July 24, 1956 R. ORTHWINE 2,755,798

DEEP FRICTION GENERATOR

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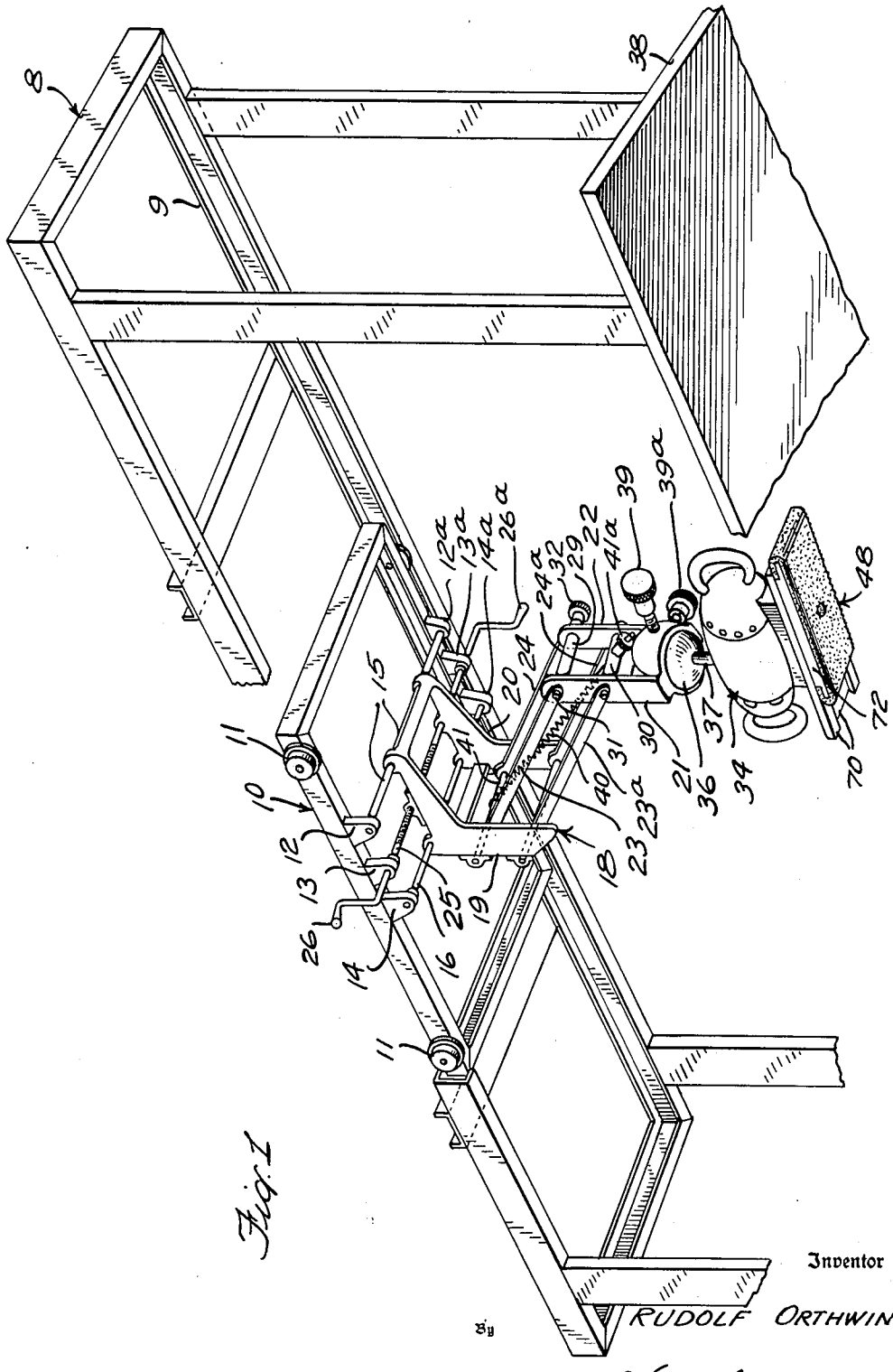


Fig. 1

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Fig. 2

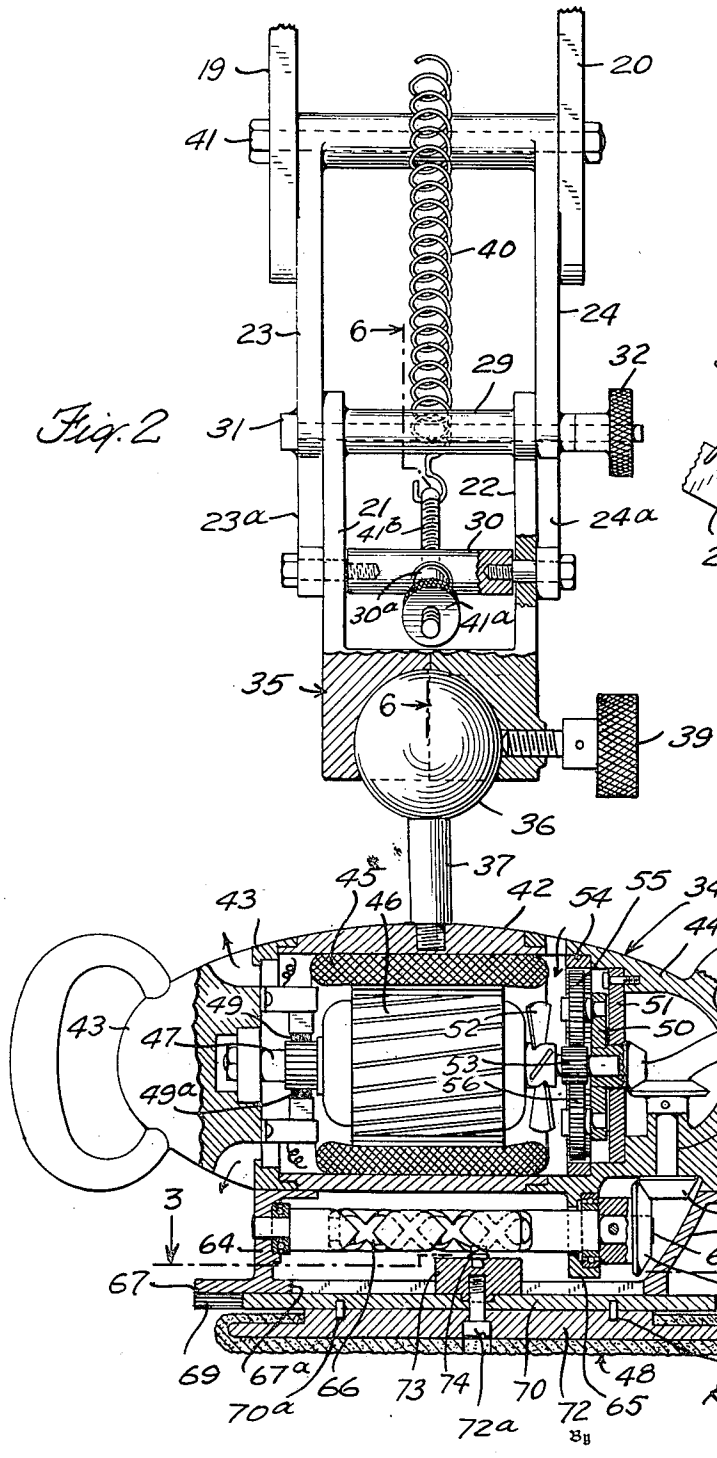
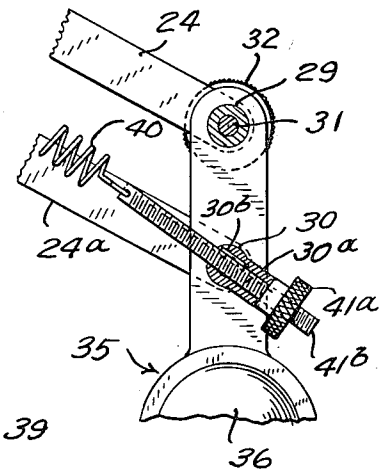


Fig. 6



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Fig. 3

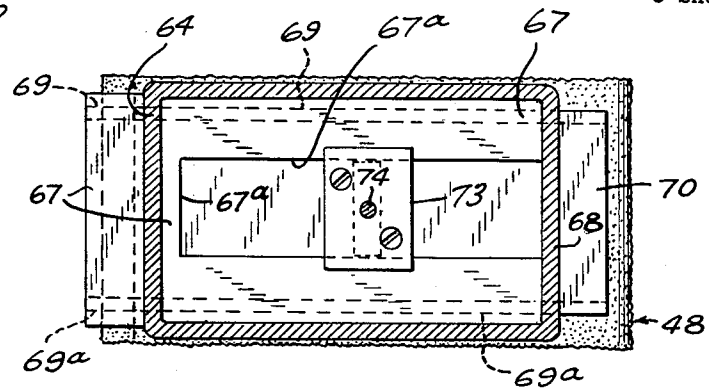


Fig. 4

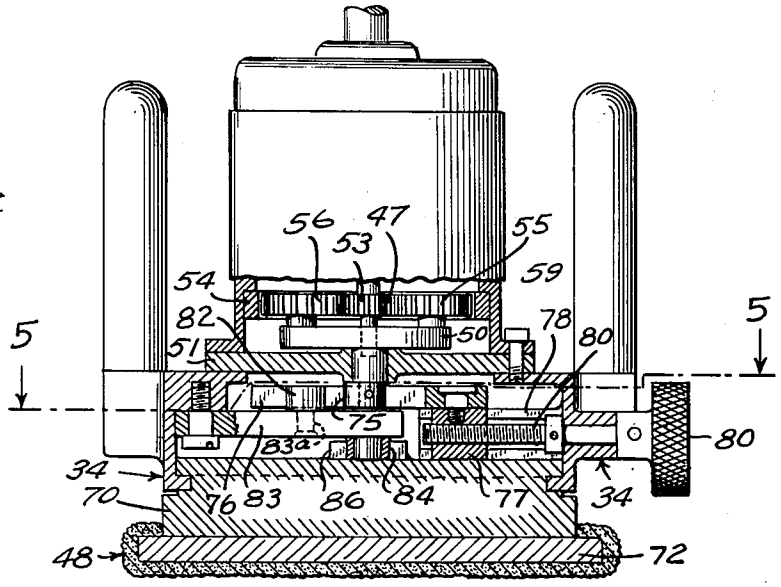
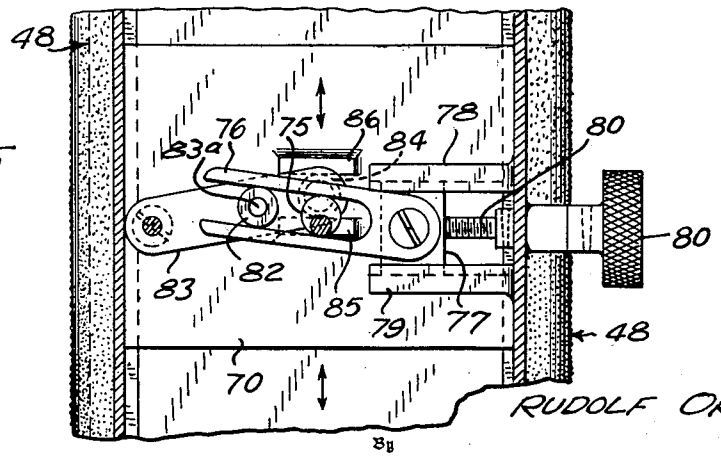


Fig. 5



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DEEP FRICTION GENERATOR

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10 Claims. (Cl. 128—62)

This invention relates to a massage apparatus and more particularly to a machine for applying deep friction massage to any part of the human body and for facilitating such application to alleviate suffering from arthritic and rheumatic pains.

Utility of the device which embodies the invention relies on the accepted theory that the heat and static electricity generated by heavily rubbing the body surface over the afflicted area will penetrate to the area and at least partially relieve the condition. The massaging must be accompanied by considerable pressure to afford the best results and therefore manual devices are not practical. This invention provides a weighted massager which is easily positioned with reference to the general massaging area and adjusted for direction and length of massaging stroke at the particular location.

There is also provided a novel type of massaging unit for imparting reciprocal movement to a rubbing pad preferably of wool fabrication to develop static electricity and heat. According to a modified construction, means are provided for adjusting the length of the reciprocating stroke.

In general the invention contemplates the provision of carriage means supported by a framework for longitudinal positioning of the massaging unit in the horizontal plane and a second carriage for transversely positioning in the same plane. The plane of the massage stroke is adjustable out of the horizontal plane by means of a ball and socket connection between the second carriage and the massaging unit. The second carriage has an attachment member for the ball and socket joint which is pivotally connected to the elements directly carried by the first carriage for positioning the unit in the vertical plane. The weight of the unit is counterbalanced by a spring connected between the two sections of the second carriage. The tension of the spring is preferably adjustable. The two sections of the second carriage are preferably attached pivotally by parallel link connections so that change of vertical position will not disturb the desired disposition of the massaging unit in the other planes.

The means adopted for reciprocating the massaging pad is a motor powered unit which provides compact and efficient mechanism for converting rotary to reduced translatory motion the reciprocating stroke of which can be made adjustable.

Therefore an object of the invention is to provide a weighted and easily maneuverable massager for applying deep friction massage to afflicted areas of the body.

Another object of the invention is to provide a massager having universal movement and adjustable weight counterbalancing means to vary the normal pressure resulting from its weight.

A further object of the invention is to provide an efficient massaging unit having means for applying reciprocating pad pressure to any part of the body.

Other objects will appear on reading the following description in conjunction with the accompanying drawings, in which:

Fig. 1 is an isometric view showing the massaging unit and the universal suspension means in balanced condition;

Fig. 2 is an enlarged detail showing the massaging unit, the ball and socket joint and connections with the second carriage;

Fig. 3 is a plan section taken on the line 3—3 of Fig. 2;

Fig. 4 is a vertical section partially in elevation showing a modified construction of the massaging unit;

Fig. 5 is a fragmentary section taken on the line 5—5 of Fig. 4 showing means for adjusting the reciprocating stroke of the massaging pad; and

Fig. 6 is a fragmentary view taken on the line 6—6 of Fig. 2 showing the means in the second carriage for adjusting the tension on the weight counterbalancing springs.

As shown in Fig. 1 the suspension means for the massaging unit are supported by a four legged frame 8 having tracks in the form of channels 9 longitudinally disposed thereof. The channels are U-shaped and face inwardly. A carriage 10 comprising a four sided frame having coasters 11 adapted to ride in the channels 9 is disposed within the frame being movably supported thereby. Three pairs of complementary ears, 12 and 12*a*, 13 and 13*a*, and 14 and 14*a*, depend from the intermediate portion of the underside of the carriage 10. The outer ears 12, 12*a* and 14, 14*a* support transversely disposed guide rods 15 and 16 respectively. The guide rods slidably support a second carriage 18 which is constructed in two sections and includes a pair of angle plates or brackets 19 and 20 and a pair of vertical members 21 and 22 pivotally connected to the angle plates 19 and 20 respectively by parallel links 23 and 23*a* and 24 and 24*a*.

The angle plates 19 and 20 have horizontal arms with end apertures adapted to receive the guide rods. A threaded screw spindle 25 is rotatably supported by ears 13 and 13*a* in parallel with guide rods 15 and 16. A threaded nut is secured to the angle plate 19 and receives the screw spindle 25 which can be turned as by hand cranks 26 or 26*a* exterior of the frame 8 for causing the second carriage to traverse the frame on the guide rods 15 and 16 for lateral adjustment.

The parallel connections for the two sections of the second carriage are pivotally connected to the vertical arms of the angle plates and the vertical members 21 and 22. Their function is to maintain positively the perpendicularity of the vertical members through all their pivotal positions. The vertical members are connected by spacers 29 and 30. A bolt 31 extends through the top shaft 29, vertical members 21 and 22, parallel links 23 and 24 and is provided with a clamping nut 32. Any desired pivotal position of the vertical members with respect to the angle plates can thus be held if desired by clamping the connections against the vertical members by tightening the nut 32.

In the preferred construction the massaging unit 34 is supported indirectly by the vertical members by means of a ball and socket joint 35. The exposed surface of the ball 36 is connected to the massaging unit by attachment post 37. The socket joint permits the unit to be brought into operative contact with any part of the body, presumed to be supported on the platform 38. Adjustment screws 39 and 39*a* are disposed in the socket and adapted to impinge against the surface of the ball to hold it and the unit in the desired angular position.

Thus suspended, the massaging unit is capable of bringing deep friction massage to bear on any part of the body. Some of the weighted pressure of the unit may be relieved by a tension spring 40 connected between the two sections of the second carriage. As shown the spring is extended between an angle plate spacer 41 which

serves as a pivot for the links 23 and 24, and the shaft 30. The tension on the spring may be altered for adjustment of the massaging pressure by means of an adjustment knob 41*a* which is threaded on spindle 41*b* having a key way milled therein. A key 30*b* mounted in the spacer 30 permits the axial sliding of the spindle 41*b* in the spacer.

The massaging unit 34 comprises a main body portion 42 and two end portions 43 and 44, a motor of standard construction having a stator 45, rotor 46 on an armature shaft 47, a massaging pad 48 and means for reciprocating the pad. The left hand end of the armature shaft 47 is journalled in bearings in the end portion 43 which supports commutator brushes 49 and 49*a*. The right hand end of the armature shaft 47 is coaxially journalled in rotatable disc 50 an outer hub portion of which rotates in a vertical plate 51 which is attached to the end body portion 44. Intermediate the disc 50 and the rotor 46 are an air circulating fan 52 and pinion 53 secured to rotate with the armature shaft 47. An outer ring gear 54 is fixed to the inner surface of the end body portion 44 in the vertical plane of the pinion gear 53. A pair of sun gears 55 and 56 mesh with the pinion 53 and ring gear 54 on opposite sides of the armature shaft. The disc 50 is attached by stub shafts to the two sun gears and is caused to turn with the rotation of the sun gears. The advantage of the particular gearing arrangement shown is the symmetry and balance achieved at the right hand end of the armature shaft and the required reduction in the drive ratio. A bevel gear 58 connected to the outer end of the hub is in meshing connection with reduction bevel gear 59 secured to vertical shaft 60. A bevel gear 61 is connected to the opposite end of the shaft 60 and engages reduction bevel gear 62 secured to the end of shaft 63 which is journalled in bottom extension members 64 and 65 of the motor housing. The shaft 63 has an enlarged cylindrical intermediate portion having right and left hand cam grooves 66. A base plate 67 is secured to the bottom of extension 64 and a third extension 68 which forms a continuation of the outer surface of the end body portion 44. The plate 67 has a central opening 67*a* and longitudinally depending ways 69 and 69*a* forming a recess on the under side of the base plate. The inner surfaces of the ways are disposed upwardly and inwardly. A guide plate 70 is slidably disposed in the recess and has side bevelled edges which complement the inner surfaces of the ways 69 and 69*a* which serve as a retaining track for the guide plate 70. The base plate has secured thereto a pad plate 72 which carries a woolen rubbing pad. A block 73 rides in the opening 67*a* of the base plate and is attached by a screw to the pad plate 72 and the upper surface of guide plate 70. A cam follower 74 is secured to the block 73 and engages the groove 66 in the cylindrical portion of the shaft 63 and is caused to reciprocate with the turning of same.

When it is desired to alter the length of the reciprocating stroke a modified massaging unit has been conceived and is shown in Fig. 4 and Fig. 5. The motor armature 47 is directed downwardly and has a pinion 53, sun gears 55 and 56 engaging ring gear 54, rotating disc 50 in driving connection with the sun gears and end plate 51 in identical arrangement as was described for the basic construction. The armature extends through the bearing plate 51 and an eccentric 75 is secured to its protruding end. The eccentric is disposed between the two branches of bifurcated member 76 which is pivotally attached at one end to adjustment block 77. The block 77 is movably retained between two parallel guide elements 78 and 79. The block is positioned between the guide elements by screw 80 which is rotatably held therein being rotatably supported in an aperture in the base portion of body 34. The position of the pivot end of the bifurcated member 76 controls the degree it will swing under the control of the eccentric 75.

Also disposed in the bifurcated member 76 near its free end is a roller 82 secured to rock arm 83 by means of pin 83*a*. Attached to the bottom surface of the rock arm 83 near its free end is a roller 84 which engages a channel formed by projections 85 and 86 of guide plate 70 to which is attached the pad plate 72 by dowel pins similar to those shown in Fig. 2. Hence the massaging pad 48 is reciprocated by the rock arm 83 and the length of stroke is governed by the adjustable position of the pivot axis of the bifurcated member which rocks the arm. The pad plate 72 is removably secured to the block 73 by a filister screw similar to that shown in Fig. 2.

Thus the length of massage stroke is made adjustable as well as the location and plane of the stroke which is determined by the suspension means above described. The arrangement for suspending the massage unit over the body also assures sufficient pad pressure which is required for successful operation. This is achieved without sacrifice of mobility and facility of use.

The disclosed embodiment is obviously susceptible to some change or modification without departing from the invention as defined by the following claims.

What is claimed is:

1. A universal support for a body massager comprising a frame supported in elevation over a body platform, a carriage supported by and longitudinally slidable within the frame, a second carriage supported by and transversely slidable within said first carriage and comprising pivotal means for supporting said massager and positioning the unit in the vertical plane.

2. A universal support for a body massager comprising a leg supported frame having longitudinal channels extending substantially the length of the frame, a carriage slidably supported in the channels, a second carriage slidably supported on transversely disposed guide rods carried by said first carriage, a screw spindle rotatably supported by said first carriage in parallel with said guide rods and operable to transversely feed the second carriage back and forth on said guide rods, said second carriage consisting of two angle brackets having horizontal arms supported by the guide rods and vertical arms and a pair of vertical members pivotally connected to the vertical arms of said angle brackets for supporting the massager.

3. A universal support for a body massager comprising a leg supported frame having longitudinal channels extending substantially the length of the frame, a carriage slidably supported in the channels, a second carriage slidably supported on transversely disposed guide rods carried by said first carriage, a screw spindle rotatably supported by said first carriage in parallel with said guide rods and operable to transversely feed the second carriage back and forth on said guide rods, said second carriage consisting of two angle brackets having horizontal arms supported by the guide rods and vertical arms, a pair of vertical members pivotally connected to the vertical arms of said angle brackets and a ball and socket joint carried by said vertical members for supporting the massager.

4. A universal support for a body massager comprising a leg supported frame having longitudinal channels extending substantially the length of the frame, a carriage slidably supported in the channels, a second carriage slidably supported on transversely disposed guide rods carried by said first carriage, a screw spindle rotatably supported by said first carriage in parallel with said guide rods and operable to transversely feed the second carriage back and forth on said guide rods, said second carriage consisting of two angle brackets having horizontal arms supported by the guide rods and vertical arms, a pair of vertical members each pivotally connected to the vertical arms of said angle brackets by parallel links so as to positively maintain a parallel relation between the vertical arms of said angle brackets and the vertical members and a ball and socket joint having adjustable screw means carried by said vertical members for supporting the massager.

5. A universal support for a body massager as claimed in claim 4 wherein a spring is connected to said angle brackets and said vertical members as a counterbalance for the massager.

6. A universal support for a body massager as claimed in claim 5 wherein means are provided for adjusting the tension on the counterbalance spring.

7. A massage apparatus comprising a massager and a support attached to and suspending the massager therefrom, said support including means for positioning the unit in the horizontal and vertical planes, said massager comprising an armature motor of standard construction, a housing for said motor, a guide plate slidably supported by said motor body, means for reciprocally driving said guide plate and a massage pad attached to said guide plate.

8. A massage apparatus comprising a massager and a support attached to and suspending the massager therefrom, said support consisting of a leg supported frame having longitudinal channels extending substantially the length of the frame, a carriage slidably supported in the channels, a second carriage slidably supported on transversely disposed guide rods carried by said first carriage, a screw spindle rotatably supported by said first carriage in parallel with said guide rods and operable to transversely feed the second carriage back and forth on said guide rods, said second carriage consising of two angle brackets having horizontal arms supported by the guide rods and vertical arms, a pair of vertical members pivotally connected to the vertical arms of said angle brackets and a ball and socket joint carried by said vertical members for supporting the massager, said massager comprising an armature motor of standard construction, a housing for said motor, a guide plate slidably supported by said motor body, means for reciprocally driving said guide plate and a massage pad attached to said guide plate.

9. A universal support for a body massager comprising a frame supported in elevation over a body platform, a carriage supported by and longitudinally slidable within the frame, a second carriage constructed in two sections, one of said sections being supported by and transversely slidable within said first carriage and the second of said sections being pivotally connected to said first section and adapted to support said body massager and position the massager in the vertical plane.

10. A massage unit comprising an armature motor of standard construction, a housing for said motor, a bifurcated member pivotally supported in said housing, an eccentric driven by said armature and engaging said member, a rock arm slidably connected to said bifurcated member, being rocked thereby, a guide plate reciprocally driven by said rock arm and a massage pad carried by said plate, the pivotal axis of the bifurcated member being adjustable to and away from the eccentric so as to vary the extent of pivot of said member and hence the stroke of the reciprocally driven guide plate and massage pad.

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