United States Patent

Adams

[15] **3,669,050**

[45] **June 13, 1972**

[54] **PUSH BUTTON PRESSER BAR RELEASE**

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[22] Filed: **May 25, 1971**

[21] Appl. No.: **147,100**

[52] **U.S. Cl.** **112/237**

[51] **Int. Cl.** **D05b 29/00**

[58] **Field of Search** 112/235, 236, 237, 238, 239, 112/240

[56] **References Cited**

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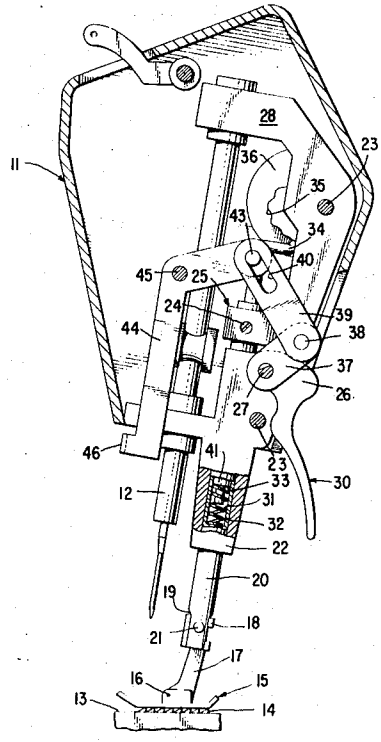
[57] **ABSTRACT**

A linkage arrangement operating on the presser bar assembly to facilitate the release and controlled descent of the presser foot, or the limited ascent of the presser foot upon the operator's depressing a lever readily accessible from the front of the sewing machine and immediately adjacent to the sewing area.

6 Claims, 6 Drawing Figures



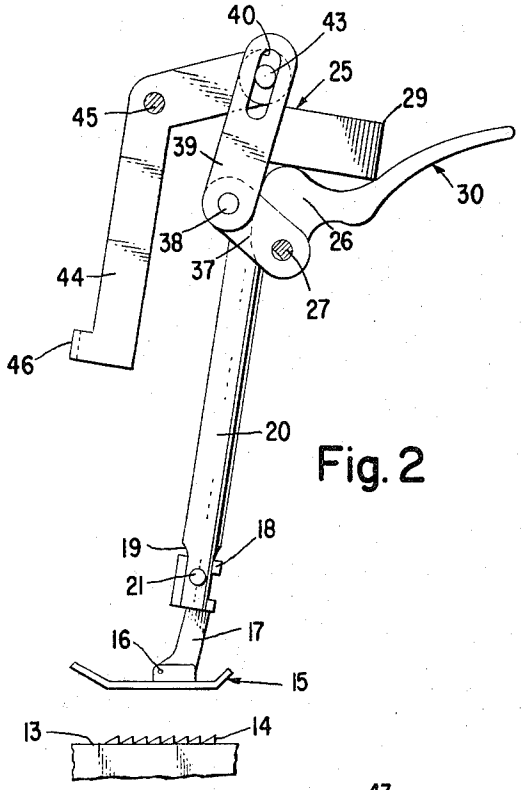


Fig. 2

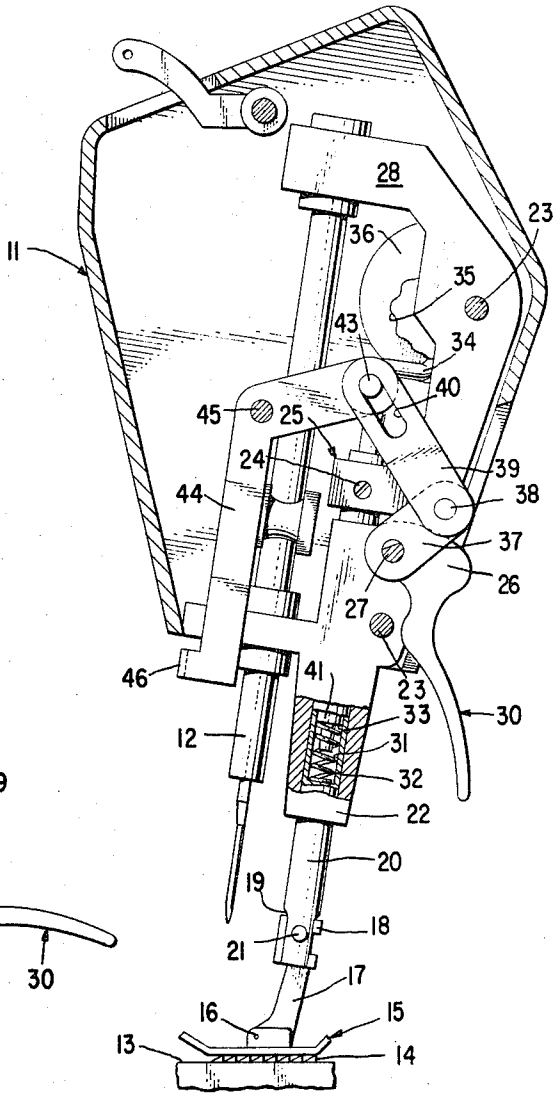


Fig. 1

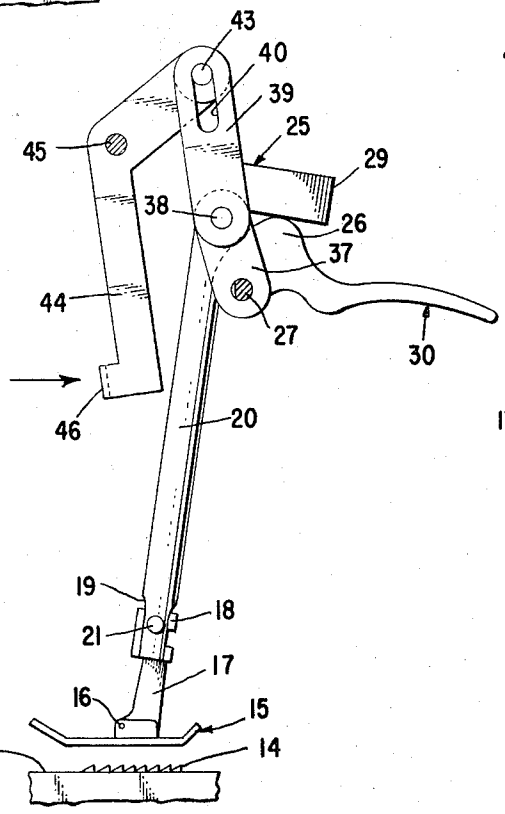


Fig. 3

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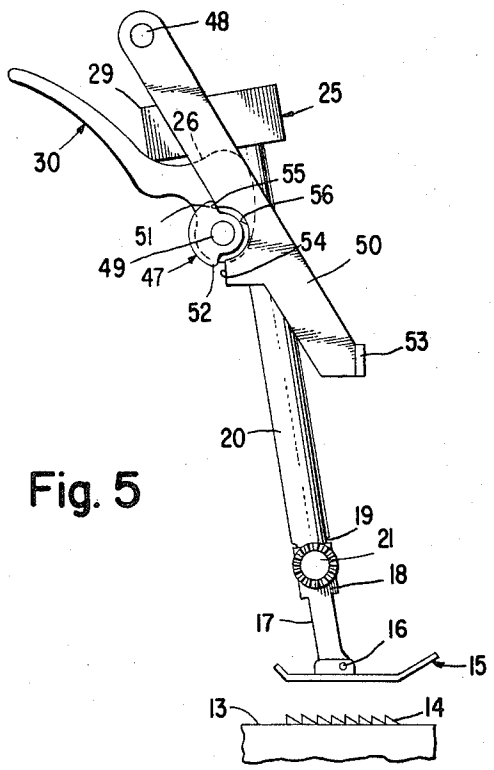

Fig. 5

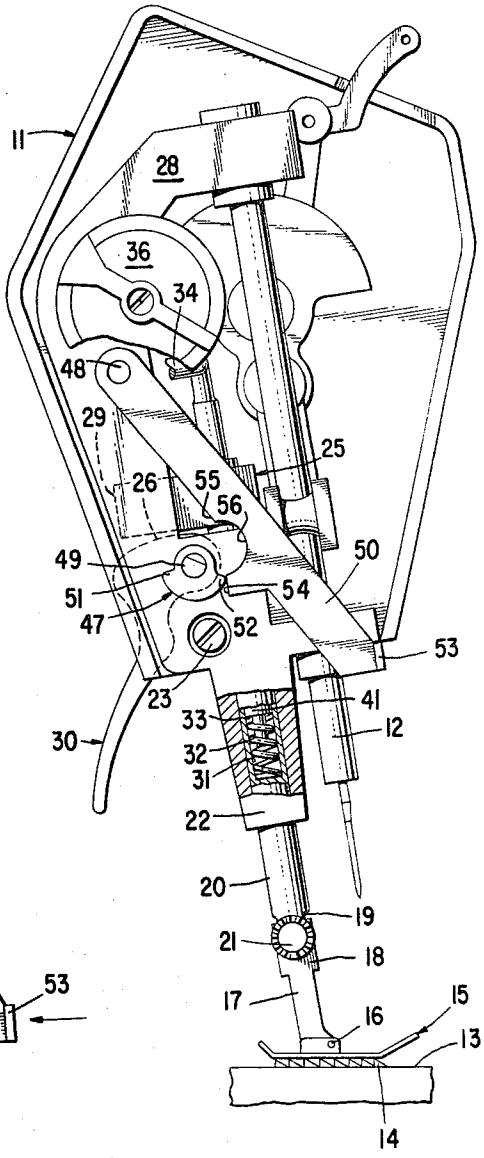

Fig. 4

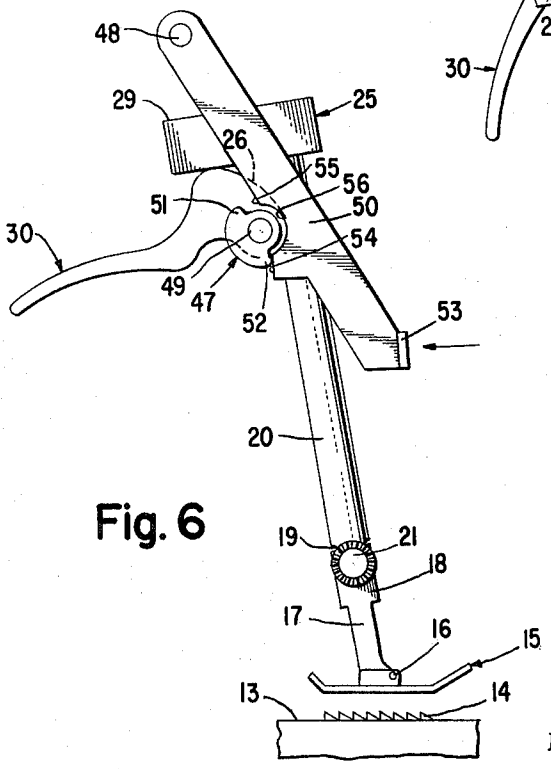

Fig. 6

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PUSH BUTTON PRESSER BAR RELEASE

BACKGROUND OF THE INVENTION

Sewing machines normally have the presser bar lifting lever located in the back of the machine to simplify the construction of the presser bar assembly by locating all the parts of this assembly in one area. A sewer having positioned the cloth under the raised presser foot is required to free one hand to reach behind the sewing machine to manipulate this lever to lower the presser foot. Frequently, the cloth will have to be repositioned because of some movement while being held by only one hand. In other machines the lever has been made more accessible by locating it closer to the sewing area, either on the front of the sewing machine or protruding from the side of the sewing machine head. In these machines, the problem still exists in that raising or lowering the presser foot generally entails sufficient movement of one hand of the operator or the application of sufficient force that she must free one hand from the work.

SUMMARY OF THE INVENTION

It is an object therefore of the invention to provide a presser bar release system located immediately adjacent to the sewing area.

It is a further object of the invention to provide a presser bar release system which may be actuated by an operator by using only one finger while the other fingers continue to control work fabric.

It is a still further object of the invention to allow the controlled lowering of the presser foot in response to movement of an operator's fingertip.

A still further object of the invention is to allow for minor repositioning of the fabric under the presser foot without requiring the operator to free more than the finger of one hand from the work adjacent to the presser foot.

Another object of the invention is to provide a presser bar release assembly which can be composed of a minimum number of inexpensive parts.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross sectional view of the bracket arm portion of a sewing machine having a preferred form of this invention applied thereto and showing the presser foot in the down position.

FIG. 2 is a view of the operative elements of the presser bar release system as shown in FIG. 1, but with the presser foot shown in the raised position.

FIG. 3 is a view similar to FIG. 2 but with the presser bar shown in the released position and indicating the manner in which the descent of the presser foot may be controlled.

FIG. 4 is a cross sectional view of the bracket arm portion of a sewing machine having a modified form of this invention applied thereto and showing the presser foot in the down position.

FIG. 5 is a view of the operative elements of the presser bar release system shown in FIG. 4, illustrating the presser foot in the raised position.

FIG. 6 is a view similar to FIG. 5, but showing the presser bar in the released position and indicating the manner in which the descent of the presser foot may be controlled.

DESCRIPTION OF THE FIRST EMBODIMENT

In FIG. 1 is shown an embodiment of the invention in the hollow sewing head portion 11 of a conventional sewing machine. The head portion 11 carries a needle bar 12 and overhangs a work supporting throat plate 13 through which projects a conventional feed dog 14 of a work feeding mechanism. Opposing the feed dog 14 is a presser foot 15 carried by a pivot pin 16 on a presser foot shank 17 which is formed with seat 18 embracing a slabbed portion 19 of a presser bar 20 and secured in place thereon by knurled clamp screw 21. The presser bar is journaled in a bushing portion 22

of a needle bar frame 28 affixed to the sewing head portion 11 by screws 23. Secured to the presser bar above the bushing portion 22 and within the hollow sewing head by a set screw 24 is a block 25 formed with a tang 29 embraced in a slot formed between the needle bar frame 28 and the sewing head portion 11 to prevent turning of the presser bar and presser foot. A presser bar lifting cam 26 having attached thereto a presser bar lifting lever arm 30 is affixed to a stud shaft 27 journaled in the sewing head portion 11 and needle bar frame 28, and is located directly beneath the block 25 to cooperate with the block when the presser bar lifting lever arm 30 and cam 26 are rotated, to elevate the presser bar 20 and consequently the presser foot 15 for removal and replacement of work material therebeneath. The presser bar 20 is formed with an upwardly open axial bore 31 within which is disposed a coil spring 32 which seats at its lower extremity against the bottom of the bore. At its upper extremity the coil spring 32 is constrained against a shoulder 33 on a shiftable abutment member 41 which fits snugly into the axial presser bar bore 31. At its upper end the shiftable abutment member 41 is formed with offset and outturned arms 34 terminating in a follower finger which is restrained in a peripheral groove in a spiral cam element 35 on a pressure regulating member 36 supported by a bracket affixed to the needle bar frame 28. Downward force is applied to the presser bar 20 by means of the coil spring 32 and thereby also to the presser foot 15.

The presser bar lifting cam 26 is affixed to the stud shaft 27 which also has affixed to it a lever arm 37 for rotation with the presser bar lifting cam. The opposite end of lever arm 37 is pivoted freely as at 38 to a connecting link 39. The opposite end of the connecting link 39 is slotted 40 inwardly of its end for free travel on a pin 43 affixed to an actuating lever 44. The actuating lever is pivoted to the frame of the sewing machine at 45 and has at its lower extremity an actuating tab 46 disposed below the sewing machine head and readily accessible from the sewing area.

OPERATION OF THE FIRST EMBODIMENT

FIGS. 1 and 2 show the presser foot in the down position and in the up position, respectively. In all positions of the presser bar 20 the coil spring 32 exerts forces on the presser bar to move it in the downwardly direction. In the position shown in FIG. 1 the block 25 and the presser bar lifting cam 26 are out of engagement and this force is transmitted to the presser foot 15. In the position shown in FIG. 2 the presser foot is held stable and in the up position by the restraint imposed on the presser bar lifting lever 30 by the tang 29 while the point of contact between the presser bar lifting cam 26 and the block 25 is in the beyond center position relative to the stud shaft 27. As indicated in FIG. 3 depressing the actuating tab 46 of the actuating lever 44 will cause the actuating lever to rotate in a counterclockwise direction, lifting the connecting link 39 thereby causing the lever arm 37, stud shaft 27, and presser bar lifting cam 26 to rotate in a clockwise direction. The condition indicated in FIG. 3 is unstable in that the presser bar lifting lever is not restrained and the point of contact between the presser bar lifting cam 26 and the block 25 is in the beyond center position relative to the stud shaft 27. Decreasing pressure gradually on the actuating tab 46 will allow the presser foot 15 to gently come down on to the material to be sewn. While the presser foot is seated as indicated in FIG. 1, it will be obvious that depressing the actuating tab 46 will cause the presser foot 15 to be raised sufficiently to move the work material therebeneath.

DESCRIPTION OF THE SECOND EMBODIMENT

In FIG. 4 is shown a modified form of the invention in a head portion 11 of a sewing machine similar to that shown in FIG. 1. Identical parts in the two machines are given the same numbers to preserve their identity. Thus the head portion 11 overhangs a work supporting plate 13 through which projects a feed dog 14 of a work feeding mechanism. A presser foot as-

sembly, **15**, **16** and **17** are affixed to a presser bar **20** by a knurled screw **21**, the presser bar being journaled in a bushing portion **22** of a needle bar frame **28** affixed to the head portion **11** of the sewing machine by screws **23**. A block **25** is affixed to the presser bar above the bushing portion **22**, the block having a tang **29** embraced in a slot formed in between the needle bar frame **28** and the sewing head portion **11** to prevent turning of the presser bar and presser foot.

The presser bar lifting cam **26** in this second embodiment is affixed to a shaft **49** which has also affixed to it to straddle the needle bar frame **28** a releasing cam **47** formed with two lobes **51** and **52** spaced essentially opposite each other. As the presser bar lifting cam **26** is rotated the releasing cam **47** rotates with it. Rotatably mounted on a pin **48** depending from the needle bar frame is an actuating lever **50** which passes in front of the releasing cam **47** and at its lower extremity is formed into an actuating tab **53** disposed below the sewing machine head and readily accessible from the sewing area. The actuating lever **50** is formed around the releasing cam **47** as at **56** in a fashion to touch a lobe whenever the presser foot **15** is in a raised or in a lowered position. Surface **54** of the actuating lever **50** cooperates with the lobe **52** and surface **55** with lobe **51**.

OPERATION OF THE SECOND EMBODIMENT

Referring to FIG. **5** it will be apparent that depressing the actuating tab **53** will rotate the actuating lever in a clockwise direction, causing the lever to strike the upper cam lobe **51** and force it, the shaft **49**, and the presser bar lifting cam **26**, in a counterclockwise direction. As in the first embodiment when the point of contact between the presser bar lifting cam **26** and the block **25** is beyond center of the cam and as shown in FIG. **6** the presser bar lifting cam is not restrained, the presser bar **20** may be gently lowered by gradually decreasing the finger pressure on the actuating tab **53**. It will be noted from FIG. **4** that depressing the actuating tab **53** will cause the lower cam lobe **52** to rotate about the axis of the shaft **49** thereby elevating the presser foot sufficiently to allow the work material to be moved.

It will be obvious to those skilled in the art that in place of the actuating lever **50**, a push button may be substituted slidable in a horizontal plane in the sewing machine frame **11** and having its surface adjacent the releasing cam **47** in the same shape as the actuating lever **50** viz. with a relief **56** to clear the releasing cam **47** and with surfaces **54** and **55** to actuate the releasing cam by way of the lobes **52** and **51** respectively. Depressing the push button will have a like effect as with lever **50** of releasing the presser foot for controlled descent or raising the presser foot sufficient to allow repositioning of the work fabric therebeneath.

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

1. In a sewing machine having a sewing head containing a needle bar and a presser mechanism including a presser bar, a work engaging means affixed to one end of the presser bar, means to resiliently urge the presser bar towards the work, a first operator influenced member, rotatably supported on the sewing machine, presser lifting means operatively associated with the first operator influenced member for moving the work engaging means away from the work in opposition to the resilient means, locking means associated with the presser lifting means of the first operator influenced member and effective to constrain the presser mechanism in an elevated position away from the work, wherein the improvement comprises a second operator influenced member having an operator influenced portion thereon, the second operator influenced member being shiftably supported on the sewing machine, the operator influenced portion being disposed below the sewing head adjacent the needle bar, release means associated with the second operator influenced member for rendering the locking means of the first operator influenced member ineffective upon operation of the second operator influenced member.

2. In a sewing machine as claimed in claim **1** restraining means associated with the second operator influenced member whereby after rendering the locking means of the first operator influenced member ineffective, the second operator influenced member will be effective to control the descent of the work engaging means against the urgings of the resilient means.

3. In a sewing machine as claimed in claim **1** presser lifting means associated with the second operator influenced member whereby the work engaging means may be lifted from contact with the work material upon actuation of the second operator influenced member.

4. In a sewing machine having a presser mechanism including a presser bar, a work engaging means affixed to one end of the presser bar, means to resiliently urge the presser bar towards the work, wherein the improvement comprises first and second operator influenced members, means on the sewing machine shiftably supporting the operator influenced members for independent movement, presser lifting means operatively associated with each of the operator influenced members for moving the work engaging means away from the work in opposition to the resilient means, locking means associated with the presser lifting means and the first operator influenced member and effective to constrain the presser mechanism in an elevated position away from the work, release means associated with the presser lifting means and the second operator influenced member for rendering the locking means of the first operator influenced member ineffective upon operation of the second operator influenced member, and restraining means associated with the presser lifting means and the second operator influenced member to allow the controlled descent of the work engaging means against the urgings of the resilient means.

5. In a sewing machine as recited in claim **4** wherein the release means include a lever arm (**37**) operatively connected to the presser bar lifting cam, an actuating lever (**44**) pivoted on the sewing machine frame and having an actuating tab (**46**) disposed in the front of the sewing machine adjacent the sewing area, a connecting link (**39**) shiftably joining the actuating lever (**44**) and the lever arm, whereby depressing the actuating tab will cause the actuating lever to rotate about its pivot and displace the connecting link and the cam lever attached thereto causing the cam lever to rotate and release the presser mechanism from an elevated position or assume a temporary intermediate elevated position.

6. In a sewing machine as recited in claim **4** wherein the release means includes a structure forming two spaced protuberances operatively connected to the presser bar lifting cam; an actuating lever pivoted on the sewing machine frame, having an actuating tab disposed in front of the sewing machine adjacent the sewing area and having a surface cooperating with the first protuberance of the structure when the presser mechanism is in an elevated condition and the actuating tab is depressed to rotate the presser bar lifting cam out of the locked position, and cooperating with the second protuberance of the structure after the presser mechanism is released from the locked position when the actuating tab is depressed to control the descent of the presser mechanism or enable the limited elevation of the presser mechanism.

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