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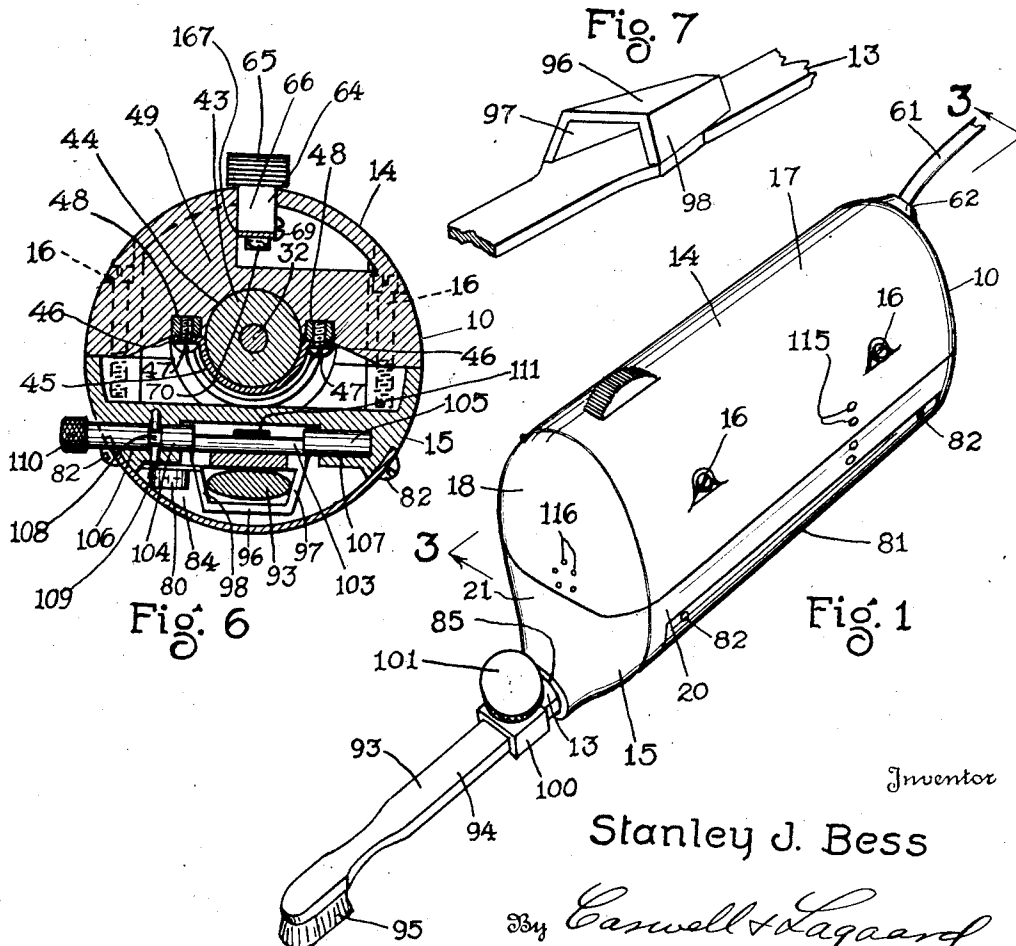
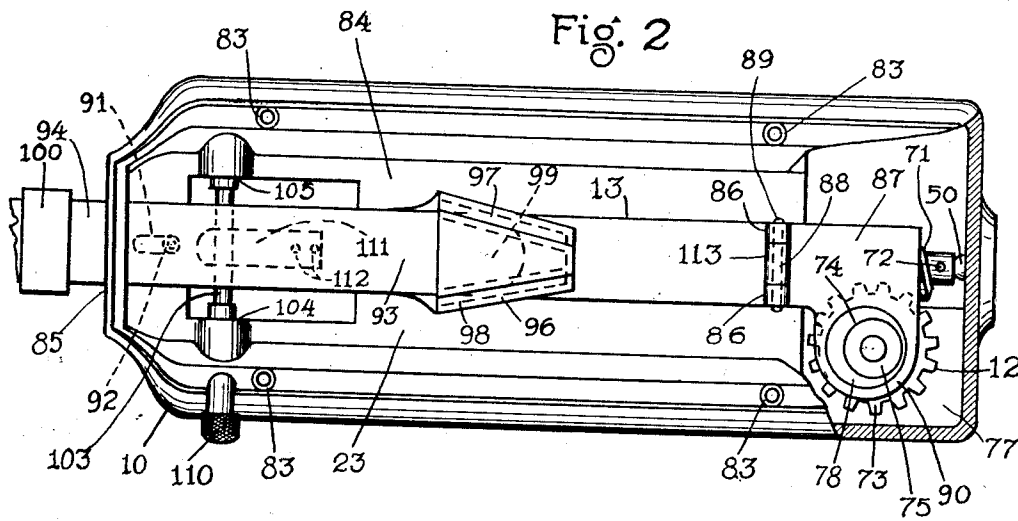
S. J. BESS

2,095,956

MASSAGING DEVICE

Filed July 19, 1933

2 Sheets-Sheet 1



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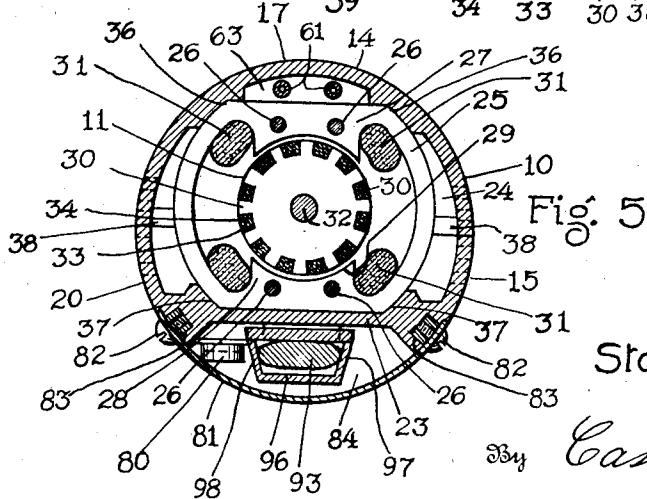
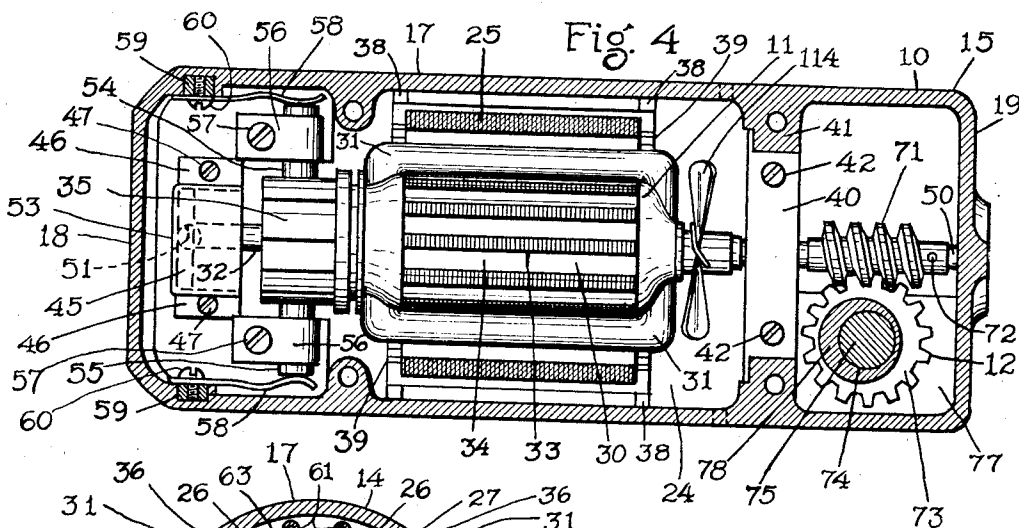
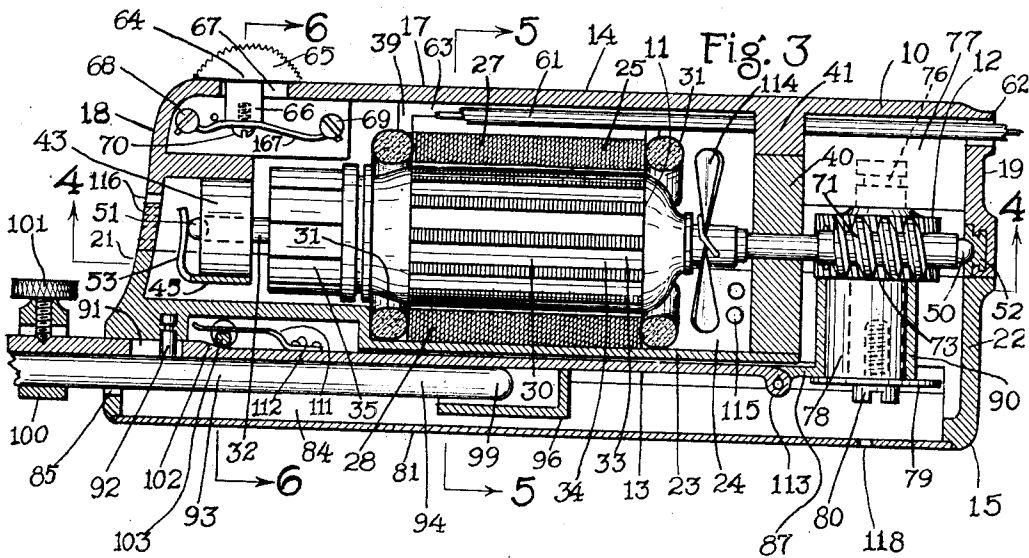
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## UNITED STATES PATENT OFFICE

2,095,956

## MASSAGING DEVICE

Stanley J. Bess, Minneapolis, Minn.

Application July 19, 1933, Serial No. 681,100

12 Claims. (Cl. 128—62)

My invention relates to massaging devices and has for its object to provide a massaging device adapted to be driven by an electric motor.

Another object of the invention resides in providing a massaging device in which the massaging member is caused to move in a circuitous path.

An object of the invention resides in providing a massaging device in which the massaging member is caused to move in a direction at right angles to the plane and path of its circuitous motion.

Another object of the invention resides in providing an arm carrying the massaging member at one end thereof and in providing guide means for the arm intermediate its ends and means for procuring movement of said arm at its other end.

A feature of the invention resides in providing a cylindrical case having a motor therein and in disposing said arm along said motor.

Another object of the invention resides in arranging the guide means at one end of said motor and driving means for operating the arm at the other end of said motor, said driving means being actuated by said motor.

An object of the invention resides in utilizing a crank or eccentric for operating said arm.

A still further object of the invention resides in constructing the arm and case with juxtaposed parts and in providing one of said parts with a slot and the other with a pin extending into said slot for guiding said arm for reciprocating and swinging movement.

An object of the invention resides in constructing said arm with a hinge and in further constructing said arm with a cam adapted to engage a member on the support by means of which said arm is vibrated in a direction at right angles to the path of the circuitous movement of said arm when the arm is reciprocated.

Another object of the invention resides in providing a throw-out device for rendering the vibrating mechanism of the invention inoperative at will.

A feature of the invention resides in providing a holder by means of which an ordinary tooth brush may be secured to the arm of the invention.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is a perspective view of a massaging device illustrating an embodiment of my invention.

Fig. 2 is an inverted plan view of a part of the

structure shown in Fig. 1 with the cover removed.

Fig. 3 is a longitudinal sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is an inverted elevational sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a cross sectional view taken on line 5—5 of Fig. 3.

Fig. 6 is a cross sectional view taken on line 6—6 of Fig. 3.

Fig. 7 is a fragmentary perspective view of a portion of the brush holder.

My invention proper comprises a case 10 which has mounted in it a motor 11. Motor 11 drives a suitable transmission 12 by means of which rotary motion from the motor is converted into combined rotary and reciprocating movement. An arm 13 to which the massaging device proper is attached is operated by the transmission 12 and functions in a manner to give the massaging device the desired movement. These various parts will now be described in detail.

The case 11 is preferably constructed of bakelite or some other similar phenol formaldehyde product and consists of two parts 14 and 15. These parts are semi-cylindrical in form, being adapted to be secured together to form a cylindrical structure through suitable screws 16 which pass through the part 14 and are threaded into the part 15. The part 14 is constructed with a semi-cylindrical wall 17 and end walls 18 and 19. The part 15 is similarly constructed with a semi-cylindrical wall 20 and end walls 21 and 22. Across the cylindrical wall 20 is provided a partition 23 which together with the other walls of the two parts of the case, forms a chamber 24 within the case in which the motor 11 is disposed. The various elements of the invention are held in position within the case 10 through suitable bosses and supports which will be described in detail in conjunction with the description of said elements.

The construction of the motor 11 is best illustrated in Figs. 3, 4 and 5. This motor consists of a field core 25 constructed of laminations and held together through four longitudinally extending rods 26 which may be riveted over the end laminations. The field core 25 is constructed to provide two pole pieces 27 and 28 and is bored as indicated at 29 to receive the armature 30 which is disposed between the two pole pieces 27 and 28. Field coils 31 extend about the pole pieces 27 and provide suitable flux for procuring rotation of the armature 30. Armature 30 is preferably constructed laminated, the same as the field 25, which laminations are mounted upon a shaft 32.

The armature 30 is provided with slots 33 in which suitable windings 34 may be placed. These windings are connected to a commutator 35, Fig. 3, which is mounted upon the shaft 32.

5 The field core 25 is supported between the two parts 14 and 15 of case 10, as best shown in Fig. 5. For this purpose, grooves 36 and 37 are formed in the walls 17 and 23 respectively of the two parts 14 and 15. These grooves serve to hold 10 the said field coil in place. In addition, lugs 38 on the wall 17 in proximity to the diametrical edge thereof further engage the field core 25 and assist in centering and supporting the same. Field core 25 is held from endwise movement 15 through beads 39 which are formed on the inner surfaces of the walls 17 and 23 of the case in proximity to the grooves 36 and 37.

The shaft 32 is journaled at one end in a bearing 40 which consists of a block of metal screwed 20 to a bridge portion 41 formed on the wall 17 of part 14 of the case 10. For this purpose two screws 42 are employed which extend through the bearing and are tapped into the bridge 41 or into suitable inserts secured thereto, but not illustrated. Shaft 32 is journaled at its other end in 25 a bearing 43 which is clamped in position in a socket 44 formed in a member 49 formed on wall 17 of part 14 of case 10. For this purpose a cap 45 is employed. Cap 45 is constructed with ears 30 46 which extend outwardly therefrom and through which screws 47 may pass, which screws are threaded into inserts 48 set into the member 49 in which the socket 44 is constructed. By means of this construction, the bearing 43 is 35 firmly held in position.

To prevent longitudinal movement of the shaft 32, two ball bearings 50 and 51 are employed which are seated in sockets formed in the ends of the said shaft. The ball bearing 50 is seated 40 against an end thrust bearing 52 set into the wall 19 of part 14 of case 10 while the ball bearing 51 is seated against a finger 53 formed on the cap 45. This finger and cap are preferably constructed of resilient material so that the finger 45 53 urges the ball against the end of the shaft 32 and prevents longitudinal movement thereof.

For the purpose of energizing the motor, two brushes 54 and 55 are employed which are mounted in brush holders 56 attached to member 49 of 50 the case 10 through screws 57. These brushes are yieldingly held in contact with the commutator 35 through leaf springs 58 which are secured to bushings 59 set into the wall 17 and attached to said bushings through screws 60. A suitable 55 cable or twin electrical conductor 61 is employed which passes through an opening 62 in the rear wall 19 of the case and which extends through the bridge 41 and follows along a space 63 formed between the field core 25 and said wall 17. The 60 branches of the conductor 61 are connected to the brushes 54 and 55 and to the field coils 31 and are also connected to a suitable switch 64 by means of which the motor may be turned off or on.

The switch 64 comprises a finger piece 65 dis- 65 posed upon the exterior of the case and is constructed with a lug 66 extending into the interior of the case through a slot 67 along which the said lug is movable. Lug 66 carries a spring connector bar 167 which is adapted to contact with two 70 contacts 68 and 69 secured to the member 49 of the case. The bar 167 is secured to the lug 66 through a screw 70. When the finger piece 65 is in the position shown in Fig. 3, the circuit through the two contacts 68—69 is completed and the 75 motor is energized. When the finger piece 65 is

moved toward the right, the contactor bar 167 is disengaged from the contact 68 and the circuit broken.

The motor 11 is maintained at the proper temperature through a fan 114 which is attached to the shaft 32. This fan draws air through openings 115 in the walls 17 of part 14 of case 10 and discharges the same through other openings 116 in the end wall 17 of the said part of the case. The air in this manner flows through the field and armature of the motor and over the commutator thereof and is discharged at the forward end of the case.

The transmission mechanism 12 by means of which the brushes on the massaging device of the invention are manipulated is best shown in Figs. 2, 3 and 4. Upon the end of the shaft 32 adjacent bearing 40 and between said bearing and the end wall 19 of the case is provided a worm 71. This worm is attached to the end of the shaft 32 in any suitable manner as by a pin 72. Worm 71 meshes with a worm gear 73 which is provided with a centrally disposed bore 74. The worm gear 73 is journaled on a stub shaft 75 which fits within the bore 74 and which is imbedded at one end as indicated at 76 in Fig. 3 in a block 77 cast integral with the part 14 of case 10. The worm gear 73 has formed integral with it an eccentric 78 which projects outwardly therefrom, as best shown in Fig. 3. A washer 79 overlies the end of 30 the stub shaft 75 and is attached to said shaft through a machine screw 80. This washer and screw hold the eccentric and gear in proper position on the stub shaft so that the worm 71 properly meshes with the worm gear 73 and drives 35 said eccentric.

The part 15 of case 10 having the partition 23 is covered through a cover plate 81 which is attached to the wall 20 of the case through screws 82 threaded into inserts 83 set in the walls of 40 the case. This cover forms in conjunction with the partition 23 a compartment 84 within the case disposed on the opposite side of the partition 23 from the compartment 24 in which the motor 11 is disposed. The arm 13 carrying the 45 massaging element of the invention is disposed within the compartment 84 and extends outwardly through a slot 85 formed in the end wall 21 of the part 15 of case 10. The arm 13 is hingedly connected by means of a hinge 113 to 50 a member 87 through which motion is imparted to said arm. This hinge is constructed as follows: Arm 13 is formed at its inner end with spaced hinge leaves 86. The member 87 is constructed with a hinge leaf 88 which fits be- 55 tween the leaves 86. A pin 89 passes jointly through all of said leaves and hingedly connects the arm 13 to the member 87. Member 87 has formed on it an eccentric strap 90 which fits over the eccentric 78. The washer 79 and 60 screw 80 serve to hold the eccentric strap in position upon the eccentric as best shown in Fig. 3. By means of this construction the member 87 is given a reciprocating and rotary movement as the worm gear 73 turns. 65

In the use of the invention, it frequently occurs that water or other preparation used on the brush of the massaging device follows along the brush and drains into the compartment 84 of the case 10. For this purpose the partition 70 23 is employed which forms the separate compartment 84 and in which the brush holder and arm are disposed. This compartment is readily accessible by removal of the cover 81 so that the entire brush holder and arm may be cleaned 75

whenever necessary. This cover is constructed with openings 118 through which liquids entering this compartment may drain out of the device.

For the purpose of guiding the arm 13 for movement, the same is constructed near its outer end with a longitudinally extending slot 91. A pin 92 set into the partition 23 is received within the slot 91. As the eccentric 78 rotates arm 13 is given a reciprocating and oscillatory movement through the action of the pin 92 and slot 91 which movement is utilized to impart a similar motion to the massaging member carried by the arm.

In order to illustrate the method of attaching the massaging member to the arm 13, an ordinary tooth brush 93 has been shown as applied to the same. This tooth brush comprises a handle 94 having bristles 95 at the outer end thereof. For securing the tooth brush in place, a socketed member 96 is employed which is attached to the arm 13 intermediate the ends thereof and disposed within the compartment 84. This socketed member has two converging walls 97 and 98 which in addition to converging, also incline with respect to one another. When the end 99 of the tooth brush is inserted into this socketed member the said member serves to center the tooth brush with respect to the arm 13 and to draw the same securely against the back of the arm as shown in Fig. 3.

In addition to the socketed member 96 for holding the tooth brush in place a clamp 100 is employed. This clamp fits about the end of the arm 13 holding the tooth brush and is provided with a set screw 101 which fits against the said arm and serves to draw the clamp against the tooth brush and to hold the brush firmly attached to the arm.

In the operation of the device, the eccentric 78 gives the member 87 a circuitous movement and at the same time reciprocates the same, causing the arm 13 to simultaneously reciprocate and oscillate. The bristles 95 at the end of the brush 93 are hence caused to take the same path of movement as the said member 87. This causes the bristles to travel in a circuitous path, the radius of which can be controlled through the selection of an eccentric having proper eccentricity and the disposition of the pin 92 with respect to the brush and the eccentric.

In addition to imparting to the massaging device movement in a circuitous path, it is also desirable to give it a vibratory movement in a direction at right angles to the plane of the said path. This is accomplished through the action of a cam 102 formed on the arm 13 near the end thereof. For this purpose the said arm is thickened at the locality in which the slot 91 is disposed and subsequently reduced in thickness as illustrated. Cooperating with the cam 102 is a crank 103 which is formed with two bearings 104 and 105 journaled in suitable sockets 106 and 107 formed in parts of the partition 23. The bearing 104 is constructed with a groove 108. A pin 109 is seated in this groove and is attached to the partition 23 and serves to hold the said crank in position. A knurled head 110 on the end of the crank 103 permits of rotating said crank from its position in Fig. 3 to a position in which the said crank is disposed 180 degrees from said position. A leaf spring 111 is attached to the arm 13 through rivets 112 and is adapted to engage the crank 103 on the side thereof opposite the cam 102. This spring serves

to hold the said crank in engagement with cam 102. When the parts are disposed as shown in Fig. 3, movement of the arm 13 toward the right through the action of the eccentric 78 causes the cam 102 to ride along crank 103 and to move the said arm about the hinge 113 outwardly from the partition 23. Movement of arm 13 in the opposite direction brings about movement of said arm back toward partition 23 through the action of spring 111. In this manner the arm 13 is vibrated in the direction of the length of the bristles 95 and at the same time the bristles caused to travel in a circuitous path. When the brush 93 is dipped in a suitable dental preparation and applied to the mouth and particularly to the teeth, the bristles 95 travel in a circuitous path and engage the gums at the locality thereof adjoining the teeth. This causes massaging of the gums and the stimulation of the flow of blood therein which is highly effective in curing pyorrhea and other gum diseases.

When the crank 103 is turned to a position exactly 180 degrees from that shown in Fig. 3, the said crank is held free from the cam 102. Movement of the arm 13 through the eccentric 78 is in such case purely confined to a single plane. By adjusting the crank 103 through the knob 110 any degree of vibration can be procured.

Although I have referred to my invention as useful for the purpose of massaging the gums and cleaning teeth, the same can be used for massaging muscles or for any other similar purpose. Other massaging elements may be used instead of the conventional tooth brush, such as a friction pad or a rubber toothed head.

In manipulating my improved massaging device and particularly when used for massaging the gums, the same is grasped through the case 10 which serves as a handle. When so disposed, the forefinger is in close proximity to the switch 64 by means of which said switch may be manipulated to operate the device. The brush 93 is covered with paste or some other dental preparation and placed in the mouth and upon the teeth. The current is then turned on through the switch 64 which procures a circuitous movement of the brush. As the brush is so driven, cleansing of the teeth and massaging of the gums is procured. If desired the brush may be directly applied to the gums or to any other parts of the body to which the desired massaging effect is to be given. When combined rotary and vibratory movement is utilized more vigorous action is produced.

My invention is highly advantageous in that an extremely simple and convenient device is provided whereby massaging of the gums or other parts of the body may be effectively procured. Through the action of the rotary movement of the massaging element, results are procured and particularly in conjunction with the gums which could not be procured with merely rectilinear reciprocatory movement. By means of the gearing employed, a high speed motor may be utilized and the massaging device still caused to travel at the desired speed. Due to the particular construction of the case utilizing the partition, any water or foreign matter following along the brush may be discharged from the case without entering the transmission mechanism thereof. With my invention any type of massaging device can be utilized and an ordinary tooth brush quickly and securely attached to the movable member. By means of the vibratory move-

ment the massaging device is caused to more effectively massage the surface on which it is applied and a greater stimulating effect is procured than would be possible were this feature omitted.

- 5 Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

- 10 1. In a massaging device, a support, an arm, a massaging member carried by said arm, guide means carried by the support and engaging said arm, means carried by the support for moving  
15 the arm, said last named means cooperating with said guide means to procure movement of said massaging member in a plane circuitous path, and other guide means cooperating with said  
20 last named means to procure movement of said massaging member in a direction transverse to the plane of said path thereby giving said massaging member movement in three dimensions.

2. In combination, a cylindrical case, an electric motor carried in said case, said motor having a shaft extending outwardly therefrom at one  
25 end, an arm substantially coextensive with said motor and confined within said case, means for guiding said arm for reciprocating and swinging movement, a crank disposed within said case,  
30 transmission mechanism connected to said crank and motor shaft for operating said crank, said crank being pivoted to said arm and functioning to swing and reciprocate said arm.

3. In a massaging device, a support, an arm carried by said support, a massaging member  
35 carried by said arm, said support and arm having juxtaposed parts, one of said parts being provided with a groove and the other with a pin extending into said groove, said pin and groove  
serving to guide said arm for swinging and reciprocating movement, means for swinging and reciprocating said arm, and means for urging  
movement of said arm in the direction of extent  
of said pin.

4. In a massaging device, a support, an arm, a massaging member carried by said arm, guide  
45 means carried by the support and engaging said arm, means carried by the support for moving the arm in one direction, a cam on said arm having a surface angularly disposed with respect to  
50 the direction of movement of said arm, and means on said support for engagement with said cam to move said arm in another direction.

5. In a massaging device, a support, an arm, a massaging member carried by said arm, guide  
55 means carried by the support and engaging said arm, means carried by the support for moving the arm in one direction, a cam on said arm having a surface angularly disposed with respect to  
60 the direction of movement of said arm, a crank having a part engaging said cam, said crank being revoluble to throw said part out of the path of movement of said cam to cause the arm to  
travel freely or to bring said part into engagement with said cam to cause the same to move  
65 in a direction away from said support.

6. In a massaging device, an elongated case, an arm extending longitudinally of the case within  
70 the same and projecting from one end thereof, means carried by said case for engagement with the arm intermediate the ends thereof, said means guiding the arm for lateral swinging movement and for reciprocating movement in

the direction of the length of the case, said reciprocating and swinging movement being confined to a plane, means for causing the free end of the arm to move in a direction at an angle with respect to said plane, means for holding a massaging device attached to the free end of said arm and driving means connected to the inner end of the arm.

7. In a massaging device, an elongated case, an arm extending longitudinally of the case within the same and projecting from one end thereof, said arm and case having juxtaposed parts, one of said parts having a longitudinally extending groove and the other having a trunnion projecting therefrom and disposed within said groove  
15 whereby said arm may have swinging and reciprocating movement, driving means carried by said case and connected with the inner end of said arm for reciprocating and swinging said arm, and means for holding a massaging device attached to the free end of the arm.

8. In a massaging device, a support, an arm, a guide for guiding said arm for reciprocating movement, hinge means for guiding said arm for swinging movement about one axis, other hinge  
25 means for guiding said arm for movement about another axis, and means for reciprocating said arm.

9. In a massaging device, a support, an arm, a guide for guiding said arm for reciprocating  
30 movement, hinge means for guiding said arm for swinging movement about one axis, other hinge means for guiding said arm for movement about another axis, the axes of said hinge means being at right angles to one another and means  
35 for reciprocating said arm.

10. In combination, a cylindrical case, an electric motor carried in said case, said motor having a shaft extending outwardly therefrom at one end, an arm extending along said motor and confined within said case, a crank disposed within said case at the shaft end of the motor, means  
40 for operating the crank from the projecting portion of the motor shaft, a guide within said case, said guide being disposed at the other end of the motor and engaging said arm, said arm extending outwardly from the case at the end thereof having the guide and a massaging device at the free end of the arm.

11. In a massaging device, a support, an elongated arm, guide means acting between said support and arm for guiding said arm for longitudinal and swinging movement, means engaging said guide means at a locality spaced from said arm and imparting to said arm at such  
55 locality a complete circular motion confined to a plane containing said arm, and a massaging device carried by the arm and traveling over the entire extent of a complete circuitous course.

12. In a massaging device, a support, an elongated arm, guide means acting between said support and arm for guiding said arm for longitudinal and swinging movement, a shaft having its axis disposed transversely of said arm, a circular bearing in said arm, a crank rotated by said shaft and directly journaled in said bearing and imparting a complete rotary movement to the portion of the arm having said bearing, and a massaging device carried by said arm and traveling over the entire extent of a complete  
65 circuitous course.

STANLEY J. BESS.

## CERTIFICATE OF CORRECTION.

Patent No. 2,095,956.

October 19, 1937.

STANLEY J. BESS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, second column, line 54, claim 11, for the words "guide means" read arm; and line 55, same claim, for "arm" first occurrence, read guide means; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of March, A. D. 1938.

(Seal)

Henry Van Arsdale,  
Acting Commissioner of Patents.

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