Aug. 7, 1928. 1,679,357

N. E. HANSON

SEWING MACHINE

Filed Oct. 8, 1923 4 Sheets-Sheet 1

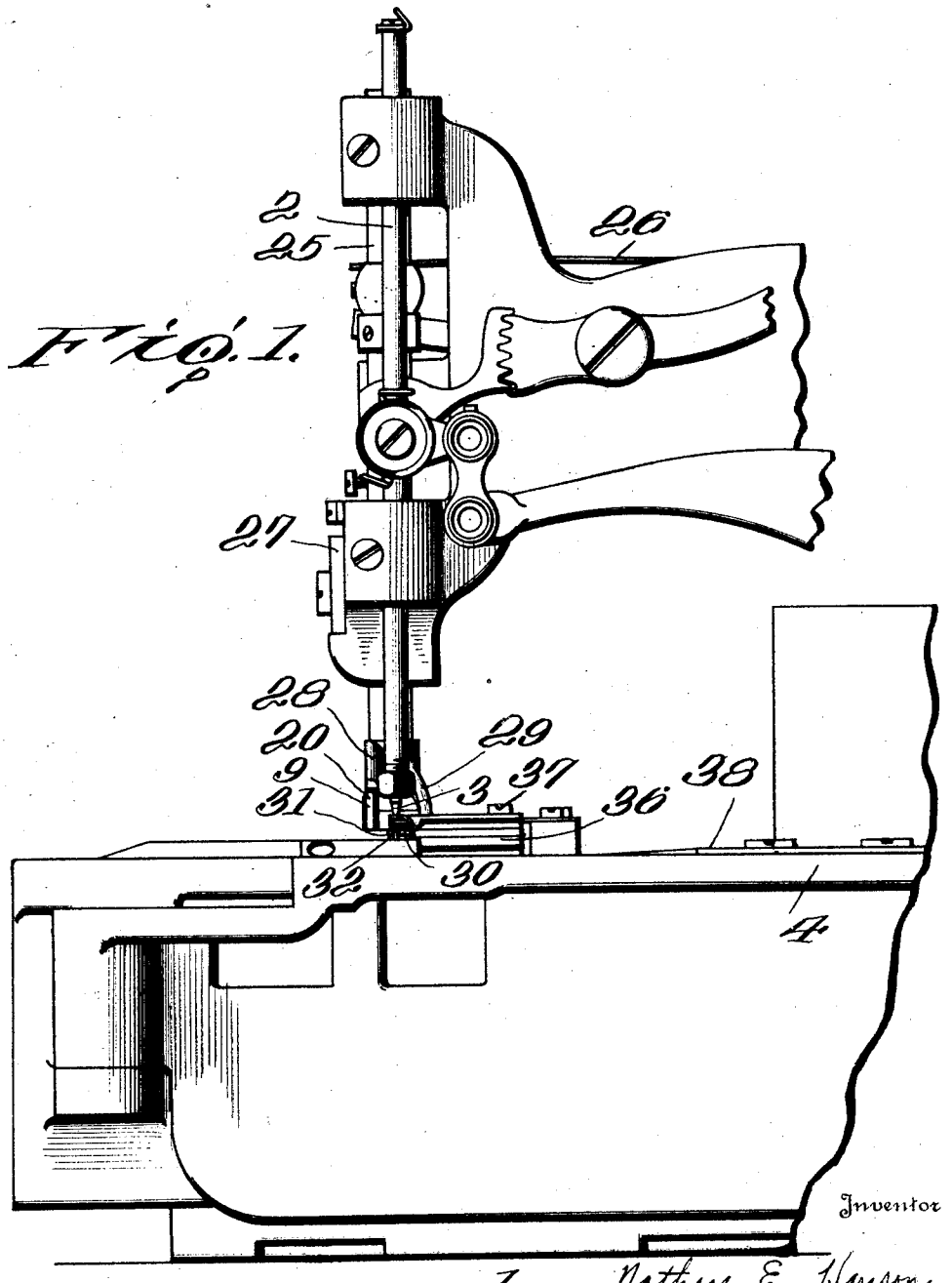


Fig. 1.

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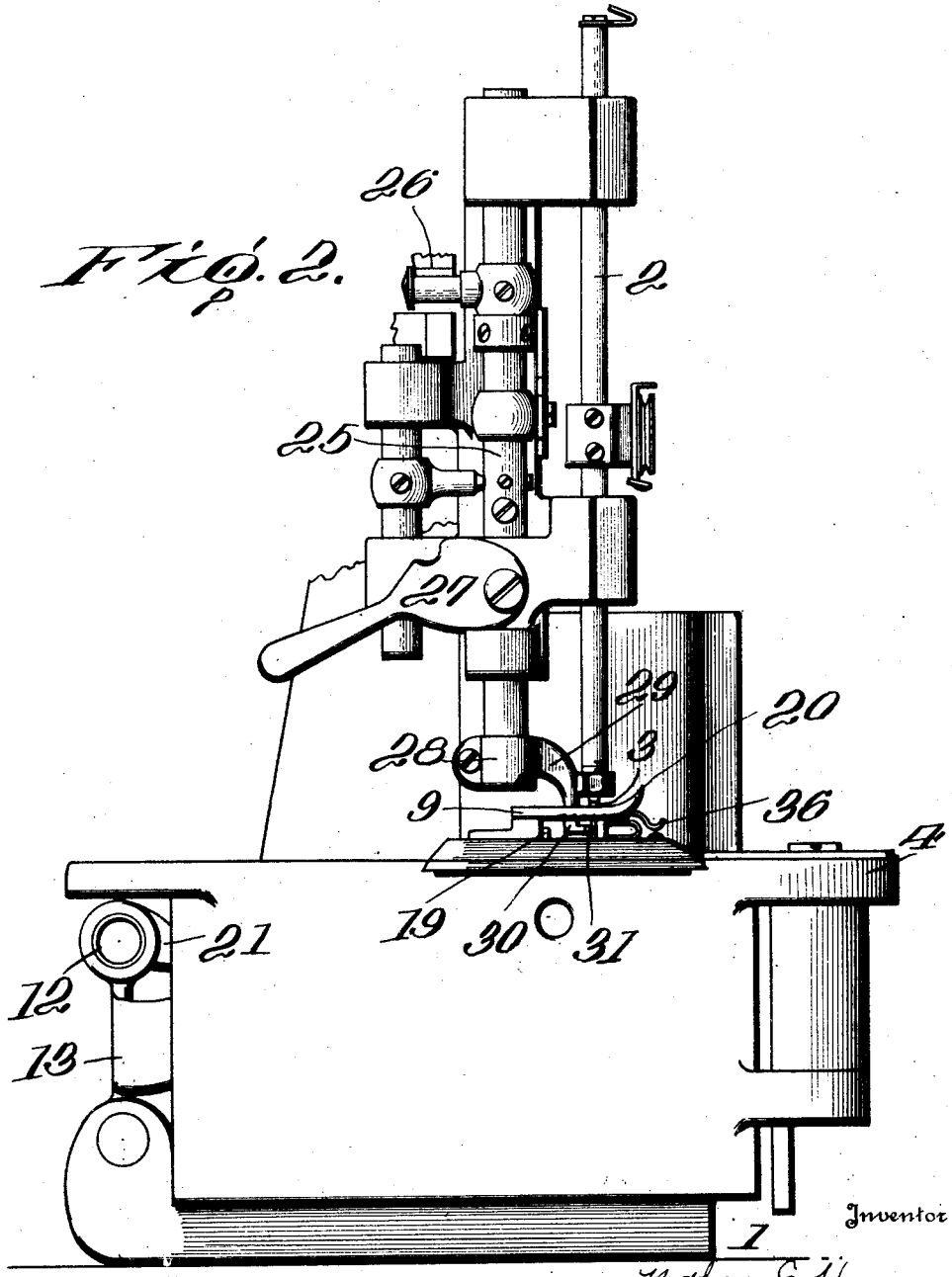
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Fig. 2.



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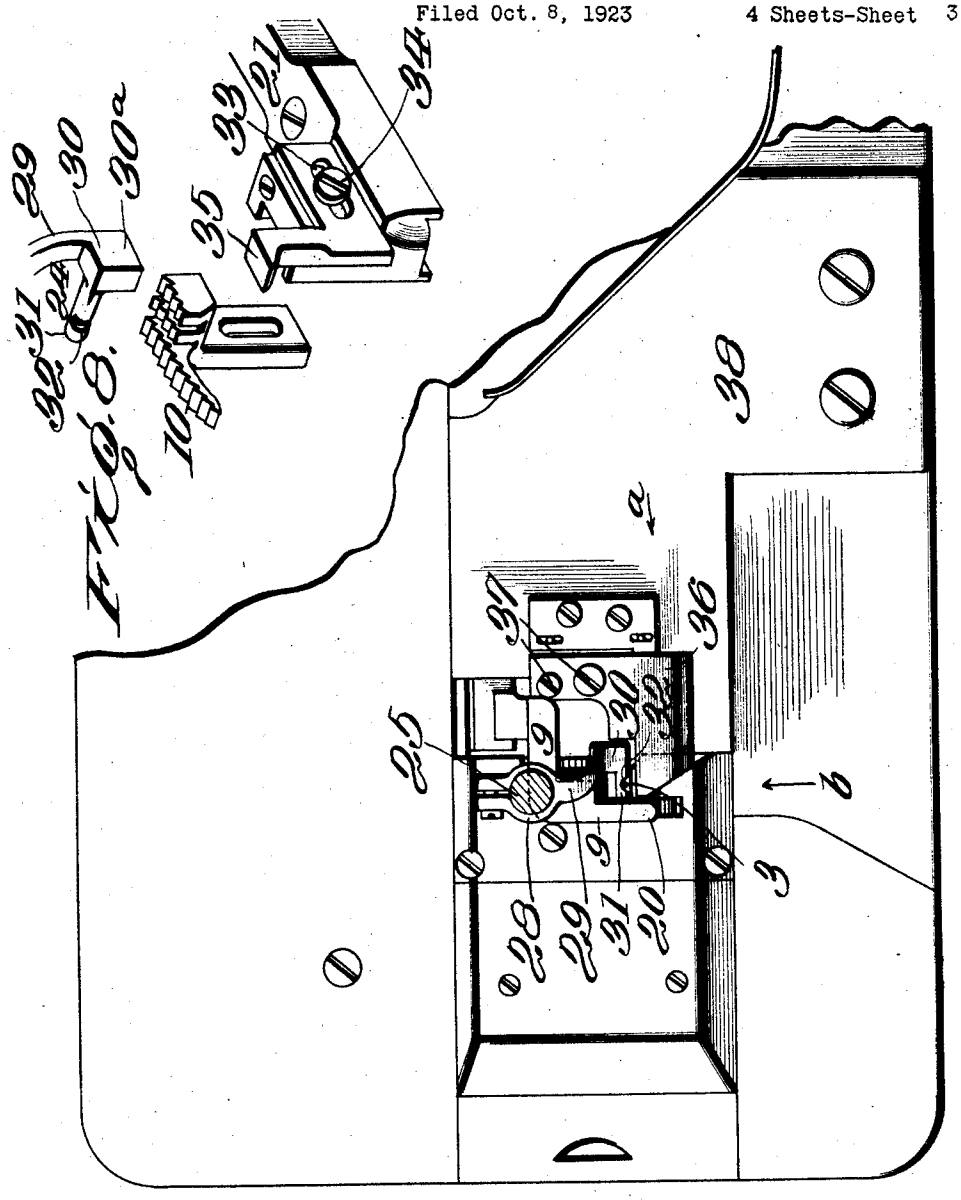


FIG. 3.

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FIG. 4.

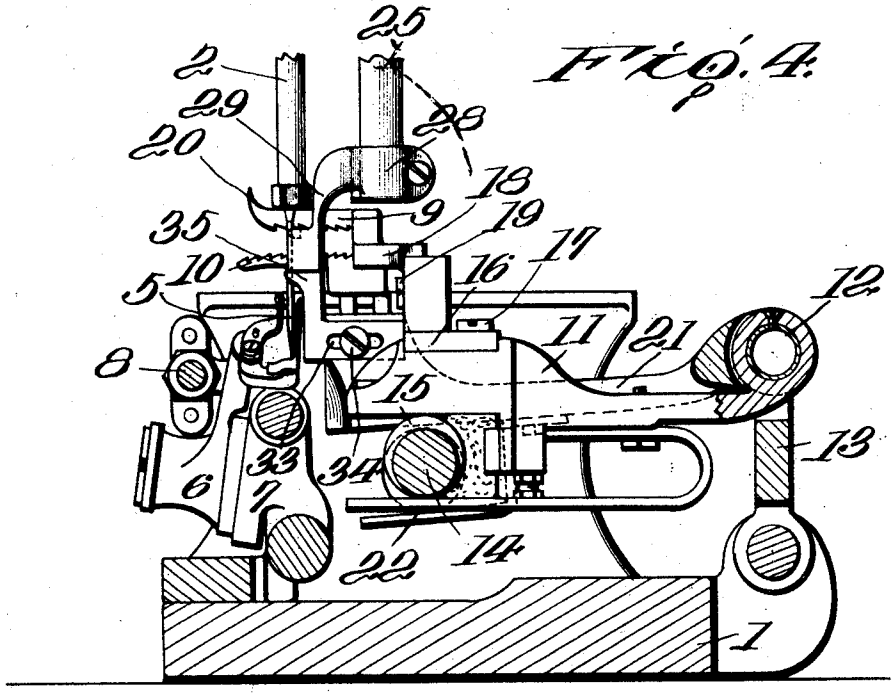


FIG. 6.

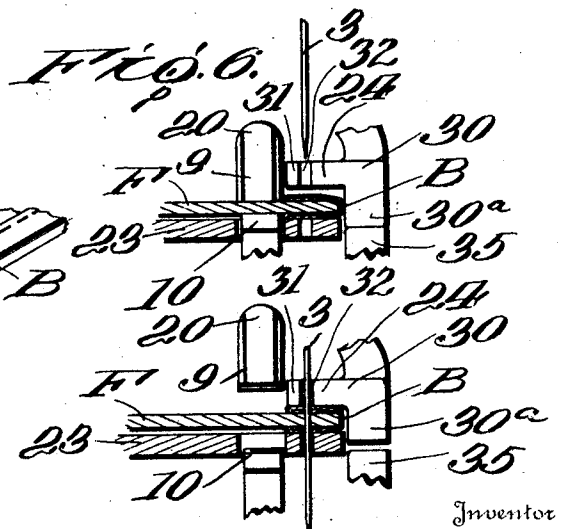


FIG. 5.

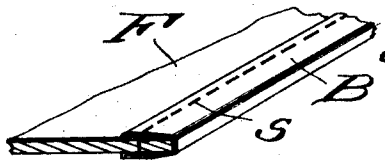


FIG. 7.



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UNITED STATES PATENT OFFICE.

NATHAN E. HANSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO UNION SPECIAL MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SEWING MACHINE.

Application filed October 8, 1923. Serial No. 667,261.

The invention relates to new and useful improvements in sewing machines, and more particularly to the means for feeding the material and for holding the material while the feeding mechanism is moving through its idle stroke.

An object of the invention is to provide a sewing machine of the above character with upper and lower feed dogs operating to clamp and feed the material with the presser foot, which is located at one side of said dogs, and cooperates with the work support for holding the material on the work support while the needle is being retracted, and wherein means is provided for raising the presser foot while the feed dogs are on their active stroke so as to permit the free feeding of the material.

A further object of the invention is to provide a sewing machine of the above character with means for lifting the presser foot, which means is so timed that the presser foot is raised while the feed dogs are free of the material and while the needle is in the material, but on its retracting stroke, whereby the material may turn about the needle for stitching around corners or sharp curves.

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

Figure 1 is a front view of a sewing machine embodying my improvements;

Fig. 2 is an end view of the same;

Fig. 3 is a view partly in plan and partly in section of the parts for feeding and holding the material;

Fig. 4 is a transverse sectional view through the machine showing the feeding mechanism in side elevation;

Fig. 5 is a perspective view showing a binding applied to a fabric by my improved mechanism;

Fig. 6 is an enlarged detail, showing the feed dogs engaging the material for feeding the same while the presser foot is raised to permit the material to be fed;

Fig. 7 is a view similar to Fig. 6, but showing the feed dogs out of engagement with the material and on their idle stroke while the presser foot is engaging and holding the material;

Fig. 8 is a detail showing the front portion of the lower feed bar.

Referring to the drawings, wherein I have illustrated one embodiment of the invention, the sewing machine includes a supporting bed 1, on which is mounted the usual overhanging arm and in this overhanging arm is a reciprocating needle bar 2, carrying a needle 3. Also, carried by the supporting bed 1 is a work support 4. Co-operating with the needle beneath the work support is a looper 5. Said looper is carried by a looper carrier 6, which is pivotally mounted on a looper support 7. The looper carrier is swung by means of a link 8. The looper support is oscillated so as to give the looper a needle avoiding movement.

The stitching mechanism which has been briefly referred to is of the ordinary construction and further detail description thereof is not thought necessary.

The present machine is particularly adapted for stitching a binding on a fabric. In Fig. 5 of the drawings, I have shown a fabric F, to which a binding B is stitched by a line of stitching S. It will be noted that the edges of the binding are turned in. The material is fed to the needle by means of upper and lower feed dogs which are so constructed as to co-operate in clamping the material and moving it a stitch length, after which they release the material and return through an idle movement for the next feeding movement. The upper feed dog is indicated at 9 and the lower feed dog is indicated at 10. This upper feed dog, as shown in Fig. 4, is carried by a feed bar 11 which is pivoted at 12 to a feed rocker 13 which is moved back and forth by a suitable connection with a crank disk on the end of the main shaft which is indicated at 14. These parts are of the usual construction and have not been illustrated in detail. The feed bar 11 is raised and lowered by means of an eccentric 15, mounted on the shaft 14. The feed dog is carried by a bracket 16, which is secured by a screw 17 to the feed bar 11. This bracket extends upwardly to a point above the work support. The feed dog 9 has a shank 18, which extends laterally and then vertically downwardly and fits in a curve in the bracket 16. The shank of the feed dog is secured in the bracket by a screw 19. It will be noted that the upper feed dog lies wholly at one side of the needle 3 and has an upturned end 20 to facilitate its movement over the fabric without catching in the same. The lower feed dog 10 is carried by a feed bar 21, which is likewise pivoted at

12 to the feed rocker 13, so that the two feed bars are moved back and forth by the same feed rocker and are given the same extent of movement. This feed bar 21 is raised and lowered by means of an eccentric 22, carried by the shaft 14, and oppositely set thereon from the eccentric 15. The feed bar 21 rests on the eccentric.

It will be noted, therefore, that when the main shaft 14 rotates, while the eccentric 15 is raising the feed bar 11, the eccentric 22 will be lowering the feed bar 21 and vice versa. Thus it is that the two feed dogs are moved so as to clamp the material and these eccentrics are timed relating to the rocking movements of the feed rocker so that after the material is clamped, it will be moved a stitch length, after which the feed bars are so moved as to separate the feed dogs from the material and while they are so separated they are moved forward through their idle movement to a position for again engaging the material.

The lower feed dog 10 is directly beneath the feed dog 9 and lies wholly at one side of the needle 3. The feed dogs work through slots in the throat plate 23 of the work support, as indicated in Figs. 6 and 7. The throat plate has a solid section in the region of the needle and at the right-hand side of the two feed dogs 9 and 10. This solid section has a needle throat, of course, through which the needle passes.

As a means for holding the fabric on the work support during the idle movement of the feed dog, I have provided a presser foot 24, which is carried by a presser bar 25, of the usual construction. Said presser bar is moved downwardly by means of a spring 26, and can be raised by a hand lever 27. Said presser foot includes a sleeve portion 28 which is clamped to the lower end of the presser bar 25. It also includes a forwardly projecting arm 29 at the lower end of which is a rigid portion or member 30, and projecting laterally from the said rigid member is the foot portion 31, which is provided with a cut away part forming a recess 32 for the needle. Said rigid portion 30 also extends downwardly, as indicated at 30^a in Figs. 6 and 7 of the drawings. Directly beneath this presser foot 24 is the rigid part of the throat plate, as shown in Figs. 6 and 7, so that the presser foot bears on the material and presses the material against the solid part of the throat plate. It will be noted from the drawings that the depending portion 30^a extends below the edge of the fabric being stitched and is so disposed as to serve as an edge guide for the material being stitched.

As a means for raising the presser foot to permit the feed of the material, I have provided the feed bar 21, which carries the lower feed dog, with a bracket 33 which is secured to the feed bar by a screw 34 passing through a slot in the bracket. This bracket is provided with an upwardly extending arm 35, which lies directly beneath the rigid portion 30 of the presser foot. When the lower feed dog is raised into engagement with the material for the purpose of feeding the same, this bracket 35 will be brought up into engagement with the section 30^a of the presser foot and will raise the presser foot. The bracket 35 has its upper face flat so that the part 30^a slides thereon. Therefore, the raising of the presser foot does not interfere in any way with the horizontal movements of the feed bar for feeding the material. It will be obvious, therefore, that the presser foot is raised when the lower feed dog comes up into engagement with the material and will be held raised during the feeding movement. Then when the feed dog drops for its idle return stroke the presser foot will be dropped on to the material and the material will be clamped against the work support at this time. It is while the material is clamped on the work support by the presser foot that the needle penetrates the material, the stitch is formed and the needle is retracted. The presser foot, therefore, will strip the material from the needle as it is raised and hold the material down on the work support until it is again clamped by the feed dogs.

My machine is particularly adapted for putting a binding on a fabric, and I have provided a binding guide for the binding strip B, which is of the well-known English binder type. Said binder is indicated at 36. Said binder is secured by screws 37—37 to a supporting plate 38, which in turn is secured to the work support of the machine. The binding strip passes into the binder in the direction of the arrow *a*, Fig. 3, and is thence turned at right angles and passes in the direction of the small arrow *b*, which is, of course, the direction of feed. The work support is cut away so as to permit the binding strip to be turned about the edge of the fabric, as indicated in Figs. 5, 6 and 7.

It will be noted that the delivery end of the binder is right close to the front end of the presser foot and almost directly in front of the needle. Furthermore, the presser foot is very narrow and, as a result, with my machine, I am able to turn very sharp corners or curves. Then again, it will be noted that the lower feed dog engages the presser foot and lifts it free of the material before the lower feed dog reaches its extreme upward movement. As a result, the material is freed from the pressure of the presser foot and also of both feed dogs for a brief period, and during this time, the needle is penetrating the material so that the operator can readily turn the material about the needle as a pivot, and this aids greatly in turning

sharp corners or curves. The feed dogs, however, will clamp the material before the needle is withdrawn therefrom, and therefore, the feed dogs will operate to positively feed the material, and the binding will be held properly positioned about the edge of the fabric, either by the needle, the presser foot or the feed dogs, during the entire period that it is being stitched. The binding being stitched to the fabric, of course, will be carried along with the fabric.

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 my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination of a work support, stitch-forming mechanism including a single reciprocating needle, a feeding mechanism including an upper feed dog and a lower feed dog, said feed dogs being located at one side of said needle and operating to clamp and feed the material which is being stitched, a presser foot at one side of said feed dog adjacent the needle and adapted to cooperate with the work support in the holding of the material during the idle stroke of the feed dogs, said presser foot having a depending member rigid therewith projecting beneath the plane of the work support and serving to guide the edge of the material, said lower feed dog having an upwardly projecting portion adapted to freely engage the depending portion on the presser foot for raising the presser foot, said depending member on the presser foot and said upwardly projecting portion of the feed dog being so formed and timed as to lift the presser foot from the material before the feed dog clamps the material, and while the needle is still in the material on its retracting stroke, whereby the material may be turned about the needle as a pivot to aid in turning sharp corners or curves.

2. The combination of a work support, stitch forming mechanism including a single reciprocating needle, a feeding mechanism including an upper feed dog and a lower feed dog, said feed dogs operating to clamp and feed the material which is being stitched, a presser foot cooperating with the work support in holding the material during the idle stroke of the feed dogs, said presser foot having a depending member projecting beneath the plane of the work support and serving to guide the edge of the material, said lower feed dog having means adapted to freely engage the depending portion of the presser foot for raising the presser foot, said depending member on the presser foot and said raising means on the feed dog being so formed and timed as to lift the presser foot from the material before the feed dog clamps the material and while the needle is still in the material on its retracting stroke, whereby the material may be turned about the needle as a pivot to aid in turning sharp corners or curves.

In testimony whereof, I affix my signature.

NATHAN E. HANSON.