Dec. 31, 1940. H. W. HAPMAN 2,226,609

MASSAGE APPARATUS

Filed Dec. 23, 1939 5 Sheets-Sheet 1

Fig. 1.

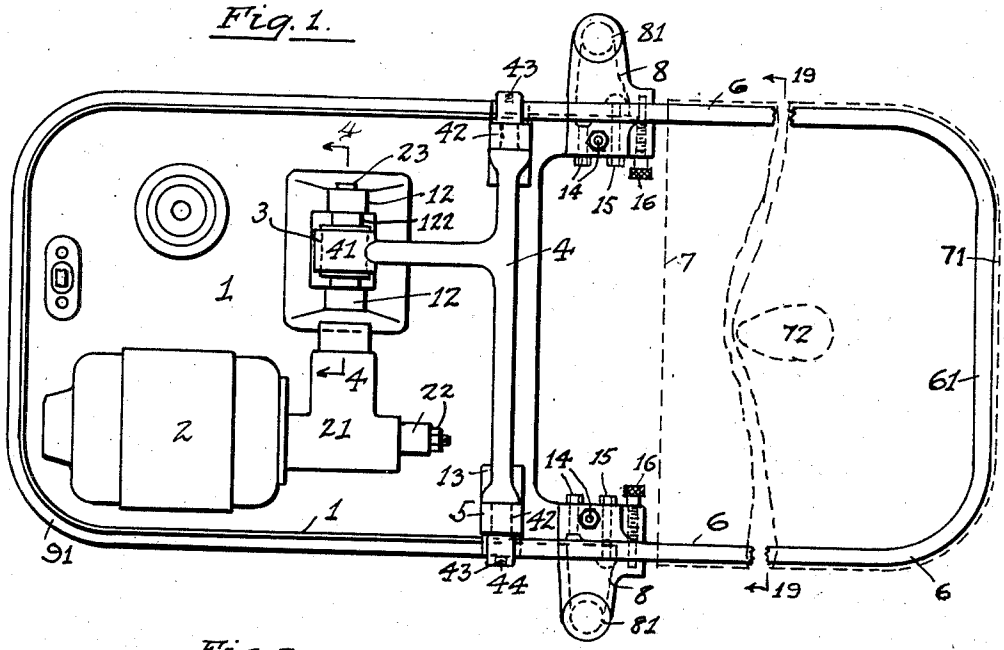


Fig. 2.

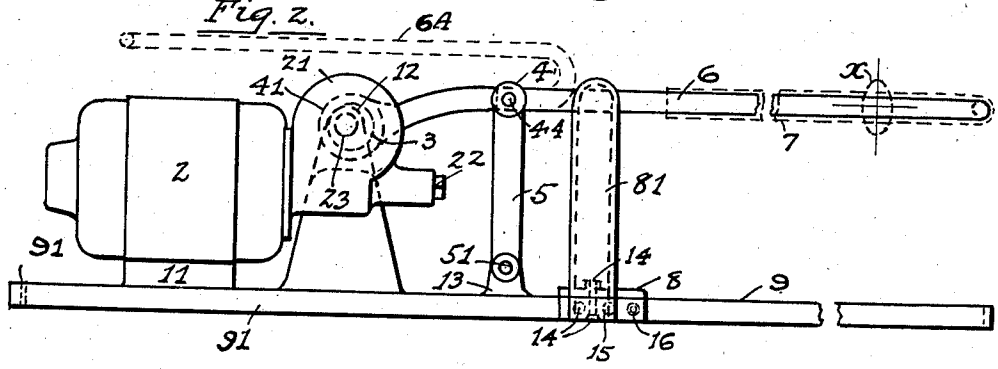


Fig. 3.

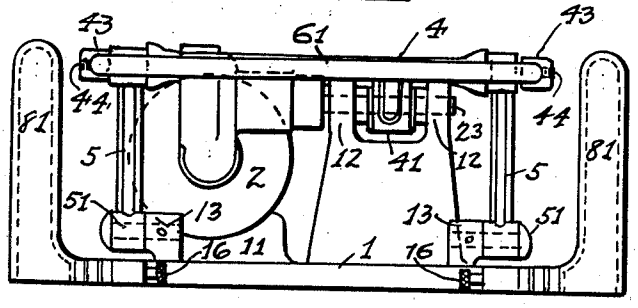


Fig. 4.

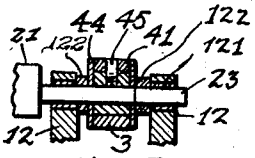
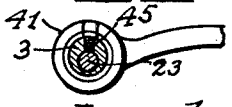


Fig. 5.



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Fig. 6.

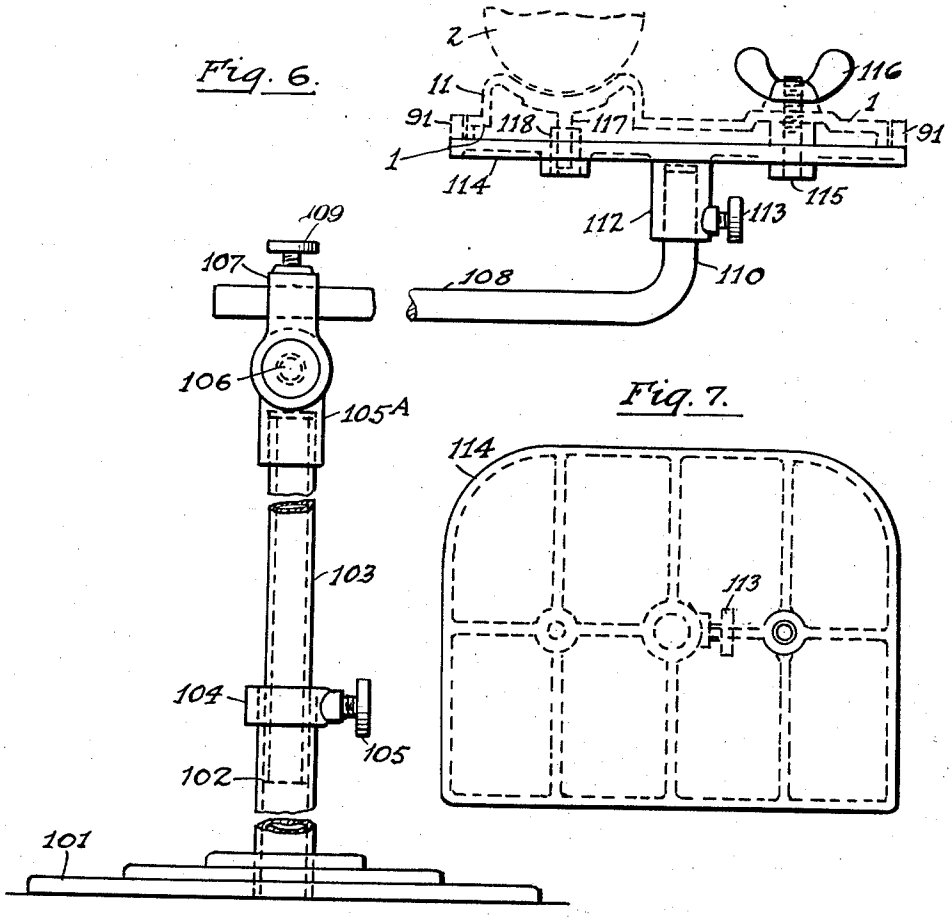


Fig. 7.

Fig. 8.

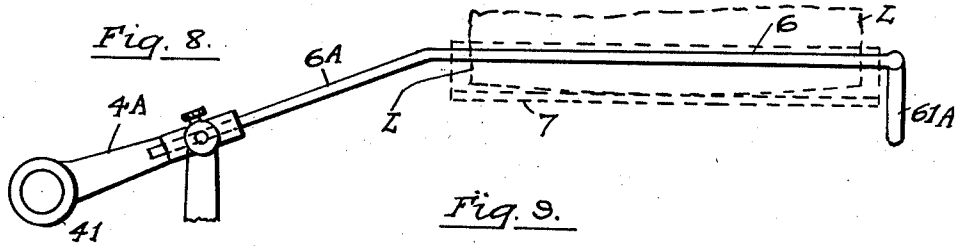
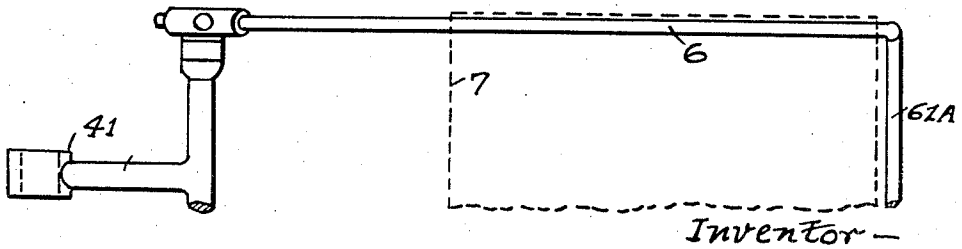


Fig. 9.



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Fig. 10.

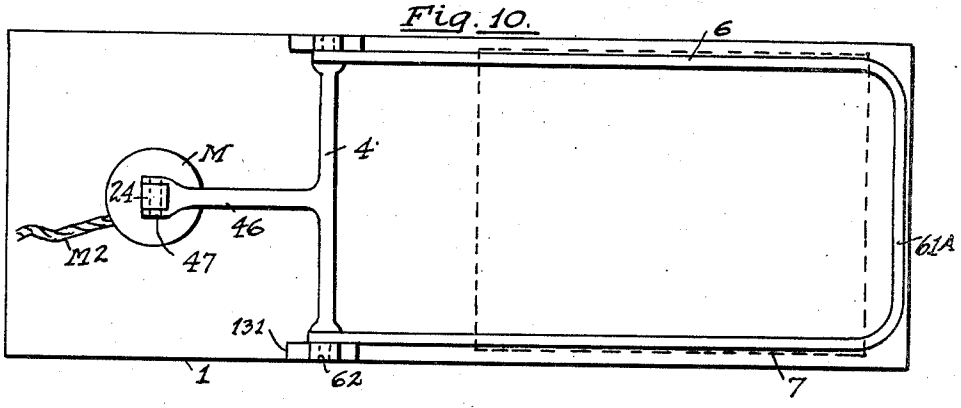


Fig. 11.

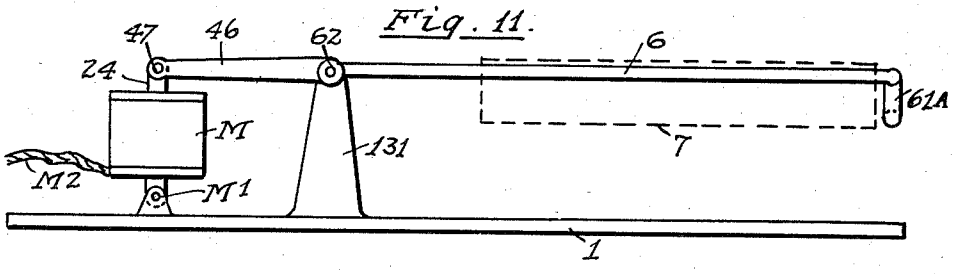


Fig. 12.

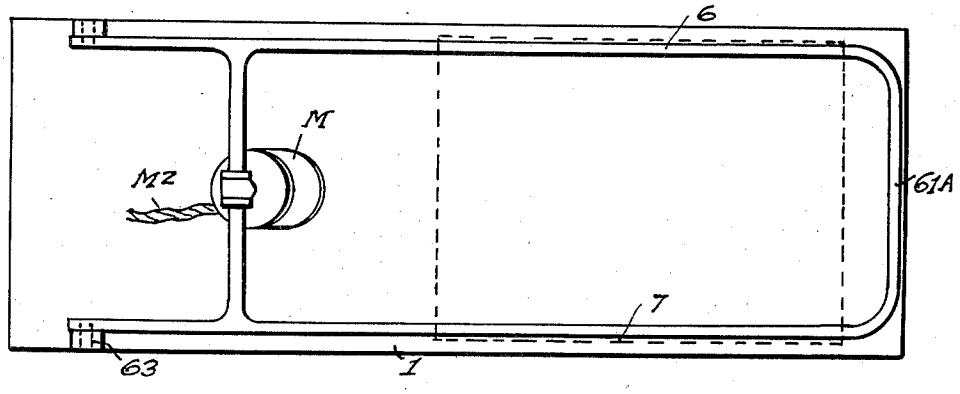
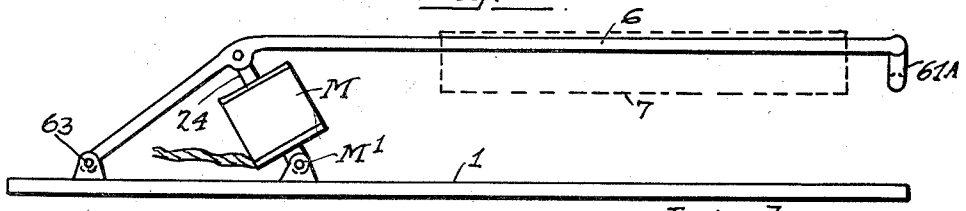


Fig. 13.



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Fig. 14.

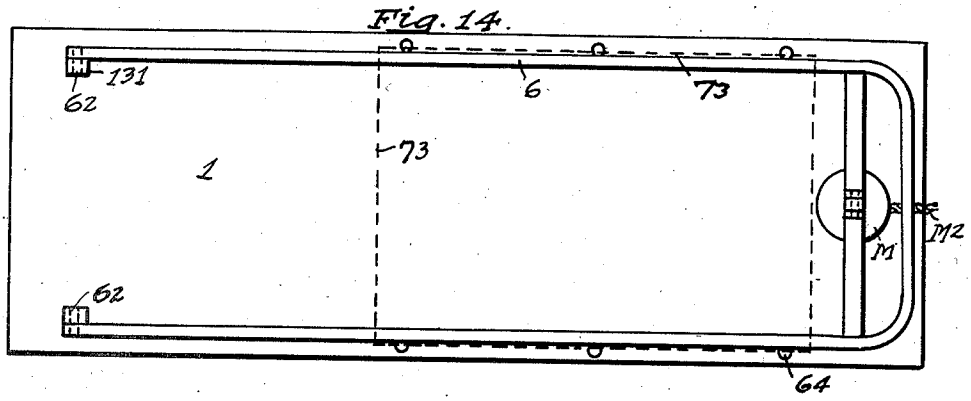


Fig. 15.

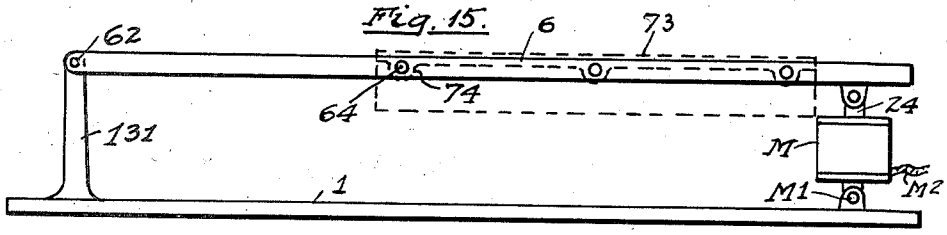


Fig. 16.

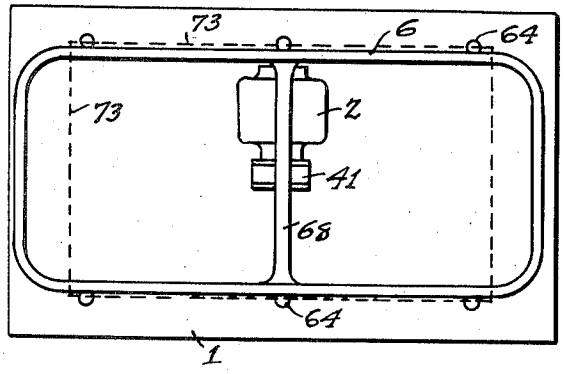


Fig. 19.

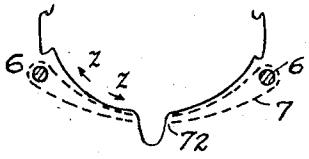


Fig. 17.

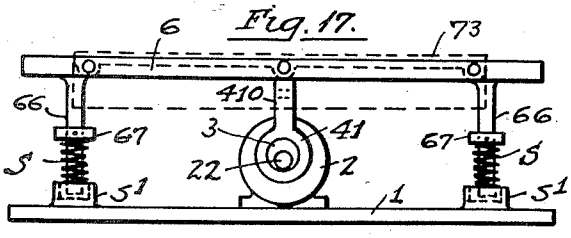
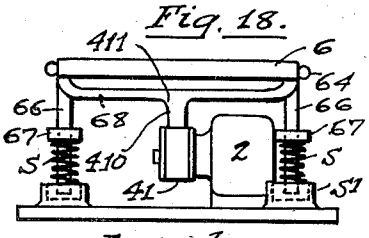


Fig. 18.



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Fig. 20.

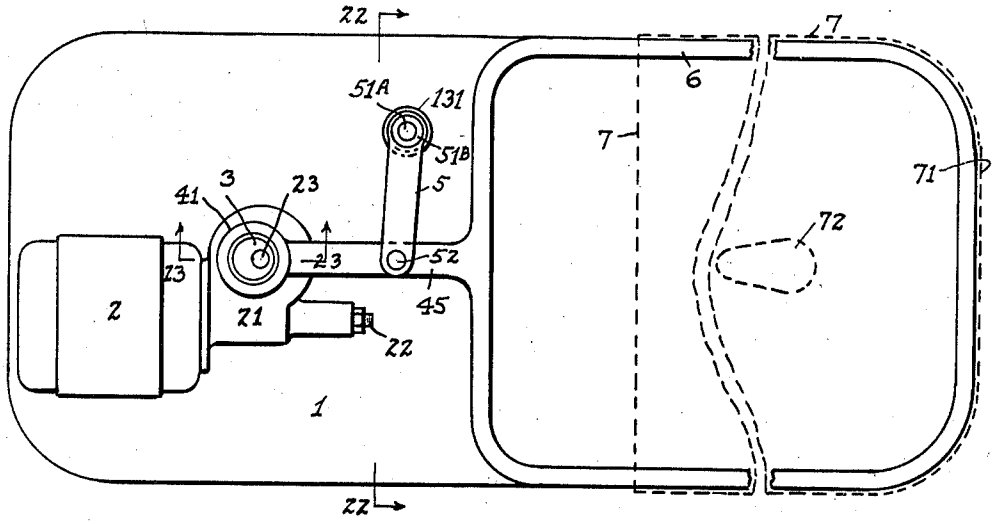


Fig. 21.

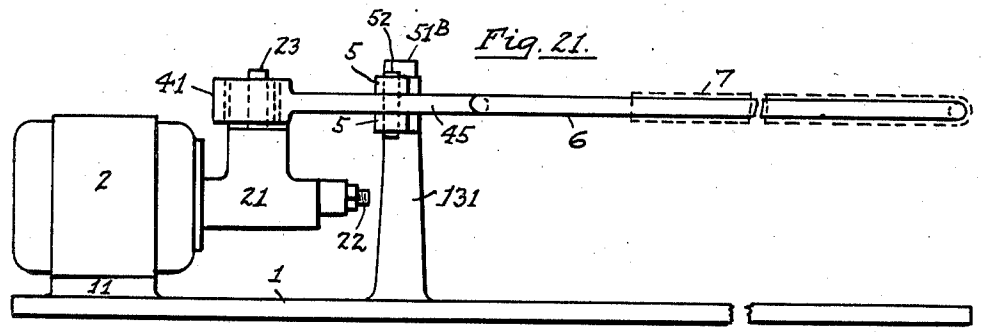


Fig. 23.

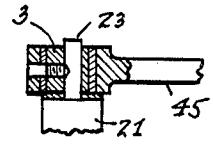
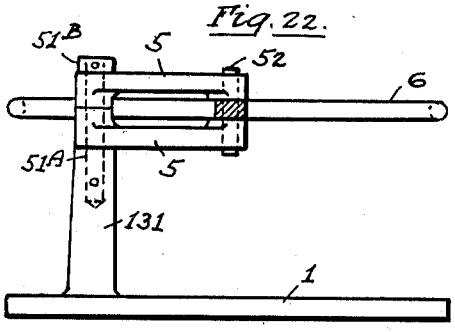


Fig. 22.



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UNITED STATES PATENT OFFICE

2,226,609

MASSAGE APPARATUS

Henry W. Hapman, Detroit, Mich.

Application December 23, 1939, Serial No. 310,693

8 Claims. (Cl. 128—32)

My invention relates to apparatus for massaging or otherwise manipulating various parts of the body, and its principal object is to provide an apparatus of this kind, actuated by electric or other form of motive power, which is capable of administering the required treatment in a regular and systematic manner as distinguished from the sporadic and irregular treatments obtained by the use of the vibratory or other hand applicators usually employed.

In order to obtain the quickest and most beneficial results it is necessary that the speed, amplitude and nature of the movements used shall be similar during each successive operation upon the same part of the body, so as to insure that the effects of an individual treatment shall not be nullified by the ones following.

Another object of the invention is to provide an apparatus of the character recited in which is employed a flexible and elastic form of applicator of such construction that by its use the beneficial operations upon the body resulting from skillful application of the hands may be produced automatically by the patient himself.

A further object is to provide an apparatus which is quickly and easily adjustable to different positions relative to the body so as to render it practically universal in its application.

A still further object is to provide an apparatus which is simple in construction and economical to manufacture by modern production methods, so that it may be sold at a price which will place it within the reach of persons to whom the cost of the present mechanical devices is prohibited.

With these and other objects in view, I will now describe a preferred embodiment of my improved apparatus, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view showing my improved apparatus as driven by means of an electric motor of the rotary type.

Figure 2 is a side elevation of the same.

Figure 3 is an end elevation.

Figure 4 is a fragmentary sectional elevation taken on line 4—4 of Figure 1.

Figure 5 is a fragmentary side elevation, partly in section, showing certain details of the vibratory mechanism.

Figure 6 is an elevational view illustrating a preferred form of adjustable floor stand for supporting the apparatus.

Figure 7 is a plan view of the table upon the stand to which the apparatus is secured.

Figure 8 is a fragmentary side elevation showing a modified form of the apparatus.

Figure 9 is a fragmentary plan view of the same.

Figure 10 is a diagrammatical plan view showing a method of actuating the apparatus by means of a magnetic vibrator.

Figure 11 is a side elevation of the same.

Figure 12 is a plan view similar to Figure 10 showing a slight variation.

Figure 13 is a side elevation of the same.

Figure 14 is a diagrammatical plan view showing yet another variation of the apparatus with magnetic vibrator.

Figure 15 is a side elevation of the same.

Figure 16 is a diagrammatical plan view showing a modified arrangement of the apparatus driven by a rotary motor.

Figure 17 is a side elevation of the same.

Figure 18 is an end elevation of the same.

Figure 19 is a transverse section on line 19—19 of Figure 1 drawn to reduced scale.

Figure 20 is a plan view illustrating a modification of my invention in which the movement of the applicator occurs in a horizontal plane, and

Figure 21 is a side elevation of the same, and

Figure 22 is a fragmentary vertical section taken on line 22—22 of Figure 20 showing the mounting of the vibratory frame upon the supporting links.

Figure 23 is a fragmentary vertical section taken on line 23—23 of Figure 20 showing the mounting of the eccentric upon the driving shaft.

Like characters designate corresponding parts throughout the several views.

Referring now more particularly to Figures 1 to 5, inclusive, of the drawings, 1 is the base, preferably of cast aluminum, Duralumin, or other light material, having thereupon a support 11 for the motor 2. The motor 2 is provided with a built-in speed reduction gear 21 of any convenient type, consisting, in the example shown, of a worm upon the motor shaft 22 meshing with a worm wheel upon the right-angularly disposed driving shaft 23. The shaft 23, where it projects from the reduction gear casing, is supported in bearing brackets 12 arranged in spaced relation upon the base and preferably integral therewith, and between these brackets is positioned an eccentric 3, secured upon the shaft, upon which is mounted the strap member 41 which forms part of the vibrator rock shaft 4. The shaft 4 is connected to the base by means of vertical links 5, pivoted at 51 to lugs 13 upon the base

and having at their upper ends bearings adapted to receive trunnions 42 upon the shaft.

In the ends of the shaft 4 are openings 43 within which are secured, as by set screws 44, the free ends of a substantially U-shaped applicator frame 6, which extends outwardly from the base 1 as shown in Figures 1 and 2. Thus it will be seen that, when the shaft 23 is rotated, the frame 6 will be subjected to a rocking motion about the shaft 4 and also a longitudinal reciprocatory motion upon the links 5, so that a point upon the frame removed from the shaft 4 will describe a quasi-elliptical or oval path, as shown diagrammatically at *x* in Figure 2.

The applicator proper, designated 7, consists in the example shown, of a sac-like member of rubber or other elastic material which is slipped over the frame 6 until the closed end 71 comes against the end cross-bar 61 in which position it is firmly held by the stretching of the material. Midways of the member 7 is an opening 72, as shown in Figure 1, which is intended to receive the nose of the patient when a facial massage is being performed, the face in this case being pressed downwards upon the applicator, with the forehead towards the shaft 4 and the chin towards the cross bar 61.

Now, it will be understood that that portion of the applicator which touches the lower part of the face will have considerably more movement than the portion which touches the upper part or forehead, which is as it should be. It will be observed, further, by reference to the diagram Figure 19, which represents a transverse section of the applicator at that point where the nose projects through the opening 72, that a compound movement of the applicator is produced in the plane of this section, and to a larger or smaller extent in other corresponding cross sections. For example, the frame 6, vibrating in a vertical plane, causes the material of the applicator to be stretched, at each vibration, in the direction indicated by the arrows *z—z*, and this, together with the horizontal vibration of the applicator, produces a compound movement of the applicator against the surface of the face which has almost the same effect as is obtained by the digital manipulation in the ordinary manual massage, except that it is much more regular and effective and, due to the fact that the speed of the vibrations can be adjusted by any of the usual means well known in the art, operations of any desired amplitude may be produced by merely pressing the face more or less heavily downwards upon the applicator.

Secured to the base 1 as by bolts 14 are brackets 8 cast from light alloy, the said brackets having vertical extensions 81 which serve as handles for holding and transporting the apparatus. Pivoted to the base and to the brackets 8 as by bolts 15 is a U-shaped member 9 which, when the apparatus is to be used without the supporting stand, extends forward as shown in full lines in Figures 1 and 2, but when the machine is mounted upon the stand it is folded back to the position indicated at 91. The said member is held in the operative position by means of the set screws 16 which are threaded into the brackets and have reduced portions 161 adapted to enter suitable openings in the member 9. In Figures 4 and 5 of the drawings are shown details of the construction of the eccentric 3 together with the adjacent parts. From these views it will be seen that the brackets 12 are furnished with bushings 121 having upon their adjacent ends flanges 122, the bushings being of the well known oil-less type, and in order to retain the eccentric strap 41 in position laterally there are provided washers 44. The eccentric is rotatably secured to the shaft by means of the headless set screw 45.

The apparatus as hitherto described is obviously suitable only for use upon a table or other elevated support and for conditions where it is desired to store it away when not in use. In order, however, to adapt the apparatus for use in barber shops, beauty parlors, and so forth, I have provided a floor stand as shown in Figures 6 and 7 of the drawings. This stand comprises a base 101 to which is secured a tubular socket 102, and slidable within this socket is a tubular pillar 103 adjustably held within the socket as by the collar 104 and set screw 105. Upon the upper end of the pillar is secured a bracket 105A, and to this bracket is pivoted, as by the set screw 106, a bracket 107, the said bracket having an opening in which is slidably supported the horizontal arm 108, the same being secured in position by the set screw 109. The arm 108 is provided with an upwardly bent end portion 110 on which is rotatably mounted the boss 112 of a cast metal plate 114, the boss being secured in position upon the portion 110 by means of the set screw 113. This plate is adapted to receive the base 1 of the apparatus which is secured in position by means of the bolt 115 and the thumb nut 116, as shown in dotted lines in Figure 6. The base 1 is further secured laterally by means of the projection 117 which fits within a bushing 118 in the plate 114.

By this arrangement, the apparatus may be moved around in various ways to suit the convenience of the patient.

My improved apparatus as hitherto described and as shown in Figures 1 to 5 of the drawings, is intended more especially for facial massage, but it will be understood that the same may be constructed in various forms according to the intended application, and I will now describe two modified forms with reference to the drawings, Figures 8 to 18, inclusive.

One modified form which may be useful in certain cases might be formed by turning back the member 6 over the actuating motor and gearing, as shown in dotted lines at 6A in Figure 2. In Figures 8 and 9 is shown a variation of a design which is of particular utility for massaging the leg or arm of a patient. In this modification the member 4 and the member 6 are inclined upward as at 4A, 6A, so that the main portion of the frame 6 occupies an elevated position in relation to the base. In such a case it may not be necessary to close the end of the sac-like applicator 7 which may be of trough-like form so that a limb of the patient, designated L, could pass over the top of the motor and driving mechanism. In this case it might be advisable to form the end cross member 61 in a downwardly bent arcuate form as shown at 61A so as to allow the limb to pass through the trough without obstruction from the framework.

In some applications it may be sufficient to provide a simple up-and-down movement to the applicator, and this may be readily performed by means of the modification shown in Figures 10 and 11 of the drawings. In this case the member 6, together with the applicator 7, is pivoted at 62 upon a pair of rigid brackets 131 upon the base 1, and the oscillatory movement may be imparted to the applicator by means of the lever 46,

the free end of which is connected as at 47 to the power plunger 24 of a vibratory magnet M which is pivoted to the base as at M' and connected as by the wire M2 to any available source of electricity. Similarly, in Figures 12 and 13, the member 6 is pivoted to the base 1 as at 63, the rear end being at an angle to the main portion 6, as shown in Figure 13. The actuating means in this modification is similar to that shown in Figures 10 and 11.

In Figures 14 and 15 is shown a modification in which the vibratory frame member 6 is pivoted at 62 to the brackets 131 on the base 1, and the actuating magnet is located at the opposite end of the said frame. In this form of my apparatus I prefer to employ an applicator consisting of a single sheet of rubber or other elastic or flexible material designated 73, the said sheet being retained in position upon the frame by means of ears or lugs 74 having holes by which it is secured to buttons or projections 64. In Figures 16, 17, and 18 I have shown a modified form of my improved apparatus in which the frame 6 is vibrated in a circular direction. For this purpose the frame is provided with four rigid and downwardly extending legs 66 which are held in position upon the base 1 by means of helical springs S, the said springs being secured within cup-like bases as S1, and passing around the lower portion of the legs, the upper ends of the springs being adapted to press against collars 67 upon the legs. In this case the driving mechanism comprises the motor 2 having the shaft 22 on which is mounted an eccentric 3 which operates through a strap 41, the rod 410 of which is rigidly secured as at 411 to a cross member 68 upon the frame 6. With such a construction it is found that while the frame 6, during the first few revolutions of the motor, has an irregular movement, the said movement finally settles down to a truly circular one which results in a very simple and economical structure, and is highly advantageous for certain forms of treatment.

It will be observed from the foregoing description and by reference to the drawings that I have provided an apparatus which is simple in construction and efficient in operation, and while I have herein described several preferred embodiments of my said invention, it will be readily understood by those skilled in the art to which the same relates that various modifications may be made to suit any particular or peculiar requirements without departing from the spirit of my invention as defined in the appended claims. For example, while I have herein shown types of apparatus in which the face or other part of the body is pressed downwards upon the applicator, it may be found advisable in some cases, for example where the apparatus is used in a barber shop or beauty parlor, to invert the vibratory frame and the applicator so that it may press downwardly upon the part to be massaged. Further, since it may be sometimes necessary to vary the period of vibration of the applicator, it will be obvious that in the case of alternating current some variable speed device may be employed for this purpose, while in case a direct current motor is used it may be sufficient to rely upon the variation of speed which will result from different degrees of pressure upon the applicator. Sometimes, moreover, it may be necessary to use a reversible motor.

Further, in those modifications in which a vibrating magnet is shown, it will be recognized that some other prime mover such as a compressed air cylinder may be used with equal efficiency.

Also, while in the various modifications of my improved apparatus heretofore described, the vibratory movement used combines a longitudinal movement in the plane of the applicator and a movement of smaller amplitude at right angles to the said plane, it may sometimes be found advantageous to combine the said longitudinal movement with a lateral movement also in the plane of the applicator. In this arrangement guide links such as those designated 5 in Figure 2 of the drawings will of course be mounted on vertical pivots, while the eccentric shaft designated 23 will be disposed vertically as will be understood.

One form of this modification is illustrated in Figures 20, 21, 22, and 23 of the drawings in which it will be noted that the driving shaft is disposed vertically, carrying at its upper end an eccentric 3 which is surrounded by the strap 41 having an arm 45 made integral with the applicator frame 6. Pivoted to the arm 45 at 52 are a pair of horizontal links 5, the other ends of which are mounted on the stationary shaft 51A upon the upper end of the column 131, being retained in position by the collar 51B. By this arrangement rotation of the eccentric 3 causes the applicator frame 6 to move longitudinally and also laterally, so as to produce the movement of the applicator as and for the purpose hereinbefore recited.

Having thus described my said invention, what I claim and desire to secure by Letters Patent of the United States is:

1. An apparatus of the character described comprising a base, a pair of vertically disposed spaced links having their lower ends pivoted to said base and having bearings in their upper ends, a rock shaft mounted in said bearings, an arm upon said rockshaft having in its end a circular opening, a transverse driving shaft having thereupon an eccentric adapted to engage said opening, motive power means for rotating said driving shaft, a hollow frame of substantially U-shape having its free ends secured to the ends of said rockshaft, and an applicator member of flexible material stretched over said frame.

2. An apparatus of the character described comprising a base, a pair of vertically disposed spaced links having their lower ends pivoted to said base and having bearings in their upper ends, a transverse rockshaft mounted in said bearings, an arm upon said rockshaft having in its end a circular opening, a transverse driving shaft having thereupon an eccentric adapted to engage said opening, a hollow frame of substantially U-shape having its free ends secured to the ends of said rockshaft, an applicator member of flexible material stretched over said frame, and motive power means for rotating said driving shaft, whereby longitudinal and also angular vibrations are imparted to said frame and said applicator.

3. An apparatus of the character described comprising a base, a pair of horizontally disposed links pivotally connected to said base, a frame pivoted to the free ends of said links, an arm upon said frame having in its end a circular opening, a vertical driving shaft having thereupon an eccentric adapted to engage said opening, an applicator member of flexible material stretched over said frame, and motive power means for ro-

tating said driving shaft, whereby longitudinal and also lateral vibrations are imparted to said frame and said applicator.

4. The combination, with an apparatus of the character described in claim 1 and including a base, of an adjustable support for said base comprising a flat circular member adapted to rest upon the floor surface and having thereupon a hollow socket, a vertical pillar adjustably supported in said socket, a radial arm pivoted to the upper end of said pillar and adapted for adjustment in a vertical plane, said arm having at its free end an upwardly extending portion, a plate rotatably mounted upon said portion and adapted to receive said base, and means for detachably securing said base to said plate.

5. In an apparatus of the character described in claim 1, the combination, with a vibratory frame, of a sac-like applicator member of flexible material extending above and below said frame.

6. In an apparatus of the character described in claim 1, the combination, with a vibratory frame, of a tubular applicator member of flexible material extending above and below said frame.

7. In an apparatus of the character described in claim 1, the combination, with a vibratory frame, of a flexible applicator member extending above and below said frame and having aligned openings in the upper and lower portions adapted to permit passage of a protuberance upon the body of the subject.

8. In an apparatus of the character described in claim 1, the combination, with a base and a vibratory frame projecting beyond said base, of a withdrawable member aligned with said base and projecting therefrom below said frame to maintain said apparatus in equilibrium.

HENRY W. HAPMAN.