

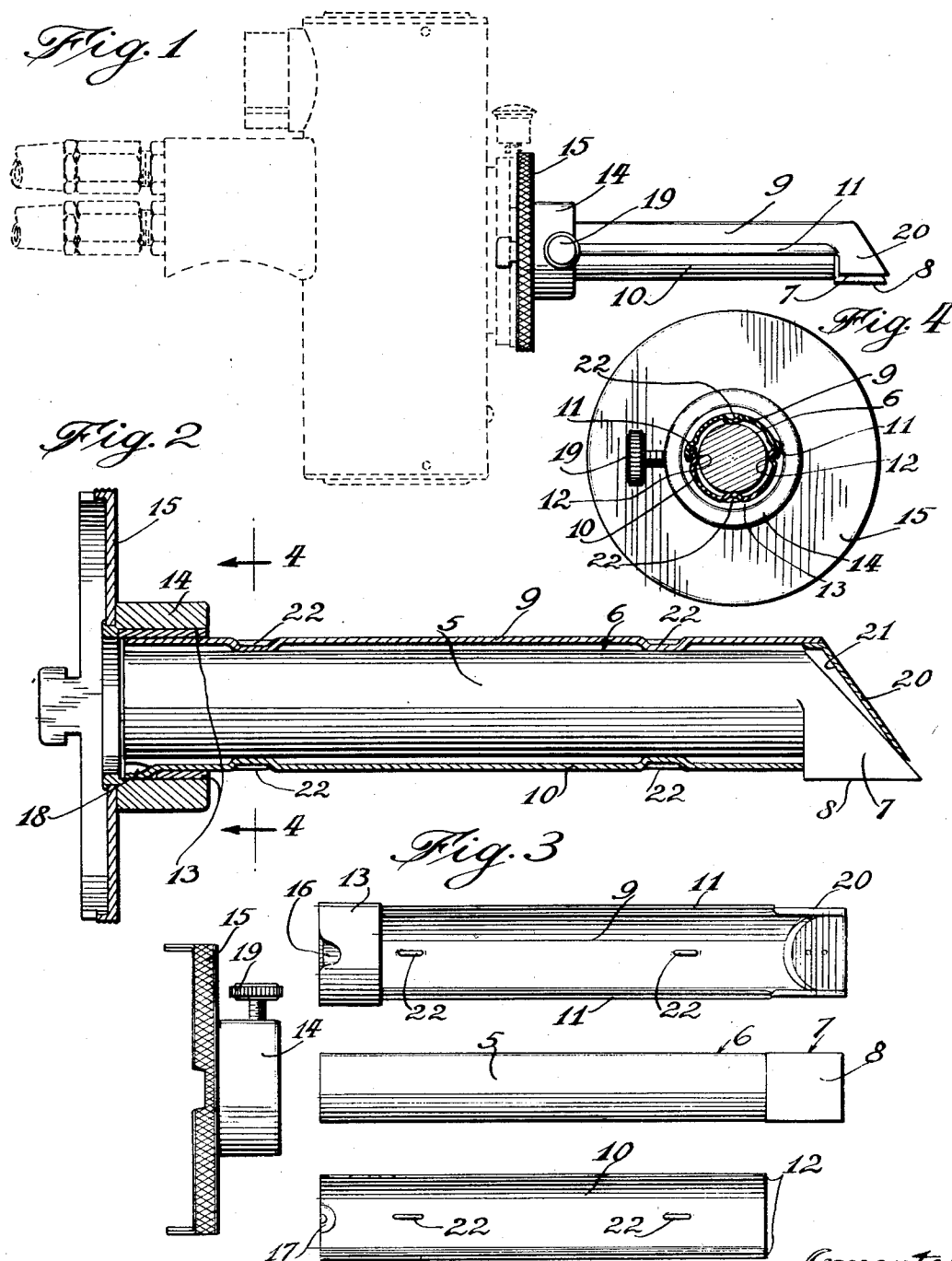
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THERAPEUTIC APPLIANCE

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THERAPEUTIC APPLIANCE

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1 Claim. (Cl. 174—177)

My invention relates to therapeutic appliances.

More particularly it relates to appliances for localized application of radiant energy, particularly within body cavities such as the mouth and throat.

The invention will be illustrated and explained as embodied in an appliance or applicator of the quartz light-conductor type particularly adapted for local application of rays from an ultra-violet source. Quartz applicators in the form of solid and hollow rods have long been known and used for localized application of ultra-violet light but their use has been fraught with considerable danger to patients, particularly in situations requiring that the rays be deflected from their normal direction. The tendency of the light rays is to travel parallel to the axis of the quartz, but the source of light, i. e., the burner or tube, not being a point source, all of the rays can not enter and travel parallel to the axis. Rather a considerable quantity of the rays enter at an angle and are reflected back and forth by the surface tension of the quartz until they finally emerge from the opposite end. In practice, however, it has been found that when the outer surface of the rod contacts with any substance, and particularly if that substance be moist or wet—as in the case of the tissues of the mouth or throat—the rays are no longer reflected at the surface of the rod but pass through to the tissues. This condition is particularly prevalent at the bends of curved and at the reflecting surfaces of prismatic applicators. The result is that, with the quartz rod applicators heretofore employed, the rays thus lost by non-reflection offer a serious menace to a patient. More or less severe burns have occurred.

One of the objects of my invention is to provide an improved therapeutic appliance for locally applying radiant energy.

Another object is to provide an applicator from which the loss of rays is reduced to non-injurious amount even when employed in contact with wet tissue.

Another object is to provide an improved shield for a quartz rod applicator,—one to which the rod may be easily fitted and removed to permit separate sterilization of the shield.

Other objects and advantages will hereinafter appear.

In the drawing:

Fig. 1 is a side elevation of an applicator shown associated with a water-cooled ultra-violet therapeutic lamp, which is shown in dotted lines;

Fig. 2 is an enlarged longitudinal section of the applicator;

Fig. 3 is a plan view drawn to a smaller scale, of the four elements composing the complete applicator; and

Fig. 4 is a section on the line 4—4 of Fig. 2.

In general, my improved appliance comprises an applicator rod, preferably of quartz, through which radiant energy is conducted from a suitable source to the area to be treated, a rod enveloping and supporting shield, preferably of metal, for preventing the rod from contacting with tissues except at the treated area and an adaptor for effecting a readily detachable connection between the rod and its shield and a therapeutic lamp.

In the embodiment chosen for illustration, the quartz rod 5 is of the prismatic type having a relatively long cylindrical stem 6 for conducting the light rays to the region of application and a head 7 from which the rays emerge through the face 8 at the area to be treated substantially at right angles to the stem.

The rod carrying shield comprises a generally cylindrical tube, formed in two semi-cylindrical sections 9 and 10, which envelops all of the rod except the end thereof adjacent the lamp where the rays enter and the end immediately adjacent the face 8 where the rays emerge. Shield sections 9 and 10 are preferably composed of sheet metal; section 9 formed with a small longitudinal inwardly opening bead 11 along each edge thereof and section 10 having a complementary projecting bead 12 along its edges. Thus the two longitudinal edges of section 10 have a complementary fit with the edges of section 9 so that the two sections may be slidably united or separated, and when united form a cylinder surrounding the rod. The beads of section 10, which form a pair of diametrically spaced inwardly projecting ribs, also serve to assist in centering the rod within the enclosing shield. At the forward end of the section beads 11 gradually merge or blend into the curved portion of the section so as to eliminate sharp corners and present a smooth surface to the walls of any cavity into which the applicator may be inserted.

The end of section 9 which is adjacent the lamp when the applicator is in use is provided with a ring 13 which fits into the socket 14 of an adapter 15 and through which section 10 is inserted in assembling the shield and withdrawn in disassembling it. Ring 13 is provided with a small notch 16 into which is received a lug 17 on section 10 when the sections are together. Lug 17 serves

as a grip to facilitate the withdrawal of section 10 from section 9 and cooperates with the walls of the notch to serve as a stop and latch in properly locating the sections and holding them in place. Socket 14 is provided with a small inwardly projecting annular ledge or shoulder 18 against which the inner ends of the assembled shield sections abut when the same are fitted to the socket and with a set screw 19 which, when turned down, clamps the shield to the adapter. The applicator adapter, by means of which the applicator is associated with and secured to a therapeutic lamp, may be of any appropriate type, the one I have chosen to employ being that disclosed in my Patent No. 1,559,062, granted October 27, 1925.

The opposite or outer end of shield section 9 is provided with a box-like head 20 which receives and fits about the head of the quartz rod, of course leaving the emitting face thereof uncovered. The inner surface 21 of the sloping end of this box should be highly polished, or, if desired, it may be equipped with a suitable reflector, so that any rays which the angled end of the rod fail to reflect will be reflected back by the end of the shield and caused to pass through the uncovered face 8 of the applicator rod. Sections 9 and 10 are provided with small inwardly extending projections 22, preferably located midway between the edges thereof, (i. e., about at right angles to beads 12) which afford restricted contacts with the quartz rod and together with beads 12 serve to center the applicator rod within its shield and hold the same in place.

To assemble the applicator the quartz rod is first placed in shield section 9 with its prismatic head in the box-like end thereof. Then shield section 10 is applied through the ring 13 of section 9, with the complementary beaded edges thereof interfitting, and slid forward until its front end engages the box-like end of section 9 and lug 17 lies in recess 16. Next the rear ends of the applicator rod and its shield sections are inserted in adapter socket 14 and set screw 19 turned down until it tightly clamps ring 13. The applicator is now assembled into a compact and easily handled unit ready for attachment to

a lamp. The applicator is readily disassembled by reversing the procedure just described.

I have thus provided an applicator in which the quartz rod is adequately shielded from contact with tissue and consequently the loss of rays and the resultant hazard of burning a patient is eliminated. The extremely restricted areas of contact between the rod and its enveloping shield do not permit the escape of a sufficient quantity of rays to create any appreciable hazard. The applicator may be quickly disassembled in order that the shield may be sterilized, for example, by immersion in boiling water, and then quickly and easily reassembled for use. Rods and shield sections of different shapes and to afford various effective angles of reflection may be designed to accommodate a single adapter socket so that a wide variety of conditions for treatment may be met with a minimum of equipment. By merely loosening set screw 19 the rod and shield of the applicator may be turned so as to change the direction of its light emitting face and still permit the lamp and its tube to remain substantially upright.

Having thus illustrated and explained the nature and one embodiment of my invention, what I claim and desire to secure by United States Letters Patent is as follows:

An applicator for a therapeutic lamp comprising a pair of semi-tubular opaque sections having detachable complementary interlocking engagement along their edges so that they may be united to form a tube and completely separated into its sections, one of the sections having an end formed into a reflecting box open laterally of the axis of the tube, and the sections having inwardly extending projections, a prismatic quartz rod having a straight cylindrical section for lying within the tube formed by the sections in contact with the projections thereof and a prismatic head to fit the reflecting box and deflect the light at an angle to the cylindrical portion, and an adapter having a socket for receiving the adjacent ends of the united sections to hold the sections and rod together and attach the same to a lamp.

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