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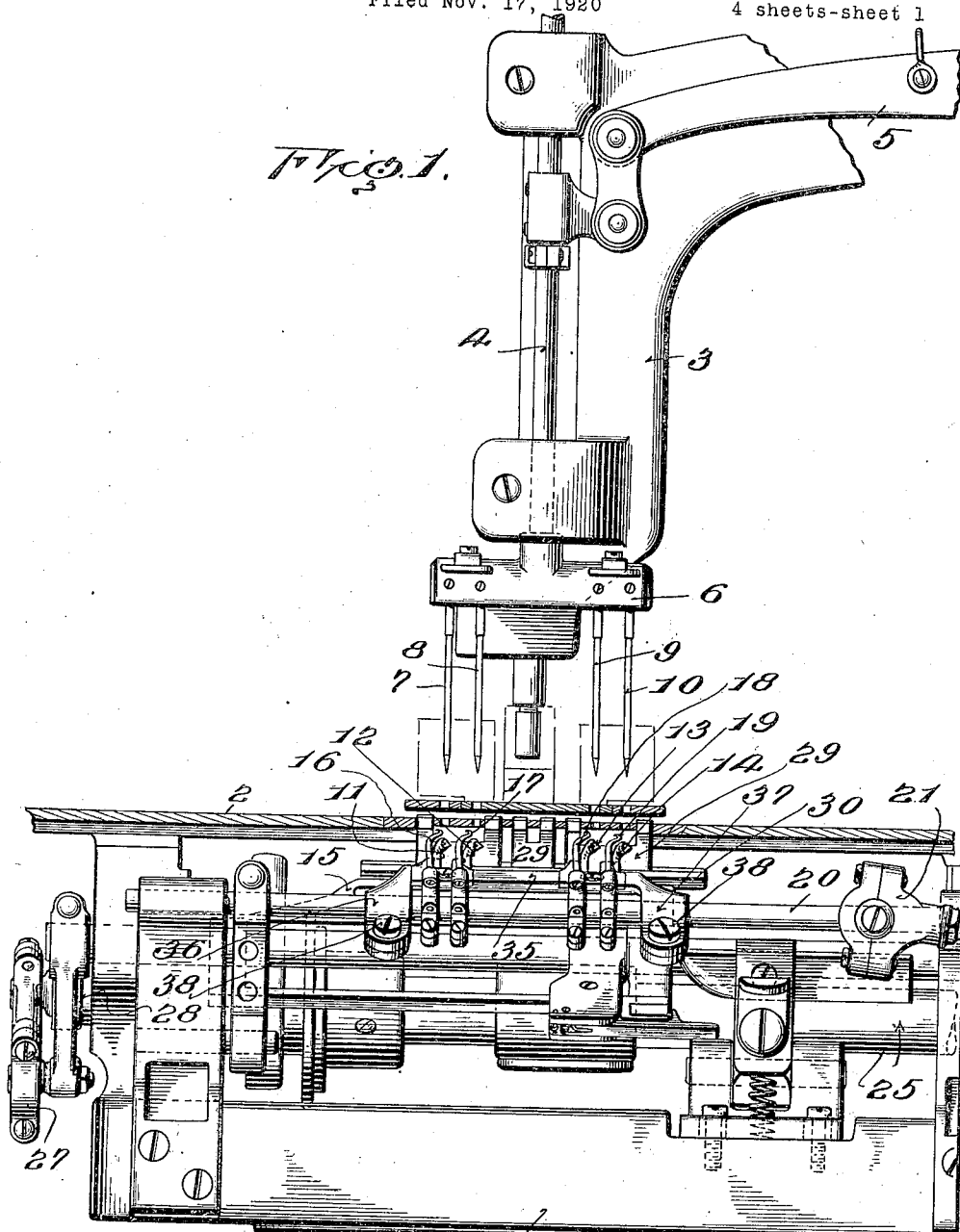
J. R. MOFFATT

1,444,633

NEEDLE GUARD FOR MULTIPLE NEEDLE SEWING MACHINES

Filed Nov. 17, 1920

4 sheets-sheet 1



Inventor
James R. Moffatt

By *Sturtevant Mason*
Attorneys

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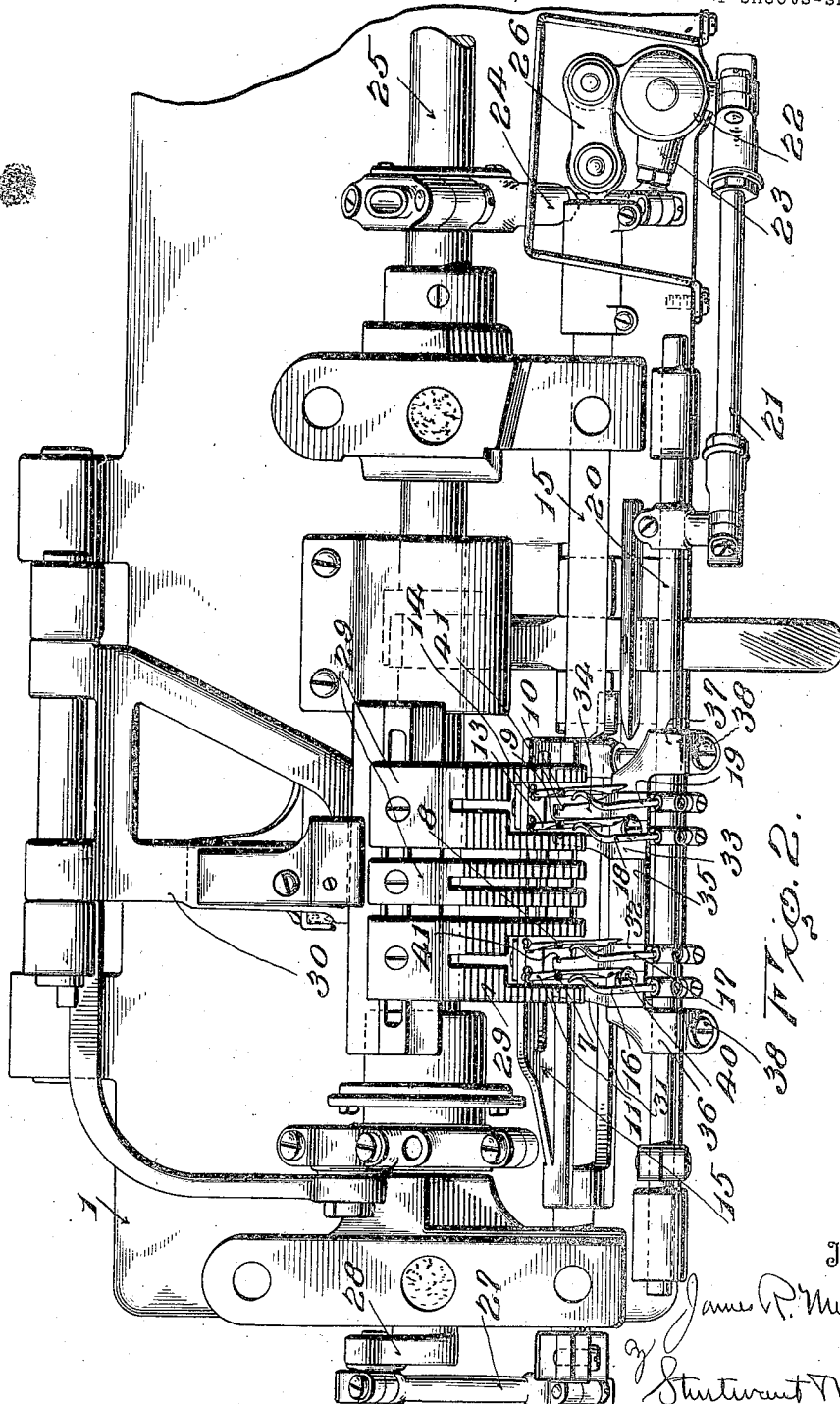
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4 sheets-sheet 2



Inventor

James R. Moffatt

Sturtevant Mason

Attorneys

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Fig. 3.

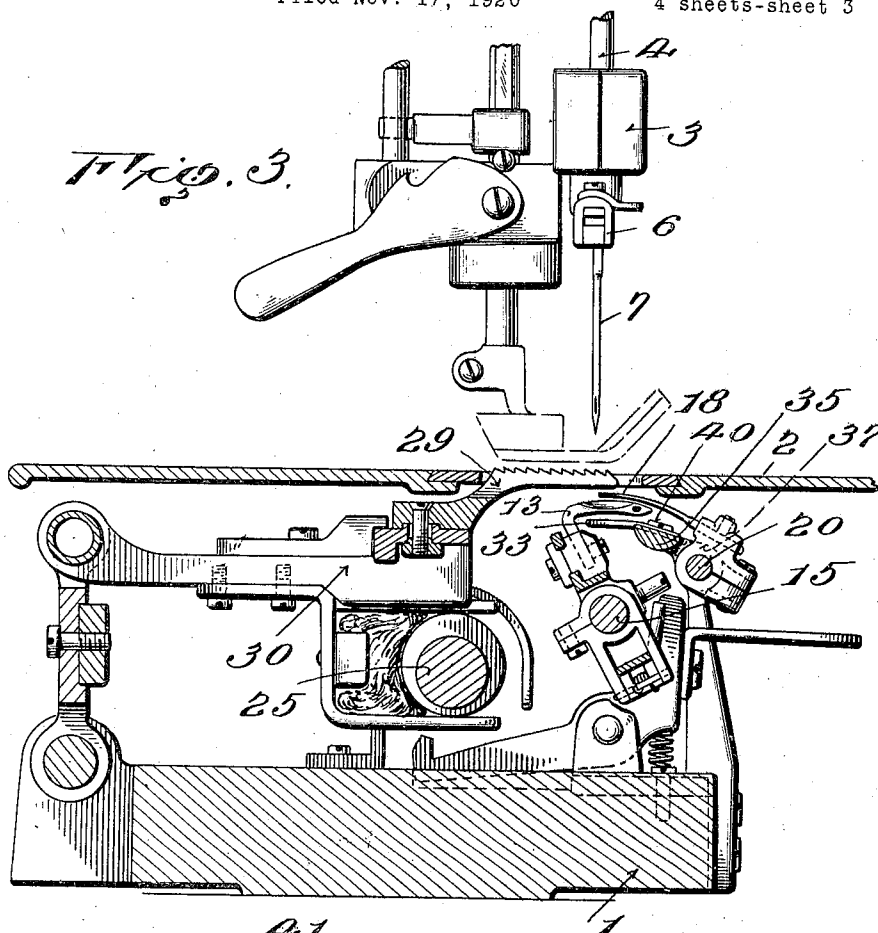
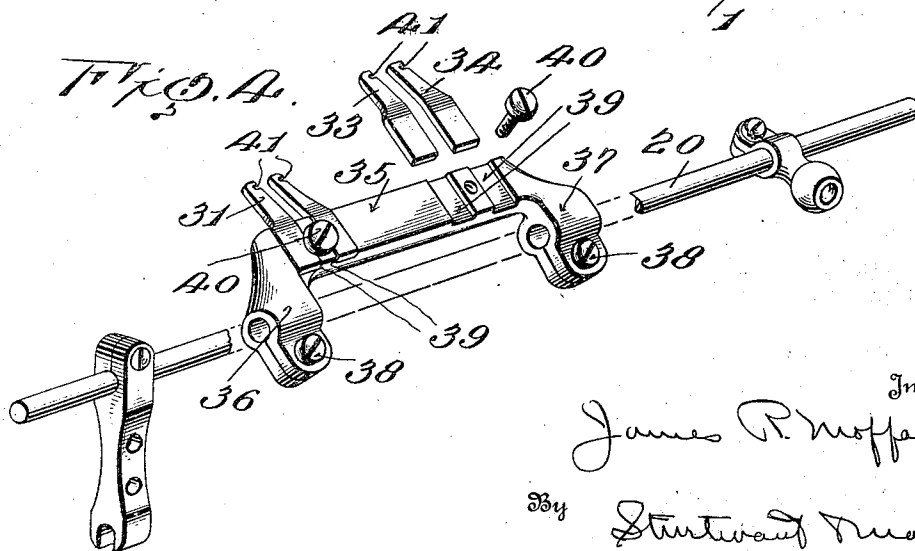


Fig. 4.



Inventor

James R. Moffatt

By

Stewart Mason

Attorneys

Feb. 6, 1923.

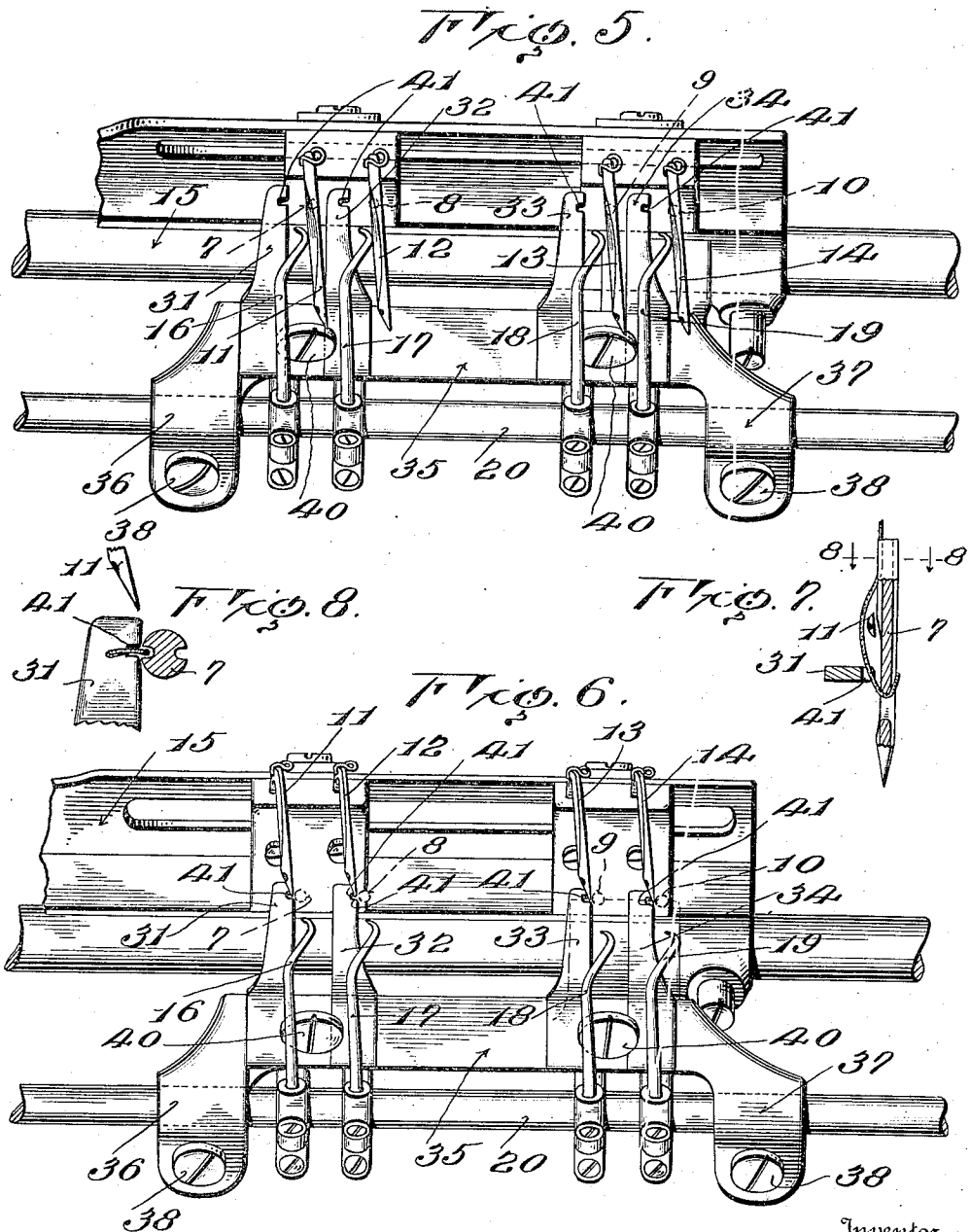
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NEEDLE GUARD FOR MULTIPLE NEEDLE SEWING MACHINES

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4 sheets-sheet 4



Inventor

James T. Moffatt

 $\mathbb{B}_y$

Stewart Mason
Attorneys

UNITED STATES PATENT OFFICE.

JAMES R. MOFFATT, OF CHICAGO, ILLINOIS, ASSIGNOR TO UNION SPECIAL MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

NEEDLE GUARD FOR MULTIPLE-NEEDLE SEWING MACHINES.

Application filed November 17, 1920. Serial No. 424,699.

To all whom it may concern:

Be it known that I, JAMES R. MOFFATT, a citizen of the United States residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Needle Guards for Multiple-Needle Sewing Machines, of which the following is a description, reference being had to the accompanying drawing, and to the figures of reference marked thereon.

The invention relates to new and useful improvements in needle guards for sewing machines, and more particularly to needle guards for multiple needle abreast sewing machines having a threaded looper cooperating with each needle and disposed so as to move in a direction substantially parallel with and opposed to the direction of feed as the loopers enter their respective needle loops.

In a copending application Serial No. 424,698 filed of even date herewith by Ralph S. Kelso and myself jointly, there is shown, described and claimed a needle guard for a multiple needle abreast sewing machine having a threaded looper positioned, and operating as above stated. The needle guards in said application are supported in a manner so as to limit the gage of the machine to which they are applied. An object of the present invention is to provide a needle guard support for a multiple needle abreast sewing machine wherein the distance that the needles are set apart is only limited by the size and lateral movement of the needle guards, which necessarily extends between certain of the needles.

A further object of the invention is to provide means of the above character for supporting the needle guards wherein the spreaders, if used, and needle guards may be all mounted on a common support so as to simplify the structure of the machine.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings, which show by way of illustration one embodiment of the invention:—

Figure 1 is a view, partly in front elevation and partly in vertical section, of a front portion of a machine having my improvements embodied therein;

Fig. 2 is a top plan view of a front por-

tion of a machine showing the parts beneath the work support;

Fig. 3 is a vertical section along the line of feed;

Fig. 4 is a detail in perspective showing the rod for carrying the spreaders and the needle guards and yoke for supporting the guards;

Fig. 5 is a detail in plan showing the loopers, the spreaders and the needle guards, and also the needles in dotted lines, the loopers being at the forward ends of their strokes;

Fig. 6 is a similar view but showing the loopers just entering the needle thread loops;

Fig. 7 is an enlarged detail showing one of the needles in side elevation, the needle guard and the looper just previous to the point thereof entering the needle thread loop; and

Fig. 8 is a sectional view on the line 8—8 of Fig. 7.

The invention is directed to a needle guard for a multiple needle sewing machine of the type wherein a plurality of needles are set in a line at right angles to the line of feed and a threaded looper cooperates with each needle, said loopers being supported and positioned so as to move in a direction substantially parallel with and opposed to the feed as the loopers enter their respective needle thread loops. Also associated with each looper is a spreader which engages the looper thread and holds it away from the body of the looper during the backward movement of the looper so as to insure the needle passing downwardly between the looper thread and the body of the looper with which it is associated.

The specific details illustrated in the drawings of the above features form no part of the present invention except in combination with the needle guards as these specific features are shown, described and claimed in the application filed jointly by Ralph S. Kelso and myself October 17, 1919, Serial No. 331,371. Also in a copending application Serial No. 424,698 filed of even date herewith by Ralph S. Kelso and myself, there is shown, described and claimed broadly a needle guard which is located along the side of the needle passed by the

looper as it moves into the needle loop. Said needle guards are below the loopers and the spreaders. As shown in said application, they are independently mounted on the same carrier which the spreaders are mounted on. The gage of the machine, that is the distance the needles are set apart, is limited by reason of this particular mounting of the needle guards. The present invention is directed broadly to the support for a plurality of needle guards in a multiple needle abreast machine which is so constructed as to permit the setting of the needles closer together. The limit of the positioning of the needles close together is determined only by the width of the needle guard and the movement given thereto so far as said needle guards are concerned.

Referring more in detail to the drawings, the machine consists of a bed plate 1 having a work support 2 and an overhanging arm 3 on which is mounted a needle bar 4 reciprocated in the usual manner by a needle lever 5. Said needle bar is provided with a cross head 6 at its lower end in which is mounted four needles 7, 8, 9 and 10. Cooperating respectively with these needles beneath the work support are loopers 11, 12, 13 and 14. Each looper is of the threaded type and the loopers are mounted on a looper supporting shaft 15. The looper supporting shaft 15 is oscillated for imparting oscillations to the loopers for moving the loopers into and out of their respective needle loops. The looper support 15 is moved endwise for giving a needle avoiding movement to the loopers.

Associated respectively with the loopers 11, 12, 13 and 14 are spreaders 16, 17, 18 and 19. These spreaders are carried by a spreader supporting bar 20 which is mounted in suitable bearings and is moved endwise by means of a link 21. The link 21 is connected to one arm of a bell crank 22. This bell crank 22 is provided with an arm 23 which is connected to an eccentric strap 24 cooperating with an eccentric on the main shaft 25. This bell crank 22 through a link 26 imparts endwise movements to the looper support 15. The looper support 15 is oscillated by a link 27 connected to a crank 28 on the end of the main shaft 25. These parts, as above noted, are all shown, described and claimed in the joint application above referred to.

The loopers move in a direction substantially parallel with the line of feed, and also in a direction opposed to the feed as they enter the needle thread loops. The loopers are moved laterally for a needle avoiding movement and during their lateral movement the spreaders also move laterally but in the opposite direction, make contact with the looper threads of the loopers with which they are associated, and hold the looper

threads away from the bodies of the loopers for the entrance of the needles into the looper thread loops. The material is fed across the machine in a direction at right angles to a line containing the needles 7, 8, 9 and 10 by a feed dog 29 carried by a feed bar 30 operated in the usual manner. From the drawings, it will be apparent that the spreaders move in a path above the loopers.

As above noted, the invention is directed particularly to the manner of mounting the needle guards. The needle guards for the needles 7, 8, 9 and 10 are respectively indicated at 31, 32, 33 and 34. These needle guards, as shown in the drawings are mounted on a single yoke 35. This yoke includes the sleeves 36 and 37 through which the spreader rod 20 extends, and these sleeves are clamped to the rod 20 by screws 38. The yoke 35 is provided with recesses 39, one for each needle guard. The needles in the present machine are arranged in pairs and close together and, therefore, one clamping screw 40 is sufficient to hold each associated pair of needle guards. The spreader bar moves endwise carrying the spreaders into engagement with the looper thread in a manner fully set forth in the joint application referred to above.

The needle guards will also be moved laterally from the position shown in Fig. 5 to the position shown in Fig. 6, and when brought to the position shown in Fig. 6 each guard is so located relative to its respective needle as to insure that the needles will be properly positioned for the loopers cooperating therewith to pass the faces of the needles without striking the needles. The needle guard is located adjacent that face of the needle which is passed by the looper during the forward movement of the latter. Each needle guard is formed with a thread slot 41 which opens outwardly towards said needle. The width of this slot is slightly less than the diameter of the needle. The slot is positioned in line with the thread groove in the needle, and the purpose of this slot is to permit the free bowing out of the needle thread during the upward stroke of the needle. In other words, if the side of the needle at the eye of the needle or slightly above the eye of the needle be engaged by the needle guard, the free bowing out of the needle thread would be interfered with, but by forming the slot so that the thread may bow outwardly in the slot, then the needle thread loop will be properly formed. The slot in the needle guard is slightly wider than the diameter of the thread and gives, therefore, a free space or passageway for the needle thread.

The slot in the needle guard also serves to maintain the needle thread loop in a plane at right angles to the path of movement of the looper during the downward movement

of the latter. There is a more or less tendency of the needle thread loop to whip about the needle, and this is prevented by the slot in the needle guard. It will be understood, of course, that if the needle remained in its normal vertical line of reciprocation, it would be properly passed by the looper in its forward movement. If it is slightly deflected, however, the guard will position it properly for the looper to pass. Then again, in high speed machines, there is more or less tendency of the needle to vibrate laterally and the needle guard being close to the path of the needle will prevent such excessive vibrations which tend to cause the looper to skip the needle thread loop and the needle to strike the looper in its descent.

While I have shown the needle guards carried by a yoke which is mounted on the same supporting bar for the spreaders, it will be understood that said yoke may be mounted in other ways, the essential features consisting in the supporting of the needle guards on a yoke in such manner that the needles may be set in positions very close together without being limited by the support for the needle guards. The needle guards and support therefor are below the spreaders and also below the path of movement of the body portion of the loopers, so that each needle guard will cooperate with its associated needle to prevent vibration thereof or deflection and insure the proper positioning of the needle for the looper to pass without striking the needle and the needle to pass the looper without striking the same on its descent.

The yoke can be readily adjusted endwise on the supporting bar therefor; the needle guards can also be adjusted longitudinally in their supporting slots; the yoke can be swung about the rod 20, and thus the free ends of the needle guards raised and lowered, and by these three adjustments the needle guards may be properly placed to cooperate with the needles. The needle guards extend between the needles and to a point in rear thereof. The holder or yoke 35 extends under the spreaders and is disposed in front of the needles and loopers. Said holder or yoke also spans all of the spreader supporting devices.

It is obvious that minor changes in the details of construction and the arrangement of parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what is claimed as new is:—

1. The combination with feeding mechanism, a plurality of needles arranged in a line at right angles to the line of feed, a looper for each needle, means for moving said loopers in a direction substantially parallel

with and opposed to the direction of feed as they enter their respective needle thread loops, a needle guard for each needle disposed at the side of the needle passed by its respective looper as the looper enters its needle thread loop, a supporting yoke on which the needle guards are mounted, and means for supporting said yoke.

2. The combination with feeding mechanism, a plurality of needles arranged in a line at right angles to the line of feed, a threaded looper for each needle, means for moving said loopers in a direction substantially parallel with and opposed to the direction of feed as they enter their respective needle thread loops, a needle guard for each needle disposed at the side of the needle passed by its respective looper as the looper enters its needle thread loop, a supporting yoke on which the needle guards are mounted and means for securing the guards to the supporting yoke whereby said guards may be adjusted independently in an endwise direction, and means for supporting said yoke.

3. The combination with feeding mechanism, a plurality of needles arranged in a line at right angles to the line of feed, a threaded looper for each needle, means for moving said loopers in a direction substantially parallel with and opposed to the direction of feed as they enter their respective needle thread loops, a needle guard for each needle disposed at the side of the needle passed by its respective looper as the looper enters its needle thread loop, a supporting yoke on which the needle guards are mounted whereby they may be adjusted in an endwise direction, and means for supporting said yoke, said supporting means being so constructed that the yoke may be adjusted in a direction at right angles to the line of feed and whereby the portion supporting the needle guards may be raised and lowered.

4. The combination with feeding mechanism, a plurality of needles arranged in a line at right angles to the line of feed, a threaded looper for each needle, means for moving said loopers in a direction substantially parallel with and opposed to the direction of feed as they enter their respective needle thread loops, a spreader cooperating with each looper, a supporting bar for said spreaders, a needle guard for each needle disposed at the side of the needle passed by its respective looper as the looper enters its needle thread loop, a yoke on which the needle guards are mounted, and means for mounting said yoke on the supporting bar for said spreaders.

5. The combination with feeding mechanism, a plurality of needles arranged in a line at right angles to the line of feed, a threaded looper for each needle, means for moving said loopers in a direction substantially parallel with and opposed to the di-

re-
ction of feed as they enter their respective
needle thread loops, a spreader cooperating
with each looper, a supporting bar for said
spreaders, a needle guard for each needle
5 disposed at the side of the needle passed by
its respective looper as the looper enters its
needle thread loop, a yoke on which the
needle guards are mounted whereby they
may be adjusted in a direction parallel with
10 the direction of feed, means for supporting
said yoke on said spreader supporting bar
whereby it may be adjusted in a direction
at right angles to the line of feed and turn
about said supporting bar to raise and
15 lower the needle guards.

6. The combination with feeding mechanism, a plurality of needles arranged in a line at right angles to the line of feed, a

threaded looper for each needle, means for
moving said loopers in a direction substan- 20
tially parallel with and opposed to the di-
rection of feed as they enter their respective
needle thread loops, a spreader cooperating
with each looper, a supporting device for
each spreader, a supporting bar for said sup- 25
porting devices, a needle guard for each
needle disposed at the side of the needle
passed by its respective looper as the looper
enters its needle thread loop, a yoke span-
ning all of the spreader supporting devices 30
and mounted on said supporting bar for the
spreaders, and means for adjustably sup-
porting the needle guards on said yoke.

In testimony whereof, I affix my signature.

JAMES R. MOFFATT.