Feb. 28, 1933. K. H. WHITNEY 1,899,544

VIBRATORY APPARATUS

Filed Dec. 24, 1930 3 Sheets-Sheet 1

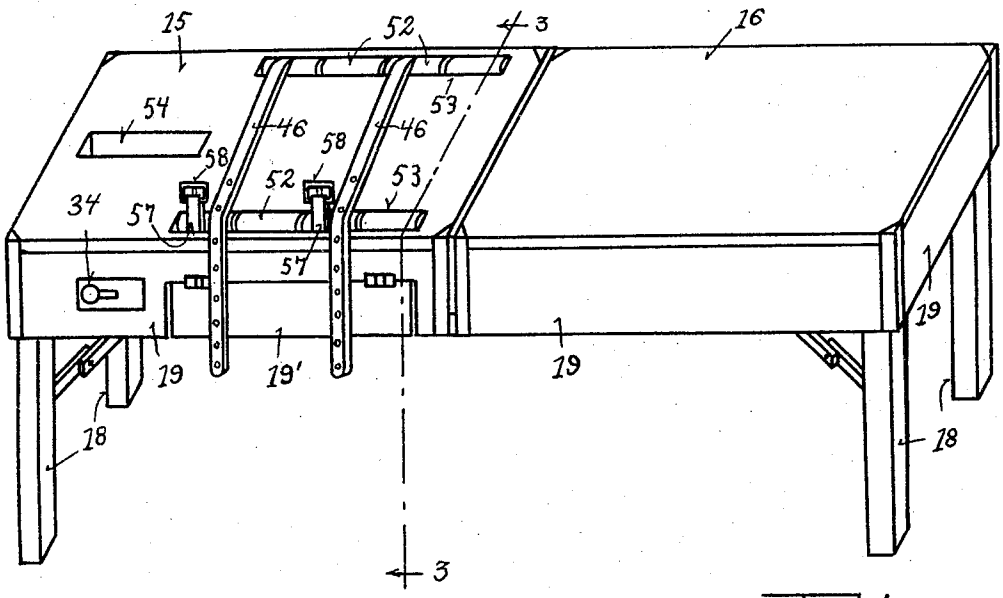


Fig. 1.

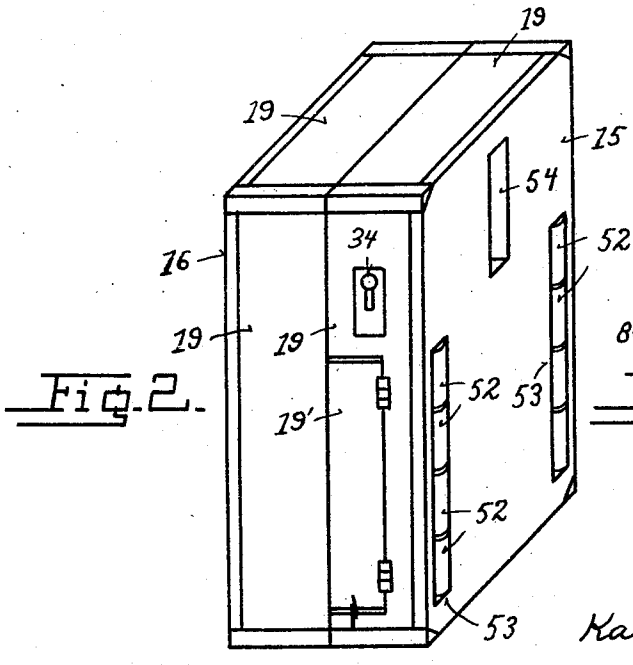


Fig. 2.

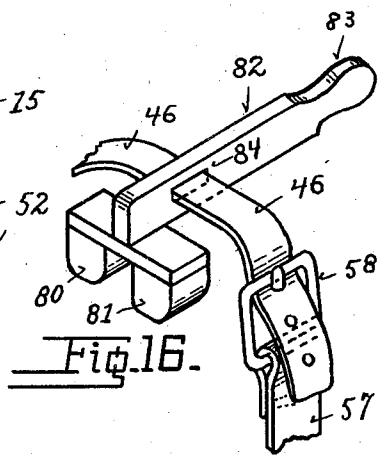


Fig. 16.

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INVENTOR

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VIBRATORY APPARATUS

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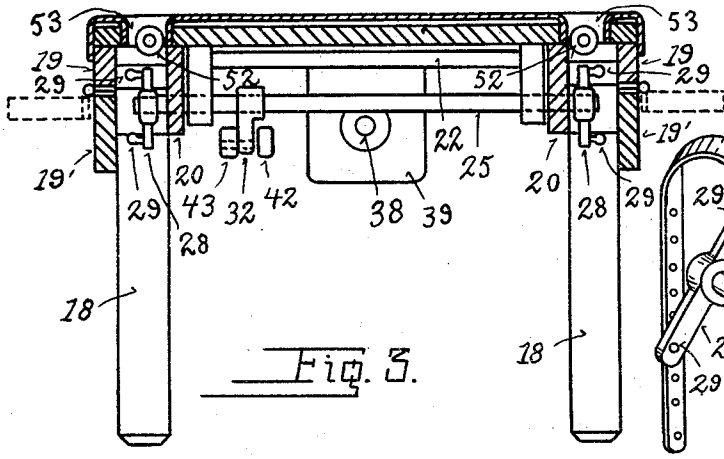


Fig. 5.

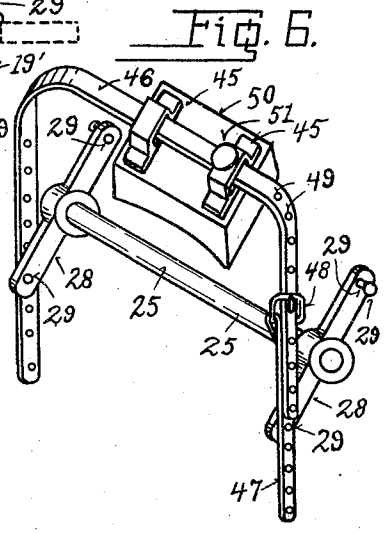


Fig. 6.

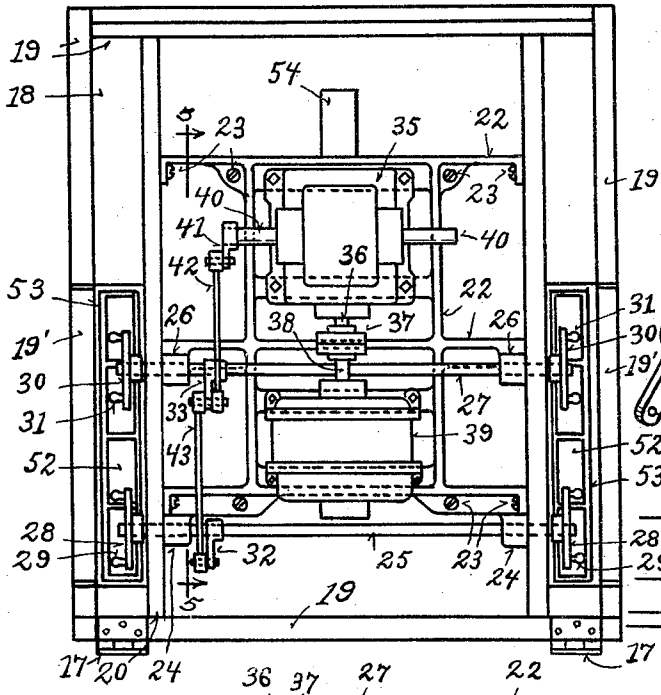


Fig. 4.

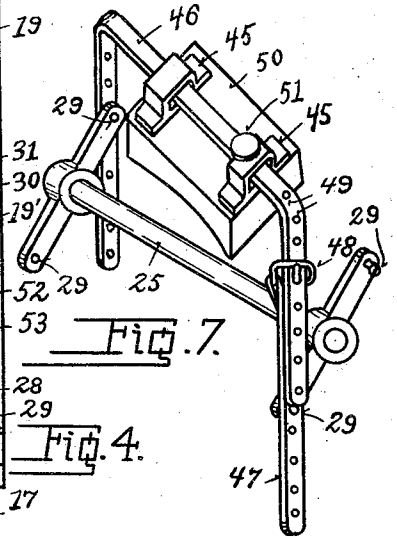


Fig. 7.

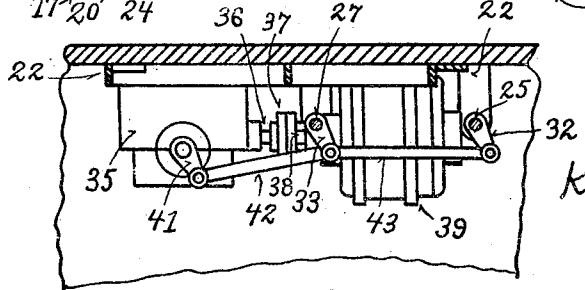


Fig. 5.

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VIBRATORY APPARATUS

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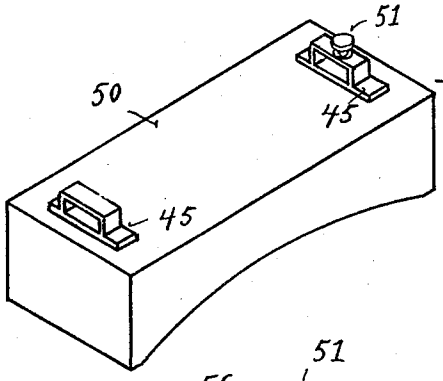


Fig. 8.

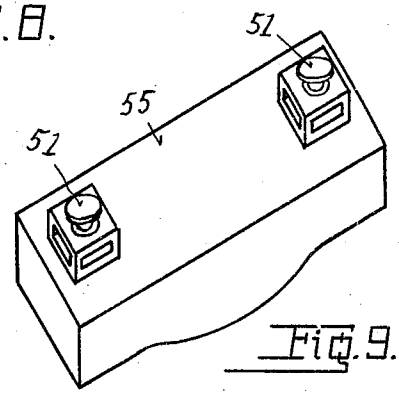


Fig. 9.

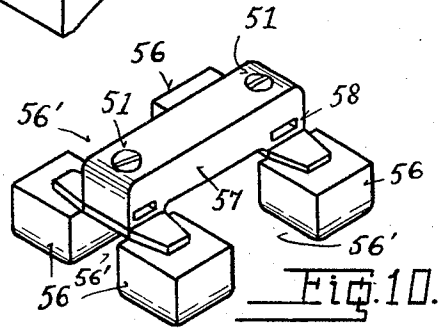


Fig. 10.

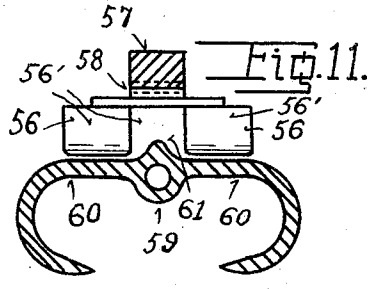


Fig. 11.

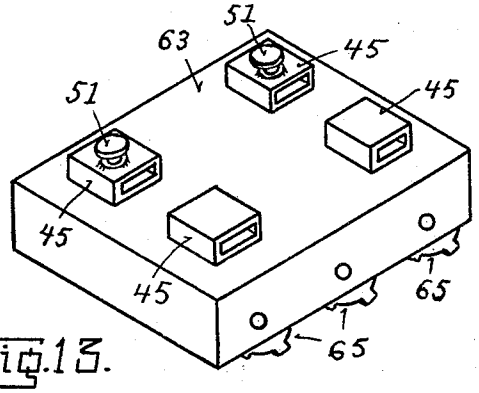


Fig. 13.

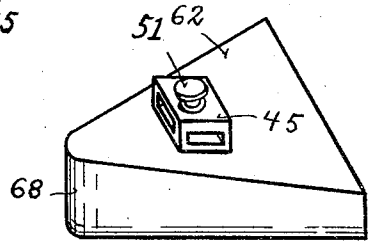


Fig. 12.

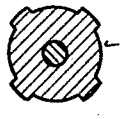


Fig. 14.

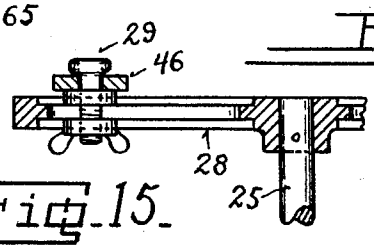


Fig. 15.

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1,899,544

UNITED STATES PATENT OFFICE

KARL H. WHITNEY, OF KIRKSVILLE, MISSOURI, ASSIGNOR TO WHITMANIS MANUFACTURING COMPANY, INC., OF KIRKSVILLE, MISSOURI, A CORPORATION OF MISSOURI

VIBRATORY APPARATUS

Application filed December 24, 1930. Serial No. 504,489.

My invention relates to improvements in vibratory apparatus. One of its objects is to provide improved vibratory apparatus adapted to vibrate, exercise, and massage different portions of the human body. Another object is to provide improved vibratory apparatus adapted to effect a deep-seated massage and exercise of portions of the human body to thereby promote and accelerate the circulation of lymphatic and other fluids and secretions of the body. Another object is to provide for use of a variety of vibratory pads and a variety of movements thereof to promote the circulation of fluids and secretions at different localities. Another object is to provide for connecting up a plurality of vibratory pads in a variety of different relations and movements. Another object is to provide an improved mechanism and unitary supporting base or frame therefor adapted to be mounted as a substantially rigid unit upon a table or other patient supporting member. Another object is to provide an improved patient support. Another object is to provide an improved vibratory apparatus having improved variable speed adjustments. My invention also comprises certain details of form and arrangement, and combination of components, all of which will be fully set forth in the description of the accompanying drawings, in which:

Fig. 1 is a perspective view of a patient supporting table with my improved vibratory apparatus applied thereto, and in position.

Fig. 2 is a perspective view of the same folded into compact space and adapted to render it more readily portable.

Fig. 3 is a vertical section through the table Fig. 1, taken upon line 3—3 of Fig. 1.

Fig. 4 is a bottom plan view of a portion of the table shown in Fig. 1.

Fig. 5 is a sectional detail taken on line 5—5 of Fig. 4.

Fig. 6 is a diagrammatic view showing one type of connection of a pad to the vibratory apparatus.

Fig. 7 is a diagrammatic view showing another type of connection of a pad to the vibratory apparatus.

Fig. 8 is a perspective view of one type of pad, detached.

Fig. 9 is a perspective view of another type of pad, detached.

Fig. 10 is a perspective view of another type of pad, detached.

Fig. 11 is a diagrammatic view showing the application of the pad Fig. 10 to the spinal column and base of the ribs of a human being.

Fig. 12 is a perspective view of another type of pad adapted to securing local and deep-seated vibratory movement.

Fig. 13 is a perspective view of a type of vibratory pad adapted particularly to reduction of weight of a patient.

Fig. 14 is a sectional detail through one of the rollers of the pad shown in Fig. 13.

Fig. 15 is a detail of one of the rocker arms detached.

Fig. 16 illustrates a modification of the pads.

It is frequently desirable to make use of a mechanical stimulation of the flow of blood, lymphatic fluid, bile, and other fluids and secretions of the body, both generally and locally. Further to stimulate certain nerve centers and nerve endings that are sufficiently accessible to be affected by the mechanical action of the apparatus. Also by deep massage of the spinal muscles and other tissues to help break down fibrotic conditions that may be present in the muscle tissue, and aiding in their absorption. It is also desirable to be able to reach by mechanical vibratory means the deep-seated organs and tissues to stimulate and promote a fluid circulation therein. It is also desirable to variably adjust the vibratory movement of the apparatus to suit the vibratory movements to the work in hand, and to vary the amplitude of the movement, and the speed ratio thereof. All of which are adapted to be attained with my improved apparatus.

The accompanying drawings illustrate modifications of my improved apparatus in which 15 and 16 represent the two body sections of a patient supporting bed or table hinged together at their meeting edges by means of hinge members 17, and supported

in an extended or useful position as shown in Fig. 1 by means of legs 18 which are pivotally attached at the upper ends of said legs by hinges to the body sections 15 and 16, and adapted to be folded against the under face of said body sections when or before the body sections are folded together. When the table sections and legs are folded together as shown in Fig. 2, said table is adapted to be folded into compact space out of the way, and also to be lifted by means of a shawl-strap or other carrying means and carried from place to place in the same manner as a suit-case. Each of said body sections has an apron 19 depending from the top at the sides and at one end. One of said body sections 15 has depending rails 20 endwise thereof and located inside of said apron 19 and inside of the legs 18 when in their folded position.

A metal frame 22 is preferably constructed in a single piece, and preferably of an aluminum alloy casting in order to secure a maximum of strength and rigidity combined with relatively light weight. The frame 22 is secured by screws or bolts 23 to the under face of the top plate of the section 15, and also to the rails 20, so as to space and brace the rails 20. The frame 22 is provided with a pair of journal boxes 24 in which a through shaft 25 is journaled near opposite ends, the free ends of said shaft extending through perforations in the rails 20 into the spaces between the rails 20 and the apron members 19'. The frame member 22 is also provided with a pair of journal boxes 26 in which boxes is journaled a shaft 27, opposite ends of which shaft 27 extend through perforations in the rails 20 into spaces between said rails and apron members 19'. Cross bars or rocker bars 28 are attached rigidly to opposite ends of the shaft 25 and provided with crank pins or buttons 29 near opposite ends of said rocker bars 28. Rocker bars 30 similar to the rocker bars 28 and provided with crank pins 31 similar to the crank pins 29 are attached rigidly to opposite ends of the shaft 27. The shaft 25 is provided with a crank arm 32 by means of which it is adapted to be rocked. The shaft 27 is provided with a crank arm 33 by means of which it is adapted to be rocked.

A variable speed motor 39 preferably an electric motor, and specially wound to have a range of three or more rates of speed or a progressive change of speed covering a considerable speed range, is attached rigidly to the frame 22 and provided with a speed regulating lever 34 adapted to be manually shifted to secure different motor speeds. A speed reducing member comprising a housing 35, in which is rotatably mounted a worm carried upon a shaft 36 coupled at 37 to the shaft 38 of the motor 39, and a worm wheel meshing with and driven by said worm and mounted upon a relatively slow speed shaft 40 journaled in said housing 35. The housing 35 is attached rigidly to the frame 22, and the shaft 40 is provided with a crank arm 41. The free end of the crank arm 41 is pivotally attached to one end of a link or pitman 42. The opposite end of the pitman 42 is pivotally attached to the free end of the crank arm 33 to rock the shaft 27. One end of a link or pitman 43 is also pivotally attached to the free end of the crank arm 33. The opposite end of the pitman 43 is pivotally attached to the free end of crank arm 32 to rock the shaft 25. Thus the shafts 25 and 27 and their rocker arms 28 and 30 are adapted to be rocked at different rates of speed, for instance covering a range of speeds from about forty-five to one hundred and fifty per minute.

The crank pins 29 and 31 are preferably adjustable along the rocker arms 28 and 30 toward and from the shafts 25 and 27, as shown in detail in Fig. 15, to thereby adjust the throw or sweep of said crank pins to a greater or less amount and thereby increase or decrease the movement of the vibratory pads. One or more vibratory pads are adapted to be applied to a patient resting upon said table, usually face downwardly to treat the back and spine, or face upwardly to treat the chest and contents of the pelvic cavity. These pads are adapted to be used singly or in groups of two, three or four. In Fig. 8 I have illustrated one type of pad 50, constructed of flexible or spongy rubber, for instance approximately four inches wide, twelve inches long, and two inches thick, provided with metal clips 45 through which one of the straps 46 is adapted to be threaded. The straps 46 and 47, one of which is longer than the other, are respectively attached at one end to one of the crank pins 29 or 31, preferably by forcing said crank pin through a button hole in the end of the strap, so that the straps may be easily detached and readjusted. One of said straps is provided with a strap buckle 48, and the opposite strap 46 is provided with a series of perforations 49 to receive the tongues of said buckles.

In Fig. 9 I have shown a pad 55, similar to the pad 50 shown in Fig. 8, except that the pad 55 is convex on its under face instead of concave on the under face as shown in Fig. 8. The pad 55 is adapted to rest either crosswise of the patient or longitudinally of the patient. When arranged crosswise of a patient, it is attached by one strap 46 and one strap 47 to two crank pins 29 and/or 31, to have an up and down movement, or a movement endwise of the strap. When the pad 55 is arranged longitudinally of the patient, it is designed to be attached by two straps 46 and two straps 47 to two pairs of crank pins 29 and/or 31, and to be alternately depressed at opposite ends. The convex section of the pad 55 is adapted to locally concen-

trate the pressure for instance upon a single organ or region.

In Figs. 10 and 11 I have illustrated a series or group of four smaller pads 56 united above by a crossbar 57, with recesses 58 through which straps 46 may be threaded. These pads are separated both laterally and longitudinally by intervening spaces 56'. In Fig. 11 I have shown this pad applied to the spinal column 59 in such manner that the respective pads 56 rest upon the base of the ribs 60 upon opposite sides of the spinal column, with the medial spinal processes 61 extending outwardly into the spaces 56' between but out of contact with the pads 56. In Fig. 12 I have illustrated a pad 62 of triangular pattern with one end 68 of greater thickness than its opposite end. The pad 62 is adapted to have an up and down or lateral movement, and is designed for application to the abdomen. A pad of this general type is adapted to concentrate vibratory movement and massage pressure in a manner adapted to stimulate particular organs or localities.

In Figs. 13 and 14, I have illustrated a pad 63 with clips 45 to be attached to two straps 46. This pad is armed with a series of pivotally mounted grooved or fluted rubber faced rollers 65 adapted to roll over the exterior of the patient when coupled to the rocker arms as shown in Fig. 7, to thereby give a movement to the pad 63 endwise of the strap 46, and to thereby reduce the weight of a patient. The pad 63 is designed for application to the back and hips of a patient.

The pads, straps, and crank pins on the rocker arms are adapted to be connected up in a variety of combinations, only a portion of which are herein mentioned specifically. After one or more of the pads, 50, 55, 56, 62, or 63 for instance, have been adjusted to position upon the chest, abdomen, back or other portion of a patient, and a strap 46 threaded through the guides 45 or other strap guides of the pad and the strap 46 connected by a buckle 48 to a strap 47, thereby connecting each pad with a pair of rocker arms through a pair of crank pins 29 or 31. The pad if connected to two crank pins on the same side of the rock shaft, in the manner shown in Fig. 6, will be alternately drawn downwardly toward the shaft 25 applying pressure to the front or back of a patient and releasing such pressure as the shaft 25 rocks in a reverse direction. If the pad should be connected to the crank pins as shown in Fig. 7, that is strap 47 connected to a crank pin 29 on one side of the rock shaft 25, and strap 46 connected to a crank pin 29 upon the opposite side of the rock shaft 25, then the pad will be alternately drawn endwise of the straps in one direction and then in the opposite direction across the front or back of a patient by the action of the rock shaft 25 and its crank pins. By connecting two pads up to the rock shaft 25, one pad connected to a pair of crank pins 29 upon one side of the rock shaft 25, and the other pad connected to the pair of crank pins 29 upon the opposite side of the shaft 25, then one pad will be drawn downwardly toward the table top, while the opposite pad is being released and moved upwardly, and the two pads will move in synchronism, one up and the other down, so as to displace the contents of the chest or abdomen laterally and longitudinally from beneath the descending pad to thereby cause a deep seated vibratory or massage movement, which in turn promotes a circulation of the fluids such as the blood and lymphatic fluid, and further stimulates accessible nerve centers and nerve endings, and hence operates to improve the health of the patient in several respects.

By connecting one pad to a set of crank pins 31 on the rock shaft 27, the same synchronous movement of the pads may be had, but with the pads spaced further part. In like manner three or four pads may be employed at the same time in synchronous movement, by utilizing the crank pins of both rock shafts 25 and 27. A latch or cam faced lock 51 serves to latch the strap 46 to one of the clips 45 to prevent displacement of the pad endwise upon its strap 46 after once adjusted to position with reference to the patient. A series of rollers 52 are pivotally mounted in slots 53 near the edges of the table top section 15, over which rollers the straps 46 and 47 ride as the shafts 25 and 27 are rocked. The rollers 52 hold the straps out of frictional engagement with the edges of the table top, and out of contact with the sides of a patient. A perforation 54 centrally of the table top section 15, is located opposite the face of the patient when in a face downward position, and enables the patient to conveniently breathe through said perforation.

The pad Fig. 10 is adapted to be adjusted to the sacrum of a patient facing downwardly and rocked thereon by means of two straps 46 and two straps 47, and two oppositely moving pairs of crank pins 29 and/or 31, arranged as shown in Fig. 6, so as to give a rythmatic movement to the entire spinal column adapted to promote blood circulation to the various nerves and nerve channels entering the spinal column. When the pad is applied over the sacrum so that alternate pressure is made on the upper and then on the lower part of the sacrum, it causes a springing movement to occur at the articulations of the sacrum with the innominates, which stretches and tends to normalize the articular tissues. The pads Fig. 10 are applicable generally to different portions of the patient.

In Fig. 16 I have illustrated two adjacent pads 80 and 81 attached together and to a handle bar 82 provided with a handle 83

and with a slot 84 for the passage of a strap 46. The pads 80 and 81 have an intervening space sufficient to receive the medial processes of the spine, and to adapt the pads 80 and 81 to seat upon the base of the ribs at opposite sides of the spine. In use the operator grasps the handle 83, and is thus enabled to guide the movements of the pads to a limited extent, and to control and to vary the energy with which the vibratory movement of the pads is applied to the patient. The pads 80 and 81 are adapted to general application.

The apparatus herein shown and described is capable of considerable modification within the scope of the claims without departing from the spirit of my invention.

What I claim is:

1. Vibratory apparatus comprising a patient supporting member having slots near opposite edges and channels longitudinally thereof at the rear face of said patient supporting member, idler rollers mounted in said slots, and rocker arms mounted in said channels, a mechanical vibrating member mounted at the rear face of said patient supporting member intermediate of said channels, a relatively thick pneumatically cushioned pad resting upon the patient, and a flexible connection attached at opposite ends to said rocker arms and looped over said idler rollers and over said pad to impart vibratory motion to said pad.

2. Vibratory apparatus comprising a patient supporting member having slots near opposite sides and idler rollers journaled in said slots, a mechanical vibrating member mounted upon the rear face of said patient supporting member intermediate of said slots and provided with centrally attached rocker arms located in substantial alignment with said slots, a pair of pneumatically cushioned relatively thick pads resting side by side upon the patient, and a pair of flexible connecting members each attached at opposite ends to one pair of rocker arm ends and looped over one pair of idler rollers and one of said pads to impart movement in different directions to said respective pads.

3. Vibratory apparatus comprising a patient supporting member having idler rollers near opposite edges thereof, a mechanical vibrating member mounted upon the rear face of said patient supporting member intermediate of said idler rollers, and provided with a rock shaft, centrally attached rocker arms located respectively at opposite ends of said rock shaft and in substantial alignment with said idler rollers, a pair of relatively thick flexible pads resting upon the patient side by side, and a pair of flexible connecting members each attached at opposite ends to one pair of rocker arm ends and looped over one pair of idler rollers and one of said pads to impart movement in different directions to said respective pads.

4. Vibratory apparatus comprising a patient supporting table member composed of two sections hinged together centrally and transversely of its length, one section of said patient supporting member being provided with slots near its edges, a rock shaft journaled to said section intermediate of said slots, and provided at its ends with rocker arms centrally attached to said rock shaft and in substantial alignment with said slots, idler rollers located in said slots, a motor to drive said rock shaft, and a flexible member connected at opposite ends to said rocker arms in pairs and looped over said idler rollers and over a patient to impart vibratory movement to the patient, said table sections being adapted to fold together for transportation purposes, and when folded together, to house said motor, rock shaft and rocker arms.

In testimony whereof I have affixed my signature.

KARL H. WHITNEY.