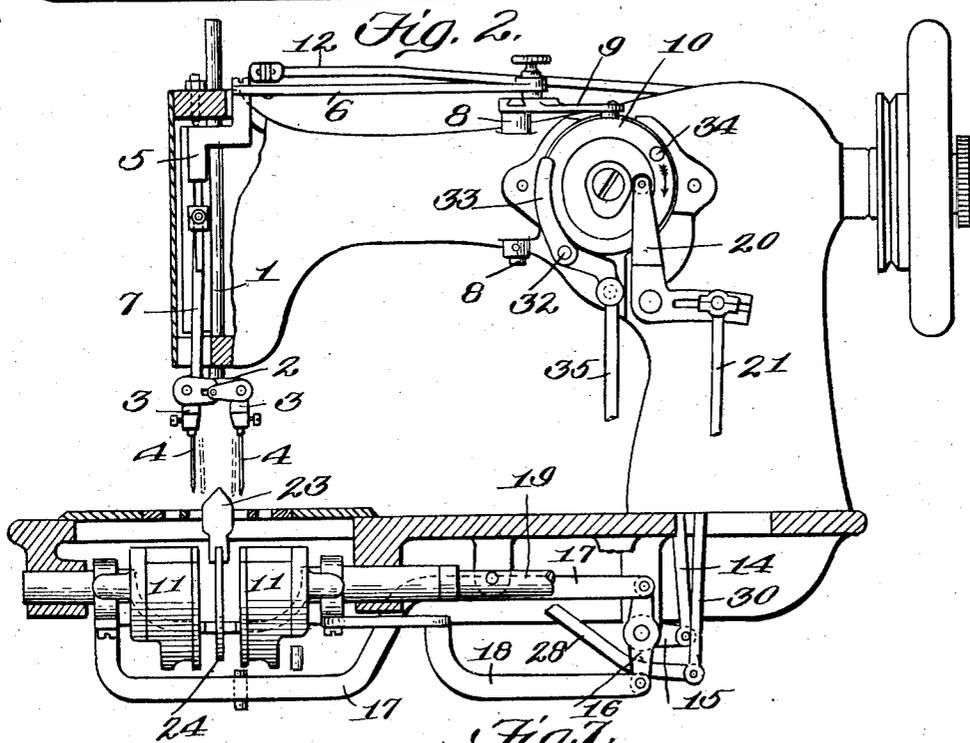
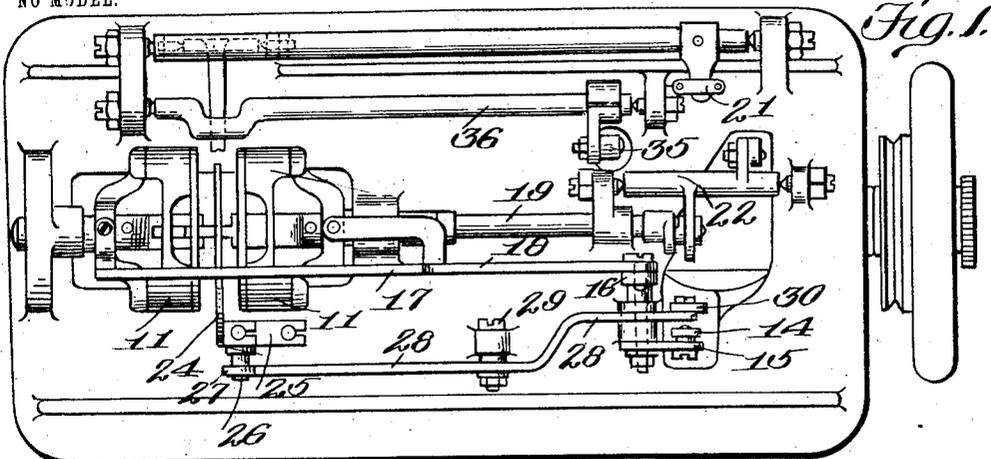


A. J. A. OESTERREICH.  
TWO NEEDLE HEMSTITCH SEWING MACHINE.

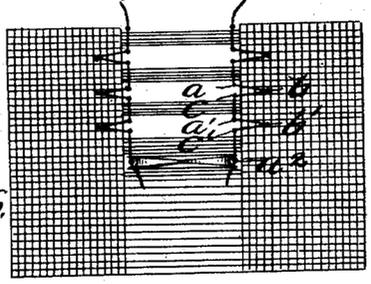
APPLICATION FILED MAR. 29, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
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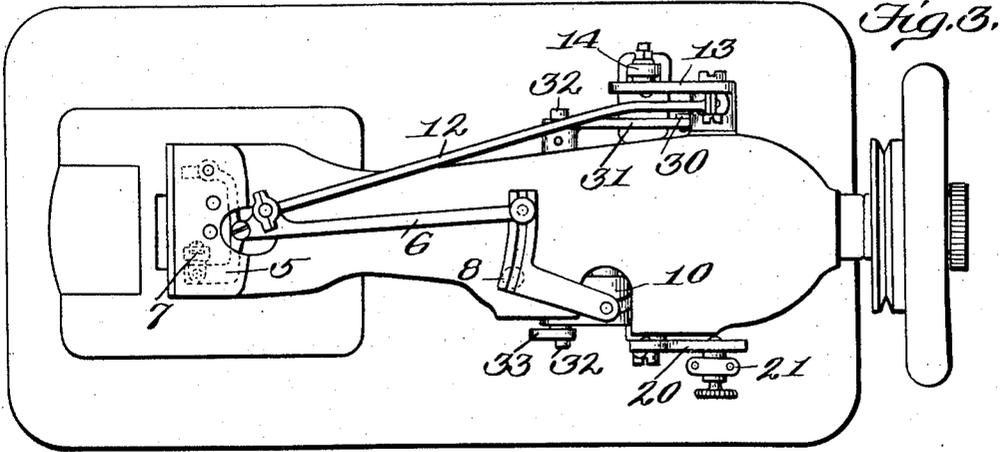


Fig. 3.

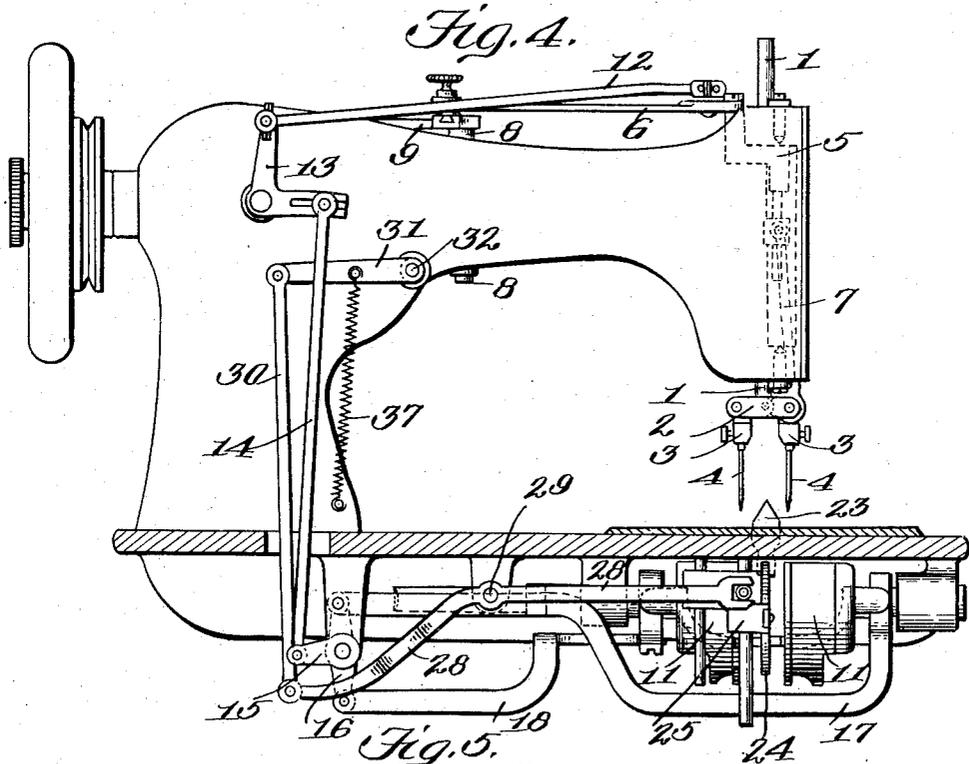


Fig. 4.

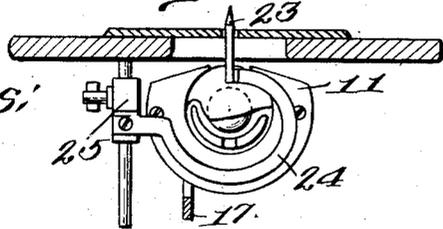


Fig. 5.

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Attys.

# UNITED STATES PATENT OFFICE.

AMANDUS JOHANN AUGUST OESTERREICH, OF HAMBURG, GERMANY,  
ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF ELIZABETH,  
NEW JERSEY.

## TWO-NEEDLE HEMSTITCH SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 737,012, dated August 25, 1903.

Application filed March 29, 1902. Serial No. 100,500. (No model.)

*To all whom it may concern:*

Be it known that I, AMANDUS JOHANN AUGUST OESTERREICH, a subject of the German Emperor, and a resident of Hamburg, in the German Empire, have invented certain new and useful Improvements in Two - Needle Hemstitch Sewing - Machines, of which the following is a specification.

In making a simple hemstitch either a one-needle or a two - needle hemstitch sewing-machine is employed and the vertically-reciprocating needle or needles are moved laterally or horizontally to make the proper hemstitch-figures. With a one-needle sewing-machine the two tying-seams along the two edges of the hem can, of course, only be made one after the other, whereas with a two-needle sewing machine both tying-seams are made simultaneously, thus doubling the production.

The present invention relates to certain improvements in that class of two - needle hemstitch-machines in the operation of which two hemstitch or tying seams are simultaneously formed; and the invention has for its object to provide a two-needle hemstitch-machine of such construction that it is adapted for wider hemstitching than the two-needle hemstitch-machines heretofore in use.

In the accompanying drawings, Figure 1 is a bottom view of a machine embodying the invention. Figs. 2 and 4 are opposite side elevations of the same, partly in vertical section. Fig. 3 is a top view of the machine; Fig. 5, a partial cross-section of the same near the forward end of the work-plate. Fig. 6 is a detail view of the thread-divider, and Fig. 7 is a diagrammatic view illustrative of the formation and stitching of the hem.

Referring to the drawings, 1 denotes the needle-bar, provided at its lower end with a cross-head 2, on which are pivotally mounted needle-carriers 3, to which the needles 4 are secured, the said needle-carriers having a pin-and-slot connection with each other and one of them being provided with the upwardly-extending arm 7, to which vibrating movements are imparted, so as to move the needles toward and from each other horizontally, as denoted by the full and dotted lines

in Fig. 2. The arm 7 is vibrated back and forth by the U-shaped lever 5, (see Fig. 3,) fulcrumed in the head of the machine and having a depending arm loosely connected with said arm 7. To the lever 5 is jointed at its forward end a pitman 6, adjustably connected at its rear end to one arm of a bell-crank lever 9, fulcrumed on a pin 8, and the other arm of said bell-crank lever is provided with a pin or stud entering a cam-groove in a cam-cylinder 10, which is geared to the needle-bar-operating shaft in the usual manner.

Coöperating with the vertically and horizontally reciprocating needles 4 are suitable shuttles or loop-takers, mounted in laterally-movable races or boxes 11, so as to be moved alternately to and fro coincidentally with the to-and-fro lateral movements of the needles. To this end a connecting-rod 12 is jointed at its forward end to the pitman 6, from which the needles receive their lateral movements, and said rod 12 is jointed at its rear end to the upper arm of a bell-crank lever 13, the lower arm of which is joined by a pitman 14 to a crank-arm 15, with which is connected a two-armed rocking lever 16. The lower arm of the lever 16 is joined by a connecting-rod 17 with one of the shuttle-races or loop-taker boxes 11, and the other arm of said lever is joined in a similar manner by a connecting-rod 18 to the other of the said shuttle-races or loop-taker boxes 11, so that the loop-takers in said boxes will be moved to and fro laterally in unison with the laterally-moving needles.

The loop-taking devices which I prefer to employ in the present machine are oscillating shuttles of a well-known "Singer" type, and said shuttles are operated from a rock-shaft 19, to which oscillating movements are imparted in a well-known manner from a rocker 22, receiving its movements in the usual manner from the rotating needle-bar-operating shaft mounted in the upper part of the bracket-arm of the machine.

Between the shuttle-races or loop-taker boxes 11 is mounted a relatively broad thread-divider 23, attached to a carrier 24, secured to a vertically-reciprocating block 25, pro-

vided with a pin 26, embraced by the fork at the forward end 27 of a lever 28, fulcrumed on the screw 29 and connected at its rear end by a pitman 30 with a crank-arm 31, attached to a rock-shaft 32, provided with an arm 33, arranged to be engaged at times by a pin 34 on the cam-cylinder 10 when the said thread-divider is to be moved downward at the intervals when the work is to be fed, the upward movements of the said thread-divider being imparted thereto from the spring 37, connected to the arm 31 and to a stationary part of the machine.

The feeding mechanism of the present machine is or may be of a well-known hemstitch type and in which only one forward feeding movement of the work will occur to three vertical reciprocations of the needles. The feed-dog of the present machine and part of its operating mechanism have been omitted from the drawings for clearness of illustration; but the said feed-dog may be operated in the usual manner through rock-shafts beneath the work-plate, the rock-shaft 36, operated by the rod 35, connected with the lever 33, serving to impart vertical movements to the said feed-dog and a second rock-shaft, operated by a rod 21, connected with the lever 20, serving to impart feeding movements to said feed-dog.

The operation of the machine is as follows: When the machine is stopped, the thread-divider 23, which is arranged between the needles 4, should be below the work, and the needles, which are reciprocated vertically in the usual manner from the rotating needle-bar shaft, should be in their raised positions. The work being placed beneath the presser-foot (not shown) and the machine being started, the thread-divider is first pushed upward between the threads of the fabric from below, and the needles in their first descent will be in the inner positions, (denoted by dotted lines in Fig. 2,) so as to pass downward in the needle-grooves (shown in Fig. 6) at the edges of the broad thread-divider. During their second descent the needles will occupy the outer positions (denoted by full lines in Fig. 2) and the loop-takers, following the lateral movements of the needles, will be correspondingly moved outward by the mechanism hereinbefore described and which is connected with the mechanism which moves the needles horizontally or laterally. At their third descent the needles will occupy the inner positions, (denoted by dotted lines in Fig. 2,) these three descents of the needles completing the hemstitch-figure, and after this has been completed the thread-divider will be lowered and the work will be fed forward for the next hemstitch-figure.

The formation of the hemstitch-seams is diagrammatically illustrated by Fig. 7, at one side of which are lettered the three stitches *abc* of the zigzag hemstitch-figure, and *a'b'c'* represent another zigzag hemstitch-figure, these figures being joined by tying a stitch

*c a'* and the last figure being joined to the next succeeding hemstitch-figure by a tying-stitch *c' a'*.

With many hemstitch-machines now in use and in which the loop-taking devices are not moved laterally with the needles only comparatively narrow hemstitch-seams can be formed, for the reason that if lateral movements of greater extent be imparted to the needles the latter will be so much out of time from the loop-taking devices that the loop-takers will be liable to miss the needle-loops, and thus imperfect work will result; but in the present improved machine, in which the loop-taking devices are moved laterally with the needles, very wide hemstitch-seams may be formed, as no such danger of skipping stitches will arise.

The present invention contemplates forming hemstitch-seams of different widths by providing interchangeable thread-dividers of different widths and by mounting the needles to correspond. Also the extent of the depth stitches of the zigzag hemstitch-seams at the opposite sides of the open-work seams may be varied by varying the point of connection of the rear end of the pitman 6 with the lever 9, which is slotted for such adjustment, and such adjustment will likewise in the present improved machine vary the lateral movements of the shuttle-race or loop-taker boxes 11, which are operated to move toward and from each other from the same part (the lever 9) from which the needles receive their lateral movements, so that one adjustment will provide for a variation of the lateral movements of the needles and of the loop-taking devices cooperating therewith.

The invention is not to be understood as being limited to the details of construction or to the particular form of sewing-machine herein shown and described, but may be varied widely without departing from the spirit thereof.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a hemstitch sewing-machine, a stitch-forming mechanism comprising two needles and mechanism for imparting lateral to-and-fro movements thereto, of a thread-divider located between the vertical paths of said needles, two loop-taking devices cooperating with said needles, and means, operated from the mechanism which imparts lateral movements to the needles, for imparting to-and-fro lateral movements, corresponding to the lateral movements of the said needles, to the said loop-taking devices, and adjusting means whereby the lateral throws of the needles and of the loop-taking devices may be simultaneously varied.

2. In a hemstitch sewing-machine, the combination with two needles and two cooperating loop-taking devices, of operating mechanism therefor, comprising means for moving said needles and loop-taking devices to-

ward and from each other laterally, and a thread-divider located below the work-plate of the machine between said loop-taking devices and also between the vertical paths of  
5 said needles, and mechanism for reciprocating said thread-divider vertically, said operating mechanism being constructed and timed to lift said thread-divider before the  
needles descend for the first stitch of a hemstitch-figure and to hold the same in a raised position during the formation of the stitches  
10 of a hemstitch-figure.

AMANDUS JOHANN AUGUST OESTERREICH.

Witnesses:

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