Dec. 19, 1967 A. J. BORRELLI 3,358,679

MASSAGING DEVICE WITH VIBRATING SURFACE FORMED OF SPACED RESILIENT MEMBERS

Filed Jan. 5, 1965 2 Sheets-Sheet 1

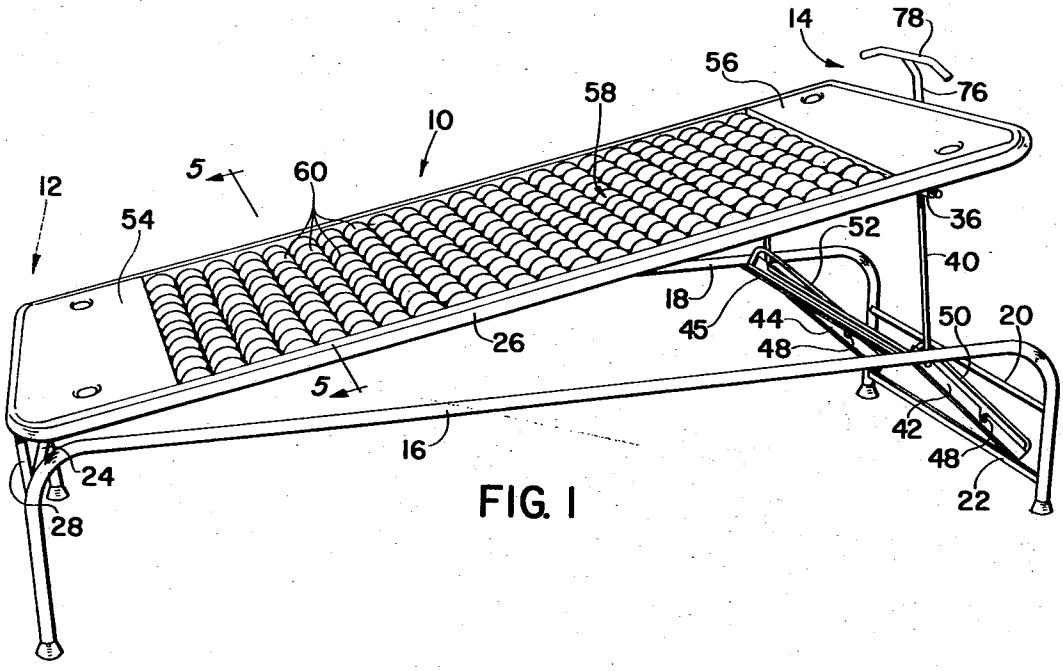


FIG. 1

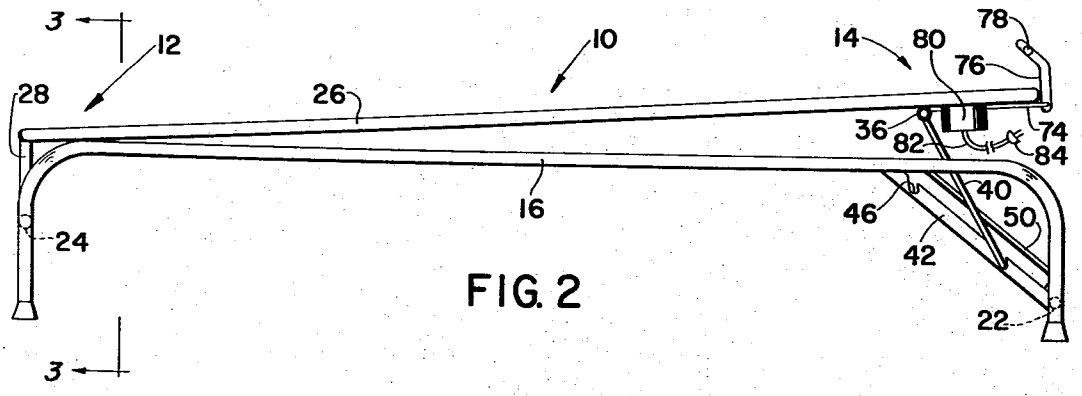


FIG. 2

INVENTOR
Albert J. Borrelli

BY Wilfred J. Baranick
ATTORNEY

Dec. 19, 1967 A. J. BORRELLI 3,358,679

MASSAGING DEVICE WITH VIBRATING SURFACE FORMED OF SPACED RESILIENT MEMBERS

Filed Jan. 5, 1965 2 Sheets-Sheet 2

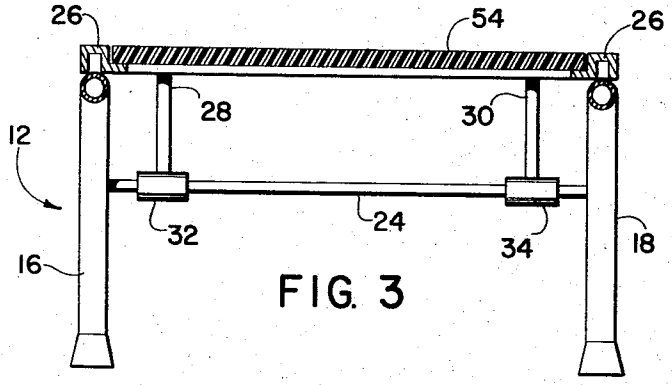


FIG. 3

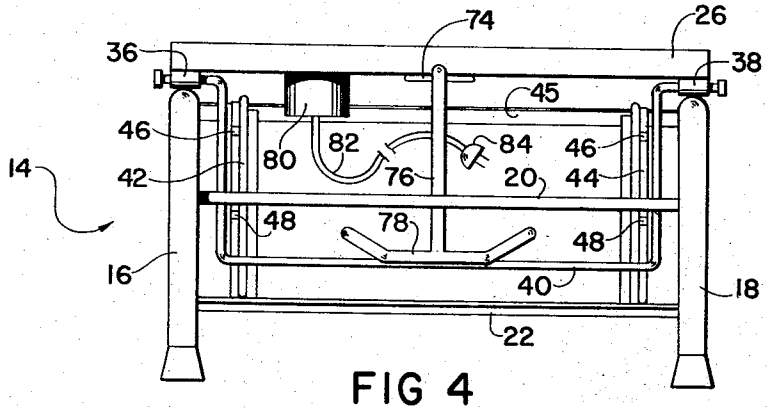


FIG 4

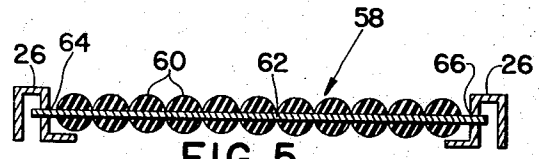


FIG. 5

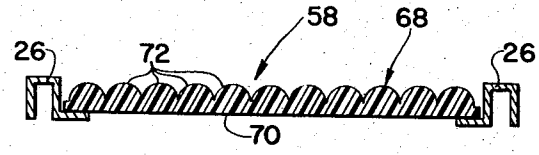


FIG. 6

INVENTOR

Albert J. Borrelli

BY Wilfred J. Baranick

ATTORNEY

United States Patent Office 3,358,679 Patented Dec. 19, 1967

3,358,679

MASSAGING DEVICE WITH VIBRATING SURFACE FORMED OF SPACED RESILIENT MEMBERS

Albert J. Borrelli, Stoneham, Mass., assignor to Verta-Aide Corporation, Woburn, Mass., a corporation of Massachusetts

Filed Jan. 5, 1965, Ser. No. 423,535
6 Claims. (Cl. 128—33)

ABSTRACT OF THE DISCLOSURE

A cot including a body support surface having a plurality of substantially evenly spaced, resilient elements which are spherical or hemispherical in shape and arranged in both lateral and longitudinal rows and a vibrator for imparting to the body support surface a relatively high frequency vibratory motion. One end of the body support surface may be selectively elevated and retained in such elevated position.

This invention relates to orthopedic apparatus and, more specifically, to a cot or table for supporting a person in a reclining position while applying a relaxing and beneficial vibratory massaging action.

Many forms of apparatus have been previously suggested for the purpose of automatically applying a massage to the body of the user through various mechanical elements. For example, elongated, cylindrical elements have been rotatably mounted on axles and arranged on a suitable support to roll back and forth along the user's body. Such elements are usually arranged at right angles to the body axis for relative movement parallel thereto either by moving the body across the rotatably mounted elements, or by applying a mechanical drive to the elements while the user's body remains stationary. The elements through which the massaging action is applied have been provided in a number of forms other than the elongated, cylindrical configuration suggested above, but the reciprocal relative motion between the elements and the user's body remains much the same throughout the prior art devices.

The present invention is illustrated in a preferred embodiment comprising a basic support frame on a set of legs in the nature of a conventional bed, cot or table. Means are provided for selectively elevating one end of the frame, which is intended to support the body of the user in a supine position with the feet elevated. In this position the major portion of the user's back is in contact with a rather large number of individual, resilient body support elements which are spherical, or hemispherical, in shape and arranged in both lateral and longitudinal rows. A mechanical vibrator may be provided to impart vibrations to the body support members which thus apply a vibratory massage to the user's back. The body support elements are fixedly mounted with respect to the support frame and, while the weight of the user's body may compress the support elements somewhat due to their resiliency, there is essentially no relative movement between the support elements and the body.

It is a principal object of the invention to provide novel apparatus in the nature of a cot, or the like, for supporting a person in a face-up, reclining position and to impart a relaxing and soothing feeling, particularly to the user's back, which is in contact with the apparatus.

Another object is to provide a cot including a surface portion for contacting the back of a person reclining thereon at a plurality of evenly spaced points and having means for applying a relatively high frequency vibration

to said surface which is transmitted to the person's back with no appreciable relative motion between the two.

A further object is to provide apparatus of the character described for applying a vibratory action through novel supporting structure, thereby relieving tension and pain in the neck, shoulders, back and legs of a person reclining thereon.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the apparatus possessing the construction, combination of elements and arrangement of parts which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings wherein:

FIGURE 1 is a perspective view of a preferred embodiment of the invention in the fully elevated position;

FIG. 2 is a side elevation thereof in the partly elevated position;

FIG. 3 is an elevational view in section on the line 3—3 of FIG. 2;

FIG. 4 is an end elevation of the end on the right as shown in FIG. 2;

FIG. 5 is a fragmentary sectional view taken on the line 5—5 of FIGURE 1; and

FIG. 6 is a sectional view as in FIG. 5 showing an alternate embodiment of a portion of the apparatus.

Referring now to the drawings, the over-all form of the apparatus may be seen to be that of a more or less conventional cot having the usual legs, support frame and surface portion adapted to support the body of a person in a reclining position. The cot is denoted generally by the reference numeral **10**, and the two ends thereof are termed for convenience the "head" end and "foot" end, denoted by reference numerals **12** and **14** respectively. The four legs which support cot **10** may conveniently be provided in the form of a pair of tubular U-shaped members **16** and **18**. Leg members **16** and **18** are rigidly connected by crossbars **20** and **22** at foot end **14** and by crossbar **24** at head end **12**.

Support frame **26** is generally rectangular and may be formed of a single, rigid member as shown, for example, or in any other conventional way, such as by attaching four straight members to form a rectangular frame. The cross sectional configuration of support frame **26** shown in FIGS. 3, 5 and 6 is merely illustrative, many other convenient shapes being equally adaptable. Support frame **26** is pivotally attached to crossbar **24** by means of rigid bars **28** and **30** which are affixed to frame **26** at one end and include at the other end eyes **32** and **34** which encircle crossbar **24**, as best seen in FIG. 3.

At foot end **14**, eyes or bearings **36** and **38** are attached to the lower side of support frame **26**. U-shaped member **40** is pivotally attached to the support frame by means of bent-over end portions which extend through bearings **36** and **38**. Rigid bars **42** and **44** are fixedly attached at one end to crossbar **22** and at the other end to another crossbar **45** extending between leg members **16** and **18**, so that bars **42** and **44** are diagonally disposed with respect to the leg members. Notches **46** and **48** are formed in bars **42** and **44** for insertion of member **40**. Thus, it may be clearly seen that support frame **26** may be moved pivotally about crossbar **24**, thereby raising and lowering the support frame at foot end **14** with respect to leg members **16** and **18**, and therefore with respect to the horizontal support upon which cot **10** rests. The support frame may be retained in the position shown in FIGURE 1

by engagement of member 40 in notches 46 of bars 42 and 44, or in the position of FIG. 2 by engagement of member 40 in notches 48. Retaining rods 50 and 52 may be affixed to bars 42 and 44 in conventional fashion to prevent rotation of member 40 more than a short distance away from bars 42 and 44. Of course, the notches in the bars may be provided in any desired number and spacing to allow for any number of vertical positions of foot end 14, if desired.

The body support section of the cot is held by support frame 26 and is generally divided into three sections, head support pad 54, foot support pad 56 and a central support section, generally denoted by the reference numeral 58. The head and foot support pads may be of conventional construction and either affixed by some means to support frame 26, or merely laid within the frame and retained in position by the shape thereof, as shown in FIG. 3. Central support section 58, as may be seen from FIGURE 1, is made up of a series of spherical elements 60 arranged tangentially in a plurality of rows with the spherical elements of each adjacent row also in tangential relationship.

FIGS. 5 and 6 illustrate two methods of arranging the elements to perform the desired function in substantially the same manner, as will later become more apparent. In the FIG. 5 embodiment, spherical elements 60 are initially supplied as separate, individual units and arranged on rigid, elongated shaft 62. The ends of shaft 62 are affixed to a portion of support frame 26 as indicated at 64 and 66, by welding or other appropriate means. Spherical elements 60 are made of a moderately resilient material such as natural rubber, for example, having a durometer hardness in the general range of from 15 to 35. As a satisfactory method of arranging spherical elements 60 in the desired relationship on shaft 62, it is proposed that the individual spheres be initially formed as solid balls and a hole slightly smaller in diameter than shaft 62 drilled therethrough. The natural resilience of the material of sphere 60 permits shaft 62 to be forced through the hole therein so that each sphere upon being placed in the desired position on the shaft, is retained by the frictional engagement due to the force fit of the shaft through the hole in the sphere. As shown in FIG. 5, a number of the spheres are arranged in contacting relationship with one another to form a row of spheres; the shafts are then affixed to frame 26 with the spheres of each row in contacting relationship with the adjacent spheres of the rows on each side thereof. The frictional engagement between adjacent spheres, and that between each sphere and the shaft upon which it is mounted, prevents any substantial movement of the spheres either laterally upon the shafts or rotationally thereabout.

In FIG. 6 is shown a second embodiment wherein central support section 58 is formed as a single, continuous sheet or mat by a conventional molding process, for example. The FIG. 6 embodiment includes upper surface 68 and lower surface 70 which rests upon support frame 26 between head and foot support pads 54 and 56. The material is somewhat resilient, as in the FIG. 5 embodiment and may be of the same material but is shown as plastic or other synthetic material. Lower surface 70 is sufficiently rigid to support the section and the weight of the person reclining thereon, or auxiliary support means (not shown) may be provided in conventional fashion. It may be seen that upper surface 68 is formed in a plurality of hemispheres 72 which are joined at their points of tangency to form the unitary, continuous mat. Hemispheres 72 are arranged in lateral and longitudinal rows, whereby surface 68 of the continuous central support section presents substantially the same surface to the body of the user as the support section embodiment of FIG. 5, wherein the surface is made up of separate, individual spherical elements. The preferred radius of the spheres or hemispheres comprising the support surface for the user's body is one to three inches, but the invention is not intended to be limited thereto.

Element 74 is attached to the lower side of support frame 26 at foot end 14 and extends through an opening in one end of rod 76, which is thereby pivotally mounted upon element 74. Bar 78 is fixedly attached to the end of rod 76 opposite the pivotal mounting. As seen in FIGS. 1 and 2 rod 76 is at the upper position of its pivotal movement and bar 78 is disposed above foot support pad 56 and transversely of cot 10. Thus, a person lying face-up on cot 10 with his head on pad 54 may insert his feet under bar 78 and thereby overcome any tendency to slide down the cot due to the elevation of foot end 14. In the interest of compactness, rod 76 may be moved to a position below support frame 26, as shown in FIG. 4. In the construction shown, due to the position of crossbar 22 and the length of rod 76, the rod should be rotated to the lower position before foot end 14 of the cot is lowered so that the rod is positioned behind the crossbar.

Vibrator 80 is attached to cot 10, preferably to a support element (not shown) which is rigidly attached to support frame 26 on the underside of foot end 14. The vibrator is of conventional design, as used in many commercial applications, and may comprise an electric motor with an eccentrically balanced armature. Electric cord 82, with a standard plug 84 on the end, is provided for operating vibrator 80 on standard house current. A switch may also be provided in the line, of course, located on the cot or in another convenient location. Upon supplying current to vibrator 80, the body supporting portion of cot 10 is vibrated at a frequency dependent on the revolutions per minute of the electric motor of the vibrator. The vibrations are transmitted to the body, principally the shoulders, back and thighs, of the user through the plurality of evenly spaced, resilient elements of central support section 58. It is preferred that a motor of approximately 1,500–2,000 r.p.m. be used to provide the vibrations. Thus, a relatively high frequency vibration with a short distance of oscillatory movement is imparted to the user at a large number of individual points of contact. With the user reclining, as previously suggested, in a supine position with the feet elevated, the vibratory massage has a most relaxing and beneficial effect on the muscular, circulatory and nervous systems.

Other refinements may easily be added to the illustrated embodiment of the cot by those skilled in the art within the framework of the invention. For example, hydraulic or other systems may be used to selectively elevate one end of the cot. Also, a timer may easily be associated with the vibrator switch to begin and/or end the vibrating action at preselected times.

Since certain changes may be made in the above apparatus without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A cot, or the like, for supporting a person in a reclining position while applying a vibratory massaging action, said cot comprising, in combination:

(a) a rigid frame;

(b) leg members upon which said frame is supported;

(c) a body support surface supported by said frame and having a plurality of substantially evenly spaced, resilient elements, each of said elements presenting a spherical surface for contact by a person reclining thereon;

(d) said elements being so arranged that said spherical surfaces each include a point lying substantially in a single, flat plane;

(e) said points being spaced by a distance not substantially greater than the diameter of said spherical surfaces; and

(f) vibrator means selectively operable to impart to

said body support surface a high frequency vibratory motion.

2. A cot, or the like, for supporting a person in a reclining position while applying a vibratory massaging action, said cot comprising, in combination:

(a) a rigid frame;

(b) a body support surface supported by said frame and having a plurality of substantially evenly spaced, resilient elements, each of said elements presenting a spherical surface for contact by a person reclining thereon;

(c) means for supporting said frame, and thereby said body support surface, at an angle to the horizontal;

(d) said elements being so arranged that said spherical surfaces each include a point lying substantially in a single, flat plane;

(e) said points being spaced by a distance not substantially greater than the diameter of said spherical surfaces; and

(f) vibrator means selectively operable to impart to said body support surface a high frequency vibratory motion.

3. A cot, or the like, for supporting a person in a reclining position while applying a vibratory massaging action, said cot comprising, in combination:

(a) a generally rectangular, rigid frame;

(b) leg members upon which said frame is supported;

(c) a body support surface supported by said frame having a plurality of substantially evenly spaced, resilient elements, each of said elements presenting a spherical surface for contact by a person reclining thereon;

(d) said elements being so arranged that said spherical surfaces each include a point lying substantially in a single, flat plane;

(e) said points being spaced by a distance not substantially greater than the diameter of said spherical surfaces;

(f) means for selectively rotating said frame and thereby said body support surface about a horizontal axis;

(g) means for retaining said frame in a plurality of positions of its rotational movement including at least one position wherein said plane is horizontally disposed, and at least one other position wherein said plane is disposed at an angle to the horizontal; and

(h) vibrator means selectively operable to impart to said body support surface a high frequency vibratory motion.

4. A cot, or the like, for supporting a person in a reclining position while applying a vibratory massaging action, said cot comprising, in combination:

(a) a generally rectangular, rigid frame;

(b) leg members upon which said frame is supported;

(c) a body support portion formed as a continuous unitary mat supported by said frame and occupying a major portion of the rectangular area defined thereby;

(d) said body support portion having an upwardly disposed surface for contact by a person reclining on said cot, said surface comprising a plurality of closely-spaced hemispherical elements joined substantially at their points of tangency to form said continuous mat;

(e) said elements each having a point thereon lying substantially in a single, flat plane; and

(f) vibrator means selectively operable to impart to said mat, and thereby to said elements, a relatively high frequency vibratory motion.

5. A cot, or the like, for supporting a person in a reclining position while applying a vibratory massaging action, said cot comprising, in combination:

(a) a generally rectangular, rigid frame;

(b) a plurality of shafts extending in parallel relation between two opposite sides of said frame, said shafts being fixedly secured to said frame;

(c) a plurality of resilient, spherical elements arranged in side-by-side relation on each of said shafts with a point on each of said elements lying substantially in a single flat plane, said elements being substantially fixedly mounted on said shafts; and

(d) vibrator means selectively operable to impart to said elements a high frequency vibratory motion.

6. The invention according to claim 5 wherein said spherical elements are arranged in tangential relation on said shafts, whereby each shaft carries a row of said elements, and each of said shafts is so mounted on said frame that the elements of each of said rows are in tangential relation.

References Cited

UNITED STATES PATENTS

2,643,651	6/1953	Colston	128—33
2,820,454	1/1958	Wright	128—252
2,874,689	2/1959	Gavelek	128—33
2,951,479	9/1960	Sellner	128—33
3,113,567	12/1963	Russell	128—33
3,205,887	9/1965	Henry	128—57

LAWRENCE W. TRAPP, *Primary Examiner.*