G. S. GATCHELL.

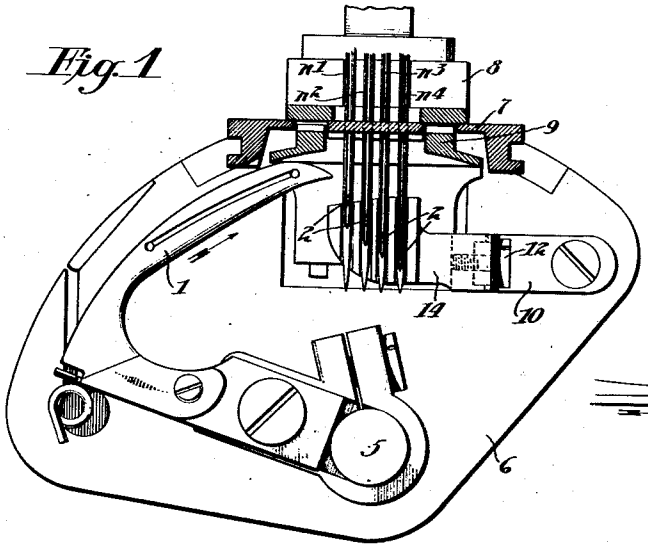
NEEDLE GUARD FOR SEWING MACHINES.

APPLICATION FILED SEPT. 27, 1919.

1,388,943.

Patented Aug. 30, 1921.

Fig. 1



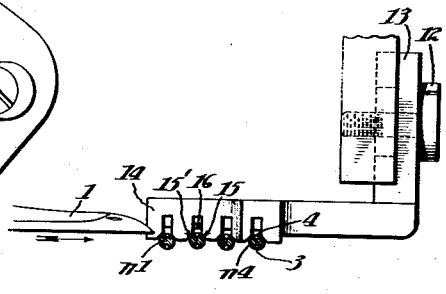


Fig. 2

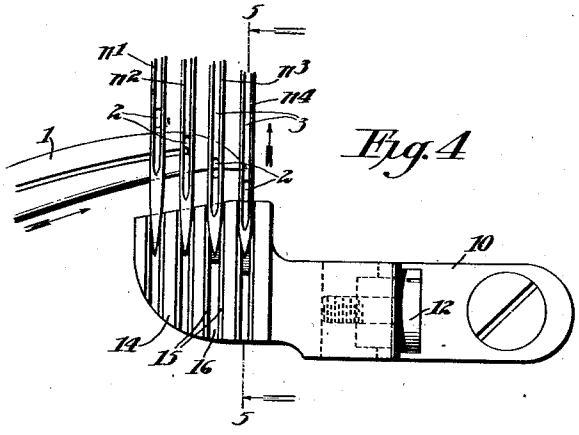


Fig. 4

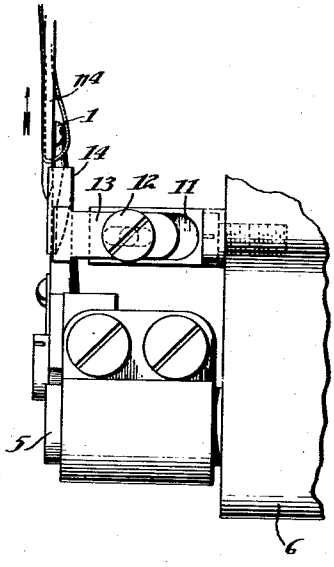


Fig. 3

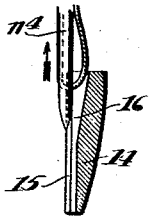


Fig. 5

WITNESSES:

Adrian DeWaes

John F. Steine

INVENTOR

George S. Gatchell

BY Henry J. Miller

ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE S. GATCHELL, OF ROSELLE PARK, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

NEEDLE-GUARD FOR SEWING-MACHINES.

1,388,943. Specification of Letters Patent. Patented Aug. 30, 1921.

Application filed September 27, 1919. Serial No. 326,872.

To all whom it may concern:

Be it known that I, GEORGE S. GATCHELL, a citizen of the United States, residing at Roselle Park, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Needle-Guards for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to needle-guards for sewing machines and has for an object to provide a needle-guard which will prevent displacement of the needle into the path of the loop-taker without interfering with the formation of the needle-loop and the presentation of such loop to the loop-taker.

The invention is intended, more particularly, for use in multiple-needle single-looper machines wherein the eyes of the needles are arranged on an incline so that the advancing looper beak will pass each needle at the correct distance above the eye thereof to insure proper seizure of the respective needle-loop. In machines of this type the eye of the last needle passed by the advancing looper is usually formed close to the point of the needle and it is found that if the old type needle-guard which bears directly against the back of the needle, is used, it cannot be placed high enough to guard the needle at the instant the looper-point is about to pass the needle, without obstructing the formation of the needle-loop.

According to the present improvement, the needle-guard is formed with a groove presenting side surface portions adapted to bear against the needle at each side of the usual thread-groove in the back side of said needle. The groove in the needle-guard is preferably V-shaped and the central portion thereof is deepened sufficiently to provide a clearance for the expansion of the nascent needle-loop before the point of the needle reaches the upper end of the needle-contacting walls of the guard. A needle-guard of this construction can be placed high enough to be in contact with the short cylindrical portion of the needle between the eye and point thereof when the looper is about to pass said needle, as is particularly desirable for use in connection with the last needle passed by the looper in a multiple needle machine.

In the accompanying drawings, Figure 1 is an end elevation of the work-supporting arm of a multiple-needle sewing machine embodying the invention; the needle-guard being shown at front elevation. Fig. 2 is a top plan view of the needle-guard with the needles shown in section. Fig. 3 is a side elevation of the guard as mounted on the work-supporting arm. Fig. 4 is an enlarged front elevation showing the needle-guard associated with the needles and looper at the period of cycle when the looper point is passing the last needle and Fig. 5 is a section on the line 5—5, Fig. 4.

While the present invention is of general application to sewing machines having one or more eye-pointed needles, I have chosen for the purpose of the present disclosure to embody it in a machine having a plurality of needles n^1, n^2, n^3 and n^4 which are set in a plane crossing the line of feed and coöperate with the looper 1 to form stitches. As is usual in machines of this type, the eyes 2 of the needles are arranged at progressively lower elevations beginning with the first needle passed by the looper and the needles are provided with thread-grooves 3 and 4 along their front and rear sides, respectively.

The looper 1 is mounted upon the usual rocking and sliding looper-shaft 5 which is mounted within the work-supporting arm 6 and causes the looper to advance along the rear sides of the needles in seizing the needle-loops and to retract along the front side of said needles. The machine includes the usual throat-plate 7, presser-foot 8 and feed-dog 9 all of which may be constructed substantially in accordance with the disclosure of my copending application Serial No. 185,446, filed Aug. 10, 1917.

Mounted on the work-supporting arm 6 is a bracket 10 which is formed with a groove 11 in which is adjustably secured by the screw 12 the slotted shank 13 of the needle-guard body 14 which is in the form of a block having in its front face a series of parallel clearance grooves 16 of less width than the diameter of the needles. Each of these grooves is preferably flared at its mouth to form the angularly related side surfaces 15 which engage the corresponding needle at either side of the thread-groove 4. The depth of the grooves 16 preferably increases toward their upper ends, as shown in Fig. 5, to afford sufficient clearance for the expansion of the

nascent needle-loops before the needles rise beyond the control of the guard, as shown in Fig. 5. By virtue of this construction the needle-loops may begin to form or expand while the corresponding needle-eyes are below the upper edge of the needle-guard and, consequently, the guard may be placed close enough to the looper-path to properly guard the needles which have their eyes placed relatively close to their points. The side walls of the central portions 16 of the loop-receiving grooves also serve to guide the nascent needle-loops and prevent their twisting sidewise prior to seizure by the looper.

Having thus set forth the nature of the invention, what I claim herein is—

1. A needle-guard for sewing machines comprising, a guard-body formed with a needle-loop clearance groove and having spaced needle contacting surfaces at the mouth of said groove, said surfaces being spaced apart a distance less than the diameter of the needle.

2. In a sewing machine, the combination with a reciprocating needle and a loop-taker, of a needle-guard having spaced needle contacting surface portions adapted to hold the needle against deflection into the path of the loop-taker beak, said needle-guard being formed intermediate said needle contacting surface portions with a needle-loop receiving and guiding groove.

3. The combination with a reciprocating needle and a loop-taker having a beak adapted in passing the needle to seize a needle-loop, of a needle-guard having a body-portion disposed mainly at the same side of the needle passed by the loop-taker beak and formed with a clearance groove adapted to receive and guide the nascent needle-loop.

4. The combination with a reciprocating needle and a loop-taker, of a needle-guard adapted to engage the needle at a level below the path of loop seizing movement of the loop-taker beak and prevent deflection of the needle into said path, said needle-guard being formed with a clearance groove permitting expansion of a nascent needle-loop into said groove.

5. The combination with a reciprocating needle and a loop-taker, of a needle-guard body formed with a needle-loop clearance groove of less width than the diameter of said needle, the mouth of said groove being flared to embrace the needle.

6. A needle-guard for sewing machines comprising a block formed in one face with a groove presenting at its mouth a pair of angularly related flat sides adapted to engage the cylindrical walls of a needle at either side of the usual thread-groove therein, the central portion of the groove in said block being deepened sufficiently to receive and guide the expanding needle-loop.

7. A sewing machine, having in combination, a work-support, a reciprocating eye-pointed needle having a thread-groove, a loop-taker, and a needle-guard at the same side of the work-support as the loop-taker and located near enough to the path of the loop-taker to retain control of the rising needle-point until the loop-taker passes the needle, said guard having surface portions bearing against the needle at opposite sides of the thread-groove therein, and a groove opposite the thread-groove in the needle adapted to receive and guide the expanding needle-loop.

8. A sewing machine having a plurality of eye-pointed needles set in a plane crossing the line of feed with the eyes of the needles arranged on an incline, a looper cooperating therewith to form stitches, and a needle-guard formed with a plurality of needle-receiving grooves and set high enough to retain control of the needle-points until the needles are passed by the looper, the central portions of one or more of the needle-grooves being deepened to permit expansion of the corresponding nascent needle-loop or loops prior to their seizure by the looper.

9. A sewing machine having a plurality of eye-pointed needles set in a plane crossing the line of feed with the eyes of the needles arranged on an incline, a looper coöperating therewith to form stitches, and a needle-guard formed with a plurality of needle-receiving grooves and set high enough to retain control of the needle-points until the needles are passed by the looper, one or more of said grooves presenting a pair of angularly related flat sides and a deepened central portion as and for the purpose specified.

In testimony whereof I have signed my name to this specification.

GEORGE S. GATCHELL.