

- [54] APPARATUS FOR THE MAKING OF
STRAIGHT SEAMS, FOR EXAMPLE FALSE
CREASES IN TROUSERS

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112/121.27, 136, 203, 217.1, 260

- [56]

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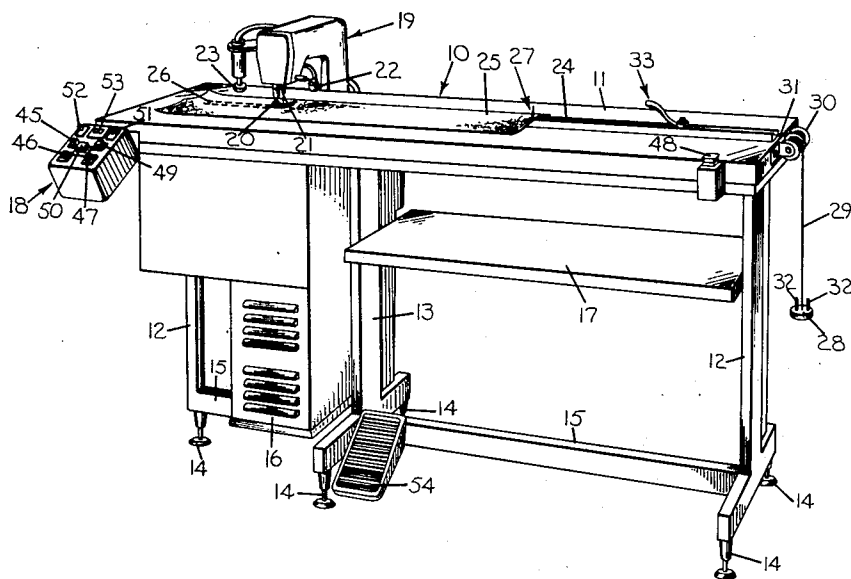
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ABSTRACT

An apparatus for the making of straight seams comprises a sewing machine and rectilinear guide means along which a workpiece retaining means moves to keep the workpiece aligned with the workpiece feeding means of the sewing machine.

7 Claims, 3 Drawing Figures



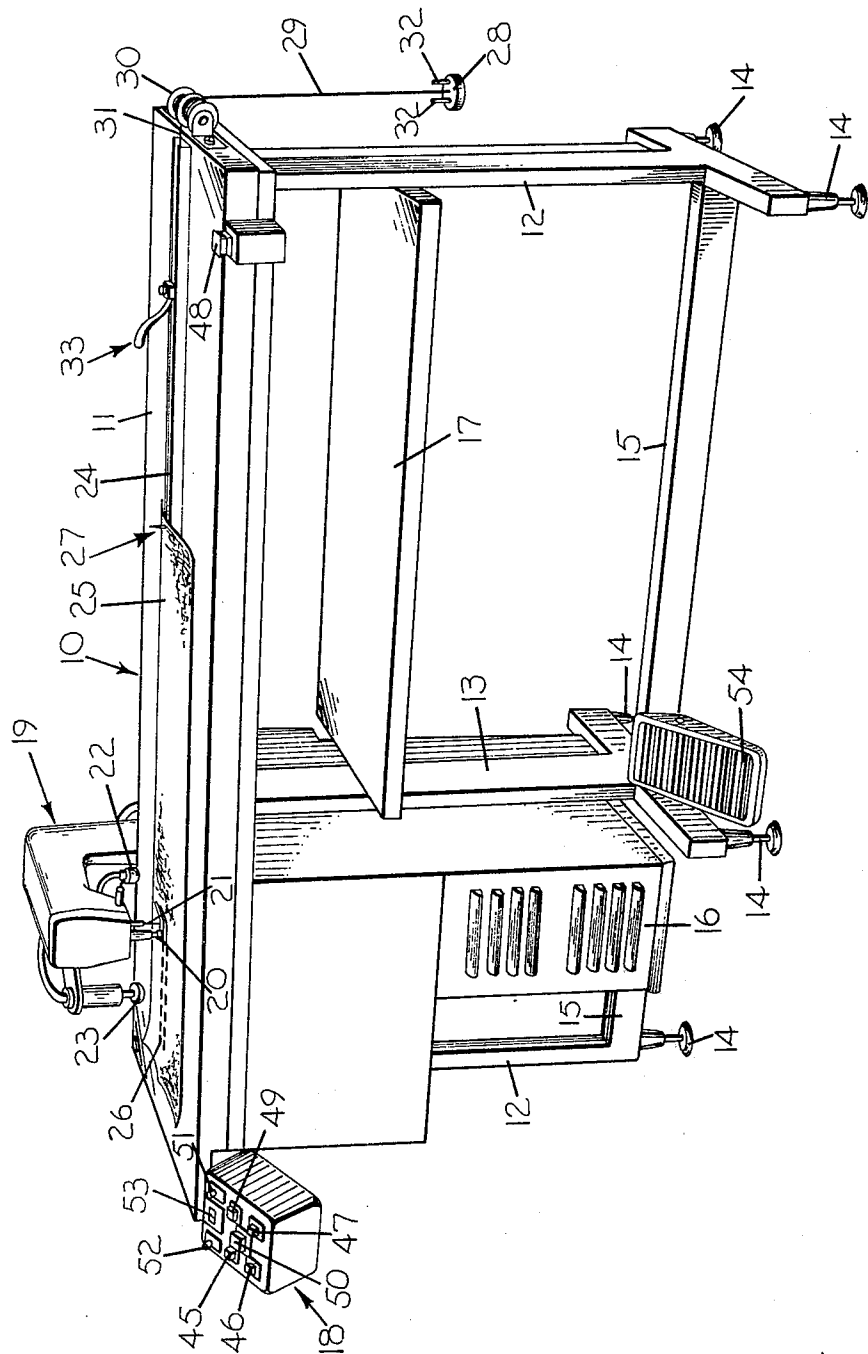


FIG. 1

FIG. 3

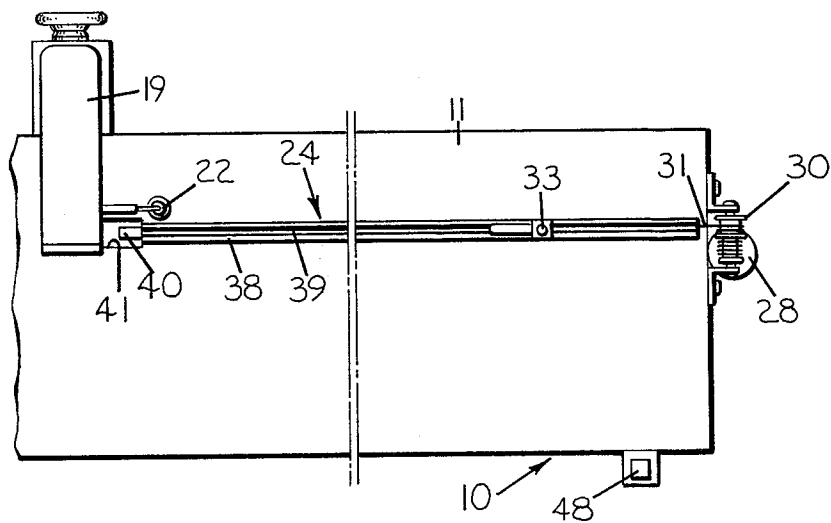
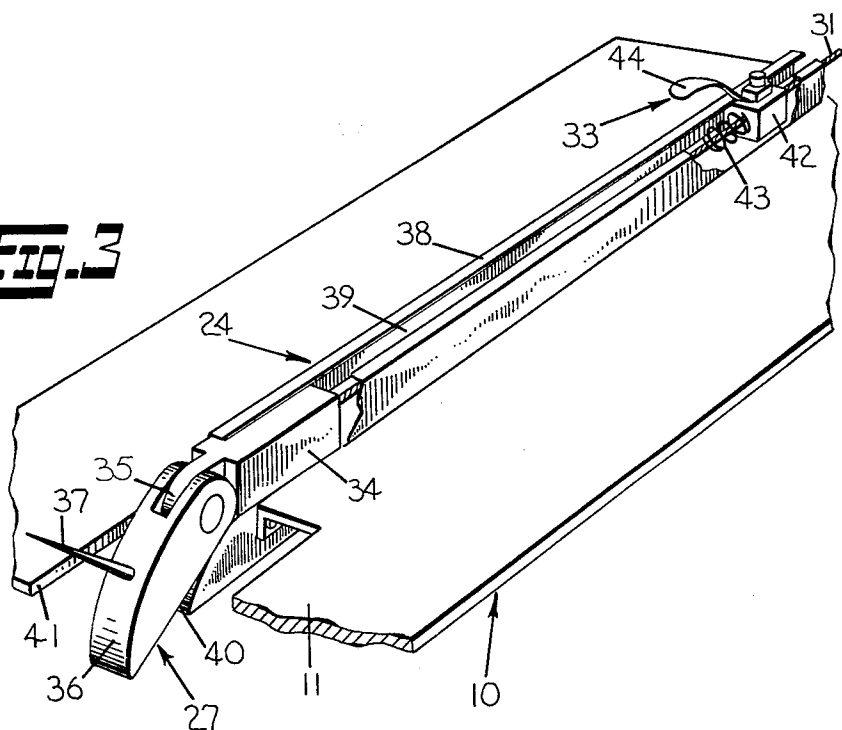


FIG. 2

APPARATUS FOR THE MAKING OF STRAIGHT SEAMS, FOR EXAMPLE FALSE CREASES IN TROUSERS

The present invention refers to an apparatus for the making of straight seams, for example false creases in trousers comprising a sewing machine with sewing means and workpiece feeding means; comprising in addition rectilinear guide means acting together with retaining means for keeping the workpiece aligned with the said sewing means when approaching them.

Apparatus of this kind already known in sewing processes and in these apparatus the feed guide of the workpiece, for seams at or adjacent the edge of the piece is ensured by special workpiece holder clamps. If the seam is to be some distance from the edges a rectilinear rail element, on which the workpiece is spread out, is used to maintain the workpiece in its rectilinear path toward the feed elements of the sewing machine.

The said piece holder clamps have a principal drawback in that they do not allow sewing far from the edges of the workpiece, in addition, they have to be of a rather large size when sewing, for example, trousers.

As regards the speed of operation, the use of the said clamps causes a certain loss of time because of the necessity of having to return the said clamps to the starting point each time an operation cycle has been completed. In the case of the rail guide element on which the workpiece is moving, the principal drawback is due to the absence of any clamping elements keeping the workpiece well aligned with the sewing means of the machine during the entire sewing operation, so that the workpiece, when approaching the sewing point is subjected to partial rotations on the sewing surface removing it from the required rectilinear path and out of the correct alignment.

It is an object of the present invention to eliminate the above-mentioned drawbacks, so that each seam made on the workpiece will be perfectly straight and so that the workpiece as such does not leave the predetermined rectilinear path from the moment it begins to travel to the end of the sewing operation.

Thus, the technical problem to be solved is the realization of an apparatus for making straight seams, for example, the false creases of trousers, which ensures that the part of the workpiece not engaged by the sewing means remains constantly and perfectly aligned with the said sewing means during its approach to the sewing station.

The technical problem has been solved by an apparatus of the above-mentioned kind, in which the rectilinear guide means are paired with retaining means drawn by the said workpiece; the latter being stretched out in the said rectilinear guide means and moved by the sewing machine feeding means and the retaining means being hooked to that end of the workpiece which is not engaged by the sewing means. Guide means to accompany the workpiece when travelling toward the sewing means.

The apparatus designed in this manner simplifies preliminary operations, for example, those appurtenant to charging the single workpiece, as well as simplifying the sewing process. It further ensures a high output of finished pieces and the making of false trouser creases, to return to the case taken as example, which are perfectly straight and therefore of high quality product.

Other characteristics and advantages will become evident from the following description and the accompanying drawings, in which:

FIG. 1 shows the apparatus object of the present invention, in perspective;

FIG. 2 is a partial plan of the same apparatus;

FIG. 3 is a perspective of the rectangular guide means and workpiece retaining means.

Referring now to FIG. 1, the apparatus object of the present invention, comprises a bed 10 formed of a sewing surface 11 with a pair of side shoulder 12 and a centre shoulder 13, and having supporting feet 14 that are connected by a crosspiece 15. Below the sewing surface 11 there is a box 16 supported by the crosspiece 15 serving as container for the electro-pneumatic control circuit of the apparatus. At the side of the box 16, supported by the shoulders 12 and 13 there is an auxiliary shelf 17 which may, for example, be used for holding the semiworked pieces to be sewn. At one side of the sewing surface 11 is fixed the usual control box 18 connected to the above-mentioned control circuit serving for controlling and starting the said apparatus. In addition, on the sewing surface 11, we have a sewing machine 19 comprising a pressure foot 20 paired with the usual workpiece feed means (not shown) and a pair of needles 21 of the known sewing means of the said sewing machine. The latter is provided at the front with a photoelectric cell 22 which, in the embodiment shown, serves to stop the machine and for other operations required when the workpiece to be sewn has completely passed underneath the pressure foot 20, indicating that the working cycle has come to an end. Similar operations may be, for example, the raising of the pressure foot, the action of an auxiliary work stop device, cutting of the sewing threads etc. Behind the sewing machine is an auxiliary stopping device 23 for locking the workpiece at the end of the cycle and to permit cutting of the sewing threads when the workpiece is no longer retained by the pressure foot 20. On the sewing surface 11 in front of the needles are positioned rectilinear guide means 24 (see also FIG. 2) on which the workpiece 25 to be sewn is spread out by means of a double line of stitches 26 made in known manner and fixed to lower part of the workpiece by a single looper thread (not shown) in the manner normally used to make false creases in trousers. Retaining means 27 mounted in rectilinear guide 24 are also provided for stretching the workpiece 25 during the sewing operations, when the feed means of the machine move it from the feed point to the sewing station.

The stretching of the workpiece is ensured by counterweight 28 hooked to the free end of a cable 29 running on a reel 30 provided for this purpose and pivoted to the edge of the sewing surface far from the sewing machine 19. The same reel 30 is designed to receive, though wound in opposite direction, a second cable 31 hooked to the abovementioned retaining means 27. In this manner, the unwinding of the cable 29 because drawn by the counterweight 28 will cause the winding up of the cable 31 which attracts the retaining means 27. On the other hand, when the retaining means move in the direction of the sewing machine drawn by the feed means of the latter, the cable 31 will be unwound and the cable 29 wound up against the pull of the counterweight 28. The stretching of the workpieces depends therefore on the resistance of the counterweight 28, so that, by adding or removing suitable metal disks (not

shown) fitted on a pair of stakes 32 of the counterweight 28, the weight of the latter can be adjusted and the said stretching effect adapted to the elasticity of the fabric the workpiece is made of. When the retaining means 27 are no longer engaged by the workpiece, they are returned by the counterweight 28 to a stop 33, the position of which is regulatable along the rectilinear guide means 24, so that the starting position of the said retaining means 27 can be determined according to the requirements.

Referring now to FIG. 3, the retaining means 27 comprise a pad 34 with the end 35 pointing toward the sewing means 19 of the apparatus to which is pivoted in known manner a support 36. Support 36 has means for engaging the workpiece, and is here shown as a vertical pin 37. The said pin serves to hold the workpiece to be sewn. The pad 34 is directly hooked on its end furthest from machine 19 to the cable 31 and moves under the effect of the counterweight 28 along the rectilinear guide means, or else is moved by the workpiece being fed to the sewing means or by the counterweight, when it is no longer attached to the said workpiece.

The said rectilinear guide means consist of a rail 38 with a longitudinal slot 39, along which pad 34 moves and from which the pin 37 of the retaining means 27 extends to grip the workpiece rail. The end of the rail 38 near the needles 21 of the sewing means is provided with a sliding ramp 40 pointing downward and along which the support 36 of the retaining means 27 can slide at the end of the working stroke, as clearly shown in FIG. 3, so that the pin 37 will now point downward and automatically free the workpiece 25.

The forward travel of the retaining means 27 is ensured by the said workpiece 25, one end of which is placed under the pressure foot 20, at the beginning of the work cycle while the other end is fixed to the pin 37. In this way, when the machine is functioning, the workpiece and the retaining means 27 are fed forwardly by the feeding means.

Near the sliding ramp 40, which enters into a space 41 formed in the sewing surface 11 right in front of the needles 21, the support 36 swings downward, so that the workpiece leaves the pin 37 and continues to move freely through the short distance separating the ramp 40 from the said needles. The retaining means 27, no longer detained by the workpiece, return to the stop 33 under the action of the counterweight 28.

To damp the impact of the pad 34 against the stop 33, the latter is fitted with a base 42 inserted into the rail 38, hollow, and is provided with a helical spring 43 through which the cable 31 extends. In this way the pad 34 does not come into direct contact with the stop, but rather against the said spring. On the top, the said base 42 is fitted with a shaped blade 44 acting as safety for the operator against possible injury caused by the pin 37 when it is in resting or starting position.

Operation: The workpiece to be sewn can be inserted into the above-described apparatus in two ways or cycles: by hooking the workpiece first to the retaining means 27 and inserting it then under the pressure foot (first working cycle) or else by inserting it first under the pressure foot and then hook it to the retaining means (second working cycle). The first method, or first working cycle, is carried out by lowering the pressure foot onto the workpiece and starting the machine simultaneously as a single operation, while the second method or second working cycle requires first the low-

ering of the pressure foot onto the workpiece and, subsequently, the starting of the sewing machine after hooking the workpiece to the said retaining means. This second method is preferred when the false crease begins far inside the workpiece.

The control box 18 contains a pushbutton 45 connecting the apparatus to the mains; a selector 46 for choosing the working cycle or using two distinct operations; a starting pushbutton 47 for simultaneously lowering the pressure foot and starting the machine once the selector has been set in this manner, or else, lower first the pressure foot, if the selector gives the second work cycle.

In this latter case to start the machine it is required that the pressing of pushbutton 48 at the right-hand side of the sewing surface 11 be effected. This button is easily reached when the workpiece is hooked to the retaining means. The installation of a dual control formed by the pushbuttons 47 and 48 as required by the second working cycle makes it possible to insert first the workpiece below the pressure foot and then hook it to the said retaining means, because otherwise the machine would start simultaneously with the lowering of the pressure foot. It is obvious that, if the hooking of the workpiece to the retaining means is the first step, the successive insertion of the workpiece below the pressure foot would form no obstacle at all to the immediate starting of the sewing machine. A further pushbutton 49 in the control box serves to restart the machine in case of an incidental stopping thereof before the end of the cycle, for example because of thread break or similarly. A pushbutton 50 serves as emergency stop at any point of the working cycle. In addition, there are; (a) a first timer 51 for varying the time interval between the moment the photoelectric cell 22 is being illuminated by its own excitation lamp after the workpiece has moved away and the instant in which the pressure foot 20 is leaving the workpiece, or else the sewing machine must stop; (b) a second timer 52 for varying the time interval between the above-mentioned moment and that at which an auxiliary work stopping device is engaged; and (c) a workpiece counter 53 for recording the number of working cycles which have been completed.

If the machine should stop before the end of the working cycle, a special pedal 54 permits the raising of the pressure foot from the workpiece, without causing any change in the chosen cycle.

The here given embodiment relates to a machine for the making of false creases for trousers according to the method using two needles and a single looper, so that the fabric is plied underneath between the two parallel lines of stitches to form an upside crease.

What is claimed is:

1. In a seaming apparatus which includes a bed having a sewing surface and a sewing machine having means for feeding and for sewing a workpiece, the combination comprising,

- rectilinear guide means mounted on the sewing surface and extending from a position adjacent a needle of the sewing machine in a direction substantially parallel to the direction of travel of a workpiece when it is being seamed;
- retaining means mounted within said rectilinear guide means for sliding movement in a forward stroke toward a most forward location adjacent the needles of the sewing machine and a return stroke

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away from the sewing machine, said retaining means, (b), comprising,

1. a pad slidably disposed within said guide means,
2. a support pivotally mounted on that end of said pad nearest to the sewing machine, and
3. means on said support attaching said pad to the workpiece, and

c. means attached to that end of said pad furthest from the sewing machine to bias said retaining means away from the sewing machine and to thereby tension the workpiece.

2. An apparatus according to claim 1, in which the rectilinear guide means are provided at the end near the sewing means of the sewing machine with a sliding ramp, on which the retaining means slide down at the end of their forward stroke, the said sliding ramp being downward inclined so as to cause the sliding down of the retaining means.

3. An apparatus according to claim 1, in which the rectilinear guide means are formed of a hollow rail to receive the said retaining means; the said rail being provided at the upper part with a slit, through which the

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said retaining means project and along which they move.

4. An apparatus in accordance with claim 1 in which said rectilinear guide means are formed of a hollow rail to receive the said retaining means, the said rail being provided at the upper part thereof with a slit through which said means located on said support to attach said support to the workpiece projects.

5. An apparatus according to claim 4, in which the rectilinear guide means are fitted with a stop for arresting the retaining means during the return stroke, the said stop being moveably positioned along the said rectilinear guide means.

6. An apparatus according to claim 5, in which the stop comprises a base inserted into the hollow rail of the rectilinear guide means, the said base being provided with spring for damping the impact of the retaining means.

7. An apparatus as defined in claim 1 wherein said means on said support for attaching said support to the workpiece comprises a pin.

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