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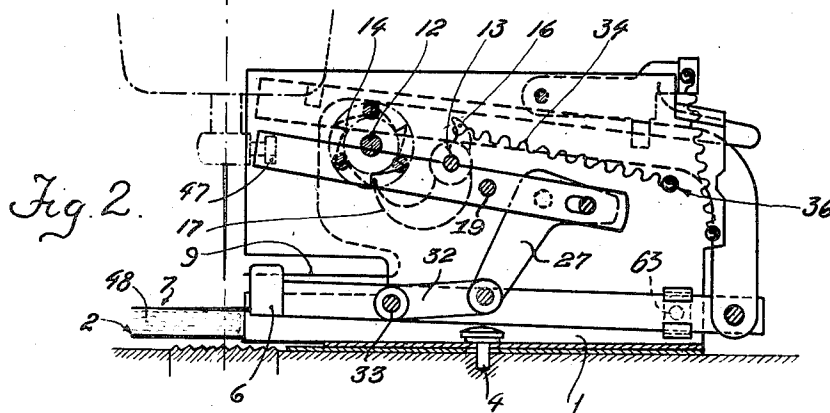
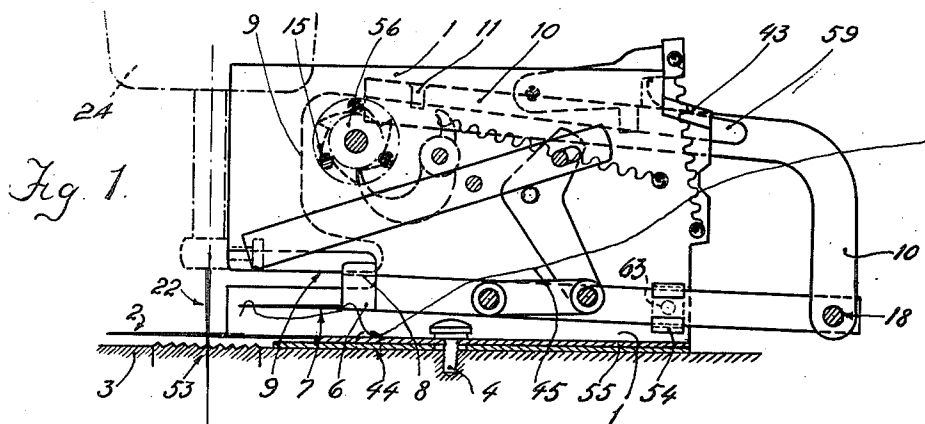
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2,197,597

WHIP-STITCHING ATTACHMENT FOR SEWING MACHINES

Filed Aug. 7, 1934

2 Sheets-Sheet 1



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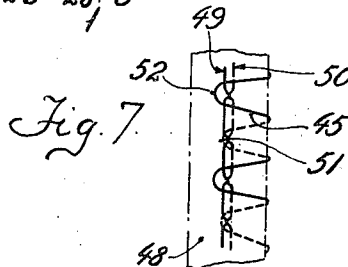
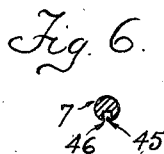
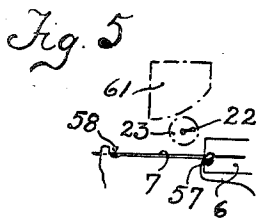
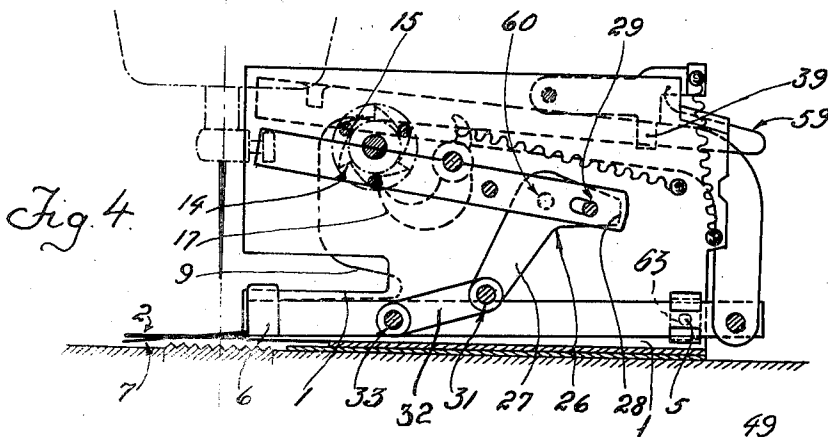
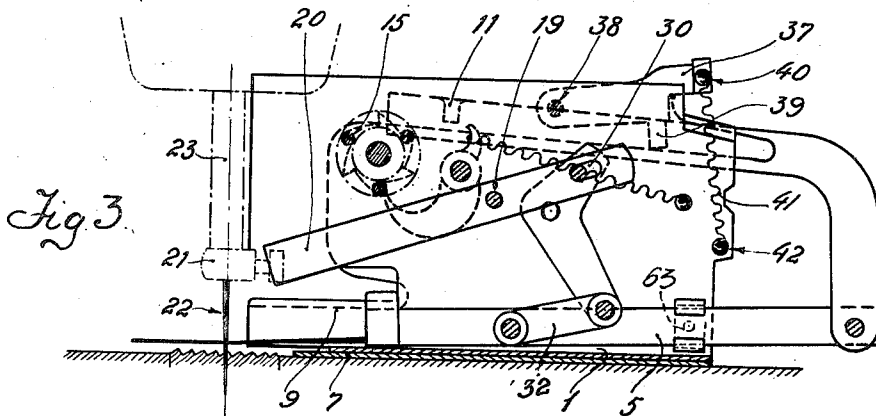
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WHIP-STITCHING ATTACHMENT FOR SEWING MACHINES

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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WHIP-STITCHING ATTACHMENT FOR
SEWING MACHINES

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6 Claims. (Cl. 112—162)

The methods of whip-stitching hitherto known were based either on the use of special whip-stitching machines which use, however, is limited to large tailors or ready-made clothes businesses or on manual work which, on the other hand, is very expensive. The present invention relates to means for rendering it possible to carry out whip-stitching at relatively small costs for tailor work as well as other work, e. g., sack sewing.

According to the invention, the method consists in the fact that when using a common sewing-machine or similar device, the threads running in the machine are utilized for stitches through the material, whereas the whip-stitching operation proper is effected by means of a thread or group of threads which by means of a looper or the like is introduced alternatively above and below the material laterally in relation to the direction of movement of the needle of the machine. Further, the invention is characterized by the material moving forward without lateral motion and that the looper for whip-stitching thread is introduced for every second (or every fourth) stitch alternatively above and below the edge of the material, the thread being for every second stitch passed around the upper thread at the entrance and issue places thereof into and out of the material and for every second stitch around the lower thread in corresponding manner.

The invention is further characterized by whip-stitching means, which will be more fully described according as the following description proceeds.

In the accompanying drawings, in which an apparatus according to the invention is illustrated, Figs. 1 to 4 show front views of an apparatus to be applied to a common tailor sewing machine in different positions of the apparatus. Fig. 5 is a plan view of a detail showing the arrangement of the looper for the third thread. Fig. 6 is a cross-section of said looper on an enlarged scale. Fig. 7 is a diagrammatic view of the threads in the whip-stitching operation.

In the drawings, reference numeral 3 designates the upper part of the sewing-machine table and 53 the feeding device. 24 designates guides for the needle bar 23 and 21 a holder for the needle 22. All these foregoing numerals relate to parts of the sewing machine. The device according to the invention comprises the following parts but is not limited to parts of exactly this type, which only form a certain embodiment.

1 designates a frame preferably consisting of a vertical plate or the like formed at its lower

portion so as to provide a base plate 55 which may be secured to the machine table by means of a large head screw 4. In the embodiment shown, this frame carries the whole device for effecting whip-stitching, but, evidently, certain parts thereof may be arranged in other manner than on the frame. Moveable on said frame 1, preferably in guides 54, is a bar 5 formed at its front end so as to provide a holder 6 for the looper 7. During its reciprocating movement, the bar 5 moves up and down, said latter movement being effected by the holder 6 being movable on a wire guide arm 9, which passes through a hole 3 in the holder and this arm 9 during the sewing operation moves upward and downward with the aid of certain means. This means may consist of a ratchet-wheel 56 rotatable on a shaft 12 and having teeth 14, every second of which is provided with a laterally projecting pin 15, said pins serving as support for the wire arm 9, which bears either on two pins 15 simultaneously, as shown in Figs. 3 and 4, assuming then its lowermost position, or only on one pin 15, as shown in Figs. 1 and 2, in which case the guide 9 occupies its uppermost position. The wire guide 9 is rigidly connected to the frame 1, as at 43, and adjacent said place the arm 9 is provided with a bent portion 59 so as to provide for a sufficient resiliency to permit the wire arm 9 to bear on the pins 15. Consequently, the pins will determine the level of the wire guide and also that of the looper 7, which according to the invention is moved alternatively above and below the material 48. In order to effect the movement of the looper 7 and of the ratchet-wheel 56, an arm 20 is mounted on a pin 19 on the frame 1. At its end adjacent the needle bar 23, said arm 20 is provided with a recess embracing a screw 47. The screw 47 serves to press the needle 22 rigidly against the needle bar 23. By this means movement is imparted to the arm 20, when the needle 22 moves up and down. Pivotaly connected by means of a pin 29, movable in a slot 30, is a bell crank lever 26 having arms 27 and 28. Arm 27 is mounted on a pin 30. Pivotaly connected with said arm, at the free end thereof, by means of a pin 31, is a link 32 connected at its other end with the bar 5 by means of a pin 33. As shown in the drawings, the looper 7 will on account of the arrangement described obtain an inward and outward movement in relation to the frame 1, when the needle 22 moves up and down whereby the whip-stitching operation is rendered possible. In order to move the ratchet-wheel 56, different means may

be used. For instance, the movement of the ratchet wheel 56 may be obtained directly from the arm 20 by an enlargement thereof or by a link secured to said arm 20 and engaging the teeth of the wheel which link follows the movement of the arm, the fulcrum of the link being preferably guided in a slot in the frame 1, when the ratchet-wheel and the arm are situated on opposite sides of said frame as in the embodiment shown. In this embodiment, an arm 10 is by means of a pin 18 pivotally connected with the bar 5, said arm moving to and fro above the ratchet-wheel 56 causing, on account of the reciprocating movement of the bar 5 by means of a tooth 11, rotation of the six-toothed wheel 56 through one tooth pitch. Evidently, the ratchet-wheel may have another number of teeth, as for instance 4 or 8.

The arm 10 is held pressed against the ratchet-wheel by means of an arm 37, which is actuated by a spring 41 and rotatably mounted on a pin 38, said arm 37 carrying a part 39 effecting the pressure. The spring 41 is mounted on pins 40 and 42. In order to hold the ratchet-wheel in position, a pawl 17 is provided rotatably mounted on a pin 13 secured to the frame 1 and having its arm 16 actuated by a spring 34 secured to a pin 36. The direction of rotation of the ratchet-wheel may be opposite to that shown in the drawings in which case the pawl 17 has another position.

The looper 7 is provided with a slot 46 for the thread 45, which is fed from a reel (which may be vertically arranged on the base plate 55) to a loop 44 secured to the frame 1 and through a hole 57 close by the looper 7, the thread then passing through the eye 58 at the end of the looper. When starting the work, the thread 45 hangs freely downwards. Preferably, the looper 7 has the slot 16 formed longitudinally thereof. Base plate 55 has mounted thereon a plate 2 which supports the material at the point of piercing thereof by the sewing machine needle. Said plate 2 has a raised portion which lifts the material above the base plate 55 in order that the looper 7 may be inserted between said base plate 55 and the underneath side of the material together with the raised portion of said plate 2. According to the diagrammatic view in Fig. 7 showing on an enlarged scale how the three threads will be situated in relation to each other after the whip-stitching operation, 49 designates the upper thread from the needle 22, 50 the lower thread from the shuttle of the machine, 52 the loop around the upper thread 49 and 51 the loop around the lower thread 50, both said loops forming parts of the thread 45, that is the third thread.

The positions of the needle 22 and looper 7 in relation to each other is clearly shown in Fig. 5, which also illustrates how the pressure foot 61 must be arranged. As seen, this foot must not as in common sewing machines be provided with shanks which extend on opposite sides of the needle. However, it is also possible to use the common pressure foot of a sewing machine, if said foot is adapted to be turned aside in such a manner that the shanks do not prevent the movement of the looper 7. Also other manners of arrangement are possible. In the embodiment shown a part 61 may, for instance, be provided having its lower face approximately the shape shown in Fig. 5, and on said part the pressure foot of the machine may rest so as not to extend

down to the material, the pressure against the material being effected by said part 61.

As previously stated, Figs. 1 to 4 show different positions of the needles in relation to each other and to the material. In Fig. 1 the looper 7 occupies its innermost and highest position. When the needle 22 moves upwardly, the looper 7 moves outwardly of the machine above the material making the loop 52 and takes up the position shown in Fig. 2. In corresponding manner Figs. 3 and 4 illustrate how the thread loop 51 is formed from the thread 45 around the lower thread.

Apparatuses for carrying out the method of whip-stitching according to the invention may be constructed in different manners. Preferably, sewing-machines are built together with an apparatus according to the invention applied directly on the machine in such a manner that it can easily be turned aside when not in use. Also whip-stitching machines may be built for carrying out the present method for whip-stitching with three threads.

The invention may be carried out in other manners than that above described. Also certain of the details disclosed may be combined with other constructions departing from those described.

Further it is possible for the whip-stitching operation proper to use a group of threads or more than one looper and more than one thread or group of threads.

I claim:

1. A device for whipstitching fabrics in combination with an ordinary sewing machine comprising a frame detachably mounted on the bed of said sewing machine, a device connected with said frame for lifting the fabric up over its main guiding plane at the place for piercing the fabric by the needle of the sewing machine, an arm slidably mounted on said frame, a whipstitching looper mounted on one end of said arm for introducing a continuous thread around the stitches of the sewing machine at the place for said piercing alternatively above and below the fabric, said whipstitching looper being arranged to move alternatively in and out over and under the border of the fabric, and means mounted on said frame and driven by the sewing machine for actuating said arm in order to impart the desired motion to the whipstitching looper.

2. A device for whipstitching fabrics in combination with an ordinary sewing machine comprising a frame detachably mounted on the bed of said sewing machine, a stationary support connected with said frame for lifting the fabric up over its main guiding plane at the place for piercing the fabric by the needle of the sewing machine, an arm slidably mounted on said frame, a whipstitching looper mounted on one end of said arm for introducing a continuous thread around the stitches of the sewing machine at the place for said piercing alternatively above and below the fabric being arranged to move alternatively in and out over and under the border of the fabric, and means for actuating said arm in order to impart the desired motion to said thread introducing looper comprising means driven by said sewing machine giving said arm a horizontal reciprocation, and a means actuated by said driven means imparting a vertical reciprocation to said arm.

3. A device according to claim 2, characterized in that the stationary support consists of a plate like part which projects from the detachable frame in under the fabric leaving a space free

for the whipstitching looper between its underside and the main guiding plane for the fabric.

4. A device for whipstitching fabric in combination with an ordinary sewing machine comprising a frame detachably mounted on the bed of said sewing machine, an arm slidably and pivotally mounted on said frame, a looper support mounted on one end of said arm, a straight looper mounted in said looper support for introducing a continuous thread around each piercing of said fabric by the needle of said sewing machine, alternatively above and then below said fabric, means for actuating said arm in order to impart the desired motion to said thread introducing looper comprising a means for giving said arm a horizontal reciprocation comprising an arm pivotally mounted on said frame and pivotally connected at one end to the needle holder of said sewing machine, said arm having a slot formed in its other end, and an L-arm pivotally mounted at its vertex to said frame and having a projection mounted within the slot formed in said second mentioned arm, a straight arm pivotally connected at one end to said first mentioned arm and its other end pivotally connected to said L-arm and a means for giving said first mentioned arm a vertical reciprocation comprising an L-arm pivotally connected at one end to one end of said first mentioned arm, a resilient L-shaped rod firmly connected at one end to said frame and at the other end to the end of said first mentioned arm having said looper support thereon, a ratchet wheel rotatably mounted on said frame and actuated by said second mentioned L-arm, lugs projecting from the sides of said ratchet wheel and having one portion of said resilient rod thereon

for moving said rod upwardly and downwardly, and a pawl pivotally mounted on said frame and cooperating with said ratchet wheel.

5. A device for whipstitching fabrics in combination with an ordinary sewing machine comprising a frame detachably mounted on the bed of said sewing machine, a stationary support connected with said frame for lifting the fabric up over its main guiding plane at the place for piercing the fabric by the needle of said sewing machine, an arm slidably mounted on said frame, a whipstitching looper mounted on one end of said arm, means driven by said sewing machine for actuating said whipstitching looper through said arm for introducing a continuous thread around the stitches of the sewing machine at the place for said piercing alternatively above and below the fabric being arranged to move alternatively in and out over and under the border of the fabric, and means for timing the relative movement of the needle of said sewing machine and said whipstitching looper for causing said needle during its reciprocation to pierce the fabric between the whipstitching looper while extended during its reciprocation and the part of the whipstitching thread between the whipstitching looper eye and the preceding piercing of the fabric by said needle.

6. A device according to claim 5 characterized in that the stationary support consists of a plate like part which projects from the detachable frame in under the fabric leaving a space free for the whipstitching looper between its underside and the main guiding plane for the fabric.

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