Jan. 9, 1968 M. M. KATZ 3,362,401

THERAPEUTIC DEVICE

Filed Sept. 18, 1964 2 Sheets-Sheet 1

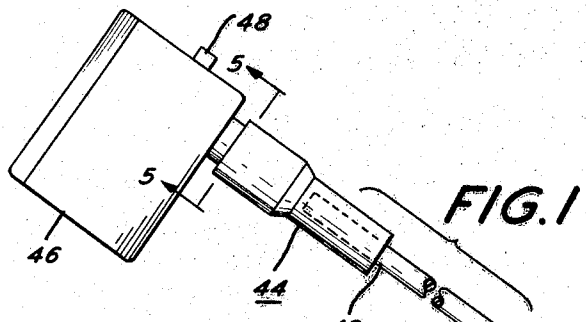


FIG. 1

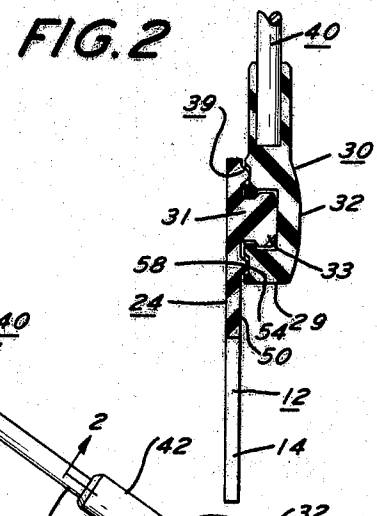


FIG. 2

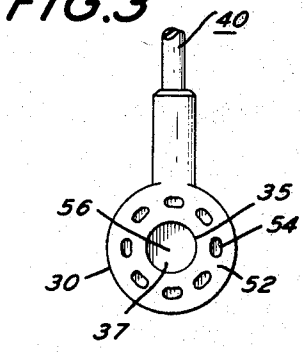


FIG. 3

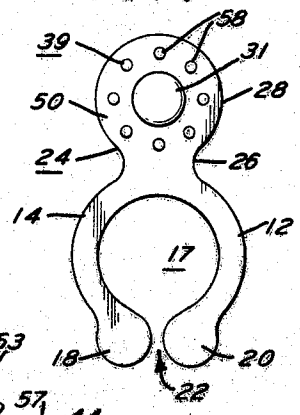


FIG. 4

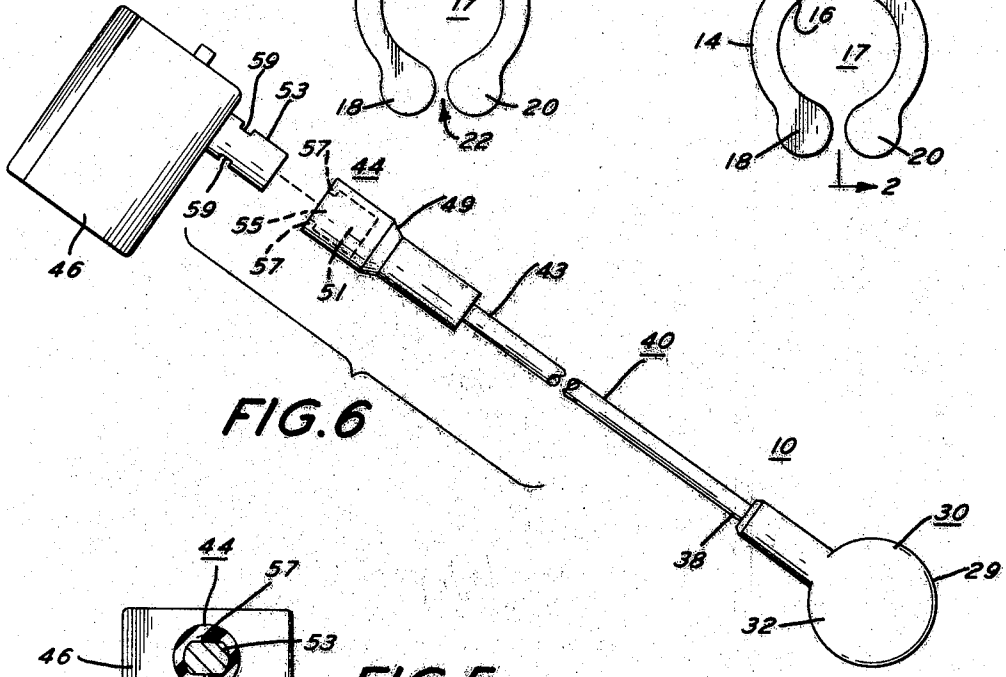


FIG. 6

FIG. 5

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THERAPEUTIC DEVICE

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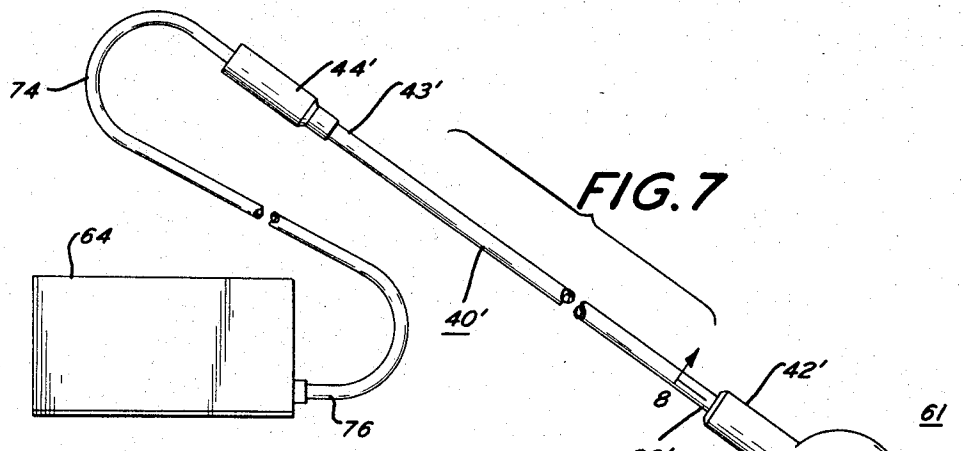


FIG. 7

FIG. 8

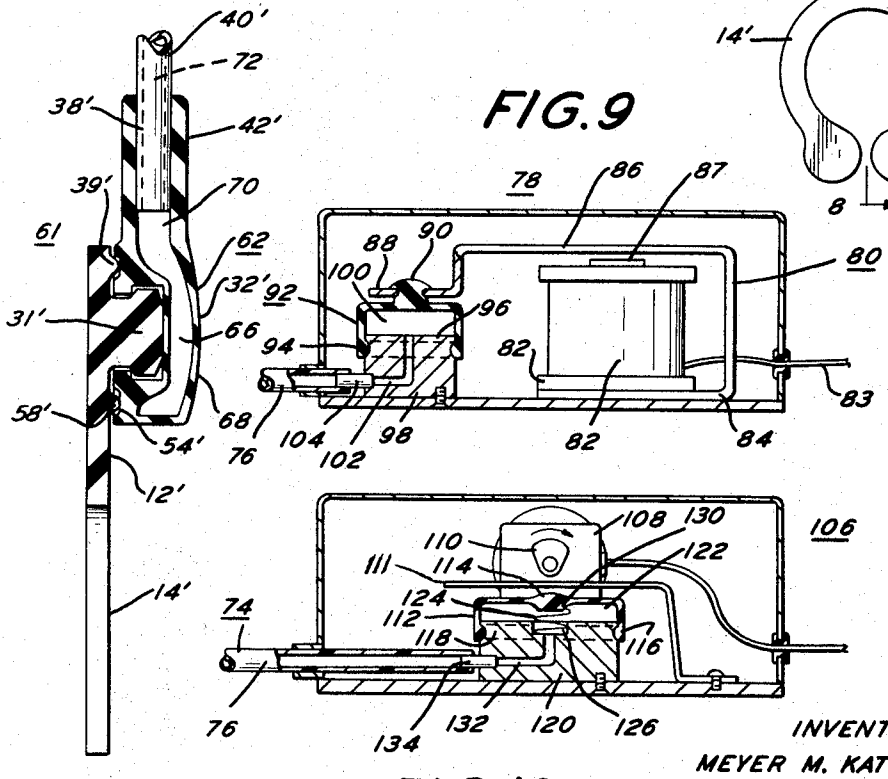


FIG. 9

FIG. 10

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THERAPEUTIC DEVICE

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Filed Sept. 18, 1964, Ser. No. 397,462
20 Claims. (Cl. 128—44)

This is a continuation-in-part of my application Ser. No. 2,247 filed Jan. 13, 1960, entitled, "Therapeutic Appliance," and issued as Patent No. 3,149,629 on Sept. 22, 1964.

This invention relates to therapeutic appliances and more particularly, to an appliance to promote physical complacency by vibratory massage, the application of pressure of varying degrees, and manipulation regardless of the lack of skill and experience of the user.

It is a well documented observation that physical maladjustment is the underlying cause of many emotional ailments. This lack of harmony has a detrimental reaction upon physical well-being.

It is not inconceivable that tension could adversely effect the mechanisms which play a role in important body functions. Proper massage is said by some authorities to relieve this tension and set in action certain internal contractions and increase glandular activity. This reaction is advantageous under many circumstances.

It is, therefore, a principal object of the invention to provide a therapeutic appliance that can be worn on a portion of the anatomy, for example, one or more fingers, or proximately positioned to engage and massage such regions that are required to bring about physical well being regardless of the lack of skill, physical ability and experience of the user.

It is also an object of this invention to provide a therapeutic appliance for the above mentioned purposes that is light in weight, small, easily cleaned, and not difficult to use.

A further object of this invention is to provide a therapeutic appliance as aforementioned that is easily disconnected for use when the wearing of a positioning portion is not required.

Still a further object of the invention is to provide a therapeutic appliance to be worn on a portion of the anatomy, which appliance is relatively thin and will not prevent or interfere with its proper use.

A further object of this invention is to provide a therapeutic appliance for the above mentioned purposes that will be easily adaptable to fit the natural variation in size and shape of the anatomy without any major change or adjustment of said device.

Also, it is the object of this invention to provide a therapeutic appliance to be used for the purpose as aforementioned that will be worn externally without causing any injury or discomfort to the parties using same.

An important object of this invention is to provide a therapeutic appliance to be worn externally in performing its function without any undue exertion on the parties using same where such exertion would be detrimental or generally injurious to their heath.

The above, as well as other objects of the invention, are achieved by providing a therapeutic appliance comprising a member made of a resilient material having a ring-like portion provided with an open region defining an entrance to the central opening and capable of being spread apart, a connecting portion extending from the ring-like portion opposite the open region, and an actuating portion detachably connected and protruding from the connecting portion and extending in the axial direction of the ring-like portion of the member. A vibrating means is provided for vibrating the actuating portion comprising a rod which is connected at one end with the actuating portion of the member and may be hand manipulated or detachably joined with an electric vibrator.

The actuating portion may be made rotatable about its axis for adjusting the position of the actuating rod. The appliance may also be modified to include means for adjusting the position of the actuating portion along its connecting portion to suit the requirements of the users.

The foregoing and other objects of the invention will become more apparent as the following detailed description of the invention is read in conjunction with the drawings, in which:

FIGURE 1 is a front elevational view of a therapeutic appliance including the invention,

FIGURE 2 is a sectional view of the member of said appliance taken on line 2—2 of FIGURE 1 and including an unsectioned portion of the actuating rod of said appliance,

FIGURE 3 is a rear elevational view of the actuating portion of the therapeutic appliance,

FIGURE 4 is a front elevational view of the connecting and positioning portions of the therapeutic appliance with the actuating portion detachably removed therefrom,

FIGURE 5 is a sectional view taken on the line 5—5 of FIGURE 1,

FIGURE 6 is a view similar to FIGURE 1 showing the actuating portion of the member with its positioning portion detached and the vibrating means disconnected from the end of the rod means,

FIGURE 7 is a front elevational view of a therapeutic appliance which is a modified form of the appliance shown in FIGURE 1,

FIGURE 8 is a sectional view of the member of said appliance taken on the line 8—8 of FIGURE 7 and including an unsectioned portion of the rod means of said appliance,

FIGURE 9 is a front elevational view partly in section illustrating in detail a vibratory reed form of the pneumatic pressure generating means shown in FIGURE 7, and

FIGURE 10 is a front elevational view partly in section illustrating in detail a cam actuated form of the pneumatic pressure generating means shown in FIGURE 7.

Like reference numerals designate like parts throughout the several views.

Refer to FIGURES 1 through 7 which disclose a therapeutic appliance 10 embodying the invention.

The appliance 10 comprises a member 12 made of resilient material having a substantially flat circular portion 14 with an inner edge 16 forming a central opening 17 for receiving a portion of the anatomy. The positioning portion 14 is provided with proximity positioned ends 18, 20 defining an entrance 22 to the central opening 17. The ends 18, 20 may each have an enlarged circular form and are capable of being spread apart for enlarging the entrance 22 of the central opening 17.

The positioning portion 14 of the member 12 is provided with an integral connecting portion 24 which extends radially outward from the positioning portion 14 along its periphery 180° from the ends 18, 20. The connecting portion 24 may be provided with a narrowed neck region 26 and an enlarged circular end 28 (see FIG. 4). An actuating portion 30 of a substantially circular configuration provided with circumferential wall 29 and top contact surface 32 is detachably joined with the connecting portion 24.

For detachably connecting the portion 24 with the portion 30, the portion 24 is provided with a projecting element 31 having an enlarged resiliently deformable head portion 33 which is received through the restricted entrance 35 into the chamber 37 in the actuating portion 30 of the member 12, as shown in FIGURES 2, 3 and 4.

The projecting element 31 is dimensioned so that when received within the chamber 37 of the actuating portion, sufficient clearance is provided to allow the actuating portion 30, which protrudes in the direction perpendicular to the plane of the positioning portion 14, to be rotatable about the projecting portion 31. The actuating portion, which is also made of resilient material, is, thus, mounted for rotation about its axis parallel to the axis of the ring-like positioning portion 14 of the member 12.

To limit the rotation and controllably adjust the rotational position of the actuating portion 30 with the positioning portion 14 of the member 12, detent means 39 clearly shown in FIGURES 2, 3 and 4 are provided in the proximately positioned surfaces 50, 52 respectively of the connecting portion 24 and the actuating portion 30. The surface 52 of the actuating portion 30 is provided with a plurality of depressed regions 54 equally angularly spaced along a circular path having a center at 56, while the surface 50 of the connecting portion 24 provides a plurality of extending detent elements 58 for respectively being received within the depressed regions 54 of the actuating portion 30.

Upon application of sufficient rotary force to the actuating portion 30 and the connecting portion 24, the extending detent elements 58 may be moved from their respective depressed regions 54 into their next adjacent depressed regions for adjusting the relative angular position of an actuating portion 30 with respect to the connecting portion 24 without detaching the actuating portion 30 from the connecting portion 24. Alternatively, the portion 30 may be disconnected from the portion 24, at which time the angular position of the elements may be altered and the actuating and connecting portions rejoined in a selected new relative angular position, or the actuating portion 30 and connecting portion 24 of the member 12 may be left detached for use of the actuating portion 30 without the positioning and connecting portions 14 and 24, as shown in FIGURE 6, when such use is desirable.

One end 38 of an actuating rod 40 is connected with the actuating portion 30 of the member 12. The connected end 38 extends radially from the actuating portion 30 and is received and secured within a radial extension 42 of the actuating portion 30. The other end 43 of the rod 40 is provided with a connecting means 44 for being readily attached with a vibrating means, such as an electrical vibrator 46, provided with a control on-off switch 48. The electrical vibrator 46 may be of the vibrating reed type for providing vibrations of a frequency of 120 cycles per second in the direction along the actuating rod 40.

The connecting means 44, as shown in FIGURES 5 and 6, includes the end connector 49 of the rod 40, which may be made of a resilient deformable material having a cylindrical chamber 51 therein for receiving the cylindrical shaft element 53 of the electrical vibrator 46. The entrance 55 to the cylindrical chamber is partially enclosed by a pair of opposite deformable segmental portions 57. The shaft element 53 is provided with a pair of complementary flat regions 59 which receive therein the segmental portions 57 of the end 49 of the rod 40 for transmitting the vibratory actuation produced by the vibrator 46 through the rod 40 to the actuating portion 30 of the member 12, while fixing said rod 40 and vibrator 46 against their relative rotation.

In operation, when the appliance 10 is used, it is positioned about the portion of the anatomy which is received through the central opening 17 of the positioning portion 14 of the member 12, while the surface 32 of the actuating portion 30 is located in contact with the area to be treated. At this time, the actuating rod 40 may be manually manipulated to vibrate the actuating portion 30 of the member 12 for treatment of the area, or the electrical vibrator 46 may be used for providing the vibratory actuation of the actuating portion 30.

Of great importance is the entrance 22 provided by the proximately positioned ends 18, 20 of the positioning portion 12 of the member 14 which may be readily spread apart. After the use of the appliance 10, this feature allows the ready removal of the appliance 10 during the continued manual massaging or manipulation without its interruption.

Since the actuating portion 30 is rotatable about its axis, the angular position of the actuating rod may be adjusted for the convenience of the parties. The projecting elements 58 and the depressed regions 54 of the detent means 39 interdigitate for adjusting the angular position of the actuating portion 30 within a predetermined range. The limited angular movement of the actuating portion 30 allowed by the detent means provides to some degree a decoupling of the vibratory motion imparted to the actuating means 30 by the vibrating means, so that the vibration is not entirely transmitted to the positioning portion of the member.

The detachability feature of the member 12 of the appliance 10 allows the positioning and connecting portions 14 and 24 to be detachably removed from the actuating portion 30, permitting the use of the actuating portion 30 without the positioning portion 14 when this is desired and thereby provides increased flexibility and utility in the use of the appliance 10. The connecting portion 14 may be detachably removed from the actuating portion 30 of the member 12 for the purpose of adjusting the angular positions of the portions 14, 30 as described above. The complete and ready detachability of the actuating portion 30 from the connecting portion 24 allows the efficient and thorough cleaning and sterilization of same.

FIGURES 7 and 8 disclose a therapeutic appliance 61 which is a modified form of the appliance 10 shown in FIGURE 1 in that a modified actuating portion 62 is provided for pneumatic actuation by a pressure generating means 64. Otherwise, the structure of the member 12', its positioning portion 14' and its connecting portion 24', as well as its detachable means including projecting portion 31', and detent means 39', including depressed regions 54' and projecting elements 58', are identical to that disclosed in connection with the appliance 10.

The actuating portion 62 of the member 12' is made of a resilient material and provides a chamber 66 enclosed by a thin flexible integral diaphragm member 68. The chamber 66 is connected with a passage 70 through the radially extending portion 42' which receives the end 38' of the rod means 40'. The rod means 40' has a passage 72 therethrough which is connected by the passage 70 with the chamber 66. The connector 44' at the end 43' of the rod 40' connects with a flexible air line 74 which has its other end 76 connected with the pneumatic pressure generating means 64 for providing a pneumatic connection between the means 64 and the chamber 66 of the actuating portion 62 of the member 12'.

FIGURE 9 discloses a vibratory reed type of pneumatic pressure generator 78 which may be used as the pneumatic generator 64 in FIGURE 7.

The generator 78 comprises a vibratory metallic reed 80 which is energized by the electromagnet 82 activated by an alternating current over leads 83. One end 84 of the reed may be anchored to the base of electromagnet 82, while its upper portion 86 is spaced from the pole 87 of the magnet and is caused to vibrate with respect thereto. The end 88 of the reed 80 is connected to the extending knob portion 90 of a cup shaped diaphragm 92 which has its peripheral edge 94 sealed with the top 96 of a cylindrical body 98 providing an air chamber 100 therebetween. The air chamber 100 is connected by a passage 102 to the projecting tube 104 which is joined with the end 76 of the air line 74.

In operation, the vibrating reed 80 actuates the diaphragm 92 to provide pressure variations within the chamber 100. The pressure variations are transmitted from the chamber 100 through the line 74, the passage 72 of the rod means 40', and the passage 70 of the actuating

portion 62 to its chamber 66. The variations of pressure within the chamber 66 of the actuating portion 62 cause the diaphragm member 68 to vibrate back and forth, providing the desired stimulation of the region to which the top surface 32' of the diaphragm member 62 is applied.

FIGURE 10 discloses a motor driven cam operated type of pneumatic pressure generator 106 which may provide another form of the pneumatic generator 64 of FIGURE 7.

The generator 106 utilizes an electric motor 108 which has a cam 110 connected to its shaft for rotary actuation. The cam 110 is contoured to depress once during each of its revolutions a flat spring element 111 which contacts a diaphragm 112 at its top region 114 which is of thickened construction for this purpose. The diaphragm 112, which is cup shaped, has its lower peripheral edge 116 sealed with the top 118 of a cylindrical body 120 providing an air chamber 122 therebetween. The diaphragm 112 is normally actuated to its expanded position by a coil spring element 124 which has one end received within a circular depressed region 126 centered in the top of the cylinder 120 and its other end received about a depending hub portion 130 in the center region 114 of the diaphragm 112. The air chamber 122 is connected by a passage 132 through the cylinder 120 to an extending outlet tube 134 which connects with the end 76 of the air line 74.

In operation, the energization of the motor 108 results in the cam 110 periodically depressing the diaphragm 112, resulting in its periodic compression and expansion providing variations in pressure within the chamber 122. The variations in pressure within the chamber 122 are transmitted by the air line 74 through the rod 40' and the passage 70 to the chamber 66 in the actuating portion 62 of the member 12, causing vibration of its diaphragm member 68, as explained above in connection with the generator 78 of FIGURE 9.

While only a few representative embodiments of means of practicing the invention disclosed herein have been described in detail, there will be obvious to those skilled in the art, many modifications and variations accomplishing the foregoing objects and realizing many or all of the advantages, but which yet do not depart essentially from the spirit of the invention.

What is claimed is:

1. A therapeutic appliance of the class described comprising a member made of a resilient material having a substantially circular positioning portion providing a central opening for receiving a portion of the anatomy and an actuating portion for contacting the area to be treated, said circular positioning portion having ends defining an entrance to said central opening and being detachably connected with said actuating portion of said member, and means for vibrating said actuating portion.

2. A therapeutic appliance of the class described comprising a member made of a resilient material having a substantially circular positioning portion providing a central opening for receiving a portion of the anatomy and an actuating portion for contacting the area to be treated, said circular positioning portion having ends defining an entrance to said central opening and being detachably connected with said actuating portion of said member, and rod means connected with the actuating portion of said member and having an extending end for controlling the position of the actuating portion of the member with respect to the area to be treated.

3. The appliance of claim 2 in which said circular positioning portion extends in a plane, and including a connecting portion which extends from said positioning portion and has a projecting element protruding in a direction perpendicular to the plane of said positioning portion for detachably connecting said positioning portion with said actuating portion of said appliance.

4. The appliance of claim 3 in which said actuating portion is connected for relative movement with respect to said positioning portion.

5. The appliance of claim 4 including vibrating means connected with the second end of said rod means.

6. A therapeutic appliance of the class described comprising a member made of a resilient material having a ring-like portion provided with an open region defining an entrance and capable of being spread apart, a portion extending from said ring-like portion opposite said open region, and an actuating portion detachably connected with and protruding from said extending portion in the axial direction of said ring-like portion of said member, said actuating and extending portions being attachable and detachable to and from each other by their movement respectively together and apart in said axial direction.

7. The appliance of claim 6 including means for vibrating the actuating portion of said member.

8. The appliance of claim 7 in which said actuating portion of said member is connected with said extending portion for rotation about an axis parallel to the axial direction of the ring-like portion of said member.

9. The appliance of claim 8 including rod means connected with the actuating portion of said member and having an extending end for controlling the position of the actuating portion of said member and connecting with said vibrating means.

10. The appliance of claim 9 in which said vibrating means includes a virbrating element actuated by an electromagnet driven by an alternating current.

11. The appliance of claim 9 in which said actuating means includes a pneumatically actuated diaphragm enclosing a first chamber pneumatically connected with said vibrating means, and said vibrating means comprises pneumatic pressure generating means including a second, compressible air, chamber having a diaphragm, and a motor driven cam unit periodically actuating said diaphragm of said vibrating means to provide alternating pressure pulses for vibrating said actuating means.

12. A therapeutic appliance of the class described comprising a member having a positioning portion having an opening for receiving a portion of the anatomy and an actuating portion detachably connected with said positioning portion for contacting the area to be treated, and means for vibrating the actuating portion of said member.

13. The appliance of claim 12 in which the positioning portion of said member is arcuate for engaging a portion of the anatomy, and includes rod means for vibrating said actuating portion of said member.

14. The appliance of claim 13 in which said actuating portion of said member is rotatably connected with said positioning portion and said proximate surfaces of said actuating portion and said positioning portion are provided with detent means for adjusting the angular position of said actuating portion, the proximate surface of said actuating portion being provided with a plurality or circularly arranged depressions while the proximate surface of said positioning portion has a plurality of projections for being respectively received in said depressions.

15. In a therapeutic appliance a member made of a resilient material having a pneumatically energized actuating means for contacting the area to be treated and positioning means for receiving a portion of the anatomy, and rod means connected with the actuating means of said member and having an extending end for controlling the position of the actuating means of said member.

16. The appliance of claim 15 in which said actuating means includes a pneumatically actuated diaphragm enclosing a chamber, and including vibrating means pneumatically connected with said actuating means and providing periodic variations in air pressure in said chamber of said actuating means for causing vibratory actuation of the diaphragm of said actuating means.

17. The appliance of claim 16 in which said vibrating means comprises pneumatic pressure generating means including a compressible air chamber having a diaphragm

and a motor driven cam unit periodically actuating said diaphragm to provide alternating pressure pulses for vibrating said actuating means.

18. The appliance of claim **16** in which said vibrating means comprises pneumatic pressure generating means including a compressible air chamber having a diaphragm, a vibrating element and an electromagnet energizing said vibrating element being driven by an alternating current periodically actuating said diaphragm to provide alternating pressure pulses for vibrating said actuating means.

19. The appliance of claim **15** including a vibrating means comprising a pneumatic pressure generating means connected with said rod means for vibrating said actuating means.

20. In a therapeutic appliance a member made of a resilient material having an actuating portion for contacting the area to be treated, rod means connected with the actuating portion of said member and having an extending end for controlling the position of the actuating portion of said member, and vibrating means connected with said

rod means for vibrating said actuating portion, said rod means being provided at its extending end with a circular opening partially enclosed by a pair of opposite segmental portions and said vibrating means being provided with an extending shaft element having a pair of opposite flat regions for engagement by the segmental portions of said rod means when said shaft element is received therein for fixing said rod and vibrating means against relative rotation.

References Cited

UNITED STATES PATENTS

2,024,983	12/1935	Street	128—79
2,559,059	7/1951	Worstenholm	128—79
3,149,629	9/1964	Katz	128—44

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