May 26, 1925. 1,539,253

C. W. FULLER

SANITARY SHIELD FOR DENTAL INSTRUMENTS

Filed June 9, 1923

Fig. 1,

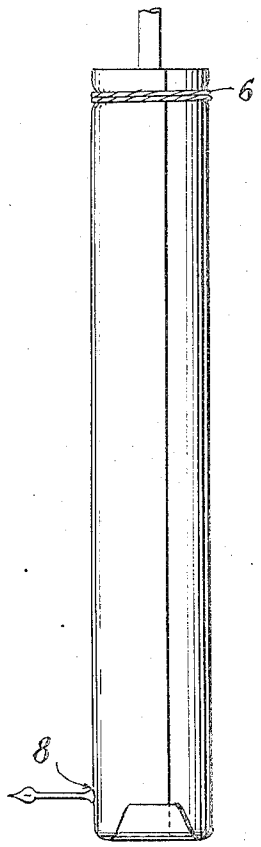


Fig. 2,

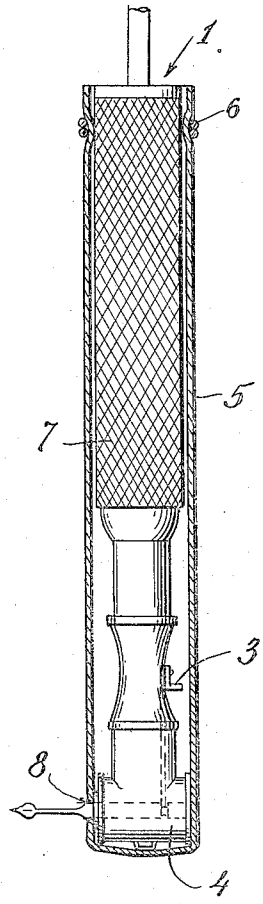


Fig. 4,

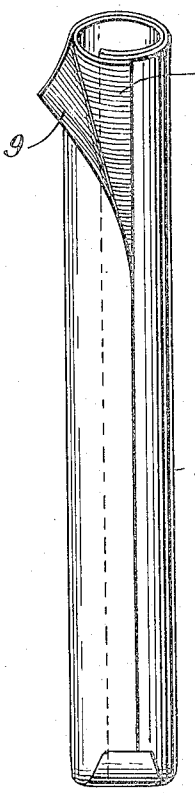


Fig. 5,

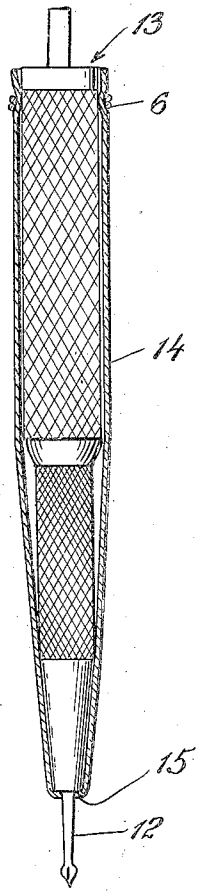


Fig. 3,

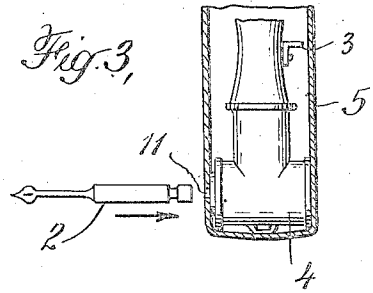
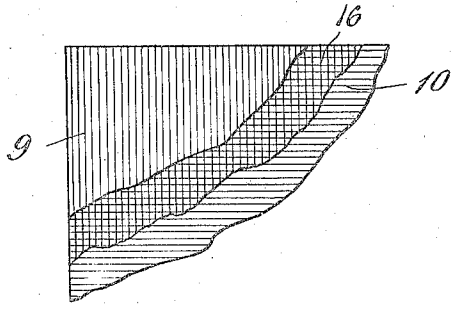


Fig. 6,



INVENTOR
Clarence W. Fuller
BY
Dennis, Davis, Marvin & Edmonds
ATTORNEY

Patented May 26, 1925. 1,539,253

UNITED STATES PATENT OFFICE.

CLARENCE W. FULLER, OF YONKERS, NEW YORK.

SANITARY SHIELD FOR DENTAL INSTRUMENTS.

Application filed June 9, 1923. Serial No. 644,375.

To all whom it may concern:

Be it known that I, CLARENCE W. FULLER, a citizen of the United States, residing at 72 Ashburton Avenue, Yonkers, in the county of Westchester, State of New York, have invented certain new and useful Improvements in Sanitary Shields for Dental Instruments; 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.

This invention relates to improvements in sanitary shields for dental instruments, the principal object being to provide wholly satisfactory shields which can be manufactured in large quantities at such a low cost as to make it practicable to throw away the shields after they have been used once.

Various attempts have been made to provide a satisfactory sanitary shield for dental handpieces, but these attempts have not produced the desired results. Such shields have been made out of rubber, corrugated paper and a few other materials none of which are satisfactory for this purpose. The ideal instrument shield must be made of soft, thin, inelastic material having high resistance to permanent distortion. The material must be such that the shield can not be stretched out of shape by the rather severe treatment to which it is subjected when the instrument is in use, even though the material is subjected to the action of moisture and oil. If the shield is made out of elastic material, it pulls away from around the tool in the end of the handpiece; and the same effect is produced if the shield is made out of material which can be permanently distorted. If the shield is of such a character that it will pull away from the tool at the end of the handpiece, the sole purpose of having such a shield is defeated, for the handpiece is exposed at the one point which needs the most protection.

The sanitary shield which I have invented, possesses all of the desirable characteristics above outlined, and it possesses the distinct advantage of being easy to manufacture in large quantities. In making my improved shield I prefer to employ a thin inelastic material preferably of fibrous composition, such as certain grades of paper or finely woven cloth. In making the preferred embodiment of my invention I employ two thicknesses of a thin tough material such as thin long-fiber paper, the two thicknesses of the paper being cemented together by means of an adhesive water-proofing composition, preferably latex, rubber, gutta percha, or the like. The shield of course can be made out of a single layer of tough material which may be coated on one, or preferably both, sides, with a water-proofing composition.

My improved shield may be made out of the tough material above described, by forming it into a tube in substantially the same manner that a piece of paper is folded to form an envelope. The shield may be made by machinery which folds the material of the shield in the desired manner, applies a suitable cement to the overlapping edges, and seals these overlapping parts. The shield may be made in such a manner that a tube open at both ends is first formed, after which a cap is then applied to one end; however, I prefer to construct this shield in such a manner that a folded, closed end is formed out of an extension of the material of the body portion of the shield.

The numerous objects and advantages of this invention will be more apparent upon considering the following detailed description, which is to be taken in conjunction with the accompanying drawings, in which:

Fig. 1 is an elevation of the right angle type of dental handpiece, provided with the improved sanitary shield.

Fig. 2 is a longitudinal section view of the handpiece and shield shown in Fig. 1.

Fig. 3 is a fragmentary section view of the right angle type of handpiece provided with one embodiment of my improved sanitary shield, showing the manner in which a drill is inserted through the shield.

Fig. 4 is a perspective view of the preferred embodiment of the improved sanitary shield.

Fig. 5 is a longitudinal section view of the common straight type of dental handpiece provided with the improved sanitary shield; and

Fig. 6 is an enlarged plan view of a portion of the preferred embodiment of this invention, showing the manner in which the layers of material are arranged.

Figs. 1 to 3 incl. show the modern type of right angle dental handpiece 1, adapted to receive a tool 2, such as a drill. The drill or other tool may be inserted in the head 4 of the handpiece, where it is held in position by a latch operated by a small lever 3.

This lever is usually arranged near the head 4 of the handpiece, in the reduced section between the head and the handle 7. My improved sanitary shield 5 is adapted to be slipped over the head or active end of the handpiece, as shown in Figs. 1, 2 and 3. The shield is large enough so that it slips over the head 4, the dimensions of which are usually somewhat larger than those of the handle. The shield is also large enough to permit the normal operation of any moving parts associated with the head 4. The shield is quite loose in the vicinity of the lever 3, so as to permit ready manipulation of this lever at all times. I prefer to provide a waxed cord 6 encircling the upper end of the shield, and which may be tied tightly so as to bind the shield close to the handpiece. The sanitary shield is made out of material that is very thin and soft, the material being much thinner than shown in the drawing in which the thickness of the shield is magnified for the purposes of illustration. The shield is made out of soft thin material in order to make it possible to secure a firm grip on the knurled handle 7.

I prefer to construct my sanitary shield so that it has a closed imperforate end. The sanitary shields heretofore employed have been provided with an opening for receiving the drill. The provision of such an aperture is open to the objection that it can never be made the proper size to fit snugly about the drill or other tool; and this opening also makes it necessary to apply the shield to the handpiece in a definite manner, so that the opening will register with the tool socket in the head of the handpiece. I prefer to make the closed end of my improved shield imperforate, so that it is impossible to apply the shield to a handpiece improperly; and so that when the tool is forced through the shield into its socket, the shield will always fit tightly around the tool, as shown at 8, thus effectively preventing the passage of oil and moisture along the tool. If it is so desired, however, the shield may be provided with a very small opening 11 (see Fig. 3) substantially smaller than any drill or tool to be used. Such a small aperture makes it possible to tell more exactly where to apply the tool so that it will enter directly into the socket of the head 4; and it is still necessary to puncture the shield, thus insuring a tight fit between the shield and the tool.

In regard to the material out of which the sanitary shield can be made, I have found that the materials which are most satisfactory are those which possess the physical qualities of a high degree of toughness, and considerable flexibility or softness. The material must not only be tough and flexible, but it must also have considerable resistance to permanent distortion, so that it cannot be readily pulled out of shape. I have found that certain fibrous materials, such as long-fiber Japanese paper, and finely woven cloth, such as silk, will give the best results. I prefer to use long-fiber Japanese paper which can be made very thin, without sacrificing toughness. The most satisfactory results can be obtained by employing two sheets of long-fiber Japanese paper and cementing them together with water-proofing composition, which should be dried and vulcanized. While I refer to two sheets of paper, it is of course to be understood that the same result can be accomplished by using a single sheet of paper, which is folded so as to provide two thicknesses; and, therefore, the term "two sheets of material" is intended to include such a folded construction. However, one thickness only of paper may be used and left unfolded. The layers of paper should be arranged so that the long fibers of one layer extend generally at an angle to the long fibers of the other layer. In fact, I prefer to arrange the layers of paper so that the fibers of one layer are arranged at substantially right angles to the fibers of the other layer. This arrangement makes the shield very tough, and makes it capable of withstanding severe stresses, no matter how they are applied to the shield.

Figs. 4 to 6 show the manner in which I prefer to make the sanitary shield. The shield shown in Fig. 4 consists of two layers 9 and 10 of long-fiber Japanese paper, and it will be noted that the long fibers of sheet 10 extend circumferentially, while those of sheet 9 extend longitudinally. In making the shield, the sheets of tough material are first arranged in the desired manner. If the material is of a fibrous nature, the sheets are preferably arranged so that they are on the bias with respect to each other. The two layers of material are then coated with a suitable adhesive composition, (shown at 16 in Fig. 6) which is preferably a water-proofing compound. I have found that either latex, rubber, or gutta-percha, gives very satisfactory results, as an adhesive water-proofing compound. The sheets of material may be passed around rollers; the adhesive material applied to the sheets as they pass around the rollers; and the rollers may be arranged so that they press the sheets together after they have been coated with the adhesive material. The sheets, cemented together in this manner, are dried and the adhesive material vulcanized, thus rendering the sheets water and oil proof. The sheets are then folded in substantially the same manner as a piece of paper is folded to form an envelope, the object being to form the sheets into a tube, one end of which is closed. The overlapping edges of the folded sheets are gummed and sealed, pref-

erably by means of rubber cement. The shield is then ready for use; although as pointed out above, a small aperture may be formed in the end of the tube, the diameter of the aperture being substantially smaller than any tool which is to be used with the handpiece for which the shield was designed.

Fig. 5 shows the common straight type of dental handpiece 13, adapted to receive a tool 12 in the end thereof, the axis of the tool coinciding with the axis of the handpiece. In making a shield 14 to fit this type of handpiece the material is folded so as to form a tapered tube, the smaller end 15 of which is folded over and sealed.

It is to be understood that the various details of this invention may be modified without departing from the spirit of the invention, which is not limited to the particular embodiment shown and described but includes such modifications thereof as fall within the scope of the appended claims.

I claim:

1. A shield of the type described, comprising a tube consisting of at least one layer of tough, inelastic material, and at least one layer of a vulcanized elastic material.

2. A shield of the type described, comprising a tube of thin tough paper, and at least one layer of vulcanized latex adhering to the paper.

3. A shield of the type described, comprising a tube consisting of two layers of thin inelastic material, separated by a layer of vulcanized latex tightly adhering to the layers of paper.

4. A shield of the type described, comprising a tube consisting of at least two layers of tough, inelastic fibrous material, the layers being arranged on the bias with respect to each other, and means for cementing the two layers together and for making the tube waterproof.

5. A shield of the type described, comprising a tube consisting of at least two layers of long fiber paper, and means for securing the two layers of paper together, said layers being arranged so that the long fibers of one layer extend generally at an angle to the long fibers of the other layer.

6. A shield of the type described, comprising a tube having a closed imperforate end, said tube consisting of two layers of long fiber paper arranged so that the long fibers of one layer extend generally at an angle to the long fibers of the other layer, and a layer of vulcanized latex cementing the two layers of paper together and rendering the tube water-proof.

7. A shield of the type described, comprising a tube having a closed imperforate end, said tube consisting of two layers of long fiber Japanese paper arranged so that the long fibers of one layer extend generally at right angles to the long fibers of the other layer, and a layer of vulcanized latex cementing the two layers of paper together.

8. A shield of the type described, comprising a tube having a closed imperforate end, said tube consisting of two layers of long fiber Japanese paper arranged so that the long fibers of one layer extend generally at right angles to the long fibers of the other layer, a layer of vulcanized latex cementing the two layers of paper together, and a waxed cord for binding the open end of the tube close to the instrument.

9. The method of making a shield of the type described, which consists in coating two sheets of thin tough material with an adhesive water-proofing material, pressing the coated surfaces together to fix the sheets together, folding the sheets to form a tube, and cementing the overlapping folded portions together.

10. The method of making a shield of the type described, which consists in coating two sheets of thin tough material with latex, pressing the coated surfaces together, drying and vulcanizing the latex, folding the sheets to form a tube having a closed end, and cementing the overlapping folded portions together.

11. The method of making a shield of the type described, which consists in coating two sheets of long fiber paper so that the long fibers of one sheet extend generally at an angle to the long fibers of the other sheet, coating one surface of each sheet with latex, pressing the coated surfaces together to secure the sheets together, drying and vulcanizing the latex, folding the sheets to form a tube having a closed end, and cementing the folded overlapping edges together.

In testimony whereof I affix my signature.

CLARENCE W. FULLER.