April 24, 1934. G. F. SCHMIDT 1,955,863

ELECTRO-THERAPEUTIC AND MECHANICAL VIBRATORY DEVICE

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Fig. 1.

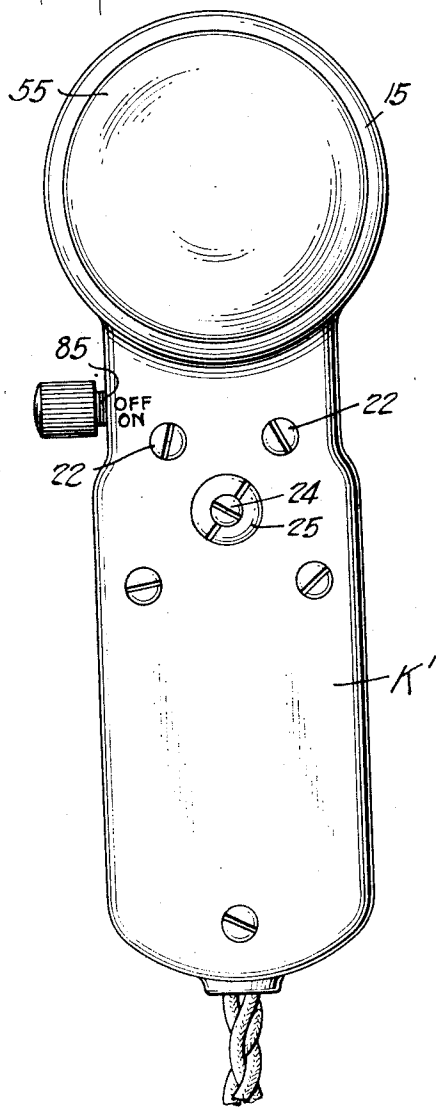
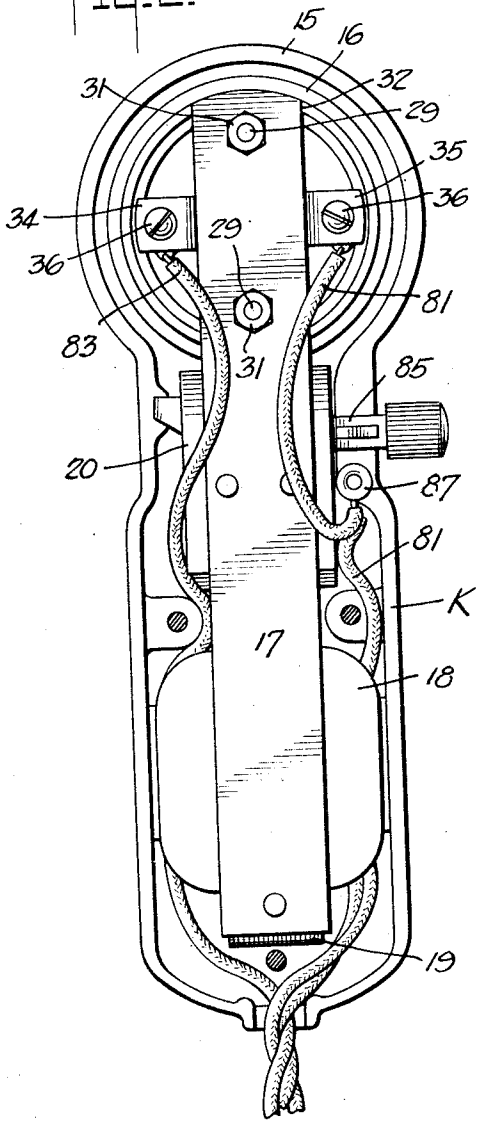


Fig. 2.



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Fig. 3.

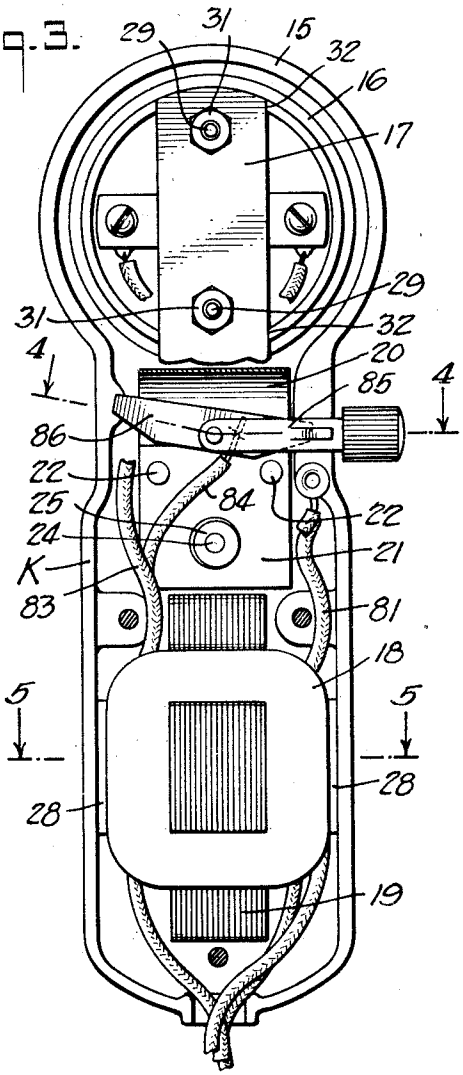


Fig. 4.

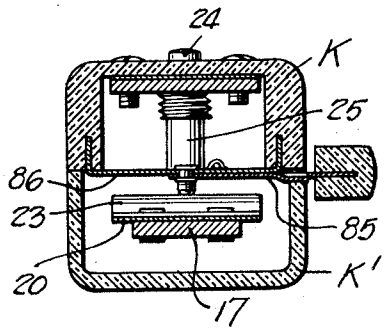
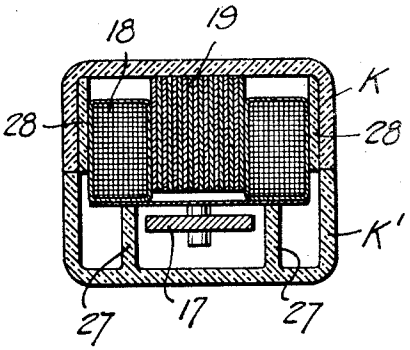


Fig. 5.



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Fig. 6.

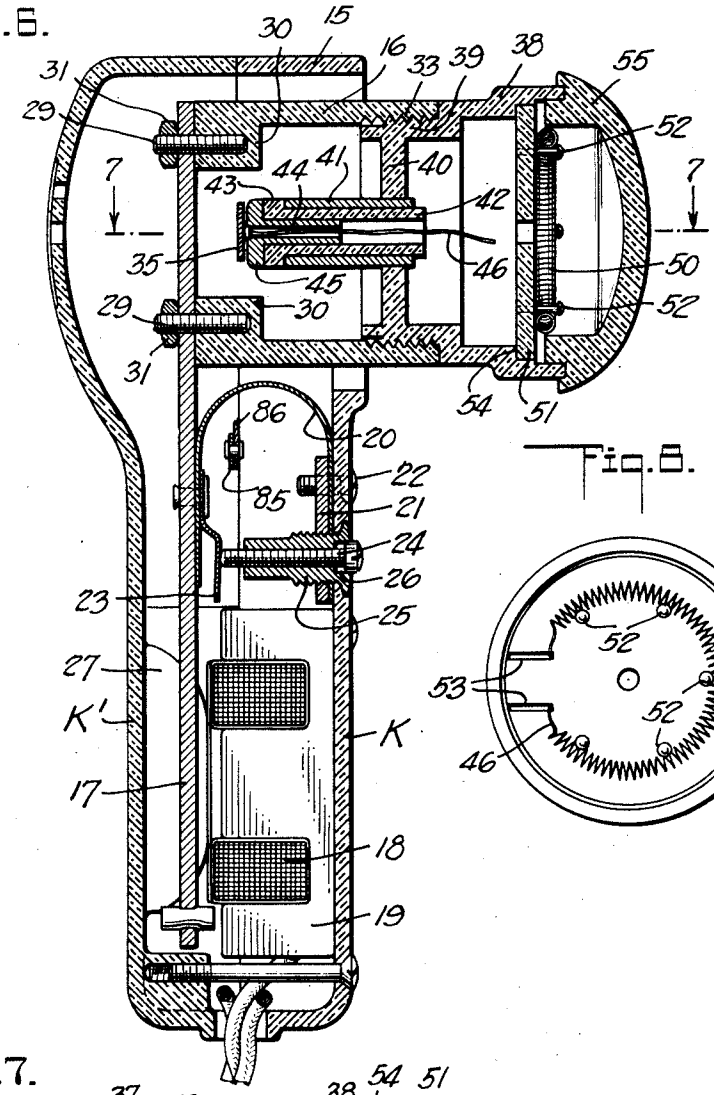
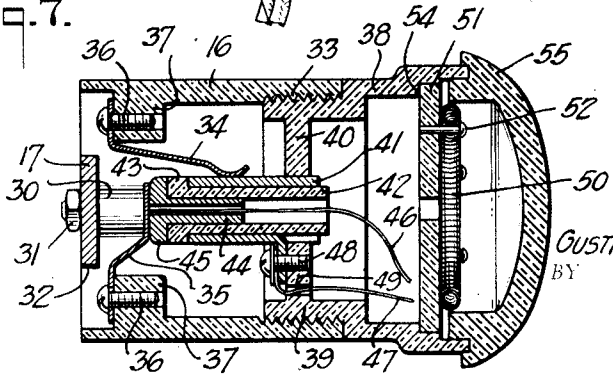


Fig. 8.

Fig. 7.



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Fig. 9.

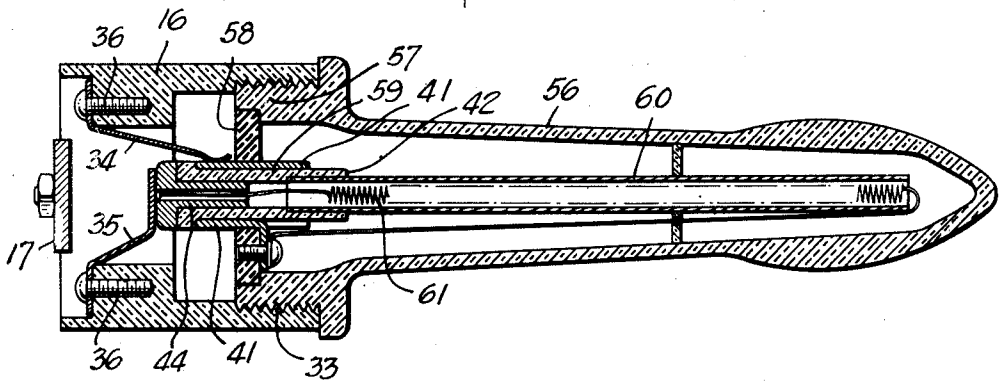


Fig. 10.

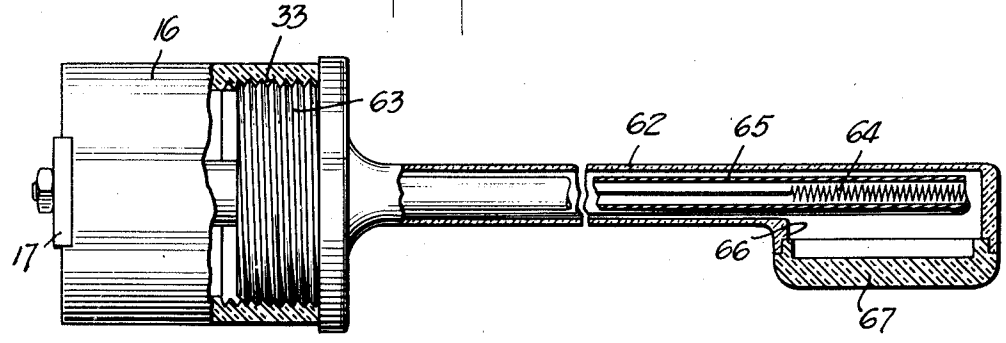
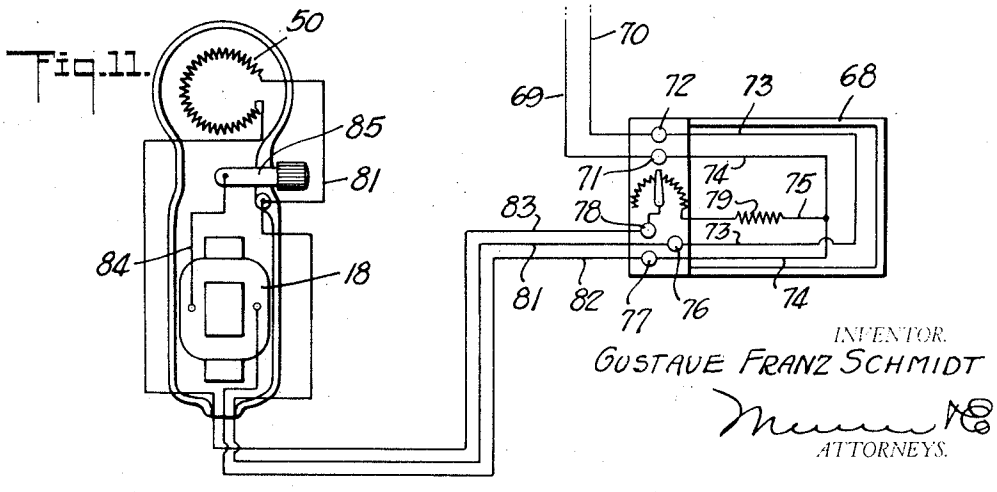


Fig. 11.



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UNITED STATES PATENT OFFICE

1,955,863

ELECTRO-THERAPEUTIC AND MECHANICAL VIBRATORY DEVICE

Gustave Franz Schmidt, Los Angeles, Calif.

Application February 19, 1931, Serial No. 517,076

7 Claims. (Cl. 174—173)

My invention has reference to electro-therapeutic and mechanical vibratory devices for imparting beneficial treatments to the human body.

It is a purpose of my invention to provide a portable device by which the human body can be simultaneously massaged, and treated with heat and infra-red or other forms of health giving rays, and wherein the source of heat and light rays are likewise vibrated.

Another purpose of my invention is the provision of a device of the above described character which embodies a vibrator and various forms of applicators for treating various parts of the human body and any one of which contains an electrical element for producing health giving light rays and heat, and is readily attachable to the vibrator to be vibrated thereby so that it functions when applied to the body to massage the latter concurrently with the application of light and heat.

It is also a purpose of my invention to provide a device in which the vibrator part thereof is of extremely simplified and durable construction, and which embodies an electromagnet as the vibrating means, the armature thereof being controllable by mechanical means adjustable to vary the amplitude of its vibrations and in consequence the vibratory motion of the particular applicator attached to the vibrator.

I will describe only one form of electro-therapeutic and mechanical vibratory device and three forms of applicators, all embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawings:

Figure 1 is a view showing in front elevation one form of device embodying my invention.

Figure 2 is a view showing the same device with the cover thereof removed.

Figure 3 is a view similar to Figure 2 but with the armature of the device removed and the spring support thereof in section.

Figures 4 and 5 are transverse sectional views taken on the lines 4—4 and 5—5, respectively, of Figure 3.

Figure 6 is a view showing the device in vertical longitudinal section, and with one form of applicator in applied position therein.

Figure 7 is a sectional view taken on the line 7—7 of Figure 6.

Figure 8 is a view showing the applicator illustrated in Figures 6 and 7 in front elevation but with the lens thereof removed.

Figure 9 is a view showing in longitudinal section another form of applicator embodying my invention, and in applied position to the vibrator of the device.

Figure 10 is a view similar to Figure 9 showing another form of applicator embodying my invention, but with parts of the vibrator and applicator in elevation.

Figure 11 is a diagrammatic view showing the electrical circuits for the device and a current supply means for the device.

Similar reference characters refer to similar parts in each of the several views.

In carrying out my invention, I provide a two part casing of insulating material, one part K constituting a frame for supporting certain elements of the device, and the other part K′ constituting a cover to conceal the elements mounted on the frame. The frame K is structurally characterized by a ring shaped head 15 at one end of the frame which provides an opening in the front side of the casing, and in this opening a vibrating head 16 is adapted to be moved by means of the armature 17 of an electro-magnet. The magnet comprises, in the present instance, a winding 18 and a three pole laminated core 19 secured on the inside of the frame K.

The armature 17 is poised within the influence of the core 19 by a U-shaped spring 20 secured at one end to the inside of the frame K between a plate 21 and the frame by screws 22. At the other end the spring is riveted to the armature 17, and thus the armature is resiliently supported so as to be capable of vibration by and when the magnet is energized with alternating current.

The amplitude of the vibrations of the armature 17 can be varied within a certain range by the provision of a short spring 23 riveted to the armature and engaged by the inner end of a screw 24. This screw 24 is threaded in the bore of a stud 25, and the latter is threaded in the plate 21, as best illustrated in Figure 6. The outer or head end of the screw 24 is disposed in a pocket 26 of the head of the stud 25 and so as to be accessible from the outer side of the casing to permit rotation of the screw in the stud for effecting longitudinal adjustment thereof to increase or decrease the pressure exerted thereby on the spring 23. In this manner vibratory movement of the armature 17 can be varied at will.

As best illustrated in Figure 5 the armature 17 operates at one end between partitions 27 extending inwardly from the cover K′, and these partitions abut the winding 18 of the magnet to hold the winding and core in fixed position within the casing. Plates 28 of insulating material

are interposed between the winding and the sides of the frame K also to secure the winding against displacement from the frame.

The opposite end of the armature is connected to the vibrating head 16 by threaded studs 29 secured in bosses 30 on the inside of the head, and the studs are provided with nuts 31 for securing the armature to the studs. The armature extends diametrically of the vibrating head and is seated in recesses 32 in the edge of the vibrating head, so that by means of the studs and nuts the armature is fixedly secured within the recesses to prevent relative movement of the armature and vibrating head, it being understood that it is essential to the proper vibration of the head that the armature be fixedly secured thereto.

The vibrating head is of such length as to project from the ring head 15, as best illustrated in Figure 6, and as here shown it is interiorly screw threaded as indicated at 33 for the reception of various forms of applicators, each containing an electrical heating and lighting element. As will be more fully described hereinafter, current is adapted to be supplied to the electrical element of each applicator through the vibrator, and hence it is necessary that suitable electrical connections be provided between the vibrating head and each applicator. To this end I provide spring contacts 34 and 35, one extending longitudinally of the head and the other transversely thereof, as best illustrated in Figure 9. By means of screws 36 these contacts are secured to internal bosses 37 of the head.

In Figures 6 and 7 I have shown one form of applicator embodying my invention in applied position to the vibrator, and this applicator is particularly designed for the vibratory massaging accompanied by the application of heat and light rays to exterior parts of the human body, and particularly for massaging and melting cosmetic creams into the facial tissues at the same time effecting a valuable tissue stimulating light, heat, and massage treatment.

The afore-mentioned applicator comprises a cylindrical body 38 of insulating material having a reduced end 39 which is exteriorly threaded for engagement with the internal threads 33 of the vibrating head. Within this reduced end is a disk 40 constituting an integral part of the body 38 and formed centrally with an opening in which is secured a contact plug. As best shown in Figure 7, this plug comprises an external tube 41 formed of conducting material. One end of this tube has a driving fit within the opening of the disk 40 so as to provide a water tight joint between the two. Within the tube 41 is a second tube 42 formed of insulating material and projecting from the inner end of a tube where it is provided with an annular collar 43. A third and shorter tube 44 formed of conducting material extends into the tube 42, and where it projects from the tube 42 it is likewise provided with an annular collar 45.

One wire 46 is connected to the collar 45 and extends through the tubes 42 and 44 and into the interior of the body 38, as shown in Figure 7. A second wire 47 is connected to an off-set part of the outer tube 41 by means of a screw 48, and this wire extends through an opening 49 in the disk 40 so as to likewise be disposed interiorly of the body 38.

These wires 46 and 47 constitute the terminals of an electrical element 50 which when energized provides a source of heat and a source of health giving rays. This element 50 comprises a coil of chromium alloy wire or any other material which when heated emits a generous amount of infra-red rays. As shown in Figure 8, the element 50 is secured in circular form on one side of a disk 51 by a circular arrangement of headed pins 52, while the ends of the coil are extended through slots 53 in the disk and to the opposite side of the latter where they are connected to the respective wires 46 and 47.

The disk 51 is formed of insulated material and is secured by a driving fit in the body 38 and against an annular shoulder 54. Covering the element 50 is a concavo-convex lens 55 which is grooved to receive the edge of the body 38, as shown in Figure 6, and in such manner that the lens is secured against displacement from the body. This lens constitutes a massage member and it is constructed of crystal, quartz, or any other material which has the property of transmitting infra-red rays therethrough. By constructing the lens as described, it serves to concentrate the light and infra-red rays passing therethrough as emitted from the element 50 so that in operation the part of the body to which the lens is applied can be treated by heat and light rays and at the same time massaged.

In applying the aforedescribed applicator to the vibrator, the body 38 is screwed into the vibrating head 16, and in so doing the plug of the applicator is moved into engagement with the spring contacts 34 and 35 so that the latter engage, respectively, the contact tube 41 and the contact tube 44 for supplying current to the element 50, assuming of course, that the spring contacts are connected to a source of current. With the plug inserted as shown in Figure 7, the contact 44 engages the side of the plug, while the contact 35 engages the end of the plug, and by reason of the construction of the spring contacts, the plug serves to hold the contacts under tension. The tension thus produced reacts to retain the plug against rotation and with sufficient security to prevent accidental unthreading of the applicator from the vibrating head. This is an important feature of my invention for it is essential that the applicator be fixedly secured in the vibrating head to prevent loosening and subsequent displacement thereof under the vibrating action of the head.

Referring now to Figure 9 I have here shown another form of applicator embodying my invention and adapted for use in connection with the vibrator. This applicator is in the form of a dilator for administering rectal and vagina treatments, and as in the other applicator it is useable to simultaneously massage, heat, and treat with light the affected part.

The dilator comprises a hollow body 56 which is formed of any suitable insulating material and provided at one end with an exteriorly threaded and flanged collar 57 which is adapted to be threaded into the head 16 of the vibrator. The collar 57 is completely closed by a disk 58 of insulating material, and this disk carries a contact plug 59 of the same construction as the contact plug of the previously described applicator. Thus when the collar is threaded into the head 16, the plug engages the spring contacts 34 and 35 to form the requisite electrical connections between the contacts and the plug for supplying current to the lighting and heating element of the dilator. Also, the spring contacts being placed under tension to prevent accidental unscrewing of the collar from the head. The insulating tube 42 of the plug is extended beyond

the inner end of the outer tube 41 for the purpose of receiving and supporting a tube 60 within the dilator body. This tube 60 contains the electrical element 61 which is likewise in the form of a coil of chromium alloy wire for the purpose of emitting infra-red rays, and as shown in Figure 9 one terminal of the coil is connected to the conducting tube 44 while the other end is extended from the free end of the tube 60 and along its outer side where it is finally connected to the outer conducting tube 41.

The tube 60 is formed of glass or any other material having refractory properties to increase emission of infra-red rays from the element 61, and to thereby increase the therapeutical effect of the rays in the adaptation of the dilator to the various parts of the body. The association of the disk 58 with the collar 57 and the plug 59 with the disk 58 is such that the entire body of the dilator is hermetically sealed against the entrance of fluid, and as a consequence the dilator can be immersed in a sterilizing solution without damage to any of its parts.

In the adaptation of the dilator to the vibrator, the element 61 is heated to emit heat as well as infra-red rays, and the dilator is simultaneously vibrated thus permitting the administration of a massaging action as well as heat and light to the part being treated.

Referring now to Figure 10 I have here shown a third form of applicator embodying my invention. This applicator is particularly adapted for treating the gums of the teeth for the purpose of stimulating circulation in the gums to promote healthy tooth growth and alleviate pyorretic conditions.

The gum treating applicator comprises a tubular body 62 formed of insulating material and terminating at one end in a collar 63 of the same construction as the collar 57 of the dilator and having a contact plug adapted for association with the spring contacts for supplying current to the electrical element of the applicator. As in the instance of the dilator, the body 60 contains an electrical heating element 64 enclosed in a glass tube 65. However, the element 64 is relatively short and co-extensive in length with an opening 66 in one side of the body 62, and which opening is closed by a lens 67.

In the use of this applicator, the lens constitutes a massage member and permits radiation of heat and the infra-red rays so that the tube can be simultaneously applied to the gums during the massaging operation, it being understood that the applicator as a whole is vibrated when in operation.

In Figure 11, I have shown diagrammatically the necessary circuits for supplying current to energize the electromagnet for effecting operation of the vibrator, and heating of the electrical element for producing the heat and light rays. The circuits are associated with the form of applicator illustrated in Figure 6, although it will be understood that the same circuits can be employed in connection with the other two applicators for heating their respective elements.

In Figure 11 is also shown a cabinet 68 which contains electrical devices for connecting and controlling the supply of current to my device, although it will be understood that other forms of devices than those shown can be employed.

In Figure 11, alternating current supply lines 69 and 70 are adapted to be connected to cabinet contacts 71 and 72, and from these contacts wires 73, 74, and 75, lead to contacts 76, 77 and 78, the wires 74, and 75, being in parallel. In the wire 75 is interposed a resistance coil 79, and also a rheostat 80. Wires 81, 82, and 83 are adapted to be connected to the contacts 76, 77, and 78, respectively, the wires 81 and 83 being connected to the terminals of the heating and lighting element 50 so that the latter is in series with the rheostat 80 and the coil 79. Thus the coil 79 serves to reduce the current supplied to the element 50 for preventing excessive heating thereof, while the rheostat 80 permits regulation in heating of the element to suit the requisites of a particular applicator or treatment.

The magnet winding 18 is adapted to be connected in parallel with the element 50 by wires 82 and 84 and a switch whose arm 85 is pivoted on a bar 86 (Figure 3) of conducting material to engage and disengage a contact 87 in series with the wire 81. Thus the magnet can be energized by closing the switch to effect operation of the vibrator.

Although I have herein shown and described only one form of electro-therapeutic and mechanical vibratory device and three forms of applicators all embodying my invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of the invention and the spirit and scope of the appended claims.

I claim:

1. An applicator for a vibrator, comprising a cylindrical member having an enlarged end, and a reduced and threaded end, a lens secured in the enlarged end, a disk in the enlarged end, and a light and heat producing element secured to the lens side of said disk.

2. An applicator for a vibrator, comprising a cylindrical member having an enlarged end and a reduced and threaded end, a lens secured in the enlarged end, a disk in the enlarged end, an annular series of pegs projecting from the lens side of the disk, and a light and heat producing element secured on the disk by said pegs.

3. An applicator for a vibrator, comprising a hollow body having a wall closing one end of the body and formed with an opening, a tube of conducting material secured within the opening, a tube of insulating material secured within the first tube so as to project from one end thereof, a collar formed on the projecting end of the second tube, a third tube of conducting material secured in the second tube so as to project from the collared end of the latter and provided on said projecting end with a collar abutting the collar of the second tube, a massage member secured to the body, and a light and heat producing element positioned in the massage member and having its terminals connected respectively to the two tubes of conducting material.

4. In combination, a vibrator including a head, a pair of spring contacts on the head, an applicator having a massage member, a lighting and heating element, and a plug having two contact members connected to said element, and coacting means on the vibrator head and applicator for detachably connecting the two, said spring contacts positioned to be engaged by the plug and held under tension to maintain the vibrator head and applicator against detachment one from the other.

5. A therapeutic device comprising a rectangular bar armature; a U-shaped spring having one branch fixed and its other branch secured to the armature intermediate the ends of the latter for mounting the armature to vibrate; an electro-

magnet correlated with one end portion of the armature for vibrating the latter; a massaging lens and a source of light and heat rigidly supported on the other end portion of the armature for vibration by the latter; and means for supplying current to the electro-magnet and said source of light and heat.

6. In a therapeutic device, an armature; a U-shaped spring having one branch fixed and its other branch secured to the armature intermediate the ends of the latter for mounting the armature to vibrate; an electro-magnet correlated with one end portion of the armature for vibrating the latter; a second spring secured to the armature; a screw engaging said second spring and adjustable for coaction with the latter in varying the amplitude of vibration of the armature; and an applicator supported on the other end portion of the armature for vibration by the latter.

7. In a therapeutic device, a head having two spring contacts one of which is centrally disposed and yieldable axially of the head, and the other of which is eccentrically disposed and yieldable radially of the head; a body threadedly mounted on the head and having two contacts one of which is centrally disposed for engagement with the first mentioned contact of the head, and the other of which is annular in form and engages the second mentioned contact of the head; an applicator including an electrical element supported by the head; and means for electrically connecting said element to the contacts of the body.

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