

[54] **WATERPROOF BATTERY OPERATED VIBRATOR**[75] Inventors: **Lester M. Cutler**, Roslyn Heights;
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of N.Y.[73] Assignee: **Vibra-Spa Products, Inc.**, Roslyn,
N.Y.[22] Filed: **June 29, 1972**[21] Appl. No.: **267,578**[52] U.S. Cl. **128/36**[51] Int. Cl. **A61h 1/00**

[58] Field of Search 128/34-36, 24.1, 24.2

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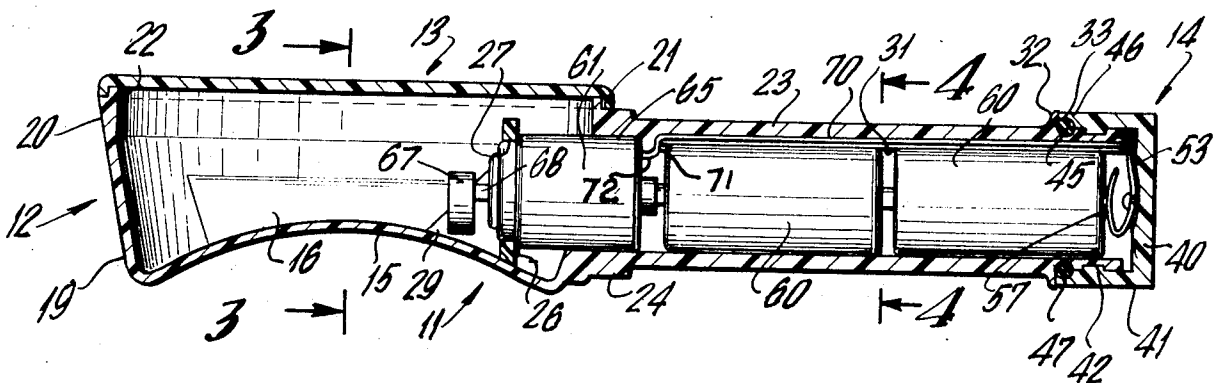
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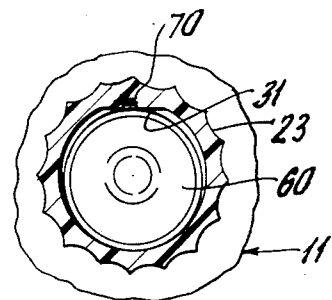
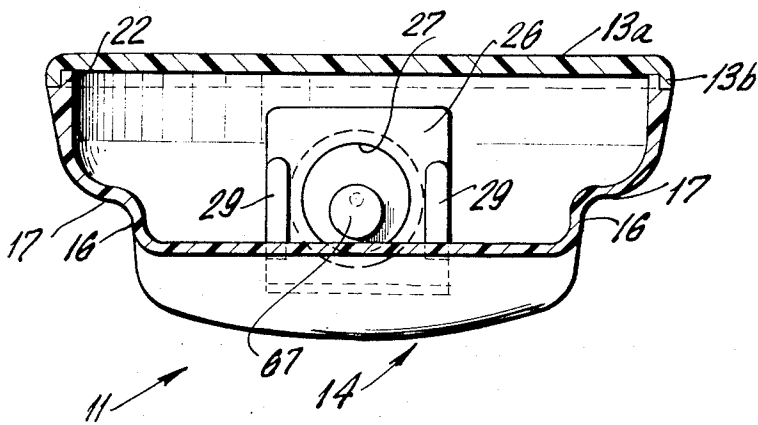
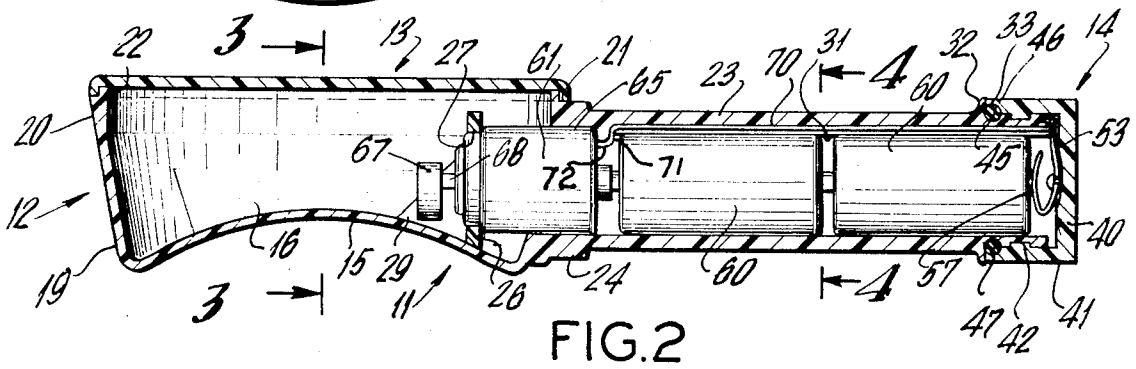
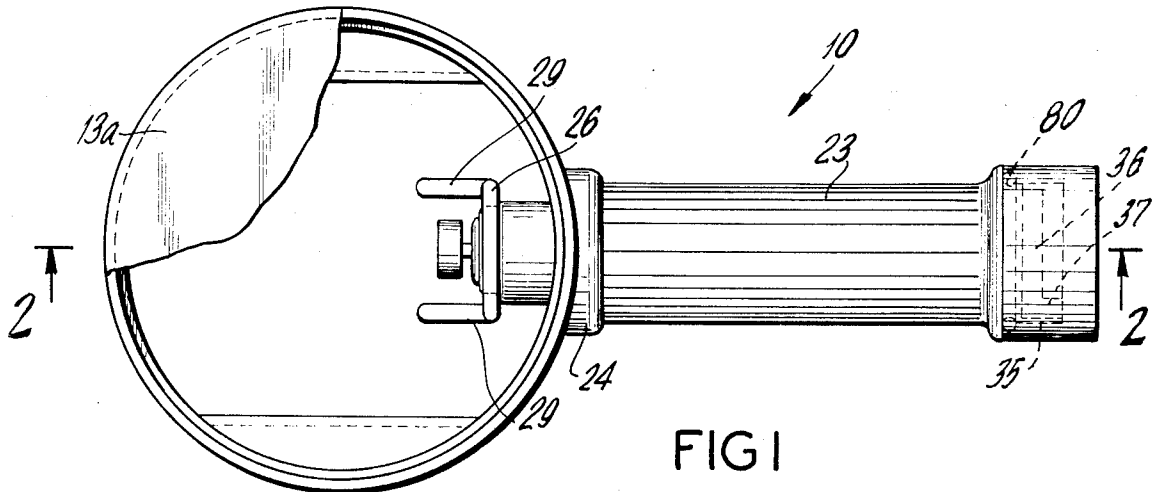
Primary Examiner—Lawrence W. Trapp

Attorney—Marvin Feldman et al.

[57] **ABSTRACT**

The casing of this vibrator comprises three molded parts. The first molded part comprises a head having a bottom wall from which an annular side wall extends upwardly. An integral sleeve handle extends from the side wall at right angles to the axis of the bottom wall. The second molded part comprises a top cover fitted on the side wall and having a heat-sealed watertight connection therewith. The third molded part comprises a cap which has a bayonet, removable, rotary connection to the outer end of the sleeve. An electric motor in the sleeve projects into the interior of the head. An integral flange or wall extends up from the bottom wall and is formed with a hole into which the forward end of the motor projects for support. Dry batteries back up the motor in tandem, within said sleeve handle. The cap carries a switch for ON and OFF connection of the rearmost battery in circuit with a connector to the motor, upon turning the cap. An eccentric weight is fixed to the central motor shaft to vibrate the casing. An O-ring on the cap presses against an annular shoulder on the rear end of the sleeve to render the capped end of the sleeve watertight.

24 Claims, 8 Drawing Figures



SHEET 2 OF 2

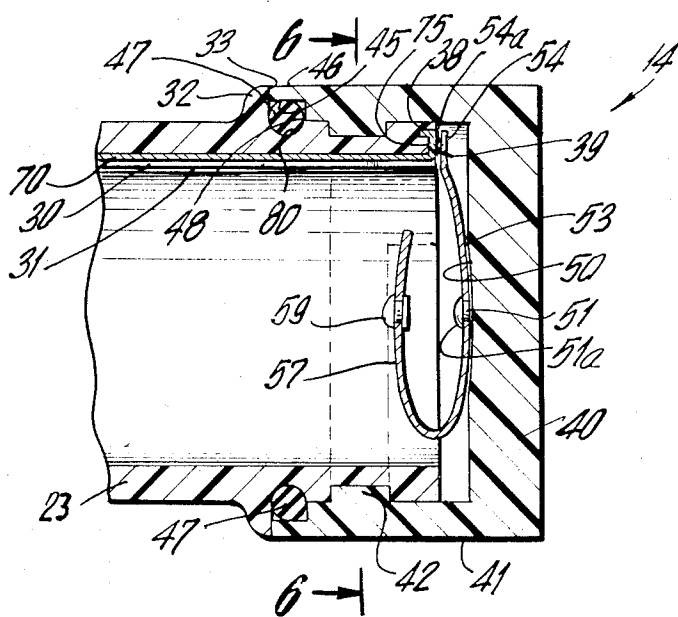


FIG. 5

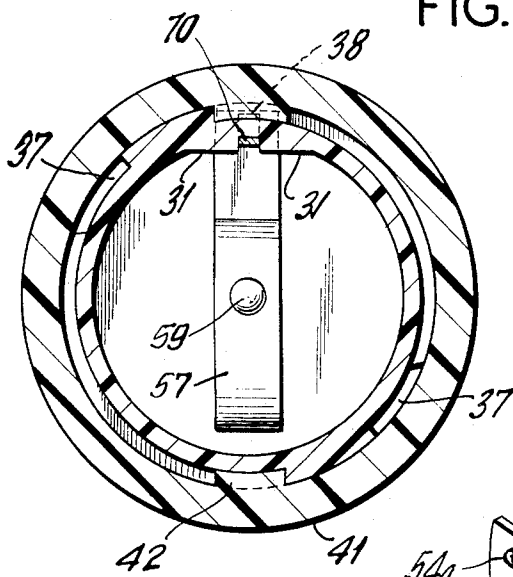


FIG. 6

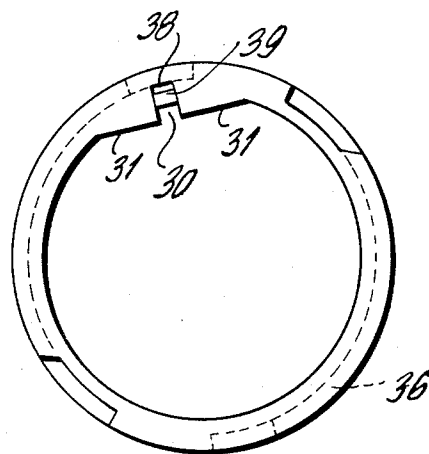


FIG. 7

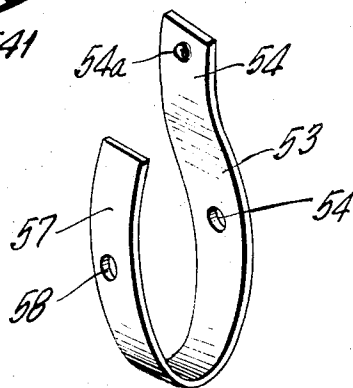


FIG. 8

WATERPROOF BATTERY OPERATED VIBRATOR

This invention relates to vibrators.

One object of this invention is to generally improve the construction disclosed in our copending application Ser. No. 162,976 filed July 15, 1971.

Another object of this invention is to provide a vibrator of the character described in which the bottom wall and side wall of the head, and the sleeve are made as a single molding, which molding also includes an integral wall extending up from the bottom wall and formed with an opening into which the front end of the motor projects, for support.

Yet another object of this invention is to provide a vibrator of the character described provided with a simplified switch to control the circuit for the motor, upon rotating the cap.

Still another object of this invention is to provide a strong, rugged and durable vibrator of the character described which shall be watertight, relatively inexpensive to manufacture, easy to assemble, and which shall yet be practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

This invention accordingly consists in the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of the invention will be indicated in the following claims.

FIG. 1 is a top plan view of a vibrator embodying the invention, with part of the top wall broken away;

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view taken on line 4—4 of FIG. 2;

FIG. 5 is an enlarged view of the rear end of the handle and cap shown in FIG. 2;

FIG. 6 is a cross-sectional view taken on line 6—6 of FIG. 5;

FIG. 7 is a rear end view of the sleeve, with the cap removed, and

FIG. 8 is a perspective view of the spring switch.

Referring now in detail to the drawing, 10 designates a vibrator embodying the invention. Said vibrator comprises a casing 11 composed of three separately molded parts 12, 13, 14. Molded part 12 comprises a bottom wall 14 having an upwardly and inwardly curved part-cylindrical wall portion 15 from which substantially vertical parallel end walls 16 extend upwardly, forming horizontal under-shoulders 17. Extending up from said bottom wall 15, and shoulders 17 and interconnecting the ends of said walls 16, is an upwardly and outwardly tapering side wall 19 merging with a substantially cylindrical upper side wall portion 20. At the upper end of wall 20 is an outer annular shoulder 21 and an upstanding reduced annular flange 22 surrounding said shoulder.

Integrally formed with side wall 19, 20, is an integral outwardly extending tubular radial sleeve handle 23. An annular thickened boss 24 is located at the junction of sleeve 23 with side wall 19, 20 for strength. The flange 22 is located at a level just above the level of boss 24. A vertical transverse wall 26 projects upwardly from wall 15 and is located between the axis of said bottom wall 14 and the boss 24. Said wall 26 has a cir-

cular opening 27 for the purpose hereinafter appearing. At the ends of wall 26 are forwardly extending webs 29 of triangular shape interconnecting said wall 26 with the bottom wall.

Vertical planes perpendicular to the axis of sleeve 23 cut wall 15 in straight parallel lines. Said bottom wall portion 15 thus fits the arms or legs of the user, to render massaging or vibration of the body comfortable and assuring smooth movement of the vibrator over the body.

The inside of sleeve 23 is formed with a longitudinal top groove 30 for the purpose hereinafter explained. Said sleeve also has a pair of aligned inner flat surfaces 31 on opposite sides of the groove 30. The flat surfaces 31 are in a plane tangent to a circle of less radius than the radius of the cylindrical surface of the sleeve. Said sleeve 23 also has an outwardly extending annular ridge 32 spaced inwardly of the outer end thereof. Said ridge 32 has an outer annular surface 33 in a vertical plane perpendicular to the axis of sleeve 23. The outer surface of said sleeve, longitudinally outwardly of said ridge 32, has in its outer surface, a pair of similar bayonet slots 35. Each slot 35 has a part circular portion 36, spaced from ridge 32, and a longitudinal portion 37 extending from one end of slot portion 36 to the outer end of the sleeve.

The outer end of the sleeve has a blind indentation 38 spaced rigidly outwardly somewhat from groove 30. Grooves 30, 38 are interconnected by a recessed groove 39 at the rear end of the sleeve.

Rotatably and removably fitted on the outer end of the sleeve 23 is the cap 14. Said cap 14 has a circular back wall 40 from which there extends forwardly a cylindrical wall or flange 41 which fits onto the rear end of sleeve 23. Said cylindrical wall 41 is formed with a pair of diametrically opposed radially inwardly extending lugs 42 which can slide longitudinally into bayonet slot portions 37 and then rotatably into bayonet slot portions 36. At the ends of cylindrical wall 41 of the cap is an annular groove 45 forming a reduced flange 46, to accommodate an O-ring 47 which abuts the vertical annular shoulder a surface 33 of ridge 32 and a vertical annular shoulder 48 on the cap to render the sleeve watertight and yet allow the cap to turn. The circular portions 36 of the bayonet slots are less than 180° in angular extent. When the lugs 42 reach the ends of slots 36 remote from slots 37, the cap stops rotating in one direction, and can then only be rotated back in an opposite direction.

At the center of the inner surface of wall 40 of cap 14 is a shallow diametric longitudinally curved groove 50. An integral axial pin 51 extends from wall 40 at the middle of groove 50. A switch member 52 is attached to the cap. Said switch member 52 is made of a strip of resilient hardened spring steel or other conductive metal. Said strip maybe nickel plates and comprises a rear diametric portion 53 fitted into shallow groove 50, and formed with a center hole 54 through which the center pin 51 projects. The forward end of the pin is swaged or headed or riveted as at 51a, onto the front side of switch portion 53 to hold the switch fast against the cap and to prevent turning of switch relative to the cap. The outer end 54 of switch portion 53 contracts the rear circular edge of the sleeve. Extending from the opposite end of switch portion 53 is a bent back portion 57 having a hole 58 centered with respect to the axis

of sleeve 23. A battery contact 59 projects through hole 58 and is riveted to the bent back arm 57.

In the sleeve 23 are a pair of dry batteries 60 in tandem and behind an electric battery operated motor 61.

Battery contact 59 engages the rear end of the casing of the rearmost battery 60. The anode of that battery contacts the rear of the casing of the front battery 60. The anode of the front battery contacts are terminal of the motor 61. The front end of the motor fits into the hole 27 in wall 26. A sleeve or coating 65 of plastic or rubber may cover the outer surface of motor tightly in the sleeve against turning. An eccentric weight 67 fixed on the motor shaft 68 will vibrate the casing when the motor is energized in the manner hereinafter appearing.

A conductor connector strip 70 fitted in groove 30 has as its forward end, an offset portion 71 from which a longitudinal end portion 72 extends into contact with an opposite terminal of the motor. The forward end of contact strip 70 is bent back as at 75 into recess 39 and around the rear end edge of sleeve 23 at said recess, and is inserted into blind groove 38.

A bump 45a on the front side of spring end 54 contacts the portion 75 of the connector to close the circuit.

Upon rotating the cap in one direction until stop lugs 42 reach the ends of slots portions 36, bump 54a on spring end 54 will contact bent back portion 75 of the conductor strip 70 to complete the circuit through the motor to energize the latter and operate the vibrator. To stop the motor, the cap is merely rotated in an opposite direction to open the circuit. To remove the cap, said cap need only be turned until the lugs 42 reach the opposite ends of slots 36 to allow the cap to be pulled through slots 37 and off the sleeve, rearwardly.

The outer surface of sleeve 23 just rearwardly of ridge 32 has a curved recessed groove 80 to accommodate the inner periphery of the O-ring and to seat the O-ring in the groove and between surfaces 33, 48.

The cover 13 has a circular flat wall 13a from which a peripheral flange 13b fits onto flange 22 and sits on shoulder 21. Flange 13b is preferably heat-sealed to flange 22 to render the casing watertight. The internal diameter of the head of the casing is about four times the internal diameter of the sleeve 23. The height of the head at its center, from the bottom wall 14 to the underside of the corner wall 13a is somewhat greater than the inner diameter of said sleeve 23. The vibrator is floatable in water so that it can float in a bath tub. The vibrator can be used safely in a bath tub because it is watertight.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative.

We claim:

1. A vibrator comprising a casing, said casing comprising a one piece molded member having an enlarged head and a sleeve integrally formed with said head and extending outwardly from said head, said head being open at one end, a cover closing the open end of said

head and having a watertight connection to said head, a cap rotatably and removably mounted on the outer end of said sleeve, means to provide a watertight connection between said cap and said sleeve, an electric motor in said sleeve and projecting into said head, batteries in tandem in said sleeve and behind said motor, means to connect said motor and batteries in series circuit, said means including switch means on said cap to close said circuit, and a weighted means in said head, eccentrically mounted on the rotary shaft of said motor.

2. The combination of claim 1, said one piece molded member comprising a transverse wall perpendicular to the axis of said sleeve, said wall having means to support the front end of said motor.

3. The combination of claim 1, and a layer on the outside of said motor to hold the motor tight in said sleeve.

4. The combination of claim 1, said switch comprising a portion formed with a hole, a pin on said cap passing through said hole and having a head contacting said portion.

5. The combination of claim 4, said cap having a radial groove to partially receive said portion of said switch.

6. The combination of claim 1, said switch comprising a portion fixed to the interior of said cap, and a bent back portion contacting the casing of the rearmost battery, said means to connect said motor and batteries in series circuit, comprising a connector connected at one end to a terminal of the motor, said switch having a means to resiliently contact said connector upon rotating said cap on said sleeve.

7. The combination of claim 1, said cover being heat-sealed to said head to provide said watertight connection between said head and cover.

8. The combination of claim 1, said means to connect said motor and batteries in series circuit including a connector of conductive material connected at one end to a terminal of said motor, said switch means being movable into contact with the opposite end of said connector, said sleeve having a longitudinal groove in the inner surface thereof, said connector being disposed in said longitudinal groove, and said sleeve having flat surfaces on opposite sides of said longitudinal groove and extending to an inner cylindrical surface said flat surfaces lying in a plane tangent to a circle of less radius than the radius of the cylindrical inner surface of the sleeve which interconnects the outer limits of said flat surfaces.

9. The combination of claim 8, said sleeve being formed at the outer end thereof with an indentation disposed between said longitudinal groove and the outer surface of said sleeve and spaced from said groove, said outer end of said connector having a portion bent around the portion of said sleeve between the rear end of said longitudinal groove and said indentation and projecting into said indentation.

10. The combination of claim 9, said switch comprising a spring strip having a portion attached to the inner wall of the cap by material integral with the molded cap, said portion of said spring strip having a spring end adapted to contact said bent back portion of said connector, and said strip having a bent back spring arm contacting the rear end of the rearmost battery.

11. The combination of claim 10, said portion of said spring strip being received in a groove at the inside of

said cap to prevent turning of the spring strip relative to said cap.

12. A watertight battery operated vibrator comprising an enlarged hollow head, a handle sleeve extending from said head, and communicating with the interior of said head, an electric motor in said sleeve provided with an axial drive shaft, and projecting into said head, battery means in said sleeve in tandem with and behind said motor, a cap rotatably mounted on the outer end of said sleeve, means to connect said battery means in series circuit with said motor and switch means on said cap to control said circuit upon rotating said cap, and an eccentric weighted means fixed on the motor shaft, said head having a top wall, a bottom wall and a side wall, the top wall of said head comprising a cover on said side wall, said cover having an air-tight connection to said side wall.

13. The combination of claim 12, said vibrator being of weight and volume to be floatable in water.

14. The combination of claim 12, and means within said head to support the end of said motor which projects into said head.

15. A watertight battery operated vibrator comprising an enlarged hollow head, a handle sleeve extending from said head, and communicating with the interior of said head, an electric motor in said sleeve provided with an axial drive shaft, and projecting into said head, battery means in said sleeve in tandem with and behind said motor, a cap rotatably mounted on the outer end of said sleeve, means to connect said battery means in series circuit with said motor, and switch means on said cap to control said circuit upon rotating said cap, and an eccentric weighted means fixed on the motor shaft, said head having an inwardly curved surface to fit an arm or leg of the user.

16. The combination of claim 15, said surface extending transversely of said sleeve.

17. The combination of claim 12, and an O-ring between said cap and sleeve to render the sleeve watertight.

18. The combination of claim 12, said sleeve having

a watertight connection to said head.

19. The combination of claim 12, said cap having a bayonet connection to the rear end of said sleeve.

20. A watertight battery operated vibrator comprising an enlarged hollow head, a handle sleeve extending from said head, and communicating with the interior of said head, an electric motor in said sleeve provided with an axial drive shaft, and projecting into said head, battery means in said sleeve in tandem with and behind said motor, a cap rotatably mounted on the outer end of said sleeve, means to connect said battery means in series circuit with said motor, and switch means on said cap to control said circuit upon rotating said cap, and an eccentric weighted means fixed on the motor shaft, said head being annular, said sleeve extending radially of said head.

21. A watertight battery operated vibrator comprising an enlarged hollow head, a handle sleeve extending from said head, and communicating with the interior of said head, an electric motor in said sleeve provided with an axial drive shaft, and projecting into said head, battery means in said sleeve in tandem with and behind said motor, a cap rotatably mounted on the outer end of said sleeve, means to connect said battery means in series circuit with said motor, and switch means on said cap to control said circuit upon rotating said cap, and an eccentric weighted means fixed on the motor shaft, said head being circular and the axis of said sleeve being at right angles to the axis of said head.

22. The combination of claim 21, said sleeve being of circular cross-section, the diameter of said head being larger than the diameter of said sleeve.

23. The combination of claim 12, said head having a top wall, a bottom wall, and a side wall interconnecting said top and bottom walls, said sleeve extending from said wall.

24. The combination of claim 23, said sleeve being disposed between the levels of said top and bottom walls of said head.

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