Sept. 6, 1949. H. L. BOUWKAMP ET AL 2,481,286

PRESSER FOOT ATTACHMENT FOR FRENCH SEAM SEWING MACHINES

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Fig. 1

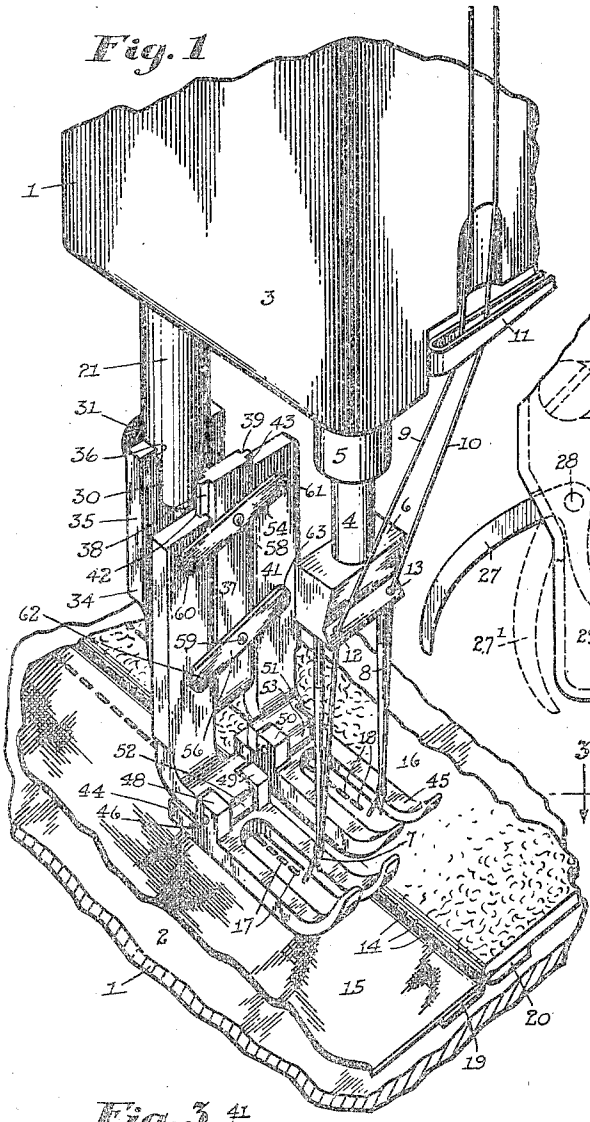


Fig. 2

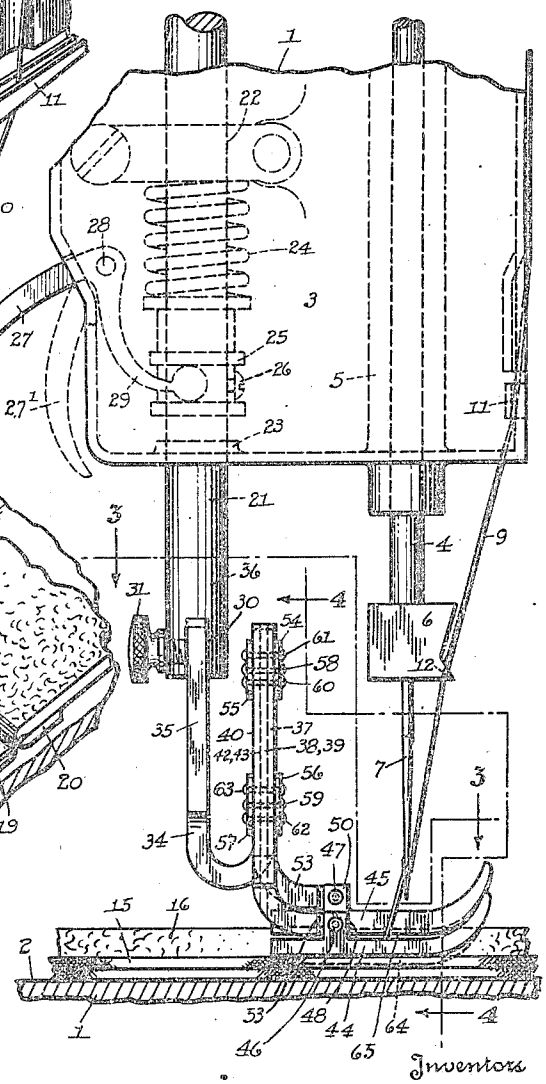
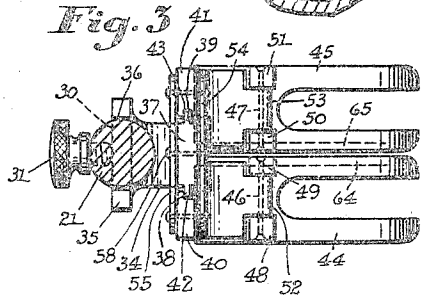


Fig. 3



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Fig. 4

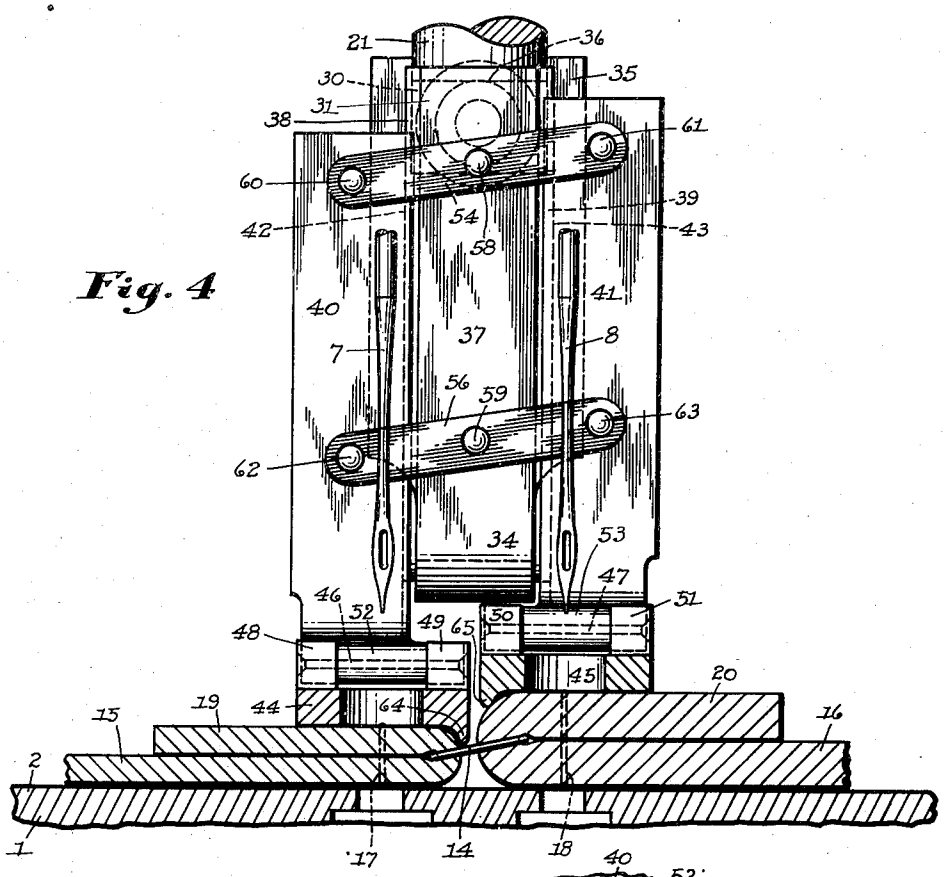
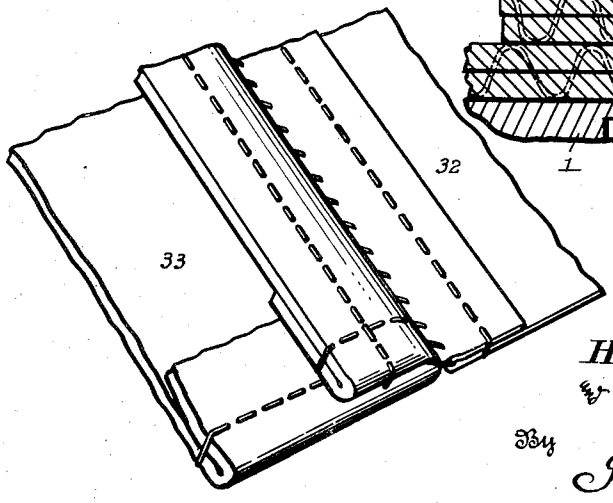


Fig. 5



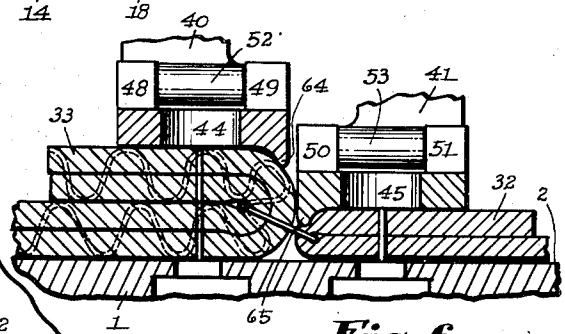


Fig. 6

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PRESSER FOOT ATTACHMENT FOR FRENCH SEAM SEWING MACHINES

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10 Claims. (Cl. 112—235)

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The present invention relates to sewing machines and more particularly to sewing machines adapted to sew parallel rows of stitching in the making of what is known in the upholstering art as a "French seam."

The primary objects of the invention are to provide an improved presser foot attachment for such machines, which attachment firmly and unfailingly presses the adjacent edges of the sheets of material being sewn against the sewing bed of the machine, notwithstanding differences in thickness of the sheets of material being stitched, and notwithstanding differences in the number of folds in the respective sheets of material; to provide such an attachment having a pair of individually movable presser feet one of which engages the upper surface of one of the sheets of material being sewn and the other of which engages the upper surface of the other of said sheets of material, so that the sheets of material are independently pressed against the sewing bed of the machine during the sewing operation; to provide such an attachment which may as a unit readily be attached to or detached from sewing machines of existing design and construction; to provide such a presser foot attachment having guiding means for facilitating guiding of the material beneath the sewing needles in such a manner that the parallel rows of stitching are maintained in parallelism with the seam edges of the material being sewn; and in general to provide such a presser foot attachment which is simple and sturdy in construction and efficient in use.

A preferred embodiment of the invention is illustrated by the accompanying drawings, wherein:

Figure 1 is a fragmentary perspective view of the sewing head of a conventional sewing machine having a pair of needles for sewing parallel rows of stitching, showing the new presser foot attachment applied thereto, and showing marginally folded sheets of material in position for sewing;

Figure 2 is a side elevational view of the same;

Figure 3 is a horizontal sectional view of the presser foot attachment, taken on line 3—3 of Figure 2;

Figure 4 is an enlarged fragmentary sectional view taken on line 4—4 of Figure 2;

Figure 5 is a fragmentary, perspective view of sheets of material stitched together by means of French seaming, and showing a special condition wherein the stitching pierces four plies of one of the sheets of material; and

Figure 6 is a fragmentary sectional view of the

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presser feet of the attachment, similar to that shown in the lower portion of Figure 4, and illustrating the positions of the presser feet when sewing the special condition shown in Figure 5.

Referring now in detail to these drawings, the sewing machine there shown in fragment comprises a frame 1 having a sewing bed 2 and a sewing head 3 extending above the sewing bed 2 in vertically spaced registry therewith. A needle shaft 4 is vertically reciprocally mounted in a bearing 5 in the sewing head 3 and said shaft 4 carries at its lower end a horizontal needle bar 6 in which are mounted conventional sewing machine needles 7 and 8. Thread strands 9 and 10 extend downwardly from spools (not shown) through a thread guide 11 on the sewing head 3, through thread guides 12, 13 in the needle bar 6 and through the eyes of the needles 7, 8 respectively. The sewing machine with its twin needles 7 and 8 is thus adapted to perform the final stitching of a French seam which as shown in Figure 1 comprises a row of primary stitching 14 which secures together two sheets 15 and 16 of upholstery material along their marginal edges, and parallel rows 17 and 18 of final stitching each of which secures the marginal flap 19 or 20 of a sheet of material to the body of said sheet. This final stitching may be accomplished either with the body of the material uppermost as shown in Figure 1, or with the flaps 19 and 20 uppermost as shown in Figure 4.

As in all conventional type sewing machines, it is desirable and even necessary that the material be firmly pressed against the sewing bed 2 during the sewing operation. This is customarily accomplished by means of a presser foot attachment of bifurcated formation which presses the material against the sewing bed on both sides of the needle, and which attachment is usually detachably affixed to the lower end of a presser plunger mounted rearwardly of the needle shaft and manually shiftable to a raised position for permitting the insertion of material thereunder and movable to a spring-pressed lowered position of pressing engagement against the upper surface of the material. Such a presser plunger is shown in Figures 1 through 4 of the drawings and is designated 21. This plunger 21 is vertically slidably mounted in bearings indicated at 22 and 23 in the sewing head 3, and the plunger is normally urged downwardly by means of a coiled compression spring 24 interposed between the bearing member 22 and a collar 25 fixedly mounted on the plunger by means of a set screw 26. A manually operable

bell crank lever 27 pivotally mounted at 28 on the sewing head has an arm 29 which engages the collar 25 to raise the plunger 21 when the lever 27 is manually lowered to its dotted line position indicated at 27^1. Means (not shown) may if desired be provided for releasably maintaining the plunger 21 in raised position.

The lower end of the presser plunger 21 has a transverse slot 30 for the reception of a presser foot attachment, and a thumb screw 31 threaded in the plunger 21 is provided for detachably securing the presser foot attachment to the plunger. The conventional presser foot attachment comprises a shank secured to the plunger and an integrally formed pedal part pivotally secured to the lower end of the shank and including the presser elements for both of the twin needles 7 and 8. One disadvantage of this conventional attachment lies in the fact that, because the presser elements are integral and inseparable, a difference in the thickness of the two sheets of material results in little or no pressure against the thinner of the two sheets, and the stitching therethrough is therefore unsatisfactory. This condition obtains particularly when the two sheets are of different material, such as the fabric sheet 15 and leather sheet 16 indicated in Figures 1 and 2, and also when stitching across an area wherein one sheet of material 32 is doubled and the other sheet 33 is quadrupled, as indicated in Figures 5 and 6.

The difficulties encountered in the use of the conventional attachment, as above noted, are eliminated by the present invention. The new presser foot attachment comprises a body member 34 of U-shaped formation having its upwardly extending rear leg 35 notched at 36 and secured within the slot 30 of the plunger 21, and the upwardly extending front leg 37 of the body member 34 is provided with laterally extending tongues 38, 39 at its opposite side edges forming spaced vertical slide bearings. The presser feet of the attachment comprise shank portions 40, 41 having vertical grooves 42, 43 on their inner edges adapting them for vertical sliding movement on the tongues 38, 39 of the body member, and bifurcated pedal portions 44, 45 are pivotally mounted on pins 46, 47 extending through lugs 48, 49 and 50, 51 on these pedal portions 44 and 45 respectively, and through the interposed bearings 52, 53 on the lower ends of the shank portions 40, 41.

The shank portions 40, 41 are associated for opposite vertical sliding movements on the front leg 37 of the body member 34, by means of upper and lower pairs of connecting bars 54, 55 and 56, 57 secured by means of pivot pins 58 and 59 to the front leg of the body member and secured by means of pivot pins 60, 61 and 62, 63 to the shank portions 40, 41 respectively. The connecting bars of each pair are disposed on opposite sides of the shank portions 40, 41 so as to equalize the wear on the pivot pins and thus prolong the life of the attachment.

The pedal portions 44, 45 of the presser feet are provided with depending guides 64, 65 respectively along their inner and lower edges, which guides travel in the groove formed between the two sheets of material during the sewing operation.

Operation

The French seam is made by first stitching together as at 14 the two sheets of material along their marginal edges on a single needle sewing machine, and then stitching the flaps 19 and 20 to the body portions of the material on the twin needle machine shown.

The presser foot attachment is raised by means of the lever 27 and the material inserted in the machine as shown in Figure 1, whereupon the attachment is lowered into engagement with the material, one presser foot engaging the upper surface of the material 15 and the other presser foot engaging the upper surface of the material 16, while the depending guides 64, 65 of the two presser feet engage in the groove formed between the two sheets of material and above the stitching 14.

It will be seen that the constant downward force exerted on the attachment by the spring 24, transmitted through the connecting bars 54, 55, 56 and 57, to the two presser feet, effects downward movement of the attachment until both presser feet are in firm pressing engagement against the upper surfaces of the respective sheets of material, and that the downward pressure is equalized between the two presser feet. A difference in thickness between the two sheets of material results in elevation of one presser foot relative to the body member of the attachment and corresponding depression of the other presser foot, and the downward pressure remains equal on the two presser feet notwithstanding variations in the relative thicknesses of the sheets of material during the sewing operation such as would occur when sewing through the quadruple thickness of the material 33 illustrated in Figures 5 and 6.

It will thus be seen that the present invention provides a presser foot attachment for French seam sewing machines which is particularly well adapted for its intended use, and while but one specific embodiment of the invention has been herein shown and described, it will be understood that details thereof may be altered or omitted without departing from the spirit of the invention as the same is defined by the following claims.

We claim:

1. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser device mounted on the machine for movement to a raised position and to a spring-pressed lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a body member and a pair of presser feet individually vertically slidably mounted on the body member, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, and a connecting bar pivotally connected at its middle to the body member and pivotally connected at its opposite ends to the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements.

2. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser device mounted on the machine for movement to a raised position and to a spring-pressed lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a body member and a pair of bifurcated presser feet individually vertically slidably mounted on the body member and

adapted to straddle the paths of the needles respectively, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, and a connecting bar pivotally connected at its middle to the body member and pivotally connected at its opposite ends to the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements.

3. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser device mounted on the machine for movement to a raised position and to a spring-pressed lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a body member and a pair of presser feet each having a shank portion vertically slidably mounted on the body member and a pedal portion connected to the lower end of said shank portion pivotally about a horizontal axis transverse the movement of the material during the sewing operation, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, and a connecting bar pivotally connected at its middle to the body member and pivotally connected at its opposite ends to the shank portions of the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements.

4. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser plunger vertically slidably mounted in the machine rearwardly of the needles, spring means for normally urging the plunger downwardly, a presser device detachably mounted on the lower end of the plunger and movable with said plunger to a raised position and to a lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a U-shaped body member having a rearward leg adapted for attachment to the plunger and a forward leg provided with laterally extending vertically elongated tongues at its opposite sides, a pair of presser feet having vertical shank portions provided with grooves vertically slidably embracing said tongues whereby said presser feet are individually vertically slidably keyed to said forward leg of the U-shaped body member, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material.

5. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser plunger vertically slidably mounted in the machine rearwardly of the needles, spring means for normally urging the plunger downwardly, a presser device detachably mounted on the lower end of the plunger and movable with said plunger to a raised position and to a lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a U-shaped body member having a rearward leg adapted for attachment to the

plunger and a forward leg provided with spaced vertical slide bearings, a pair of presser feet each having a shank portion vertically slidably mounted on one of said slide bearings and a pedal portion connected to the lower end of said shank portion pivotally about a horizontal axis transverse the movement of the material during the sewing operation, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, and a connecting bar pivotally connected at its middle to the body member and pivotally connected at its opposite ends to the shank portions of the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements.

6. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser device mounted on the machine for movement to a raised position and to a spring pressed lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a body member and a pair of presser feet, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, a connecting bar pivotally connected at its middle to the body member and pivotally connected at its opposite ends to the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements, and a guide depending from said presser device and adapted to travel between the sheets of material to serve as a guide during the sewing operation.

7. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser device mounted on the machine for movement to a raised position and to a spring pressed lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a body member and a pair of presser feet individually vertically slidably mounted on the body member, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, a connecting bar pivotally connected at its middle to the body member and pivotally connected at its opposite ends to the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements, and companion guides depending from the adjacent edges of the presser feet and adapted to travel between the sheets of material to serve as a guide during the sewing operation.

8. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser device mounted on the machine for movement to a raised position and to a spring-pressed lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a body member and a pair of presser feet individually vertically slidably mounted on the body member, one presser foot being adapted to engage the upper

surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, and vertically spaced parallel connecting bars each pivotally connected at its middle to the body member and pivotally connected at its opposite ends to the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements.

9. In a machine for sewing French seams, in combination: spaced vertical needles mounted for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser device mounted on the machine for movement to a raised position and to a spring-pressed lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a body member and a pair of presser feet individually vertically slidably mounted on the body member, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, a pair of parallel connecting bars disposed on opposite sides of the vertical sliding connections between the body member and the presser feet, a pivot pin pivotally connecting said bars to the body member, and pivot pins pivotally connecting the opposite ends of said pair of bars to the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements.

10. In a machine for sewing French seams, in combination: spaced vertical needles mounted

for simultaneous vertical reciprocation to sew parallel rows of stitching in adjacent sheets of material, a presser device mounted on the machine for movement to a raised position and to a spring-pressed lowered position for pressing the material against the sewing bed of the machine, said presser device comprising a body member and a pair of presser feet individually vertically slidably mounted on the body member, one presser foot being adapted to engage the upper surface of one sheet of material and the other presser foot being adapted to engage the upper surface of the other sheet of material, vertically spaced pairs of parallel connecting bars, the bars of each pair being disposed on opposite sides of the vertical sliding connections between the body member and the presser feet, a pivot pin pivotally connecting the bars of each pair to the body member, and pivot pins pivotally connecting the opposite ends of the bars of each pair to the presser feet respectively whereby the presser feet are associated for opposite vertical sliding movements.

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