Nov. 14, 1961 W. HOFGESANG 3,008,178

CONCEALED HINGE FOR SEWING MACHINE CABINETS

Filed Dec. 7, 1959

2 Sheets-Sheet 1

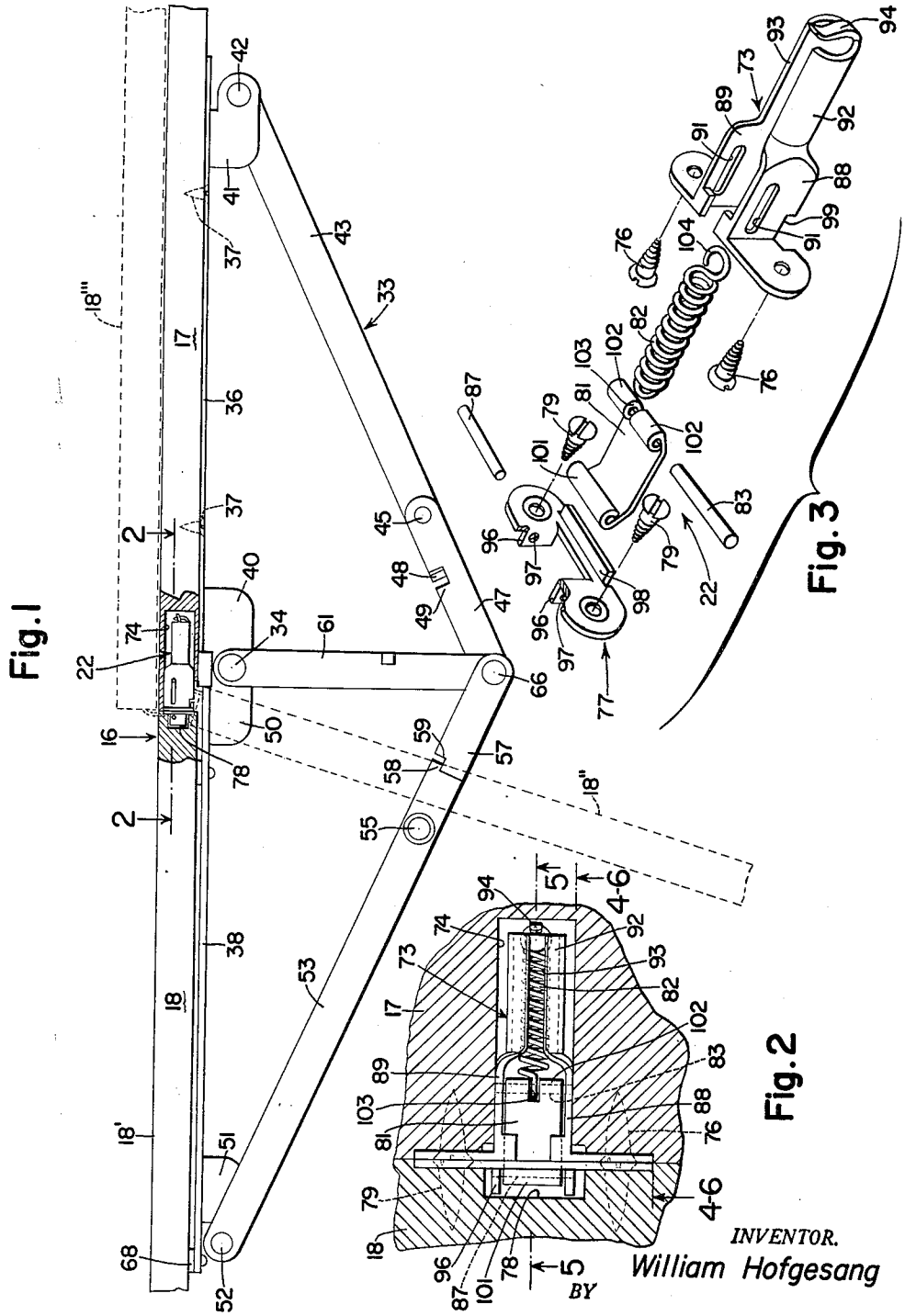


Fig. 1

Fig. 2

Fig. 3

INVENTOR.
William Hofgesang
BY
Marshall J. Breen
ATTORNEY

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Fig. 4

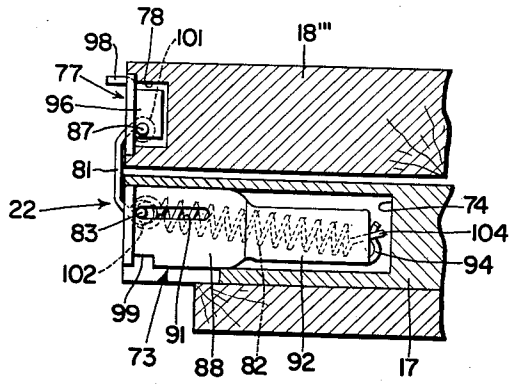


Fig. 5

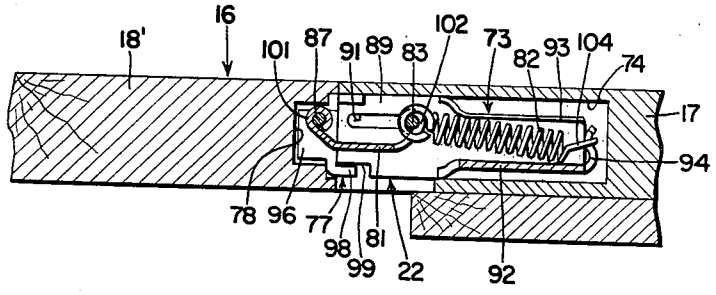
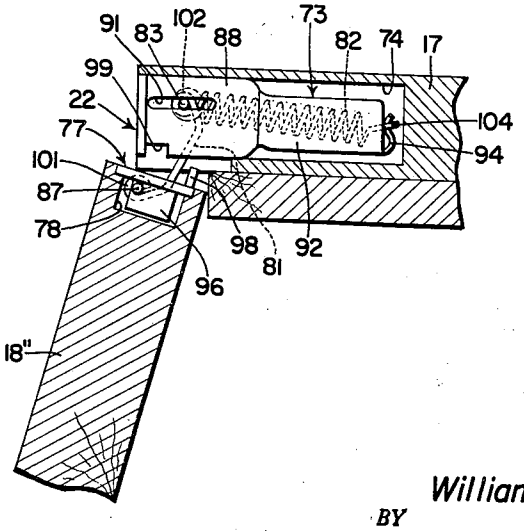


Fig. 6



INVENTOR.
William Hofgesang

BY
Marshall J. Breen
ATTORNEY

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CONCEALED HINGE FOR SEWING MACHINE CABINETS

William Hofgesang, Avenel, N.J., assignor to The Singer Manufacturing Company, Elizabeth, N.J., a corporation of New Jersey

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This invention relates to sewing machine cabinets and tables, and more particularly to a concealed hinge especially adapted for use with the hinged leaf of sewing machine cabinets and tables, and the principal object of the invention is to provide an improved hinge of this nature.

Another object of the invention is to provide a hinge which will be entirely concealed when the drop-leaf of a sewing machine cabinet or table is coextensive with the table-top of said sewing machine cabinet or table.

A further object of the invention is to provide a concealed hinge having a spring means which will forceably draw one edge of the drop-leaf of the sewing machine table against the edge of the table-top of the sewing machine table from which the drop-leaf is supported.

A still further object of the invention is to provide an improved concealed hinge which will permit the drop-leaf of a sewing machine cabinet or table to hinge through an angle of substantially 270 degrees.

Another object of the invention is to provide an improved concealed hinge which will permit the drop-leaf of a sewing machine cabinet or table to assume a position in which it lies flat on top of the table top.

Another object of the invention is to provide an improved concealed hinge which will permit the drop-leaf of a sewing machine cabinet or table to assume a position coplanar with the table-top or to depend therefrom.

United States Patent No. 2,883,249 discloses a collapsible support for a drop-leaf, the collapsible support being adapted to support the drop-leaf when it is in a raised or extended position. The aforesaid Patent No. 2,883,249 also discloses a hinge used to attach the drop-leaf to the table-top of the sewing machine table. The hinge of the present invention is intended to replace the hinges of the above mentioned patent.

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 side elevational view of a portion of a sewing machine table to which a collapsable support and a concealed hinge, the latter embodying the present invention, have been applied. Full lines show the drop-leaf in an extended position and dashed lines show the drop-leaf in two other positions, one resting on the table-top and the other depending therefrom,

FIG. 2 is a fragmentary sectional view taken substantially on the line 2—2 of FIG. 1,

FIG. 3 is an exploded perspective view, showing various parts of the concealed hinge illustrated in FIGS. 1 and 2,

FIG. 4 is an elevational sectional view taken substantially on the line 4—6, 4—6 of FIG. 2 and showing the drop-leaf positioned on top of the table-top,

FIG. 5 is an elevational sectional view taken substantially on the line 5—5 of FIG. 2 and showing the drop-leaf coplanar with the table-top, and

FIG. 6 is an elevational sectional view taken substantially on the line 4—6, 4—6 of FIG. 2 and showing the drop-leaf depending from the table-top.

The sewing machine table 16 shown in the drawings comprises a table-top 17 and a drop-leaf 18, the drop-leaf 18 being hingedly connected to the table-top 17 by means of a pair of hinges (the drawings showing only one hinge 22) embodying the present invention. The table 16 also includes a number of unshown portions as, for example, a rail portion (not shown) for supporting the table-top 17 and a plurality of legs (not shown) for supporting the rail portion (not shown). Reference to FIG. 1 shows that the drop-leaf 18 can assume any one of three different positions, these positions being indicated by the numerals 18', 18'' and 18'''. The position 18''', shown in FIG. 1 by dash-dash lines, is such that the drop-leaf 18 is positioned upside-down and thereby overlies the table-top 17. The position shown in FIG. 1 by solid lines and indicated by the numeral 18' is such that the drop-leaf 18 is coextensive with the table-top 17. The position shown in FIG. 1 by dash-dash lines and indicated by the numeral 18'' is such that the leaf 18 hangs below or depends from the table-top 17.

In order to support the drop-leaf 18 in the position 18' there are provided two collapsible supports, however, only one support 33 is shown in the drawings. Each support 33 has a common fixed central pivot-pin 34, a fixed arm 36 and a movable arm 38. The fixed arm 36 is secured to the lower surface of the table-top 17 by a plurality of wood screws 37. A depending fixed central plate 40 is secured to the end of the arm 36, and a depending fixed terminal plate 41 is secured to the terminal end of the arm 36. The plate 40 carries the previously mentioned pivot-pin 34 and the plate 41 carries a fixed terminal pivot-pin 42 which pivotally supports a first toggle leg 43. The other end of the toggle leg 43, by means of a rivet 45, is connected to one end of a second toggle leg 47. The other end of the toggle leg 43 extends beyond the rivet 45 and at the end of the extended portion is provided with a bent-lug 48 which, when the two toggle legs 43 and 47 are extended so as to be substantially in line, enters a notch 49 formed in the second toggle leg 47.

Opposite ends of the movable arm 38 carry a depending movable central plate 50 and a depending movable terminal plate 51. The plate 50 is pivoted on the previously mentioned pivot-pin 34 and the plate 51 carries a movable terminal pivot-pin 52, which pivotally supports a third toggle leg 53, the other end of the leg 53 is, by means of a rivet 55, connected to one end of a fourth toggle leg 57. The end of the toggle leg 53 extends beyond the rivet 55 and at the end of the extended portion is provided with a bent lug 58 which, when the two toggle lugs 43 and 47 are extended so as to be substantially in line, enters the notch 59 formed in the toggle leg 57.

The pivot-pin 34, in addition to passing through plates 40 and 50, passes through the upper end and thus pivotally mounts a strut 61, the free end of the strut 61 as well as the ends of the toggle legs 47 and 57 remote from the rivets 45 and 55 respectively, are pivotally connected together by a rivet 66. While not shown in the drawing, it will be understood that the collapsible support 33 can be folded in such a manner that the movable arm 38 substantially coincides with the fixed arm 36. This positions all parts of the collapsible support 33 beneath the table-top 17 and allows the drop-leaf 18 to assume the position 18''. On the other hand, when the collapsible support 33 is in the solid line position shown in FIG. 1, the movable arm 38 by means of a bumper 68 supports the drop-leaf 18 in the position 18'. The collapsible support 33, which is fully described in Patent No. 2,883,249, supra, forms no part of the present invention.

The hinge **22** embodying the present invention, comprises a fixed butt **73** positioned in a hole **74** formed in the table-top **17**, and the butt **73** is held in place by a pair of screws **76**. Cooperating with the fixed butt **73** is a movable butt **77** positioned in a recess **78** formed in one edge of the drop leaf **18**, the movable butt **77** being secured to the drop leaf **18** by a pair of screws **79**. In addition to the above, the hinge **22** has a floating link **81**, a helical tension spring **82**, and pivot pins **83** and **87**.

The fixed butt **73** has a pair of inwardly extending plates **88** and **89**, each of which is provided with an elongated hole **91**. Inwardly of the holes **91—91**, the plates **88** and **89** merge into one end of a part-circular tube **92** having a longitudinally extending opening or slot **93** and at its inward end the tube **92** has a hook **94**. The movable butt **77** has a pair of inwardly extending ears **96—96** each of which is provided with a circular hole **97** and the movable butt **77** is provided with a forwardly extending tongue **98** which is adapted to enter elongated notches **99—99** formed on the plates **88** and **89** of the fixed butt **73**.

When the hinge **22** is assembled, the pivot-pin **87** passes through the holes **97—97** and through a hook **101** formed on one end of the floating link **81**. Also the pivot-pin **83** will engage the elongated holes **91—91** and pass through a pair of coaxially positioned spaced hooks **102—102** formed on the end of the floating link **81** opposite from a hook **101**. The pivot-pin **83**, because of the opening **103** located between the two hooks **102—102**, also passes through a looped end of the tension spring **82**. The other end of the tension spring **82** is provided with an eye **104** which is entered by the hook **94** formed on the end of the tube **92**. From the above, it will be understood that the tension spring **82** urges the hooks **102—102** and pivot-pin **83** to enter the space between the plates **88** and **89** and also urges the pivot pin **83** to position itself adjacent the innermost end of the holes **91—91**. This, of course, biases the hook **101** and the pivot pin **87** toward the fixed butt **73** causing the movable butt **77** to assume the position shown in FIG. 2. When the hinge **22** is thus assembled and positioned, the drop-leaf **18** assumes a position coextensive with the table-top **17** as shown in FIG. 5. Should it be desirable to move the table-top **18** to the stored position shown in FIG. 4, the table-top **18** is swung about the hinge. This tensions the spring **82** and causes the floating link **81** to assume the position shown in FIG. 4 with the hooks **102—102** positioned between the plates **88—89** and with the hook **101** positioned in the recess **78**. Should it be desirable to place the drop-leaf **18** in the depending position shown in FIG. 6, the link **81** assumes the depending position shown in FIG. 6, wherein the central portion of the main body portion of the floating link **81** drops down between the two plates **88** and **89**.

From the above, it can be seen that the hinge of the present invention allows the drop-leaf **18** to swing through substantially 270 degrees to assume any one of three advantageously desirable positions, namely, the position (FIG. 4) in which the drop-leaf rests on top of the table-top **17**, the position (FIG. 5) in which the drop-leaf is coextensive with the table-top **17**, or the position (FIG. 6) in which the drop-leaf depends from the table-top **17**.

The herein disclosed concealed hinge **22** employs a spring **82**. One function of this spring is to maintain the butt **77** in tight engagement with the butt **73** when the drop-leaf **18** is in the position shown in FIG. 5. It will be understood that satisfactory results could be obtained by eliminating the spring **82** and by substituting a latch or hook adapted to hold the butt **77** in tight engagement with the butt **73**.

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

1. A concealed hinge designed pivotally to connect the drop-leaf of a sewing machine cabinet or table to a table-top thereof, said hinge comprising a fixed butt secured to said table-top, a movable butt secured to said drop-leaf, one of said butts having a pair of elongated holes, a floating link, means for pivotally connecting one end of said link to one of said butts, a pivot pin slidingly carried in said pair of elongated holes, and means for pivotally connecting the other end of said floating link to said slidably carried pivot pin.

2. A concealed hinge designed to pivotally connect the drop-leaf of a sewing machine cabinet or table to a table-top thereof, said hinge comprising, a fixed butt secured to said table-top, a movable butt secured to said drop-leaf, a pivot pin carried by said movable butt, a floating link, means for pivotally connecting one end of said link to said pivot pin on said movable butt, a tension spring, means for securing one end of said tension spring to said fixed butt, a pivot pin carried by said fixed butt, means for connecting one end of said floating link to the pivot pin carried by said fixed butt, and means for connecting the other end of said tension spring to the pivot pin carried by the fixed butt.

3. A concealed hinge designed to pivotally connect the drop-leaf of a sewing machine cabinet or table to a table-top thereof, said hinge comprising, a fixed butt secured to said table-top, a movable butt secured to said drop-leaf, a pivot pin carried by said movable butt, a floating link having one of its ends engaging said pivot pin, a second pivot pin, means for connecting said second pivot pin to the other end of said floating link, means formed as a part of said fixed butt for carrying said second pivot pin, a tension spring, means for connecting one end of said tension spring to the second pivot pin, and means for connecting the other end of said tension spring to said fixed butt.

4. A concealed hinge designed to pivotally connect the drop-leaf of a sewing machine cabinet or table to a table-top thereof, said hinge comprising a fixed butt secured to said table-top and said fixed butt having a pair of elongated holes extending inwardly from the face of the fixed butt, a tubular member formed on said fixed butt and positioned inwardly of said elongated holes, a hook formed on the inwardly end of said tubular member, a movable butt securely attached to said drop-leaf, a pair of apertured ears carried by said movable butt, a floating link having on one of its ends a hook and having on its other end a pair of coaxially positioned spaced hooks, a pivot-pin passing through the first hook on said floating link and engaging the apertures in the ears of said movable butt, a second pivot-pin passing through the pair of spaced hooks on the floating link, opposite ends of said second pivot-pin entering the elongated holes in said fixed butt, a tension spring having one of its ends engaging the pivot-pin at a location between the spaced hooks and the other end of said helical spring being attached to the hook formed at the end of said tubular member.

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