

Nov. 9, 1926.

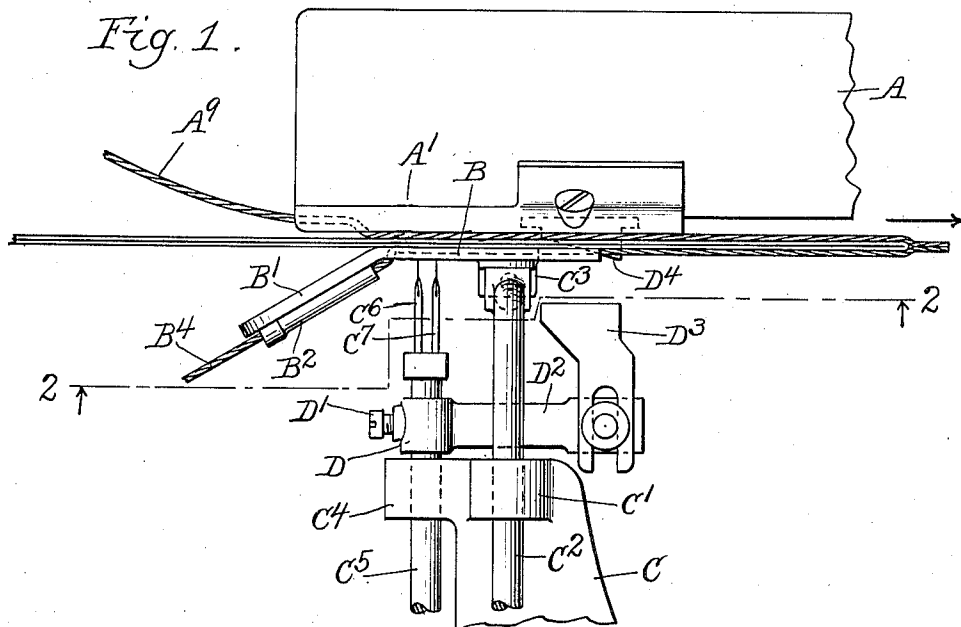
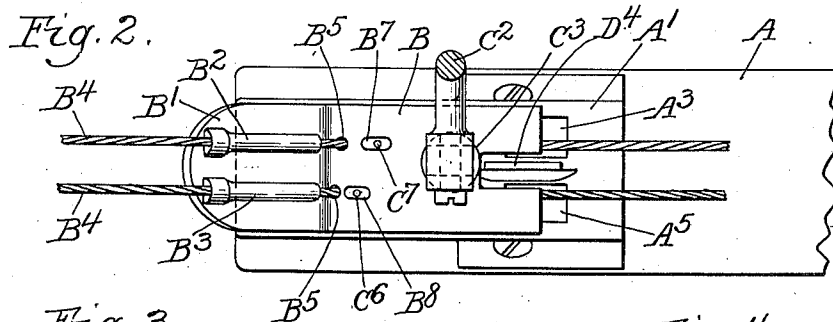
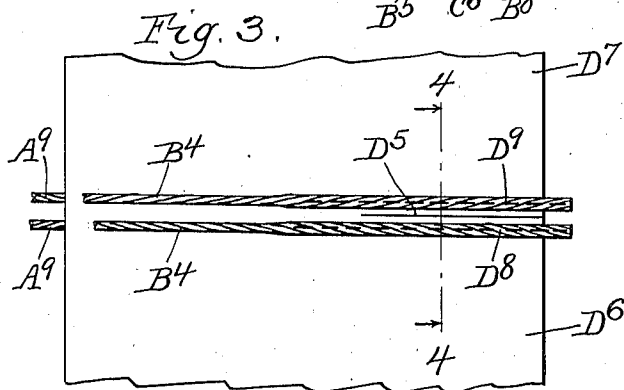
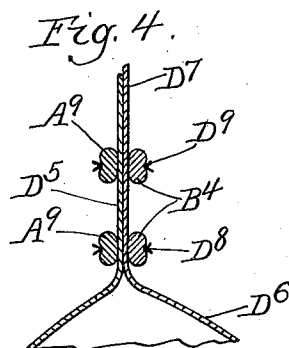
1,605,913

A. M. BATES

SEWING MACHINE

Filed July 7, 1921

2 Sheets-Sheet 1



Witness.

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2 Sheets-Sheet 2

Fig. 5.

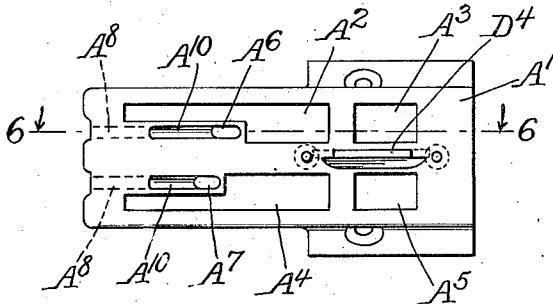


Fig. 6.

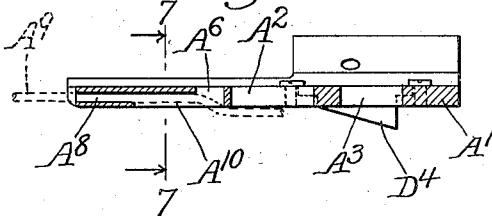


Fig. 7.

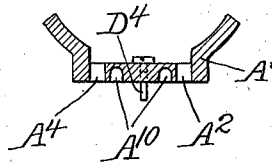


Fig. 8.

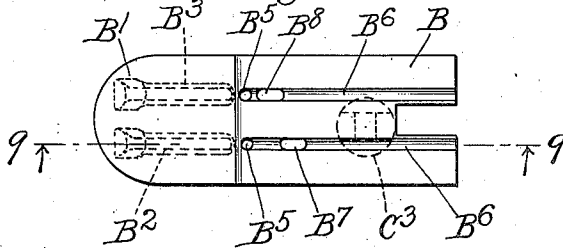
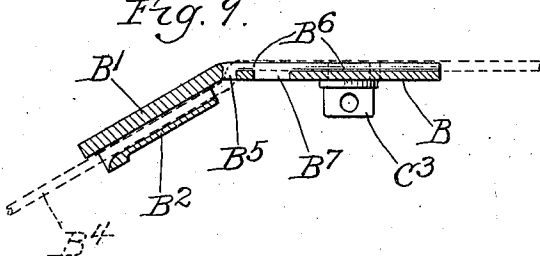


Fig. 9.



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UNITED STATES PATENT OFFICE.

ADELMER M. BATES, OF CHICAGO, ILLINOIS, ASSIGNOR TO BATES VALVE BAG COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF WEST VIRGINIA.

SEWING MACHINE.

Application filed July 7, 1921. Serial No. 482,943.

My invention relates to an improved sewing machine for sewing reinforced seams and the like and is adapted to be used in connection with sewing paper and other thin, brittle, weak or easily torn fabrics or materials. It is particularly adapted for use in connection with the sewing of cross seams in a continuous bag tube of such materials to form bags or packages therefrom.

For a long period of time many efforts have been made to produce a sewing machine which would successfully sew paper. The difficulty has been that when paper or similar material is sewn in the usual way the series of holes from the needle tend to weaken it so that when tension is brought on the fabric it will tear out at the seam.

I propose to avoid this difficulty by providing a reinforced seam in which a soft cotton, paper or other cord is sewed in with the seam on both sides of the joined fabric, so that the stitches pass through four thicknesses, that is, two thicknesses of fabric, and outside of them, on each side, a cord which reinforces or cushions the seam and distributes the tension or load throughout the entire width of the fabric instead of allowing it to be concentrated on the fabric between the holes where the stitches pass through. The reinforcement thus acts as a cushion and as a bridge to distribute the load, and my present invention has to do with a sewing machine for sewing this kind of a seam.

My invention is illustrated more or less diagrammatically in the accompanying drawings wherein:

Fig. 1 is a plan view of the sewing machine; Fig. 2 is a section along the line 2—2 of Fig. 1; Fig. 3 is a plan view of a bag forming tube in a partially sewn condition; Fig. 4 is an enlarged section along the line 4—4 of Fig. 3; Fig. 5 is a view of the plate through which the feed dogs project; Fig. 6 is a section along the line 6—6 of Fig. 5; Fig. 7 is a section along the line 7—7 of Fig. 6; Fig. 8 is a view of the presser foot, and Fig. 9 is a section along the line 9—9 of Fig. 8.

I have shown only a fragmentary view of the supporting arrangement for the sewing machine and it is to be understood that the bag forming tube comes down from above, passing through the machine as shown in Fig. 1, and the needles of the sewing machine work in a horizontal plane.

Like parts are indicated by like letters throughout the drawings and specification.

A is a supporting arm which contains stitch forming mechanism and the feed dogs and feeding mechanism by which the work is fed through the machine in the direction of the arrow shown on the right hand side of Fig. 1. These feed dogs are not shown because they are hidden during the operation but it will be understood that their function is to feed the material through in the usual way. A' is a throat plate carried by this feed arm. It has the apertures A² A³ A⁴ A⁵, Fig. 5, through which these feed dogs project. A⁶ A⁷ are holes through which the needles pass to bring the thread into engagement with the stitch forming mechanism inside of the hollow arm A. A⁸ A⁹ are guide tubes or passages through which the reinforcing ropes or cords A⁹ pass. These tubes or passages terminate in open slots A¹⁰, which guide these cords or reinforcing ropes across the holes A⁶ A⁷ so as to bring them into the paths of the needles.

B is a presser foot having an outwardly inclined guide lip B', which lip carries two guide tubes B² B³, through which pass the reinforcing cords or ropes B⁴ B⁴. These cords or ropes pass through holes B⁶ B⁵ in the face of the presser foot and the cords are guided by slots B⁶ B⁶ extending clear through to the rear edge of the presser foot. The holes B⁷ B⁸, through which the needles pass, are in line with these slots, so that the reinforcing cords are guided to and from the sewing point and are held in line with the needles. The presser foot has a plane under-face contacting the material between the seams and for some distance on the other side of each seam.

C is a supporting arm which carries lugs C' and C⁴, in the form of which is reciprocally mounted the presser foot bar C², which engages the lug C³ on the presser foot. Lug C⁴ guides the needle bar C⁵ and this needle bar carries the two needles C⁶ C⁷. Means are provided, not here shown, for yieldingly holding the presser foot against the throat plate so that the pressure of that foot holds the fabric against the plate and in working engagement with the feed dogs, and means, not here shown, are also provided to reciprocate the needle bar to pass the needles back and forth through the fabric. The stitch forming mechanism inside the

hollow arm A is not shown, as its operation is the usual sewing operation and its mechanism forms no part of my invention.

D is a sleeve held by the set screw D' on the needle bar and carrying the member D² upon which is mounted the knife D³. This knife moves back and forth in engagement with the fixed knife D⁴ and, as the fabric is fed forward a predetermined distance between each stroke of the needle bar, the knife at each stroke cuts that distance along the line D⁵ between the two lines of stitches. D⁶ represents the filled or completed bag or package in process of being closed by a seam and cut off from the package forming tube D⁷. D⁸ is the closing seam for the top of the finished bag and D⁹ the closing seam for the bottom or end of the bag forming tube. The rear of the presser foot is notched for the accommodation of the cutters, as appears from Figs. 1 and 2; and by comparing these figures with Fig. 8, it will be seen that the grooves B⁶ B⁶ guide the reinforced seams to their proper positions on opposite sides of the cutting members.

In Figure 4 it will be noted that the reinforcing cord is laterally collapsed by the stitching operation, thus forming a soft, flexible reinforcement for the fabric. The stitches do not come in contact with the fabric except at the actual point of penetration of the needle, and the pad of cushioning material between the bag fabric and the thread at all other points obviates the danger of cutting or tearing the fabric at the seam.

It will be understood that while I have shown a practical working form of my invention, many changes may be made in size, shape and relations of parts without departing from the spirit of my invention.

The use and operation of my invention are as follows:

The tube or fabric or group of fabrics to be joined together will be fed into the jaws between the throat plate and the bent end of the presser foot, forcing the presser foot away from the throat plate sufficiently to permit the passage of the fabric thereunder. In ordinary conditions the needle bar will be operating and stitches will be in process of formation, thus joining the two reinforcing cords or strings together before the fabric is fed into the machine. The introduction of the fabric between the two cords will, as soon as the material reaches the stitching point, result in the joining together of the fabric and the reinforcing cords into a single reinforced, cushioned seam. This will continue until the fabric has passed entirely through, when the reinforcing cords are again joined and the stitch chain may be cut to free the material from the machine.

Where the idea is applied to bag or pack-

age forming from tubes, the reciprocating knife cuts the fabric between the two sections and between the two seams.

The guide grooves in the presser foot continue their guiding action after the seams are formed and hold the seams in proper relation to the cutters, and also permit the contact of the rest of the face of the presser foot with the material at the sides of the seams.

Under some conditions, the reinforcement on the throat plate side might be dispensed with because if two fabrics, one weak and one strong, are being fastened together, the reinforcement or cushion on the weak side only would be enough; or under some conditions, the thickened chain of stitches on one side would be enough, and while I have shown provision for providing reinforcement on the throat plate side and on the needle side, it will be understood that under some conditions only one side might be reinforced and this reinforcement might be on the needle side or it might be on the throat plate side. It will be understood that various obvious modifications, not specifically mentioned, may be made within the scope of the appended claims.

I claim:

1. In apparatus of the character described, means to sew a thickened seam, cutting means, and members having opposed surfaces providing between them a channel adapted to receive a thickened seam and extending continuously in a straight line from said seam forming means past one side of said cutting means.

2. In apparatus of the character described, means to sew a thickened seam, cutting means, and members having opposed surfaces providing between them a channel adapted to receive a thickened seam and extending continuously in a straight line from said seam forming means past one side of said cutting means, said opposed surfaces being parallel with each other on the side of said channel towards the cutting means.

3. In apparatus of the character described, means to sew parallel thickened seams, cutting means adapted to cut material between the seams as the material moves away from said sewing means, and members having opposed faces providing between them channels adapted to receive thickened seams and extending from the means for forming the several seams in parallel straight lines past the cutting means.

4. In apparatus of the character described, means to sew parallel thickened seams, cutting means adapted to cut material between the seams as the material moves away from said sewing means, and members having opposed faces providing between them channels adapted to receive thickened seams and extending from the means for forming

the several seams in parallel straight lines past the cutting means, said opposed surfaces being parallel with each other between said channels.

5 5. In apparatus of the character described, a needle, cutting means, members having opposed surfaces providing between them a channel extending from in front of the
10 needle backward in a straight line to one side of the cutting means, and means to guide a reinforcing element to the channel in front of the needle.

6. In apparatus of the character described, means to sew parallel seams, cutting means
15 adapted to cut material between the seams as the material moves away from the sewing means, members having opposed faces providing between them channels extending from in front of the means for sewing the
20 several seams backward past the cutting means, and a guide cooperating with each of said channels and adapted to guide a reinforcing element into the front end thereof.

7. In apparatus of the character described,
25 a needle, cutting means, and a presser foot having a groove in its pressing face extending from in front of the needle to one side of the cutting means.

8. In apparatus of the character described,
30 a needle, cutting means, a presser foot having a groove in its presser face extending from in front of the needle to one side of the cutting means, and a guide adapted to direct a reinforcing element into said groove
35 in front of the needle.

9. In apparatus of the character described, a pair of needles, cutting means in position to cut material between seams sewed by said
40 needles, a presser foot having holes for the passage of said needles, a notch in its rear end to accommodate said cutting means, and

grooves in its pressing face extending from in front of said needles to the rear end of the foot.

10. In apparatus of the character de- 45 scribed, a pair of needles, a throat plate having a plane surface, a foot having a pressing surface opposed to said plane surface, there being parallel grooves in said pressing surface and extending from in front 50 of the needles to the rear of said surface, guides connected with the foot and adapted to direct reinforcing elements into said grooves in front of said needles, and guides 55 connected with said throat plate and adapted to direct reinforcing elements in line with said grooves in front of said needles, there being a notch in the rear of said foot between said channels, a stationary knife rising from said throat plate beneath said 60 notch, a movable knife, and means to reciprocate said movable knife through said notch and in shearing relation with said stationary knife.

11. In apparatus of the character de- 65 scribed, means to sew parallel thickened seams comprising a throat plate and presser foot having opposed surfaces providing therebetween channels adapted to receive 70 the thickened seams as they are formed and guide them away in their passage backward from the forming point, there being a notch in the rear of the presser foot between said channels, a stationary knife rising from said throat plate beneath said notch, a movable 75 knife, and means to reciprocate said movable knife through said notch and in shearing relation with said stationary knife.

In testimony whereof, I affix my signature this 1st day of July, 1921.

ADELMER M. BATES.