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G. A. ZERNE

1,889,272

DIATHERMIC ELECTRODE AND APPLICATOR

Filed Sept. 29, 1931

FIG. 1.

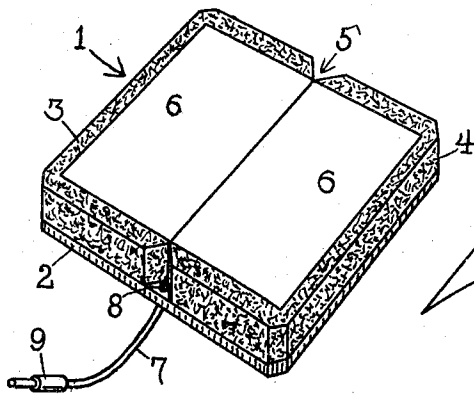


FIG. 2.

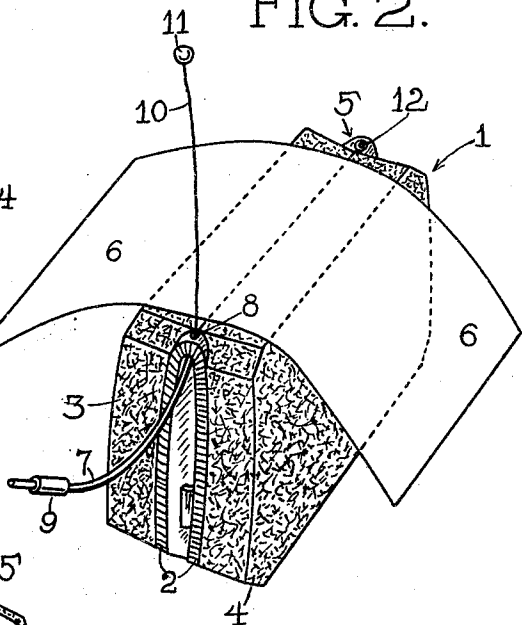


FIG. 3.

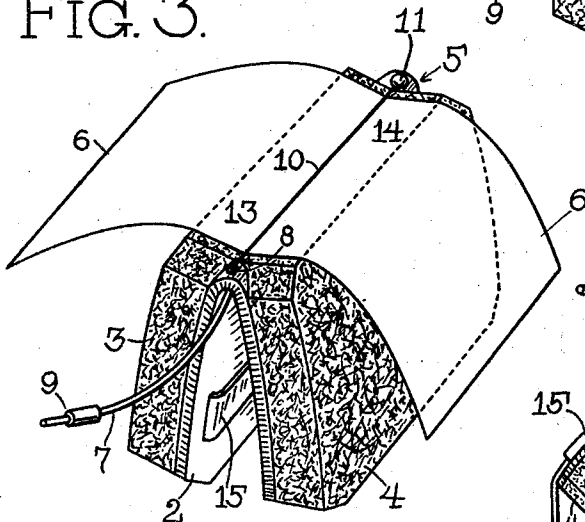


FIG. 5.

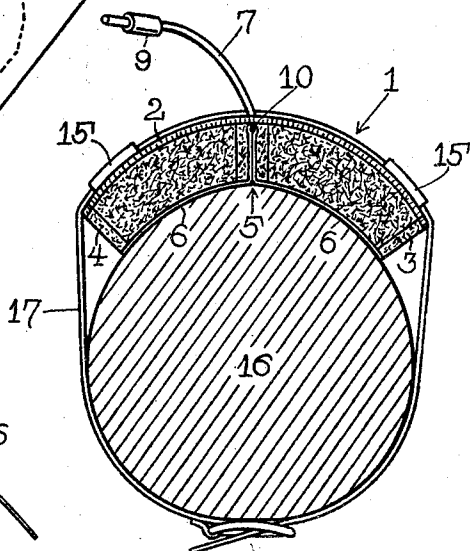
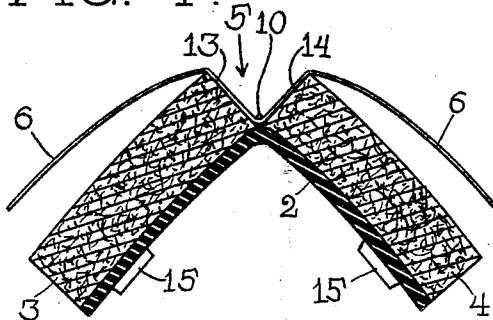


FIG. 4.



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DIATHERMIC ELECTRODE AND APPLICATOR

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This invention relates to electrodes and applicators for diathermic and other electrical treatments administered to the body in order to produce various desired effects, and refers particularly to the class in which a resilient insulating cushion is partly divided and furnished with a flexible conductor adapted to lie in the cleft of said cushion with a thin metallic sheet enfolding said conductor and extending out from the cleft upon both sides of the cushion to form a uniform conducting facing thereon.

The main object of my invention is to provide a very soft and resilient conductor for applying to the surface of the body which will readily conform to any irregularity of shape thereof and be at the same time free from any rigid mechanical members.

Another object is to provide such an applicator which protects the body from all contact with the lead or conductor from a machine to the applicator as a whole by having the applicator conceal said conductor within its structure and outline.

A further object is to provide an applicator of the character indicated wherein the metallic sheet or foil used thereon may be immediately and conveniently replaced with new foil for sanitary reasons.

Yet another object is to provide such an electrode and applicator which is exceedingly simple and light, as well as very reasonable in cost to manufacture.

Other objects and the various features and advantages inherent in my invention will appear more fully hereinafter as this specification proceeds.

In the accompanying drawing forming part hereof,

Fig. 1 is a perspective view of an electrode and applicator made according to the novel features of the present invention and embodying the same in a practical form, the applicator here lying face up.

Fig. 2 is an illustration of the manner in which the applicator may be opened for replacing the metal foil thereon, the conducting cord or lead being open and raised to leave an open field for such replacement.

Fig. 3 is a similar view wherein the con-

ducting wire or cord has been lowered into position upon the foil and fastened.

Fig. 4 is a cross section of the whole when partly closed, in order to reveal the structure and relation of the parts.

Fig. 5 shows the applicator strapped upon a limb as in actual use upon a patient.

Throughout the views, the same reference numerals indicate the same or like parts.

In the practise of my invention, a resilient backing 2 of rubber or other suitable and flexible material is provided with a pair of similar soft cushions thereon at 3 and 4 which meet at their common line of division at 5, said cushions being made of sponge rubber or any other resilient material and preferably cemented on the resilient backing 2. In view of the fact that solely the backing unites the cushions, the same may be bent apart as shown in Fig. 2. Of course, a single sponge or cushion which is partly cut or cleaved may also serve the purpose.

However, when the cushion as a whole, indicated by 1 is flexed open as already stated, it is easily possible to lay a sheet of metal foil upon the opening so that the two ends 6-6 overhang the two halves 3 and 4 at the sides. A bare conducting wire or cord 10 is preferably mounted upon the cushion at 8 and adapted to be let down upon the foil along the line of cleavage 5, the conducting cord having a snap fastener 11 at the inner end engageable with a corresponding fastening member 12 at the far end of the cushion. When thus fastened down, the cord 10 will hold down the middle portion of the foil so that upon closing the cushion again, as shown partially performed in Fig. 4, the intermediate portions 13 and 14 of the foil are bent toward each other and tend to enclose the conductor and conceal the same far down in the cleft between the cushions.

The cushion when closed presents the appearance shown in Fig. 1, where the free halves or leaves of the foil 6, 6 lie upon halves 3 and 4 of the cushion, with the conducting cord far down within the cushion completely out of sight and beyond reach from the upper surface of the cushion. The free outer end of the conducting cord at 7 is preferably insulat-

ed and passed through the backing 2 of the cushion and provided upon its end with a contact means or connector, or even a plug similar to 9 by which the cord may be connected to a machine or source of current. If the hand should be laid upon the cushion thus assembled with the foil in place, and then pressed down hard, the hand would fail to make any mechanical contact with the concealed and protected conducting cord 10 within the cushion, and at the same time, the portions 13 and 14 of the foil within the cleft of the cushion would readily be deformed and crumpled in a manner corresponding to the degree of compression suffered by the surrounding cushion members 3 and 4, without, however breaking or losing their contact with cord 10 or losing their conducting property, and also without losing their yielding property, but instead softly yielding to the mentioned pressure.

In Fig. 5, the cushion is shown as in actual use, wherein the same has been placed face down on the limb 16 with the conducting metal foil leaves 6, 6 making direct contact with said limb. The backing 2 is preferably furnished with a plurality of loops similar to 15, 15, through which straps such as 17 are passed by which the cushion or applicator as a whole is secured to said limb or to any part of the body. The lead 7 is then upon backing 2 and well spaced away from the limb or part being treated, with no danger of the same making accidental contact with the skin presenting itself, thus avoiding accidental burns. If the connector 9 becomes detached from the current source, the whole applicator is immediately dead and free from any element of danger.

Owing to the resilient construction of the applicator as a whole, wherein there is incorporated no rigid mechanical member, the applicator readily conforms to any part of the body without the slightest harsh pressure or unyielding portion presenting itself, for even the foil in the cleft of the cushion yields so as to present no sensible difference in mechanical effect between the same and any flat portion of the cushion proper upon either leaf 6. The contact is thus effective at all times while being perfectly flexible and yielding.

Of course, the cushion members 3 and 4 can be made of any material that will serve as an insulator, and can be woven, stuffed, of actual sponge material or rubber sponge, so long as the mechanical features described are incorporated, and the conducting cord 10 may be actually secured at 8 or releasable from said position, so long as it may be laid down upon the foil while the cushion is flexed open and later enfolded within the foil and cushion when the latter is closed again. The backing may be integral with cushion mem-

bers 3 and 4 and of the same piece and material, if desired.

Having now fully described my invention, I claim:—

1. An electrical applicator including the combination, with a flexible backing, of a pair of flexible cushion members secured upon said backing in adjacent positions, and a conducting cord associated with said applicator having an uninsulated portion thereof releasably disposed upon said backing between said cushion members, there being a flexible metallic sheet conductor interposed between the uninsulated portion of said conducting cord and said backing between said cushion members and extend from between said members upon the surfaces thereof.

2. An electrical applicator of the character described, including the combination, with a conducting cord adapted to be connected to a source of current, of a resilient insulating cushion which is partly divided from the upper face toward the back or under face thereof so as to present a cleft across the cushion, an uninsulated portion upon said conducting cord normally lying removably in the cleft of said cushion, and a flexible sheet metal conductor upon said cushion having an intermediate fold thereof extending down into said cleft under the uninsulated portion of said conducting cord and having the main free ends thereof lying upon the two portions of said upper face of the cushion upon both sides of said cleft in the latter.

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