STAND FOR SEWING MACHINES AND SEWING UNIT COMPRISING THE SAME

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This invention relates to an improved sewing stand or table on which may be mounted a sewing machine, a motor and clutch unit, appropriate treadmill means for controlling the operation of the machine and other devices incidental to the operation of the machine.

Sewing stands or tables, as heretofore constructed for industrial use, have usually been cumbersome and not readily shiftable from one position to another, as is frequently desired in mills equipped with various lines of machines adapted to perform a series of different sewing operations on articles passing from operator to operator along the line. Such stands have also required substantial time and effort to adapt them for use in connection with machines arranged to perform different sewing operations or for use by operators of different physical stature. Also, such stands have been so constructed that it has been difficult, if possible at all, to eliminate the objectionable effects of vibrations incident to the operation of the sewing machine.

A primary object of the invention has been to provide a simple, sturdy and inexpensive stand which is of lightweight construction and is particularly suited as a support or carrier for a sewing machine, the driving and controlling means therefor, and other devices incidental to the operation of the machine.

Another object has been to provide a stand of the character indicated which is easily adjustable as to height so that sewing machines of various types may be positioned for most convenient use by operators of different physical stature.

A further object has been to provide a sewing stand having a part or parts capable of arrangement in different positions to enable the mounting of different types of sewing machines in different relations to the supporting top or table board and to permit the most convenient location of certain control members.

Still further objects of the invention include the provision of means, or the construction and arrangement of parts, which will reduce to a minimum the production of objectionable vibrations in the sewing stand.

In achieving the foregoing objects the present invention incorporates in the improved sewing stand a number of important features. One is the formation of the supporting means for the table top or board of a plurality of U-shaped tubular members. These are preferably so formed that two of the members, which have secured thereto the work supporting table board, have a telescopic fit in relation to complementary U-shaped members which have floor engaging foot elements. Means are provided for retaining the inverted U-shaped members in different positions of relative adjustment for varying the over-all height of the sewing stand. Preferably the legs of the U-shaped members are inclined at a small angle to the vertical, the upper and lower members being complementary in this respect, so that a flexing and binding action of the legs results from their relative adjustment.

Another feature of the improved construction is the provision of a support member for the motor and clutch unit which is capable of attachment to certain of the U-shaped members in a plurality of different relationships so as to vary the relative positions of said motor and clutch unit and the table top or board which is secured to the upper U-shaped members. Thus, if the sewing machine is to rest upon the top of the table board the support member mentioned may be secured to the leg structure in one position, whereas if the machine is mounted in submerged relation to the table board, the indicated support member may be secured to the leg structure in an inverted position.

Other objects, features, and advantages of the invention will appear from the detailed description of an illustrative embodiment of the same which will now be given in conjunction with the accompanying drawings in which:

Fig. 1 is a front elevational view of a sewing stand embodying the invention, having applied thereto a sewing machine and related devices for its operation and control;

Fig. 2 is a view similar to Fig. 1 but illustrates a modified arrangement, in relation to the stand, of the sewing machine and a power unit for driving the same;

Fig. 3 is an end elevational view of the construction illustrated in Fig. 1, as seen from the right of that figure;

Fig. 4 is a detail view illustrating, on an enlarged scale, the means for mounting a switch box and a combined thread stand and cable lead-in on the sewing stand;

Fig. 5 is an exploded perspective view of a clamping unit provided for adjustable supporting the lower tubular cross-member to the side frames of the standard;

Fig. 6 is a plan view of the structure shown in Fig. 1, with the sewing machine removed;

Fig. 7 is an enlarged detail view, in elevation, illustrating the mode of attachment of a motor and clutch unit to the standard;

Fig. 8 is a detail view, partly in plan and partly in horizontal section, illustrating the mode of attachment of a tubular cross-member and a thread stand to one of the side frames of the sewing stand;

Fig. 9 is a plan view of the mounting means shown in Fig. 7, with a portion of the tubular cross member broken away;

Fig. 10 is an enlarged detail view, in vertical section, illustrating a vibration isolating form of connection between the table board and the supporting structure of the sewing stand;

Fig. 11 is a plan view of the presser bar lifting treadmill and its mounting means, certain parts being broken away for clarity of illustration; and

Fig. 12 is a view, partly in elevation and partly in vertical section, of the devices shown in Fig. 11.

Referring now to the drawings, the main supporting structure of the improved sewing stand comprises two end frames and 11 of substantially tubular form. As will be more fully explained hereinafter, these frames, which are of identical construction, have their front and rear vertical leg portions inclined inwardly to a slight extent from bottom to top so that the frames are slightly narrower at the top than at the bottom. This is illustrated on a somewhat exaggerated scale in Fig. 3. Each frame comprises a lower U-shaped member 12 which is formed from a straight piece of metal pipe or tubing and is bent into the configuration illustrated in Fig. 3. It also comprises an inverted U-shaped member 13 similarly formed by the appropriate bending of a straight section of metal pipe or tubing. The outside diameter of the tubing of which the member 13 is formed is slightly less than the inside diameter of the tubing from which the member 12 is formed and the lower ends of the legs of the member 13 are fitted telescopically within the upper ends of the legs of member 12. By way of example, the member 12 may be formed of a 1¼ inch standard pipe while member 13

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may be formed of a 1 inch standard pipe. To insure a snug fit between the telescoped portions of the legs of the two members, these legs are inclined inwardly at a slight slope to the vertical from the bottom toward the top of the frame. The angle of inclination of the legs should be quite small and preferably about 2°. An inclination of any substantially greater extent will tend to interfere with the vertical adjustment of the member 13 in relation to member 12, which affords the means for varying the overall height of the frame and hence the entire stand. It will be understood that the ends of the legs of the two members 12 and 13 will be telescoped to a greater or less extent depending upon the desired height of the stand. When appropriately adjusted the members 12 and 13 are clamped in fixed relation to each other, as by means of set screws 14 having screw threaded engagement with suitable openings in the legs of the member 12 and having their ends driven into firm gripping relation with the lower ends of the legs of member 13. A very rigid frame structure is thus provided. The retention of the U-shaped members 12 and 13 in a given set relation is assisted by the friction between the telescoped portions of the legs of the members, which is increased by their slight inward inclination as explained above. It will be apparent that the legs of the two U-shaped members will be resiliently flexed to a certain extent as they are forced into telescopic relation. This tends to reduce the production of transmission of vibrational forces.

Suitable foot elements 15, formed of rubber, cork, or other material adapted to provide good frictional engagement with the floor and also to isolate the vibrations which may be developed in the frame, are secured to the members 12, preferably adjacent the elbows provided between the horizontally extending portions of these members and the vertically disposed legs. These foot elements may suitably be secured by screws 16 extending through appropriate openings in the members 12 and threaded into nuts or the like embedded in the foot elements.

A table board 17 is mounted on and secured to the horizontally disposed portions of the members 13. For this purpose a vibration isolating form of connection is preferably provided. This may be of the character illustrated in Fig. 10 and comprises a bolt unit having a disc or cylinder 18, formed of rubber or the like, in which is embedded the head 19 of a downwardly extending bolt 20 which passes through suitable openings in the horizontal portion of the member 13. A nut 21 serves to clamp the bolt firmly in place. Also embedded in the rubber element of the head 19 of an upwardly extending bolt 23. The heads 19 and 22 of the two bolts are suitably spaced and separated by an appropriate layer of rubber forming part of the element 18. A hollow screw 24, cooperating with the upper end of the bolt 23 and having its head 22 countersunk in the top of the table board 17, serves to retain the latter firmly against the resilient element 18. It will be understood that four or more of such units are provided to attach the table board to the two frames.

The table board is provided with an opening 25 arranged to receive the base portion of a sewing machine 26. At each corner of the opening 25 an inwardly extending shoulder or ledge 25a is formed at an appropriate distance below the top of the table board and these ledges serve to receive and support portions of the base of the frame of the sewing machine 26. The arrangement is preferably such that the cloth plate or working supporting surface 27 of the sewing machine is substantially flush with the top of the table board.

Referring to Fig. 2 there is illustrated a modified arrangement for supporting a sewing machine of a different type. In this modified arrangement the table board 17a has secured to its underside a block 28 which is cut away over the opening 25 in the table board of Fig. 6. This block provides a shelf 28a on which a sewing machine 29 may be mounted. Preferably the base of this sewing machine is provided with foot elements 30 formed of rubber, felt, or other vibration absorbing material and the shelf 28a is provided with sockets 31 to receive these foot elements.

It will be understood that various other arrangements may be provided for supporting the sewing machine on the table board. In lieu of the submerged arrangement illustrated in Figs. 1 and 2, the base of the sewing machine may rest upon the upper surface of the table board. In some instances a semi-submerged arrangement may be preferred.

Returning now to Fig. 1, there is shown a motor and clutch unit 32 which is connected by means of a belt 33 with a pulley shaft 26a on the motor 34 of the sewing machine. To support the motor and clutch unit the improved sewing stand is provided with a tubular cross member 34 which is suitably connected with the rear legs of the U-shaped members 13. In order to make possible the mounting of the sewing machine in any of a variety of ways, such as illustrated in Figs. 1 and 2, for example, the cross-member 34 is preferably shaped as indicated in Fig. 1. Its main central portion 35, to which the motor and clutch unit 32 is attached in the manner to be explained, has its axis offset upwardly from the axis of the end portions 36 of the cross-member. The motor serves to position the central supporting portion 35 of the member closely beneath the table board 17. The extremities of the cross member 34 are flattened and then curved to provide a portion 37 which conforms with the contour of the tubular member 13, as best shown in Fig. 6. A belt 38 cooperating with suitable openings in the vertical leg of the member 13 serves to clamp the portion 37 of the cross member firmly upon the member 13. It will be understood that a similar type of connection is provided at the opposite end of the cross-member.

In the event that the stand is to be used in the manner shown in Fig. 2, it will be found desirable to reverse the arrangement of the cross-member 34 so that its main central support portion 35 has its axis below that of the end portions 36. In this arrangement the flattened and curved portions 37 of the cross-member will engage the opposite faces of the member 13 from the arrangement illustrated in Fig. 8. The arrangement of the parts as shown in Fig. 2 serves to provide adequate clearance between the power unit 32 and the table board 17a with its downwardly extending block 28. It also permits use of a belt 33a of desirable length to connect the motor and clutch pulley with the driving pulley of the sewing machine. The motor and clutch unit, commonly referred to as an electric transmitter, may be of any suitable construction. It embodies an electric motor and a clutch which may be shifted under treadle control to connect and disconnect the pulley shaft of the unit with the motor shaft. This power unit is supported from the cross-member 34.

For this purpose the central portion 35 of the cross-member has clamped thereon a pair of bracket elements 39 (Figs. 1, 2, 7 and 9). Each bracket element comprises a main body portion 40 having a semi-cylindrical recess formed in its top adjacent the rearward end of the main portion 40. A complementary cap 41 provides the other half of the cylindrical opening through the bracket element as a whole. The member 40 and cap 41 are clamped about the portion 35 of the cross-member 34 and firmly secured thereto by screws 42. To insure against turning of the bracket element about the portion 35 of the tubular cross-member, a set screw 43 is preferably provided, this being received by a screw threaded opening in the cap 41. By tightening the set screw 43 adequate frictional resistance to turning of the bracket element is created. It will be understood that the two bracket elements 40 all be shifted along the portion 35 of the tubular cross-member and then set in any desired position to locate the power unit in proper relation to the sewing machine. Member 40 of each of the bracket elements is provided with a laterally extending flange or shelf 44 hav-
ing elongated slots or openings 45 extending through the same. These slots receive the shanks of screws 46, the lower ends of which have screw threaded engagement with upwardly extending bosses or lugs 47 provided on the housing of the power unit. Washers 48 are provided between the heads of the screws 46 and the top of the flange or shelf 44. The arrangement described provides for adjustment of the position of the power unit from front to rear of the stand to enable tightening or loosening of the belt 33 or 33w. When the power unit is appropriately adjusted the screws 46 are tightened to retain it in set position.

For operating the clutch of the power unit a lever 49 is provided, this being pivotally mounted at 50 on a portion of the frame of the power unit. As will be understood, the upwardly extending arm of the lever is forced to engage an axially shiftable clutch element. An extendable rod 51, which may simply be two separate rod elements connected in any desired overlapping relationship by a clamping collar 51a to provide for appropriate adjustment of the length of the rod, has its upper end suitably connected with a point on the horizontally extending portion of the lever 49. The point of attachment of the rod to the lever may be varied to suit the relative positions of the power unit and the treadle to be described. The lower end of the rod 51 is connected with a bracket 52 secured to a suitable support 53 suitably mounted for rocking movement upon a tubular cross-member 54. A ball pin 52a carried by the bracket 52, for cooperation with a spherical seat adjacent the lower end of the rod 51 may be located in any one of the openings in the bracket 52 shown in Fig. 5. The position of the treadle 53 longitudinally of the cross-member 54 may be varied to suit the convenience of the operator and the nature of the particular assembly of the parts provided on the sewing stand. Clamping collars 55 serve to retain the treadle against longitudinal movement along the cross-member 54 after appropriate adjustment has been made.

At each end of the cross-member 54 there is provided a hollow T-shaped fitting 56, the stem 57 of which receives the end of the tubular cross-member 54. A set screw 58 cooperating with a nut 59 welded to the outer surface of the stem 57 and passing through an aligned opening through the head serves to retain the parts 54 and 56 in assembled relation. Member 56 has a tubular head 60 which surrounds the horizontal portion of the U-shaped member 12. In the production of the stand the member 56 is thus applied to the tubular member 12 prior to the bending of the latter in its U-shape. The members 56 at the two ends of the cross-member 54 may be shifted to any suitable position along the horizontal portions of their respective members 12 and then secured in adjusted position by means of set screws 61 cooperating with nuts 62 welded to the outer face of the head portion 60 of member 56. Set screws 61 pass through suitable openings in the head 60 and engage the outer surface of the tubular elements 12 to lock the parts in set position. The arrangement described thus enables the positioning of the treadle 53 at any convenient or desired point from front to rear of the table stand.

If desired a second treadle 63 may be rockily mounted on the cross-member 54 for the purpose of operating the presser bar lifting mechanism of the sewing machine. A hook element 64 carried by the treadle 63 may be connected by a chain 65 to a lever conventionally provided on the sewing machine for achieving the indicated purpose. Suitable means may be provided for rockily mounting the hook element 64 upon the cross-member 54 at any desired position along the length of the latter. The arrangement may be similar to that explained in connection with treadle 53. Preferably, however, the arrangement shown in Figs. 11 and 12 is employed. This involves the provision of a support member 63a which is clamped upon the cross-member 54 by means of set screws 63b. A pivot rod 63c carried by the support member and retained thereon by a set screw 63d cooperates with openings in downwardly extending ears 63e of the treadle. Provision is preferably made for the location of the hook element 64 at any of a number of selected points around the arcuate end 63f of the treadle 63, so that, depending upon the location of the treadle, the most desirable connection between the latter and the presser bar lifting lever of the sewing machine may be effected. For this purpose the element 64 may be provided with a hook or eyelet at each end, these hooks being disposed in planes at right angles to each other. The hook at the inner end is swivelled about a screw or bolt 63g extending downwardly from the under face of the treadle in the center of curvature of the end 63f. The stem of the element 64 may be positioned in any one of a series of notches 63h provided around the arcuate end of the treadle. Each of the treadles 53 and 63 is preferably of cast iron construction with suitable openings through the foot supporting portion thereof, the upper surface of the treadle being covered by a pad or mat formed of rubber or any suitable composition material.

Means are provided on the improved sewing stand for supporting a treadle stand, the support for which may also conveniently constitute a lead-in tube for the cable connected with the power unit. For this purpose a bracket 66 (Figs. 1, 2, 4, and 8) is suitably adapted to one of the vertical legs of one of the U-shaped members 13. The bracket member 66 has a semi-cylindrical portion 67 which is arranged to grip the tubular member 13 and is secured to the latter by the same bolt 38 which serves to retain the corresponding end 37 of the tubular member 34. Bracket 66 has a socket portion 68 adapted to receive and retain the lower end of a tube 69 forming part of the thread stand support and cable lead-in. A bracket 70 is clamped upon the tube 69 adjacent its upper end by means of a set screw 71. Bracket 70 extends laterally from the tube 69 and is arranged to receive a post 72 which carries a thread cone supporting member. Post 72 is clamped in position on the bracket 70 by means of set screws 73. At the upper end of the post is mounted a platform 74 adapted to carry a plurality of thread cones 75. These are retained on the platform by means of rods or spindles 75a. The platform 74 also carries a rod 76 in association with each of the thread cones to present a thread guiding eye above the center of each cone. It will be understood that the thread is led upwardly from each cone and then downwardly to suitable guides and thread tensioning devices on the sewing machine.

As indicated, the thread stand may also be used as a lead-in for the electric conduit which supplies power to the power unit. For this purpose, the tubular support 69 is preferably provided with an extension 77 connected with the support by a coupling 78. Members 69 and 77 have threads of opposite hand for cooperation with the coupling. At the top of extension 77 there is mounted a cap 79 with an opening through which cable 80 may be led into and downwardly through members 77 and 69. At the lower end of member 69 the cable extends outwardly through an opening in the bracket 66 and is led to a suitable switch box. A clamp 81 at the free end of the cable may be suitably attached to the switch box 82, which is provided with a switch 82a of any suitable form for controlling the supply of current to the motor. A clamp 83 at the free end of another cable 84 is attached to the switch box and the cable 84 serves to deliver the current to the motor. Switch 82 is suitably supported from an L-shaped bracket member 85 which is secured to the forward vertical leg of one of the U-shaped members 13 by means of a pair of screws 86. The switch box is attached to the horizontally disposed arm of the bracket by means of screws 87. While a preferred embodiment of the invention has been disclosed in considerable detail it will be understood that various changes may be made in the con-
What is claimed is:

1. A sewing stand adapted to carry a high speed sewing machine and a power unit for driving the same which comprises a pair of substantially rectangular end frames, each end frame comprising a pair of tubular members, each of said members being bent into a U-shape with straight leg portions and a straight connecting portion between such legs and integrally connected therewith, said members of each pair being formed of tubing of just sufficiently different cross-sectional area to enable the legs of one member to fit snugly in telescopic relation into the legs of the other of said members, the members of each pair being in inverted relation and telescopically interconnected, means for retaining the interconnected legs of the members telescoped in relation to each other to any extent desired in accordance with the desired over-all height of the stand, a table board secured to the horizontal portions of the upper U-shaped members of the two frames and adapted to support a sewing machine, a tubular cross-member secured to the rear legs of said upper members of the two frames, and a second tubular cross-member secured to the horizontal portions of the lower U-shaped members of the two frames.

2. A sewing stand adapted to carry a high speed sewing machine and a power unit for driving the same which comprises a pair of substantially rectangular end frames, each end frame comprising a pair of tubular members, each of said members being bent into a U-shape with straight leg portions and a straight connecting portion between such legs and integrally connected therewith, said members of each pair being formed of tubing of just sufficiently different cross-sectional area to enable the legs of one member to fit snugly in telescopic relation into the legs of the other of said members, the members of each pair being in inverted relation and telescopically interconnected, means for retaining the interconnected legs of the members telescoped in relation to each other to any extent desired in accordance with the desired over-all height of the stand, a table board secured to the horizontal portions of the upper U-shaped members of the two frames and adapted to support a sewing machine, a tubular cross-member secured to the rear legs of said upper members of the two frames, and a second tubular cross-member secured to the horizontal portions of the lower U-shaped members of the two frames.

3. A sewing stand adapted to carry a high speed sewing machine and a power unit for driving the same which comprises a pair of substantially rectangular end frames, each end frame comprising a pair of tubular members, each of said members being bent into a U-shape with straight leg portions and a straight connecting portion between such legs and integrally connected therewith, said members of each pair being formed of tubing of just sufficiently different cross-sectional area to enable the legs of one member to fit snugly in telescopic relation into the legs of the other of said members, the members of each pair being in inverted relation and telescopically interconnected, the legs of the lower member being inclined inwardly toward each other at a small angle and the legs of the upper member being inclined outwardly away from each other at a corresponding small angle, said legs of said members being arranged to flex slightly in relation to said connecting portions thereof in accordance with the desired over-all height of the stand, a table board secured to the horizontal portions of the upper U-shaped members of the two frames and adapted to support a sewing machine, a tubular cross-member secured to the rear legs of said upper members of the two frames, and a second tubular cross-member secured to the horizontal portions of the lower U-shaped members of the two frames.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,875,006
February 24, 1959

Arthur N. Hale

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 8, lines 26 and 27, strike out "legs of one member to fit snugly in telescopic relation".

Signed and sealed this 16th day of June 1959.

(SEAL)
Attest:
KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents