

Sept. 2, 1969

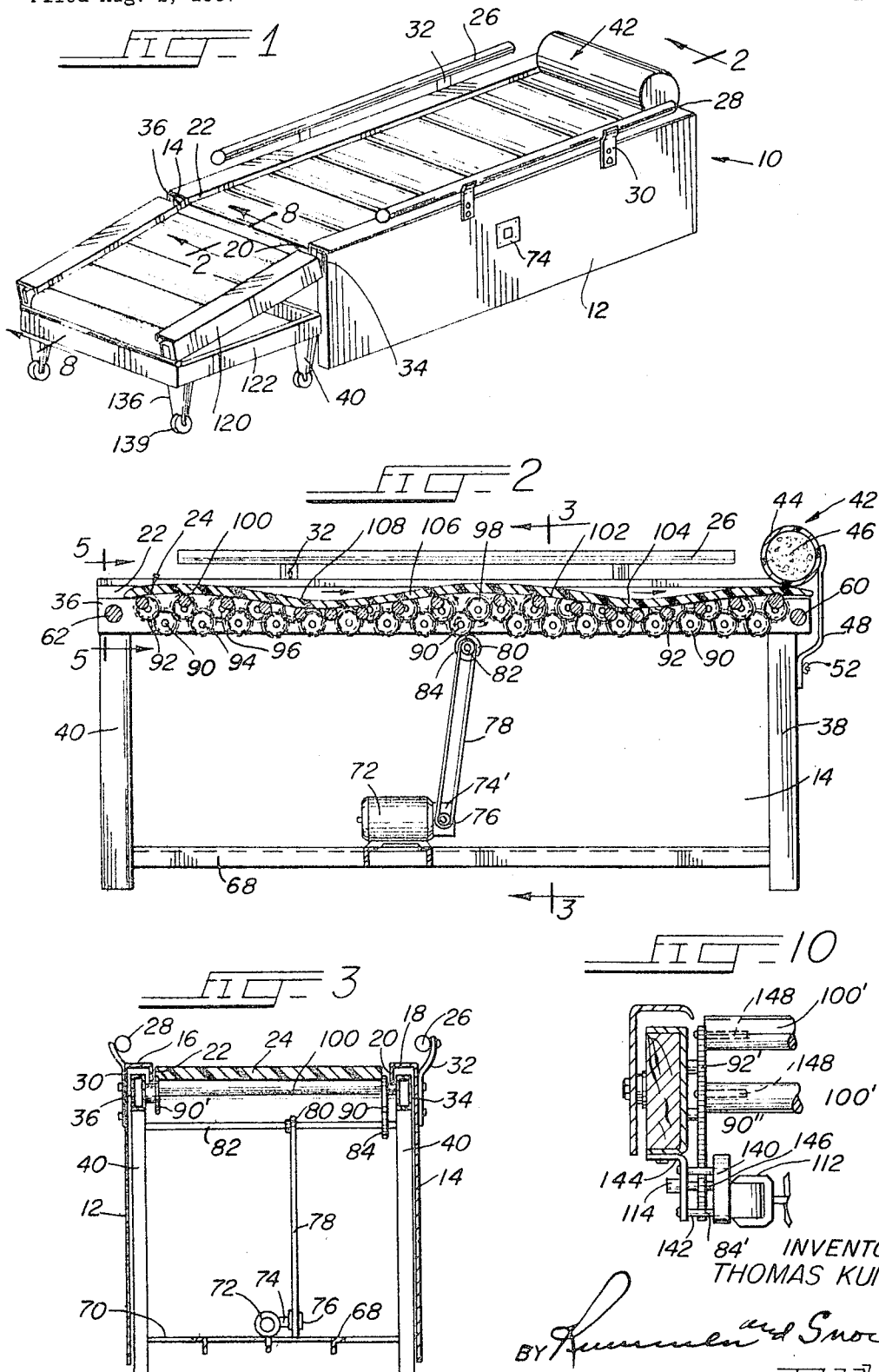
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THERAPEUTIC COUCH

Filed Aug. 2, 1967

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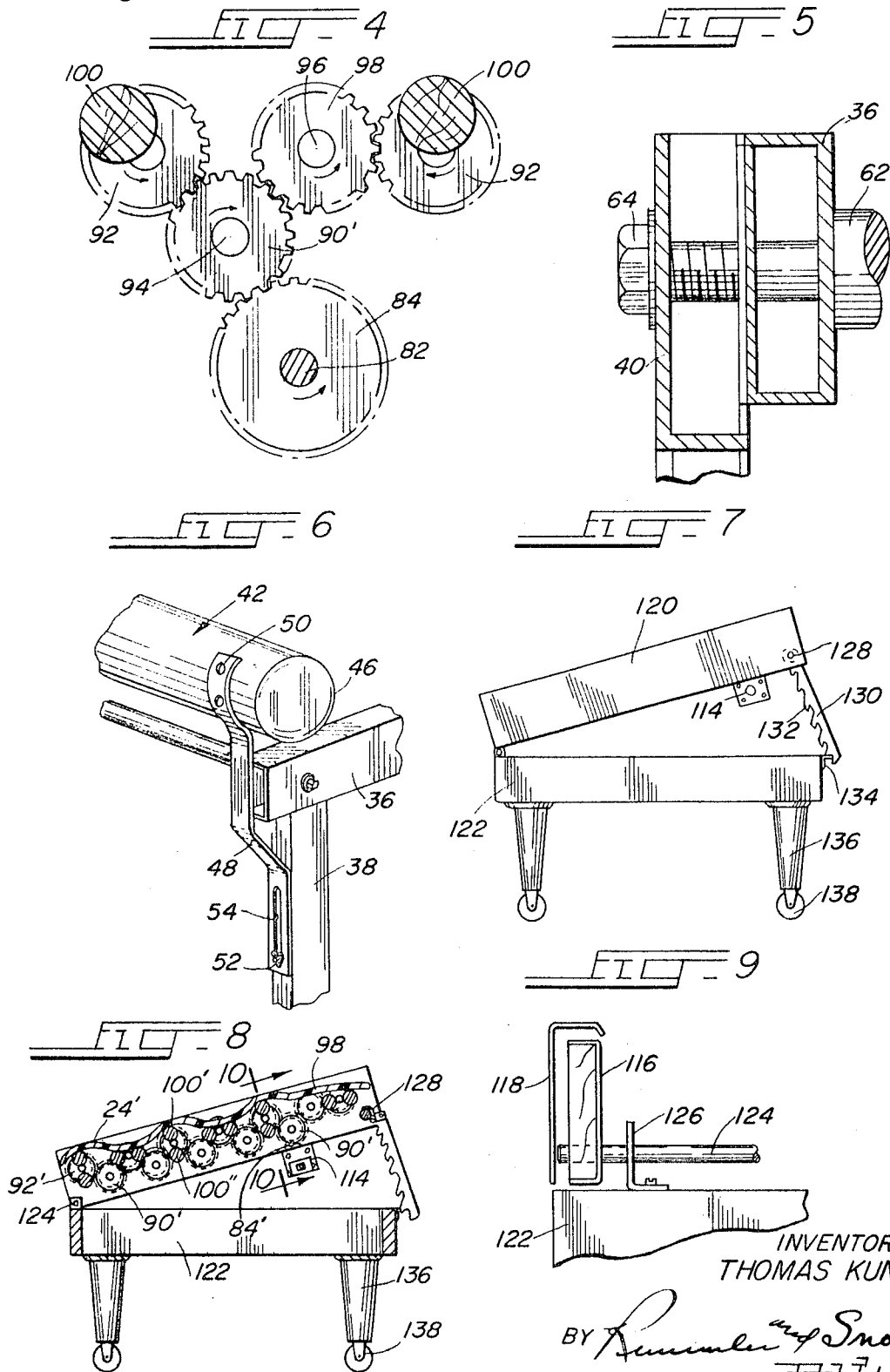
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2 Sheets-Sheet 2



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3,464,406

THERAPEUTIC COUCH

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Filed Aug. 2, 1967, Ser. No. 657,831

Int. Cl. A61h 15/00, 7/00

U.S. Cl. 128—57

6 Claims

ABSTRACT OF THE DISCLOSURE

A therapeutic couch wherein, in one embodiment, a soft, flexible pad, adapted to receive a body in repose, is supported by a series of spaced, transverse, rotatable, elongated eccentric members which upon simultaneous rotation serially in opposite directions from a central drive member, impart an undulating, wave-like massaging action to the body. Other embodiments are disclosed including the use of double eccentric cams and an auxiliary leg rest also having rotating eccentric cams to undulate a pad.

Background of the invention

This invention concerns a body massaging device characterized by its diverging parallel wave action which simultaneously rolls, pulls and kneads the body in two directions to impart a particularly restful, therapeutic and undulating sensation to the user. The invention further concerns the eccentric roller means and drive mechanism therefor associated with and supporting a soft, pliant pad upon which the user reposes. The characteristic feature of this invention is the discovery that the cyclic, harmonic, transverse undulations or waves traveling in diverging directions from the center of the pliant pad to the extremities is unusually pleasant, restful and soothing to the body structure of the user or patient and after use the body is therapeutically invigorated and stimulated through increased blood circulation and muscle nerve tone imparted thereby.

The prior art massaging devices employ vibratory members or rocking and hinged members operating perpendicular to localized areas of the body. These devices do not massage the entire body from extremity to extremity and the direction of movement of the massaging action is fixed or dependent upon physical passage of the device from one local area to another in order to complete the massaging action. Furthermore, the prior art devices are generally hand-operated requiring the assistance of an operator to treat more than local portions of the body or the back side of the patient. The use of high frequency vibratory lateral or gyratory oscillations in the prior art devices does not pull or massage the body tissue and bone structure or actuate the body joints or vertebrae in a therapeutic manner. The desideratum of this art is to simulate through mechanical means the kneading, pulling and rolling action of the hands of the professional masseuse. This invention is intended to meet this need.

Because of the complex mechanical, physiological and metabolic relationship of the skeletal, muscle, nerve, connecting tissue and organ systems of the human body, such factors as exercise, stimulation of blood circulation, muscle tone and periodic relaxation have been recognized as being of vital importance to the general well being, continued health and restoration of the health of our bodies. Massaging, rubbing, the application of heat and cold, ultraviolet rays and chemical preparations have been used to provide some measure of therapeutic treatment to meet this need. There are also available beds with vibrating springs or frame members designed to treat the entire body of the user. The peculiar and effective therapeutic and relaxing action of the instant invention

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is not to be found in these prior art devices or modes of treatment.

Summary of the invention

The present invention concerns a therapeutic couch for massaging, working and pulling the skeletal, muscular, nervous, articulate and connecting tissue systems of the body with an undulating, bi-directional, wave-like action. This invention employs a flexible, pliant pad resting upon a plurality of spaced transverse, rotatable, eccentric roller members arranged in a planar configuration with means to rotate the eccentric roller members in unison against the underside of the pad upon which the body is inclined. Portions or sections of the spaced rollers can be rotated in opposite directions so that the undulations of the pad pass from a center part to the extremities or from the extremities to the central part. Means are provided to operate the sections of the eccentric rollers individually at different speeds and in different directions. Means are included to vary the angle of repose of portions of the body thereon and, in addition, certain safety features are incorporated in the device of this invention.

Accordingly, it becomes a primary object of this invention to provide a therapeutic couch having a soft planar undulating top surface adapted to support the body of the user in repose wherein the undulations are sequential and cyclic, longitudinally of the body from a point intermediate of the extremities. Another object of this invention is to provide a plurality of spaced transverse elongated eccentric double or single rollers rotating in opposite directions from the center of a supporting substantially planar frame to the extremities with a soft pliant stationary pad thereon which transmits to the body of the patient an unusually invigorating and thorough massaging action. Other objects and advantages of this invention will become apparent or be described as this specification proceeds.

Description of the drawings

The specific embodiment of this invention is shown in the drawings, wherein:

FIG. 1 is a perspective view of the therapeutic couch of this invention;

FIG. 2 is a cross-section view taken along the lines 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken along the lines 3—3 of FIG. 2;

FIG. 4 is an enlarged end view of planetary gear system with a pair of the transverse eccentric rollers shown in cross-section thereon;

FIG. 5 is a partial view in cross-section of the end of an eccentric roller and its associated planetary gear;

FIG. 6 is a perspective partial view of the frame to show the manner of attachment of the head rest;

FIG. 7 is a side elevation view of a unit of the device;

FIG. 8 is a partial cross-sectional view taken along the lines 8—8 of FIG. 1;

FIG. 9 is a partial end view of the unit shown in FIGS. 7 and 8; and

FIG. 10 is a cross-sectional view taken along the lines 10—10 of FIG. 8.

The preferred embodiment

Referring to the drawings, particularly FIGS. 1, 2 and 3, the device of this invention comprises a rectangular couch 10 having a pair of side panels 12 and 14 having inturned box flanges 16 and 18, respectively, the inner walls 20 and 22 of which are inwardly spaced and extend in a substantially parallel relationship along the top of the couch 10. The flanged walls 20 and 22 extend downwardly a distance sufficient to act as longitudinal guides for the soft pliant pad 24 which extends substantially

along the length of the couch 10. A pair of side rails 26 and 28 are affixed to the panels 12 and 14 by means of the pairs of spaced bracket members 30 and 32.

The couch has a pair of longitudinal box frame members 34 and 36 and a pair of upright support or leg members 38 and 40 at the head and foot ends which are also box-shaped in cross-section. A tubular head rest 42 having a soft resilient cover 44 encasing a solid wooden core member 46 is provided at the head end of the couch, held thereto by means of a pair of bracket members 48 through suitable screws 50 (see FIG. 6). The brackets are affixed to legs 38 through the wing nut 52 engaging the slot 54 in the off-set end of each of the brackets 48. To complete the frame a pair of transverse tie bars 60 and 62 are provided at the juncture of the leg members 38 and 40 and side frame members 34 and 36 (see FIG. 5) held by a cap nut 64 or other means. Suitable longitudinal braces 68 and cross braces 70 complete the frame and serve as a mounting for the drive motor 72.

The drive motor 72 is connected to a source of current (not shown) controlled by the switch 74 which may be a simple "On and Off" switch or a multiple position or rheostat control switch whereby two or more speed settings are available for the motor 72. The motor is connected to a reduction gear box 74' having a drive pulley 76 engaged by the V-belt 78 and connected to the driven pulley 80 rotatably mounted on the shaft 82. The shaft 82 is supported by suitable sleeve bearings (not shown) attached to the frame member and has affixed at one end the main drive gear 84 (FIG. 3).

As shown in FIGS. 2 and 3, the frame members 34 and 36 each carry a lower tier of spaced spur or planetary gears 90 which in turn engage an upper tier of spaced planetary gears 92. The gears 90 and 92 are the same diameter and are rotatably mounted on shafts 94 and 96, respectively, along the inner side of the frame members 34 and 36. The manner of mounting the shafts 94 and 96 is immaterial as long as these gears are free to rotate and intermesh with one another in the alternate manner shown. The distance between peripheries of any pair of the top planetary gears 92 is slightly less than the diameter of the bottom gear 90 with which they mesh.

One of the bottom planetary gears 90' is engaged by the drive gear 84 and serves as the drive gear for the entire train of gears on both side frame members. As an alternative the shaft 82 can carry a second drive gear 84 to engage with one of the gears 90' rotatably mounted on the frame member 36, so that a double drive arrangement is formed. The preferred direction of rotation of the drive gear 90' and the respective planetary gears is shown in FIG. 4. Other gearing and drive arrangements can be used. In order that the top tier of gears will rotate from a central position on the couch toward each end a spacer or reversing gear 98 is used. This gear can be located on either side of the gear 90'.

Each opposite pair of the top tier of gears 92 carries therebetween an elongated roller 100 which extends in spaced relationship transversely between the frame members 34 and 36 forming a support for the pad 24. These rollers 100 are circumferentially off-set one from the other from each gear 92. All of the gears 90 and 92 are intermeshed and they rotate in reverse directions one to the other. All of the rollers 100 to the right (FIG. 2) of the gear 98 are rotated clockwise, while those to the left of this gear are rotated counter-clockwise. By this arrangement it is seen that the pad 24 is given an undulating action which starts on either side of the idler gear 98 and travels to the head and foot of the couch. The crest 102 and the trough 104 are shown on the head side and the crest 106 and the trough 108 are shown on the foot side of this reversal point in the gear system. As the device operates these crests and troughs will continue in opposite directions to the respective ends and new crests and troughs will be formed by the rotation of the eccentric

rollers 100. The pad 24 remains stationary during operation of the couch. The direction of the undulations can be reversed, that is, from the foot and head to the center, but the ends of the pad 24 would require attachment to the frame.

In FIGS. 7, 8, 9 and 10, there is shown an auxiliary leg massager 110 operating on essentially the same principle as the couch 10, having a separate motor drive 112, controlled by the switch 114. The frame 116, has side plates 118 and 120, and is a box type frame hinged to the base 122 by means of the shaft 124 and the brackets 126 (one of which is shown). The frame 116 has an end bar 120 to which is attached an adjusting ratchet arm 130, having teeth 132 for engagement with the flange 134 on the frame 122. Suitable legs 136 with casters 138 are provided so that the auxiliary massager 110 can be positioned in accordance with the height of the user of the couch 10. The ratchet arm 130 allows adjustment of the angle of the frame 116 as desired.

The auxiliary massager 110 carries a pad 24' upon a series of double eccentric gears 92' having the rollers 100' and 100'' diametrically spaced thereon with the lower tier of driven gears 90', a driving gear and a reverse gear 98, these parts having the same functions as described in connection with FIGS. 1, 2 and 3. In this embodiment because of the use of double eccentric rollers, the undulations are of shorter wave length yet travel in opposite directions from the gear 90'. The manner of use of the auxiliary leg massager 110 with the couch 10 is shown in FIG. 1. The double roller arrangement shown in FIG. 8 can also be used in the embodiment shown in FIG. 2.

FIG. 10 shows the details of construction of the auxiliary couch wherein the motor 112 is connected with the reduction gear box 140 held to the frame by means of bracket bolts 142 with the flange 144 holding the switch 114. The main drive gear 84' is carried on the shaft 146 and is meshed with the first driven gear 90'' to drive the double eccentric cam gear having the diametrically opposite roller cams 100' rotatably mounted thereon by means of axle pins 148. A similar arrangement is used to rotatably support the rollers 100 on the gears 92 shown in FIG. 4.

The couch of this invention can be operated at various speeds so that the roller cams 100 and 100' or 100'' revolve at any desired number of revolutions per minute i.e. from about 4 r.p.m. to 10 r.p.m. or more. The eccentric rollers are preferably constructed of hard wood e.g. hickory or oak for strength and some resilience or yielding action as they press against the under side of the pad 24 or 24'. The longitudinal resilience of the eccentric rollers allows them to bend slightly and conform to the body contours. The rollers may also be made of metal or fiber glass. Both of the motor drives 72 and 112 can be controlled from a single switch i.e. at 114 or two switches at this location. Also, if desired, the auxiliary massager 110 can be affixed to the couch 10 or adjustably linked thereto, and operated from a single motor.

The rollers 100 are spaced about three to four inches apart along the length of the couch and other spacings can be used. Different sizes of rollers can be used from about 1/2 inch in diameter to about 2 inches. The rollers need not all be the same size (diameter) and are spaced off center on their gears 92 by any desired amount. Radial slots can be used for mounting the pin shafts 148 in the gears 92 with clamp bolts at the end so that the eccentric distance can be adjusted. The action of the rollers 100 is planetary in relation to the spur gear carrying same. The pads 24 and 24' can be heated as by means of electrical resistors imbedded therein.

Each roller 100 or each pair of rollers has its axis of rotation circumferentially off-set from the preceding rollers at any one time along the length of the side members to provide serial eccentric contact with the pad means. The magnitude of this off-set depends on the type or fre-

quency of undulation desired. In the embodiment shown this off-set is about 42.5°, there being eight rollers in sequence to describe positions around a complete circle or the distance from crest to crest of successive waves. Angular off-sets of 30° to 45° will impart diverging wave patterns of the type having sufficient height to properly massage the body. By placing the reversing gear 98 at a point substantially equi-distant from the ends of the couch, designed to massage the body only and not the legs, the bi-directional undulations are placed along the spine of the user for greater benefits.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

What is claimed is:

1. A therapeutic couch comprising, in combination:
 - (a) an elongated supporting frame including longitudinal spaced side members;
 - (b) a series of spaced eccentrically mounted elongated rollers extending transversely between said side members;
 - (c) pad means resting on said rollers; and
 - (d) means to move said rollers in serial eccentric contact with said pad means.
2. A therapeutic couch in accordance with claim 1 in which said rollers are moved in serial eccentric contact with said pad from an intermediate point of said couch in opposite directions toward the ends thereof.
3. A therapeutic couch in accordance with claim 1 in which a second supporting frame with all of the features of the first frame as recited in claim 1 is provided and adapted to be oriented in operable angular relationship with said first frame to accommodate the legs of the user.
4. A therapeutic couch in accordance with claim 1 in which:
 - (a) said transverse rollers are rotatably mounted at each of their ends to alternate spur gears in a series

supported by said side members with their axes of rotation radially spaced from the axes of rotation of said gears and their circumferential surfaces extending beyond the outer edges of said gears;

- (b) an idler drive gear is rotatably mounted in the plane of each adjacent pair of said spur gears to interconnect said alternate spur gears and rollers serially; and
- (c) a drive gear engages one of said idler gears in the series with motor means to drive said drive gear and rotate said rollers about the axis of said spur gears.

5. A therapeutic couch in accordance with claim 4 in which a reversing gear is connected between said drive gear and the first of said spur gears at a mid-point in said frame whereby the rollers are made to rotate away from said mid-point to the ends of said couch.

6. A therapeutic couch in accordance with claim 1 in which:

- (a) a pair of said transverse rollers is rotatably mounted between axially aligned spur gears supported by said side members, the axis of rotation of said rollers being radially spaced from the axis of rotation of said spur gears;
- (b) and each succeeding pair of said rollers has their axes of rotation circumferentially off-set from the preceding pair of said rollers along the length of said side members.

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U.S. Cl. X.R.

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