

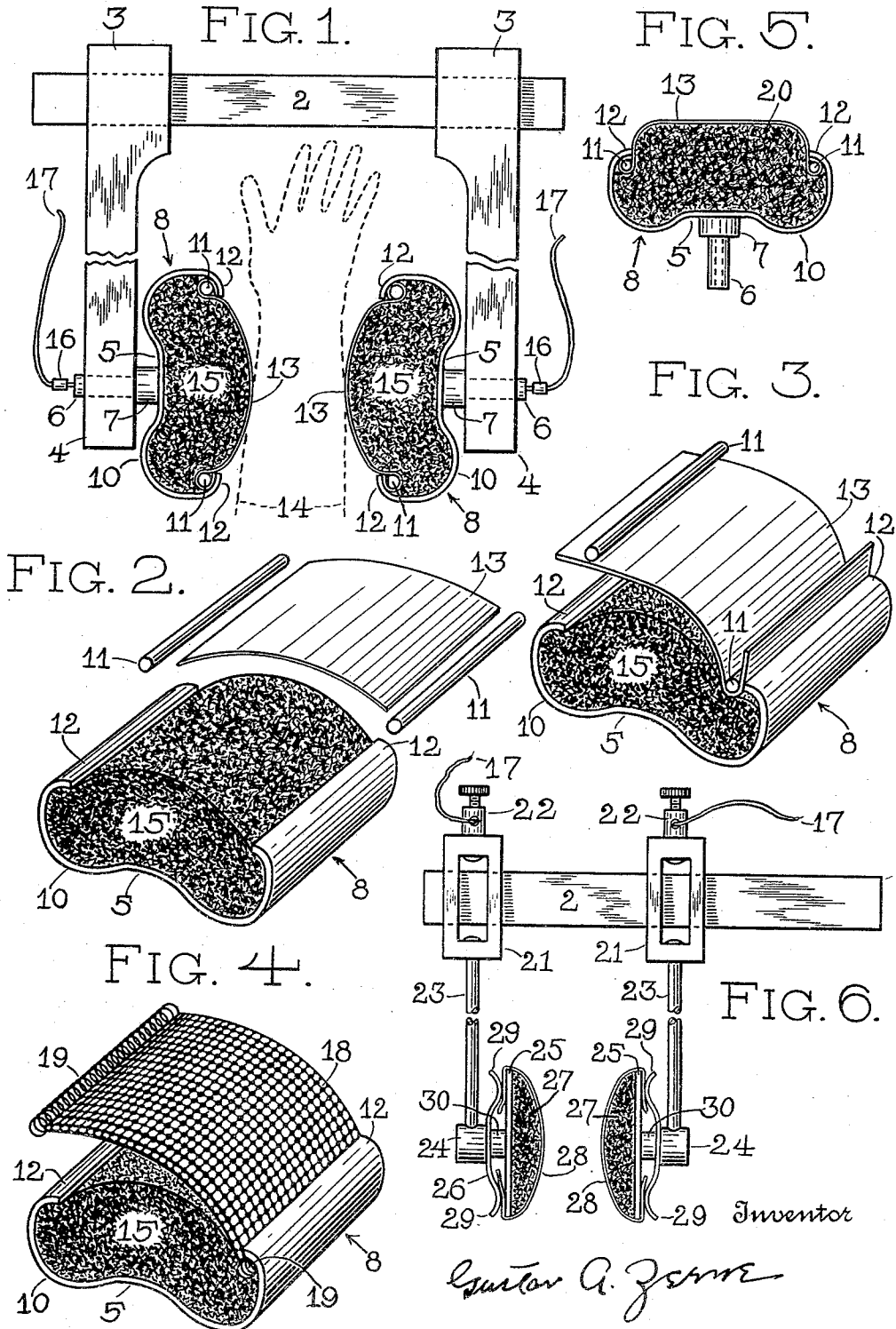
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ELECTRICAL CONTACT PAD

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UNITED STATES PATENT OFFICE

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ELECTRICAL CONTACT PAD

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This invention relates to contact pads for use in diathermic clamps and other apparatus for electrotherapeutic treatments, where such pads are intended to come into contact with the skin of a patient, and particularly refers to that class of pads where a cushion of insulate material is covered with a conductive metal facing which may be conveniently replaced.

The main object of my invention is to provide a pad of the character indicated with a metal facing having special facilities for being instantly removed and replaced with another facing which at all times makes perfect contact with the electrodes and with the skin.

There is also another object of equal importance involved in providing a metal clamping plate for the contact pad whose form is such as to efficiently retain a rubber cushion which serves as a resilient backing for the metal facing, and also serves to hold said facing in place when once set in position.

Another object is to provide the metal facing with means for engaging beneath the edges of the clamping plate whereby to retain said facing over the cushion of the pad without danger of its becoming disengaged by the outward pressure exerted by the cushion from within the clamping plate.

It is also an object of my invention to make a contact pad with a sanitary facing which may be discarded after each treatment, by which a new treatment facing is assured to each patient.

Further objects and the various advantages inherent in my invention will appear more fully in detail as this specification proceeds.

In the accompanying drawing,

Fig. 1 is a general view of a diathermy clamp wherein two contact pads are included which are made according to the main features of my invention and embody the same in practical form.

Fig. 2 is a view of one of the contact pads in disassembled condition, or just prior to putting the metal facing in place.

Fig. 3 is another view of the same pad when partly assembled, showing the manner of placing the facing into position.

Fig. 4 is a modification of Fig. 3, showing another facing.

Fig. 5 is a view of a modification of the contact pad when the cushion has a different form.

Fig. 6 is a modification of the diathermy clamp with somewhat modified contact pads for gripping smaller objects, such as fingers, etc., the former clamp being more adapted for use when treating arms, legs, elbows or shoulders, etc.

Throughout the various views, the same reference numerals indicate the same or corresponding parts.

It is customary for practitioners in diathermy and electrotherapeutics to apply water, or soap solution, lather, or similar aqueous applications to the mesh facing of diathermy pads used in clamps familiar to the art when about to place the said pads in contact with the skin of a patient, whereafter currents of various qualities and degrees are passed through the member of the patient clamped between the pads. It has been found by experience that such pads become foul and insanitary after a short period of use, due to the fact that the metal mesh facing is very difficult to remove, resulting also in corrosion of the same, which makes for poor contacts and sometimes abrupt shocks and irregularity in the passage of the currents through the mesh. In other words, the pads break down in a short time and become both disgusting, insanitary and ineffective, so that they must be bodily discarded, although representing no small outlay on the equipment list.

It has been with the object in view of eliminating the named disadvantages as well as including the aforesaid objects that the present invention was designed.

In the practice of my invention, a diathermy clamp, generally indicated at 1 has the usual construction in regard to the insulate bar 2 upon which a pair of clamping arms 3, 3 are slidable so long as no object is being clamped between the arms or jaws, as they may also be termed. As well known, this general type of clamp will hold any object between its lower ends when the arms

are pushed toward each other, for they then begin to bind on the bar 2. However, this is no actual part of this invention, but mentioned to provide a proper background for the contact pad about to be minutely described.

Near the lower ends 4, 4 of the clamping arms 3, 3 are pivoted a pair of clamping plates, generally indicated by 8, 8, the latter being mounted upon posts 6, 6 which are hollow to receive the contact points 16, 16 of the current wires or cords 17, 17. Each clamping plate has a curved back 10 whose middle portion is depressed to receive the shoulder 7 of the post 6, while the ends are bent over to form retaining edges 12, 12. The plate is adapted to swivel on its post 6, so that it may be turned to most useful position at will. A soft cushion of sponge rubber or other suitable material 15 is placed into the clamping plate, and, due to its expansive properties, will fill the space between the retaining edges 12, 12, and between the same will project in a bulging curve, as seen in Fig. 2 without any facing thereon. The cushion itself is, of course retained in assembly with the plate owing to the form of the latter preventing the escape of the cushion therefrom. If now a metal facing is to be put into place upon the cushion, this is not done as ordinarily, that is, the facing, often a chain mesh of some kind is placed about the cushion and the ends clamped or screwed down or otherwise permanently fixed in place. Instead, it is preferred to use a length of tinfoil, or the like as at 13, and a pair of retaining bars or tubes 11, 11, and first lay one bar upon the end of the foil and press said end with the bar enveloped therein under one retaining edge 12 of the clamping plate, after which the same is done at the other end, and the foil is held at both ends while the cushion holds the intermediate portion up to conform with its shape. It may sometimes be desirable to have a more prominent cushion such as 20 in Fig. 5, where the cushion projects more fully at the ends immediately within the retaining edges 12, 12, this ensuring a greater surface contact with the patient's skin if the parts to be treated are very convex. Then again, it may also be useful to have a metal chain mesh 18 instead of the thin metal foil, and in this case, the ends of the mesh may be linked directly to a rod or a coil spring 19 which is merely pushed down under the retaining edge 12, and the same will hold the mesh in place by virtue of the pressure of the rubber cushion. The whole front of the pad 8 is soft and yielding so that if two such contact pads are fitted into the clamp as shown in Fig. 1, the pads may resiliently clamp a limb between them, as indicated at 14. When the treatment is terminated, the foil can readily be removed by individually

pulling inward each end to release the same, and another piece of foil then placed in the pad structure. It is obvious that the currents pass from cords 17, 17 through points 16, 16 into the posts 6, 6 and plates 10, 10 and retaining edges 12, 12, and thence into the foil 13, 13, from which the same pass into the member treated.

Upon occasion, only a finger or two requires treatment, and then a smaller clamp shown in Fig. 6 is suitable, operating on the same general principles. The usual insulate bar 2 is here equipped with a pair of sliding blocks 21, 21 upon which a pair of binding posts 22, 22 are secured for the cords 17, 17, and to the lower portions of said blocks are secured metal rods 23, 23 which bear swivel posts 24, 24 upon their lower extremities. These posts have contact plates 25, 25 swiveled on the same, and intermediately upon the reduced portions 30, 30 of the same are mounted leaf springs 26, 26 whose ends lie heavily against the contact plates at 29, 29, etc. Upon the faces of these plates, cushions 27, 27 are mounted, being preferably cemented thereto, while the lengths of tinfoil 28, 28 have their ends readily caught under the ends 29, 29 of the leaf springs, for it is but necessary to lift one end 29 of the spring involved and pass the extreme end of the foil in under the same and then let the spring end fall back into place on the same, and the same operation repeated at the other end, to present a resilient metal surface upon the relatively flat pads of this smaller clamp. Replacing the foil is here only a moment's work, for upon lifting first one end, and then the other of each leaf spring, the strip of foil can be withdrawn and new pieces set into place as already described.

It is manifest that if metal mesh is used, the same can be very easily removed for washing and disinfecting the same and when dry, just as readily replaced in position again. However, it is preferred to use tinfoil or aluminum foil, replacing the same with new foil frequently, and instead of covering either the foil or metal mesh with conducting solutions, it is also intended that the skin surface to be treated is instead to be more carefully wet just prior to the application of the pads or clamps thereto, thus avoiding any wetting of the mesh or foil. This also avoids all wetting of the cushion and any deterioration thereof. Even if it should be desired to wet the metal mesh, the same can now be so easily removed and through a simple and common manipulation cleaned and then replaced, that sanitary conditions and efficient operation of the device can be relied on to be permanent and satisfactory at all times.

Variations may be resorted to and parts may be used without others, and instead of sponge rubber for cushions, I may use chem-

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ically treated sponges or cotton cushions, etc.

Having now fully described my invention,
I claim:

5 1. A contact pad for electro-therapeutic devices, including the combination, of a clamping plate having solely the ends thereof bent over to form retaining edges while the sides of said plate are open, a resilient body normally disposed upon said clamping plate between said bent over edges and having the sides thereof exposed as well as the upper portion of the same, and a resilient contact means disposed upon said resilient body having the ends caught under said bent over plate ends and the surface thereof exposed upon said resilient body between said plate ends.

10 2. A contact pad for electro-therapeutic devices, including the combination, of a clamping plate having solely two opposite ends thereof bent over to form retaining edges, a resilient cushion normally held upon said plate between said bent over ends, the sides of said plate being open and exposing said cushion while the upper surface of the latter is exposed between said retaining edges, a resilient contact means overlying the cushion and having the ends thereof caught under said retaining edges, and means associated with said resilient contact means and said retaining edges in order to releasably retain said contact means in assembled relation with said cushion and plate.

15 3. A contact pad for electro-therapeutic devices, including the combination, of a clamping plate having solely two opposite ends thereof bent over to form retaining edges while the sides of said plate are open, a resilient cushion disposed upon said clamping plate between said retaining edges having the top and sides thereof exposed, a resilient contact member overlying the upper surface of said cushion and having solely two ends thereof caught under said retaining edges while the surface thereof is exposed between said edges upon said cushion, and means including elongated members inserted with the ends of said contact means under said retaining edges in order to releasably retain said contact means in assembled relation to said cushion and clamping plate.

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