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UNITARY PRESSER BAR SPRING REGULATING DEVICES

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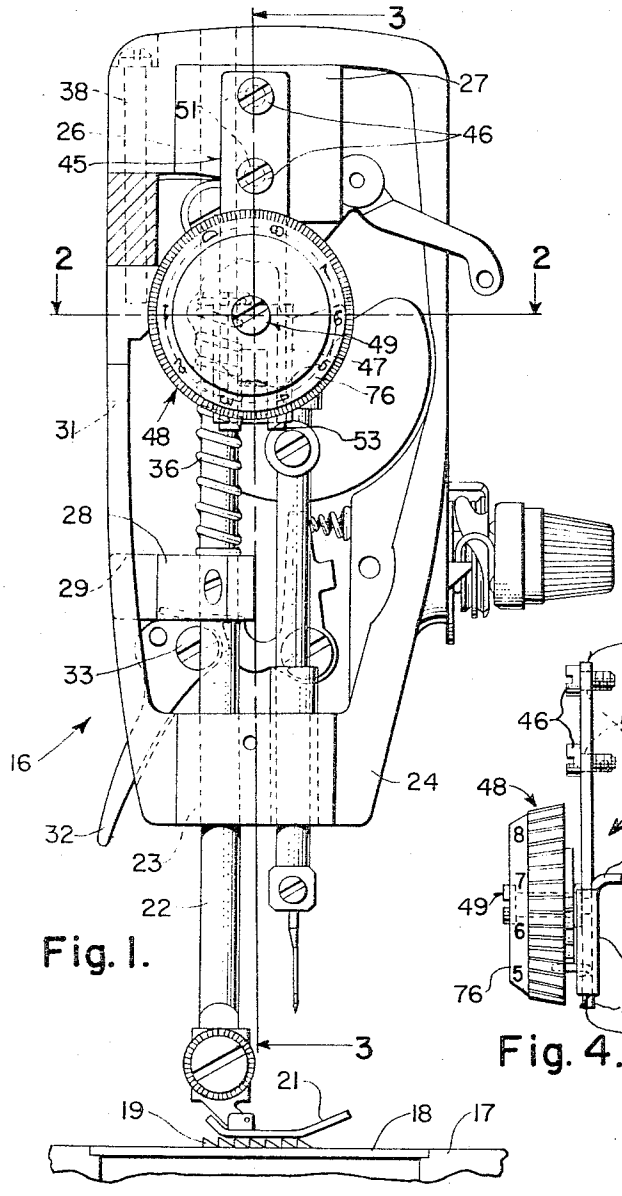


Fig. 1.

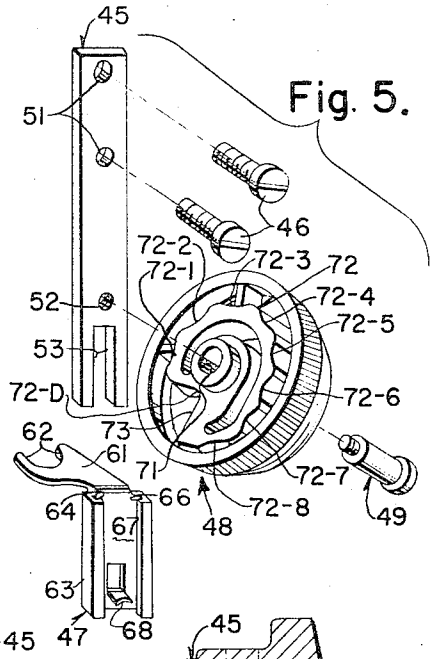


Fig. 5.

Fig. 4.

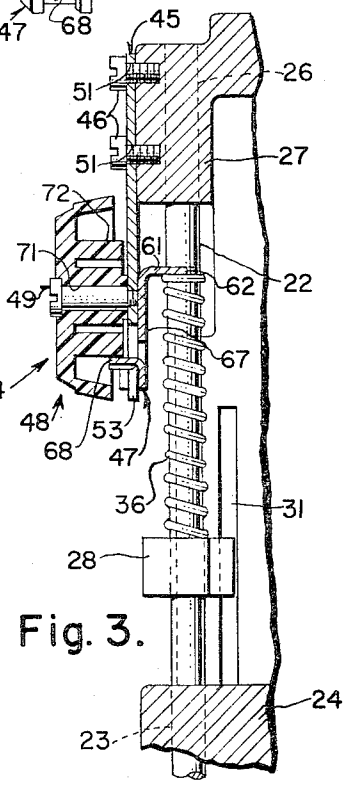


Fig. 3.

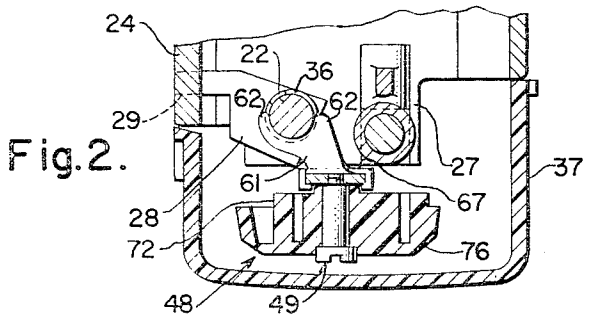


Fig. 2.

INVENTOR.
PAUL LESORT
BY
Marshall J. Breen
ATTORNEY

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UNITARY PRESSER BAR SPRING REGULATING DEVICES

Paul Lesort, Freneuse, France, assignor to The Singer Company, New York, N.Y., a corporation of New Jersey

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This invention relates to sewing machines and more particularly to a unitary regulating device for adjusting or regulating the pressure which a presser bar spring applies to the presser bar of a sewing machine.

Presser bar spring regulating devices are old and well known and in fact United States Patent No. 3,055,326 shows a device for regulating the spring pressure of a presser bar spring. However, prior art presser bar spring regulating devices have been more or less "built into" the sewing machine and were not constructed as a unit that could easily be applied to and removed from a sewing machine. Therefore, one of the primary objects of the present invention is to provide an improved presser bar spring regulating device of the type herein shown that can be assembled as a unit and then easily applied to or removed from a sewing machine.

Another object of the invention is to provide an improved presser bar spring regulating device which is constructed from a few simple parts that can be manufactured economically.

A still further object of the invention is to provide an improved unitary spring regulating device for the presser bar spring of a sewing machine.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings:

FIG. 1 is a fragmentary elevational end view of a sewing machine equipped with a unitary presser bar spring regulating device embodying the present invention, the face plate of the sewing machine having been removed to show the internal construction,

FIG. 2 is a horizontal sectional view taken substantially on the line 2—2 of FIG. 1, but showing the face plate,

FIG. 3 is a vertical sectional view taken substantially on the line 3—3 of FIG. 1,

FIG. 4 is a front elevational view showing the unitary presser bar spring regulating device of this invention before it has been applied to a sewing machinne, and

FIG. 5 is an exploded perspective view showing certain parts of the mechanism illustrated in FIGS. 1 through 4.

Referring more particularly to FIG. 1 of the drawings, there is shown a portion of a sewing machine **16** having a work support **17** fitted with a throat plate **18** through which projects a feed dog **19**. A presser foot **21** carried by the lower end of a presser bar **22** cooperates with the feed dog **19** to hold and forward work (not shown). A midportion of the presser bar **22** is vertically slidable in a bore **23** formed in a lower portion of the head **24** of the sewing machine **16**, and the upper end of the presser bar **22** is slidably mounted in a bore **26** in a boss **27** formed integral with the upper end of the head **24**. Secured, as by a screw, to the presser bar **22** is a collar **28** having a radially extending finger **29** which is slidably received in a slot **31** formed in the head **24**. The slot **31** and the finger **29** prevents the presser bar **22** from turning and the slot **31** also accommodates a presser lifter **32** which is fulcrumed on a pivot screw **33** threaded into a boss formed

in the head **24**. When the lifter **32** is raised, it lifts the presser bar **22** against the downward bias of a helical compression spring **36** coiled around the presser bar **22**. The lower end of the spring **36** abuts the upper end of the collar **28**, and the upper end of the spring **36** is engaged by a member presently to be described. A face plate **37** swings on a single hinge screw **38** and when the face plate **37** is closed, it encases most of the previously described mechanism as well as the unitary presser bar regulating device **44** presently to be described.

The unitary presser bar regulating device **44**, as best shown in FIGS. 4 and 5, comprises essentially six parts, namely, a guide member **45**, two screws **46—46** for securing the member **45** to the sewing machine boss **27**, a spring abutment bracket **47** slidably mounted on the member **45**, an adjusting knob **48**, and a shouldered pivot stud or screw **49** for turnably mounting the adjusting knob **48** on the guide member **45**.

The guide member **45** is in the form of an elongated rectangular parallelepiped having adjacent to its upper end a pair of unthreaded holes **51—51** for receiving the mounting screws **46—46**, and toward its lower end a threaded hole **52** for accommodating the threaded end of the pivot screw **49**. The lowermost end of the member **45** is bifurcated to provide an open ended slot **53**. The upper end of the spring abutment bracket **47** is formed with a horizontally extending arm **61**, the free end of which is bifurcated to form abutment fingers **62—62** and the main body **63** of the bracket **47** is in the form of a crosshead having facing parallel grooves **64** and **66** for slidably mounting the bracket **47** on the member **45**. The wall **67** of the bracket **47** between the two grooves **64** and **66** is formed with a struck out follower **68** which, as best seen in FIG. 3, is long enough to pass through the slot **53** and extend beyond the front portion of the bracket **47**.

The adjusting knob **48**, which has a central hub-aperture **71**, is similar to and serves the same purpose as the pressure regulating member shown in United States Patent No. 3,055,326, supra, and the knob **48** is formed on its inner side with a spiral cam track **72** and, when the unitary regulator device **44** is assembled, the cam track **72** is disposed contiguous to the guide member **45**. As best illustrated in FIG. 5, the cam track **72** has a plurality of angularly spaced peripheral notches **72–D**, **72–1**, **72–2**, **72–3**, **72–4**, **72–5**, **72–6**, **72–7**, and **72–8**, each notch being disposed at a different radial distance from the axis of the pivot stud **49**. The cam track **72** also has a substantially radial wall **73** extending from the radial notch **72–D** nearest the axis of the pivot stud **49** to the outer periphery of the cam track **72** adjacent to the notch **72–8** that is most remote from the axis of the pivot stud **49**. The follower **68** extends through the open ended slot **53** and tracks the periphery of the cam track **72** to seat in any one of the selected peripheral notches **72–D**, **72–1**, **72–2**, **72–3**, etc. The distance of the selected notch in which the follower **68** is seated from the axis of the pivot stud **49** determines the position of the abutment fingers **62—62** on the presser bar **22** and thus influences the compression applied to the spring **36**. When the follower **68** rests in notch **72–D**, the fingers **62** engage the presser bar **22** at a high location and thus the spring **36** is relaxed. In this position the presser foot **21** is not forced against the feed dog **19** and the sewing machine **16** may be used for darning. As the knob is turned so that the follower **68** rests successively in the notches **72–1**, **72–2**, **72-3**, etc., the spring **36** is successively compressed until, when the follower rests in notch **72–8**, the presser foot **21** presses on the feed dog **19** with maximum pressure.

The outer face of the knob **48** is formed with a frustoconical dial **76** having indicia D, 1, 2, etc.–8 corresponding to each of the peripheral notches **72–D**, **72–1**, **72–2**,

72–3, etc. of the cam track 72. Preferably the indicia corresponding with each notch is disposed on the dial at an angle of approximately 90° in a counterclockwise direction as viewed in FIG. 1 from the portion of the notch to which it corresponds.

The unitary presser bar spring regulator device 44 is applied to the sewing machine 16 in the following manner. First, the adjusting knob 48 is mounted on the guide member 45 by passing the pivot screw 49 through the hub aperture 71 and by then threading the screw 49 into the threaded hole 52. Next the bifurcated lower end of the guide member 45 is moved downwardly into the grooves 64–66 until the follower 68, which passes through the slot 53 engages the cam track 72. Then the abutment fingers 62—62 are placed on top of the spring 36 and the guide member 45 is fastened to the boss 27 by means of the screws 46—46. As soon as this is done, the pressure with which the presser foot 21 engages the feed dog 19 can be adjusted by turning the knob 48. Closing the face plate 37 completely covers the unitary presser bar spring regulating device 44.

Having thus set forth the nature of the invention, what is claimed herein is:

1. A unitary regulating device for regulating the pressure which a presser bar spring applies to the presser bar of a sewing machine, said unitary regulating device comprising, an elongated apertured guide member provided at one end with an open ended slot, an adjusting knob, a cam track on said knob, means for pivotally mounting said knob on said guide member, an abutment bracket entirely supported by and slidably mounted on said guide member, an arm on said bracket adapted to engage said presser bar spring, a cam follower formed on said bracket and positioned to extend through the open ended slot in said guide member to engage the cam track on said knob, and means for securing said guide member to the said sewing machine.

2. A unitary regulating device for regulating the pressure which a presser bar spring applies to the presser bar of a sewing machine, said unitary regulating device

comprising, an elongated apertured guide member provided at one end with an open ended slot, an adjusting knob formed on one face with a dial and on its other face with a cam track, means for pivotally mounting said knob on said guide member, an abutment bracket having a pair of facing parallel grooves for slidably mounting said bracket on said guide member, an arm bifurcated to form a pair of fingers extending outwardly from said bracket and adapted to engage said presser bar spring, a cam follower formed on said bracket and positioned to extend through the slot in said guide member to engage the cam track on said knob, and means for securing said guide member to the said sewing machine.

3. A unitary device for regulating the pressure, which a presser bar spring applies to the presser bar of a sewing machine, said device being adapted to be assembled as a unit and applied to or removed from a sewing machine as a unit, and said device comprising an apertured elongated rectangular parallelepiped shaped guide member provided at one end with an open ended slot, an adjusting knob formed on one face with a dial and on its other face with a cam track, means pivotally mounting said knob on said guide member, an abutment bracket having spaced means for embracing said guide member and thereby slidably mounting said bracket on said guide member, finger means carried by said bracket and adapted to engage said presser bar spring, a cam follower formed on said bracket and positioned to extend through the slot in said guide member to engage the cam track on said knob, and means securing said guide member to said sewing machine.

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PATRICK D. LAWSON, *Primary Examiner.*