M. H. SHOENBERG.

ELECTRICALLY HEATED SYRINGE.

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1,026,611.

Patented May 14, 1912.

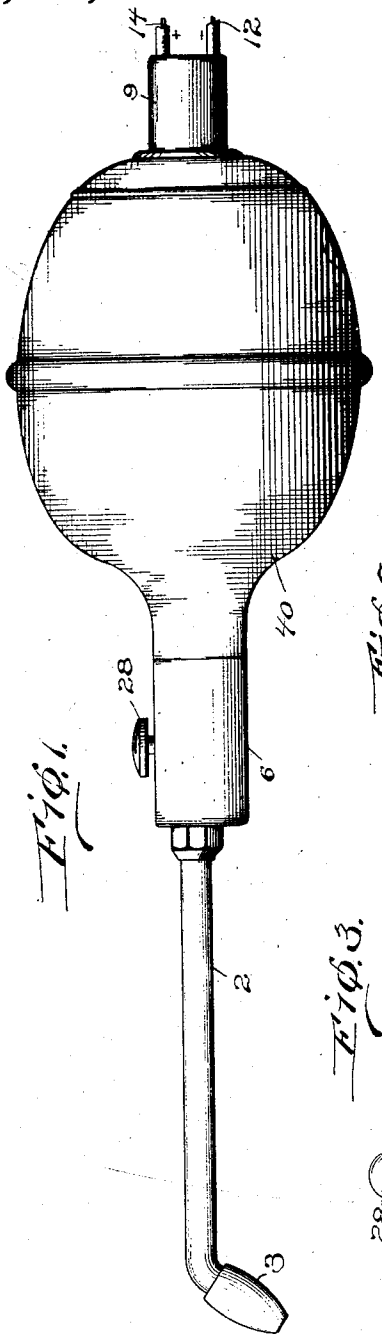

Fig. 1.

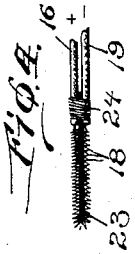

Fig. 4.

Fig. 3.

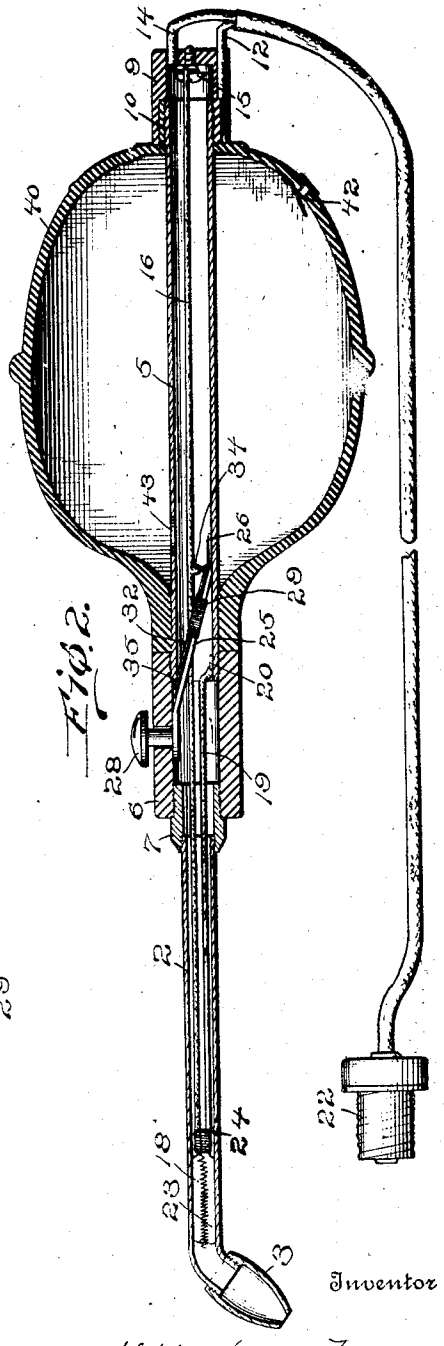

Fig. 2.

Witnesses

J. N. Fowler Jr.

R. S. Trogner.

Inventor

M. H. Shoenberg

By Eugene C. & Brown

Attorney

UNITED STATES PATENT OFFICE.

MILTON H. SHOENBERG, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE PRESTO ELECTRICAL MANUFACTURING COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

ELECTRICALLY-HEATED SYRINGE.

1,026,611. Specification of Letters Patent. Patented May 14, 1912.

Application filed March 6, 1912. Serial No. 682,008.

To all whom it may concern:

Be it known that I, MILTON H. SHOENBERG, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Electrically-Heated Syringes, of which the following is a specification.

My invention relates to hot-air syringes in which the air flowing through the discharge nozzle passes over an electrically heated coil, and is especially adapted for use by dentists and surgeons. In instruments of this type, it is desirable that the heated air should be of a uniform temperature and also that the heating element should be under the direct control of the operator. It is also desirable that the heat should be concentrated near the nozzle in order that the heating effect may be felt immediately and that the other portions of the instrument which are liable to contact with the face or body of the patient may not become hot.

It is the purpose of my invention to embody the advantageous features above mentioned, and to provide a syringe which will remain in a predetermined position in the hand of the operator when the bulb is manipulated, and will not be liable to shift from one side to the other. I also provide means for avoiding any sparks at the electrical contacts, so that the instrument may be connected to the ordinary lighting circuits.

Other objects will be manifest from the following description, in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of an instrument embodying my invention; Fig. 2 is a longitudinal section thereof; Fig. 3, is an enlarged detail view of the spring contact arm; and Fig. 4 is an enlarged detail view of the electric heater.

The nozzle tube 2, carrying the nozzle 3, and the brass or other metal current-carrying stem 5 are secured rigidly together by a hard-rubber or other insulating bushing 6, the tube 2 being preferably connected by means of a nut 7. A hard-rubber or other insulating bushing 9, is fastened to the outer end of the stem 5, by means of an inner threaded metal ring 10, to which one of the electric conductors 12 is secured. The other conductor 14, passes through an aperture in the end of the bushing and is fastened under the head of a screw 15, to which one end of the insulated conductor 16, leading to the heater 18, is secured, the return heater conductor 19 being soldered or otherwise connected at 20 to the metal stem 5, thus forming a complete circuit through the heater when the plug 22 is inserted in a socket of the electric lighting system or other source of electricity.

The electric heater is placed in the end of the nozzle tube, adjacent the nozzle 3, so that the effect of the heated coil will be felt at once upon the air discharged through the nozzle. I construct the heater of a continuous fine resistance wire coil which is doubled upon itself, the two sections being separated by means of a mica or other insulating septum 23, which may be secured by means of a binding cord 24. The mica separating member not only serves to insulate the two parts of the heater coil, but also serves as a heat-insulating support to maintain the heater at an intermediate point between the walls of the nozzle-tube and prevent the possibility of contact therewith, which is quite important.

I preferably make the heater coil of comparatively low resistance, and connect an incandescent lamp in series therewith when operating upon a lighting circuit. There is, therefore, no danger of the heating coil being burned out. If the circuit is broken in a circuit having as high a voltage as is found upon a lighting circuit, destructive sparking occurs which will rapidly destroy the switch contacts. For the purpose of avoiding this, I prefer to arrange the switch in the instrument to short-circuit the heater coil through a shunt path instead of actually breaking the circuit. For this purpose, I have shown the spring-arm 25 of the switch soldered or otherwise fastened to the inner wall of the tube 5 at 26, and carrying a hard-rubber or other press-button 28 at its

free end, the shank of the button passing through an aperture in the bushing. Fastened to the spring-arm 25, by means of a binding-cord 29, or otherwise, but insulated therefrom by a mica or other strip 30, is a metal strip 32, which is connected at one end by means of a flexible wire 34 to the conductor 16, and at the other end is adapted to be normally held in contact with the end of the tube 5 at 35. It will thus be observed that normally the metal strip 32 forms a short-circuit between conductor 16 and the current-carrying stem 5, thus shunting the current away from the heater-coil 18. By depressing the press-button 28 with the finger, the contact at 35 will be broken, and the current will flow through the heater by way of the conductors 16, 19, and the stem 5. Inasmuch as the current is not interrupted when the contact strip 32 is depressed by the button 28, but is merely shifted through another path in the instrument, there can be no sparking at the contact 35. It will be observed that the path of the current through the switch is entirely by way of the contact strip 32, and not through the spring 25. When the instrument is connected to a low voltage battery, so that the sparking upon the breaking of the circuit is of no consequence, I prefer to arrange the switch in series with the circuit, instead of in shunt as just described.

As I have previously pointed out, it is important that the nozzle should remain steadily in one position in the hand of the operator when it is being manipulated, so that he may accurately direct the discharge of the air current. When the rubber bulb is attached to the end of the stem, as is usual, the nozzle stem is shifted laterally with every movement of the bulb in deflation or inflation. For the purpose of obviating this defect, I pass the stem 5 entirely through the rubber bulb 40, one end bearing against the end of the intermediate bushing 6, and the other end being pressed firmly by the outer bushing 9 which is screwed against it. Each end of the bulb is thus positively supported and held by the stem 5 which serves as the central axis and prevents the bulb from shifting to one side when it is being deflated and maintains the instrument in the same position in the hand of the operator. The bulb may be provided with an inlet valve 42, and the air is forced through the opening 43 into the hollow stem from whence it passes into the nozzle tube. By means of the finger button 28, the operator may instantly control the air passing through the instrument, making it either warm or cool at will.

I have described in detail the construction illustrated in the accompanying drawings for the purpose of disclosing an embodiment of my invention, but I am aware that changes may be made therein, without departing from the spirit of my invention, and I aim to cover such modifications in the appended claims.

I claim:—

1. An electrically heated syringe, comprising a nozzle tube, an elastic bulb connected therewith, and an electric heating element in said tube comprising a spiral resistance wire doubled upon itself and an insulating septum interposed between the portions of said spiral wire and separating the heater from the opposite walls of the tube.

2. An electrically heated syringe, comprising a nozzle tube, a hollow stem, an insulating bushing intermediate said tube and stem, an elastic bulb surrounding said stem, a bushing threaded to the other end of said stem and provided with electrical contacts, an electric heating coil in said tube, and conductors connecting said coil and said contacts.

3. An electrically heated syringe, comprising a nozzle tube, a hollow stem, an insulating bushing intermediate said tube and stem, an elastic bulb surrounding said stem, a bushing threaded to the other end of said stem and provided with electrical contacts, an electric heating coil in said tube, conductors connecting said coil and said contacts, and a switch member within said stem having a push-button projecting through an aperture in said intermediate bushing, said switch member being arranged to interrupt the flow of current from said conductors to said heating coil.

4. An electrically heated syringe, comprising a nozzle tube, a hollow metal stem provided with a lateral aperture, an insulating bushing connecting said tube and said stem, an elastic bulb surrounding said stem, a bushing threaded to the outer end of said stem, an electric heating coil in said tube, conductors passing through said end bushing, means connecting one of said conductors to said stem, a wire connecting the other conductor with one terminal of said coil, and a wire connecting the other end of said coil with said stem.

5. An electrically heated syringe, comprising a nozzle tube, a hollow metal stem provided with a lateral aperture, an insulating bushing connecting said tube and said stem, an elastic bulb surrounding said stem, a bushing threaded to the outer end of said stem, an electric heating coil in said tube, conductors passing through said end bushing, means connecting one of said conductors to said stem, a wire connecting the other conductor with one terminal of said coil, a wire connecting the other end of said coil with said stem, and a spring-pressed

switch member within said stem having a push-button projecting through an aperture in said intermediate bushing, said switch member being arranged to normally interrupt the flow of current from said conductors to said heating coil.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MILTON H. SHOENBERG.

Witnesses:
LEWIS ADELSDORFER,
M. MEAGHER.