Feb. 19, 1946. E. W. CURTIS 2,395,040

MASSAGING MACHINE

Filed Jan. 8, 1940 3 Sheets-Sheet 1

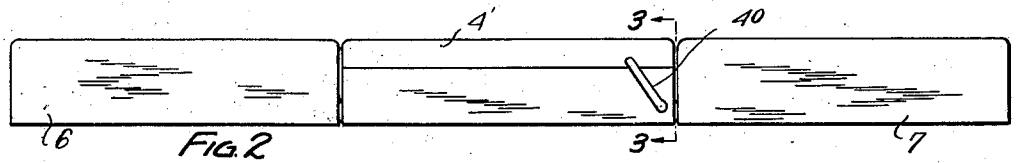


FIG. 2

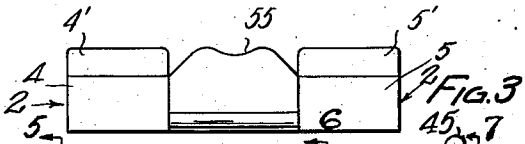


FIG. 3

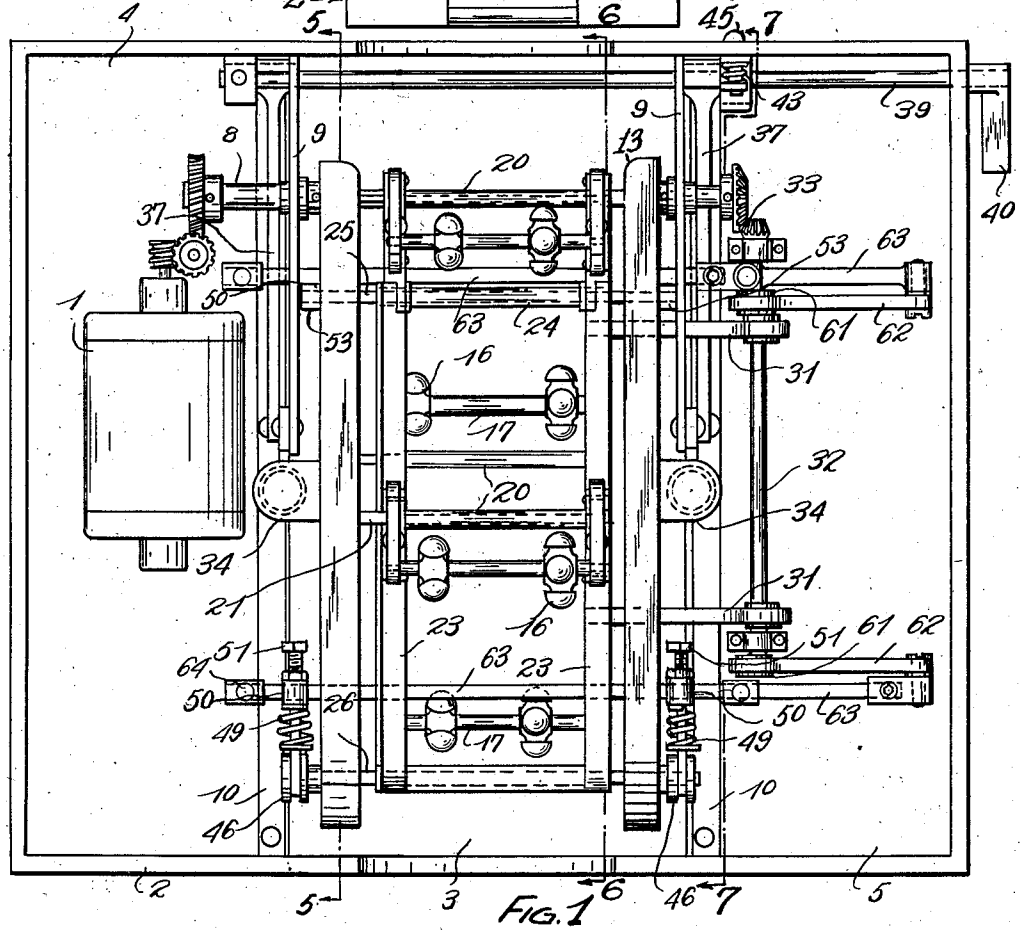


FIG. 1

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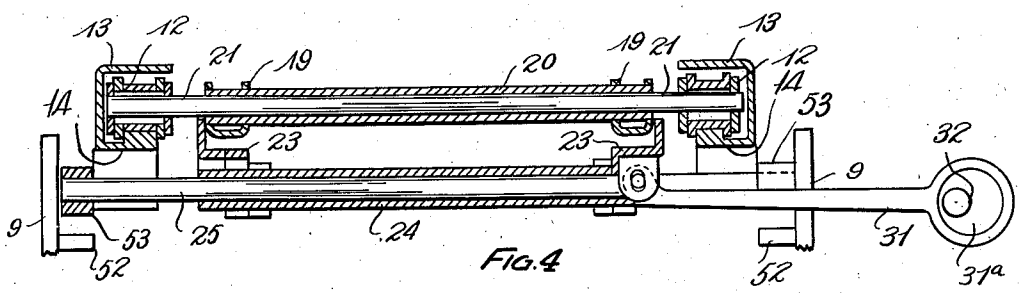


FIG. 4

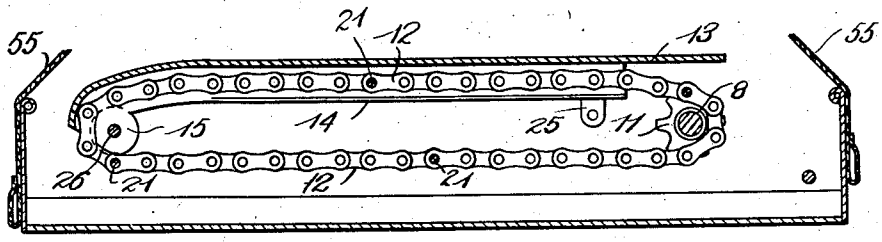


FIG. 5

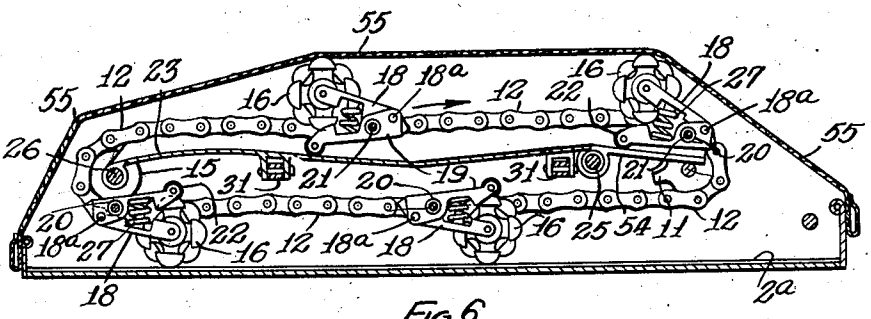


FIG. 6

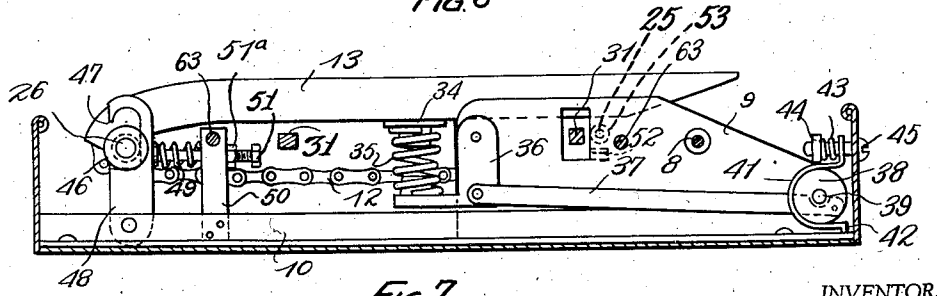


FIG. 7

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MASSAGING MACHINE

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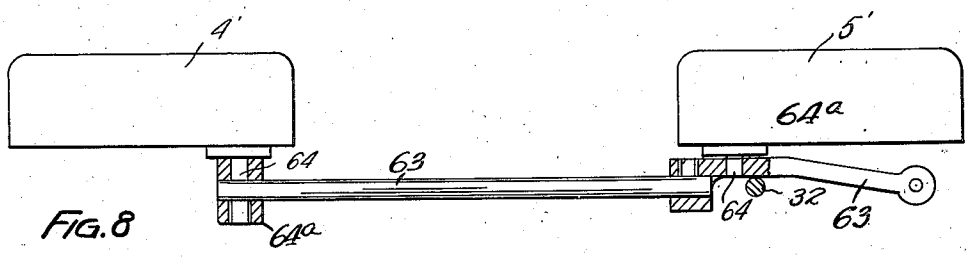


FIG. 8

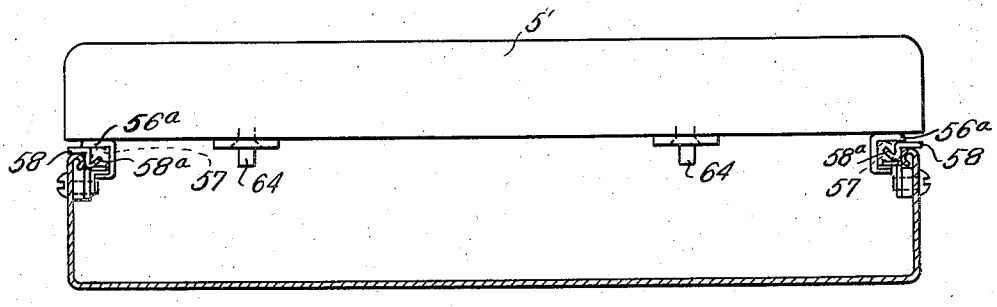


FIG. 9

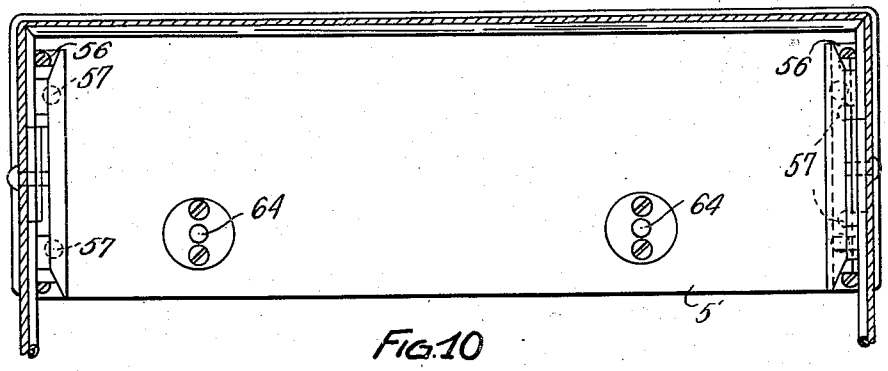


FIG. 10

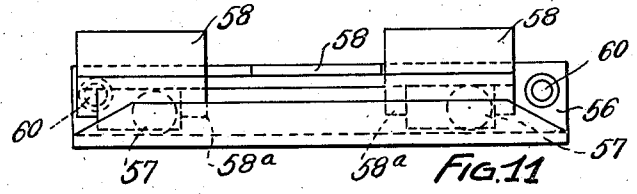


FIG. 11

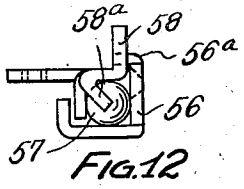


FIG. 12

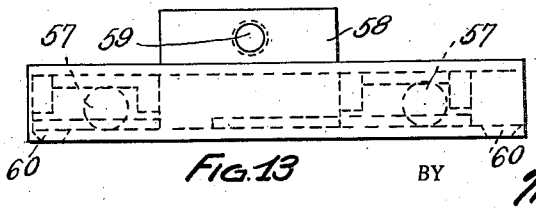


FIG. 13

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Patented Feb. 19, 1946 2,395,040

UNITED STATES PATENT OFFICE

2,395,040

MASSAGING MACHINE

Earl W. Curtis, Cuyahoga Falls, Ohio

Application January 8, 1940, Serial No. 312,801

16 Claims. (Cl. 128—58)

This invention relates to the art of massaging devices, the present form of apparatus being motor-operated.

It is of course very old practice to massage the different parts of the body including the region of the spinal column, it being considered most important to have the nerves and the blood circulation throughout the entire nervous system properly stimulated. It is also important that there be effected a complete relaxation of the muscles in the region of the spinal column. Heretofore such massaging action has been performed by hand but this is very tiresome and there is of course a limit to the endurance of any pair of hands. Consequently such treatments are often not as thorough and complete as they should be for the best possible results.

Therefore, the object of the present invention is to devise an apparatus which is motor-operated and which is capable of massaging various parts of the body for an indefinite period of time.

Another object is to devise such a machine that is readily portable and is capable of adjustment so as to vary the degree of the force of the massaging action upon the body of the patient.

Another object is to provide such a machine with means whereby there may be obtained a substantially equalized pressure of engagement with the body throughout the region being treated, after the device has once been given the adjustment desired for any particular treatment.

Another object is to devise such a machine in which there is a resiliently yieldable support for the body of the patient when in position for treatment, as well as independently resiliently yieldable fingers for engaging the body of the patient.

Another object is to provide such a machine in which the pressure fingers have a compound movement that is conducive to the proper massaging of the body of the patient throughout the region being treated.

Another object is to devise such an apparatus that can be built into a table with suitable mechanical arrangement so that either the massaging machine can be moved into raised position for massaging treatment of a patient upon the table or the machine can be lowered into idle position beneath the table so as to permit the table to be employed with the usual plain top.

Other objects will appear from the following description and claims when considered together with the accompanying drawings.

Fig. 1 is a plan view of the mechanism itself with the cushions omitted;

Fig. 2 is a side elevation of the entire assembly with the cushions included;

Fig. 3 is a view taken on line 3—3 of Fig. 2;

Fig. 4 is a transverse sectional view illustrating the means of carriage control, other parts being omitted from the view.

Fig. 5 is a view taken on line 5—5 of Fig. 1 and illustrates the arrangement of the sprocket chain and its guard and rail, other parts being omitted from this view;

Fig. 6 is a view taken on line 6—6 of Fig. 1 and illustrates the arrangement of the carriages and the rail therefor, other parts being omitted from this view;

Fig. 7 is a view taken on line 7—7 of Fig. 1 and illustrates the means for varying the tension, other parts being omitted from this view.

Fig. 8 is a transverse view illustrating the operative connections for effecting the reciprocating lateral movement of the cushions 4′ and 5′;

Fig. 9 shows the general assembly of the bearing arrangement for the cushions 4′ and 5′ when the lateral reciprocating movement thereof is employed;

Fig. 10 is an inverted view of the cushion mounting just referred to;

Fig. 11 is an enlarged view of the bearing assembly in inverted plan;

Fig. 12 is an end view thereof; and

Fig. 13 is a side view thereof.

It is to be understood that the present form of disclosure is merely for the purpose of illustration and that there may be devised various modifications without departing from the spirit of the invention as herein set forth and claimed.

My present form of device is self-contained and, by means of an electric cord, the motor can be connected to any house line of electric current when it is desired to employ the device. As will be seen from Fig. 1 of the accompanying drawings, the electric motor 1 and other mechanism to be operated thereby, is enclosed within a casing 2. That part of the mechanism which actually engages the body of the patient for the massaging operation, is located in the middle part 3 of the casing 2 while the motor 1 and the operating shafts are enclosed within the side parts 4 and 5 of the same casing. These side parts of the casing are intended to be covered with cushions 4′ and 5′, and end cushions 6 and 7 are intended to be provided upon the table or floor upon which the casing rests and at the two ends thereof, the purpose of these end cushions being to afford comfort and relaxed condition of the patient as he lies upon the device for treat-

ment in the manner to be explained. A switch may be provided upon the casing or in the electric cord so as to readily start or stop the machine, and I have provided also a conveniently located means for varying the degree of pressure engagement of the massaging elements with the body of the patient so as to be readily accessible to the patient at any time during a treatment, as will be explained.

Briefly, my present invention comprises a device upon which the patient may lie and by which there will be produced a massaging action along the region of the body applied to the active parts of the device. That is to say, rotatable finger elements will move along the body of the patient and will at the same time have a rolling action with the body. There will also be produced a lateral movement of the finger elements back and forth as they are progressed along their path of active engagement with the body of the patient. The finger elements themselves have also a particular manner of arrangement with respect to each other, as will be explained.

The motor 1, through suitable gear connections, drives the transverse shaft 8 which is mounted in the frame uprights 9 secured to the bracket angle members 10 in the bottom of the casing 2. Upon the shaft 8 there are mounted the sprocket wheels 11 for driving the sprocket chains 12 each of which has a guard 13 thereabove and a rail 14 therebelow for directing the passage of the chains therealong, as indicated in Fig. 5. Each chain rail has an enlarged stationary rounded portion 15 at the end opposite the sprocket 11, for directing the sprocket chain thereabout, thereby eliminating the necessity of a sprocket at this end of the chain.

Each pair of finger tip wheels 16 is fixed to a tubular shaft 17 which is rotatably mounted at its ends in the rocker arms 18 of the carriage therefor, the other arms 19 of which carriage are pivotally connected at 18*a* to the arms 18 and are mounted on tubular members 20 laterally slidable on rods 21, the ends of which serve as pins in the chain 12. Arms 19 carry the rollers 22 for engagement with the carriage rails 23 which are carried by the tubular members 24 slidable laterally upon the rods 25 and 26 whose ends are mounted in the chain rails 14. A coil spring 27 is arranged between the pair of rocker arm 18 and roller arm 19 of each carriage, and the rear ends of the arms 18 and 19 are so arranged with respect to each other that there is a limit to the extent of their opening movement. This same structure is provided for each pair of finger wheels.

It will be observed that the carriage rails 23 are here shown as being of angular form so as to have operative engagement with all of the carriages or the ends of the carriage tubes 20, for the purpose of effecting the lateral reciprocating movement thereof. The underside of the carriage rail upon the one side of the device has suitable pivotal connection with the eccentric rods 31 which are operated by the cranks or eccentrics 31*a* on the shaft 32, and there is suitable play provided in the pivotal connection to allow such reciprocatory movement and also the vertical adjustment of the carriage rails as described.

Thus it will be seen that as the carriages with the finger tip wheels are carried along their path of movement, they are also reciprocated transversely across the forward path of movement thereof.

It will be observed that the finger tips themselves are so arranged that those on the one wheel are staggered with respect to those on the companion wheel; and that the wheels of successive sets are in different paths of movement forwardly, while the wheels of alternate sets are in the same path. This is clearly indicated in Fig. 1 of the drawings. Also, these finger tips are of rounded form resembling the ends of the human fingers and are free to rotate as they engage the body of the patient during operation of the device. Thus, as these fingers progress forwardly, there is obtained a combined rotative and transverse reciprocatory movement, these movements being performed automatically and at the same time by the same unitary mechanism, without any attention being required after the device is once set into operation, except possibly to vary the degree of pressure of the finger tips with the body of the patient, as will now be more fully explained.

Affixed to the chain guards 13 are the laterally extending pressure spring brackets 34 for cooperative engagement therebeneath by the coil springs 35 which engage also pressure rocker arms 36. The arms 36 are of angular form and are pivotally mounted upon the frame uprights 9 for adjustable movement by the rods 37 which are pivotally connected to the crank wheels or eccentrics 38 on the shaft 39 mounted in the casing for manipulation by the readily accessible hand lever 40 outside of the casing. As a means of holding this adjusting means in position to which adjusted, I have provided a tension band 41 which is anchored by the block 42 and extends about the wheel 38 and is engaged at its other end by the tension spring 43. The spring 43 abuts against a square nut 44 at the end of a screw 45, the edge of the nut engaging the band 38, whereby this tension means is capable of adjustment by turning the screw. Such tension is intended to be sufficient to hold the pressure rocker 36 in position to which adjusted. Thus by adjusting the rods 37 towards the left, as viewed in Fig. 7, the tension of the springs 35 will be increased and hence the effective tension of the engagement of the finger tips with the body of the patient will be increased, since such adjustment will cause the carriage rails to be raised and the effective engagement of the finger tip wheels is thus increased. By locating the springs 35 midway of the length of the chain rails 14, they may serve as a pivot means to permit rocking movement of these rails and other parts connected thereto, according to the exertion of pressure upon one end or the other.

As a means of equalizing the pressure of the finger tip wheels for all positions of the same throughout their progressive movement, I have curved the carriage rails 23 downwardly towards the middle, as indicated in Fig. 6. It will be seen that when two carriages are in engagement with the carriage rails and at approximately equal distance from the middle of the carriage rail, the upward pressure of these two carriages will be practically equal. But as one of the carriages passes off of the carriage rail, the other carriage will occupy position substantially over the low part of the carriage rail, that is about midway of the length thereof; and then, except for the present provision, the effective pressure of this carriage would be considerably greater, in fact about twice that of each carriage, when two of them engage the carriage rail at the same time, since the one carriage occupying midway position bears the entire pressure of the springs 35.

From the above description and accompanying drawings, as above explained, it will be understood that the chain guards 13, the chain rails 14, and the carriage rails 23 are all connected together as a unit by the rods 25 and 26 and that the only means of support for these elements is by virtue of the engagement of the chains 12 about the sprockets 11, except for the auxiliary means now to be described.

It will be understood that the upper part of the carriage chain will be raised or lowered more or less according to the adjustment of the pressure of the carriages, as above explained, there being sufficient slackness in the chain to ensure substantially horizontal position of the parts at all times. As a means of maintaining the tension of the chain normal at all times, I have provided the follower means comprising rollers 46 which engage in the open slot 47 of the shaft hanger 48 pivoted to the angle bars 10. The coil spring 49 is arranged between the shaft hanger 48 and the bracket 50 which is fixedly mounted in the casing. In each case the screw 51 extends through the bracket and serves as a means of adjustment to limit the slack in the chains at all times. The lock nut 51*a* is also provided.

Thus it will be seen that the entire bed of the device upon which the patient lies is resiliently yieldable and hence comfortable and effective for treatment. There is also an individual resilient manner of engagement provided for each finger tip wheel, as above explained.

The downward movement of one end of the carriage rails is limited by the stop means 52 in the bottom of the casing, this stop being adapted for engagement by the spacer collar 53 at the one end of the device, while at the other end the downward movement is limited by the hanger 48.

At the one end of the device there are provided extension carriage rails 54 which are hinged to the carriage rail connecting tube 24 and rest upon the shaft 8 at their free ends. Thus for all adjustments and other movements of the movable parts of the device, as above explained, there will always be a continuous path of travel for the carriages along the rails thereof.

The pliable cover 55 extends over the operating mechanism and is secured to the casing in any suitable manner so as to permit ready access to the mechanism at any time. The arrangement of this cover will permit movement of the carriages in the manner intended and the body of the patient will be so positioned as to have the part to be treated rest upon the pliable cover so as to receive the benefit of the action of the finger tips as they progress in the manner already described.

In using this device, the patient may lie down thereupon with his back for instance in engagement with the finger tip wheels so as to cause a massaging action upon the two sides of the spinal column, the finger tip wheels moving preferably away from the head. By adjustment of the lever 40, there may be obtained the desired degree of pressure engagement of the finger tips with the back of the patient. Thus there may be obtained a massaging action upon the back or other parts of the body, and this treatment may be continued for as long a time as desired without the fatigue that is involved in the old style of hand massaging. The action of the finger tips is gentle and yet effective and is calculated to produce only beneficial results.

The cushion 2*a* in the bottom of the casing is intended to prevent the finger tips from contacting metal so as to preclude the noise that would otherwise be caused.

Thus I have devised a self-contained motor-operated massaging device that can be applied to various parts of the body and operated for as long a time as desired and without requiring attention. The manner of engagement of the device with the body of the patient is of a resiliently yieldable nature by virtue of the individual spring means in the separate carriages as well as the other spring means. There is a means for ensuring equalized pressure engagement with the body of the patient and also a means for adjusting the degree of pressure engagement. These several means not only ensure comfortable and effective manner of treatment but they also permit regulation to suit the individual case, thereby still further ensuring against anything but the most effective and comfortable manner of engagement with the body of the patient, at all times and under all conditions. This device can be used by the individual himself or it can be adopted by the physician as an accessory to his practice and can be built into the table commonly found in the office of the physician, as above explained.

If so desired, there may be produced a lateral reciprocating movement of the side cushions 4' and 5' so as to give such movement to the middle part of the body as it rests upon the device during a treatment, that is with respect to the massaging means. It is to be understood that the middle part of the patient's body will be supported by the cushions 4' and 5' as well as by the massaging means. Such lateral movement will, of course, be of only comparatively slight extent and will not disturb the position of the rest of the body during treatment. This feature is made possible by the operating connections illustrated in Figs. 8 to 13 inclusive.

Upon the under-side of each cushion 4' and 5' there is a carriage 56 which rests upon the ball bearings 57 supported by the track members 58 attached along the inside of the casing 2. The carriage is attached by means of screws 59 and the track is attached by means of screws 60. This ball bearing arrangement will support downward and lengthwise pressure upon the cushions 4' and 5'. The ears 58*a* serve to retain and limit the movement of the balls, thereby confining them within the region of effective operation. The extension 56*a* is bent over at the time of assembly so as to make a unit which can be used at both ends of both cushions. These bearing units are first attached to the cushions and then to the casing. An under-side view of the cushion mounting is found in Fig. 10, while Fig. 11 shows an enlarged view of the bearing assembly in inverted plan while Fig. 13 shows a side view thereof and Fig. 12 shows an end view thereof, all based upon the view in Fig. 10. The general assembly of this bearing arrangement is shown in Fig. 9 while the operating connections therefor are shown in Figs. 1 and 8.

This reciprocating lateral movement of the cushions 4' and 5' is produced by means of the eccentrics 61 fixed to shaft 32 and arranged in opposite relation to the eccentrics 31*a*, thereby producing opposite movement to that of the rails as above described. The eccentrics 61 operate the cranks 62 which have operating connection with the shafts 63 which in turn have operating connection with the cushions 4' and 5' by means of the pins 64 which are provided upon the underside thereof and which are set in the sockets 64*a* on the shafts 63, as indicated in Fig. 8.

Shafts 63 are supported in the bracket 50 and the frame upright 9, respectively. Thus with this arrangement, there is produced an opposite reciprocation with respect to that of the fingers, thereby heightening the effect of the treatment of a given region.

What I claim is:

1. In a massaging machine, the combination of an endless carrier having a portion adapted to traverse an approximately straight line of substantial extent, means for operating the same, rotatable means adapted to engage the body of the patient, lever arms mounted upon said carrier for holding said body-engaging means, and means for rendering said body-engaging means resiliently yieldable, whereby said finger means may have a compound rotary and bodily movement when applied to the body of the patient and a self-accommodating engagement therewith.

2. In a massaging machine, the combination of a resiliently yieldable endless carrier means having a portion adapted to traverse an approximately straight line of substantial extent, means for operating the same, rotatable means adapted to engage the body of a patient, and resiliently yieldable lever arms mounted upon said carrier for holding said body-engaging means, whereby said body-engaging means may have a compound rotary and bodily movement when applied to the body of the patient and may have also a resiliently yieldable engagement therewith.

3. In a massaging machine, the combination of an endless carrier means having a portion adapted to traverse an approximately straight path of substantial extent, means for operating the same, rotatable body-engaging means mounted upon said carrier, a continuous rail along the path of said body-engaging means, and means for providing resiliently yieldable operative engagement between said body-engaging means and said rail, whereby said body-engaging means may have a compound rotary and bodily movement when applied to the body of the patient and also resiliently yieldable engagement therewith.

4. In a massaging machine, the combination of an endless carrier, a roll mounted upon said carrier, means for operating said carrier so as to cause said roll to move continuously in the same direction, a rail extending lengthwise of the path of said carrier, means of operative bearing engagement of said roll with said rail and with the body of the patient, said last-named means including means affording resilient operative bearing engagement of said roll with the body of the patient, whereby the roll will follow in a compensating manner a path corresponding substantially with the curvature of a given region of the human body being treated by the machine.

5. In a massaging machine, the combination of an endless carrier having a portion adapted to traverse an approximately straight path of substantial extent, rotatable body-engaging means mounted upon said carrier, a continuous rail along the path of said body-engaging means, resiliently yieldable means of support for said carrier and rail, means for providing resiliently yieldable operative engagement between said body-engaging means and said rail, means for operating said carrier, and means for varying the degree of tension of said engagement, whereby said body-engaging means may have a compound rotary and bodily movement and adjustable resilient engagement thereof with the body of the patient.

6. In a massaging machine, the combination of an endless carrier having a portion adapted to traverse an approximately straight path of substantial extent, rotatable body-engaging means mounted upon said carrier, a continuous rail along the path of the body-engaging means, means having operative engagement with said rail for affording resiliently yieldable engagement for the body-engaging means with the body of the patient, means for adjusting said rail so as to vary the force of engagement of the body-engaging means with the body of the patient, and means for operating said carrier, whereby said body-engaging means may have a compound rotary and bodily movement and adjustable resiliently yieldable engagement with the body of the patient when applied thereto.

7. In a massaging machine, the combination of rocker lever arms, supporting means having means of operative connection with said rocker lever arms, rotatable body-engaging means mounted upon one end of said rocker lever arms, means for rendering said rocker lever arms resiliently-acting, said supporting means being capable of forward movement so as to effect progressive engagement of said body-engaging means with the body of the patient, means for effecting such movement of said supporting means, and means for adjusting said rocker lever arms as a unit so as to vary the force of engagement of said body-engaging means as a unit with the body of the patient.

8. In a massaging machine, the combination of means for supporting the body of a patient, an endless continuously traveling carrier mounted below the position of the patient's body, a lever arm pivotally mounted upon said carrier at a point between the ends of said lever arm, a rocker arm pivotally mounted at its one end upon the one end of said lever arm, a massaging roll rotatably mounted upon the other end of said rocker arm so as to be adapted to engage the body of the patient, means of resilient engagement between said lever arm and rocker arm, a rail against which the other end of said lever arm has bearing engagement, and means for operating said carrier so as to cause said massaging roll to move continuously in the same direction and to have resilient engagement with the body of the patient.

9. In a massaging machine, the combination of rotatable body-engaging members, supporting means for said body-engaging members, said supporting means being capable of straight-line movement in one direction, means for operating said supporting means, means for supporting that part of the patient's body being treated, and means for providing reciprocating movement of the said body-supporting means in a direction different from that of the said first supporting means at the same time thereof, whereby said body-engaging members may have a compound movement in a plurality of directions with respect to the region of the body being treated at any given time.

10. In a massaging machine, the combination of rotatable body-engaging members, means for effecting rotation of said body-engaging members while in engagement with the body of the patient, means for supporting that part of the patient's body being treated, and means for pro-

viding reciprocating movement of said body-supporting means simultaneously with the rotary movement of said body-engaging members and in a direction corresponding substantially with the axis of rotation of said body-engaging members, whereby there will be obtained a combined relative motion between the rotating body-engaging members and the region of the body being treated at any given time.

11. In a massaging machine, means for supporting the body of a patient, a rotatable roll for engaging the body of the patient, a part of said body-supporting means being reciprocatable in a direction corresponding substantially with the axis of rotation of said roll, roll-supporting means reciprocatable in a direction substantially opposite to that of said part of the body-supporting means, means for effecting rotation of said roll in engagement with the body of the patient, and means for simultaneously effecting reciprocating movement of said part of said body-supporting means and roll-supporting means in opposite directions to each other during rotation of said roll in engagement with the body of the patient.

12. In a massaging machine, means for supporting the body of a patient, a rotatable roll for engaging the body of a patient, a part of said body-supporting means being reciprocatable in a direction corresponding substantially with the axis of rotation of said roll, a transversely reciprocatable endless conveyor for supporting said roll, said conveyor being adapted for continuous movement in the same direction, and means for simultaneously effecting movement of said conveyor so as to permit said roll to have rotative engagement with the body of the patient and for simultaneously effecting reciprocating movement of said part of said body-supporting means and roll-supporting means in opposite directions to each other and transversely of the path of movement of said carrier.

13. In a massaging machine, the combination of rotatable body-engaging means, individually resiliently mounted rocker arms for supporting said body-engaging means and for holding the same yieldingly in engagement with the body of the patient, means for supporting said rocker arms so as to be capable of straight-line movement forwardly and in another direction transversely of the forward direction, said body-engaging means being so mounted as to be rotated by forward movement of the same while being held in engagement with the body of the patient, and means for effecting said combined movements of said rocker arms so as to produce a combined movement of said body-engaging means over the body of the patient.

14. In a massaging machine, the combination of rocker arms, supporting means for said rocker arms, rotatable body-engaging means mounted upon one end of said rocker arms, said rocker arms having operative pivotal connection with said supporting means, means for rendering said rocker arms resiliently-acting, said supporting means and rocker arms being capable of forward movement, and said rocker arms being also reciprocatable laterally, means for operating said supporting means and said rocker arms so as to effect said forward and lateral movements simultaneously, whereby said body-engaging means may have a rotative movement while traveling bodily with compound forward and lateral movements and may have also self-accommodating engagement with the body of the patient.

15. In a massaging machine, the combination of an endless carrier means having a portion adapted to traverse an approximately straight path of substantial extent, means for operating the same, a plurality of rotatable body-engaging members mounted in succession upon said carrier means, a continuous rail along the path of such body-engagement of said members, resiliently yieldable means of support for said carrier and rail, means for providing resiliently yieldable operative engagement between said members and said rail, and means for equalizing the effect of said resiliently yieldable means of support upon said rail for all positions of said members along their path of movement, whereby said members may have a compound rotary and bodily movement and equalized resilient engagement with the body of the patient.

16. In a massaging machine, the combination of an endless carrier means having a portion adapted to traverse an approximately straight path of substantial extent, means for operating the same, a plurality of rotatable body-engaging members mounted in succession upon said carrier means, a continuous rail along the path of such body-engagement of said members, said rail being inclined downwardly from its ends to the middle thereof, resiliently yieldable means of support for said carrier beneath the substantially middle part thereof, and means for providing resiliently yieldable operative engagement between said members and rail, whereby said members may have a compound rotary and bodily movement and equalized resilient engagement with the body of the patient.

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