United States Patent

[11] 3,534,698

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[54] **PRESSER BAR PRESSURE REGULATING DEVICES**
4 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **112/235**
[51] **Int. Cl.** **D05d 29/02**
[50] **Field of Search** 112/235, 218, 236, 237, 240

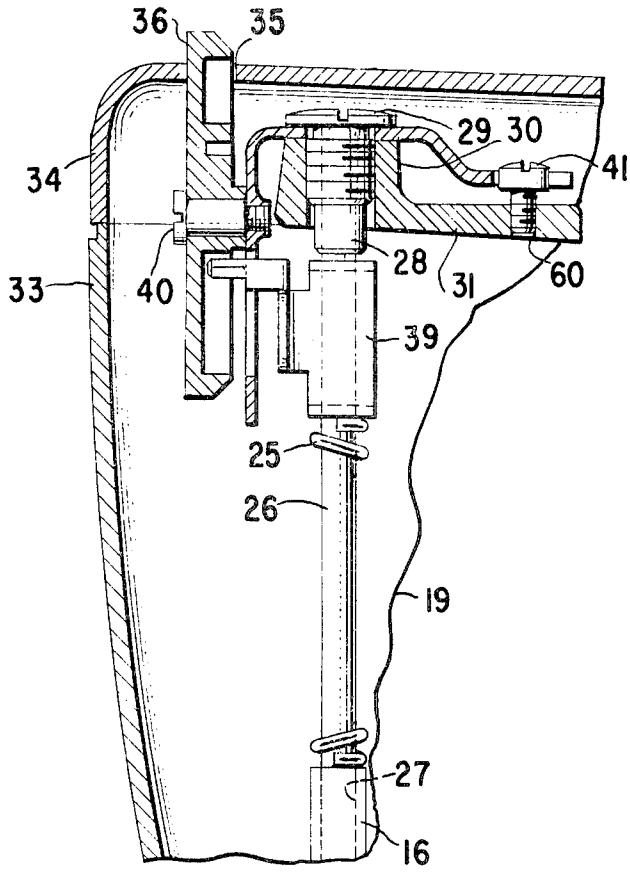
[56] **References Cited**

UNITED STATES PATENTS

3,055,326	9/1962	Grenlich	112/235
3,294,047	12/1966	Graham	112/235
3,303,804	2/1967	Lesort	112/235
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ABSTRACT: A regulating device for adjusting the pressure applied by the presser bar spring to the presser bar of a sewing machine. The device includes a two-legged bracket, one leg of which is secured to the arm of the sewing machine. An adjusting knob having a cam track is pivotally mounted on the second leg. A pressure regulating member having two apertured ears, through which the spring guide pin passes, engages the spring. A cam follower on the pressure member passes through a slot in the second leg of the bracket to engage the cam track. The knob protrudes through a window in the top cover plate of the sewing machine arm to expose a dial having indicia corresponding to positions along the cam track. Rotation of the knob to an exposed indicium effects the compression applied to the spring by the pressure member and hence the pressure applied to the presser bar.



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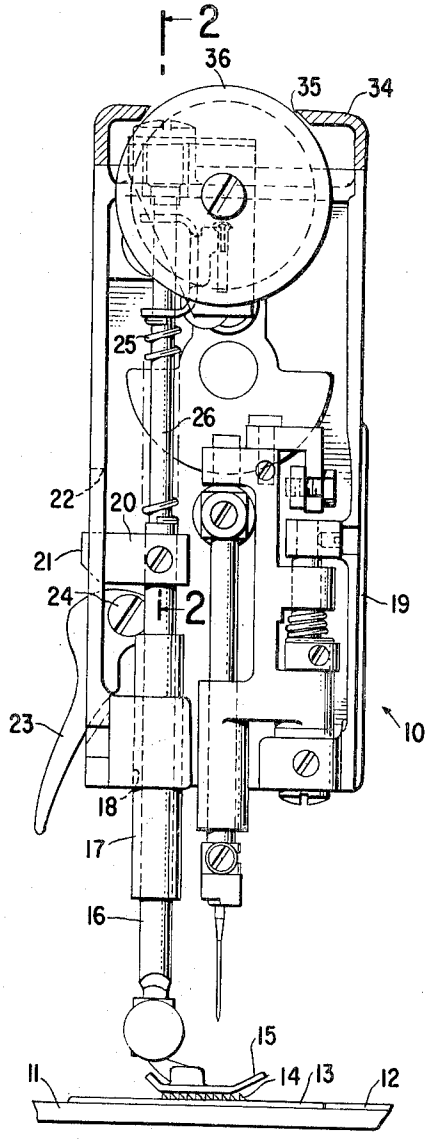


Fig. 1

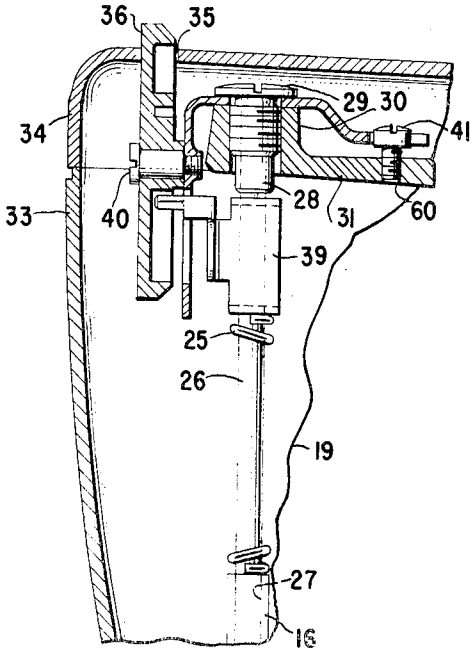


Fig. 2

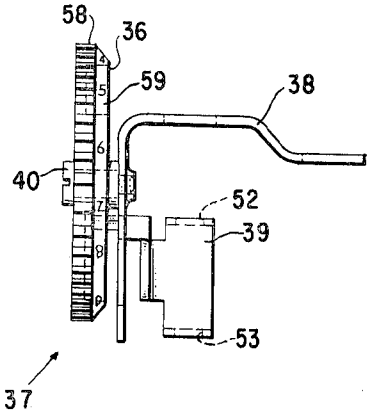


Fig. 5

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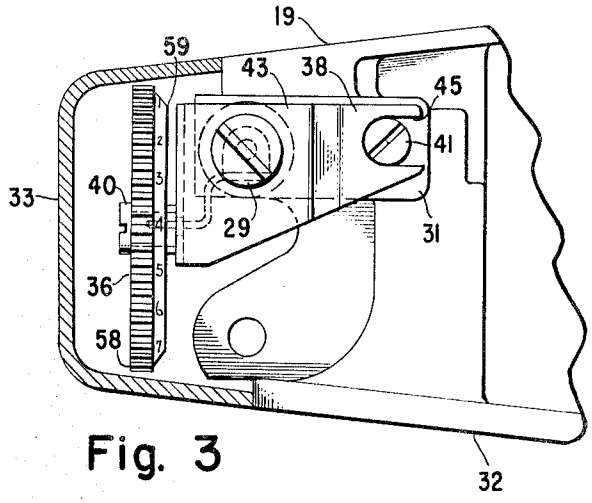


Fig. 3

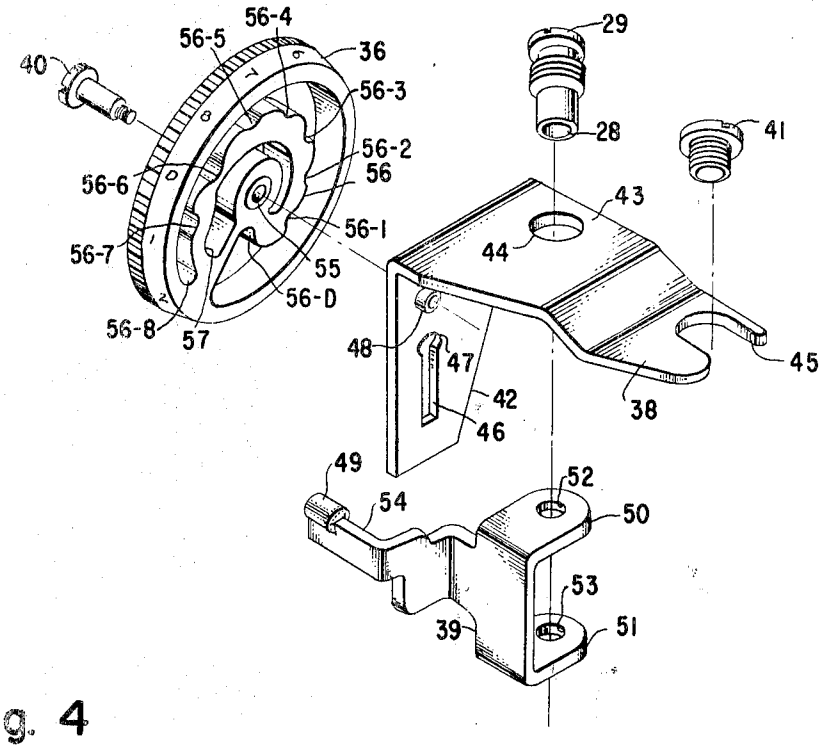


Fig. 4

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PRESSER BAR PRESSURE REGULATING DEVICES

SUMMARY OF THE INVENTION

This invention relates to sewing machines of the type having a presser bar and more particularly to a regulating device which can be installed as a unit in the sewing machine with a minimum amount of modification to the machine for adjusting the pressure applied to the presser bar by a presser bar spring.

Devices of this type have been known in the art for some time. In U.S. Pat. No. 3,055,326 a regulating device is shown which could not be assembled as a unit and then applied to the machine, but had to be more or less built into the machine. An attempt to solve this problem was made in U.S. Pat. No. 3,303,804 in which is disclosed a presser bar spring regulating device that could be assembled as a unit and then installed in a sewing machine. However, the disclosed spring abutment bracket required a rather complicated manufacturing and forming operation which tended to become expensive and wasteful because cracks developed during the manufacture. Moreover, when applying the assembled device to a sewing machine, new holes had to be drilled and tapped in the machine head which tended to add to its cost. Furthermore, since the adjusting knob fit wholly within the machine head, in order to adjust the presser bar spring pressure in prior art devices it was necessary to provide a hinged faceplate which would swing open to make the knob accessible. This again added to the complexity and cost of the machine.

It is therefore, one object of the present invention to provide a regulating device for adjusting the pressure that a presser bar spring applies to the presser bar which can be assembled and applied to a sewing machine as a unit with a minimum of modification to the machine.

It is a further object to provide a device of this type that can be economically produced from a few parts with a minimum of waste due to manufacturing defects.

It is a still further object of this invention to provide a device for adjusting the pressure that a presser bar spring applies to the presser bar which can be adjusted without having to open the sewing head.

These and other objects will be apparent from the specification and claims which follow taken in connection with the appended drawings wherein:

FIG. 1 is a fragmentary elevational end view, partly in section, of a sewing machine equipped with the preferred embodiment of the present invention in which the end faceplate of the machine has been removed and the top cover plate is partially broken away at the head end of the window;

FIG. 2 is an enlarged fragmentary cross-sectional view taken substantially along line 2–2 of FIG. 1;

FIG. 3 is an enlarged fragmentary top view, partly in section, of the head end of the sewing machine arm with the top cover plate removed;

FIG. 4 is an enlarged exploded perspective view showing certain of the parts of the device illustrated in FIGS. 1—3; and

FIG. 5 is enlarged front elevational view showing the assembled guide bracket, adjusting knob and pressure regulating member before being applied to the sewing machine.

Referring to FIGS. 1—3 of the drawing there is shown a portion of a sewing machine 10 having a bed 11 including a work support 12 fitted with a throat plate 13 through which projects a feed dog 14. A presser foot 15 carried at the lower end of a presser bar 16 cooperates with the feed dog to hold and feed the work (not shown). The presser bar is journaled in a bushing 17 fixed in a bore 18 formed in the lower position of the overhanging sewing machine head 19. Secured to the presser bar above the bushing 17 is a collar 20 formed with a radially extending finger 21 which is slidably received in a slot 22 formed in the sewing head 19 to prevent the presser bar from turning. A presser lifter 23, fulcrumed on a pivot screw 24 secured to the head 19, is disposed within the slot 22. When the lifter 23 is raised, it engages the finger 21 of a collar 20 to lift the collar and hence the presser bar against the downward bias of helical compression spring 25 coiled around a spring guide pin 26, the lower end of which sets in a bore 27 of the presser bar 16. The lower end of the spring abuts the upper end of the presser bar and the upper end is engaged by a member presently to be described. It should be noted that the present invention encompasses the case where the guide pin 26 is not provided but where a longer and more expensive presser bar is provided. In that case a larger spring would be required which would rest on the collar 20 and surround a midportion of the presser bar as described in U.S. Pat. No. 3,303,804. The upper end of the guide pin 26 is slidably received within the bore 28 of stud 29 which is threaded into the boss 30 formed on rib 31 in the overhanging arm 32. The stud 29 also serves another purpose which will presently be described. A face plate 33 secured to the head 19, as by a screw (not shown) encloses most of the previous and presently to be described mechanism within the sewing head. A top cover plate 34 provided with a transverse slot or window 35 closes the top of the overhanging arm except for the protrusion of the adjusting knob 36 as presently to be described and as shown in FIGS. 1 and 2.

The improved regulating device 37 of this invention, as best shown in FIGS. 4 and 5, comprises the adjusting knob 36, a guide bracket 38, a pressure regulating member 39, a shouldered pivot screw or stud 40 for rotatably mounting the knob on the bracket 38, and the stud 29 and screw 41 for securing bracket 38 within the sewing head to the rib 31 of the arm 32.

The guide bracket 38 is formed with two abutting legs 42 and 43 substantially normal to each other. Leg 43 is bent as shown in FIG. 4 and includes an offset hole 44 adapted to receive the stud 29 therethrough, and an open ended slot 45 which receives the screw 41. It should be noted that the particular bend in leg 43 is to accommodate the installation in the disclosed sewing machine embodiment and should not be considered as a limitation on the scope of the invention. Leg 42 includes an elongated slot 46 having an enlarged portion 47 at its upper end. The portion 47 is larger than, and of substantially the same shape, as cam follower 49 of the pressure regulating member. The remainder of the slot 46 is narrower than the width of the cam follower 49. The reasons therefor will be made clear as this description proceeds. Attached above the slot to the leg 42, as by any of the well known manufacturing methods, is a threaded bushing 48 for accommodating the threaded end of stud 40.

The pressure regulating member 39 comprises an upstanding portion with two substantially parallel spaced ears 50 and 51, each having an aperture 52 and 53 drilled therethrough. The apertures are axially aligned and are adapted to receive the spring guide pin 26 therethrough. Laterally remote from the ears 50 and 51, member 39 includes the cam follower 49 on an outstanding arm 54. The follower can either be formed integral with the arm 54 or can be attached by any of the known manufacturing methods. The follower, as seen in FIGS. 2 and 5, is long enough to pass through the slot 46 and extend beyond the front portion of the bracket leg 42.

The adjusting knob 36, which has a central hub aperture 55, is similar to those shown in U.S. Pat. Nos. 3,055,326 and 3,303,804, supra. The knob is formed on its inner side with a spiral cam track 56, which, when the knob is assembled to the bracket 38 by stud 40, is disposed contiguous to the leg 42 of the bracket. As best illustrated in FIG. 4, the cam track has a plurality of angularly spaced peripheral notches 56–D, 56–1, 56–2, 56–3, 56–4, 56–5, 56–6, 56–7, and 56–8, each notch being disposed at a different radial distance from the axis of the hub 55. The cam track also has a substantially radial wall 57 extending from the radial notch 56–D nearest the axis of the hub 55 to the outer periphery of the cam track 56 adjacent to the notch 56–8 most remote from the axis of the hub 55. In the assembled and installed position the cam follower 49 extends through slot 46 to seat in a selected one of the notches of the cam track. The periphery of the knob is knurled at 58 so as to facilitate gripping when adjustment is desired. The knob is also formed with a generally frustroconical dial 59 having indicia D, 1, 2, etc. 8 corresponding to each of the peripheral notches 56–D, 56–1, 56–2, etc. 56–8 of the cam track.

The pressure regulating device is assembled and installed in the sewing machine in the following manner. The cam follower **49** of the member **39** is inserted through the enlarged portion **47** of slot **46** and the arm **54** is allowed to drop downwardly. The cam follower is thus locked within slot **46**. Next, the adjusting knob **36** is mounted on the bracket **38** by threading the stud **40** into bushing **48** while setting the knob so that the dial indicium D is at the top, thus assuring that the follower will engage the cam track. The unit, now ready to be installed in the machine, is positioned such that the hole **44** in the bracket **38** is aligned with the holes **52** and **53** in the ears **50** and **51** of the member **39**. The bracket **38** is placed above the boss **30** of the machine arm and the spring **25** is set below the lower ear **51** of the member **39**. The guide pin is then inserted into the boss **30**, passed through the holes **44**, **52** and **53** and through the coil of the spring **25** until it is seated in the bore **27** of the presser bar. Stud **29** is then set into hole **44** and threaded into the boss **30** to slidably receive the guide pin **26** and to secure the bracket **38** to the rib **31** of arm **32**. The screw **41** is then threaded into hole **60** in the rib **31** to prevent the unit from pivotally moving. The drilling and tapping of hole **60** is the only machining operation required to adopt the new pressure regulating device to an existing sewing machine. The top cover plate **34** is next secured in place with the knob **36** protruding through the window **35**, the dial indicia thus being exposed to the view of an operator.

In operation, rotating the knurled portion **58** of the knob to align one of the indicium with the center of the window **35** will determine the notch of the cam track **56** engaged by follower **49**. The spring maintains the follower **49** in engagement with the cam track while the slot **46** constrains the follower to translatory movement. The distance of the selected notch in which the follower is seated from the axis of the hub **55** determines the position of ear **51** on the guide pin **26**, and by translating axially of the guide pin the ear **51** influences the compression applied to the spring **25** and thus the pressure applied by the spring to the presser bar.

I claim:

1. In a sewing machine having a frame including a work support and an overhanging arm terminating in a head, a presser bar axially slidable in said head, a spring axially bearing against said presser bar to bias same toward the work support, and guide means for said spring in operational engagement with said pressure bar to maintain said spring axially of said bar, the improvement comprising a regulating device for adjusting the pressure which the spring applies to the presser bar, said device comprising, a guide bracket secured to said head, said bracket having a guide slot closed at opposite ends, an adjusting knob, a cam track on said knob, means for pivotally mounting said knob on said bracket, a pressure regulating member, two substantially parallel spaced ears formed on said member, one of said ears abutting said spring, each ear having an aperture through which the spring guide means passes, and a cam follower on said member positioned to extend through said slot in the guide bracket to engage the cam track, whereby movement of said knob about its pivotal mounting means translates said ears axially of said spring guide means to change the position of said abutting ear and thereby adjust the pressure applied by the spring to the presser bar.

2. The improvement as defined in claim **1**, wherein said guide bracket comprises two legs, one of said legs being fixedly secured to said arm, the other leg having said slot, said knob being mounted on said other leg.

3. The improvement as defined in claim **1** including a cover plate enclosing the top of said arm having means therein defining a window, a dial having indicia on said knob corresponding to positions on said cam track, said knob disposed to protrude through said window to expose said indicia for indicating the position on the cam track in engagement with the cam follower.

4. A regulating device adapted to be attached as a unit to the frame of a sewing machine for adjusting the pressure which a presser bar spring applies to the presser bar of the sewing machine, said device comprising, a guide bracket adapted to be secured to said frame, said bracket having a guide slot closed at opposite ends, an adjusting knob, a cam track on said knob, means for pivotally mounting said knob on said bracket, a pressure regulating member, two substantially parallel spaced ears formed on said member, one of said ears adapted to abut said spring, each ear having an aperture through which guide means for said spring is adapted to pass, and a cam follower on said member positioned to extend through said slot in the guide bracket to engage the cam track.