding forming projection 20 are provided the oppositely extending guiding flanges 22 and 23, the latter normally projecting downwardly through the slot 9 of the throat-plate while the lower member of the U-shaped concave portion of the binder lies within the recess 8 with its operative surface somewhat below that of the throat-plate.

The outer end of the arm 17 is provided with a depending guide-lip 24 extending somewhat below the operative surface of the upper member of the concave guiding portion 21, and serving to guide the upper edge of the binding tape in its passage to the needle. Similarly arranged in register with the lower member of the concave guiding portion 21 is the lower guide-lip in the form of a block 25 extending across the forward end of the recess 8 and resting upon the bottom of the same but projecting slightly above the upper face of the throat-plate. This block is provided with a shank 26 extending backwardly within the recess 8 and is formed in one edge adjacent the guide-lip 25 with a semi-elliptical needle-aperture 27 embracing that portion of the needle-aperture of the throat-plate within the recess 8. The shank 26 is formed at its rearward end with longitudinal slots 28 entered by fastening screws 29 29′ which serve to secure the same adjustably upon a seat 30 formed on the under side of a slide-plate 31 which has its opposite edges fitted to a slideway formed in the bottom of the base plate 11. The slide-plate 31 is formed at its rearward end with an upwardly projecting lug 32 adapted to engage the rearward face of a depending lug 33 upon the rearward end of the arm 17. A spring 34 is interposed between the rearward end of the slide-plate 31 and a transverse pin 35 disposed in a longitudinal socket 36 of the base-plate 11 whereby the lug 32 is maintained normally in operative engagement with the lug 33 and the lip 25 is thus maintained in retracted position. When the binder-guide is elevated above the bottom of the recess 8 of the throat-plate, the movement of the carrying arm 17 around the axis of the fulcrum-pin 14 causes the lug 33 to move forward, thereby releasing the lug 32, which permits the slide-plate 31 to advance under the action of the spring 34 carrying with it the lower guide-lip 25 until its advance is arrested by engagement of the head of the fastening screw 29 with the forward end of the clearance slot 5′ in the throat-plate.

Secured upon the top of the base-plate 11 by means of the fastening screws 12 and the additional screw 12″ is a thin metal plate 37 provided at one edge with a spring tongue 38 adapted for engagement with a lateral lug 39 formed upon a collar 40 secured by means of a set-screw 41 to the end of the fulcrum-pin 14 opposite the head 15. The collar 40 is so adjusted upon the pin 14 that in the normal operative position of the binding guide in which the lower member of the concave guiding portion 21 is disposed within the recess 8 below the face of the throat-plate, the lug 39 is in its rearward position as shown in Fig. 2, and a spring tongue 38 acts upon the same to yieldingly maintain the binding guide in such position. When, however, the binding guide is forcibly turned upwardly, as indicated in dotted lines in Fig. 1, the lug 39 moves to a position slightly in advance of the fulcrum-pin when the spring tongue 38 tends to maintain the binding guide in its retracted or elevated position.

The base plate 11 is formed with an extension 11′ rearwardly of the bearing lug 13 upon which is adjustably mounted by means of a fastening screw 42 passing through a slot 43 therein the shank 44 of a tape-folding guide 45 having a U-shaped tape-guiding passage substantially in register with but spaced from the convex projection 20 of the binder and having a lower limb closed at one edge and an upper limb open at the extremity which is overhung by the lip 46. As will be readily seen, the binding tape may be easily introduced edgewise beneath the lip 46 into the U-shaped guiding passage of the folding guide, and as easily withdrawn when desired.

In finishing a binding operation, it is common to turn under the end of the binding tape, and by the present improvement no unthreading of the forming portion of the binder is necessary for the purpose, as the tape is at all times exposed thereon, and it is merely necessary to cut it off at the proper time and turn the cut end under by hand without the usual delay and inconvenience experienced with closed-tube binders.

Upon the bed-plate 1 is secured by means of fastening screws 47 the foot 48 of an upturned tape-guiding plate 49 with backwardly curved rearward end formed with a series of threading slots 50 of different widths through which different sized tapes may be passed in their travel to the binder. The plate 49 has projecting in advance of its lower edge a lug 51 with upturned arm 52 through which is inserted the threaded shank of an adjusting screw 53 whose point rests upon the free end of a flat spring 54 secured by means of screws 55 upon an upwardly projecting lug 56 of a swinging plate 57 fulcrumed upon the foot-piece 48 by means of the screw 58 and provided above the lug 51 with an upturned tension member 59 formed with a finger-piece 60 by means of which it may be shifted in opposition to the spring 54.

In threading up the binding apparatus for operation, the binding tape is led from the source of supply through one of the apertures 50 of the guide-plate 49 and the tension member 59 having been temporarily shifted forwardly, the tape is passed between the plate 49 and the tension member 59 and behind the lug 56 whence it is introduced beneath the lip 46 into the U-shaped folding passage of the guide 45, from which it is drawn in advance of the convex guiding member 20 and led into the concave guiding passage wherein it is held by engagement of the edge of the body fabric in the stitching operation. As will be observed, the guide-flanges 22 and 23 guide the edges of the binding tape and prevent the latter's being displaced in its travel along the convex surface 20, while the guide-lips 24 and 25 perform a like function after the binding is turned and assumes a position in which it is stitched upon the margin of the body fabric.

The concave guiding surface 21 of the binder is purposely made considerably deeper than the normal thickness of the body fabric and the folded tape applied thereto, and thus normally has only its upper portion occupied by the work; but when an increased thickness of body fabric enters the guide, its engagement with the upper member of the portion 21 causes the slight rise and advance of the block 19 so as to shift the edge-guiding portion slightly toward the stitching line, owing to the pivoting of the carrier 17 materially above the guiding portion of the attachment. Ordinarily the entrance of an enlargement in the margin of the body fabric, such as is caused by a cross seam, into the binding tape takes up an abnormal part of the tape, owing to the increased thickness of the work, and reduces the marginal portion of the tape overlying the upper and under faces of the body fabric. By this means the stitching is liable to run over the edge of the binding, which results in imperfect work. By advancing the edge-guiding portion of the binder when encountering different thicknesses of work, this defect in the stitching is avoided.

When encountering increased thicknesses of the work, whereby the binding tape is distended to cover a larger portion of the surface of the concave guiding portion 21, it will be observed that the upper edge of the binding tape recedes somewhat from the guide-lip 24. At the same time the guide-lip 25 is shifted outwardly slightly from the lower edge of the binding tape. This recession of both of the guide-lips 24 and 25 from the edges of the tape has been found advantageous in practice, especially in turning corners, where it is desirable to provide ample clearance for the free manipulation of the tape at such time.

The guiding lip 25 as before described, extends slightly above the upper or operative face of the throat-plate, and even when the binding guide 20, 21 is thrown upwardly in inoperative position, this guide-lip serves as a gage to aid in directing the work to the stitching devices in completing a binding operation.

The edge-guiding lips 24 and 25 are disposed respectively in operative relation with the upper and lower members of the concave portion 21 at the delivery end of the binding guide, and extend both forwardly and rearwardly in the direction of seam from the line of intersection of the convex and concave portions 20 and 21 by means of which the binding tape is formed and turned.

As represented in Figs. 1 and 8, the machine is constructed with lower feeding mechanism including a feed-dog having a body portion 61 arranged at the left side of the stitch line and adapted to engage the body fabric beyond the marginal portion covered by the binding, and having a lateral extension 62 arranged rearward of the delivery end of the binder, for engaging and propelling the binding after it is stitched to the margin of the body fabric. Disposed above and slightly in advance of the lateral extension 62 of the feed-dog, and also disposed rearwardly of the notched delivery end of the binder is arranged the presser-foot 63 whose shank 64 is secured to the lower end of the presser-bar 65.

Opposed to the lateral extension 62 of the lower feed-dog is the serrated lower face of the upper feeding foot 66 which is shown laterally offset from the block 67 secured to the bottom of the foot-bar 68 and forming the shank of the feeding foot. Opposed to the body portion 61 of the lower feed-dog is the yielding foot-plate 69 with upturned forward end. This foot-plate is suspended from the block 67 by means of the stud-screw 70 whose head 71 is normally seated within the countersink 72 formed in the upper portion of the block 67, and is held from turning by means of the steady pin 73 extending upwardly from the foot-plate into a suitable socket in the block 67. The foot-plate is normally pressed downwardly by means of springs 74 interposed between the top of the same and the inner ends of suitable sockets 75 formed in the lower part of the block 67. The foot-plate is thus adapted to maintain the body fabric beyond the edge of the binder in effective engagement with the presser-foot portion 61 independently of the action of the other feeding members 62 and 66 upon the adjacent portions of the work, the feeding foot 66 having imparted thereto its lateral or work-advancing movements by means of a swivel connection 76 with the vibratory bar 77, and receiving rising and falling

movements alternating with those of the presser-foot 63 through suitable mechanism connected with their respective carrying bars 65 and 68.

It will thus be seen that the present improvement not only provides for the proper handling of the binding and the edge of the body fabric when the work is of variable thickness, but also insures the proper feed of the work under such conditions without distortion or disarrangement of the binding during its presentation to the margin of the body fabric and prior to the actual stitching operation.

As will be seen by reference to the drawings, the forward end of the upper guide-lip 24 is shown rounded in its lower portion so as to readily ride over inequalities in the thickness of the work, and as this part is pressed downwardly upon the work by the action of the spring-tongue 38, it will be observed that the same serves as a pressure member auxiliary to the usual presser-foot, while causing the binding guide to closely follow the surface of the work. As this lip 24 has a movement with the part 19 toward and from the line of seam, the introduction of any cross-seams of the binding tape into the attachment causes the recession of this pressure member from the edge of the binding tape so as to afford ample clearance for the latter at such time.

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

1. In a sewing machine attachment, the combination with a throat-plate having a recess in its upper face, of a binding guide having its delivery end portion arranged substantially within the line of seam and formed with upper and lower work-engaging members, the guiding face of the lower member being normally extended within said recess and below the top of the throat-plate, means for sustaining said binding guide for movement into and out of said recess transversely to the plane of the upper face of the throat-plate, and means for yieldingly maintaining said guide in normal position partially within said recess.

2. In a sewing machine attachment, the combination with a throat-plate having a recess in its upper face, of a binding guide having its delivery end portion normally arranged within the line of seam, a fulcrum for said binding guide parallel with the line of seam and disposed above the throat-plate and the delivery end portion of said binding guide when in operative position, and means for yieldingly maintaining said guide with one side of its delivery end portion disposed within said recess and below the upper face of the throat-plate.

3. In a sewing machine attachment, the combination with a throat-plate having a recess in its upper face, of a binding guide having a concave guiding portion normally arranged substantially within the line of seam with its guiding member extending partially within said recess and below the upper face of the throat-plate, a fulcrum for said binding guide disposed parallel with the line of seam whereby the binding guide is movable transversely to the plane of the face of the throat-plate, a spring for yieldingly maintaining said guide in position, and means applied to said fulcrum and in operative relation with said spring whereby said guide is normally maintained yieldingly with one side of its delivery end portion disposed within said recess and below the upper face of the throat-plate and is also adapted to be yieldingly maintained in operative position when forcibly shifted out of normal operative position.

4. In a sewing machine attachment, the combination with a throat-plate having a recess in its upper face, of a binding guide having a concave guiding portion with spaced upper and lower work-engaging members and carrying an edge-guiding lip upon its upper member and having its lower member normally disposed within said recess of the throat-plate, said binding guide being mounted for movement transversely of the face of the throat-plate and into and out of the recess in the latter, an edge-guiding lip mounted independently of said binding guide and in operative relation with the lower member of the same, and a connection intermediate said binding guide and the second-named lip whereby the latter is caused to recede from normal operative position transversely to said concave guiding portion as the binding guide rises from its recess.

5. In a sewing machine attachment, the combination with a throat-plate, of a binding guide having a concave guiding portion with spaced upper and lower work-engaging members and an edge-guiding lip normally fixed upon its upper member, said binding guide being mounted for movement transversely of the upper face of the throat-plate, an edge-guiding lip movably mounted independently of said binding guide and normally disposed in operative relation with the lower member of the same, and a connection intermediate said binding guide and second-named lip whereby the latter is caused to recede from normal operative position transversely to said concave guiding portion as the binding guide rises from the throat-plate.

6. In a sewing machine attachment, the combination with a throat-plate having a recess in its upper face, of a binding guide having a concave guiding portion with spaced upper and lower work-engaging members and carrying an edge-guiding lip upon its upper member and having its lower

member normally disposed within said recess of the throat-plate, said binding guide being mounted for movement transversely of the upper face of the throat-plate and into and out of the recess in the latter, an edge-guiding lip movably mounted independently of said binding guide and in operative relation with the lower member of the same with its operative portion disposed partly above and partly below the surface of the throat-plate, and a connection intermediate said binding guide and the second-named lip whereby the latter is caused to recede from normal operative position transversely to said concave guiding portion as the binding guide rises from its recess.

7. In a sewing machine attachment, the combination with a throat-plate, of a binding guide comprising a laterally exposed convex forming portion with longitudinally arranged tape-edge guiding lips and an angularly disposed concave portion intersecting said forming portion and arranged substantially within the line of seam, and a U-shaped tape-guide in register with but spaced from the convex forming portion of the binding guide and having one of its limbs open at the edge to admit a binding tape edgewise into the same, means being thus provided at the receiving end only of the binding guide for confining the tape to its guiding surfaces, the lead of the tape from the delivery end serving to maintain the tape in operative relation with the guiding surfaces in other portions thereof.

8. In a sewing machine attachment, the combination with a throat-plate, of a binding guide comprising a laterally unobstructed convex forming portion and an angularly disposed concave portion with spaced upper and lower members and intersecting said convex portion in its upper and lower members at an angle, said upper and lower members being arranged substantially within the line of seam, and edge-guiding lips respectively in operative relation with the upper and lower members of said concave portion of the binding guide and extending both forwardly and rearwardly in the direction of seam from the line of intersection of said convex and concave portions.

9. In a sewing machine attachment, the combination with a throat-plate formed with a slot transverse to the line of seam, of a binding guide comprising a laterally unobstructed convex forming portion and an angularly disposed concave portion intersecting the same and arranged substantially within the line of seam, vertical oppositely extending guide-flanges formed upon said binding guide at the base of its forming portion, one of said flanges entering said slot in the throat-plate, and a carrier for said binding guide upon which the latter is movable toward and from the face of the throat-plate.

10. In a sewing machine attachment, the combination with a binding guide for presenting the binding to the stitch-forming mechanism, of a tape-guide comprising a supporting plate having a foot for attachment to the sewing machine, a swinging plate fulcrumed upon said foot and provided with a finger-piece adapted to rest against the face of the supporting plate, a spring carried by said swinging plate, a rigid arm carried by said supporting plate, and a thrust-screw carried by said arm and adapted to compress said spring for forcing said finger-piece upon said swinging plate.

11. In a sewing machine, the combination with stitch-forming mechanism, of a binding attachment adapted to present a folded binding tape to the stitch-forming mechanism, a presser-foot rearward of the delivery end of said binder, lower feeding mechanism including a feed-dog having a lateral extension provided with a feeding surface extended rearward of the delivery end of said binder, and upper feeding mechanism comprising a feeding foot having two relatively yielding portions one of which is disposed rearward of said presser-foot and opposed to the lateral extension of said feed-dog and the other of which is disposed over the body of said lower feed-dog and coöperates with the same in feeding the body fabric.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ALBERT H. DE VOE.

Witnesses:
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