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E. R. BERRY

QUARTZ APPLICATOR

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Fig. 1.

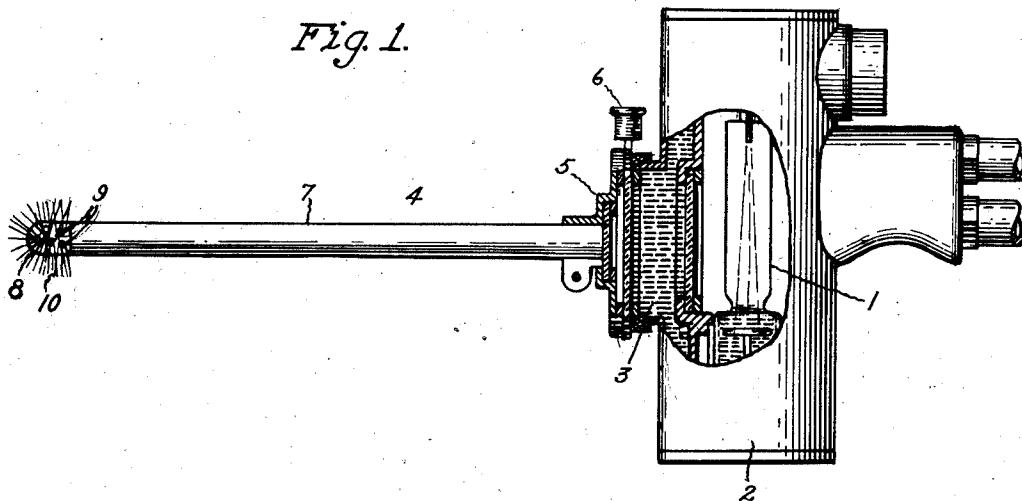
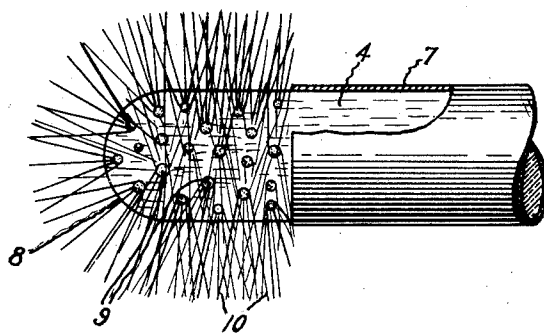


Fig. 2.



Inventor,
Edward R. Berry.
by *Wanda S. Lunt*
Attorney.

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EDWARD R. BERRY, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

QUARTZ APPLICATOR.

Application filed July 1, 1926. Serial No. 119,975.

The present invention relates to therapeutic applicators for radiant energy, such for example, as ultra-violet radiations.

In such a device it is desirable to conduct the radiation through a medium which has a minimum absorption and diffusion. Preferably such an applicator is composed of clear, homogeneous vitreous silica.

This quartz applicator may be inserted into a wound or body cavity in order to carry ultra-violet rays close to the desired part where it may be desired to make use of the rays at or near the tip. Heretofore, in order to accomplish the desired result the applicator has often been provided at the tip with prismatic or lens-like surfaces. However, when wet tissue comes into contact with the prismatic tip of the applicator the diffusion effect is or may be partly lost and it is necessary then to provide a spacer about the tip in such case, for example, a transparent quartz tube. The resulting applicator then is larger in diameter and therefore oftentimes is inconvenient to use in certain places.

In accordance with my invention, I have provided an improved applicator, the diffusing effect of which is not destroyed by being placed directly into contact with wet tissue. This improved applicator is provided with a tip of clear, fused silica which contains a number of cavities or bubbles which then act to refract or reflect or change the direction of the rays. In other words the change in direction of the rays is brought about inside of the mass of the applicator and not at its surface. There may even be a large number of bubbles as to render the material at the tip translucent.

The accompanying drawing shown in Fig. 1 is side elevation partly in section, showing ultra-violet ray apparatus provided with an applicator embodying my invention and Fig. 2 shows an enlarged tip of my improved applicator in which the cavities or bubbles are shown in large size.

Referring to Fig. 1, the apparatus here shown consists of a source of ultra-violet radiations, such as the quartz mercury vapor arc lamp 1 contained within a housing 2. The ultra violet radiations pass through a layer of water 3 which is provided to absorb heat radiations or to keep the apparatus cool or both and then pass through the applicator 4. This applicator may be mounted

as usual within a holder 5. A shutter 6 may be provided to control the amount of radiation. The applicator 4 consists of clear, homogeneous fused silica which may be made for example in accordance with the method described in Devers Patent No. 1,536,821 issued May 5, 1925, and which includes the fusion of clear quartz crystal in a vacuum followed by further fusion under pressure, for example, in the presence of gas at high pressure.

The main body of the applicator consisting of clear silica may be provided externally with a layer 7 of silver or other light reflecting material to decrease losses along the length of the applicator. The tip 8 of the applicator consists of vitreous silica having the property of diffusing ultra-violet or other radiations. This form of silica may be made, for example, by fusing quartz crystal, such as South American quartz crystal, in the open air. The translucent silica may be joined by fusion directly to the clear silica as indicated in Fig. 2. As also indicated by the lines 10 in this figure, the numerous small trapped gas bubbles 9 in the translucent silica have the property of causing the ultra-violet radiations to be sent in many directions. This diffusing effect occurs even when the translucent silica is held into direct contact with moist tissue.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A therapeutic device comprising a source of radiant energy, an applicator for ultra violet rays comprising a member of material transparent thereto and being substantially free from cavities and a tip of material which is capable of transmitting the desired radiations and having interior cavities causing said radiations to spread externally of said applicator.

2. An applicator for radiant energy comprising a main member of substantially clear silica free from cavities or bubbles and a tip of diffusing silica.

3. An applicator for ultra-violet radiations comprising a rod of substantially clear, homogeneous silica and a reflecting coating thereon and a tip of silica containing minute cavities.

In witness whereof, I have hereunto set my hand this 29th day of June, 1926.

EDWARD R. BERRY.