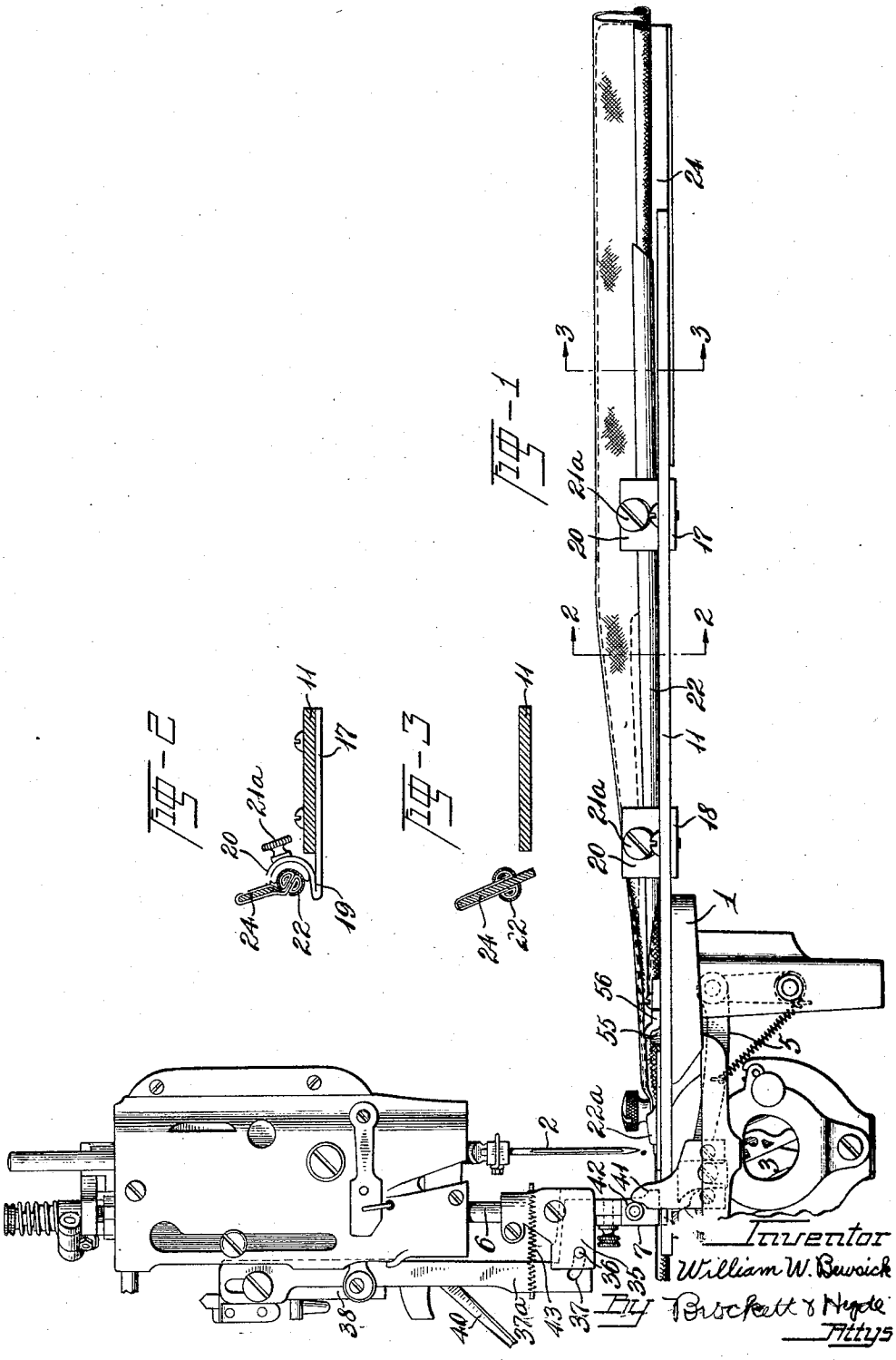
April 19, 1927. 1,625,348

W. W. BEWSICK

ROUND FABRIC BELT AND METHOD AND APPARATUS FOR FORMING THE SAME

Filed July 22, 1921 2 Sheets-Sheet 1



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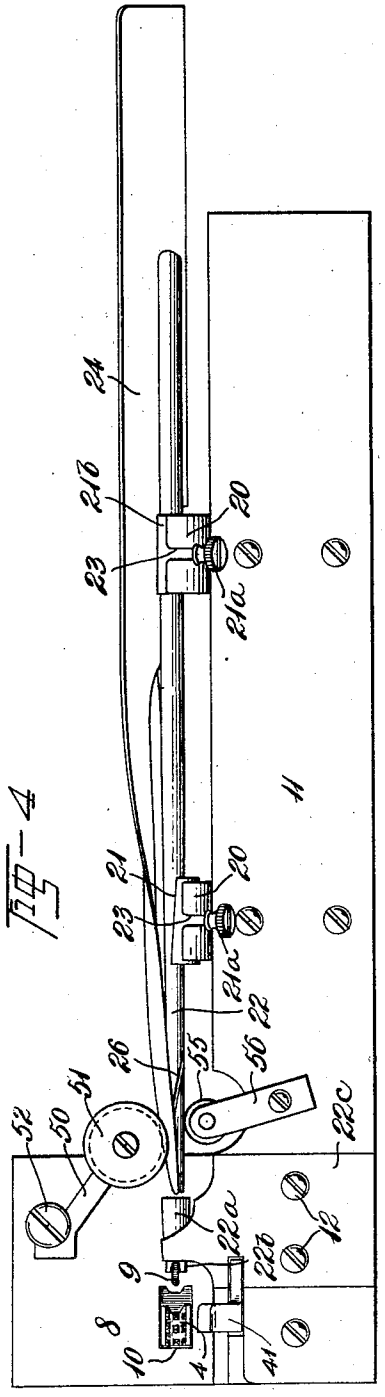


Fig-4

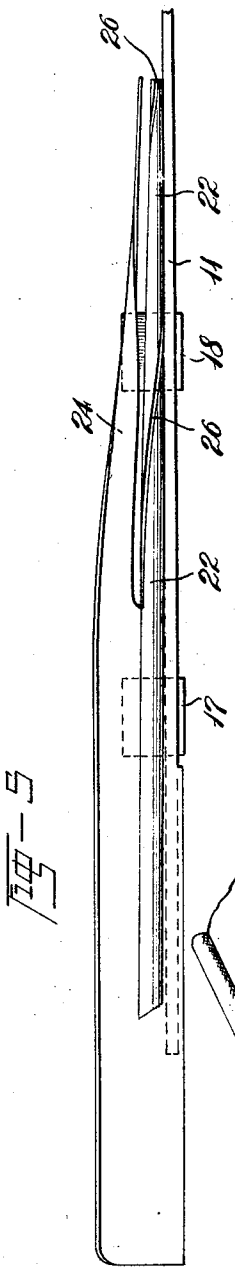


Fig-5

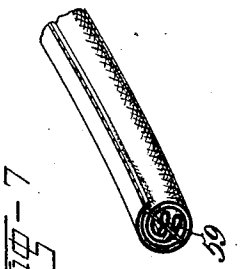


Fig-7

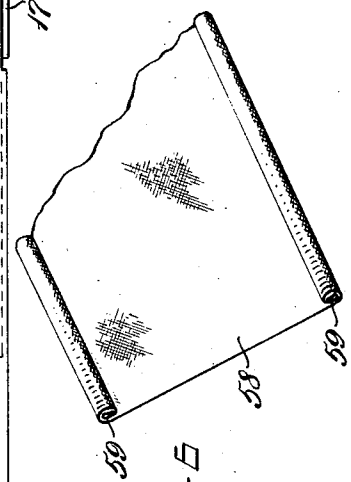


Fig-6

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Patented Apr. 19, 1927. 1,625,348

UNITED STATES PATENT OFFICE.

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ROUND FABRIC BELT AND METHOD AND APPARATUS FOR FORMING THE SAME.

Application filed July 22, 1921. Serial No. 486,913.

This invention relates to improvements in round fabric belts and the method and apparatus for forming the same.

More particularly this invention relates to an attachment for a sewing machine by which to roll and form a strip of canvas or other flexible and pliable sheet material into a substantially cylindrical form and present it in such form to the sewing mechanism by which it is stitched so that it will retain its cylindrical shape and thus form a round flexible belt.

The present invention relates to the same general type of device disclosed in the application of Albert H. DeVoe, Serial No. 327,585, filed Sept. 30, 1919, and assigned to the present applicant, and to which reference is here made for a fuller understanding of the present invention.

It is the object of this invention to provide a round fabric belt and an improved method and apparatus for forming the same; also to insure proper guiding and tensioning of the material as well as securing of the same in finished form so as to prevent unwinding. It is to be understood however that although the invention is shown and described in connection with a machine for sewing the flexible belting, it is not necessarily so limited but the flexible material may be held to shape by an adhesive such as cement or the like.

Other objects of the invention will be apparent from the following description and claims when considered together with the accompanying drawings.

Fig. 1 is a side elevation of my invention shown in combination with the stitching mechanism; Fig. 2 is a section on line 2—2, Fig. 1; Fig. 3 is a section on line 3—3, Fig. 1; Fig. 4 is a plan view of my improved mechanism; Fig. 5 is a rear elevation of the same; Fig. 6 shows in perspective the hemmed fabric cut on the bias; and Fig. 7 is a perspective of the round belt in completed form.

According to the invention in its preferred embodiment, the device is so arranged that the sheet of flexible material is rolled or wound upon itself in the form of a convolute and secured in such condition. This makes a substantially cylindrical element which is adapted for use on a sewing machine and other machinery and particularly as a substitute for the round leather belting now used for general purposes. The stitches preferably extend substantially through the diameter as better securing the folds in proper position, but obviously the invention is not limited to such an arrangement since the stitches may be applied in other suitable fashions. The apparatus consists of a fabric folding or rolling device comprising a tapered, tubular portion having a spiral work-guiding slot, and an auxiliary fabric guide strip which co-operates with the tubular member in affording proper tensioning for the fabric as it is wound. The fabric to be rolled is provided with a bead or welt along each of its longitudinal edges, preferably by either folding the material and passing the folded edge portion through the hemmer as on a sewing machine or by folding and stitching each edge portion about a cord filler. These welts or beads in this case are of substantially semi-cylindrical form and are inserted within the tubular portion of the folder so as to form together a substantially cylindrical core with the intermediate body portion of the material extending through the spiral work-guiding slot and over the fabric guide strip which maintains the same in properly distended position. As the material is passed lengthwise through the folder it is rolled or folded tightly about the welts or beads as a core and the inner walls of the tube adjacent the slot form a work confining and guiding means. A tubular guide member is located between the delivery end of the folder and the needle for properly guiding the wound belt to the table of the sewing machine.

The bed plate of the sewing machine is indicated at 1, the usual needle at 2, shuttle mechanism at 3, feed dog at 4, the feed dog being mounted upon the feed bar 5, and the presser bar at 6, upon which is mounted the presser foot 7. Throat-plate 8 is provided with the usual needle aperture 9 and an opening 10 for the feed dog.

The fabric rolling device consists of a base plate 11 formed of a flat strip or plate which is secured to the bed plate by means of the screws 12. Mounted upon the under side of the base plate 11 are the supporting strips 17 and 18 which are bent backwardly upon themselves as indicated at 19 and terminate in the substantially semi-cylindrical concave portions 20 within which are

mounted for adjustment the correspondingly curved blocks 21 and 21b carrying the slotted, tapered, tubular member 22. The upper edges of the portions 20 are slotted at 23, set screws 21a extending therethrough for threaded engagement with the blocks 21 and 21b. By loosening the screws 21a the blocks 21 and 21b can be rotated upon the axis of the tubular member 22 and set in adjusted position by clamping the screws against the bearing portions 20.

The guide strip 24 is tapered throughout its forward portion and is twisted or bent into what might be termed a spiral shape corresponding to the angularity of the spiral of the slot 26 in the tubular member 22 so as to insure proper tensioning of the fabric throughout its entire travel through the slotted tube or in other words throughout the entire belt forming operation. The guiding strip 24 is also arranged so as to occupy such a position with respect to the end of the slot 26 that as the wound fabric is drawn from the tubular member 22 the portion of fabric remaining to be wound will be held in proper position and will be laid upon the rest of the roll so as to receive the stitches through the outer marginal portion thereof. By means of the adjustable mounting of the tapered tube and the guide strip, these parts can be adjusted about the axis of the tubular member so as to ensure that the belt will be so presented to the stitching mechanism that the needle will stitch through the marginal portion of the last part of the fabric to be laid in wound position, as above referred to.

The tubular member 22 is divided throughout its rear end portion and the two halves thereof are secured along their lower edges to the opposite sides of the guide strip 24 which extends therebelow throughout its rear portion. The guide strip and the tubular member are together secured to the bearing block 21b. The tubular member is alone secured to the bearing block 21, the guide strip 24 at this point being spaced from the tubular member. Thus it will be seen that the guide strip is afforded support throughout its rear end portion in alignment with the straight portion of the slot of the tubular member so that the semi-cylindrical cores can be guided in the two half sections of the tubular member while at the same time the intermediate or body portion of the fabric extends over the guide strip. It may be observed that the guide strip begins to taper and to take on the spiral form at substantially the same point where the tubular member begins to taper and where the slot begins to spiral. It will be noted also that the direction of the spiral of the slot in the tubular member is opposite to that of the spiral of the guide strip; which means that tension is applied to the core and the outer portion of the fabric in opposite directions. The pitch of the slot of the tubular member decreases toward the smaller end thereof and the parts are so constructed and arranged that the tension upon the fabric increases as it approaches the small end of the tube. The guide member 22a is tapered in the same direction as tube 22 and is adapted to guide the wound belt to the needle. The front end of the guide 22a is slotted at 22b to accommodate the needle as it stitches the belt. This guide member is suitably mounted upon the bed-plate of the sewing machine as by means of the plate 22c.

Mounted upon the presser bar 6 is a block 35 provided with a pin 36 extending across the slot 37 in which is slidably secured the support 37a for the "walking" presser foot. The support 37a is pivotally mounted upon the member 38 which is lifted during the formation of each stitch through the cam located in the head of the machine and the clutch mechanism substantially as in the patent to Heggie No. 998,845, July 25, 1911. A more extended description is believed not to be necessary. The presser foot and presser bar may be manually lifted by means of the usual cam lever 40. Mounted upon the feed dog is the lug 41 which extends upwardly through a slot in the cloth-plate and contacts with roller stud 42 mounted upon the presser foot 7 to give a positive feeding movement to the presser foot corresponding to that of the lower feed mechanism. The presser foot and its support are normally held in forward position by spring 43. Mounted under the bed-plate is the usual feed lift arm not shown provided with the roller stud for giving the up and down motion to the feed dog, as in the application cited above. Suitably mounted upon the bed-plate is an arm 50 carrying the grooved presser roller 51 which can be adjusted by means of the screw 52 so as to engage the end portion of the guide strip 24 and force the same more or less forwardly accordingly as desired and depending upon the tension of the fabric. In other words, the adjustable presser roller affords a means of varying the degree of tension of the fabric produced by the guide strip. The idler 55 mounted upon the bracket arm 56 of the bed plate bears against the slotted tube and co-operates with the roller 51 in maintaining the end of the tube and strip in position for proper delivery of the wound fabric to the guide 22a.

In operation, a strip of flexible material such as canvas 58 cut on the bias is first formed with a welt or bead 59 preferably by folding each side of the strip upon itself several times and then passing the folded edge portions through a hemmer and stitching the hems therein. The strip of fabric is

then threaded in the tubular guide 22 by passing the body of the strip through the slot and along opposite faces of the guide strip 24, leaving the core or welt sections within the tube. The body portion of the flexible strip extends outwardly through the slot and over the edge of the guide strip as indicated in the drawings. The extent of the fabric strip between the core sections bears such relation to the effective width of the guide strip that the intermediate portion of the fabric is maintained in properly distended position so as to be given proper tension for winding. The hemmed or beaded sections afford a means by which to grip the edge portions of the strip for pulling it through the tube and form also a substantially cylindrical core about which the rest of the strip is rolled as it passes off the small end of the tubular member. As above explained, the guide strip is so constructed and arranged with respect to the spiral slot in the tubular member that proper tension is maintained for the fabric throughout its entire winding operation.

As the fabric is tightly wound when it leaves the smaller end of the tube, considerable pull is necessary to draw it through the rolling and folding device. It is therefore desirable to provide means for clamping the formed roll to pull it off of the forming mechanism and past the needle. This is done by providing the feed dog 4 and the presser foot 7 with opposed faces, these faces being formed with teeth or serrations for gripping the roll, as shown, under the action of a spring for holding the presser foot down upon the work. In order to take a portion of the strain off the feed dog, the projection 41 is provided. As the rolled material is tightly clamped between the presser foot and feed dog the belt is prevented from twisting at the stitching point. Since the outer folded portion is laid snugly over the tightly rolled portion just before the roll reaches the needle it is positioned accurately to receive the stitches adjacent the folded edge of this portion. It will thus be seen that the roll will be stitched before it has an opportunity to unwind or untwist and that it does not have any exposed raw edge which will ravel or fray, both of the raw edges of the strip being positioned at the core.

What I claim is:

1. In a device of the character described, a spiral guiding element for grasping and guiding the edges of a folded fabric strip to be formed into a belt, and fold guiding means associated with said spiral guiding element, said guiding element and said fold guiding means together constituting a tension means for the fabric strip as it is formed into a round belt body.

2. In a device of the character described, a spiral guiding element for grasping and guiding the edges of a folded strip to be formed into a fabric belt, and fold guiding and tensioning means associated with said spiral guiding element, said guiding element and said fold guiding means together constituting a tensioning means for the fabric as it is formed into a round body.

3. In a device of the character described, means for guiding the edge portions of a fabric strip, and means including said guiding means for rolling the intermediate portion of fabric about said edge portions so as to form a substantially round belt.

4. In a device of the character described, means for guiding the edge portions of a fabric strip, and means including said guiding means for rolling the intermediate portion of fabric under tension about said edge portions so as to form a substantially round belt.

5. In a device of the character described, means for guiding the edge portions of a fabric strip, and means including said guiding means and another guiding member for rolling the intermediate portion of fabric about said edge portions and applying tension thereto during the rolling operation so as to form a substantialy round belt.

6. In a device of the character described, means for guiding the edge portions of a fabric strip, and means including an auxiliary guiding member for rolling the intermediate portion of fabric about the edge portions so as to form a substantially round belt, said first named guiding means and auxiliary guiding member being so constructed and arranged as to maintain uniform tension upon the fabric during the rolling operation.

7. In a device of the character described, a spiral guiding element for engaging the edge portions of a fabric strip, and an auxiliary guiding member for engagement of the intermediate portion of said strip, said auxiliary guiding member being so constructed and arranged with respect to said spiral element as to maintain said strip under uniform tension.

8. In a device of the character described, means for guiding a fabric strip having two substantially semi-cylindrical hemmed edge portions and an intermediate portion, comprising means for guiding said hemmed portions in supplemental relation, and means for guiding the intermediate portion of said fabric strip in folded relation.

9. In a device of the character described, a spirally slotted tapered tube for receiving and guiding hemmed portions of a fabric body in supplemental relation, and means for guiding the fabric intermediate said hemmed portions in folded relation.

10. In a device of the character described, means for guiding a portion of a strip of fabric to serve as a core, means for guiding the remaining portion of said strip of fab-

ric, and means including said first named two means for winding said fabric in multiple layers upon the core into a substantially round belt.

11. In a device of the character described, means for guiding two portions of a strip of fabric, means for guiding the fabric intermediate said portions, and means including said first named two means for rolling said fabric about said first named two portions so as to form a substantially round belt.

12. In a device of the character described, means for guiding two portions of a strip of fabric, means for guiding the fabric intermediate said portions, and means including said first named two means for rolling said fabric from the inside, and outside about said first named two portions so as to form a substantially round belt.

13. In a device of the character described, means for guiding portions of a strip of fabric so as to serve as a core for a substantially round belt, and means for guiding the portion of fabric intermediate said first named portions, said means being so constructed and arranged as to place the fabric under gradually increasing tension during the belt forming operation.

14. In a device of the character described, means for guiding portions of a strip of fabric to serve as a core, means for guiding the portion intermediate of said first named portions, and means including said first named two means for rolling said fabric in one direction from the inside and in the opposite direction from the outside so as to form a substantially round belt.

15. In a device of the character described, a spiral guiding means for the edge portions of a fabric strip, a guiding means for the main body of the strip and extending lengthwise of said first named guiding means, said second named guiding means being also tapered in the direction of taper of said first named guiding means.

16. In a device of the character described, a spiral guiding means for the edge portions of a fabric strip, a guiding means for the main body of the strip and extending lengthwise of said first named guiding means, said second named guiding means being tapered and bent transversely in the opposite direction from that of the spiral of said first named guiding means, whereby the fabric is held under proper tension.

17. In a device of the character described, means having a spiral slot for guiding the edge portions of a body of fabric, and a guide strip about which the middle portion of the fabric is adapted to extend, said slotted means and guide strip being supported at their rear end portions, and the said slot and strip being spiraled in opposite directions so as to maintain said fabric under proper tension.

In testimony whereof I hereby affix my signature.

WILLIAM W. BEWSICK.