

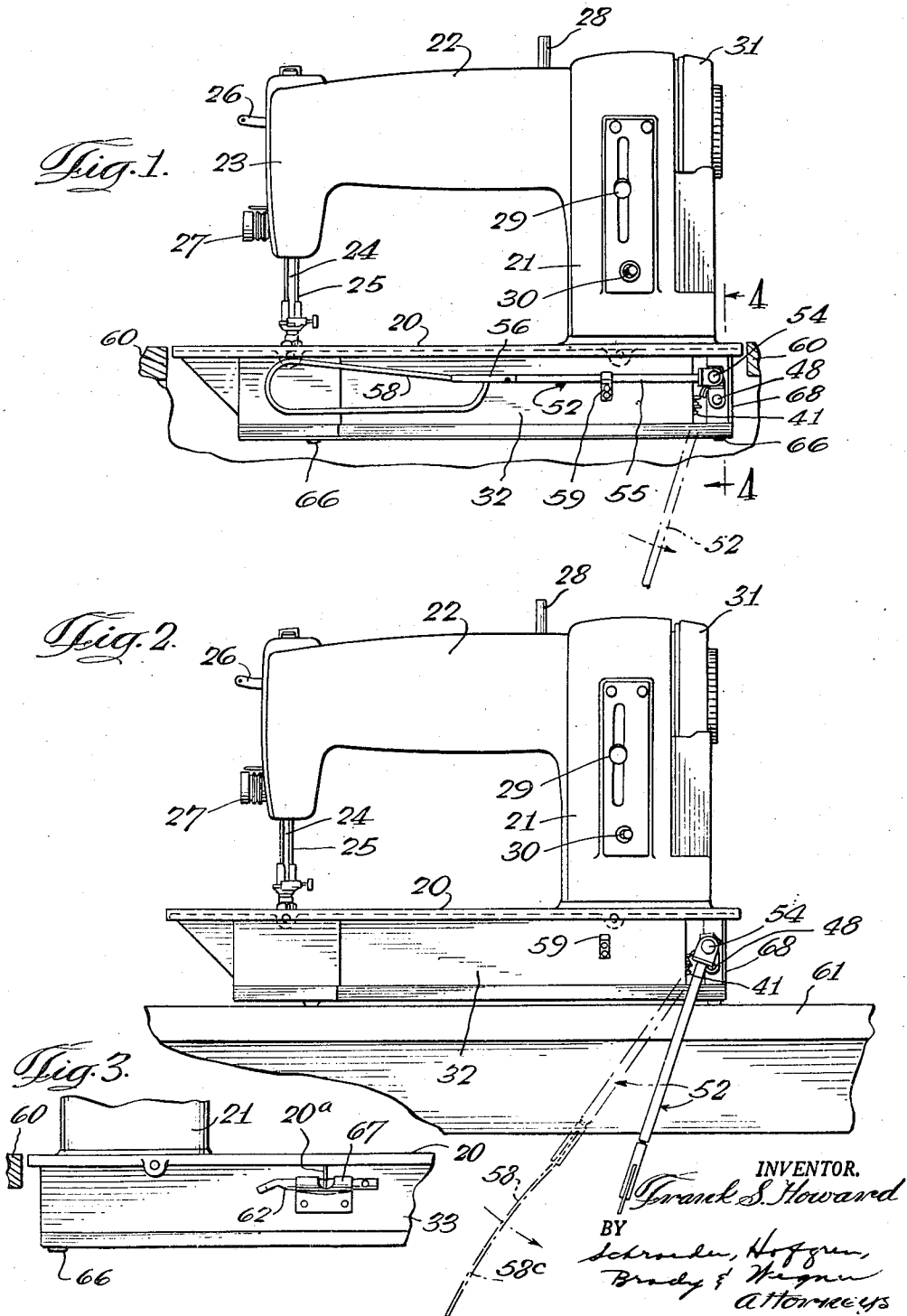
Sept. 9, 1958

F. S. HOWARD
SEWING MACHINE

2,850,996

Filed Feb. 8, 1955

3 Sheets-Sheet 1



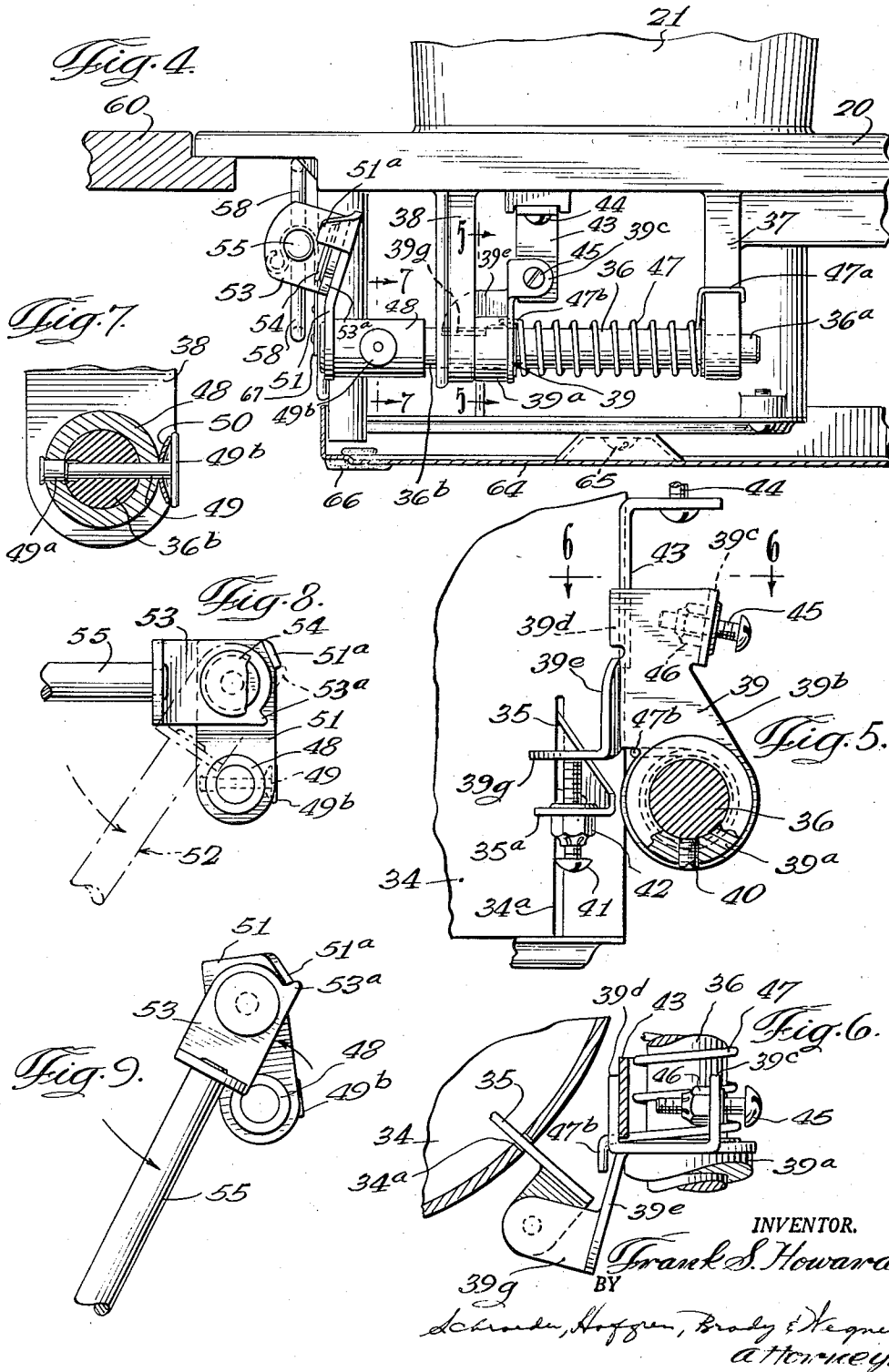
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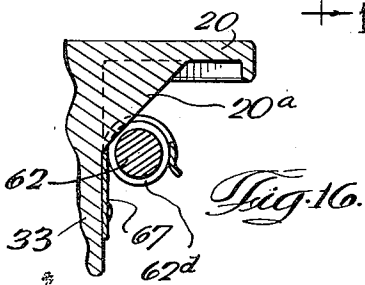
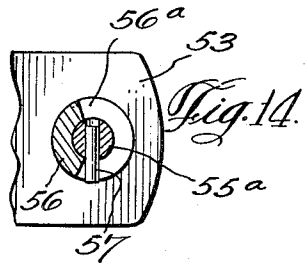
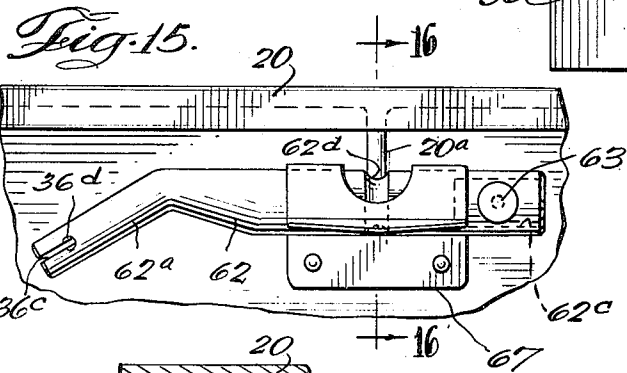
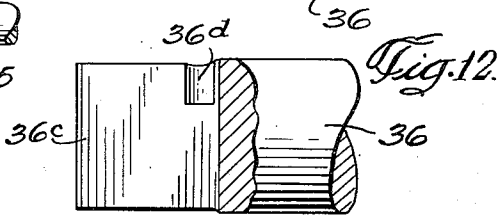
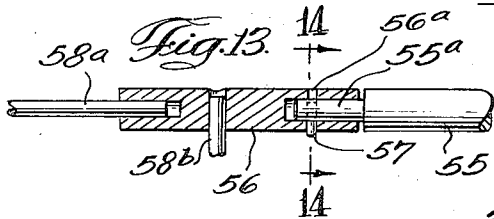
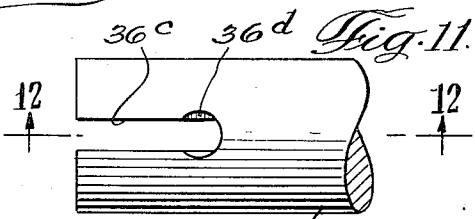
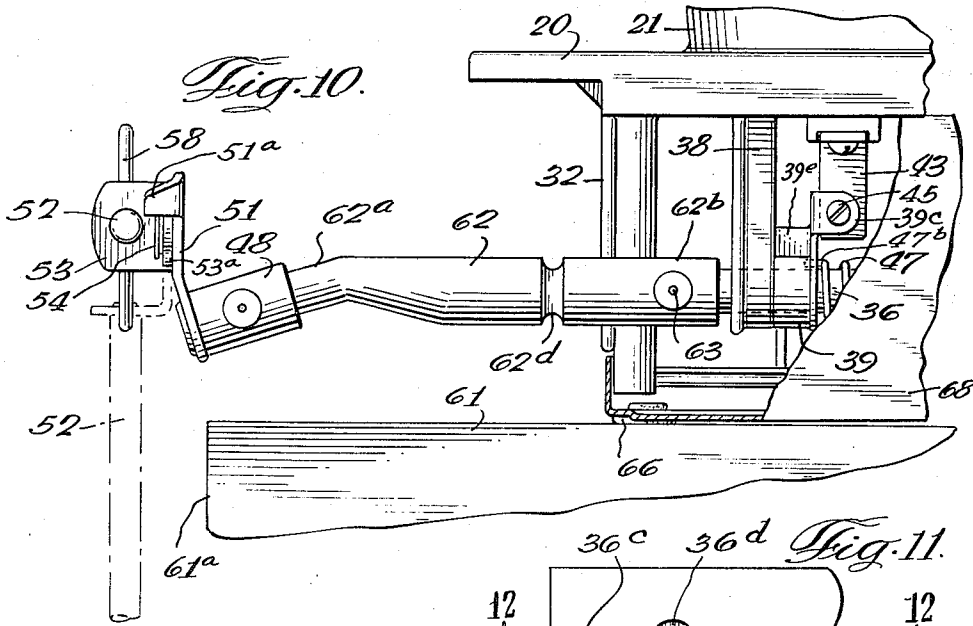
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3 Sheets-Sheet 3



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2,850,996

SEWING MACHINE

Frank S. Howard, Round Lake, Ill., assignor, by mesne assignments, to Whirlpool Corporation, a corporation of Delaware

Application February 8, 1955, Serial No. 486,804

2 Claims. (Cl. 112—220)

This invention relates to a sewing machine head structure.

Sewing machine heads which usually include the operating portions of the sewing machine are sometimes permanently mounted in a cabinet so that the head can be raised from a recessed storage position to an operating position on top of the cabinet prior to using the sewing machine. Other types of heads are of a portable nature that are contained within a small housing but when in use are placed on a flat surface such as a flat table top. The sewing machine of this invention combines the features of both types of head structures. Thus, the head of this invention is adapted to be mounted in a cabinet where such is desired with the top bed plate of the machine substantially flush with the top of the cabinet in the normal manner when the machine is being used, or the head structure of this invention can be used as an ordinary portable sewing machine, in which case it is adapted to rest on top of a flat surface.

The sewing machine head structure of this invention also includes improved apparatus for regulating the speed of operation of the head. This improved apparatus can be used with equal ease and efficiency whether the head structure is mounted in a cabinet or is used as a portable and merely rests on a supporting surface such as a table surface.

The invention will be described as related to the embodiment shown in the accompanying drawings. Of the drawings:

Fig. 1 is a side elevational view of a sewing machine head structure embodying the invention, mounted in the normal manner in a cabinet.

Fig. 2 is a view similar to Fig. 1 but showing the head structure of this invention used as a portable and resting on a table surface.

Fig. 3 is a fragmentary rear elevational view of a portion of the structure shown in Fig. 1.

Fig. 4 is a sectional elevational view, taken substantially along line 4—4 of Fig. 1.

Fig. 5 is a sectional elevational view, taken substantially along line 5—5 of Fig. 4.

Fig. 6 is a fragmentary sectional elevational view, taken substantially along line 6—6 of Fig. 5.

Fig. 7 is a fragmentary elevational view, taken substantially along line 7—7 of Fig. 4.

Fig. 8 is a fragmentary end elevational view, taken from the left-hand end of Fig. 4, showing the speed control lever arm in raised storage position in solid lines and in lowered operating position in broken lines.

Fig. 9 is a view similar to Fig. 8 but showing the lever arm in operating position.

Fig. 10 is a fragmentary end elevational view similar to Fig. 4 but showing the sewing machine head structure resting on a supporting surface.

Fig. 11 is an enlarged fragmentary elevational view showing the outer end of the speed control operating member of the head structure.

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Fig. 12 is a fragmentary sectional view, taken substantially along line 12—12 of Fig. 11.

Fig. 13 is a fragmentary sectional elevational view through one portion of the lever arm.

Fig. 14 is a sectional elevation, taken substantially along line 14—14 of Fig. 13.

Fig. 15 is an enlarged detail elevational view of a portion of Fig. 3 showing the extension member in storage position in a retaining bracket.

Fig. 16 is a fragmentary sectional elevational view taken substantially along line 16—16 of Fig. 15.

The sewing machine head structure of this invention comprises a bed plate 20, a standard 21 extending upwardly therefrom, an overhanging arm 22 and a front end portion 23 supporting the needle drive bar 24 and presser foot bar 25 therein. The head structure also includes the usual thread take-up lever 26, adjustable thread tensioner 27, spool mounting support 28, stitch regulating adjusting lever 29, switch 30 and drive wheel 31. Each of the above identified elements are customary features of sewing machine heads and perform their usual normal function.

Extending downwardly beneath the bed plate 20 of the sewing machine head are a pair of longitudinally extending substantially parallel flanges 32 and 33. These flanges are relatively wide and contain between them the ordinary drive portions and other elements of the machine that are normally located beneath the bed plate 20.

The sewing machine of this invention is provided with an essentially vertical motor housing member within the standard 21 so that the sewing machine is preferably of the type shown and described in my copending application Serial No. 288,253, filed May 16, 1952. The motor (not shown) and associated structure of the present machine are housed in a casing 34 provided with a vertical slot 34a. Extending through this slot is a reciprocable speed adjusting member 35 which is adapted to be raised and lowered in adjusting the speed of operation of the motor that drives the sewing machine head. Any type of speed regulating apparatus desired may be used. It is preferred, however, that this mechanism be of the centrifugally operated switch type in which the speed depends upon the distance of the switch from the motor. A typical speed governor of this type is that described and claimed in C. H. Sparklin U. S. Patent No. 2,532,345, issued December 5, 1950.

In order to raise and lower the speed adjusting member 35 and thus regulate the speed of operation of the sewing machine, there is provided a shaft 36 which extends through a pair of spaced brackets 37 and 38 that depend from the bed plate 20 and are essentially parallel to each other. These brackets 37 and 38 are aligned substantially transversely to the sewing machine head structure. The rear end of the shaft 36 has a reduced end portion 36a while the front end 36b extends through and beyond the front supporting bracket 38. The shaft 36 is rotatable within the bracket so that it can be oscillated about its longitudinal axis in regulating the speed of operation of the sewing machine head.

In order to move the speed adjusting member 35 upon oscillation of the shaft 36, there is provided an operating bracket 39 mounted on and attached to the shaft 36 by means of a set screw 40. The operating bracket 39 has a substantially cylindrical bearing portion 39a through which the shaft 36 extends and containing the set screw 40. This bearing portion 39a is located immediately to the rear of the front supporting bracket 38 so that the combination of this bearing portion 39a and the reduced end 36a of the shaft hold the shaft against substantial longitudinal movement.

The operating bracket 39 has a flat web portion 39b extending upwardly from the bearing portion 39a and lo-

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cated substantially transversely of the axis of the shaft 36 and of the bearing portion 39a. This web portion is provided with a first transverse portion 39c and a second transverse portion 39d angularly arranged with relation to each other and extending rearwardly from the web portion 39b. There is also provided a third transverse portion 39e extending forwardly of the web portion 39b and including an outwardly extending ear portion 39g adjacent to the outturned end 35a of the speed adjusting member 35. This outturned end portion 35a has extending therethrough an adjustable screw 41 having mounted thereon a lock nut 42. This screw 41 bears against the ear portion 39g.

The first and second transverse portions 39c and 39d of the bracket 39 are arranged on opposite sides of a downwardly extending metal strip 43 which is mounted as by a screw 44 on the bottom of the bed plate 20. The strip 43, therefore, acts as a stop to limit the extent of oscillation of the shaft 36. In order to regulate this extent of movement, the first transverse portion 39c is provided with an adjustable stop screw 45 extending through this first portion and held in place by a lock nut 46.

With the above arrangement, oscillation of the shaft 36 in a counterclockwise direction, as viewed in Fig. 5, causes the speed adjusting member 35 to be depressed, thereby increasing the speed of operation of the head. The extent of this increase is limited by the stop screw 45 striking the metal strip 43. Rotation of the shaft 36 in the opposite direction decreases the speed of the sewing machine head, with the extent of this movement being limited by the second transverse portion 39d bearing against the strip 43 in the manner shown in Fig. 5. The shaft 36 is continuously urged in a clockwise direction or toward the low speed position by means of a helical spring 47 positioned around the shaft, having one end 47a bearing against the outer side of the supporting bracket 37 and the other end 47b bearing against the inner side of the operating bracket 39 adjacent to the bearing portion 39a thereof.

In order to oscillate the shaft 36 and thus regulate the speed of operation of the sewing machine head, there is provided a knee-operable lever arm removably connectable to the operating shaft 36.

In the embodiment shown, the lever arm structure comprises a tubular connecting member 48 adapted to removably receive the outer or front end 36b of the shaft 36. In order to removably lock the connecting member 48 on this end, the end of the shaft is provided with a longitudinally extending end slot 36c, as shown most clearly in Figures 11 and 12, with one edge portion of the inner end of the slot being counterbored to provide an enlarged recess 36d. This enlarged recess is adapted to be engaged by the enlarged end 49a of a transverse pin 49 that extends from side to side of the connecting member 48. This pin which is slidable within the connecting member is urged in a direction toward the other end of the pin 49 from the enlarged portion 49a by a small concavo-convex spring plate 50 bearing against the inner surface of an enlarged head 49b on the opposite end of the pin 49. With this arrangement, the spring 50 holds the opposite enlarged end 49a in engagement with the enlarged recess 36d on the shaft 36 so that the parts are removably latched together.

The tubular connecting member 48 has attached thereto a base member 51 extending upwardly and rearwardly at a small angle in the manner illustrated most clearly in Fig. 4. Oscillatably mounted on this base member 51 is a lever member 52 with the inner end of this lever member including a bracket 53. This bracket is of essentially right angular shape and has one portion oscillatable on the base member 51 about a rivet 54 and the other portion attached to and carrying the lever member 52. The base member 51 and bracket 53 are provided with cooperating stop portions 51a and 53a which engage each other to limit the downward oscillation of the lever struc-

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ture in the manner illustrated in Figs. 8 and 9 when the lever has been moved to operating position.

The lever member 52 includes a rod or shank portion 55 having one end riveted to the bracket 53 and an outer end portion in the form of a second rod portion 56 of relatively short length axially aligned with the first rod portion 55 and mounted on an outwardly extending stud part 55a on the first rod portion 55. The second rod portion 56 is provided with an arcuate groove 56a extending more than 180° around the stud part 55a. This stud part is provided with an outwardly extending pin 57 located in this groove so that the second rod portion 56 can be oscillated about the stud part 55a through an arc that extends slightly more than 180°. The second rod portion 56 is provided with an outwardly extending wire loop 58 mounted therein. Thus, one end 58a of the loop is fastened at the extreme outer end of the rod portion 56 while the other end 58b of the wire extends and is fastened in the side of the rod portion 56. The wire loop 58 is long and relatively narrow so that the combination of the first rod portion 55, second rod portion 56 and wire loop 58 forms an extensive operating lever for oscillating the shaft 36 and thus regulating the speed of operation of the sewing machine head. The extreme outer end 58c of the wire loop 58 is preferably curved slightly, as indicated in Fig. 2, to provide a contact section to be contacted by the knee of the operator in changing the speed setting of the machine.

Because of the pivotal connection of the bracket 53 on the base member 51, the lever member 52 may be turned to a storage position as illustrated in Fig. 1. When in this storage position, the first rod portion 55 is removably held in a spring metal clip 59. The rod portion is moved out of engagement with this clip merely by pulling downwardly on the lever member 52. The lever member may then be turned to an operating position, as shown by broken lines in Fig. 1 and in Fig. 8, until the stop portions 51a and 53a engage in the manner shown in Fig. 9. The lever member 52 may then be moved through a range of movement illustrated in Fig. 2 to regulate the speed of operation of the sewing machine head. This range of movement depends upon the spacing between the second transverse bracket portion 39d and the inner end of the stop screw 45 in the manner explained above.

When the sewing machine head structure is held in a cabinet 60, in the manner illustrated in Figs. 1, 3 and 4, the tubular connecting member 48 and thus the lever member 52 will be fastened directly to the end of the oscillatable shaft 36. However, when the sewing machine head structure of this invention is used as a portable and is resting on the top of a table 61 or similar supporting structure, as illustrated in Figs. 2 and 10, there is provided an extension member 62 in order to locate the lever member 52 forwardly of the base of the sewing machine head and beyond the edge 61a of the table 61.

In the embodiment shown, this extension member 62 is a rod-like member having a bent outer end 62a with the opposite end 62b provided with a socket recess 62c to receive the outer end of the shaft 36 and an outer annular groove 62d at about the center of the body of the extension member. This opposite end 62b of the extension member is provided with a latching pin 63 and associated structure similar to the latching pin 49 in the tubular connecting member 48. With this arrangement, the extension member 62 can readily be removably attached to the outer end of the shaft 36.

When the extension member 62 is in place on the outer end of the operating shaft 36, the outer end 62a of the extension member is bent downwardly in the manner illustrated in Fig. 10. As the angle of this bent portion is substantially the same as the angle of the base member 51, the lever member 52 extends substantially straight downwardly when moved to operating position. This arrangement is provided so that the insertion of the ex-

tension member 62 will not position the lever arm 52 too far away from the knee of the operator of the sewing machine, yet will permit this lever arm to clear the edge 61a of the table 61.

The sewing machine head structure of this invention is provided with a bottom closure plate 64 that is removably attached to the bottom of the sewing machine head as by a plurality of screws 65. This bottom plate 64 extends between the downwardly extending flanges 32 and 33 and is itself provided with an upwardly extending transverse flange 68 that is normally located beyond the shaft 36 and associated structure when the bottom closure plate 64 is in place. With this arrangement, the combination of the flanges 32 and 33 on the bottom of the bed plate 20 and the transverse flange 68 on the plate itself serves to enclose the lower operating portions of the sewing machine head structure except for the outer end of the shaft 36 which is exposed for engagement with the knee operable lever structure in the manner described.

In order to aid in supporting the sewing machine head structure on a surface such as a table when the structure is used as a portable structure, the bottom closure plate 64 is provided with a plurality of substantially coplanar resilient head supporting means such as the small rubber feet 66. These feet not only support the sewing machine head structure firmly on this surface, such as on the table 61, but also prevent marring of this surface.

As has been explained above, the extension member 62 is ordinarily employed only when the sewing machine head structure of this invention is used as a portable on a table top or other surface. When the extension member is not in use, it is preferably held in a spring metal clip 67 located at the rear of the sewing machine head on the rear flange 33. When the extension member 62 is in its storage position in the clip 67 the groove 62d engages a reinforcing rib 20a on the bottom of the bed plate. This aids in centering the member 62 in the clip 67.

Having described my invention as related to the embodiments shown in the accompanying drawings, it is my intention that the invention be not limited by any of the details of description, unless otherwise specified, but rather

be construed broadly within its spirit and scope as set out in the accompanying claims.

I claim:

1. A sewing machine head structure, comprising: a sewing machine head including a bed plate; an oscillatable speed control member extending transversely of and beneath said bed plate, the speed control member having an outer end and the speed control member being oscillatable in regulating the speed of operation of said head; and a lever structure comprising a removable connecting member having a socket portion releasably receiving said outer end, a base portion attached to the socket portion normally extending upwardly and rearwardly therefrom and a lever member oscillatably mounted on the extending part of said base portion for selective positioning in a storage position adjacent to said bed plate when said connecting member is in operating engagement with said control member and a generally downwardly extending operating position when said connecting member is in operating engagement with said outer end, said extending part of the base portion and the lever member being provided with cooperating stop portions that engage each other when said lever structure is in said operating engagement.

2. The head structure of claim 1 wherein said lever member includes a shank portion and an outer end portion of substantial width substantially aligned with said shank portion and oscillatable relative thereto about its longitudinal axis.

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