

Jan. 2, 1951

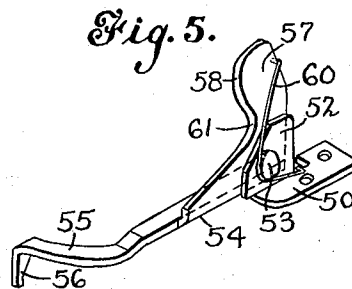
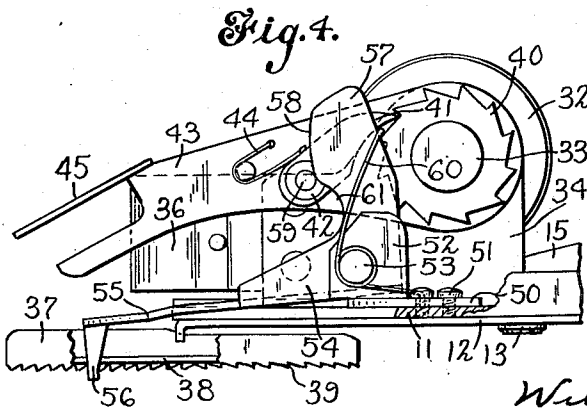
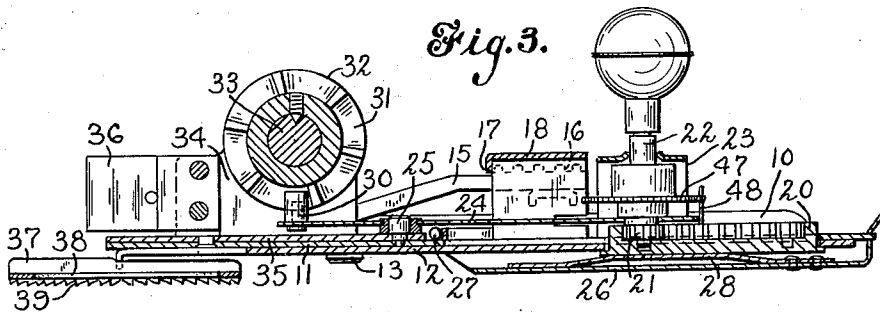
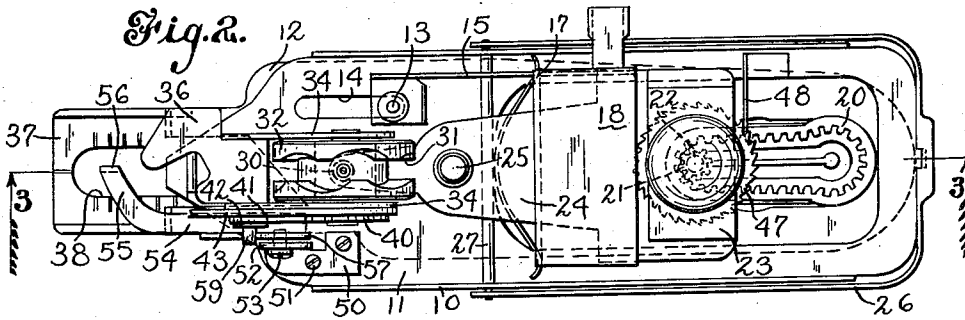
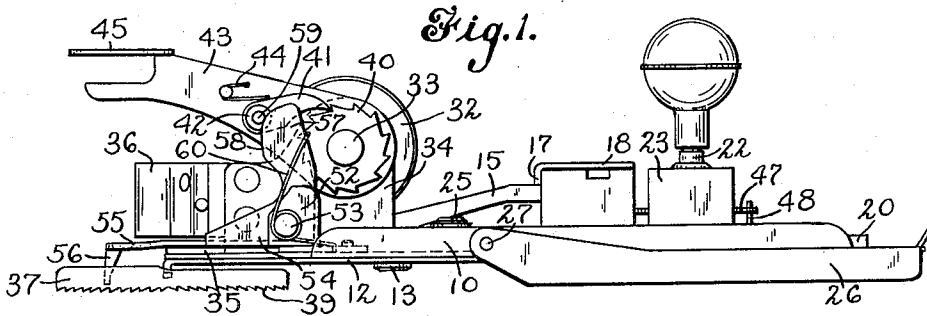
W. F. ALLENBY

2,536,620

CLOTH-HOLDING DEVICE FOR BUTTONHOLE ATTACHMENTS

Filed Oct. 22, 1949

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 6.

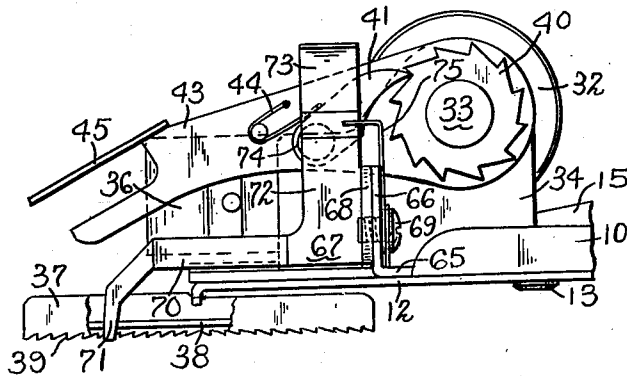


Fig. 7.

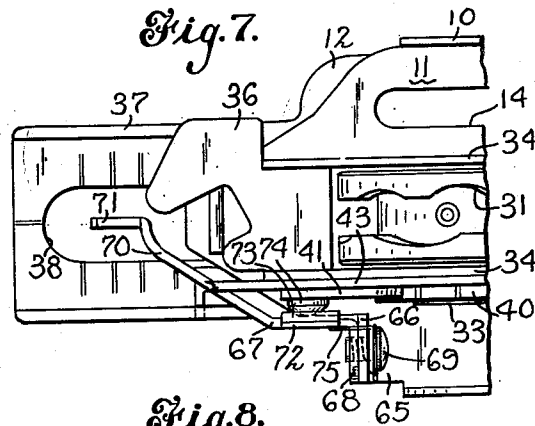
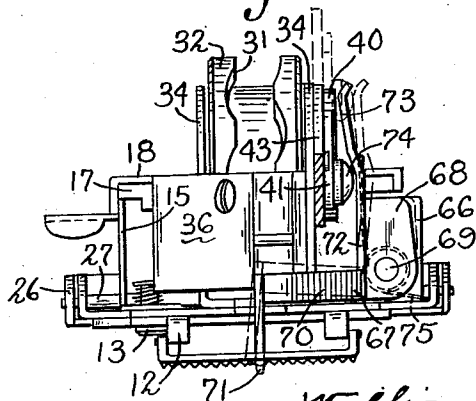


Fig. 8.



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# UNITED STATES PATENT OFFICE

2,536,620

## CLOTH-HOLDING DEVICE FOR BUTTON-HOLE ATTACHMENTS

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10 Claims. (Cl. 112-77)

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This invention relates to sewing-machine attachments and more particularly to a cloth-holding device for certain of such attachments, or a means to prevent the cloth being pulled upwardly by the needle when it is withdrawn from the cloth, or other material being sewed, upon the upward movement of the needle bar.

As illustrated, the invention is applied to a buttonhole attachment designed to be attached to the usual household sewing machine after removal of the usual presser foot, the attachment being secured to the usual presser bar. In the use of certain of these attachments, such for example as a device for stitching buttonholes, where the feeding foot must be provided with a relatively large slot through which the needle operates, difficulty is some times encountered in that the cloth which is being sewed will tend to "blouse" or be drawn upwardly with the upward movement of the needle. This is due to the fact that the edges of the slot in the feeding foot do not lie closely adjacent the needle and, therefore, cannot hold the cloth downwardly upon the machine bed at points close to the needle.

It is contemplated by the present invention to provide a movable cloth-holding member which will be carried by the attachment and which is provided with a holding foot, or end portion, which will lie relatively close to the needle. This member is actuated or moved by the fork arm, or some other movable part of the attachment, so that when the fork arm descends to drive the needle through the material being sewed the forward or operating end of the holding member will be moved downwardly against the cloth or material and will remain in this position during the initial portion of the upward movement of the needle. Thus, the holding member will prevent the lifting of the cloth by the needle until the latter is loosened from the material, at which time, the holding member will be raised from the cloth to permit release of the latter for the feeding operation.

In other words, while the cloth is held down against the bed when the needle begins its upward stroke so that it will be loosened from the cloth and not draw the latter upwardly with it, the cloth will be released after the needle is drawn therefrom so that it will not be gripped or held during the feeding movements of the cloth and, therefore, will not interfere with these feeding movements. The hold-down device being actuated from the fork arm or some other movable part of the device which is in turn actuated by the fork arm, will be synchronized in its move-

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ment with that of the needle bar and with the feed mechanism so as not to interfere with the normal sewing operations.

One object of the present invention is to provide a cloth-holding device for a sewing-machine attachment such as a buttonhole attachment.

Another object of the invention is to provide a cloth-holding attachment for a buttonhole or similar sewing-machine attachment which will engage the cloth being sewed and hold the same against "blousing," but at the same time release the cloth so as not to interfere with the proper feeding of the latter.

Still another object of the invention is to provide a cloth-holding device for a buttonhole or similar attachment which device comprises a substantially L-shaped or bell-crank lever pivoted upon the frame of the attachment, the lever having a forward end or foot to engage the cloth adjacent the needle of the sewing machine, and which will be operated or moved pivotally by a member attached to the fork arm so that it will engage the cloth at the proper time to prevent the latter being drawn upwardly by the needle, and thereafter release the cloth for the cloth-feeding operation.

A still further object of the invention is to provide a cloth-holding device for buttonhole or like attachments, which device comprises a lever pivoted on the frame of the attachment having an end or foot portion to engage the material being sewed, this end or foot portion being raised positively from contact with the material during a part of the upward movement of the fork arm of the sewing machine and which, when released by a downward movement of the fork arm, will be urged downwardly against the material by spring tension.

Still another object of the invention is to provide a hold-down device for buttonhole attachments for sewing machines, which device is pivoted to the frame of the attachment upon an axis extending longitudinally thereof and is provided with an upstanding portion or arm which may be cammed outwardly by an upward movement of the needle bar so as to raise the holding foot from engagement with the material.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a side elevational view of a buttonhole attachment having my cloth-holding device applied thereto;

Fig. 2 is a top plan view of the same;

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Fig. 3 is a sectional view on line 3—3 of Fig. 2; Fig. 4 is an enlarged elevational view of the front portion of the attachment, some parts being broken away for the sake of clearness;

Fig. 5 is a view of the hold-down lever and the bracket upon which it is secured;

Fig. 6 is a view similar to Fig. 4 showing a modified form of my invention;

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

Fig. 8 is a front elevational view thereof.

As illustrated in the drawings, the buttonhole attachment comprises a frame 10 having a base plate 11 upon the under side of which is mounted a feed blade 12. The feed blade is pivoted to the plate by the pivot pin 13, which pin is slidable in the slot 14 in the plate 11 so as to adjust the position of the pivot pin and thereby adjust the lateral throw of the forward portion of the feed blade. The pivot pin 13 may be adjusted in the slot 14 by means of the adjusting arm 15 attached to the pivot pin at its forward end and provided adjacent its rear end with a plurality of teeth 16 designed to be engaged with the flanged edge 17 of a housing member 18 mounted upon the frame.

Secured to the feed blade 12 is an endless rack member 20, the teeth of which are engaged by those of a pinion 21 mounted upon a shaft 22, which shaft is rotatably mounted in a housing 23 carried by an actuating lever 24 pivoted at 25 upon the frame plate 11.

The rack member 20 may be held in place by a cover plate 26 pivoted to the frame at 27 and provided with a flat spring member 28 which engages the lower side of the rack member 20.

The lever 24 oscillates in a substantially horizontal plane about the pivot pin 25 and at the forward end of this lever is provided a pin or roller 30 which acts as a cam follower and is disposed in the cam track 31 of a cam wheel 32, this cam wheel being secured to a shaft 33 rotatably mounted in spaced upstanding frame members 34 which may be formed integrally with a plate 35 riveted or otherwise secured to the base plate 11. Also secured to the members 34 is an adapter 36 by which the device may be secured to the presser bar of a sewing machine after the presser foot has been removed.

It will be obvious from the above arrangement that when the cam wheel 32 is rotated, the lever 24 will be oscillated as will also the pinion 21 carried thereby, and the engagement of this pinion with the teeth of the rack 20 will effect oscillation of the feed blade and thereby effect lateral movements of the work due to the fact that a feeding foot 37 is carried at the forward end of the feed blade 12. As shown in Fig. 2, this feeding foot is provided with a relatively large oblong opening 38 through which the needle is designed to operate and this foot may be roughened as shown at 39 on its lower face so as to properly engage and move the material which is being sewed.

Secured to the shaft 33 is a ratchet wheel 40, the teeth of which are engaged by a pawl 41 pivoted at 42 to a fork arm 43 loosely mounted upon the shaft 33, this pawl being urged into engagement with the ratchet wheel by the spring 44. The fork arm 43 is provided with a bifurcated end 45 designed to be engaged with the needle bar of the sewing machine so that the arm 43 will be reciprocated upon reciprocation of the needle bar. This will effect step-by-step rotation of the ratchet wheel 40, and, therefore, of the shaft 33,

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and of the cam wheel 32 secured to this shaft. As has already been described, rotation of the cam wheel will effect lateral oscillation of the lever 24 and lateral feeding movements of the work.

Secured to the shaft 22 is a ratchet wheel 47, the teeth of which are adapted to intermittently engage a resilient pawl 48 fixed to the frame upon oscillation of the lever 24. The engagement of the teeth of the ratchet 47 by the pawl 48 during lateral movements of the lever 24 will effect step-by-step rotation of the shaft 22 and, therefore, of the pinion 21 carried thereby. This step-by-step rotation of the pinion 21, by its engagement with the teeth of the rack 20, causes longitudinal movements of the feed blade 12 to which the rack is secured, so as to effect longitudinal movements of the cloth for proper oblong stitching around the buttonhole.

The operation of the parts above described is substantially like that of the device shown in the Almquist Patent No. 2,482,607, granted September 20, 1949, so that no further description thereof is believed to be necessary. It will be apparent, however, that upon oscillation of the fork arm 43 by the needle bar of the sewing machine the mechanism will cause the material engaged by the feeding foot 37 to be moved laterally and at the same time feed longitudinally so that it will travel in a generally oblong path and effect a line of zig-zag stitches at each side of the buttonhole.

As shown more especially in Figs. 2, 4 and 5, a bracket 50 is secured to the base plate 11 by screws or rivets 51, this bracket having an upstanding part 52 to which is pivoted at 53 a hold-down lever 54 of generally L-shaped or bell-crank form. This lever is provided with a forward horizontally extended portion 55, the front end of which is turned downwardly to provide a downwardly extending holding foot 56. Adjacent the pivot 53, the lever is provided with an upstanding arm 57, the forward end of which is cam-shaped as shown at 58.

The forward cam-shaped portion 58 of the lever is engaged by a projection provided upon the fork arm 43, and in this case the projection may be provided by extending laterally, as shown at 59 in Fig. 2, the pivot pin 42 of the pawl 41.

It will, of course, be apparent that a separate projection may be provided upon the fork arm if desired. As the pin 59 is in engagement only with the forward face of the lever arm 57, it will move the latter in one direction only during oscillation of the fork arm which in this case is a clockwise or rearward direction. Movement of the lever arm 57 in the other direction is effected by a spring 60 coiled about the pivot 53 of the lever, the spring having one end in engagement with the lever arm 57 and its other end bearing against the bracket 50. It will be apparent, therefore, that the spring 60 will tend to urge the arm 57 in a forward direction so as to resiliently urge the holding foot 56 downwardly or against the material being sewed.

The forward cam face 58 of the lever arm 57 is so shaped that at the lower end of the downward stroke of the needle bar the pin 59 will be disengaged from the face of the arm 57 and will permit the spring 60 to urge the lever forwardly and maintain the holding foot 56 in engagement with the material. For this purpose, the lever arm 57 may be provided with an inwardly recessed portion 61 which will receive the pin 59 and operate as a dwell to permit a certain amount of movement of the fork arm at the

lower end of its stroke without effecting movement of the lever 54.

In Fig. 1 of the drawings, the fork arm is shown at the upper end of its stroke and it will be noted that the pin 59 is in engagement with the upper end of the lever arm 57 so that the holding foot 56 is in its upper position out of engagement with the material and the latter will be free for a feeding operation. When the fork arm travels downwardly, the pin 59 travels downwardly over the forward edge of the lever portion 57 retaining the holding foot 56 out of engagement with the cloth until it passes over the cam surface 58. At this time, the pin travels into the recess 61 and releases the lever 54 so that the holding foot is urged into engagement with the material by the spring 60. The fork arm may continue its travel downwardly as required and then begins its ascent. As soon as the pin 59 is raised to a sufficient extent to engage the cam surface 58, the holding foot 56 is again raised from the cloth and, during the remainder of the ascent of the needle bar, it is held out of engagement with the cloth. By the time the pin 59 reaches the cam surface 58, the needle has been loosened from the material so that the latter will not be drawn upwardly with the needle.

In Figs. 6 to 8 of the drawings, I have shown a somewhat modified form of my invention in which the hold-down lever is pivoted to the frame upon an axis extending longitudinally thereof. In this instance a bracket 65 is secured to the plate 11, this bracket having an upstanding portion 66 extending transversely with respect to the longitudinal dimension of the attachment. A hold-down lever 67 is provided with a transversely extending flange 68 (Fig. 8) pivoted at 69 to the bracket member 65. The lever 67 is provided with a forwardly extending arm 70 carrying the hold-down foot 71 which extends into the elongated slot 38 of the feeding foot and is also provided with an upwardly extending arm 72 which, at its upper end, is bent inwardly as shown at 73 (Fig. 8).

The fork arm 43 is provided with a projection 74, which in this instance is the head of the pin upon which the pawl 41 is pivoted, and this projection engages the upper end 73 of the lever 67 to rock this lever about its horizontally disposed axis 69.

As shown in full lines in Fig. 8, the fork arm is in a lower position and it will be seen that the projection 74 is out of engagement with the upper end 73 of the arm 72 of the lever 67, and the holding foot 71 is in its lower position in engagement with the material. When the fork arm is raised, the projection 74 will engage the inner side of the member 73 and will cause the holding lever to be rocked about the pivot 69 to the dotted-line position shown in this figure. This will raise the holding foot 71 out of contact with the goods so as to free the cloth for a feeding operation.

A spring 75 is coiled about the pivot 69 and the upper end of this spring, being in engagement with the arm 72 of the holding lever 67, urges this arm in a counter-clockwise direction as shown in Fig. 8 so as to normally urge the holding foot down upon the material when the lever is released from engagement with the projection 74. It will be seen, therefore, that in this arrangement, also, the holding lever is urged upon the goods by spring pressure and is withdrawn positively from engagement with the

goods when the fork arm and needle bar are raised.

While I have shown and described some preferred embodiments of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What I claim is:

1. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, and means on the fork arm engaging said upwardly extending arm to move said foot upwardly.

2. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, means on the fork arm engaging said upwardly extending arm to move said foot upwardly, and spring means engaging said lever to urge said foot downwardly toward the cloth.

3. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, and a laterally extending member on the fork arm to engage the forward edge of said upwardly extending arm to move said foot upwardly.

4. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, and means on the fork arm engaging said upwardly extending arm to move said foot upwardly, the upwardly extending arm of said lever being disposed forwardly of the pivot of the fork arm.

5. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, said upwardly extending arm having a cam-shaped forward edge, and means on the fork arm to engage said edge and move said foot upwardly.

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6. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, means on the fork arm engaging said upwardly extending arm to move said foot upwardly, said means comprising a pin on the fork arm, a pawl pivotally mounted on said pin, and a ratchet wheel with which said pawl is engaged.

7. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, and means on the fork arm engaging said upwardly extending arm to move said foot upwardly, said lever being pivoted on an axis extending longitudinally of the frame.

8. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, and means on the fork arm engaging said upwardly extending arm to

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move said foot upwardly, said lever being pivoted on an axis extending longitudinally of the frame, said means comprising a laterally projecting member carried by the fork arm.

9. A sewing-machine attachment comprising a frame; a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine; a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, means on the fork arm engaging said upwardly extending arm to move said foot upwardly, said lever being pivoted on an axis extending longitudinally of the frame, and spring means engaging said lever to urge said foot downwardly toward the cloth.

10. A sewing-machine attachment comprising a frame, a fork arm pivoted thereon and adapted for connection with the needle bar of the sewing machine, a cloth-holding lever pivoted on the frame intermediate its ends, said lever being of L-shaped form and having an arm extending forwardly from its pivot and terminating in a cloth-engaging downwardly-extending foot, and having an arm extending upwardly from its pivot adjacent the fork arm, means on the fork arm engaging said upwardly extending arm to move said foot upwardly, said upwardly extending arm having a cam-shaped forward edge and said edge including a portion engaged by said means upon oscillation of the fork arm, and a portion lying free of engagement of said means.

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No references cited.