Jan. 12, 1954 E. LEPOW 2,665,650

SCALLOPING DEVICE

Filed March 11, 1949 2 Sheets-Sheet 1

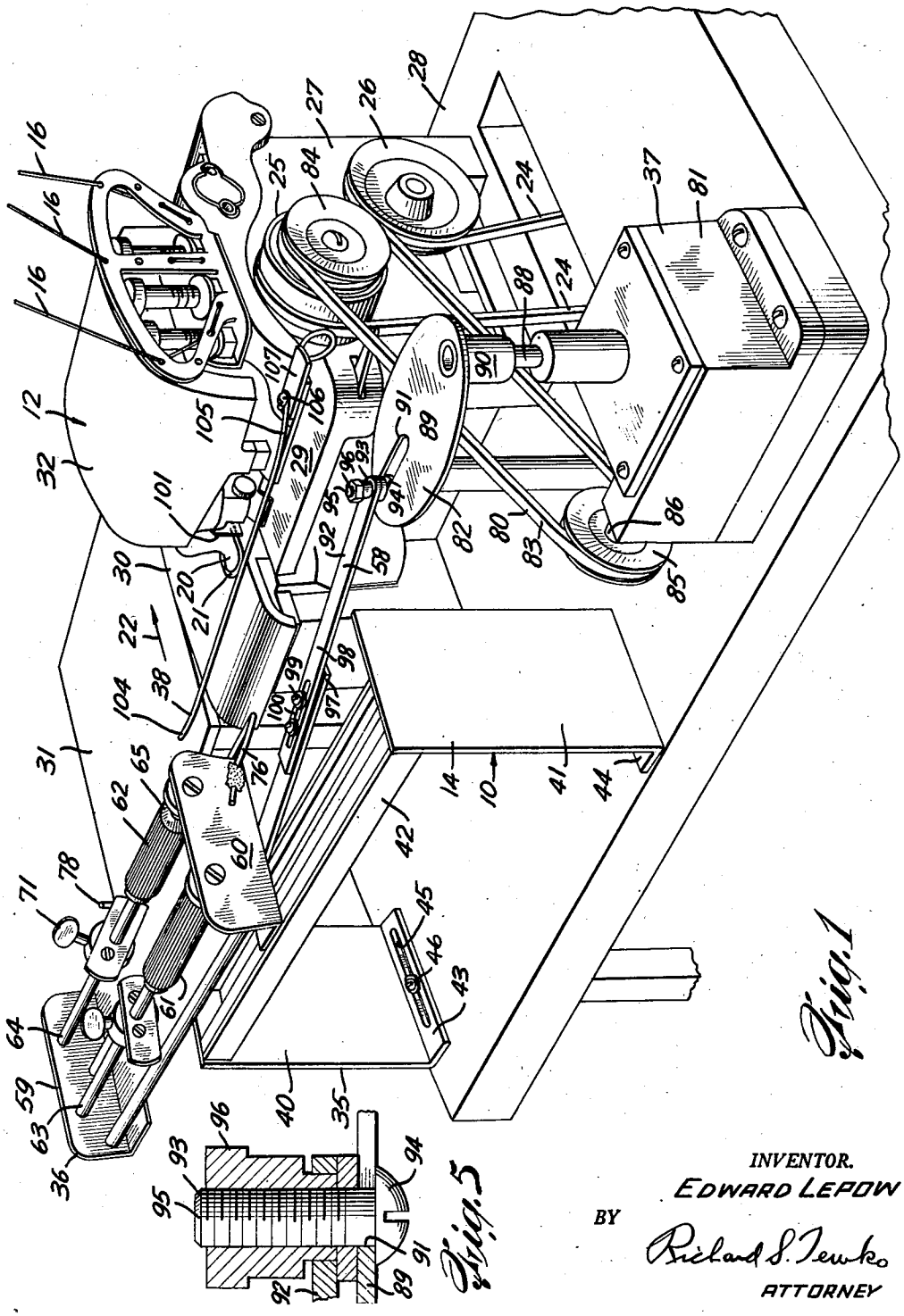


Fig. 1

Fig. 5

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Fig. 2

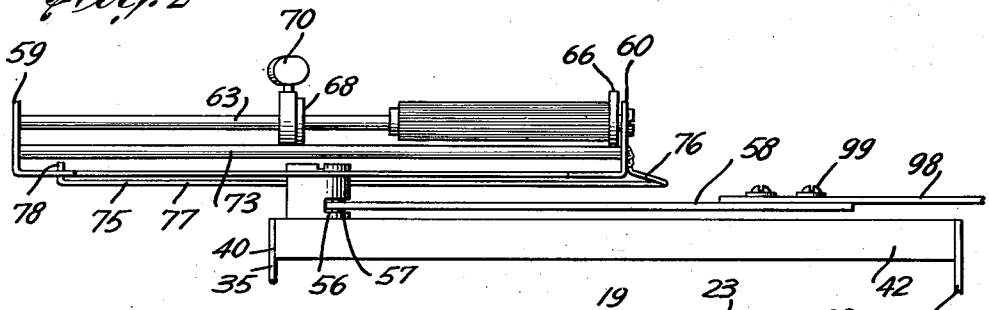


Fig. 3

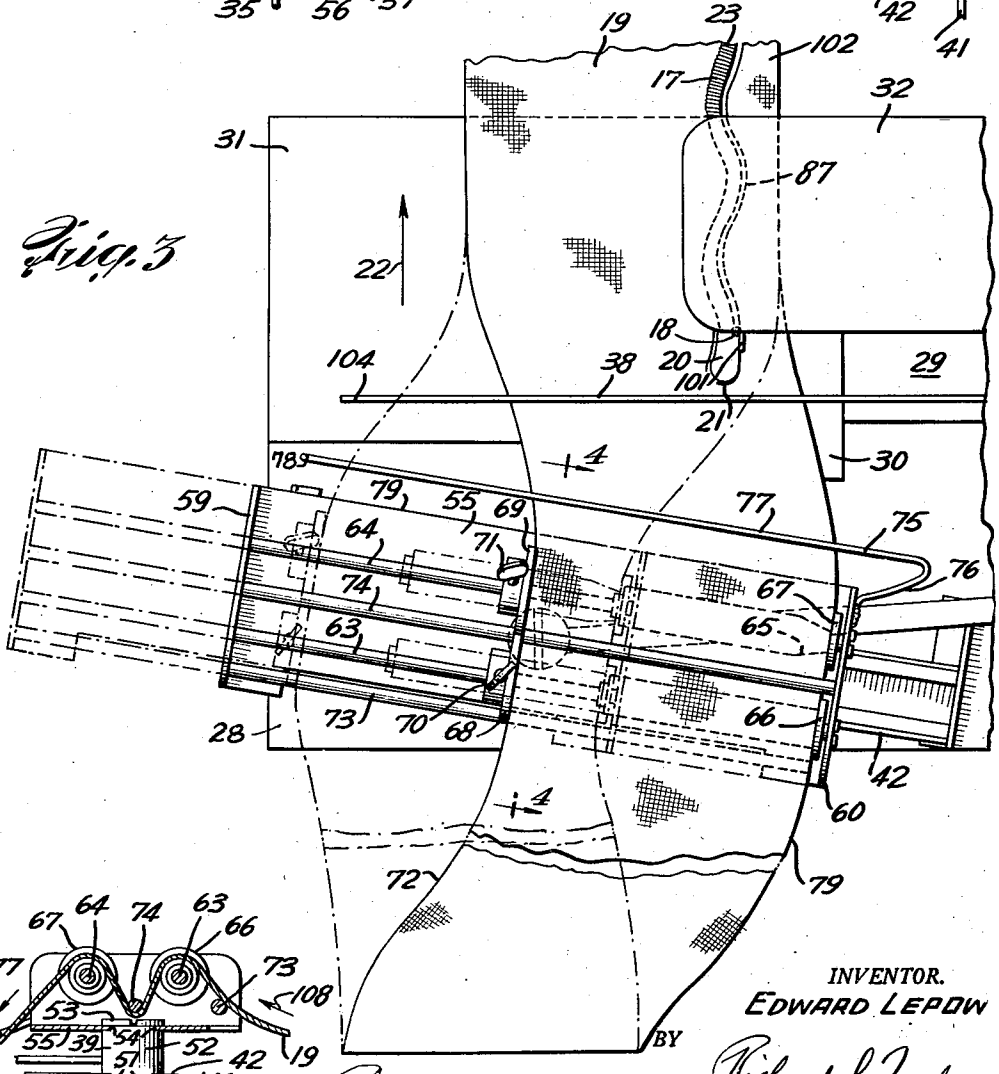


Fig. 4

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SCALLOPING DEVICE

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3 Claims. (Cl. 112—102)

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This invention relates generally to the sewing machine art and to structure for use in conjunction therewith, and more particularly to devices for the production of special edges on textile fabrics and similar flexible materials.

It is known in the art to apply a stitched edging to a scalloped edge of a flexible textile material or the like by the use of an overedging sewing machine to produce a scalloped embroidery effect but such structures and methods involved complicated and expensive machinery and have also involved a slower sewing speed so that economic production was not feasible.

It is therefore among the objects of the present invention to provide a combination of novel structure together with a known overedging machine, or the structure itself, and a method of operation whereby a scalloped embroidery effect upon the edge or edges of a flexible sheet material may be produced in a satisfactory manner and with a high rate of speed and a consequent low production cost.

Another object herein lies in the provision of structure and mode of operation as described in which a scalloped embroidery effect is obtained and which is of high quality in that the stitches are of the same or substantially the same length with respect to the edge or edges of the fabric and in which a uniform serpentine shape is obtained.

A still further object of the present invention lies in the provision of structure and mode of operation producing an oscillatory movement of the fabric in a predetermined fashion so that the sewing machine may operate in a normal manner thereby not affecting long trouble free operation.

Another object herein lies in the provision of structure and mode of operation whereby the size, contour and arrangement of the scallops in the edge as fabricated may be changed to accommodate different requirements.

A feature of the invention lies in the fact that it may be used with fabrics or sheet materials having varying lateral dimensions and different surface characteristics.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claims.

In the drawings, in which similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a fragmentary view in perspective showing an embodiment of the invention.

Figure 2 is a fragmentary elevational view of the upper left portion of Figure 1.

Figure 3 is a fragmentary plan view.

Figure 4 is a fragmentary vertical sectional view as seen from the plane 4—4 on Figure 3.

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Figure 5 is a fragmentary sectional view.

The device as generally indicated by reference character 10, comprises broadly a sewing machine 12 and a scalloping device 14.

The machine 12 is well known in the sewing machine art and is frequently referred to as an overedging machine. Such a machine is adapted for use with a plurality of threads 16 which are interlocked by the machine to produce an embroidery effect indicated by reference character 17 on Figure 3, and this is produced by the needle 18 which acts upon the fabric 19 between the presser foot 20 and the feeding bed 21. The feeding bed 21 is adapted in the usual manner by mechanism not shown to advance the fabric 19 in the direction of the arrow 22. The amount of the movement of the fabric 19 in the direction of the arrow 22 may be adjusted in a well known manner to have a predetermined correlation to the vertical reciprocations of the needle 18. Normally this adjustment is made for the purpose of setting desired spacing between the transverse portions 23 of the stitches 17. The machine 12 may be driven in any suitable manner as for example by a belt 24 driven by a motor (not shown), the belt 24 driving the pulley 25. The belt 24 also engages the pulley 26.

The machine 12 includes a frame 27 which is mounted in a suitable manner upon the table 28. The frame 27 carries a platform 29 which in turn carries at the left thereof a base guard 30. The auxiliary table 31 is at substantially the same level as the base guard 30 and the cloth 19 during the sewing operation travels across the upper surface of said base guard 30 and auxiliary table 31. A large portion of the needle operating mechanism is concealed beneath the hood 32. The auxiliary table 31 is supported from the table 28.

The scalloping device 14 comprises broadly a base element 35, a carriage element 36, a reciprocator element 37 and a stationary resilient guide element 38.

The base element 35 comprises a pair of spaced and substantially parallel end members 40 and 41 and a track member 42. The end members 40 and 41 have foot portions 43 and 44 which may be provided with slots 45 and clamping means or screws 46. Only one of the slots 45 and screws 46 is shown in the drawings and said screw 46 engages the table 28 so that upon loosening the screws the end members 40 and 41 may be adjusted in position with respect to the machine 12. As best seen in Figure 3 the track 42 is arranged at an angle of substantially 10° with respect to the guide element 38, the latter being perpendicular with respect to the normal movement of the feeding bed. The track member 42 at the ends thereof is suitably secured to the upper terminals of the end members 40 and 41 and said track member includes front and rear ways 145 and 146

which are secured to the upper edges of the front and rear walls 48 and 49.

The connecting element 39 is of irregular configuration best seen in Figure 4 and includes a base portion 50, indentations 51, a head portion 52 and a top member 53. The indentations 51 are spaced from each other a distance substantially equal to or slightly more than the distance between the opposed surfaces of the ways 145 and 146 while the vertical height of the indentations 51 is substantially equal to or slightly more than the vertical thickness of the ways 145 and 146.

The indentations 51 permit the connecting element 39 to slide longitudinally of the track member 42 but at the same time prevent rotation of the connecting element. The top member 53 is in the form of a large flatheaded screw and it is threadedly engaged with the upper surface of the head portion 52. The head portion 52 has a pair of opposed rabbets 54 upon which the base 55 of the carriage 36 is seated in a nonrotatable manner.

As best seen in Figure 2, the right hand portion of the head portion 52 has a recess 56 and a vertical pin 57 upon which the left end of the connecting bar 58 is pivotally mounted.

The carriage 36 has a frame including the base 55 and end members 59 and 60. Supported by the end members 59 and 60 are first and second roller members 61 and 62. The roller members 61 and 62 are preferably composed of a resilient material such as rubber, synthetic rubber, artificial resin or the like and they are longitudinally knurled so that they may grip the fabric 19. The roller members 61 and 62 rotate upon shafts 63 and 64 which are fastened between the end members 59 and 60. The second roller member 62 at 65 is tapered. Located on the right hand ends of the shafts 63 and 64 are flanges 66 and 67 which guide the right hand edge 79 of the fabric 19. Corresponding flanges 68 and 69 are slidably mounted on the shafts 63 and 64 and may be secured in adjusted positions thereof by the thumb screws 70 and 71. The flanges 68 and 69 guide the left edge 72 of the fabric 19. Disposed between the end members 59 and 60 are a pair of lower first and second frictional spreader members 73 and 74. The members 73 and 74 are fastened upon the end members 59 and 60 and are disposed at a lower level than are the shafts 63 and 64.

Secured to the end member 60 is a resilient guide member and since it moves with the carriage may be referred to as a movable resilient guide member. The guide member 75 includes a downwardly and rearwardly extending portion 76 and an elongated horizontal portion 77. The portion 77 at the left or free end thereof extends upwardly at substantially right angles to form the terminal 78. The portion 77 is spaced from, parallel to, and slightly below the rear edge 79 of the carriage base 55.

The reciprocator element 37 includes broadly power take-off 80, a speed reducer 81, an adjustable crank 82 and the connecting bar 50 previously referred to.

The power take-off 80 preferably includes an endless belt 83 which transmits power from the pulley 84 to the pulley 85. Pulley 84 is fixed to the end of the same shaft which carries the pulley 25 so that the device 10 receives power in a substantially direct manner from the prime mover (not shown) which drives the belt 24, and the motion of the pulley 84, pulley 85, and hence the device 10 is synchronized to the operation of the sewing machine 12. Under the loads handled, the belts 24 and 83 have substantially little or no slippage. Slippage of the belt 24 has no effect except upon total production. Slippage of the belt 83 would result in some loss of synchronism but in view of the stepped down ratio of the speed reducer 81 it may be disregarded as a practical matter. If greater precision is desired, the belt 83 may have substituted for it a chain type of belt and the pulleys 84 and 85 may be replaced with sprockets.

Motion of the pulley 85 enters the speed reducer 81 via the shaft 86. The speed reducer 81 may be of any suitable type and have a ratio which is correlated to the effective fabric feed or travel produced upon the fabric 19 by the feeding bed 21. Thus, for example, if it is desired that the distance between the point where the needle 18 engages the fabric 19 and the point 87 be, for example, two and one half inches, then the ratio of reduction in the speed reducer 81 should be such as to produce one complete revolution of the shaft 88 while the fabric 19 has been advanced two and one half inches by the feeding bed 21. Speed reducers of various types may be used, and I have found those of the worm and gear type to be satisfactory. Secured to the upper portion of the shaft 88 is the adjustable crank 82 which is preferably in the form of an elongated plate 89 integrated with a collar 90. The plate 89 is provided with an elongated, radially disposed slot 91 and the end 92 of the connecting bar 58 is adjustably and pivotally connected to the plate 89 by an adjustable pivoting element 93. The element 93 includes a bolt 94, a shank 95 and a nut 96 (see Figure 5). As seen on said Figure 5, the nut 96 clamps the bolt 94 in a stationary position with respect to the slot 91 in the plate 89 and at the same time affords a pivotal connection for the orificed end 92 of the connecting bar 58. By adjusting the position of the bolt 94 with respect to the slot 91, the amount of throw or travel of the carriage 36 is adjusted. The connecting bar 58 is composed of two parts 97 and 98 which are connected by screws 99. The screws 99 threadedly engage the part 97 and are adjustable in position longitudinally of the slot 100 in the part 98. By loosening the screws 99 the carriage 36 may be adjusted in position so that the edge 79 of the fabric 19 may be shifted with respect to the knife 101. Thus the adjustment obtained by the shortening or lengthening of the connecting bar 58 has the effect of adjusting the width of the waste portion 102 which is trimmed off by the knife 101 immediately prior to the stitching operation by the needle 18. For the low cost production of the scalloping as herein described, it is desirable that this trimmed off portion 102 be as narrow as possible while still affording a sufficient portion of the fabric 19 for the feeding mechanism of the sewing machine to engage with during the cutting and sewing operations.

It is important to note that the adjustment afforded by the screws 99, may be made without affecting the adjustment of the element 93 which governs the concavity or convexity of the scallops produced by the severance caused by the knife 101 and the stitches 17.

The stationary resilient guide element 38 is preferably composed of an elongated rod which is circular in cross section. The end 104 is bent slightly upwardly to avoid its becoming snagged with the fabric 19. The other end 105 is provided with an orifice and is secured by means of

a screw 106 upon a stationary portion 107 of the sewing machine 12. During operation the stationary resilient guide element 38 may flex slightly to accommodate the shifting position of the fabric 19 as produced by the horizontal travel of the carriage 36 and serves to hold the fabric down so that it may be properly engaged by the foot 20, the feeding bed 21, and the knife 101.

In accordance with the present invention, the operation of producing scalloped edges on fabrics is a relatively simple matter. Ordinarily in order to facilitate rapid production it is desired to apply the scalloped edge to a relatively narrow band of fabric and then to apply said band, at the unscalloped edge, to a larger article such as a curtain, bed spread, dress, or other similar article in which the decorative edging produced by the scallop is desired. The fabric 19 is preferably in the form of a long web which may be located in a suitable source such as a box or on a drum (said box or drum not being shown in the drawings), at the front of the device and said web, brought upwardly and forwardly in the direction of the arrow 108 travels over and under the respective parts as clearly shown in Figure 4, the fabric after leaving the position underneath the elongated horizontal portion 77 traveling under the element 38, as best seen in Figure 3, to be there engaged by the sewing machine parts which sever it and place the stitch. Depending upon the concavity or convexity of the scallops, the element 93 is adjusted in position upon the plate 89. A predetermined correlation between fabric travel as produced by the feeding bed 21 and the positioning of the element 93 is established. The thumb screws 70 and 71 are adjusted for the width of the fabric 19. A preliminary stitching is performed and the screws 99 are adjusted to alter the effective length of the connecting bar 58 so that only a small waste cut is made.

Following this, during the operation of the invention, the needle 18 and the knife 101 operate in a normal manner on the sewing machine 12 acting to sew in a straight line, but the fabric 19 as moved by the carriage 36 is pulled in opposite directions in sequence. In Figure 3, the fabric 19 is shown in full lines as approaching a right hand extreme while the left hand extreme is shown in the dot dash lines. This movement of the carriage accompanied by the simultaneous cutting and stitching operations produced by the machine 12 results in the scalloped effect shown in Figure 3, the scalloped edge being protected and decorated by the covering stitches 17.

While I have shown the carriage 36 and the track member 42 of a certain length obviously the sizes of these parts may be changed to accommodate the widths of the fabric 19. While the position of the element 93 affects the concavity or convexity of the scallops, the length thereof, as stated, may be altered by changing the rate of feed of the feeding bed. Also the speed reducer or the pulleys may be changed in size to produce this type of change.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A fabric reciprocating means adapted to direct a fabric to a sewing machine particularly adapted to cooperate with said reciprocating means to effect a scalloped edge thereon comprising: a carriage element and a reciprocator element; said reciprocator element including a power take off driven in predetermined synchronism with said sewing machine, a speed reducer, a crank and a connecting bar; said carriage element including reciprocating means accommodating a strip of material upon an edge of which the scalloping is formed; said connecting bar being connected at one end thereof to said crank and at the other end thereof to said reciprocating means; whereby movement of said power take off is transmitted to result in the lateral displacement of said strip with respect to the principal axis of said strip by said reciprocating means.

2. A fabric reciprocating means adapted to direct a fabric to a sewing machine particularly adapted to cooperate with said reciprocating means to effect a scalloped edge thereon comprising: a base element, a carriage element mounted upon said base element, and a reciprocator element; said reciprocator element including a power take off driven in predetermined synchronism with said sewing machine, a speed reducer, a crank and a connecting bar; said carriage element including reciprocating means accommodating a strip of material upon an edge of which the scalloping is formed; said connecting bar being connected at one end thereof to said crank and at the other end thereof to said reciprocating means; whereby movement of said power take off is transmitted to result in the lateral displacement of said strip with respect to the principal axis thereof by said reciprocating means.

3. A fabric reciprocating means adapted to direct a fabric to a sewing machine particularly adapted to cooperate with said reciprocating means to effect a scalloped edge thereon comprising: a base element, a carriage element mounted upon said base element, and a reciprocator element; said reciprocator element including a power take off driven in predetermined synchronism with said sewing machine, a speed reducer, a crank and a connecting bar; said carriage element having reciprocating means including roller members engageable with a strip of material upon an edge of which the scalloping is formed; said connecting bar being connected at one end thereof to said crank and at the other end thereof to said reciprocating means, whereby movement of said power take off is transmitted to result in the lateral displacement of said rollers thereby moving said strip laterally with respect to its principal axis.

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