

(No Model.)

2 Sheets—Sheet 1.

M. W. HOLLINGSWORTH.
APPLIANCE FOR BLEACHING TEETH.

No. 574,033.

Patented Dec. 29, 1896.

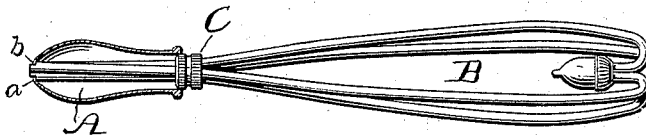
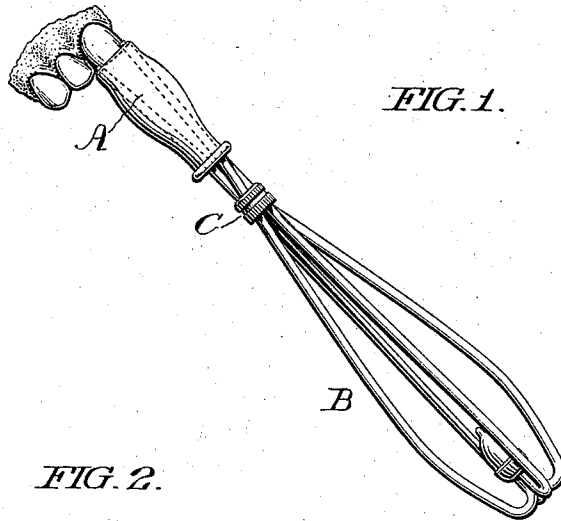


FIG. 3.



FIG. 4.

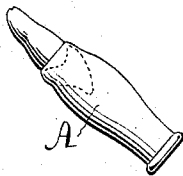
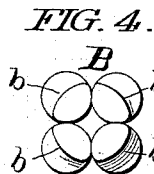
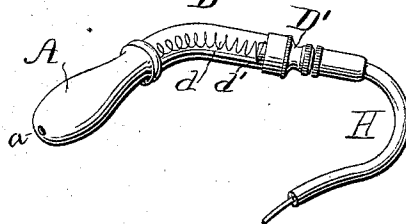


FIG. 6. D



WITNESSES:

Robt. E. Gordon
Edw. P. Simpson, Jr.

INVENTOR:

M. W. Hollingsworth
By Atty J. Peyton.

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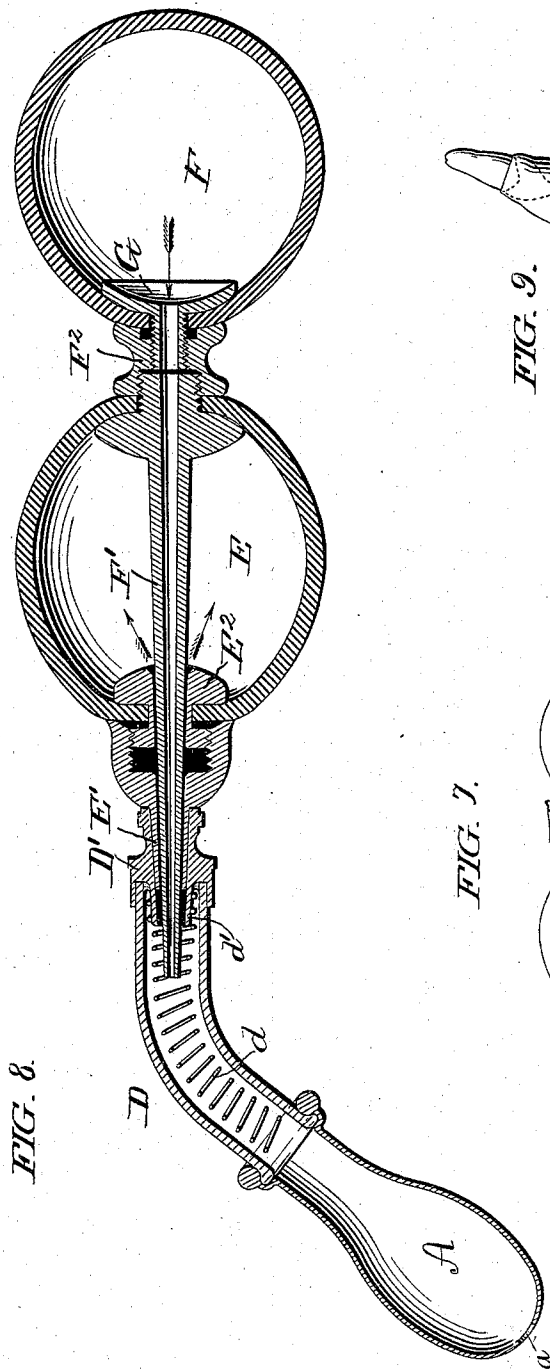


FIG. 8.

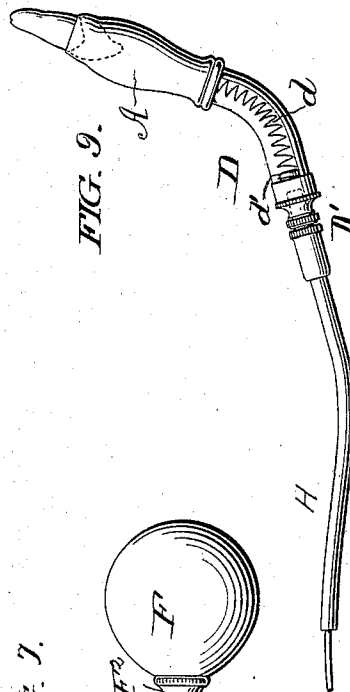
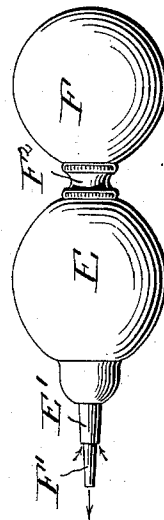


FIG. 9.

FIG. 7.



WITNESSES:
Theodore B. Voile
Edw. P. Simpson, Jr.

INVENTOR:
M. W. Hollingsworth
By atty J. C. Peyton.

UNITED STATES PATENT OFFICE.

MERRILL W. HOLLINGSWORTH, OF PHILADELPHIA, PENNSYLVANIA,
ASSIGNOR TO THE S. S. WHITE DENTAL MANUFACTURING COM-
PANY, OF SAME PLACE.

APPLIANCE FOR BLEACHING TEETH.

SPECIFICATION forming part of Letters Patent No. 574,033, dated December 29, 1896.

Application filed October 17, 1896. Serial No. 609,207. (No model.)

To all whom it may concern:

Be it known that I, MERRILL W. HOLLINGSWORTH, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in the Method of Bleaching Teeth and in Appliances Therefor; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the treatment of natural teeth with suitable liquid, so as to bleach them, and thus impart the proper color to teeth which have become so discolored as to present unsightly contrast with adjacent teeth in the mouth; and my improvements consist, as hereinafter specifically claimed, in a novel method of applying the bleaching liquid and in certain devices employed in carrying out the improved method.

In the accompanying drawings, Figure 1 is a view in perspective, showing the manner of applying a liquid-holder to a tooth. Fig. 2 is a longitudinal view showing the liquid-holder in section with the device by which it is expanded engaged therewith preparatory to expanding the orifice of the holder for adjusting it to a tooth. Fig. 3 is a view of one end of the holder-expander. Fig. 4 is a view of the opposite end of the expander, enlarged; and Fig. 5 shows the liquid-holder as applied to a tooth. Fig. 6 is a view in perspective, showing the liquid-holder as connected with a conductor of electricity. Fig. 7 is a longitudinal view of a compound syringe by which air is exhausted from the holder when engaged with a tooth and the bleaching liquid injected into the holder so as to be confined in contact with the tooth. Fig. 8 is a longitudinal sectional view, on an enlarged scale, showing the liquid-holder, a connecting-tube inclosing a conductor of electricity, and the syringe connected with the tube. Fig. 9 shows the liquid-holder as applied to a tooth and engaged by the connecting-tube with its electrical conductor.

A nipple-like holder A, of rubber, for containing a suitable bleaching liquid and confining it in contact with a tooth is open at one

end and has a small orifice *a* in its opposite end. In order to expand the orifice of the liquid-holder to adapt it to be clasped about a tooth in the mouth, I provide an expander B, consisting of a plurality of wire arms, (four are in this instance shown,) which are untied at their inner or rear ends and bent and extended forward in slightly curved or bowed form, so as in normal condition to come in contact at their front or outer ends, as represented in Fig. 4. A ring or short sleeve C embraces the expander-arms and is adapted to slide upon them. The front ends or points of the expander-arms are reduced by cutting them away for a portion of their thickness, and shoulders *b* are thus provided upon the outer surfaces of the arms adjacent to their points or free ends.

To adjust the holder to a tooth, the expander-points are inserted into the holder and engaged with the orifice thereof, as shown in Fig. 2, the slide C having been properly adjusted to hold the points closed or in contact with each other. The shoulders of the points facilitate their adjustment by preventing them from readily extending too far through the orifice of the holder. By sliding the sleeve backward upon the expander-arms they are caused to lap each other and spread apart (see Fig. 1) far enough to expand the orifice to the extent required to fit about the tooth to be treated. The expander is withdrawn from the holder after it is engaged with a tooth, and the holder is then worked into proper position upon the tooth by the fingers. (See Fig. 5.) In this way the holder may readily be applied with but little trouble.

A connecting-tube D, best made of glass and preferably bent or curved, as shown, to facilitate the introduction of the bleaching liquid, as in turn to be explained, contains an electrical conductor (coiled platinum-wire) *d*, secured to the boss *d'* of a tubular socket-cap D', of brass, which is fitted to one end of the tube. The end of the connecting-tube opposite that provided with the tubular cap is adapted to be connected with the liquid-holder, which may readily be expanded about it so as to make a tight connection.

In order to exhaust the air from the liquid-

holder after it is applied to a tooth and to then supply the holder with the bleaching liquid, a peculiar compound syringe is provided, as now to be described.

5 The syringe is provided with an exhaust-bulb E and an injection-bulb F. The exhaust-bulb E is connected with the rear end of a suction-nozzle E' by means of a coupling E², and this suction-nozzle is adapted to fit in
10 the socket-cap D' of the connecting-tube D. (See Fig. 8.) The injection-bulb is secured to a liquid-discharge nozzle F', which passes through the exhaust-bulb and its nozzle E' and projects beyond the outer end or point of the
15 latter. The two bulbs are connected together by means of union-piece F², coupling G, and nozzle F'. The suction-nozzle E' communicates only with the exhaust-bulb, and the discharge-nozzle F' communicates only with the
20 injection-bulb. The inlet to the exhaust-bulb is by way of the space provided between its nozzle and the discharge-nozzle F', which it surrounds.

In operation, assuming the bleaching-liquid holder to be in place upon a tooth, the connecting-tube D secured to this holder, and the injection-bulb supplied with a suitable quantity of some proper bleaching liquid, (preferably a twenty-five per cent. aqueous solution
30 of pyrozone,) which may be drawn in through the nozzle in the usual way, the exhaust-bulb is compressed to expel the air therefrom, and while so compressed the nozzle E' of the syringe is inserted into the socket of the cap of the connecting-tube. Upon relieving the exhaust-bulb of pressure the air is exhausted
35 from the liquid-holder, and then by compressing the injection-bulb liquid is forced therefrom into the holder and confined in contact
40 with the tooth being treated. The syringe is next detached from the connecting-tube and the coupling-plug of an electrical conductor inserted in the socket of the connecting-tube cap.

45 By this treatment the bleaching liquid is electrically energized, it being of course understood that the negative electrode of the circuit is in suitable contact with the person whose tooth is being treated, and a current
50 of electricity is caused to pass through the tooth. By this method the time required to

properly treat the tooth is much less than would be required were electricity not employed.

After completing the bleaching process the liquid may be withdrawn from the holder upon the tooth into the bulb F by a manipulation of this bulb the reverse of that required to charge the holder with the fluid, as will readily be understood.

Obviously my improved devices may advantageously be employed for obtunding sensitive teeth by the substitution of a suitable liquid obtundent for the bleaching liquid.

I claim as my invention—

1. The hereinbefore-described method of bleaching teeth, which consists in applying to a tooth in the mouth a holder for bleaching liquid, exhausting the air from the holder, charging the holder with bleaching liquid, and causing a current of electricity to pass through the tooth, substantially as set forth.

2. In a device applicable to use for treating teeth, the liquid-holder expander consisting of the connected, curved or bowed arms having the shouldered points and provided with the slide, substantially as set forth.

3. In a device applicable to use for treating teeth, the combination of the connecting-tube provided with the metallic socket-cap, and the conductor within the tube and connected with its cap, substantially as and for the purpose set forth.

4. In a device applicable to use for treating teeth, the combination of the liquid-holder, adapted for application to a tooth, and the connecting-tube provided with the socket-cap and conductor, substantially as and for the purpose set forth.

5. In a device applicable to use for treating teeth, the combination of the exhaust-bulb provided with the nozzle, and the injection-bulb provided with a nozzle passing through the exhaust-bulb and its nozzle, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MERRILL W. HOLLINGSWORTH.

Witnesses:

EDW. F. SIMPSON, Jr.,
R. DALE SPARHAWK.