Nov. 13, 1934. W. LOCKENVITZ 1,980,278

SEWING MACHINE

Filed Feb. 20, 1934 2 Sheets-Sheet 1

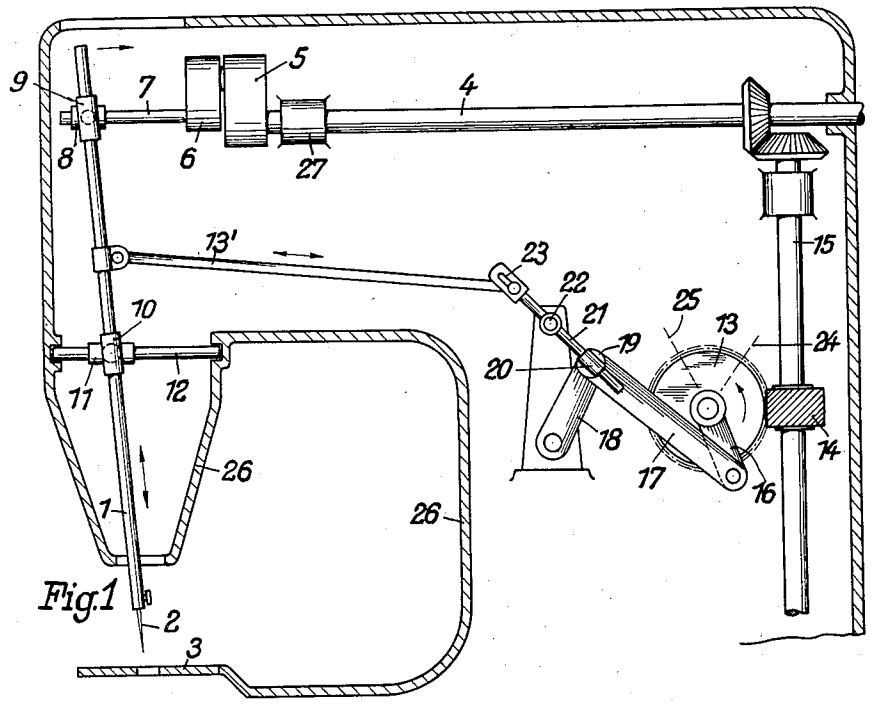


Fig.1

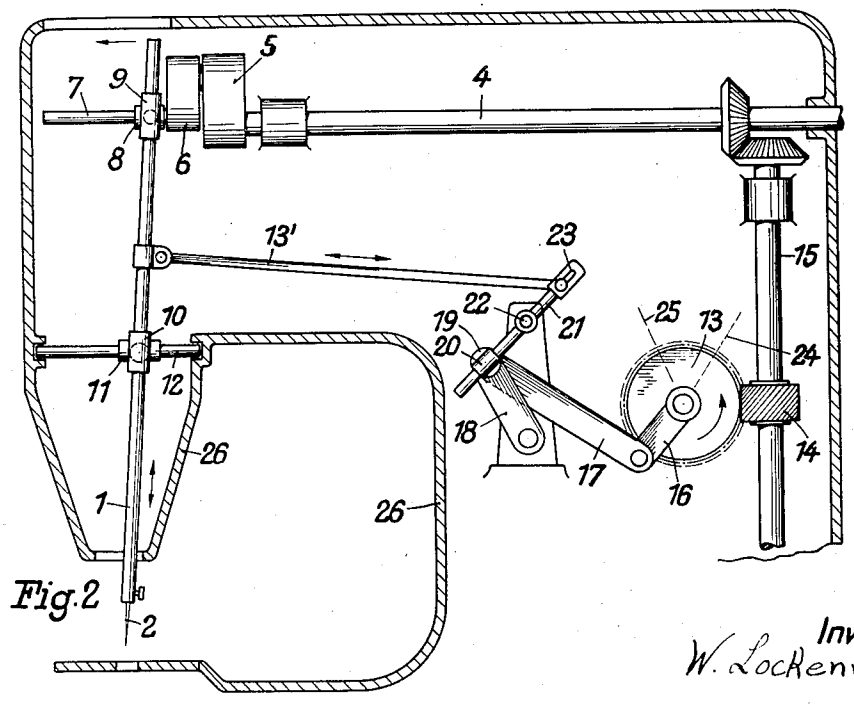


Fig.2

Inventor.
W. Lockenvitz

By: Marks & Clerk
Attys.

Nov. 13, 1934. W. LOCKENVITZ 1,980,278

SEWING MACHINE

Filed Feb. 20, 1934 2 Sheets-Sheet 2

Fig. 4

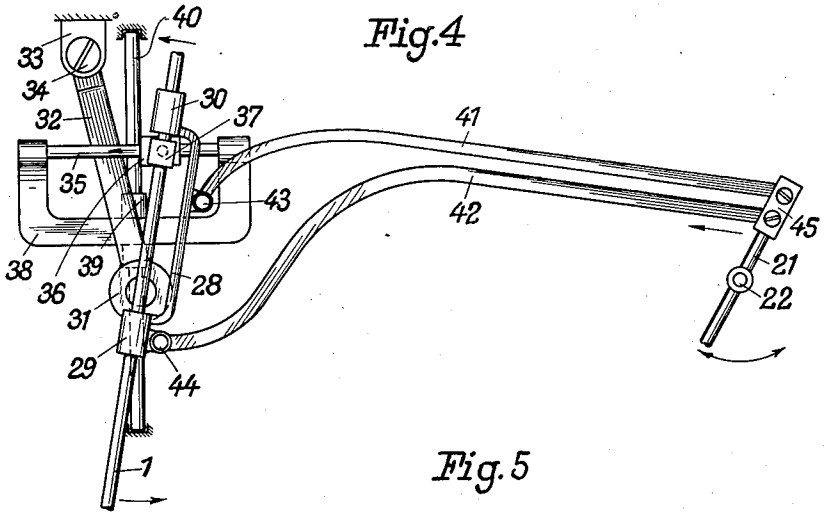


Fig. 5

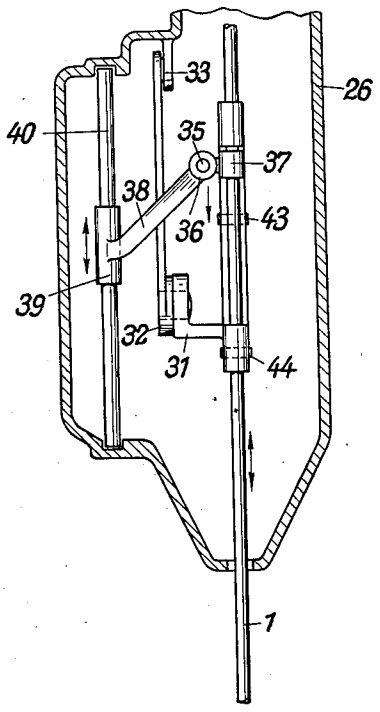
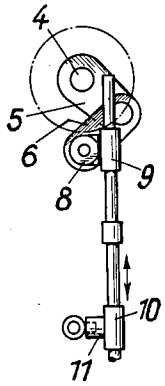


Fig. 3



Inventor:
W. Lockenvitz
By: Marks & Clerk
Attys.

Patented Nov. 13, 1934

1,980,278

UNITED STATES PATENT OFFICE

1,980,278

SEWING MACHINE

Wilhelm Lockenvitz, Kolonie Blumenau, Berlin, Germany, assignor to Carl J. Lehmann, Berlin, Germany

Application February 20, 1934, Serial No. 712,215
In Germany February 28, 1933

6 Claims. (Cl. 112—158)

My invention relates to a sewing machine for sewing the hat leathers in head coverings. In this connection there is frequently the requirement for sewing the hat leather so that the seam passes about the edge of the leather. This for example is the case when sewing hat leathers in caps.

My invention is directed therefore more particularly to a sewing machine for sewing hat leathers in peak-caps. Here the hat leather must be sewn over its edge into the edge of the hat. It is particularly important that in sewing the hat leather to the peak the seam embraces the edge in order that there should be no detrimental thickening at the edge. To my knowledge there are no existing machines which are capable of satisfying the requirements involved. The sewing machines giving a zig-zag seam which are used in part certainly enable the leather to be sewn in a manner free from objection but the zig-zag seam shows on the outer side in an unsightly manner so that such caps are difficult to sell.

Now the subject of my invention is a sewing machine for sewing in hat leathers which machine produces a zig-zag seam on the side on which stitching is performed and a straight seam on the reverse side, i. e., on the inside the hat leather is sewn in in the desired manner by means of the zig-zag seam embracing the edge of the hat leather while the simple straight seam on the outer side of the cap does not give rise to an unsightly appearance.

One feature of my invention resides in mounting the needle carrier in such way that it can perform a rocking motion in a vertical plane about a point disposed immediately beneath the work on its axial line. The needle carrier is engaged by driving elements which move it alternately from one oblique position into the other. In each oblique position the needle carrier performs the up and down motion requisite for the formation of a stitch without alteration in the oblique position. This oblique position is so chosen that the points at which the needle enters the work are spaced apart whereas the point of emergence on the other side is the same so that the seam formation which I have invented is obtained.

A further feature of my invention resides in the particular construction of the driving mechanism for producing the pivotal motion and the up and down motion of the needle carrier in such way that the motions of the needle carrier are effected alternately because if the needle were caused to perform a pivotal motion during the stitching motion it would break. The stitch formation itself by means of a shuttle together with the feed of the work, the actuating of the needle carrier and the like corresponds in every respect to that which is customary in sewing machines of this kind so that it does not appear necessary to describe these elements.

Further features and details of my invention are set out in the subsequent description and in the appended drawings which constitute a part of my application,

Fig. 1 shows one embodiment of the invention in one position of the needle carrier,

Fig. 2 shows the same embodiment in a second position of the needle carrier,

Fig. 3 shows a plan view of a detail of the machine,

Fig. 4 shows a side view of a second construction for operating the needle carrier,

Fig. 5 shows a cross section through the same embodiment.

In the drawings only those parts of the sewing machine are shown which are requisite for the proper understanding and disclosure of the invention, the remaining parts having been omitted for the sake of clarity.

26 is the housing, 1 the needle carrier to which is attached the needle 2 which passes in known manner through the plate 3 and co-operates with the shuttle. Apart from the necessary up and down motion for stitch formation, this needle carrier also performs a pivotal motion according to the invention. The drive for the up and down motion is derived in the usual way from a driving shaft 4 mounted in the bearing 27 and comprises a crank connection 5, 6. Rigidly secured to the member 6 is an arm 7 on which a bearing sleeve 8 is slidable. Pivotally mounted on the sleeve 8 is a second bearing sleeve 9 in which the needle carrier 1 is secured. Thus in each rotation of the crank connection 5, 6 the needle carrier 1 is raised and lowered. In addition it can also be displaced on the arm 7 whereby it executes pivotal motions in a vertical plane about a point disposed immediately beneath the work on the axial line of the needle carrier. To improve the guidance of the carrier 1 it is mounted so as to be axially displaceable in a separate supporting bearing 10 which is attached to a bearing sleeve 11 which is displaceable on the rod 12 secured in the machine housing. The pivotal motion of the carrier 1 is produced by means of the link 13'. With the interposition of a device for affording dead motion this link co-operates with a crank gear. The drive comprises the gear wheel 13 which is driven from the main

shaft 4 by way of the pinion 14 and the shaft 15. A lever 16 to which the lever 17 is hinged, is rigidly secured to the gear wheel 13. The lever 17 co-operates with a pivotally mounted lever 18. The connection between the lever 17 and the lever 18 is effected by means of a connecting member 19 which also carries a bearing sleeve 20. Mounted in this sleeve 20 is one arm of a double armed lever 21 which is pivotally mounted at 22, the link 13' being attached to its other lever arm. In order to be able to alter the magnitude of the pivotal motion of the needle carrier 1, the point of engagement of the link 13' with the lever 21 is adjustable in a slot 23, the end of the lever 13' being adapted to be secured in any desired adjusted position in the slot.

The mode of operation of the arrangement according to the invention is as follows:

It will be assumed that the entire arrangement is in the position illustrated in Fig. 1. As soon as the crank connection 5, 6 continues its rotation, the needle carrier is moved downwardly in its oblique position and the stitch formation occurs in the usual way. During this rotation of the crank connection 5, 6 the other crank connection 16, 17 also rotates. The latter however is in the first instance inoperative as in the continued rotation of the lever 16 the sleeve 20 initially slides outwardly on the lever arm 21 and then slides inwardly again until it again assumes the position shown. This is the case when the arm 16 has reached the oblique position indicated by the broken line 24. From this point onwardly in the further motion of the arm 16, the lever 17 rotates the lever 21 to such an extent that the needle carrier passes into the position shown in Fig. 2. When this is the case the arm 16 is in the dotted line position 25; when now the arm 16 continues its rotation the same operation as described above is repeated, namely, the bearing 20 first slides outwardly and then back again until finally the lever 16 assumes the position shown in Fig. 2. In its further motion from the position shown in Fig. 2 into the position shown in Fig. 1, the lever 21 and thus the needle carrier are again pivoted.

The individual lever ratios and gears must be so chosen that during each of the two idle motions in each rotation of the gear wheel 13, the needle carrier is moved downwardly towards the material or the leather and is withdrawn again in one of its two oblique positions.

The idle motion above referred to is necessary in order to avoid pivotation of the needle carrier during the period the needle is inserted in the work because otherwise the needle would break. The production of idle motion for the purpose of the invention may be attained with any other suitable device provided that it satisfies the requirements set out above.

The needle is thus introduced into the work in the first place in the oblique position as shown in Fig. 1 and in the subsequent operation in the oblique position according to Fig. 2. The angle of the oblique position is chosen in dependence upon the thickness of the material in such way that the two points at which the needle enters the work are spaced apart whereas the needle emerges at the same place for both stitches, namely, approximately at the underside of the sections of material or leather which are to be sewn together.

Due to this oblique positioning of the needle carrier in combination with the feed of the material, the desired zig-zag seam results on the side at which the needle is introduced and a straight seam is produced on the other side. In order to be able to adapt the machine to different thicknesses of material the magnitude of the pivotal motion is preferably variable. For example as already mentioned the pivotal motion can be varied by adjusting the point of engagement of the link 13' with the lever arm 21 where it is secured in a slot 23.

In the construction according to Figs. 4 and 5 a guiding carriage 28 is positioned on the needle carrier 1, the needle carrier being moved up and down in the sleeves 29, 30 of the carriage 28 under the action of the crank drive. The lower sleeve 29 is carried by a supporting arm 31 which is pivoted to a lever 32 which is suspended in pendulous manner from an arm 33 by means of a bolt 34. A rod 35 guides the needle carrier 1 in its pivotal motion. A sleeve 36 to which a sleeve 37 embracing the needle carrier is pivotally connected slides on the rod 35. The rod 35 is supported by means of a U-shaped guide 38 which is vertically displaceable by means of the sleeve 39 on the rod 40 which is mounted vertically in the housing 26. For effecting the pivotal motion of the needle carrier the curved levers 41, 42 are linked to the carriage 28 by means of the pins 43, 44 and at their other ends are pivotally connected to supporting plates 45 which are secured to the lever 21.

It is readily apparent from Figs. 4 and 5 that in the motion of the lever 21 as previously described the needle carrier 1 is alternately brought from one oblique position into the other. In the two limiting positions it then executes its upward and downward motion under the action of the crank gear. Due to the guide yoke 38, the guide rod 35, and the associated mounting, the needle carrier is firmly supported at all times but on the other hand the risk of wedging is avoided because the lower guide 29 is suspended in pendulous manner by means of the lever 32.

I claim:—

1. In a sewing machine for sewing hat leathers in head coverings in combination, an axially displaceable needle carrier, means for moving the needle carrier up and down, a guide for the needle carrier adapted to enable a limited pivotal motion thereof in a vertical plane about a point lying on its axial line immediately beneath the work in addition to the up and down motion, means adapted to move the needle carrier between two consecutive stitching operations alternately from one oblique position to the other in which oblique positions the motions necessary for stitch formation are executed, said oblique positions of the needle carrier being chosen to be such that the two points at which the needle enters the work are spaced apart whereas the needle emerges from the work on the other side at the same point.

2. In a sewing machine for sewing hat leathers in head coverings, the provision in combination with the means according to claim 1 of means for varying the magnitude of the pivotal motion of the needle carrier from one oblique position into the other.

3. In a sewing machine for sewing hat leathers in head coverings, the provision in combination with the means according to claim 1 of a supporting guide for the needle carrier comprising a guide in which the needle carrier is axially displaceable and a second guide which is displaceable on a horizontal rod together with the needle carrier, said first mentioned guide being pivotally mounted on said second guide.

4. In a sewing machine for sewing hat leathers in head coverings in combination, an axially displaceable needle carrier, a guide for the needle carrier adapted to allow said carrier to execute a limited pivotal motion in a vertical plane about a point disposed on its axial line immediately below the material apart from the axial motion, a pivotally mounted double armed lever, a linkage connecting one arm of said lever with the needle carrier, a crank gear driven from a source of power and adapted during a predetermined portion of its rotation to rock the second arm of said double-armed lever through a limited distance and during a further predetermined part of its rotation to pivot the double-armed lever back into its initial position, means for producing in the motion of the crank gear periods of idle motion during which the needle carrier is disposed in one of the two oblique positions and means for moving the needle carrier up and down and imparting to said needle carrier during the periods of idle motion of the crank gear the motion requisite for stitch formation.

5. In a sewing machine for sewing hat leathers in head coverings, in combination with the means according to claim 4, to constitute the connection between the crank gear and the one arm of the double armed lever, a member slidable on said lever arm, a link pivoted to said member at one end and pivotally connected to the crank gear at the other end, the individual transmission members being so dimensioned that during one part of the rotation of the crank gear the member slidable on the double armed lever rocks the latter from one position into the other whereas during a further part of the rotation said member slides idly on the arm of the double armed lever with which it is associated.

6. In a sewing machine for sewing hat leathers in head coverings, in combination with means according to claim 4, means for supporting and guiding the needle carrier comprising a guide carriage in which the needle carrier is axially displaceable, a supporting arm attached to the lower portion of said carriage, further levers forming a pendulous suspension for said supporting arm, a guide slidable on the needle carrier, a further guide pivotally connected with said slidable guide and displaceable together with said needle carrier on a horizontal guide rod, a support for said horizontal rod, a vertical guide rod on which said horizontal guide rod is slidably mounted, and transmission members pivotally connected to said guide carriage which transmit the pivotal motions of the double armed lever to the guide carriage and thus to the needle carrier.

WILHELM LOCKENVITZ.