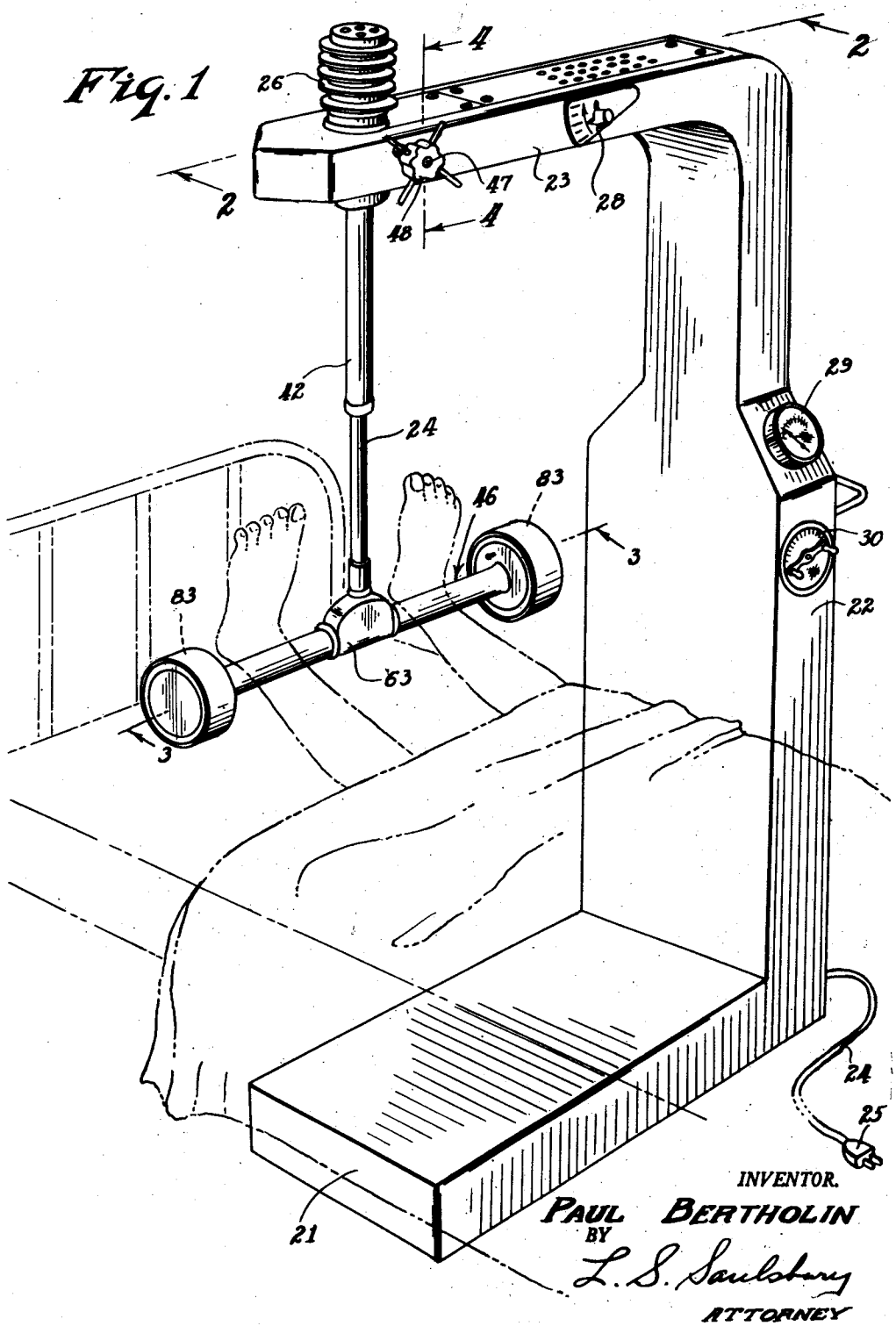
July 14, 1953 P. BERTHOLIN 2,645,219

VIBRATING MACHINE FOR TREATING HUMANS

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Fig. 1

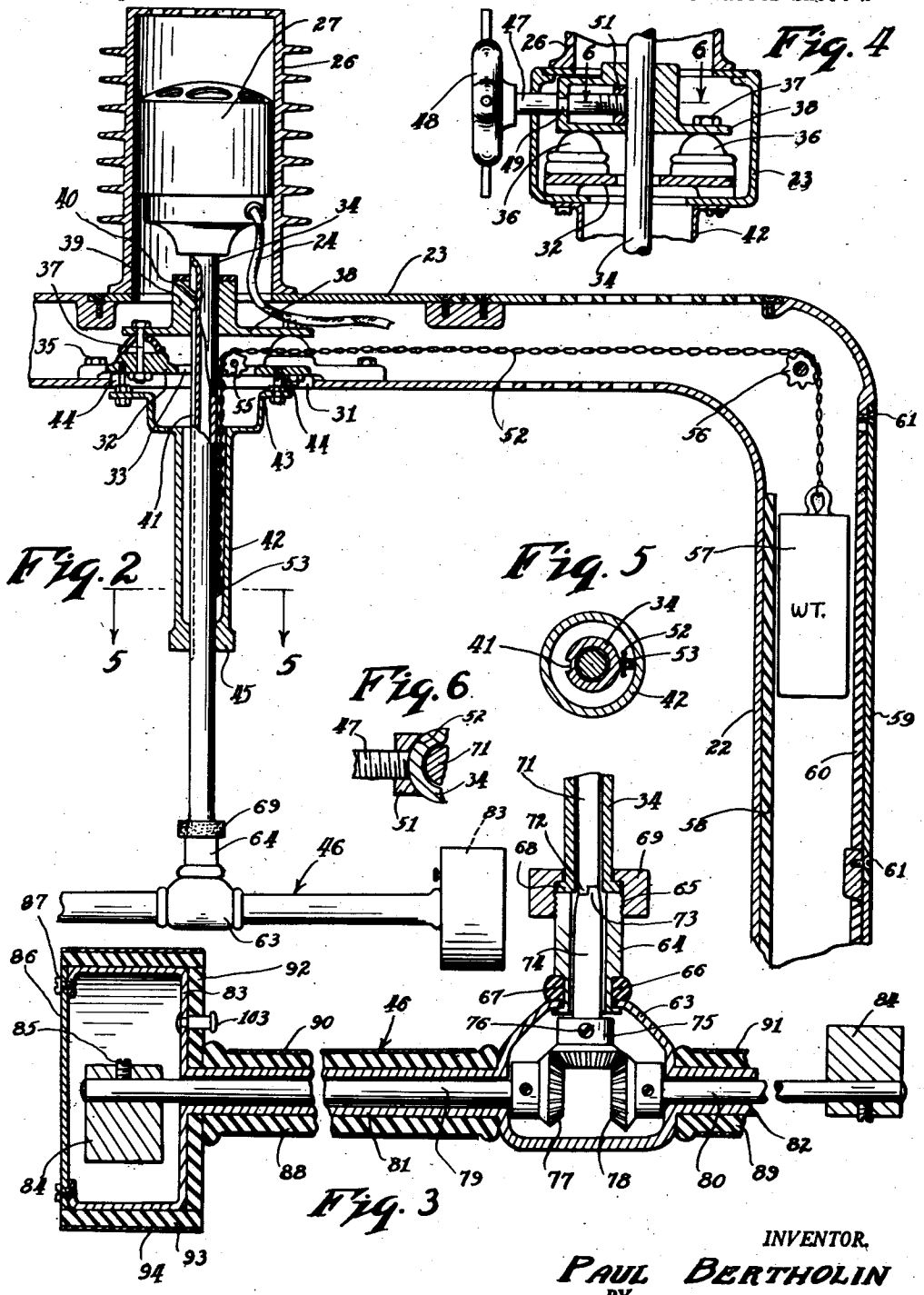


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VIBRATING MACHINE FOR TREATING HUMANS

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Fig. 14

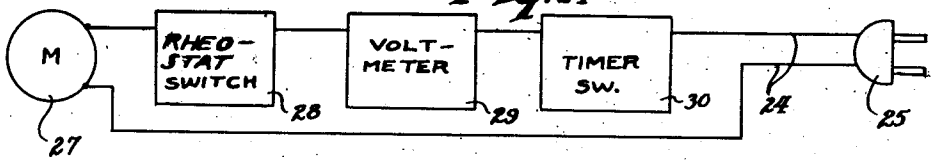


Fig. 7

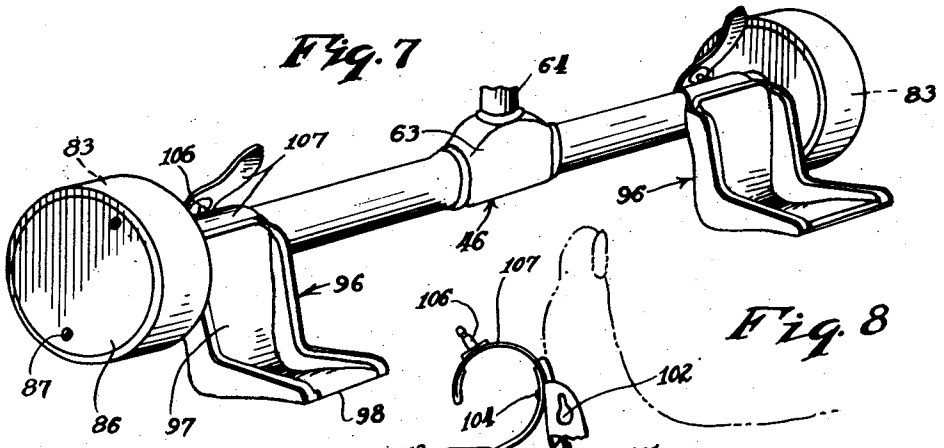


Fig. 8

Fig. 9

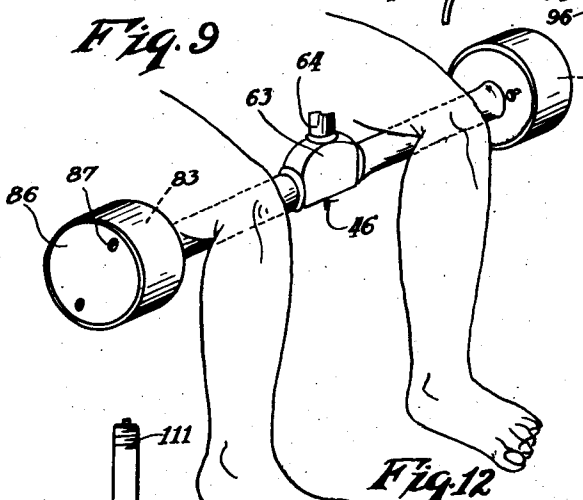


Fig. 10

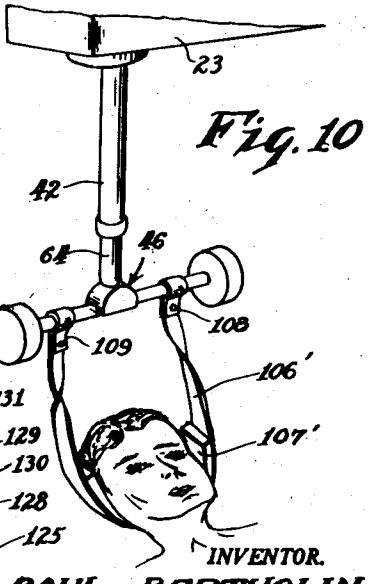


Fig. 11

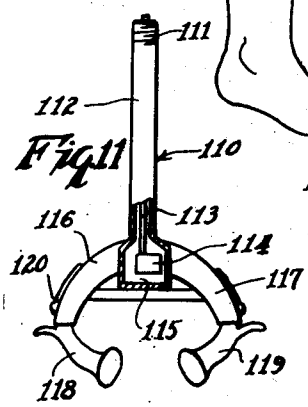


Fig. 12

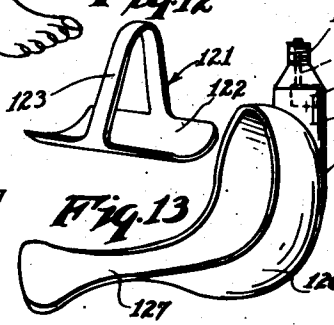


Fig. 13

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2,645,219

VIBRATING MACHINE FOR TREATING HUMANS

Paul Bertholin, New York, N. Y.

Application September 10, 1951, Serial No. 245,809

10 Claims. (Cl. 128—36)

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This invention relates to a vibrating machine, adapted particularly for working on the limbs of a human to limber them and to create good blood circulation.

It is an object of the invention to provide a vibrating machine adapted to be supported upon the floor and with arms extending outwardly from the same to locate the operating elements conveniently disposed and with ready access to a patient lying upon the bed.

It is another object of the invention to provide a vibrating machine for treating the limbs of humans wherein the operating elements can be adjusted to different elevations and carry within the same eccentric weights whereby the maximum vibrating effect can be provided at the operating elements and close to the limbs being treated.

It is another object of the invention to provide in a vibrating machine for treating the limbs of humans, with operating elements than can be altered to support the different limbs either by the attachment of parts to one of the elements or by a replacement of the elements with other elements for receiving the different parts of the body.

Other objects of the invention are to provide a vibrating machine device with the above objects in mind, which is of simple construction, inexpensive to manufacture, has a minimum number of parts, compact, easy to handle, operable from an electric source, cushioned to allow for the operation of the parts, convenient and efficient in use.

For other objects and for a better understanding of the invention reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of the machine arranged over a bed with the feet of the patient extended therefrom;

Fig. 2 is an enlarged fragmentary vertical sectional view taken on lone 2—2 of Fig. 1;

Fig. 3 is an enlarged sectional view taken through the operating head and on line 3—3 of Fig. 1;

Fig. 4 is a vertical sectional view taken through the gripping element in the driving motor on the operating gear shown in the differently vertically adjusted position, and as shown on line 4—4 of Fig. 1;

Fig. 5 is an enlarged transverse sectional view taken on line 5—5 of Fig. 2;

Fig. 6 is a fragmentary sectional view taken on line 6—6 of Fig. 4;

Fig. 7 is a perspective view of the operating head with the foot saddles mounted thereon;

Fig. 8 is a side elevational view of one of the foot saddles with a portion thereof broken away and shown in section;

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Fig. 9 is a perspective view of the operating head with the legs of a patient extended thereover;

Fig. 10 is a perspective view of a head saddle connected to the operating elements;

Fig. 11 is a perspective view of modified form of operating element adapted to be extended around the sides of a limb;

Fig. 12 is a perspective view of a hanger support adapted to fit over the operating element shown in Fig. 7;

Fig. 13 is a perspective view of a head gear vibrating element adapted to receive the head and to support the back;

Fig. 14 is wiring diagram of the electrical equipment utilized in the machine.

Referring now to the figures, 21 represents a base housing upwardly from one end of which extends a vertical housing 22. On the upper end of the vertical housing 22 is an arm housing 23 which extends outwardly over the base housing 21. The base housing 21 extends a sufficient distance when located under a bed and as shown in Fig. 1 to position the arm housing 23 and more particularly the end thereof well over the bed. The vertical housing 22 will extend upwardly from the side of the bed. A cable cord 24 having a plug 25 extends from the base portion and upon the plug 25 being set and inserted inside a wall receptacle power will be supplied to the machine. On the other end of the arm housing 23 is an upstanding housing 26 in which is a vertically slidable electric motor 27 on which electrical cable 24 extends. This cable is connected with one of its wires to a rheostat switch to control the speed of the motor, a volt meter 29 on the vertically extending housing and a timer switch 30 also on the side edge of the upwardly extending housing 22.

In the bottom of the arm housing 23 is an opening 31 over which is fixed a bridge plate 32 having a small opening 33 through which a sleeve 34 connected to the motor 27 extends. The plate 32 is fixed to the arm housing 23 by bolts 35.

Mounted on the top of the bridge plate 32 are a plurality of inverted rubber cushioning cups 36. These cups are fixed to the top of the bridge plate by bolt and nut means 37, respectively, Fig. 2, that also fix a supporting plate 38 upon the inverted cushion cups 36. This plate 38 has an upstanding boss 39 through which the tube 34 slides. This boss has a projection 40 which enters a groove 41 in the tube 34 so as to hold the tube 34 and the electric motor against rotational displacement. Any vibration in the operating head of the machine will be prevented from being imparted to the housing portions by these cushioning members 36.

Connected to the underside of the bridge plate

32 is an enlarged depending housing 42 through which the motor tube 34 extends. This housing 42 has a flanged end 43 that is connected by stud bolt and nut means 44 to the bridge plate 32. The lower end of the housing 42 has a thickened portion 45 which serves to guide the tube 34 as it is vertically adjusted on the arm housing 23 to raise or lower operating head 46.

In order to hold the tube 34 and the operating head 46 in their vertically adjusted positions, there is provided on the boss 39 of the supporting plate 38 a clamp screw 47 that extends outwardly through the arm housing 23 and has a turned handle 48 thereon. This clamping screw 47 is journalled in the boss 39 as indicated at 49 and is held thereat against axial displacement. On the inner end of the screw 47 is a clamping plate 51 which is threaded to be worked toward and away from the outer surface of the motor tube 34, Fig. 6. This clamping plate is provided with a rounded engaging surface 52 conforming with the outer surface of the motor tube 34 to partly surround the same. As the screw 47 is adjusted the tube 34 and the operating head 46 will be either released or fixed in the elevated position.

On the tube 34 is a lug 53 to which chain 54 is connected. This chain extends upwardly over a sprocket 55 journalled in the arm housing 23, laterally through the arm housing and over a sprocket 56 for connection with a weight 57 that is vertically adjustable in the vertical housing 22. The weight and the chain 42 serve as a counter-balance for the electric motor and the operating head so that they may be easily lifted at the time the adjustment is effected. The vertical housing 22 has a rubber lining 58 against which the weight 57 may bump so as to avoid excess wear of the housing and noise. Access to the weight 57 can be had upon removal of a cover plate 59 having a rubber lining 60 and held in place in the housing 22 by screws 61. It should now be apparent that the electric motor is cushioningly connected or mounted on the arm housing 23 so that the vibration set up in the operating head 46, in a manner to be described, will not be imparted to the supporting housings and the building structure.

The operating head 46 includes a box housing 63, Fig. 3, which is open at its upper end to receive an upstanding connecting element 64 threaded at its upper end, as indicated at 65. The box housing 63 is turned into a groove 66 in the connecting element 64, and is held therein against axial displacement by a rubber cushioning ring 67 in order to give play for the vibration of the operating head. To effect connection of the connecting element 64 with the lower end of the tube 34 there is provided on the lower end of the tube 34 a flange 68 which retains internally threaded coupling socket 69 that engages with the threads 65 of the connecting element 64 to bring the connecting element into tight engagement with the flange 68.

Extending downwardly through the tube 34 from the motor 27 is a dry shaft 71 that has a clutch formation 72 on its lower end for engagement with a clutch formation 73 on a short shaft 74 operable in the connecting element 64. This shaft 74 has a bevel gear 75 fixed thereto by set screw 76. This bevel gear 75 lies within the box housing 63 and engages with opposing bevel gears 77 and 78 respectively fixed to shafts 79 and 80 that respectively extend outwardly through arm housings 81 and 82 integrally connected to the opposite sides of the box housing 63. Each of the arm housings 81 and 82 has an enlarged end portion 83 into which the shaft 79 or 80 extends and in which eccentric weight 84 rotates. There is one of these weights on each shaft 79 and 80 and they are arranged with one extending upwardly and the other extending downwardly as seen in Fig. 3. A set screw 85 secures the weight to the shaft. The outer end of the enlarged end portion has a cover 86 attached thereto by screws 87 to protect the patient from becoming injured by the rotating eccentric weight 84. With these weights being rotated a beneficial vibration will be set up. Surrounding the the sleeve projections 79 and 80 respectively are rubber cushioning sleeves 88 and 89 which are respectively compressed by the cylindrical sleeve covers 90 and 91. The enlargement 83 of each sleeve projection 81 or 82 is covered with the cushioning plate 92 on the inner end of the enlargement and a cushioning sleeve 93 on the outer periphery of the enlargement. The flexible cover sleeve 94 surrounds the cushion sleeve 93. Accordingly, the patient will be protected from the hard parts of the operating head on his limbs being extended thereover in order for the patient to get the effect of the vibration.

It should be further apparent that the operating head is easily removable from the motor tube 34 by a simple turning of the coupling nut 69. Automatically the small shaft 74 and the motor shaft 72 is joined as the operating head is connected to the tube 34.

By an adjustment of the rheostat switch 28 the speed of the motor is controlled and hence the magnitude of the vibration and the speed of the operating head will be controlled. The timer switch 30 is set at the starting of the treatment on the patient to determine the length of time the treatment is to be extended. Automatically, at the end of this period of time the time switch 30 will open the motor circuit, to stop the treatment. As shown in Fig. 9, the entire legs beneath the knee joints can be extended over the arms of the operating element. As shown in Fig. 1, the feet are rested upon the arms of the operating element while inclining upon the bed. The vibration will stimulate the blood circulation and work the muscles of the limbs.

Referring now particularly to Figs. 7 and 8, there are shown foot saddles or stirrups 96, each of which having a vertical portion 97 and outwardly extending horizontal portion 98. These portions are cupped or channeled so as to receive and retain the foot of the patient against vertical and lateral displacement.

This saddle 96 has its portions formed of a metal backing 99, a cushioning or rubber layer 100 and a flexible thin skin layer 101 which extends over the cushioning layer 100 so as to provide a comfortable seat for the foot. To fix this foot saddle 96 directly to the operating head element, a keyhole slot is provided at 102 in the upright portion 97 of the saddle. The saddle is then placed in a position so that the keyhole slot 102 is aligned with a button 103 on the enlargement 83. To further retain the saddle upon the arm of the operating head a strap 103 is riveted to the back of the saddle as indicated at 104 and this strap has a clasp 105 for receiving fastening projection 106 of a strap portion 107 extending upwardly from the back of the saddle 96, as the straps are fastened about the arm, the saddle will be held upon the arm and with the button 103 extending into the slot 102,

the saddle is held against rotation thereon. The heel of a foot is placed in the saddle, as further illustrated in Fig. 8, upon the machine being operated the vibration will be given to the foot and throughout the legs of the patient. A great stimulating and helpful effect is given.

In Fig. 10, there is shown a still further form of attachment for the operating element which comprises a strip 106' having a pad 107' for receiving the back of a head of a patient. This strap can be connected at its ends by snap fastener elements to the arm portions of the operating head as indicated at 108 and 109. With the patient supporting his head in the sling or strap 106' upon the machine being started a helpful treatment will be given about the head and neck regions of the body.

In Fig. 11, there is shown a replaceable operating head, so that upon removal of the head 46 this head as indicated generally at 110 can be secured by its threads 111 into the coupling element 65 of the motor tube 34. This head has a main tube 112 on which the threads 111 are disposed and within which is a rotatable shaft 113 adapted to be coupled with the clutch formation 72 of the motor shaft 71 in the manner as above described in the connection of the operating head 46 therewith. The lower end of this shaft 113 has an eccentric member 114 which on being rotated at high speed will vibrate the entire head. The chamber 115 is provided upon the main tube 112 to contain the eccentric member 114.

Extending laterally from the chamber portion 115 there are opposing tubular arcuate arms 116 and 117. Engaging elements 118 and 119 are respectively angularly adjustable in the tubular arms 116 and 117. A fastening element 120 is provided upon each arm 116 to hold the engaging element 118 or 119 in place. This head can be disposed around the neck with the engaging elements 118 and 119 engaging the sides thereof.

Also, this head can be secured to the body at other locations. The action of this head is similar to the other head 46 and treatment is effected through the vibration of the parts of the body of the patient.

In Fig. 12, there is shown a modified form of support or hanger, as indicated generally at 121, which includes a bottom support portion 122 and a strap 123 that fits over and upon the arm portion of the operating head element 46. The arm or leg can be inserted in this hanger 121 and rested upon the bottom portion 122 thereof. The weight of the leg will cause the strap 123 to be brought down tightly upon and over the arm portion of the operating head element so that the vibration of the head element will be transmitted through the hanger 121 to the leg or arm supported therein.

In Fig. 13, there is shown a still further form of operating head which can replace the operating head element 46. This operating head is indicated generally at 125 and includes the molded or pressed body portion 126 that is hollow and open on its front face, and which has an extension 127 that can be supported downwardly along the back of patient when the patient's head lies within the body portion. Extending upwardly from the body portion 126 is a shank or attaching portion 128, in which is journalled a shaft 129 having an eccentric weight 130. The upper end of this shank 128 is threaded as indicated at 131 and can be held by the coupling nut against the end of the motor tube 34. With this form of operating head, the vibration will be given to the full part of the head and also to the upper end of the spine.

It should now be apparent that any type of operating head can be applied to the end of the motor tube 34. A full vibration may be imparted to the limbs through the connecting elements which engage with the limb or other part of the body.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the appended claims:

I claim:

1. In a vibrating machine for the treatment of human bodies, a horizontal base portion, a vertical housing portion extending upwardly from the base portion at one end thereof, an arm housing portion extending laterally from the outwardly extending vertical portion and over the horizontally extending base, an electric motor having a tube extending downwardly through the arm housing portion and with the motor extending upwardly therefrom, a drive shaft extending downwardly through the motor tube, and an operating head element releasably connected to the lower end of the tube and having a drive shaft connectable with the drive shaft of the motor, said operating head having laterally extending arms and gearing connected to the operating shaft of the head and extending laterally through the laterally extending arms and eccentric weight elements connected to the outward ends of the gearing means.

2. In a vibrating machine for treating the human body, a horizontally extending base portion, a vertical housing portion extending upwardly from the base portion, an arm housing portion extending laterally from the upper end of the vertically extending portion and over the base portion, an electric motor with a tube extending therefrom adjustably mounted in the outer end of the arm housing portion for vertical adjustment with respect thereto, means for releasably securing the tube to the arm housing portion to hold same in a vertically adjusted position, an operating head having eccentric vibrating means and means for releasably securing said operating head in the lower end of the motor tube, a drive shaft extending downwardly through the motor tube and releasably connectable with the eccentric means of the operating head.

3. In a vibrating machine for treating the human body, a horizontally extending base, an upwardly extending portion and a laterally extending arm on the upper end of the upwardly extending portion and extending over said base, said arm being hollow and having a lined top and bottom opening, a bridge plate connected to the bottom of the arm and over the bottom opening, an electric motor disposed above the top opening and having a tube depending downwardly through the top and bottom openings, a plate member cushioningly connected to the top of the bridge plate, said motor tube extending downwardly through the plate member, and clamp means on the plate for securing the motor tube to the plate, a depending housing portion connected to the under side of the bridge plate and having a guide portion, said motor tube cooperating with the guide portion to hold the motor tube against lateral displacement and an operating vibrating head connected to the lower end of the tube, gearing means in the head of a shaft

extending from the motor through the tube, connected with said gearing means.

4. A vibrating head assembly for vibration treating machines comprising a box housing, a sleeve attaching member connected to the box housing, said sleeve attaching member having a recess receiving portion of the box housing and a cushioning ring within the recess and engageable with the portions of the box housing and with the recess to cushioningly retain the box housing on the attaching sleeve portion, a shaft journalled in the attaching sleeve portion having a bevel gear thereon, sleeve portions extending laterally from the box housing at the opposite sides thereof, operating shafts disposed in the respective sleeve portions and respectively having bevelled gears engageable with the bevel gear of the shaft journalled in the attaching sleeve portion, said laterally extending sleeve portions respectively having enlarged chamber portions thereupon, eccentric weights fixed to the shafts within the enlarged chamber portions.

5. A vibrating head assembly for vibration treating machines comprising a box housing, a sleeve attaching member connected to the box housing, said sleeve attaching member having a recess receiving portion of the box housing and a cushioning ring within the recess and engageable with the portions of the box housing and with the recess to cushioningly retain the shaft journalled in the attaching sleeve portion having a bevel gear thereon, sleeve portions extending laterally from the box housing at the opposite sides thereof, operating shafts disposed in the respective sleeve portions and respectively having bevelled gears engageable with the bevel gear of the shaft journalled in the attaching sleeve portion, said laterally extending sleeve portions respectively having enlarged chamber portions thereupon, eccentric weights fixed to the shafts within the enlarged chamber portions, said enlarged chamber portions having respectively button projections thereon and foot stirrup chambers adapted for attachment to the respective laterally extending sleeve portions, having respectively side portions with a keyhole slot opening therein for receiving the respective buttons whereby the foot stirrup elements will be held against rotation upon the laterally extending sleeve portions, with detachable straps provided upon each of the foot stirrups and extendable about the same portions to further secure the foot stirrups upon the sleeve portions.

6. A vibrating head assembly for vibration treating machines comprising a box housing, a sleeve attaching member connected to the box housing, said sleeve attaching member having a recess receiving portion of the box housing and a cushioning ring within the recess and engageable with the portions of the box housing and with the recess to cushioningly retain the box housing on the attaching sleeve portion, a shaft journalled in the attaching sleeve portion having a bevel gear thereon, sleeve portions extending laterally from the box housing at the opposite sides thereof, operating shafts disposed in the respective sleeve portions and respectively having bevelled gears engageable with the bevel gear of the shaft journalled in the attaching sleeve portion, said laterally extending sleeve portions respectively having enlarged chamber portions thereupon, eccentric weights fixed to the shafts within the enlarged chamber portions, and a head sling comprising a strap with a pad on the strap for receiving the head and releasable fastener means for securing the ends of the strap over the laterally extending sleeve portions of the head element.

7. An operating head element for vibration machines for treating the human body which comprises a box housing, an attaching sleeve portion connected to the box housing and extending upwardly therefrom for connection with the vibration machine part, a shaft journalled in the attaching sleeve portion having a bevel gear thereon, opposing bevel gears within the box housing meshing with the bevel gears of the shaft, laterally extending sleeve portions on the box housing, shafts attached to the respective bevel gears extending through the respective laterally extending sleeve portions, said sleeve portions respectively having an enlarged chamber portion, eccentric weights fixed to the shafts with one weight on one shaft extending downwardly and the weight on the other shaft extending upwardly, said eccentric weights lying within the chamber portions, cushioning sleeve means surrounding the respective laterally extending sleeve portions, other cushioning means surrounding the respective chamber end portions and a removable plate on the respective chamber end portions at their ends thereof to provide access to the respective eccentric weights when desired.

8. An operating head for vibrating machines comprising a vertically extending housing enlarged at its lower end, a shaft journalled in said housing and extending upwardly through the upper end thereof and an eccentric weight on the shaft and within the enlarged bottom end of the housing, arcuate shaped sleeve arms extending respectively from the opposite sides of the enlarged portion of the upstanding body portion, engaging elements adjustably retained in the respective arcuate arm portions and latch means on the respective arm portions for retaining the engaging elements in adjusted positions.

9. An operating head element for vibrating machines for treating the human body comprising the main body portion, hollowed to receive the head of a patient and having a laterally extending portion adapted to engage along the spinal column and over the back of the patient, an upstanding attaching portion connected to the head portion, a shaft journalled in the upstanding attaching portion and an eccentric weight on the shaft.

10. In a vibrating machine for the treatment of human bodies, a horizontal base portion, a vertical portion extending upwardly from the base portion, an electric motor connected to the vertical portion and having a shaft depending downwardly therefrom, an operating head element connected to the lower end of the shaft to be driven thereby, means for supporting the operating head element on the vertical portion, said operating head having laterally extending arms and gearing connected to the motor shaft and extending laterally through the laterally extending arms and eccentric weight elements connected to the outer ends of the gearing to be driven thereby and to set up a vibratory action.

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