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P. MEMINGER

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ELECTRODE PAD

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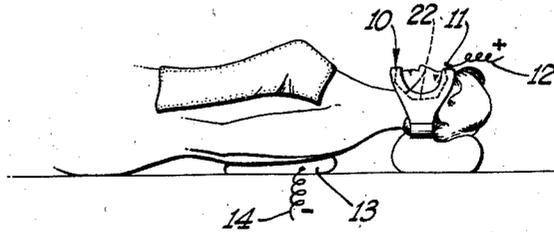


Fig. 1.

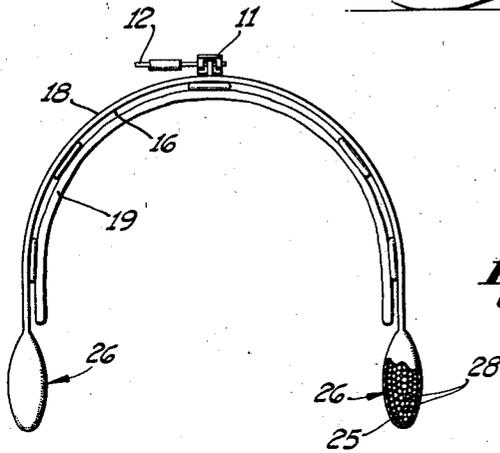


Fig. 2.

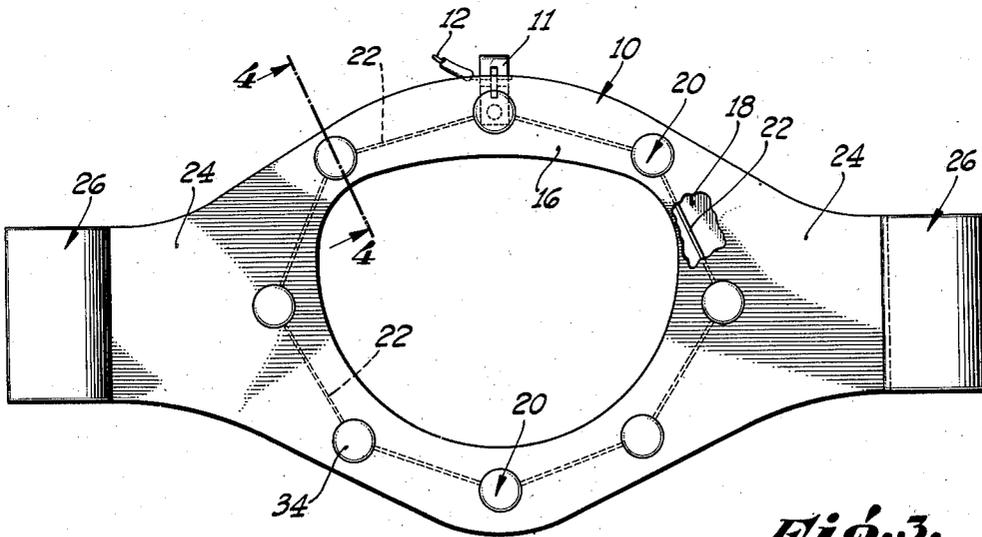


Fig. 3.

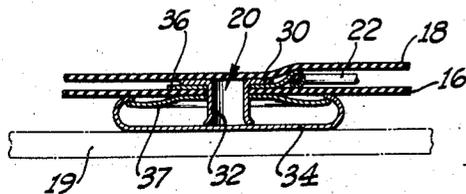


Fig. 4.

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# UNITED STATES PATENT OFFICE

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## ELECTRODE PAD

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Continuation of application Serial No. 430,215,  
February 10, 1942. This application filed May  
27, 1944, Serial No. 537,604

20 Claims. (Cl. 128—380)

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This application is a continuation of my co-pending application Serial No. 430,215, filed February 10, 1942.

My invention relates to electrotherapy, and has for its general object to provide improved means for administering such treatments, and particularly to provide means whereby electrotherapy may be combined with the application of compresses to exert beneficial effects upon the skin of the patient, as well as to facilitate the flow of electric current through the skin.

The application of electric current of low voltage and constant amperage to the human body for remedial purposes is well known, and to apply moist compresses to parts of the body such as the face in order to obtain beneficial effects upon the skin and subcutaneous tissues and muscles is also well known. I have discovered that a combination of the two different treatments gives particularly beneficial results and that they supplement one another.

The effect of the low voltage constant amperage current flowing through the body, as for instance from an electrode positioned on one side of the body to an electrode positioned on the opposite side, is stimulating to the blood circulation in the skin adjacent the electrodes and to the whole anatomy traversed by the current, provided, of course, that the voltage and amperage of the current are of proper value.

The effect of the current in passing through the skin adjacent the electrodes is to warm the skin and stimulate the circulation of blood through the capillary blood vessels. Since creases and wrinkles in the skin are in large measure due to poor condition of the skin, this stimulation of the circulation aids in restoring the tone of the skin, and when moistened cloths are pressed upon the skin over the same area during the electrical treatment, the reduction of such wrinkles, with stimulation of glandular action and cleansing of the pores of the skin is facilitated.

The treatment of the skin of the face is given by way of one example of the application of the invention, but it is to be understood that the invention is not limited to such use.

An object of the invention is to provide an improved means for applying electric treatments particularly to the facial areas of patients.

A further object of the invention is to provide an improved mask for application of "galvanic" or low tension direct current to the skin.

A still further object of the invention is to provide a simple and inexpensive yet efficacious mask of the kind referred to.

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It is also an object of the invention to provide a facial mask which serves both to facilitate the application of direct current electricity and low voltage to the face of a patient while at the same time acting to apply a compress to the face.

Another object of the invention is to provide a mask provided with weights acting both to hold the mask firmly upon the face of a patient and also to exert a smoothing or stretching effect on the skin of the face tending to aid in removing wrinkles and creases.

Still further features of the invention will hereinafter appear in the following description taken in conjunction with the accompanying drawings in which a preferred embodiment of the invention is shown by way of example. It is to be understood, however, that the scope of the invention is not limited in any way by this illustrative embodiment, but only by the scope of the appended claims.

In the drawings, in which identical numerals indicate identical parts,

Fig. 1 is a side view of a patient undergoing an electrotherapeutic facial treatment using the means of my invention,

Fig. 2 is an end view on an enlarged scale of the mask shown in Fig. 1, certain parts being shown in section,

Fig. 3 is a plan view of the means of my invention formed as a facial mask and opened out to lie in one plane with the side positioned in use next the patient's skin uppermost, and

Fig. 4 is a cross-section on the line 4—4 of Fig. 3.

While the different effects upon the skin and tissues of the electric current at the positive and negative terminals are not fully understood, the general effect of stimulation of the flow of blood through the small blood vessels of the skin, and the soothing and relaxation of the nerves and muscles in the area traversed by the current in its path from positive to negative electrode are generally conceded.

While I have shown the current as flowing into the mask and returning from the opposite side of the patient's head, I do not confine myself to arranging the apparatus for a particular direction of flow of the current, the best direction of flow being a matter which can be determined by experiment to determine the best results for the particular condition sought to be alleviated.

The particular characteristic of the current such as one of fluctuating value, or of various voltages and values of amperage is also a matter that can be chosen to afford the most benefit to

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the patient according to his particular condition.

In the drawings, 10 indicates a flexible member shaped by suitably cutting the material from which it is made so that it may closely follow the contour of the part of the body to be treated. In the embodiment of the invention shown, which illustrates a mask designed to treat the skin of the face, particularly that of the forehead, chin and cheeks, the flexible member is provided with a cutout portion leaving the eyes, nose and mouth of the patient clear, both for the comfort of the patient, and to enable the most beneficial effect to be obtained as will be more fully explained hereinafter.

The mask 10 is fitted with a clip or terminal 11 for the attachment of the positive lead 12 leading from a suitable source of power, not shown, such as a bank of electric batteries furnishing a direct current of suitable amperage and voltage. The current flows through conductors provided, as later described, in the mask 10, through the skin and tissues of the face, and leaves through a pad 11 under the patient's back to return to the source of electric power by the return lead 14 which is indicated as connected to the pad 13 which may have an electrically conductive surface such as of woven or braided metal wire cloth, or may be rendered sufficiently conductive by the covering thereof being kept in a moistened condition.

A piece of fabric or cloth 19, preferably cut out similarly to the mask 10, is positioned between the mask and the skin of the patient. This piece of material is of moisture absorbent material and serves an important purpose as will appear later.

The mask 10 is preferably formed by two pieces of material of identical contour, the inner layer 16 (Fig. 4) being of pliable nonconductive and water resistant material such as rubber, while the outer layer 18 may be of a tough and relatively heavy material serving to give body to the mask. I have found that woven asbestos cloth serves well for the purpose.

The inner and outer layers of the mask may be secured together, after assembly, in any suitable manner, as for instance by the use of an adhesive, or by stitching.

The electric current is led from the clip 11 through conductors 22, which are preferably made from insulated fine wire cable to obtain flexibility of the conductors, and positioned between the inner and outer layers of the mask to electrodes 20 (Fig. 4). These electrodes each comprise a head 30 arranged between the inner and outer layers of the mask, and a stem portion 32 passing through the inner layer 16 of the mask. A face 34 is mounted upon stem 32 to lie against the face of the inner layer next the skin of the patient. Washers 36 and 37 are arranged under the head 30 and face 34 of the electrode and serve to grip between them the inner layer 16 adjacent the stem, and to properly position the electrode. Washer 36, between head 30 and the inner layer 16, is provided with lugs for securing the ends of conductors 22, a similar washer being arranged in connection with clip 11. The specific construction of the electrodes described has been found to be satisfactory, but it will be evident that various changes in construction may be made therein.

The manner in which the electrodes are spaced and electrically connected is clearly indicated in Fig. 3 in which it will be seen that the electrodes are arranged in a ring around the cutout portion of the mask, the electrodes being linked together by lengths of conductor 22, but other arrange-

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ments of conductors and electrodes may be made that will assure a good distribution of the discharge from the electrodes into the material 19 positioned over the face of the patient, and which will supply all electrodes with electric current from clip or terminal 11.

The flexible member or mask is formed so as to secure an efficient contact of the electrodes and fabric over the areas to be treated and in addition to the flexibility obtained by reason of the cutout portion already described, is provided with laterally extending flaps 24 to which weights are attached. The weights may be of any desired form and arrangement, but the preferred construction is that shown in Fig. 2 and consists of pockets 25, provided for instance by leaving the outer and inner layers uncemented over a definite area and filling the space thus provided with lead shot, indicated by the numeral 28. The weight of the lead shot is made sufficient to not only draw the mask and moistened fabric evenly and firmly against the patient's face, but also to exert a pulling effect on the sides of the face and forehead tending to smooth and help to reduce wrinkles and creases in the skin. It will be noted that the mask around the cutout portion engages the sides of the face toward the jaw line, thus ensuring the application of pressure at the proper points to secure the aforementioned result.

The skin offers the greater portion of the resistance to the passage of the electric current and the moistened fabric element 19 serves to reduce this resistance by keeping the skin moist and to diffuse the electric current over the skin. In addition the fabric may carry medicinal lotions in themselves beneficial to the skin, and thus enhance the effectiveness of the treatment.

It has been found by actual practice that my invention provides a novel and beneficial electrotherapeutic treatment, but various modifications of the flexible element or mask, and variations in the type of electric current used, or in the values of voltages and amperages utilized may be made without departing from the scope of the invention as defined in the appended claims.

I claim:

1. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the mouth, nose and eyes of the patient, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable heat insulating material secured to said inner layer; an electric terminal secured to said outer layer; a plurality of electrodes spaced around said central aperture and overlying the chin, forehead and cheeks of the patient, said electrodes each comprising a head secured between said inner and outer layers, a stem extending through said inner layer, and a contact face mounted on said stem outside of said inner layer; flexible conductors disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and weights attached to the laterally extending flaps of said mask and adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

2. Means for applying electrotherapeutic

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treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the mouth, nose and eyes of the patient, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; electrode means disposed around said central aperture and overlying the chin, forehead and cheeks of the patient; flexible conductor means disposed between said layers connecting said electrode means in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and weights attached to the laterally extending flaps of said mask and adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

3. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the central portion of the patient's face, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; a plurality of electrodes spaced around said central aperture and overlying the chin, forehead and cheeks of the patient, said electrodes each comprising a head secured between said inner and outer layers, a stem extending through said inner layer, and a contact face mounted on said stem outside of said inner layer; flexible conductors disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and means adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

4. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the mouth, nose and eyes of the patient, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; a plurality of electrodes spaced around said central aperture and overlying the chin, forehead and cheeks of the patient, said electrodes each comprising a head secured between said inner and outer layers, a stem extending through said inner layer, and a contact face mounted on said stem outside of said inner layer; flexible conductors disposed between said layers connecting said electrodes in circuit with said terminal; and weights attached to the laterally extending flaps of said mask and adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

5. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having

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an enlarged central aperture exposing the central portion of the patient's face, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; a plurality of electrodes spaced around said central aperture and overlying the chin, forehead and cheeks of the patient; flexible conductors disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and weights attached to the laterally extending flaps of said mask and adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

6. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the central portion of the patient's face, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; electrode means disposed around said central aperture and overlying the chin, forehead and cheeks of the patient; flexible conductor means disposed between said layers connecting said electrode means in circuit with said terminal; and means adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

7. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the central portion of the patient's face, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; electrode means disposed around said central aperture and overlying the chin, forehead and cheeks of the patient; flexible conductor means disposed between said layers connecting said electrode means in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and weights attached to the laterally extending flaps of said mask and adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

8. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the mouth, nose and eyes of the patient, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; electrode means disposed around said central aperture and overlying the chin, forehead and cheeks of the patient, flexible conductor means disposed between said layers connecting said electrode means in circuit

with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and means adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

9. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the mouth, nose and eyes of the patient, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; electrode means disposed around said central aperture and overlying the chin, forehead and cheeks of the patient, flexible conductor means disposed between said layers connecting said electrode means in circuit with said terminal; and weights attached to the laterally extending flaps of said mask and adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

10. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, and having an enlarged central aperture exposing the central portion of the patient's face, said mask being provided with laterally extending flaps and comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said outer layer; electrode means disposed around said central aperture and overlying the chin, forehead and cheeks of the patient; flexible conductor means disposed between said layers connecting said electrode means in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and means adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

11. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; a plurality of electrodes on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto, said electrodes each comprising a head secured between said inner and outer layers, a stem extending through said inner layer, and a contact face mounted on said stem outside of said inner layer; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and laterally extending weighted flaps on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

12. Means for applying electrotherapeutic

treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; a plurality of electrodes on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and laterally extending weighted flaps on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

13. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; a plurality of electrodes on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto, said electrodes each comprising a head secured between said inner and outer layers, a stem extending through said inner layer, and a contact face mounted on said stem outside of said inner layer; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; and laterally extending weighted flaps on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

14. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; a plurality of electrodes on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; and laterally extending weighted flaps on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

15. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; electrode means on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto, said electrode means comprising a head secured between said inner and outer layers, a stem extending through said inner layer, and a contact face mounted on said stem outside of said in-

ner layer; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and laterally extending weighted flaps on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

16. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; electrode means on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and laterally extending weighted flaps on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

17. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; electrode means on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; and laterally extending weighted flaps on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

18. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; a plurality of electrodes on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto, said electrodes each comprising a head secured between said inner and outer layers, a stem extending through said inner layer, and a contact face mounted on said stem outside of said inner layer; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and means on said mask adapted to tension said mask evenly and firmly across the patient's face to insure

positive contact between said electrodes, absorbent layer and face respectively.

19. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; electrode means on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; a sheet of moisture absorbent material having a contour similar to that of said mask, positioned between said mask and the face of the patient; and means on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

20. Means for applying electrotherapeutic treatment which includes: a flexible mask adapted to overlie the patient's face, having aperture means exposing selected portions of the patient's face, said mask comprising an inner layer of pliable nonconductive water resistant material, and an outer layer of pliable material secured to said inner layer; an electric terminal secured to said mask; electrode means on said mask overlying the chin, forehead and cheeks of the patient and adapted to conduct current thereto; flexible conductor means disposed between said layers connecting said electrodes in circuit with said terminal; and means on said mask adapted to tension said mask evenly and firmly across the patient's face to insure positive contact between said electrodes, absorbent layer and face respectively.

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