

July 7, 1953

V. S. ROUBIAN

2,644,232

INSULATING AND MEDICINAL PAD FOR DENTAL CAVITIES

Filed March 25, 1950

Fig. 1.

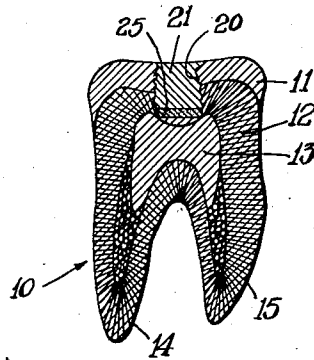


Fig. 2.



Fig. 3.



Fig. 3A.



Fig. 4.

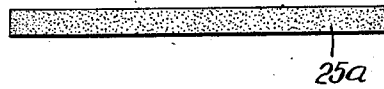
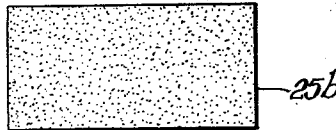


Fig. 5.



INVENTOR
VAHE S. ROUBIAN

BY *Samuel J. Stree*
ATTORNEY

UNITED STATES PATENT OFFICE

2,644,232

INSULATING AND MEDICINAL PAD FOR
DENTAL CAVITIES

Vahé S. Roubian, Manhasset, N. Y.

Application March 25, 1950, Serial No. 151,895

9 Claims. (Cl. 32—15)

1

This invention relates to an insulating and medicinal pad for dental cavities.

Dental cavities require special preparation, in order to adapt them to receive a silicate, metal or plastic filling. It is not advisable to apply the filling directly to the floor of the cavity for the reason that the tooth is very highly sensitive in that area. It is common practice, therefore, to apply a plastic substance to the sensitive area in order to insulate the same from the filling. This practice requires that the plastic substance be allowed to set before the filling is introduced into the cavity. A time lapse of several minutes, hours, and even days must accordingly be provided between the application of the plastic insulating substance and the application of the filling material. The disadvantages inherent in this practice are obvious but no way has heretofore been found to improve the practice sufficiently to overcome these disadvantages.

It is the principal object of this invention to provide an insulating material which may be interposed between the sensitive areas in the dental cavity and the temporary or permanent filling, as the case may be, and which will eliminate the need of a time lapse between the application of the insulating material and the application of the filling material. More specifically, the insulating material, which is herein described and claimed, assumes the form of a pad which may be placed directly upon the sensitive area preparatory to immediate application of the filling material. This insulating material in the form of a pad is mildly plastic and it lends itself to being tamped down in the cavity of the tooth to assume the contours of the sensitive area in said cavity. There is no need to let this somewhat plastic pad set before filling the cavity in the usual manner. It is ready for the filling operation the moment it is tamped into conformity with the contours of the cavity wall.

The insulating pad herein described and claimed may be made in many different shapes and sizes and in many different thicknesses and degrees of plasticity. The pad may be made in small disc, oval, or rectangular shapes, ready for insertion into cavities of different shapes and sizes. On the other hand, this insulating material may be provided in long strips or similar shapes, to be cut by each individual dentist in accordance with the individual requirements of each case. Thus a relatively large pad will be cut to the requirements of a relatively large cavity, and a relatively small pad will be cut to the requirements of a relatively small cavity.

2

The shape of the cavity or of the sensitive area therein will determine the shape of the pad which is to insulate said sensitive area.

It has been stated that the insulating pad herein described and claimed is but mildly plastic. To be more specific, this pad comprises a relatively flexible base which is impregnated and coated on both sides with a relatively plastic substance. The base has a relatively low modulus of elasticity and although it may be tamped down to the shape of the cavity, it will not readily stretch or spread. The plastic material with which it is impregnated and coated is sufficiently plastic to assume whatever shape is required of it under the influence of the tamping instrument. Nonetheless, its plasticity is controlled and confined by the non-plastic base which it impregnates. In the preferred form of this invention, this plastic material is sufficiently plastic under room temperature to allow it to flow in response to the action of the tamping instrument. There is no need to apply heat or a solvent to soften it for the purpose under discussion.

The insulating pad herein described and claimed is also medicated for sterilizing, sedative and other purposes. It strongly resists such chemical changes and reactions as might otherwise take place in the dental cavity.

Preferred forms of this invention are shown in the accompanying drawing in which

Fig. 1 is a vertical section taken through a tooth having a deep cavity, showing a pad made in accordance with the present invention applied to the sensitive area of the cavity wall and showing a conventional filling applied to the top of said pad.

Fig. 2 is a greatly enlarged, fragmentary sectional view through a pad made in accordance with the present invention showing the component parts thereof in somewhat exaggerated fashion.

Fig. 3 is a plan view of a disc-shaped pad made in accordance with the present invention.

Fig. 3A is a side edge view thereof.

Fig. 4 is a plan view of pad material provided in the form of a relatively long, narrow strip.

Fig. 5 is a plan view of the same pad material showing it in the form of a relatively wide strip.

Fig. 1 is a vertical section through a human molar 10. The several component parts of the tooth are designated in the drawing as follows:

The crown enamel is identified by means of the reference character 11, the dentin by means of the reference character 12, the pulp and pulp cavity by means of the reference character 13 and

the roots by means of the reference characters 14 and 15 respectively. As is well known, the pulp comprises a mass of nerve fibers and blood vessels embedded in soft tissue and it is highly sensitive. A deep cavity such as cavity 20 shown in the drawing causes the tooth to become extremely sensitive in the area immediately above the pulp cavity since there is very little dentin left to insulate the pulp in that area. It is accordingly necessary to provide artificial insulation to the sensitive area before the cavity is plugged up with filling 21, whether that filling be of a temporary or permanent nature.

The disc-shaped insulating pad 25 which is shown in Figs. 3 and 3A may be inserted into cavity 20 in order to serve as insulating material between what is left of the dentin in said cavity and the filling 21. If the cavity happens to be irregular in shape, it may be found desirable to insert an insulating pad, similar to pad 25, but of correspondingly irregular shape. But in any case, the pad should be sufficiently large and of suitable shape to adequately cover the sensitive area in the cavity. The required shape and size may be cut from narrow strip 25A or wide strip 25B which are made of the same material as pad 25. All that need be done to make use of the insulating pad herein claimed is to insert it into the cavity and tamp it gently into conformity with the contours of the cavity in the sensitive area. Once that is done, the filling may be introduced into the cavity in the usual manner and the job is done.

Fig. 2 is a greatly detailed cross-section which shows the structure of the insulating pad very clearly. It comprises a base of a fine linen fabric 26 which is impregnated and coated on both sides with a plastic insulating material 27. Linen as a base is much to be preferred over other materials but it should be understood nonetheless that other materials such as strong paper sheets may also be used to good advantage. The plastic material may be suitable for insulating purposes only, but in the preferred form of this invention, it is also self-sterilizing and it has sedative and other medicinal properties. It is chemically inert with respect to the tissues of the tooth and also with respect to the filling materials.

The plastic material with which the sheet material is impregnated and coated comprises three component elements: There is a wax which serves as the body or base of the material and it carries the other elements of the material and also renders and maintains the material in relatively plastic form. Secondly, there is a filler which performs two important functions: it lends body to the plastic wax and gives it strength, and it also provides the material as a whole with insulating properties. The third element of the plastic material is a medicinal substance which is sedative, antiseptic, and endowed with sterilizing properties.

A preferred formula for this plastic material is the following:

	Percent by volume
Beeswax	approximately 87
Eugenol	approximately 4
Zinc oxide	approximately 9

100

Eugenol (4-allyl-2-methoxyphenol) is obtained from clove oil and it is used in dentistry as an antiseptic and as a local anesthetic. It is a phenolic derivative. Another phenol, thymol (1-

methyl-4-isopropyl-3-hydroxybenzene) may be substituted for the eugenol, as may phenol itself (C_6H_5OH) and eucalyptol ($C_{10}H_{18}O$). These phenols constitute the third of the three elements above set forth, namely the medicinal element of the formula. The zinc-oxide and its substitutes as hereinafter mentioned constitute the second element of the formula, namely the insulating filler. Minerals such as asbestos and calcium carbonate may be used as substitutes for the zinc oxide. The beeswax and its substitutes constitute the first element of the formula, namely the wax body or base which lends plasticity to the material. Animal waxes such as spermaceti, vegetable waxes such as japan wax, and mineral waxes such as paraffin wax may be used as substitutes for the beeswax.

The broad range of the proportions of the materials above set forth which may be utilized in connection with the present invention is as follows:

Beeswax (or substitutes)	approx. 50% to 90% by volume
Eugenol (or substitutes)	approx. $\frac{1}{4}$ of 1% to 15% by volume
Zinc oxide (or substitutes)	approx. 5% to 60% by volume
	100%

The foregoing is descriptive of preferred forms of this invention and it will be understood that these forms may be modified in many ways and other forms may be added, all within the broad scope and spirit of this invention.

For the purposes of claims, the following terminology will be used: The base of the insulating pad herein above described will be described in the claims as being made of sheet material. The material with which said sheet material is impregnated and coated will be described in the claims as plastic material.

I claim:

1. An insulating pad for dental cavities comprising a flat base which is made of sheet material and which is impregnated with a plastic material consisting of a plastic body, an insulating filler, and a medicinal substance.

2. An insulating pad for dental cavities comprising a flat base which is made of a sheet of fabric material impregnated and coated with a plastic material consisting of a wax body, a mineral insulating filler, and a phenolic medicinal element.

3. An insulating pad for dental cavities comprising a sheet of fabric material which is impregnated and coated with a plastic substance consisting of a wax body, a zinc-oxide insulating filler, and eugenol as a medicinal component thereof.

4. An insulating pad for dental cavities comprising a sheet of fabric material which is impregnated and coated with a plastic material consisting of a wax body approximately 50% to 90% by volume, a zinc oxide insulating filler approximately 5% to 60% by volume, and eugenol as a medicinal component, $\frac{1}{4}$ of 1% to 15% by volume.

5. An insulating pad for dental cavities comprising a linen fabric base which is impregnated with plastic material consisting of a phenolic wax base and a mineral insulating filler.

6. An insulating pad for dental cavities comprising a linen fabric base which is impregnated with plastic material consisting of a phenolic wax base and filler of zinc oxide as an insulating component.

7. An insulating pad for dental cavities comprising a linen fabric base which is impregnated and coated with a plastic material consisting of

5

beeswax, approximately 87% by volume, eugenol, approximately 4% by volume, and zinc oxide, approximately 9% by volume.

8. A large insulating pad for dental cavities which may be cut to the individual sizes and shapes of a plurality of dental cavities, comprising a sheet of fabric material which is impregnated and coated on both sides with a plastic material consisting of a wax body, a mineral insulating filler, and a phenolic medicinal substance. 10

9. An insulating pad in accordance with claim 8, wherein zinc-oxide is the insulating filler and eugenol is the phenolic medicinal substance.

VAHÉ S. ROUBIAN. 15

6

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,326,552	Vogt	Dec. 30, 1919
1,612,154	Sampson	Dec. 28, 1926
1,649,508	Carmichael	Nov. 15, 1927
2,444,443	Hesselroth	July 6, 1948
2,633,637	Lucia	Apr. 7, 1953