June 21, 1932. K. MAIER 1,864,502

FEEDING MECHANISM FOR SEWING MACHINES

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FIG. 1.

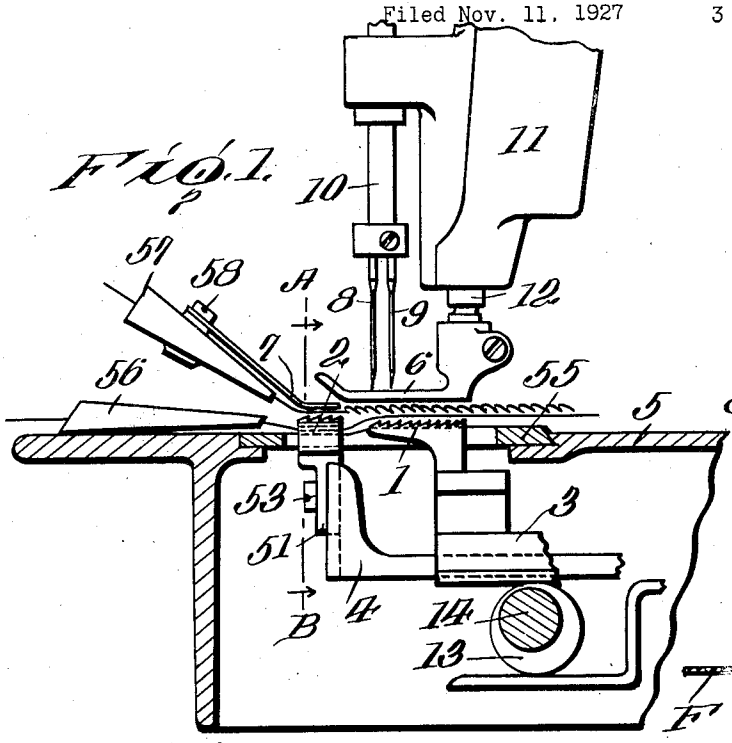


FIG. 3.

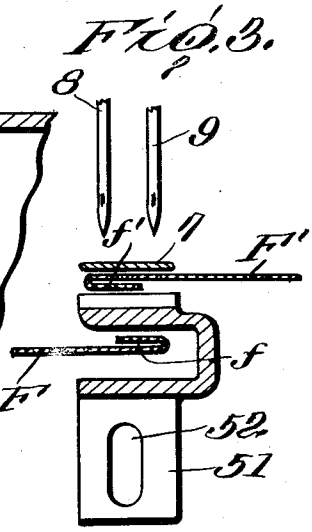


FIG. 2.

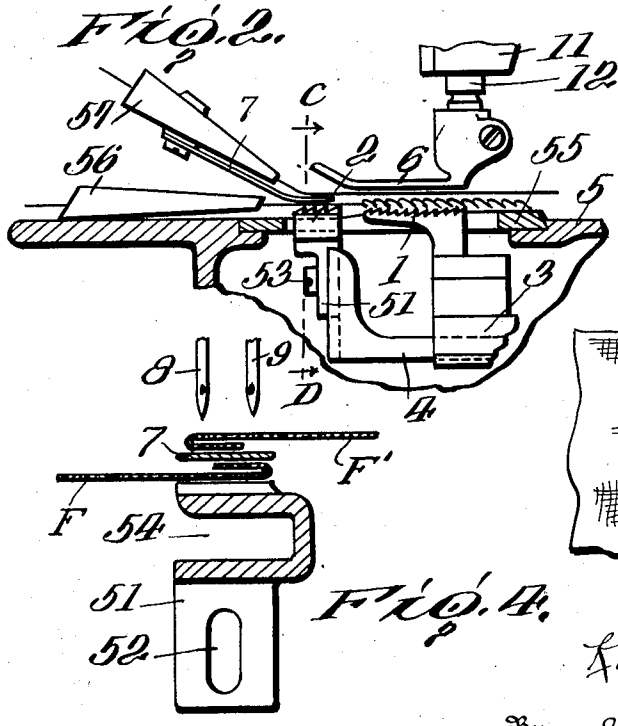
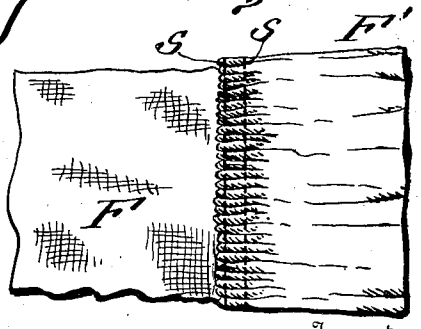


FIG. 4.

FIG. 5.



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FEEDING MECHANISM FOR SEWING MACHINES

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FIG. 6.

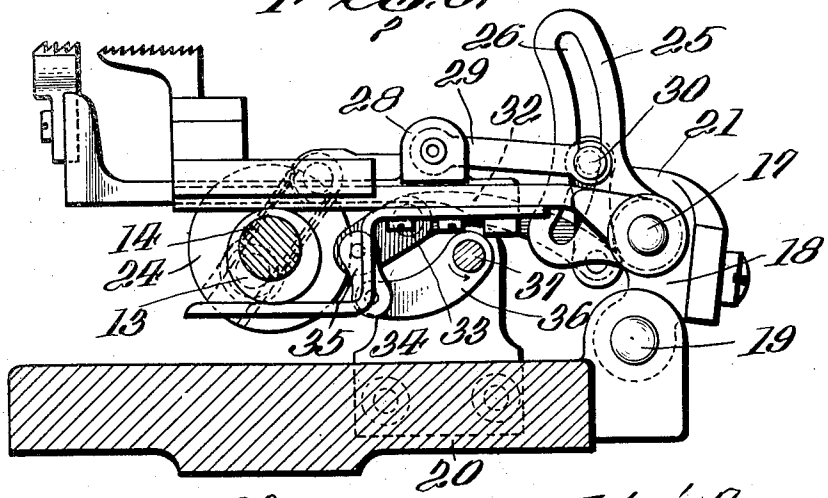
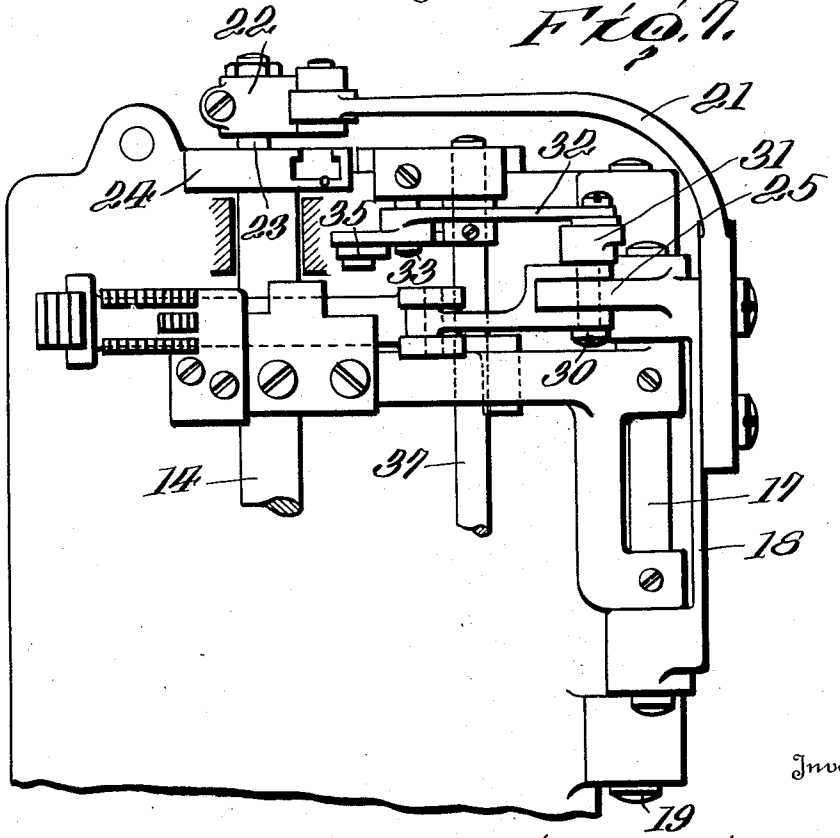


FIG. 7.



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FEEDING MECHANISM FOR SEWING MACHINES

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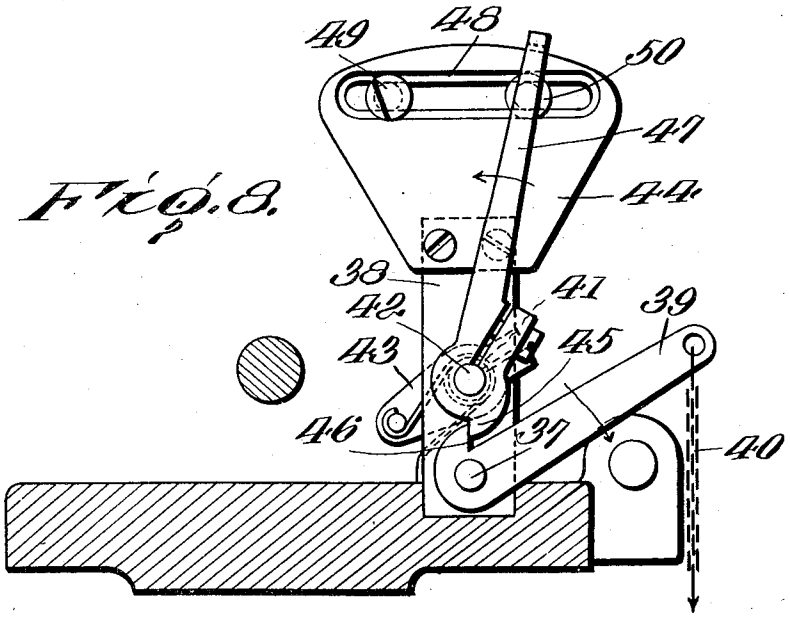
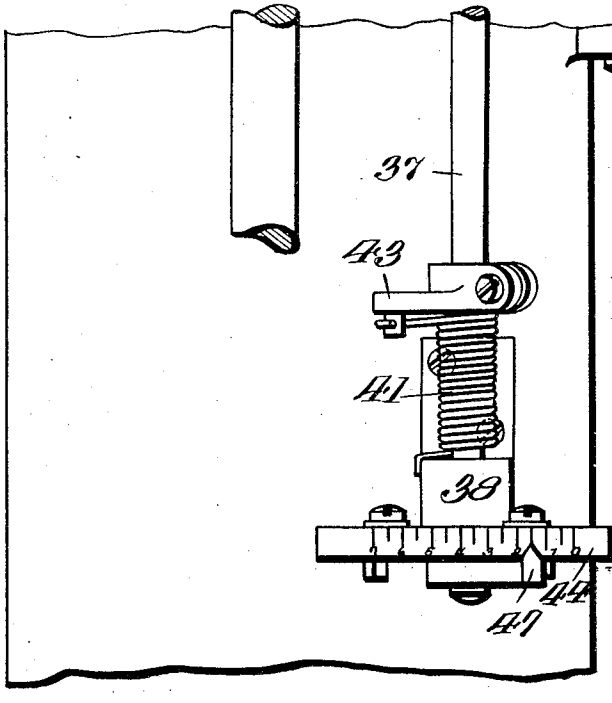


FIG. 8.



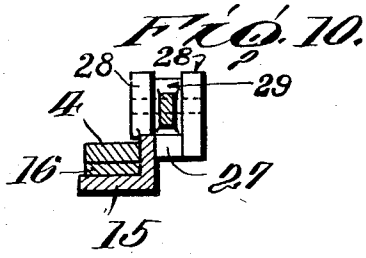


FIG. 10.

FIG. 9.

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UNITED STATES PATENT OFFICE

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FEEDING MECHANISM FOR SEWING MACHINES

Application filed November 11, 1927, Serial No. 232,617, and in Germany November 27, 1926.

The invention relates to new and useful improvements in feeding mechanisms for sewing machines, and more particularly to a feeding mechanism having a main feed dog and an auxiliary feed dog.

An object of the invention is to provide a feeding mechanism of the above type wherein the auxiliary feed dog is located in front of the main feed dog and in front of the stitch forming mechanism, and devices cooperate therewith whereby a strip of fabric may be passed from the front of the machine, either below the auxiliary feed dog, so as not to be engaged thereby, or above the feed dog, so as to be engaged and fed to the stitching mechanism in a gathered form.

A further object of the invention is to provide a machine of the above type with a yielding device for cooperating with the auxiliary feed dog with which is associated a fabric guide constructed so that the yielding device may be placed either above or below the fabric guide.

A further object of the invention is to provide a machine of the above type with means for moving the auxiliary feed dog back and forth, which is capable of adjustment so that the auxiliary feed dog may be given a feed stroke of the same length as the main feed, or a feed stroke of greater length than the main feed dog.

A still further object of the invention is to provide a machine of the above type wherein the means for varying the throw of the auxiliary feed dog is controlled by a treadle, and is capable of being shifted while the machine is in operation.

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 vertical sectional view through a portion of the machine substantially on the line of feed;

Fig. 2 is a view similar to Fig. 1, but showing a modified arrangement of the yielding device which cooperates with the auxiliary feed dog;

Fig. 3 is an enlarged transverse sectional view on the line A—B of Fig. 1 showing more or less diagrammatically, the needles, the auxiliary feed dog, the yielding device cooperating therewith, and one arrangement of the fabric sections which are being stitched;

Fig. 4 is an enlarged transverse sectional view on the line C—D of Fig. 2;

Fig. 5 is a plan view showing a portion of a seam adapted to be made with the improved feeding mechanism;

Fig. 6 is a vertical sectional view through a portion of the machine, and showing the operating mechanism for the feed dogs;

Fig. 7 is a plan view of the parts shown in Fig. 6;

Fig. 8 is a vertical sectional view showing the treadle controlled means for varying the throw of the auxiliary feed dog;

Fig. 9 is a plan view of the parts shown in Fig. 8, and

Fig. 10 is a vertical sectional view through the feed bars and the link adjacent to the connection of the link to the feed bar.

The invention is directed broadly to a feeding mechanism for sewing machines which includes a main feed dog and an auxiliary feed dog mounted on feed bars located beneath the work support. The feed bars are raised and lowered by an eccentric which simultaneously raises and lowers both feed bars. The main feed bar is connected to the usual type of feed rocker which imparts a feeding movement to the main feed dog. The auxiliary feed bar is connected to the feed rocker through a train of mechanism which may be set so as impart a different movement to the auxiliary feed dog from that imparted to the main feed dog. The auxiliary feed dog is located in front of the needles, and an independent yielding device cooperates with the auxiliary feed dog. A presser foot cooperates with the main feed dog. The auxiliary feed dog is constructed so that a strip of fabric may be directed between the auxiliary feed dog and the yielding device, in which case, the strip will be fed by the auxiliary feed dog, and if the feeding movements of the auxiliary feed dog are of greater extent than those of the main feed dog,

then the strip of fabric will be gathered. The strip of fabric may be passed underneath the auxiliary feed dog from the front of the machine, after which the strip passes between the main feed dog and the presser foot. In this case, the auxiliary feed dog is inactive on the strip which passes beneath the same and will not be gathered. Furthermore, the auxiliary feed dog may, at the same time, be operating upon the upper strip for gathering the same. The means for imparting the feeding movement to the auxiliary feed dog is capable of being adjusted to various set positions for varying the length of the stroke of the auxiliary feed dog, and manually controlled means is provided for shifting this mechanism. This may be accomplished without stopping the machine.

Referring more in detail to the drawings, the improved feeding mechanism as shown includes a main feed dog 1 and an auxiliary feed dog 2. The main feed dog is mounted on a feed bar 3, while the auxiliary feed dog is mounted on a feed bar 4. These feed bars are located beneath the work support 5. A presser foot 6 cooperates with the main feed dog, and a yielding device 7 cooperates with the auxiliary feed dog. The stitching mechanism may be of any desired character, and as shown, includes two needles 8 and 9, carried by the needle bar 10, which is mounted for reciprocation in the needle head 11 of the usual construction. The presser foot 6 is carried by a presser bar 12.

Both of the feed bars 3 and 4 are raised and lowered by an eccentric 13 mounted on a main shaft 14. The two feed bars are simultaneously raised and lowered. The feed bar 3 has a laterally extending portion 15 resting on the eccentric 13. The auxiliary feed bar 4 rests on this lateral extension 15, and if desired, a suitable wear plate 16 may be placed between these parts. When the main feed bar is raised by the eccentric, the auxiliary feed bar will likewise be raised. The main feed bar is pivoted at 17 to a feed rocker 18 which in turn is pivotally supported at 19 by the bed plate 20 of the machine. The feed rocker 18 is oscillated by means of an arm 21 connected to a link 22 which cooperates with a crank 23 mounted for radial adjustment on a disk 24 which in turn is carried by the main shaft 14. This means for oscillating the feed rocker is of the usual construction.

The auxiliary feed bar receives its back and forth movements from the feed rocker 18. The feed rocker 18 is provided with a bracket arm 25 which extends above the pivot point 17 of the main feed bar to the feed rocker. This bracket arm 25 is provided with a segmental slot 26. At the rear end of the auxiliary feed bar 4 there is a laterally projecting member 27 (see Fig. 10). This laterally projecting member is provided with spaced lugs 28. A link 29 is located between these lugs and pivoted thereto. This link 29 is forked at its rear end to straddle the bracket arm 25. A stud 30 passes through the forked end of the link and the slot 26. The stud 30 is carried at the upper end by a link 31. This link is mounted on a lever 32 which is fulcrumed at 33 to a bracket 34 secured to the bed plate. The other end of the lever 32 is connected to a link 35. This link 35 is in turn pivoted to an arm 36 carried by the shaft 37. The shaft 37 is mounted at one end in the bracket 34, and at its other end in a bearing bracket 38. The shaft 37 on the end opposite that carrying the arm 36 is provided with an arm 39. This arm 39 is connected through a suitable flexible means 40 with a knee shift or treadle so that the arm 39 may be manually shifted. A spring 41 is mounted on a shaft 42 which is supported by the bearing bracket 38. On the outer end of this shaft, is an arm 43 which is rigidly attached to the shaft. One end of the spring is attached to this arm, while the other end of the spring is attached to the bearing bracket 38. The spring tends to turn the shaft 42 in a clockwise direction. On the end of the shaft 42, outside of the bearing 38, is an arm 47. This arm 47 is provided with a lug 45 which is adapted to engage a lug 46 carried by the arm 39 which is attached to the shaft 37. When the arm 39 is swung in a clockwise direction, the lug 46 engaging the lug 45 will turn the shaft 42 in a counter-clockwise direction, and this will wind up the spring 41. When the treadle or knee shift is released, then the spring will at once turn the shaft 42 so as to raise the arm 39 and turn the shaft 37 in the opposite direction.

The depressing of the arm 39 which turns the shaft 37 in a clockwise direction will cause the arm 36 carried thereby to raise the left-hand end of the lever 32, depressing the other end thereof, and this, through the link 31, will move the stud 30 downward in the slot 26. The downward movement of the stud in the slot will place the stud closer to the pivotal point of the feed rocker, and this will decrease the extent of movement imparted to the auxiliary feed dog. On the other hand, when the treadle is released, the spring will automatically, through the parts referred to, raise the stud 30 in the slot 26, and increase the stroke of the auxiliary feed dog relative to the stroke of the main feed dog. Mounted on the bearing bracket 38 is a plate 44. This plate 44 is provided with a slot 48 in which are adjustably mounted stops 49 and 50. The arm 47 is shown in Fig. 8 as in engagement with the stop 50. The stop 50 limits the swinging movement of the arm 47 under the action of the spring 41 and this determines the upward movement of the arm 39 and the upward movement of the stud 30 in the slot 26. When the treadle is depressed the arm 47 is swung in the direction of the

arrow until it contacts with the stop 49 and this limits the downward movement of the arm 39 and also the downward movement of the stud 30. By shifting these stops 49 and 50, the stroke of the auxiliary feed dog may be changed to the desired predetermined strokes. The auxiliary feed dog may be set so as to gather the material, or so as to move to the same extent as the main feed dog, and thus the material will not be gathered. As a matter of fact, it may be set so as to move to a slightly shorter distance than the main feed dog, thus putting a slight drag on the material, if desired. The slot 26 is curved about the pivotal connection between the link 29 and the auxiliary feed bar, or substantially so, and therefore, when the stud 30 is adjusted in the slot 26, the working position, that is, the position of back and forth movement of the auxiliary feed dog will not be changed appreciably.

The auxiliary feed dog 2 includes a shank portion 51 provided with a vertical slot 52 and a screw 53 passing through said slot secures the auxiliary feed dog to the auxiliary feed bar 4. The shank of the auxiliary feed dog between the lower end thereof and the feeding portion of the dog is bent laterally, so as to provide a space 54 which is of slightly greater width than the width of the auxiliary feed dog. This space is directly beneath the feeding surface of the auxiliary feed dog. Mounted on the work support 5 is a throat plate 55 having feed slots for the feed dogs to work through. The front portion of this throat plate is slightly depressed, and the space 54 in the auxiliary feed dog is substantially on a line with the upper face of the front portion of the throat plate and the portion of the work support in front thereof.

As shown in Figures 1 and 3, a strip of fabric F is shown as having its edge *f* folded, and passed through the space in the auxiliary feed dog. This fold in the edge of the fabric is accomplished by an ordinary folding guide indicated at 56 in the drawings. The upper section of fabric F′ is shown as having its edge folded as indicated at *f*′, and this section of the fabric passes over the auxiliary feed dog and beneath the yielding device 7. A suitable folding guide 57 is provided for this upper section F′ of fabric. This folder is supported in a suitable way, and the yielding device is preferably attached to the upper face thereof by means of a screw 58. Thus it is that the fabric passing through the folding guide 57 will pass between the yielding device and the auxiliary feed dog. In Fig. 4 of the drawings, I have shown the fabric strip F as passing over the auxiliary feed dog and beneath the yielding device 7. The yielding device is also shown as attached to the under side of the folding guide 57 in Fig. 2, and therefore, the upper strip of fabric F′ passes over the yielding device, and then underneath the presser foot. When the parts are arranged as shown in Figures 1 and 3, then the auxiliary feed dog will gather the folded edge of the upper strip of fabric only, provided of course, that it is set for the feed stroke which is greater than that of the main feed dog. When the parts are positioned as shown in Figures 2 and 4, then the auxiliary feed dog will gather the folded edge portion of the lower strip of fabric only, under the same conditions of operation of the feed dog. In Fig. 5, I have shown an article produced on the machine with the parts arranged as shown in Fig. 3. The strip of fabric F′ has its folded edge gathered and stitched to the folded edge of the fabric section F by lines of stitching *s*, *s*, and the edge of the fabric section F is smooth and ungathered.

It will be understood, of course, that both fabric sections may pass between the yielding device and the auxiliary feed dog, and the auxiliary feed dog set so as to have imparted thereto, the same length of stroke as the main feed dog, in which case, the machine would perform ordinary plain sewing, without gathering either strip of fabric. When the machine is set for gathering, it will be obvious, furthermore, that by depressing the treadle or operating the knee shift, the stroke of the auxiliary feed dog may be varied without stopping the machine, and thus it is that the pattern work can be accomplished, the fabric sections being gathered to a greater or less extent as the seam proceeds, or the gathering entirely suspended, as desired.

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

Having thus described the invention, what I claim as new and desire to secure by Letters-Patent, is—

1. A feeding mechanism for sewing machines including a work support, a main feed dog, a presser foot cooperating with said main feed dog, an auxiliary feed dog located beneath the work support and in front of the main feed dog, a yielding device cooperating with the auxiliary feed dog, means for supporting and imparting feeding movements to said main feed dog, means for supporting and imparting movements to said auxiliary feed dog, said auxiliary feed dog being constructed so as to provide a space beneath the fabric engaging portions of the feed dog whereby a fabric strip may be guided beneath the feeding surface of said auxiliary feed dog and free from engagement therewith.

2. A feeding mechanism for sewing machines including a work support, a main feed dog, a presser foot cooperating with said main feed dog, an auxiliary feed dog located beneath the work support and in front of the

main feed dog, a yielding device cooperating with the auxiliary feed dog, means for supporting and imparting feeding movements to said main feed dog, means for supporting and imparting movements to said auxiliary feed dog, said auxiliary feed dog being constructed so as to provide a space beneath the fabric engaging portions of the feed dog whereby a fabric strip may be guided beneath the feeding surface of said auxiliary feed dog and free from engagement therewith, said auxiliary feed dog being spaced from said main feed dog so that the strip passing beneath the same may be led over the feeding surface of the main feed dog.

3. A feeding mechanism for sewing machines including a work support, a main feed dog, a presser foot cooperating with said main feed dog, an auxiliary feed dog located beneath the work support and in front of the main feed dog, a yielding device cooperating with the auxiliary feed dog, means for supporting and imparting feeding movements to said main feed dog, means for supporting and imparting movements to said auxiliary feed dog, said auxiliary feed dog including a shank portion located at one side of the fabric engaging portion of said auxiliary feed dog so as to provide a space beneath the fabric engaging portions of the feed dog whereby a fabric strip may be guided beneath the auxiliary feed dog and free from engagement therewith, said auxiliary feed dog being spaced from said main feed dog so that the strip passing beneath the same may be led over the feeding surface of the main feed dog.

In testimony whereof, I affix my signature.

KARL MAIER.