April 16, 1946. N. E. COLEGROVE 2,398,697

SEWING MACHINE

Filed Dec. 22, 1944 2 Sheets-Sheet 1

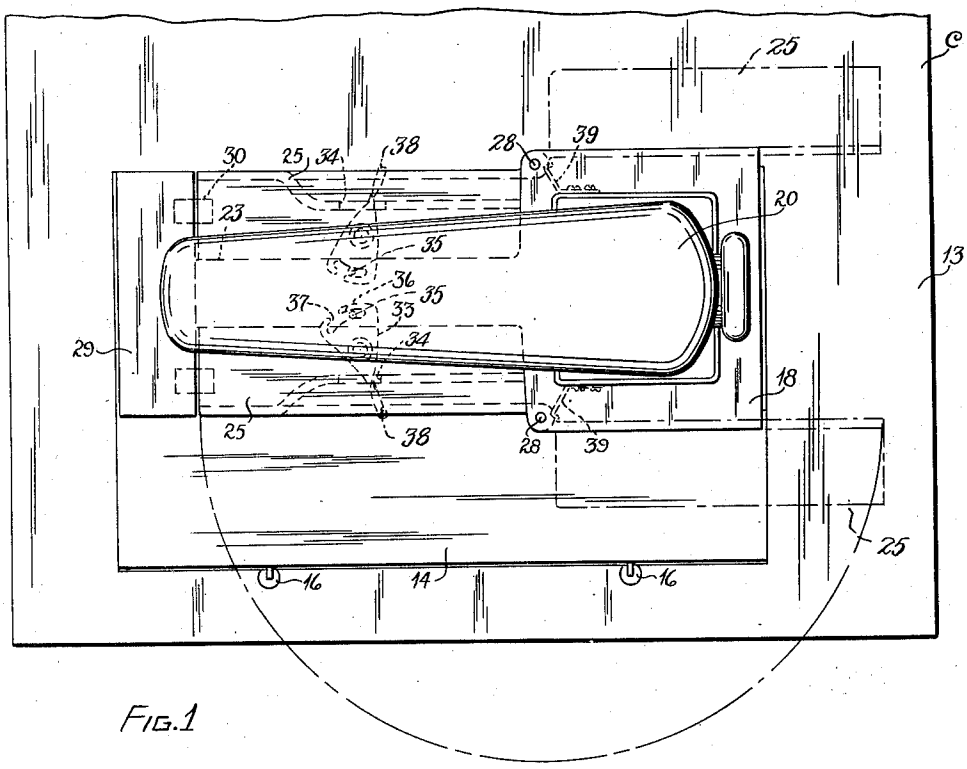


FIG. 1

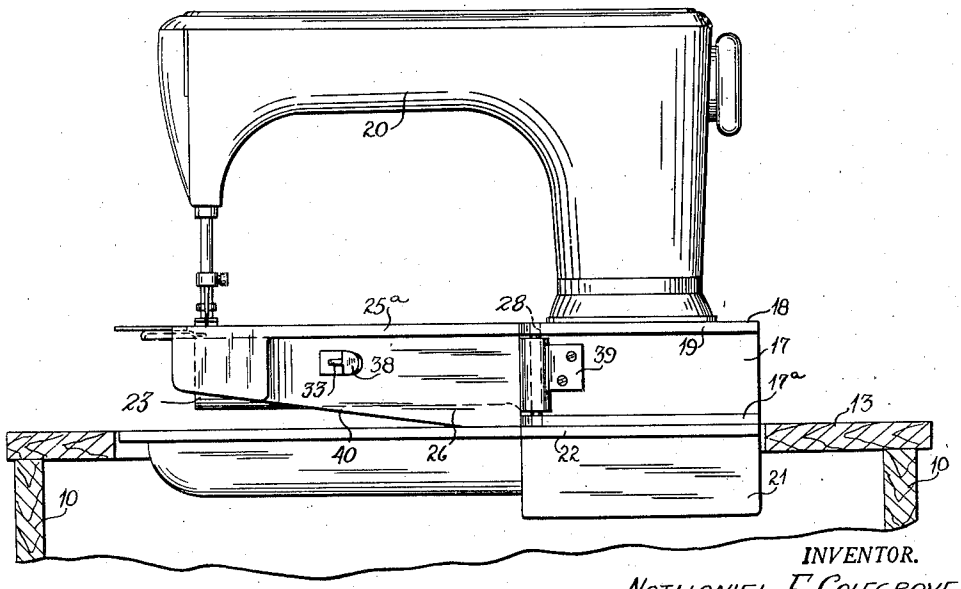


FIG. 2

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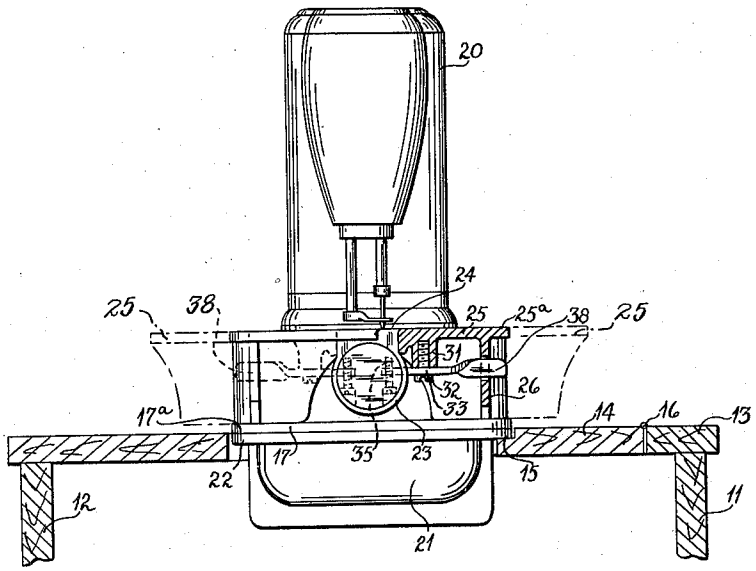


FIG. 3

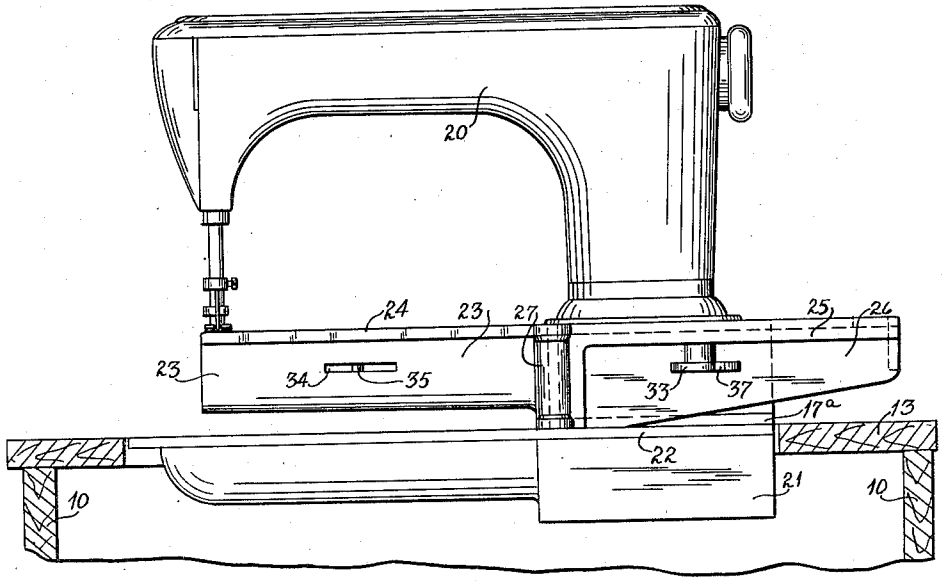


FIG. 4

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UNITED STATES PATENT OFFICE

2,398,697

SEWING MACHINE

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Application December 22, 1944, Serial No. 569,299

10 Claims. (Cl. 112—260)

This invention relates to a sewing machine and more particularly to a sewing machine of the type which is convertible from a flat top bed machine for performing plain or flat sewing operations on flat articles to a cylindrical arm sewing machine for performing darning operations on tubular articles such as sleeves, stockings and the like.

In sewing machines for performing plain or flat sewing operations on flat articles there is usually provided a plane bed plate over which the work or material passes during the sewing, and in the case of the drophead type of sewing machine the bed plate when the machine is being operated is so located as to be substantially flush with the top of the table of the sewing machine cabinet. This bed plate practically prohibits using the machine to sew or darn tubular articles. Therefore sewing machines have been designed so that a substantial portion of the flat bed plate may be removed and laid aside to expose a relatively narrow cylindrical or tubular arm, bed or horn lying below the bed plate and enclosing the sewing mechanism, and said arm, bed or horn provides the requisite work surface for tubular articles such as sleeves, stockings and the like. In the case of the drophead type of sewing machine the head is elevated to a second or raised operative position relative to the cabinet when functioning on tubular articles.

The type of sewing machine just referred to is known as a convertible type machine and the present invention is applicable thereto. Heretofore the flat bed plate which has been removed to expose the relatively narrow cylindrical or tubular arm or horn lying below it has been completely detachable from the sewing machine head and when said bed plate is removed it must be laid aside with the ever present likelihood that it may be misplaced or lost.

An object of the present invention is to provide in a convertible type sewing machine a bed plate which is operatively connected at all times to the sewing machine head but which plate can be moved from its operative position for plain or flat sewing into an inoperative position to expose the cylindrical or tubular arm, bed or horn when it is desired to use the sewing machine for darning or other operations on tubular articles.

Another object is to provide a convertible type sewing machine wherein the user of the machine can convert the same with facility from a condition for plain or flat sewing operations to one for darning or other operations on tubular articles.

A further object is to provide in a convertible type sewing machine a bed plate which is always mechanically connected to the sewing machine head but which in sewing machines of the drophead type will not when being moved from inoperative position to closed or operative position interfere with or damage the cabinet on which the drophead type sewing machine is mounted.

Further and additional objects and advantages not hereinbefore specified will become apparent hereinafter during the detailed description of an embodiment of the invention which is to follow.

Referring to the accompanying drawings:

Fig. 1 is a top plan view of a sewing machine of the drophead convertible type and shows the head of the machine in raised position relative to the cabinet with the flat bed plate in closed or operative position for performing flat or plain sewing operations, the open or inoperative position of the bed plate being indicated by dash lines.

Fig. 2 is a sectional view through the sewing machine cabinet and a front elevational view of the head of the drophead sewing machine, said head being shown in its most upward raised operative position but with the flat bed plate shown as still in closed operative position as distinguished from open or inoperative position.

Fig. 3 is a view partly in transverse section and partly in end elevation with the head shown in the position it occupies in Fig. 2; the flat bed plate being shown in full lines in closed position and in dash lines in open or inoperative position, and

Fig. 4 is a view similar to Fig. 2 but illustrates the flat bed plate moved to open or inoperative position so as to expose the cylindrical or tubular arm, bed or horn upon which darning or other operations may be performed on tubular articles.

The invention is applicable to a portable convertible type sewing machine or to a drophead convertible type sewing machine or to any other type convertible sewing machine. The invention is illustrated and described herein by way of example only and not by way of limitation as applied to the drophead convertible type sewing machine.

The cabinet C for the drophead convertible type sewing machine shown herein may be of conventional construction well understood in the art and includes the end walls 10, front wall 11 and rear wall 12 as well as the usual legs (not shown) secured to said walls. Ordinarily doors (not shown) will be provided at the front of the cabinet to provide access to the interior thereof as is well understood in the art. A top or table 13 is secured to the upper edges of the walls

and to the upper ends of the legs of the cabinet and is provided with an opening through which the sewing machine head passes in moving to an active position above the table or in moving to an inactive position wherein it is contained within the cabinet as is clearly understood in the art.

At the side of said opening in the table or top which is adjacent to the front of the cabinet a leaf 14 is provided which partially fills said opening and said leaf has its inner longitudinal edge provided with a shoulder 15 for a purpose later to be explained. The opposite longitudinal edge of the leaf 14 is hingedly connected to the top or table 13 by hinge means 16 as will be well understood in the art, and said leaf 14 is normally urged in an upward direction by spring means (not shown) secured to the interior of the cabinet and engaging the under side of the leaf 14 as is usual in cabinet constructions for the drophead type of sewing machines. In order to positively support the leaf 14 in its lower position suitable stops may be secured to the underside of the top or table 13, as is common in cabinet constructions of this type. It will be understood that a cover, not shown, may be hingedly connected to the left hand side of the table or top 13 as viewed in Fig. 1, and said cover can be swung over the table or top and the opening therein when the sewing machine head is in its idle position within the cabinet, or it can be swung outwardly in an extension of the table or top 13 when the sewing machine head is in an active or sewing position. This arrangement is conventional and well understood and for that reason and the further reason that it forms no part of the present invention it has not been illustrated herein.

In the drawings there is illustrated a sewing machine head of the convertible drophead type which can be used for plain or flat sewing operations on a flat work bed or plate or can be used for darning or similar operations on a cylindrical or tubular arm, work bed or horn.

The sewing machine head comprises a base 17 of generally rectangular box-like construction and having at its upper side a flat surface 18. The flat surface 18 projects laterally at each longitudinal side of the base 17 to provide flanges 19, with the front flange 19 adapted to cooperate with the shoulder 15 of the leaf 14 when the sewing machine head is in the active position for flat sewing operations and at which time the surface 18 is substantially flush with the table or top. The standard or gooseneck of the head is indicated at 20 and extends upwardly from the surface 18 of the base 17 as is usual in sewing machine constructions.

A sub-base 21 is secured to the lower side or bottom of the base 17 by means of flanges 22 extending along the longitudinal upper edges of the sub-base 21 and rigidly connected to the flanges 17a at the lower longitudinal edges of the base 17 by suitable securing means such as screws, rivets or the like not shown.

A tubular or cylindrical work support, horn, arm or bed 23 extends from the left hand end of the base 17, as viewed in Fig. 4, and has its free end underlying the needle and presser mechanisms carried by the standard or gooseneck 20 and said free end of the horn or bed 23 is provided with the stitching and feed mechanisms as will be well understood. The cylindrical or tubular work support, arm, horn or bed 23 and the base 17 house the motor and drive for the feed and stitching mechanisms as will be well understood in the art. The tubular support 23 is provided on its upper side with a flat surface 24, as clearly indicated in Fig. 3, and which surface is substantially coplanular with the surface 18 of the base 17.

When the sewing machine head is in its active position for flat sewing the surface 18 of the base 17 is substantially flush with the upper surface of the table or top 13 and the leaf 14 with the front shoulder 19 engaging the shoulder 15 of the leaf. At this time a bed plate, later to be referred to, is arranged in an extension of the surface 18 of the base and fills the remainder of the opening in the table or top, said bed plate being flush with and forming an extension of the flat top surface 24 of the tubular or cylindrical arm or horn 23 and of the flat surface 18 of the base 17. When the sewing machine head is in its active position for tubular sewing or darning operations the base plate is displaced to expose the arm or horn 23 and the head stands elevated relative to the top or table 13 of the cabinet and in a position wherein the underside of the front flange 22 of the sub-base 21 rests upon the shoulder 15 of the leaf 14 as clearly indicated in Fig. 3. At this time the tubular work bed, arm or horn 23 is located above the level of the table 13 and in a position where tubular articles can be passed thereover and sewing operations performed thereon.

The sewing machine head may be connected to the cabinet for raising and lowering the same to and from its two active positions and its idle position by any well known means for such purpose as, for example, the means disclosed in the copending application of Charles E. Colegrove, Serial No. 556,696, filed October 2, 1944.

The flat bed plate previously referred to and upon which plain or flat sewing operations are performed embodies the novel features of the present invention. Heretofore in the convertible type of sewing machine the flat bed plate has been completely detachable from the sewing machine head when it is desired to use the cylindrical or tubular work bed, arm or horn of the machine for darning or other operations on tubular articles. In accordance with the present invention the major portion of the flat bed plate always is mechanically connected to the sewing machine head. Heretofore in the convertible type sewing machines the removable flat bed plate was completely detachable from the sewing machine head when the machine was conditioned for sewing operations upon tubular articles. The prior arrangement often results in the flat bed plates being lost or damaged and also the completely detachable flat bed plates are not positioned and removed with the facility of the bed plate of the present invention. In accordance with the present invention the flat bed plate is constituted in large part by two movable portions which are mechanically connected to the base 17 and in the illustrated embodiment are in the form of wing-like elements which are hingedly connected to the base 17 to swing about a vertical axis from a position wherein they enclose the cylindrical or tubular arm or horn 23, except for the flat upper surface 24 thereof, to an open position wherein said horn or arm is fully exposed.

The wings or movable portions of the flat bed plate are in transverse section of angular configuration and comprise horizontally extending parts 25 and vertically extending parts 26. The wings are provided at their right hand ends, as viewed in the drawings, with vertically extending bosses 27 which mount pintles 28, the opposite

ends of which pintles are received in bearing openings formed in the flanges 19 and 17a of the base 17. When the wings are swung to their operative position, indicated by full lines in the drawings, the horizontal parts 25 thereof are flush with the flat upper surface 24 of the tubular arm or horn 23 and provide with said flat upper surface a continuous flat work bed plate or support. The opening in the table or top of the cabinet will be almost completely filled by the upper surface 24 of the horn 23, the horizontal parts 25 of the wings and the flat surface 18 of the base 17. It will be noted that the wings when in closed or operative position terminate at a transverse line which is adjacent to the sewing mechanism, thus leaving the left hand portion of the opening to be filled or closed by a removable plate 29. This plate completes the flat bed plate and is provided for the purpose of affording access to the bobbin case and the other elements of the sewing mechanism as will be readily understood. The plate 29 is held in assembled relation with the left hand end of the wings by connecting means 30 indicated diagrammatically in Fig. 1. The plate 29 is similar to removable plates heretofore used to afford access to the sewing mechanism and can be secured in position in any desired well known manner.

The horizontal parts 25 of the wings are extended to provide longitudinal flanges 25a which when the wings are closed constitute an offset extension of the flanges 19 of the base 17 with the front flange 25a adapted to engage and be supported by the shoulder 15 of the leaf 14 of the cabinet.

Suitable latch means are provided for holding the wings in closed or operative position and a form that said means may take is illustrated in the drawings. The horizontal parts 25 of the wings are provided on their undersides with downwardly extending bosses 31 which have threaded openings into which pivot pins 32 are screwed. The pins 32 rockably mount latches 33 which extend when the wings are closed through horizontal longitudinally disposed openings 34 in the diametrically opposite sides of the arm 23. Keeper pins 35 are mounted within the arm 23 and said pins cooperate with the inner ends of the latches 33. Said latches 33 are provided at their inner ends with arcuate slots 36 and said slots communicate with openings 37. When the wings are closed the latches 33 are moved by their handle portions 38 which project through openings in the vertical parts 26 of the wings to a position wherein the keeper pins 35 can pass through the openings 37 and into the arcuate slots 36 of the latches 33, whereupon the latches are moved in the proper direction to cause the wings to be drawn tightly against the arm or horn 23. When it is desired to move the wings to open position and fully disclose the arm or horn 23 the latches 33 are manually moved by the handle portions 38 to disengage the inner ends of said latches from the keeper pins 35, whereupon the wings can be swung outwardly and backwardly from the position shown in Fig. 2 to the position shown in Fig. 4. The wings are held in this latter position by means of spring retaining members 39 secured to the sides of the base 17 and engaging shoulders formed on the bosses 27 of the wings, thus the danger of the wings swinging about their axes through vibration or otherwise when not desired is eliminated.

It will be noted that the lower edges 40 of the vertical parts 26 are upwardly inclined substantially from adjacent the hinged ends of the wings to the free ends thereof. The purpose of the inclined lower edges of the parts 26 of the wings is to provide clearance and eliminate possible interference between the wings and the cabinet when the sewing machine head is being lowered to inactive position within the cabinet.

It will be understood that when the sewing machine head is lowered from an active position to an inactive position within the cabinet, it is necessary first to raise the head slightly and then to raise the leaf 14 to provide clearance for the passage of the head into the cabinet. Unless the front wing is fully closed the leaf 14 cannot be elevated. The rear edge of the opening in the table or top of the cabinet has only slight clearance with respect to the rear edge of the head, it being understood that the means carried by the cabinet for raising and lowering the head is located adjacent to the rear edge of the opening. Consequently should the wing at the rear of the head be in partly open position when the head is being lowered into the cabinet it might prevent such operation or cause damage to the head or cabinet.

The vertical parts 26 of the wings are at the outside and spaced from the body of the sewing machine head. The inclined or tapered lower edge 40 of the rear wing will cooperate with the rear edge of the opening in the table or top, if the wing is partly open when the head is being lowered into the cabinet, to produce a turning movement that acts to swing the wing into fully closed position. Thus damage to the head or cabinet is avoided.

It will be noted that the wings, particularly the upper longitudinal edges thereof, are offset relative to the upper longitudinal edges of the base 17, wherefore the wings may be swung through an arc of 180° from a closed position, paralleling the horn or arm 23 to an open position against the base 17.

Although a preferred embodiment of the invention has been illustrated and described herein it will be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck; means cooperating with the upper surface of said arm to form a flat work bed, and means operatively and movably interconnecting said first means with said base to enable said first means while so interconnected with said base to be moved from cooperative position relative to said arm to an inoperative position wherein said arm is exposed.

2. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck; separate members positionable in cooperation with said base to form a flat work bed, and means movably and operatively interconnecting said members with said base to enable said members while so interconnected with said base to be moved from their cooperative position relative to said arm to an inoperative position wherein said arm is exposed.

3. In a sewing machine head of the convertible type including a base mounting a gooseneck and

having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck; separate members positionable in cooperation with said arm to form a flat work bed, and means hingedly connecting said members to said base to swing from their cooperative position relative to said arm to an inoperative position wherein said arm is exposed.

4. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck, separate members positionable in cooperation with said arm to form a flat work bed, and means hingedly connecting said members to said base adjacent the front and rear thereof to swing about vertical axes from their cooperative position relative to said arm to inoperative positions against the front and rear of the base whereby said arm is fully exposed.

5. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck; separate members of angular cross-section and having a horizontal portion and a vertical portion, and means hingedly connecting said members to said base to swing from positions wherein the horizontal portions thereof cooperate with said arm to form a flat work bed to inoperative positions wherein said arm is fully exposed.

6. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck; separate members of angular cross-section and having horizontal portions and vertical portions, and means hingedly connecting one end of said members to said base to swing about vertical axes from positions wherein the horizontal portions of said members cooperate with said arm to form a flat work bed to inoperative positions wherein said members are substantially in contact with the front and rear sides of said base and said arm is exposed.

7. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck; means cooperating with the upper surface of said arm to form a flat work bed, means operatively and movably interconnecting said means with said base to enable said means to be moved while so interconnected with said base from cooperative position relative to said arm to an inoperative position wherein said arm is exposed, and means for latching said first named means to said arm when in cooperative position.

8. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck; separate members of angular cross-section having horizontal portions and vertical portions; means hingedly connecting said members to said base to swing from positions wherein said horizontal portions cooperate with said arm to form a flat work bed to inoperative positions wherein said arm is exposed, and cooperating means carried by said members and arm for latching said members in said first mentioned positions.

9. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck; a pair of members of angular cross-section having horizontal portions and vertical portions, means hingedly connecting said members at one end to the front and rear of said base respectively to swing from positions wherein the horizontal portions of said members cooperate with said arm to form a flat work bed to inoperative positions wherein said arm is exposed, and latches rockably mounted on the underside of said horizontal portions and provided with handles extending through openings in said vertical portions, and means carried by said arm and cooperating with said latches to latch said members to said arm in the positions wherein the horizontal portions of the members cooperate with the arm.

10. In a sewing machine head of the convertible type including a base mounting a gooseneck and having a tubular arm projecting from an end thereof with its free end underlying the sewing mechanism of the gooseneck, a pair of members of angular cross-section having horizontal portions and vertical portions and adapted in one position to extend along the front and rear of said arm respectively with the horizontal portions forming therewith a flat work bed and with the vertical portions forming an offset continuation of the front and rear sides of the base, means hingedly connecting said members at one end to said base to swing on a vertical axis away from said arm to expose the same and to a position wherein said members respectively substantially contact the front and rear sides of the base, the lower edges of the vertical portions of said members being upwardly inclined substantially from the point of the hinged connection to the base toward the free ends of said members.

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