

Feb. 6, 1951

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2,540,792

## SKIN STIMULATING AND MASSAGING DEVICE

Filed Jan. 20, 1947

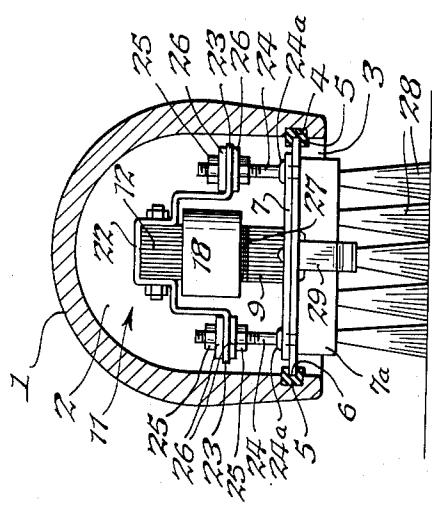
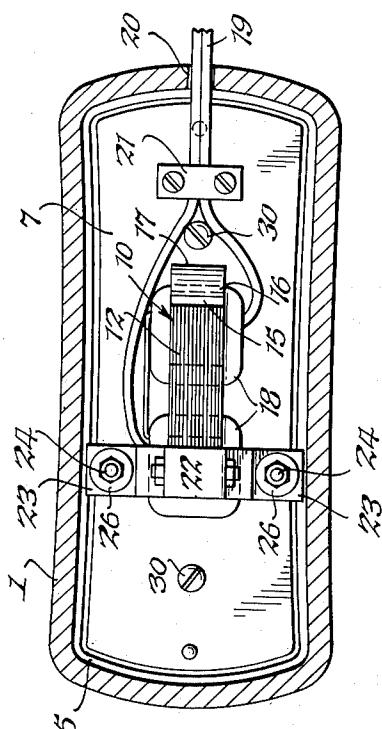
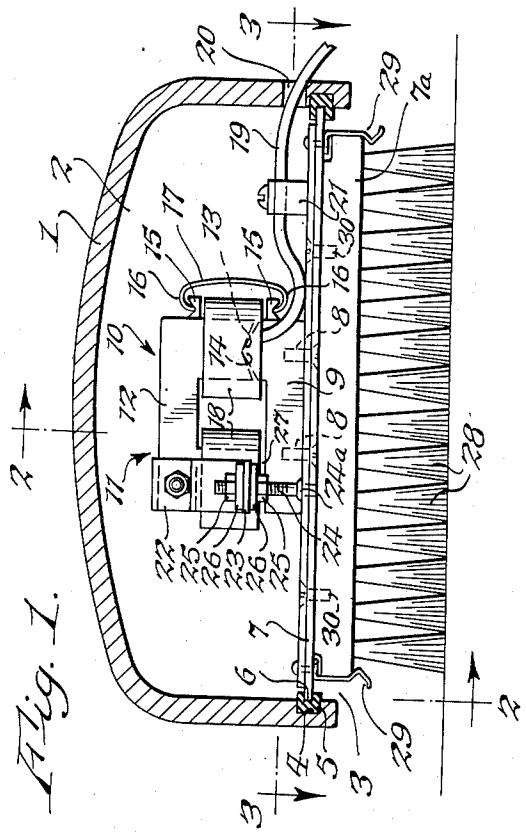


Fig. 3.

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## UNITED STATES PATENT OFFICE

2,540,792

## SKIN STIMULATING AND MASSAGING DEVICE

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Application January 20, 1947, Serial No. 723,133

5 Claims. (Cl. 128—44)

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This invention relates to skin stimulating and massaging devices, and particularly to those which may be held in one's hand and moved in any direction while in operation. Such devices are particularly useful for stimulating and massaging the scalp to aid blood circulation therein. This invention is in the nature of an improvement upon U. S. Patent No. 2,465,250 of March 22, 1949.

An object of the invention is to provide a simple, light, compact and relatively inexpensive device that may be held in one's hand and moved against and over the skin of a person to impart to such skin, stimulating, beneficial and pleasant impulses.

Other objects and advantages will be apparent from the following description of an embodiment of the invention, and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawing:

Fig. 1 is a longitudinal, sectional elevation of a hair brush embodying my invention;

Fig. 2 is a transverse, sectional elevation of the same taken on line 2—2, Fig. 1; and

Fig. 3 is a sectional plan of the base and motor, forming a part of the same and taken on line 3—3, Fig. 1.

In the illustrated embodiment of the invention, the device is shown as a power operated hair brush and includes a hollow housing 1 having a chamber 2 with an open face 3. The inner periphery of the chamber 2, a short distance inwardly from the open face, is provided with a channel 4 opening into chamber 2 and in which is disposed a strip 5 of soft, resilient, compressible material such as soft elastic rubber or sponge rubber. This strip 5 has, on its exposed face, a groove 6 which receives the edge of a plate-like base 7 that extends across and substantially closes said chamber, approximately at its open face. This strip 5 thus floatingly and yieldingly mounts the base 7 for limited movement in and relatively to the housing.

The strip 5 projects into the chamber, and the groove 6 is entirely within the projecting portion, so that the outer wall of the groove may flex or yield under stress to pass the edge of the base 7 into and out of the groove 6. The inner side wall of the channel 4 extends towards the center of the open face 3 further than the bottom of groove 6, to resist movement of base 7 beyond groove 6. The base 7 may be formed of two plates secured together face to face, with the inner plate having less crosswise and lengthwise

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dimensions than the outer plate, so that the edge of the inner plate will approximately abut the edge of one side wall of the cushion strip 5.

Secured upon the exposed face of the inner plate of base 7, such as by screws 8, is one arm 9 of a two piece core 10 of an electromagnet 11. The core 10 is of nearly, but not entirely, a closed, elongated loop, having two generally parallel arms, one of which is arm 9 and the other of which is arm 12. Arm 12 has an angular end terminating in a concave, end face 13, which fits over a corresponding but convex end face 14 on the upstanding end of arm 9, to form therewith a rocking fulcrum between arms 9 and 12, by which the opposite ends of arms 9 and 12 can move toward and from each other. The arms 9 and 12, at opposite sides of the fulcrum, carry projecting hooks 15 over which are engaged the hooked ends 16 of a spring 17. Spring 17 is preferably a steel spring and when engaged over hooks 15 is under stress so as to hold surfaces 13 and 14 in contact and to urge the free end of arm 12 in a direction away from the corresponding end of arm 9.

Surrounding the portions of the core between the arms 9 and 12 are electromagnetic coils 18 that, when energized, set up a magnetic flux through the core that pulls the free end of arm 12 towards the arm 9, stressing spring 17. When the coils 18 are de-energized, or the current therein is decreased or reversed, the spring 17 will rock the arm 12 to carry its free end away from the arm 9. The coils 18 are connected in the same circuit and are both wound to set up a magnetic flux in the same direction through the nearly closed loop path of the core 10. Current is supplied to coils 18 by a twin wire cord 19 leading therefrom and passing through an aperture 20 in the side wall of housing 1 (Fig. 1). The cord 19 may be secured against endwise yanks by a clamp block 21 having separable sections between which the cord passes and by which it is clamped.

A generally U-shaped strap 22 is secured to the upper arm 12 adjacent its free end, and its free ends are flanged laterally in directions away from each other as at 23. These lateral flanges are apertured, and studs 24 screwed into base 7 project therefrom at its inner face and extend loosely through said apertures in flanges 23. Collars 24a on studs 24 engage with base 7 and limit the movement of the studs into the base. Nuts 25 are threaded on each stud at opposite faces of the adjacent flange 23 which that stud passes through. Resilient cushions or washers

26 are disposed on each stud between each nut 25 and the adjacent flange 23. These washers 26 are preferably formed of soft rubber, and they allow limited movement of arm 12 at its free end. The nuts 25 are adjusted along the studs to 5 give a normal air gap 27 (Fig. 2) of desired size.

A backing 1a abuts flat against the outer face of base 7 so as to extend across, and substantially close, said open face 3. Bristles or flexible elements 28 extend from the outer face of backing 1a 10 in generally parallel directions. Spring hook arms 29 secured to the base 7 snap over opposite ends or edges of backing 1a to confine it releasably to base 7. Dowel screws or pins 30 (Fig. 1) project from the outer face of base 7 and enter aligned 15 dowel apertures or recesses in the inner face of backing 1a to locate the latter accurately on base 7 and hold it from sidewise movement thereon.

The backing member 1a, the base 7 and the core 10 are all spaced from the housing 1 so that 20 they may have free limited movement relatively to the housing. When a pulsating current is supplied to coils 18 through twin wire 19, the pulsating current will produce a variable magnetic flux in core 10. This causes an oscillation of 25 the free end of arm 12 on fulcrum formed of surfaces 13 and 14, in opposition to spring 17 and washer cushions 26. This imparts impulses or periodic forces to the base 7 in the directions normal to its face, which is also endwise of the bristles 28. One may grasp the housing 1 and hold it as tightly as desired and press the bristles against the scalp or skin. The impulses passing from base 7 to the bristles will be transmitted to the skin or scalp, and cause a pleasant stimulation or sensation in the skin. These impulses alone, or accompanied by a brushing movement of the bristles over the skin, will give a pleasing 35 sensation to the skull much like a massage with many fingers. These impulses appear to stimulate blood circulation through the skin and produce a healthful skin condition.

While any suitable vibrator motor or electric vibrator may be mounted on the inner face of base 7 in a position to impart impulses to the base 7 in directions normal to its face, the type of motor described and illustrated is an inexpensive but very effective vibrator motor that may be employed successfully on base 7. When the bristles need cleaning, the backing 27 may be 45 detached, cleaned and replaced.

It will be understood that various changes in the details, materials and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention may be made by those skilled in the art within the principle and scope of the invention, as expressed in the appended claims.

I claim:

1. A skin stimulating device comprising a hollow housing which may be held and manipulated, and having an opening in a face thereof, a relatively rigid member within said housing exposed through said opening and free of direct contact with said housing, soft, resilient cushioning means interposed between said member and said housing and resiliently and floatingly mounting said member for limited movement relatively to said housing and forming the sole and floating support for said member, a mechanically unbalanced, electric oscillator secured on said member within said housing and having an oscillating element fulcrumed at one end on said member for movement of its free end toward and from said member, and a plurality of freely flexible, resilient ele-

ments projecting from said member exteriorly of said housing in the general direction of movement of said oscillating element and side by side relation for contact at their free ends with one's skin and transmitting thereto impulses received from said oscillating element through said member.

2. A skin stimulating device comprising a hollow housing which may be held and manipulated, and having an opening in a face thereof, a relatively rigid base within said housing, approximately closing said opening, and everywhere spaced from said housing, soft, resilient cushioning means interposed between said base and housing for floatingly mounting said base for limited movement relatively to said housing, a magnet secured to said base within said housing in spaced relation to, and free of contact with, said housing, an armature fulcrumed on said magnet for oscillation thereon towards and from said base, an electromagnet in flux inducing relation to said magnet and armature for causing oscillations of said armature when a fluctuating current is passed through said electromagnet, and a freely flexible, resilient element projecting from said base, exteriorly of the housing in the general direction of movement of said armature, for contact at its free end with one's skin to transmit thereto impulses received from said armature through said base.

3. A skin stimulating device comprising a hollow housing which may be held and manipulated, and having an opening in a face thereof, a relatively rigid base within said housing, approximately closing said opening, and everywhere spaced from said housing, soft, resilient cushioning means interposed between said base and housing for floatingly mounting said base for limited movement relatively to said housing, a magnet secured to said base within said housing in spaced relation to, and free of contact with, said housing, an armature fulcrumed at one end on said magnet for oscillation of its free end towards and from said base, a resilient element acting between said armature and magnet to retract said armature, magnetic means in flux inducing relation to said magnet and armature and responsive to a fluctuating current for causing oscillations of said armature, and a flexible, resilient element projecting from said base, exteriorly of the housing in the general direction of movement of said armature, for contact with one's skin to transmit thereto impulses received from said armature through said base.

5. A skin stimulating device comprising a hollow housing which may be held and manipulated, and having an opening in a face thereof, a relatively rigid base within said housing, approximately closing said opening, and everywhere spaced from said housing, soft, resilient cushioning means interposed between said base and housing for floatingly mounting said base for limited movement relatively to said housing, a magnet secured to said base on the face thereof within said housing in spaced relation to, and free of contact with, said housing, an armature fulcrumed at one end on said magnet for oscillation of its free end towards and from said base, an electromagnet in flux inducing relation to said magnet and armature for causing oscillations of said armature when a fluctuating current is passed through said electromagnet, a post carried by said base and extending generally normal thereto, soft, resilient cushioning means interposed between the free end of said armature and

said post for yieldingly and resiliently opposing movement of said armature towards said base, and a freely flexible, resilient element projecting from said base, exteriorly of the housing in the general direction of movement of said armature, for contact at its free end with one's skin to transmit thereto impulses received from said armature through said base.

5. A skin stimulating device comprising a hollow housing which may be held and manipulated, and having an opening in a face thereof, a relatively rigid base within said housing, approximately closing said opening, and everywhere spaced from said housing, soft, resilient cushioning means interposed between said base and housing for floatingly mounting said base for limited movement relatively to said housing, a magnet secured to said base on the face thereof within said housing in spaced relation to, and free of contact with said housing, an armature 20 fulcrumed at one end on said magnet for oscillation of its free end towards and from said base, an electromagnet in flux inducing relation to said magnet and armature for causing oscillations of said armature when a fluctuating current is passed through said electromagnet, a post carried by said base and extending generally normal thereto, soft, resilient cushioning means interposed between the free end of said armature and

5 said post for yieldingly and resiliently opposing movement of said armature towards said base, resilient means yieldingly and resiliently urging the free end of said armature away from said base, and a freely flexible, resilient element projecting from said base, exteriorly of the housing in the general direction of movement of said armature, for contact at its free end with one's skin to transmit thereto impulses received from 10 said armature through said base.

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