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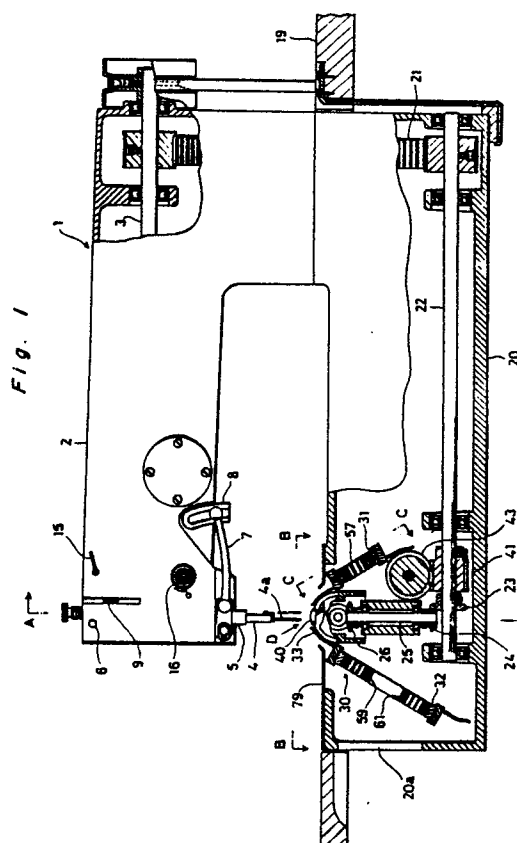
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54 Machine for sewing fur pelts.

57 The present invention relates a machine for sewing fur pelts, comprising: two flexible belts (31, 32) mounted from the front to the rear on both sides of a rotating hook (29) which is installed in a zigzag-chain-stitch sewing machine bed (20) whose needle (4a) rocks left and right; pin lines (34, 35) formed on each flexible belt whose pin-tips extend to the side portion of a throat plate (40) which extends from the front to the rear; a driving system installed to drive said pin lines (34, 35) on said forward-moving flexible belt (31, 32); a guide plate (77) extending from the front to the rear in the direction toward the center of the throat plate pinhole (73) which is installed at the front portion of the throat plate (40) on said bed (20). Accordingly, a natural flat finish of the seam portion can be obtained.



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MACHINE FOR SEWING FUR PELTS

(Background of the Invention)

Field of the Invention

The invention relates to a machine for sewing fur pelts together at the skin.

Description of the related art

In general, an area of a fur pelt available from an animal is relatively small and its shape is irregular; therefore, a plurality of fur pelts are sewn together at the skin to form a fur pelt amalgamate of various sizes. Conventionally, a cup-feeding sewing machine 90 shown in Fig. 9 has been used for sewing fur pelts together.

In operation, edge lines 91a and 92a of fur pelts 91 and 92 facing each other on the hair side, are put together in a line and are fed into a space between cups 93 and 94, where the fur pelt edges are chain-stitched together by means of a horizontally-reciprocating needle 95 and a bobbin-thread mechanism, not shown in the drawing; after completing the sewing process, the two sewn fur pelts are spread flatly and finished by ironing the seam portion with a spatula.

According to the above-described cup-feeding sewing machine, however, an expertise is required to feed the fur pelts by putting together the edges of the two fur pelts correctly, resulting in inefficient performance; moreover, finishing work by ironing with a spatula requires much time, and the seam portion of a finished product becomes convex, as shown in Fig. 10, resulting in unevenness when touched. Furthermore, since a chain-stitch sewing method is employed, once a sewn string cut occurs in any portion of the seam portion, the string cut triggers an unraveling of a wide area in the seam portion.

(Summary of the Invention)

The invention is intended to solve the above-described problems by means of a machine for sewing fur pelts, whereby a quick and easy sewing of a fur pelt is possible; in which the finished product, forming one fur pelt, has a smooth surface when touched and wherein seam portion is strengthened to prevent the unraveling of sewn strings.

The machine for sewing fur pelts in this invention is characterized by the following configurations: flexible belts mounted from the front to the rear on both sides of a rotating hook which is installed in a zigzag-chain-stitch sewing machine bed whose needle rocks left and right; a row of pins formed on each flexible belt whose pin-tips reach the side portion of a throat plate which extends from the front to the rear; a driving system installed to drive the rows of pins on the forward-moving flexible belt; and a guide plate, extending from the front to the rear in a direction toward the center of the throat plate pinhole, which is installed at the front portion of the throat plate positioned on the bed.

According to the present invention of a machine for sewing fur pelts, two fur pelts are arranged with the hair side down, wherein the edge of each fur pelt is mated by hand and then fed; thus, accomplishing the sewing process. The guide plate guides the surface portion of the skin mated edges of the two fur pelts to the pinhole center of the throat plate, i.e., the rocking center of the rocking needle. The driving system drives the rows of pins on the forward-moving flexible belts; the rows of pins pierce the skin portion of the fur pelt and the fur pelt is fed forward; then a zigzag chain stitch is executed by the needle which rocks left and right at the throat plate.

(Brief Description of the Drawings)

These objects and features of the present invention will become apparent from the following description taken in conjunction with the preferred embodiment thereof with reference to the accompanying drawings, in which:

Fig. 1 is a partially broken front view of a machine for sewing fur pelts,

Fig. 2 is a sectional view of Fig. 1 taken on line A-A,

Fig. 3 is a top view of Fig. 1 taken on line B-B; Fig. 4 is a partially sectional view of Fig. 1 taken on line C-C,

Fig. 5 is a perspective view of a timing belt driving system,

Fig. 6 is a perspective view of a presser foot and a throat plate,

Fig. 7 is an enlarged sectional view of the D portion of Fig. 1,

Fig. 8 (a) and (b) are sectional views explaining how the sewing is executed,

Fig. 9 is an explanation drawing of a conventional machine for sewing fur pelts, as already described and

Fig. 10 is a sectional view of fur pelts sewn together with a conventional machine for sewing fur pelts shown in Fig. 9, as already described.

(Detailed Description of the Invention)

Referring now to the embodiment of the invention according to Figs. 1 -8 inclusive. In drawings, numeral 1 is a machine for sewing fur pelts pertaining to the invention, whose construction is principally based on a zigzag-chain-stitch sewing machine; that is, the main construction is virtually the same as a conventional zigzag-chain-stitch sewing machine, except for the feeding mechanism.

An arm 2, comprising a needle bar 4 whose driving shaft, i.e., an upper shaft 3, is driven by a motor which is not shown in the drawing; a rocking link 8, which rocks a needle-bar-connecting stud 5, which guides the needle bar 4 through link 7 by means of a supporting point of a supporting shaft 6; a thread take-up lever 9; a movement mechanism such as a presser system 14, which vertically drives the presser rod 10 by means of a rocking shaft 13 through a link 11 and rocking arm 12; and thread path related parts, such as thread guard 15 and needle-thread-tension regulator 16. In Fig. 2, numeral 17 is a presser regulator screw, and numeral 18 is a presser. In the bed 20 mounted on a table 19, a lower shaft 22 is installed, which is rotated by the upper shaft 3 through timing belt 21; a rotating hook 29 is installed on a hook shaft 28, which is rotated by means of bevel gears 23, 24; a vertical shaft 25, and bevel gears 26 and 27. The above-described configurations of the arm 2 and the bed 20 are the same as those of a conventional machine for sewing fur pelts.

Numeral 30 is a feeding system which has flexible belts, i.e., timing belts 31 and 32 installed on both the left and right sides of rotating hook 29 - the left and right direction seen from the machine operator, or the left and right direction in Fig. 1 - whereby the timing belts extend from the front to the back as shown in Fig. 2 by arrow X. A plurality of pins 33 are vertically installed at regular intervals on the surface of timing belts 31 and 32; thereby forming pin lines 34 and 35. The pins 33 are, as shown in Fig. 4, fixed into mounting brackets 36, which are fixed to timing belts 31 and 32 with screws 37. The tips of the pins 33 extend to the side portion of the throat plate 40 when the pins move to the forward-moving portions 38 and 39 of the timing belts wherein said timing belts move in a straight line as shown in Fig. 2 and Fig. 5 by arrows Y.

Fig. 5 shows the driving mechanism of the timing belts, where a worm 41 fixed to the lower shaft 22 meshes with a worm wheel 43 fixed to an intermediate shaft; a gear 44 fixed to the end of the intermediate shaft 42 meshes with a gear 47 fixed to a driving shaft 46 through an intermediate gear 45; furthermore, the gear 47 meshes with a gear 50 which is fixed to a driving shaft 49 through an intermediate gear 48. And a worm 51 fixed to the driving shaft 46 meshes with a worm wheel 53 fixed to a driving pulley shaft 52; a worm 54 fixed to a driving shaft 49 meshes with a worm wheel 56 fixed to a driving pulley shaft 55. Thus, the driving pulley shafts 52 and 55 are driven by the lower shaft to rotate at a constant revolution speed in the same direction shown by arrow R.

The timing belt 31 is mounted on a driving pulley 57 and a driven pulley 58; wherein timing belt 32 is mounted on a driving pulley 59, a driven pulley 60 and an intermediate pulley 61 which is installed to provide a space for setting the rotating hook 29 by hand through an opening 20a of the bed 20; see Fig. 1. The above-described gears, driving shafts, pulley driving shafts, and driven pulleys are all rotatively supported by the bed 20; however, the supporting portion is not shown in the drawing except for one part.

As shown in Fig. 3 and Fig. 6, the throat plate 40 mounted on a throat plate mounting base 64, which is fixed to the bed 20, forms a long thin block extending from the front to the back; the surface of the throat plate 40 facing the lower face of the presser foot 18 is flat and the tip of the front edge face 65, seen from the machine operator, is tapered to its extended center line; wherein the upper surface having an angularly inclined face is inclined to the left and right from the center line 66 and a flat portion 68 which follows the inclined face. The front edge face 65 of the throat plate 40 forms a concave face; however, the lower surface of the presser foot 18 has a concave face 70 which mates the upper face of the throat plate 40 and a flat face 71 which follow the concave face 70. Numeral 72 and 73 are pinholes.

The middle portion of a dividing plate 75 is vertically fixed to the front edge 74 of the presser foot 18, and a slit 76 into which the dividing plate 75 is inserted, is formed. Numeral 77 is a thin steel guide plate which is vertically fixed to the bed 20 with its tip portion directed to the center of the pinhole 72, i.e., to the center of the width of the throat plate 40 at the front portion of the throat plate 40. Numeral 78 is a window formed on the guide plate 77 with a marginal portion 78a which is inclined downward to the front direction. Numeral 79 is a cover which covers the feeding system 30, other than pin lines 39 and 38, on the forward-moving side.

To sew two fur pelts 81 and 82 together with the machine for sewing fur pelts 1 wherein said machine incorporates the above-described configuration shown in Fig. 7, the two fur pelts are arranged so that the hair sides 83 and 84 face downward; and the edge faces of the skin portions 85 and 86 are manually joined together at both sides of the guide plate 77; whereupon, the feeding system 30 feeds the joined fur pelts forward to make zigzag-chain-stitch with a needle 4a. The pin lines 34 and 35 on the forward-moving sides 38 and 39 of the timing belts 31 and 32 are driven forward in unison with the various parts movements such as vertical movement and rocking of the needle bar 4 and rotation movement of the rotating hook 29; thus, pins 33 of the pin lines pierce the fur pelts 83 and 84 and feed the skin portions 85 and 86 of the fur pelts forward.

The hair of the fur pelts fed to the throat plate 40 is combed downward by the window marginal portion 78a of the guide plate 77 as the fur pelts move forward; furthermore, the hair is guided downward by a lower protrusion 75a and an upper protrusion 75c having an inclined edge 75b of the dividing plate 75 fixed to the presser foot 18 which moves vertically; thus, the hair is held under the surface of the fur pelt skin portions 85 and 86 at the place where the fur pelts are sewn together. The hair 83 and 84 of the fur pelts introduced on the throat plate 40 is separated to the left and right by the tapered front edge face 65 of the throat plate; whereupon, the hair is separated to the left and right and laid flatly on the throat plate 40, permitting smooth sewing operation. The front edge face 65 is formed in a concave shape to permit efficient hair separation; available as an alternative, the face of the front edge face 65 may be formed in a flat shape.

When the sewing operation is executed on the throat plate 40, the fur pelts are pinched together by the inclined face 67 of the throat plate 40 and the inclined face 70 of the presser foot 18; therefore, as shown in Fig. 8 (a), the fur pelts are first-sewn together to form an obtuse angle with its sewn portion upward; then, as the fur pelts are driven forward, the sewn fur pelts are flattened out, as shown in Fig. 8 (b), by the repeated tapping and ironing applied by the flat portion 68 of the throat plate 40 and the flat portion 71 of the presser foot 18. Accordingly, the sewn fur pelts are difficult to bend in the direction of a chain line 87, i.e., the direction in which the force is applied to separate the seam portion and the hair of the sewn fur pelts; thus, allowing a natural flat finish of the seam portion which is free from nonuniformity peculiar to the sewn fur pelts with conventional machines.

The invention is not limited to the embodiment described above only; for example, the facing surface of the throat plate 40 or the presser foot 18 may be entirely flat or slightly concave. Besides said vertically-moving type presser system 14 described above, an alternative system can be used in which a spring applies constant pressure to the presser foot 18 at the lowering position. Besides said timing belt for flexible belt of feeding system 30 described above, chains can also be used. Besides said upper shaft 3 for driving shaft of flexible belts driving system, described above, an exclusive-use small motor can also directly drive the flexible belts. The number of pin lines mounted on the surface of the flexible belts is not limited to one.

Claims

1. A machine for sewing fur pelts, comprising: two flexible belts (31, 32) mounted from the front to the rear on both sides of a rotating hook (29) which is installed in a zigzag-chain-stitch sewing machine bed (20) whose needle (4a) rocks left and right; pin lines (34, 35) formed on each flexible belt whose pin-tips extend to the side portion of a throat plate - (40) which extends from the front to the rear; a driving system installed to drive said pin lines (34, 35) on said forward-moving flexible belt (31, 32); a guide plate (77) extending from the front to the rear in the direction toward the center of the throat plate pinhole (73) which is installed at the front portion of the throat plate (40) on said bed (20).

2. A machine for sewing fur pelts as claimed in Claim 1, wherein said flexible belts (31, 32) are formed by timing belts.

3. A machine for sewing fur pelts as claimed in Claim 1 and Claim 2, wherein said throat plate (40) has a flat configuration in which a center portion of a front edge face (65) is tapered toward its tip; an upper surface facing; a presser foot (18) having an angularly inclined surface (67) which is inclined to right and left from the throat plate center line extending from the front to the rear and a flat surface (68) which is positioned in front of the inclined surface (67); a lower surface of said presser foot (18) having a concave surface (70) which engages with an upper face of said throat plate - (40) and a flat face (71).

Fig. 1

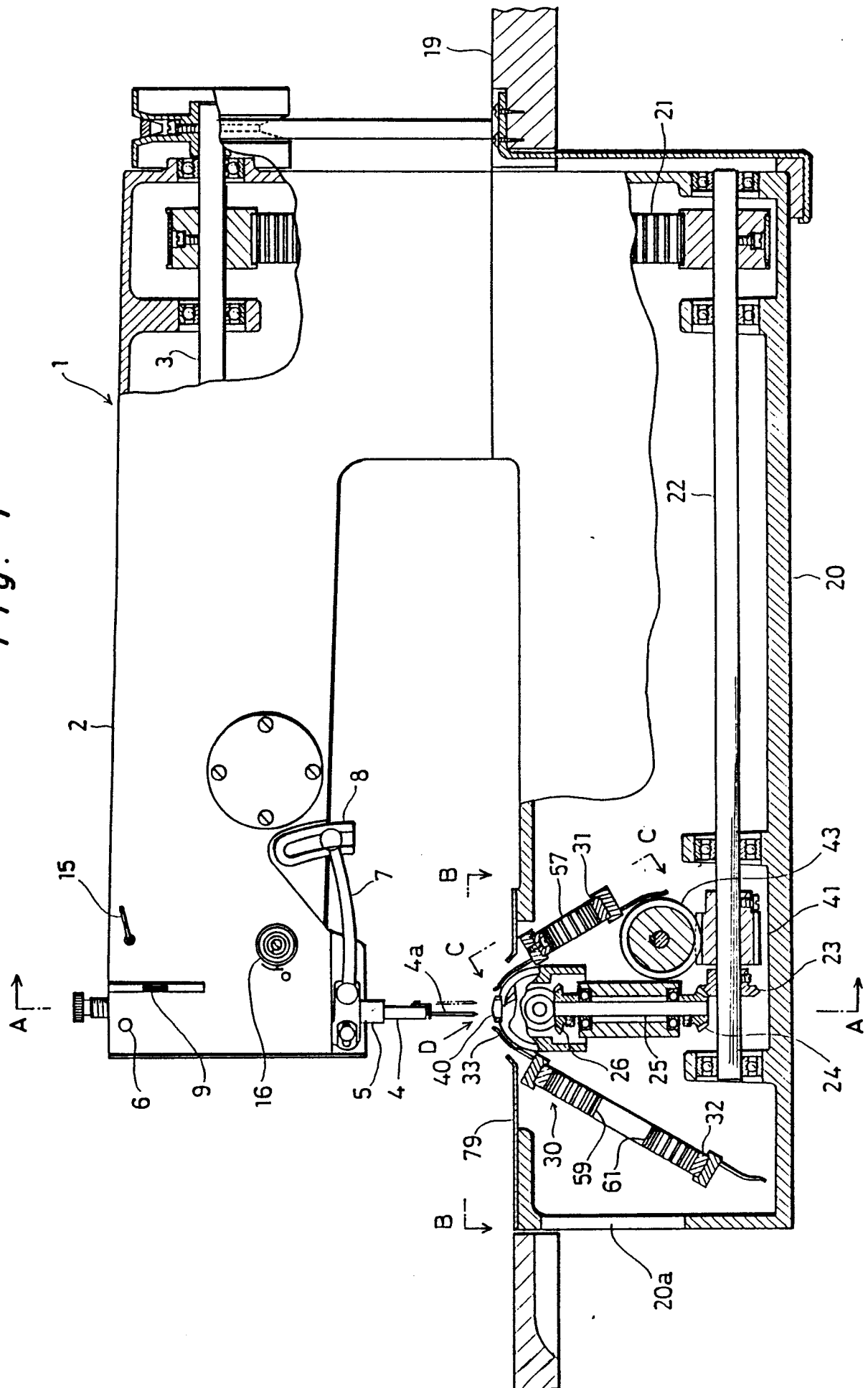


Fig. 2

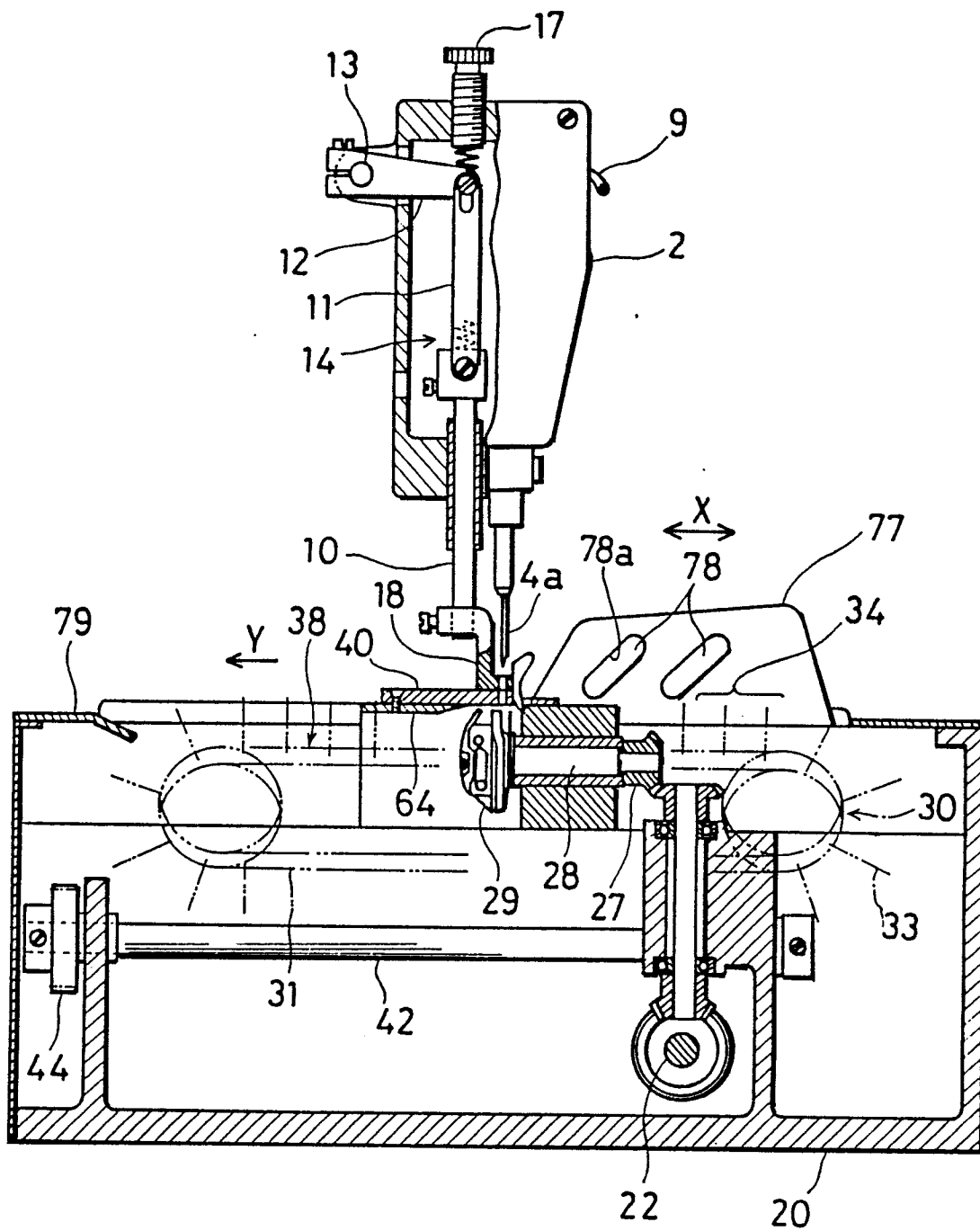


Fig. 3

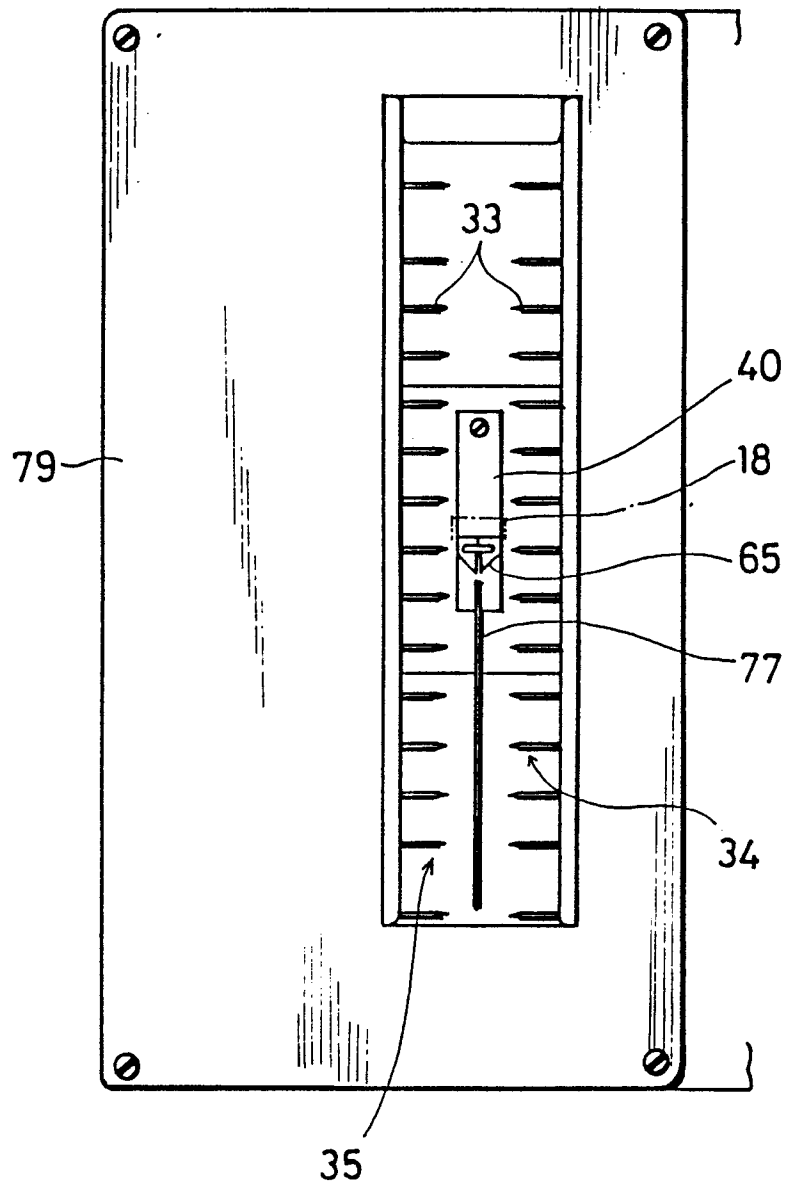


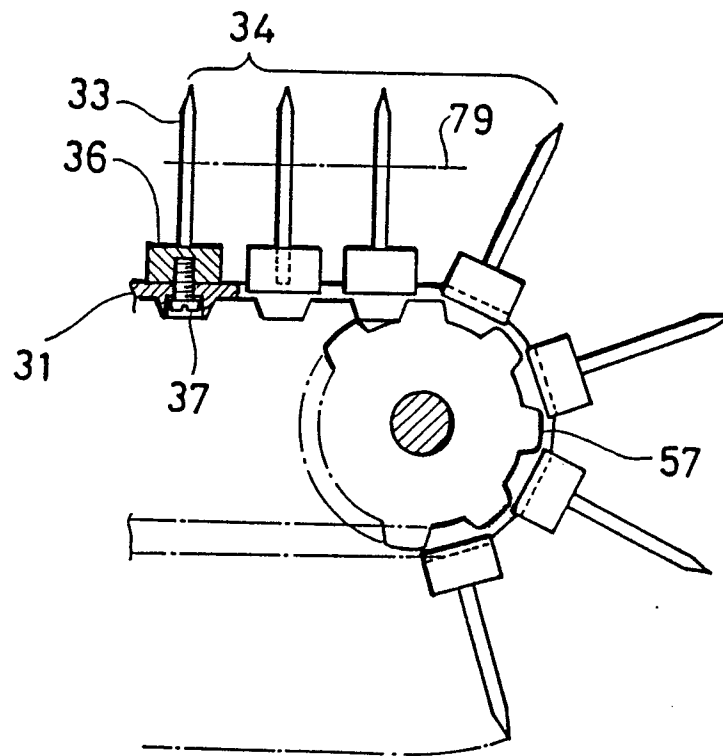
Fig. 4

Fig. 5

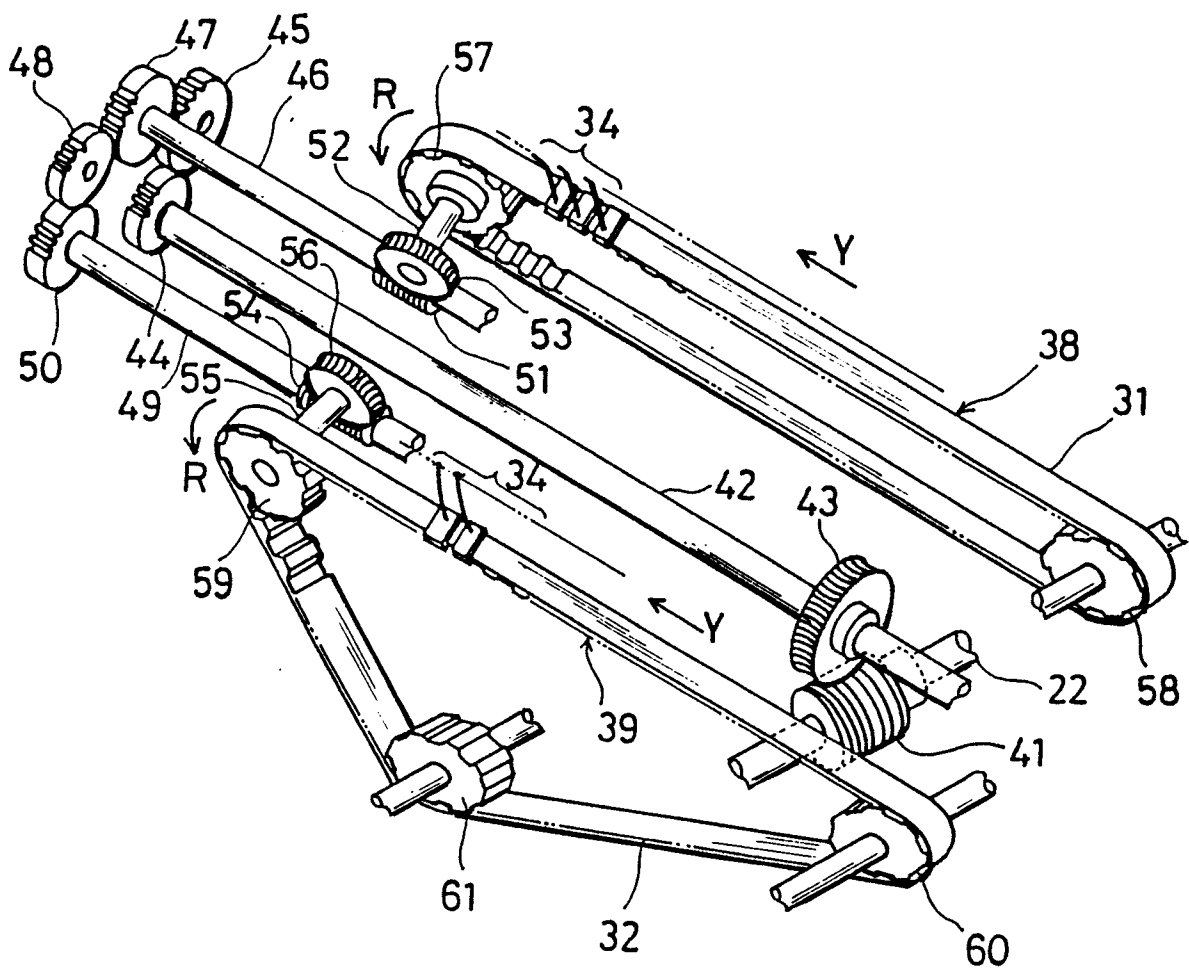


Fig. 6

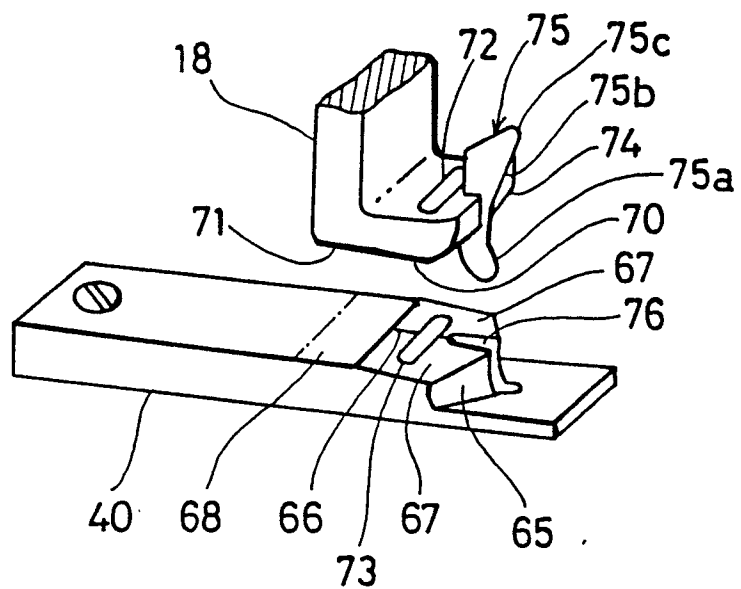


Fig. 7

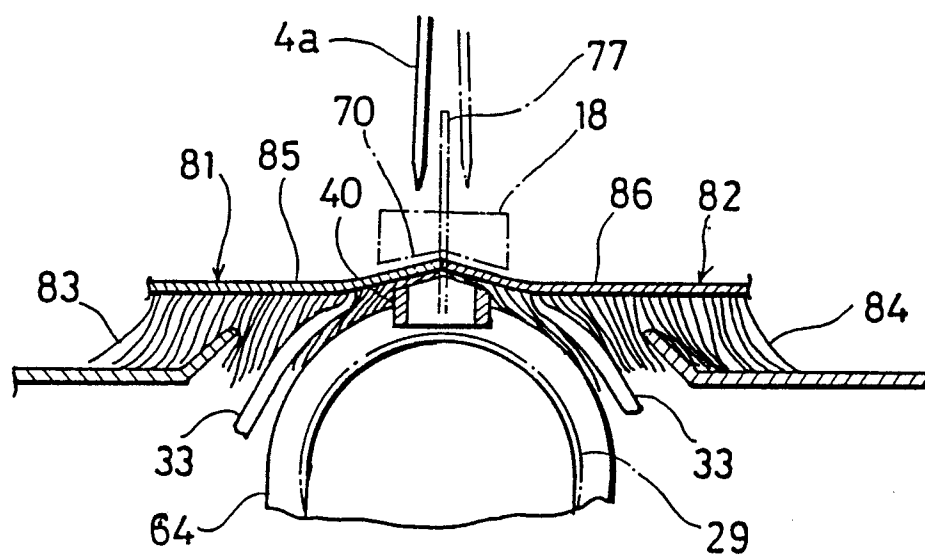
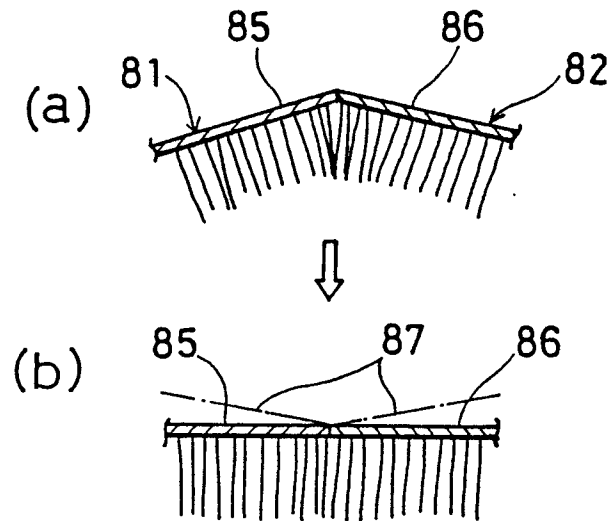
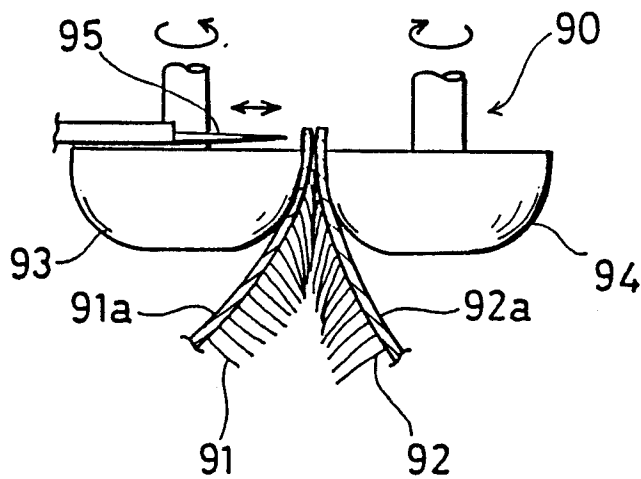


Fig. 8*Fig. 9**Fig. 10*