June 3, 1969 F. H. KING 3,447,537

FACIAL MASK

Filed Oct. 31, 1967

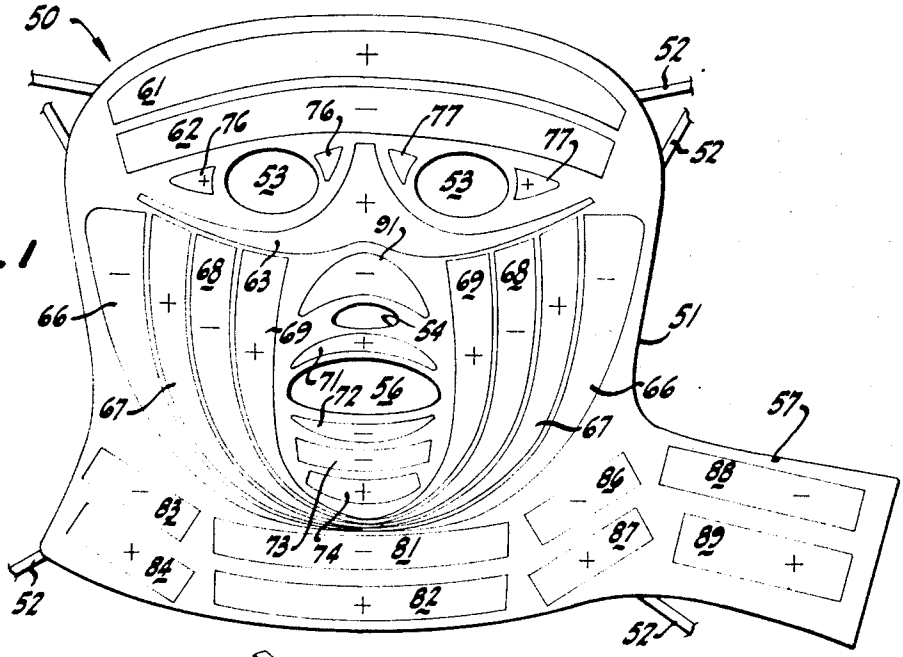


FIG-1

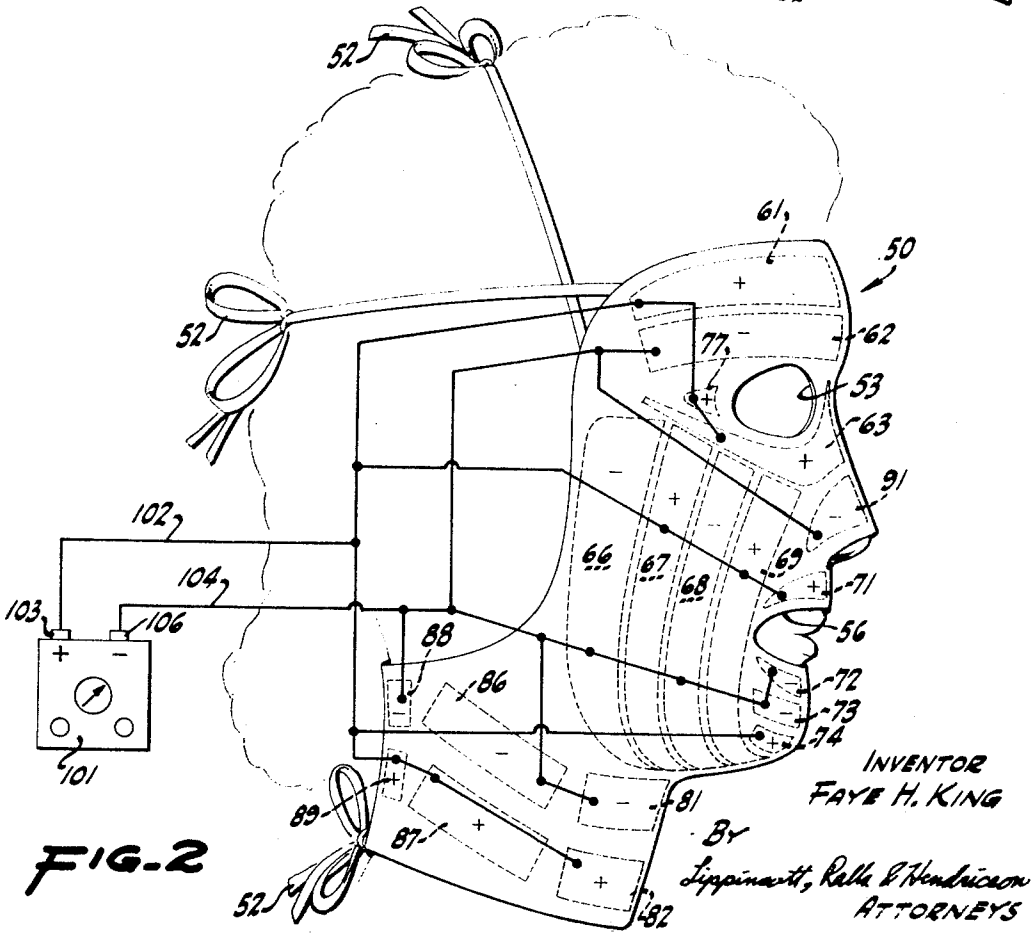


FIG-2

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United States Patent Office 3,447,537 Patented June 3, 1969

3,447,537

FACIAL MASK

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Continuation-in-part of application Ser. No. 385,257, July 27, 1964. This application Oct. 31, 1967, Ser. No. 679,439

Int. Cl. A61n 1/22

U.S. Cl. 128—410 4 Claims

ABSTRACT OF THE DISCLOSURE

The disclosure hereof comprises a mask adapted to be fitted upon the face and about the neck of a person and having flexible electrodes permanently disposed on the inner-mask surface in predetermined location. The electrodes of the mask hereof are so located that upon energization they serve to pass an electric current, preferably of a low frequency, longitudinally of facial muscles between points of origin and insertion thereof for the exercise and strengthening of such muscles to the end of improving physical appearance of the face.

This is a continuation-in-part of U.S. patent application Ser. No. 385,257, filed in the U.S. Patent Office on July 27, 1964, and now abandoned.

The present invention is related to the general field of cosmetics to the extent that it provides for a beautification of the face by the toning and strengthening of facial muscles to prevent and/or remove sagging, wrinkling and the like by muscular massage through electrical energization. Various conditions, including advancing age, commonly cause a loosening or sagging of facial muscles with the consequent wrinkling of the face; and it is generally considered that this detracts from physical appearance. This general problem has been attacked in a variety of ways, including a multitude of different cosmetic preparations. Attempts have also been made to employ electrical energization for establishing muscular contracts, and this approach to the problem has generally been directed to the application of electrical energization to nerve centers. While it has been found that this latter approach may be satisfactory for certain portions of the body, it is quite ineffectual for the exercise and strengthening of facial muscles. Extensive tests have, in fact, shown that such an approach often results in the sagging of facial muscles rather than a strengthening and tightening of same so as to produce opposite results from those desired.

The present invention provides for the electrical energization of facial muscles longitudinally thereof as between points of origin and insertion of such muscles. The invention hereof comprises a mask, or the like, adapted to be placed over the face of the user and secured about the head, so as to firmly be anchored into position. This mask is made of a soft material such as some type of cloth that is contoured so as to readily fit upon the face, and is provided upon the inner surface thereof with pliant electrodes generally of substantial extent which are so located as to lay in desired relationship to facial muscles with the mask in position. Additionally, the mask itself is provided with electrical connections from the aforementioned electrodes, such that electrical energization of the electrodes may be accomplished from an external source.

The present invention employs very small currents at relatively low frequencies, as well as zero frequency, as may be supplied, for example, by the oscillating apparatus disclosed and claimed in U.S. Patent No. 2,550,016. Although the invention is not limited to utilization with the above-noted apparatus, the following description is, at least in part, referenced to energization obtainable therewith.

A single preferred embodiment of the present invention is illustrated in the accompanying drawings wherein:

FIGURE 1 is a plan view of a mask in accordance with this invention; and

FIGURE 2 is a side view of the mask of FIGURE 1 in position upon the head of a person.

Considering now a preferred embodiment of the present invention and referring to the drawings, it will be seen that there is provided hereby a mask **50** formed of flexible outer material, or cover **51**, such as a cloth, or the like, appropriately formed to fit over the face of a human being and adapted to fit about the head thereof so as to be maintained in fixed relation to such face. This mask cover carries a plurality of pliant electrodes on the inner surface thereof, as discussed further below. It is to be particularly noted that the electrodes of the mask are maintained in fixed relationship to the mask cover, and, consequently, are disposed in predetermined fixed relationship to the face and neck of a person upon which the mask is secured. This, then, obviates certain prior art problems of locating electrode placement. Although the prior art teaches electrical energization of the face for cosmetic purposes, it is conventional for such energization to be related to nerve centers. Numerous prior art devices provide a hand-held unit incorporating a pair of electrodes adapted to be placed at various locations upon the face; however, these universally suffer from the disadvantage of requiring the user to properly locate the hand-held device upon the face. Even those prior art devices providing a mask apparently proceed upon the theory of electrical energization at nerve centers rather than the application of electrical energization longitudinally of particular facial muscles, as provided in the present invention. It is particularly noted that improper location of electrodes upon the face may well cause a loosening and sagging of facial muscles. The present invention overcomes these difficulties of the prior art by the provision of electrodes in position to longitudinally exercise facial muscles by the passage of electric current therethrough and insuring that the electrodes are so positioned. This invention follows the teaching of my above-noted copending patent application and provides the improvement therein of guaranteeing proper and permanent electrode location during exercise of facial muscles.

Considering now the mask in somewhat greater detail and referring again to the drawings, there will be seen to be provided as an exterior portion, or cover **51**, of the mask a flexible electrically nonconducting material such as a durable cloth, or the like, which is formed to fit onto and about the face of a person and having a plurality of ties, or gripping means, **52** adapted to extend about the head and neck of the person, as shown, for example, in FIGURE 2 for securing the mask in fixed position in overlaying relationship to the user's face. As previously stated, the cover, or outer portion of the mask, is contoured to fit the face, as by being formed of an appropriately deformable material, or by being formed of segments of material such as cloth joined together, so as to have a three-dimensional configuration for snugly fitting the face. It is not necessary for the mask itself to extend completely over and about the head of the user, for the ties, or joinder means, **52** are adequate to maintain the mask in desired position on the face. Preferably this cover, or outer surface **51**, is also provided with a number of openings to the eyes, nose and mouth. Thus, there are shown eye openings **53**, nostril openings **54** and a mouth opening **56**. The mask is adapted not only to fit over the face of the user, but also to extend about the neck underneath the chin, and thus may include a tab **57** extending from one lower side of the mask for disposition

about the back of the neck of the user. It is to be appreciated that the joinder means **52** may be comprised as tie strings, or any of a variety of adjustable engaging members such as, for example, materials with "self-zipper" action.

Upon the interior surface of the mask cover **51** there is fixedly disposed a plurality of flexible electrodes illustrated in both FIGURES 1 and 2 as to size, location and polarity of energization. In this latter respect each of the electrodes is shown with either a plus or minus mark indicating relative polarity of energization; and it is to be appreciated that in accordance with the present invention, the polarities of all of the electrodes may be reversed and yet accomplish the objects hereof. The individual electrodes of the mask are hereinafter described with respect to location upon the mask and subsequent relation to facial muscles of a person upon which the mask is adapted to be employed. At the top of the mask there are provided two elongated generally horizontal electrodes **61** and **62** which are to be seen in FIGURE 2 to extend across the forehead and to thus be displaced longitudinally of the occipito-frontalis muscle generally extending upwardly from the eyebrows into the forehead. These electrodes **61** and **62** are adapted to be energized with opposite polarities, so as to thereby longitudinally exercise the above-noted muscles in the forehead of the user. Beneath the electrode **62** there is provided an elongated electrode **63** curving underneath the eye openings **53** in the mask and extending upwardly therebetween, while at the same time extending well laterally of these eye openings. This electrode **63** is adapted to be maintained at a polarity opposite to that of the electrode **62**, so as to, at least in part, further energize the occipito-frontalis muscle extending between the eyes down into the upper portion of the nose. Beneath the electrode **63**, and out of contact therewith, there is provided a plurality of generally U-shaped electrodes disposed one within the other, so as to extend underneath the chin of the user from a region adjacent the lateral lower terminus of the nostrils to high on the cheekbone immediately forward of the ear. Location of these electrodes, illustrated as being the four electrodes **66**, **67**, **68** and **69**, is best seen in FIGURE 2, at least with respect to their ultimate disposition relative to the face of the user having the mask affixed in position. In position, these electrodes will be seen to curve gently from the upper regions of the cheekbone down beneath the jaw and under the chin back up to the upper portion of the opposite cheekbone. The electrodes **66** to **69** are adapted to be energized with alternate polarity, as indicated in FIGURE 1. These electrodes **66** to **69**, upon energization, operate to pass an electric current generally longitudinally through the zygomaticus muscles and masseter muscles which extend diagonally to the orientation of these electrodes on the face. Also, the risorius muscle is energized longitudinally by these electrodes.

The foregoing electrodes **66** to **69** extend somewhat in a U-shape about the front of the face and, within the area generally defined by the inner electrode **69**, there are disposed a first pair of small transverse electrodes **71** and **72** disposed one above and one below the mouth opening **56**. These small electrodes **71** and **72** are adapted to be energized with a small voltage of opposite polarity to thereby cause a current to flow longitudinally through muscles about the mouth. A second pair of small transverse electrodes **73** and **74** is disposed beneath the lower electrode **72** described above for ultimate disposition across the front of the chin of a user, as indicated in FIGURE 2. These electrodes **73** and **74** are also adapted to be energized with a low voltage of opposite polarity, so as to thereby pass an electric current longitudinally through muscles which extend downwardly from the mouth under the chin and including the depressor anguli oris. For particular applications two additional pairs of electrodes **76** and **77** may be provided, with one pair adjacent each of the eye openings **53** in the mask. The electrodes of the pair **76**, for example, may be formed as small crescents disposed on opposite sides of an eye opening **53** in the mask and energized with a low voltage of opposite polarity so as to cause a small electric current to flow about the eye for longitudinal energization of the obicularis oculi muscles.

In addition to the electrodes of the mask hereof which are adapted to be located upon the face itself when the mask is secured to the head of the person using the invention, provision is also made herein for simultaneous exercise of neck muscles. The same basic approach is followed with respect to the neck muscles in that the electrodes are secured in fixed position to the inner surface of the mask cover **51**, and are particularly located so as to pass an electric current longitudinally through particular muscles of the neck. Thus a pair of laterally extending electrodes **81** and **82** is provided beneath the center of the outermost U-shaped electrode **66** for extension across the front of the neck beneath the chin, as indicated in FIGURE 2. The electrodes **81** and **82** are adapted to be energized with the low voltage of opposite polarity, so as to thereby cause a small electric current to flow longitudinally of the neck in the front thereof for properly exercising the platysma muscle. Additional electrodes for exercising of neck muscles may be provided in the form of a first pair of electrodes **83** and **84** extending generally laterally of the mask from one end of the pair **81** and **82** and a second pair of electrodes **86**, **87** extending generally laterally of the mask from the opposite end of these front neck electrodes **81**, **82**. The electrodes of each of the pairs **83**, **84** and **86**, **87** are adapted to be energized with voltages of opposite polarity, as indicated in FIGURE 1, so that upon placement of the mask in position, as shown in FIGURE 2, these electrodes will then serve to pass a small electric current longitudinally of the neck along the side and a portion of the rear thereof. This, then, serves to properly exercise neck muscles in this area of both sides of the head, including the trapezius muscle and the rear portion of the platysma muscle. One further pair of electrodes **88**, **89** may be provided upon a tab **57** extending laterally from one side of the mask near the bottom thereof, so as to be located across the back of the neck of the user when the mask is in position. The electrodes of this pair **88**, **89** are also adapted to be energized with voltages of opposite polarity so as to cause an electric current to flow longitudinally of the neck behind the head to properly exercise the muscles thereof.

It is to be appreciated that the present invention provides means for exercising facial and neck muscles by the passage of a low-voltage and low-current signal, preferably of low frequency, longitudinal through such muscles and, furthermore, provides for the proper and necessary placement of electrodes to accomplish the foregoing. The invention provides for proper operation upon all of the facial and neck muscles of particular importance in cosmetics, and insures the appropriate electrode positioning for proper exercise of such muscles by the provision of a mask having the above-described electrodes. It is noted that an additional electrode **91** may be provided immediately above the nose opening **54** in the mask for extension across the top of the outer end of the nose. This electrode **91** is maintained at the opposite potential from the electrode **63** so as to thereby cause a small electrical current to flow longitudinally of the nose. It is not attempted in the present description of the invention to positively identify each and every facial muscle, although notations are made as to at least certain muscles operated upon by the invention. There are, however, additional facial muscles which are properly exercised by the passage of electric current longitudinally therethrough, such as, for example, the levator labii superioris alaeque nasi extending from beneath each of the eyes to the base of the nostrils.

There have been described above the physical configuration of the mask **50** of this invention and the electrodes therein. The foregoing description also notes relative

polarities of electric energization of the identified electrodes. In practice, this electrical energization is obtained from a suitable power supply such as that set forth in the above-noted U.S. patent. Such apparatus is schematically illustrated at **101** of FIGURE 2 as having a single positive and negative terminal, although it is to be appreciated that a plurality of different positive and negative terminals may be provided for the purpose of supplying electrical energization at different amplitudes. It is only for the purpose of simplified illustration and description that the low-voltage and low-frequency power supply **101** is illustrated to have but one pair of terminals.

Electrical connections to the individual electrodes of the masks are only schematically illustrated in FIGURE 2. An electrical lead **102** is shown to extend from the positive terminal **103** of the power supply to electrodes **61, 63, 67, 69, 71, 74, 80, 82, 84, 87, 89** and also extends to one of the electrodes of each pair **76** and **77**. The electrical connections may be disposed on the outer surface of the mask **50** with connections extending through the mask to the side of the electrode adjacent the mask material. For purposes of appearance, it is further possible to cover these electrical connections so that the exterior of the mask has a relatively pleasing appearance. In like manner, another electrical connection **104** is shown to extend from a negative terminal **106** of the apparatus to the remaining electrodes of the mask for applying a negative energization thereto.

It is not attempted in FIGURE 2 to illustrate a preferred physical location of the electrical connections, but, instead, the illustration is intended to only identify the electrical energization of the separate electrodes. It is furthermore to be noted that it is advantageous to be able to apply different levels of energization to different electrodes. The foregoing illustration and description of a single like energization of each positive electrode, for example, are only provided for the purpose of simplification; and it is contemplated that stronger energization shall be available for certain muscles such as, for example, the jaw and neck muscles. This can be readily accomplished by providing more than one circuit with the separate circuits being connected to separate positive terminals of the power supply or, alternatively, adapted for successive connection to the positive terminal whereat the output may be varied.

It is to be noted that the present invention provides a mask adapted to be firmly secured upon the face of a user to thereby locate the integral, flexible electrodes on the interior surface of the mask in proper position upon the face, so that with energization of these electrodes there will be accomplished longitudinal exercise of the muscles of the face. It is particularly emphasized that the present invention requires the passage of electrical energy, preferably of a low-frequency, longitudinally between origin and insertion of facial muscles, so as to thereby exercise these muscles for strengthening and tightening them. Such muscle exercise then produces the beneficial result of toning the facial muscles to reduce and eliminate sagging and wrinkles. By the provision of a mask containing the electrodes, as described above, the user need not resort to charts or descriptions of appropriate electrode locations for carrying out the invention. Instead, it is only necessary to secure the mask about the head with the eye, nose and mouth openings in appropriate positions and to connect the electrical leads **102** and **104** to an appropriate, very low-voltage, low-frequency power supply. The user may then relax and allow the invention to perform its intended function of strengthening the facial muscles. Normally,

the present invention would not be utilized for extended periods of time, but, instead, would be employed for relatively short periods which may be repeated at frequent intervals, if desired. Not only is the present invention adapted to correction of the condition of sagging facial muscles and wrinkles but also to the maintenance of muscle tone, so as to prevent occurrence of these undesirable conditions. There is achieved a marked cosmetic advantage through the use of the present invention, and, additionally, the general health as related to facial muscles is improved hereby.

That which is claimed is:

1. A facial mask comprising a flexible cover contoured to fit a human face and having at least eye and nose openings with means for removably affixing the mask on a human head, said cover also including a neck portion extending at least along the neck beneath the jaw at each side of the face portion, a plurality of flexible electrodes affixed to the inside surface of said cover and including a pair of vertically spaced and transversely elongated forehead electrodes extending over the eye openings in said cover, and a plurality of nested U-shaped electrodes extending from beneath the eye openings beneath said mouth opening and under the chin contour of the cover, and electrical connections extending from said electrodes and connected in at least two circuits adapted for energization with opposite polarity voltage, the two forehead electrodes being connected in circuits of opposite polarity and adjacent electrodes of said plurality of U-shaped electrodes being connected in separate circuits of opposite polarity, and at least neck and adjacent facial electrodes being simultaneously energized.

2. The mask of claim **1** further defined by the neck portion of said cover including an elongated lateral tab, and said electrodes including at least two vertically spaced transverse electrodes on said neck portion and tab for placement on the neck and about same, said vertically spaced electrodes being connected in separate circuits of opposite polarity.

3. The mask of claim **2** further defined by said electrodes including an electrode extending transversely of said cover beneath the two eye openings and above the upper ends of said U-shaped electrodes, and connected in a circuit of different polarity than the lower of the forehead electrodes.

4. The mask of claim **3** further defined by said plurality of electrodes including a pair of small transverse electrodes between the mouth openings and chin contour and connected in separate circuits of opposite polarity, a pair of small transverse electrodes disposed one above and one below the mouth openings in said cover and connected in circuits of opposte polarity, and a small electrode disposed on the nose contour immediately above the nose opening and connected in a circuit of opposite polarity to that of the transverse electrode beneath the eye openings.

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WILLIAM E. KAMM, *Primary Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,447,537 June 3, 1969

Faye H. King

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

In the heading to the printed specification, lines 3 to 5, cancel "Glen Ellen, Calif., assignor to Societa Internazionale Fonovisione S.p.A., Milan, Italy, a corporation of Italy" and insert -- 938 Horn Ave., Box 297, Glen Ellen, Calif. 95442 --.

Signed and sealed this 14th day of April 1970.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents