United States Patent Office 3,087,904 Patented Apr. 30, 1963



3,087,904

# DENTAL DRESSING COMPOSITION COMPRISING A POLYAMIDE AND A SOLVENT THEREFOR

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No Drawing. Filed Jan. 14, 1958, Ser. No. 708,762
2 Claims. (Cl. 260—29.2)

This invention relates to a dressing applicable to wounds of a tooth, gum, mucous membrane, jaw-bone and the like, and is a continuation-in-part of my application Serial No. 490,127, for Method for Applying a Dressing Onto a Wound of a Tooth, Gum, Mucous Membrane, Jaw-Bone and the Like, filed February 23, 1955, now abandoned.

The principal object of the present invention is to provide a new and useful dressing for a wound comprising a fluid solution of a polyamide, or a mixture of polyamides dissolved in ethyl alcohol, propyl alcohol or mixtures thereof, which solution hardens in a few seconds and forms a very thin elastic and liquid-proof film of a thickness of about 0.03 mm.to which solution may be added small quantities of chloroform or benzol, serving as softeners, and also coloring means.

The dressing made in accordance with the invention solves the problem of providing, for temporary as well as for permanent use, a sterile dressing for wounds in the cavity of the mouth, which dressing is highly insulating and easy to remove.

The main difficulty in the treatment of wounds in the cavity of the mouth is the salivation which makes the use of the commonly known wound dressings impossible. Therefore a means for dressing the above mentioned wounds had to be found which is not affected by salivation and which also meets the high requirements for dressing such wounds. Such a dressing must tightly seal the wound so that food particles as well as infectious germs cannot reach the wound and the dressing, moreover, should be unaffected by acids. Furthermore, the dressing must be adapted to the varying circumstances of use in the field of dental medicine. It is especially important that the dressing solution be of such a liquidity that it may be applied even onto and in the smallest wounds and cavities.

It has already been proposed to solve the problem of an effective pulp protection by mechanically sealing the dental capillaries, by using acid-binding agents, or by an impregnation for blocking the organic vessels and the like, but all these attempts have proved unsatisfactory. It is also known to use a dressing consisting of etheric oil in combination with zinc oxide. However, this material shows the disadvantage that it is neither elastic nor durable and has to be applied in a relatively thick layer which easily crumbles away.

The dressing according to the present invention removes all these disadvantages in that the dressing used herein offers sufficient wall stability yet is elastic, durable, impermeable to liquids, and, furthermore, may also be used to underlay, surround or cover all kinds of fillings.

It is to be noted that the tiny quantities of benzol, which serve as a softener should be added only in cases where no vital wounds are to be covered. If desired, carbon tetrachloride may be substituted for the benzol or the softener may be omitted. The coloring of the water-colored polyamide solution serves the purpose of making the solution visible in order to facilitate its application and also, in cases where transparent filling material is used, to make the filling unnoticeable. Coloring means are used which suitably serve as softeners at the same time.

A temporary dressing is preferably used in the case of wounds originating from grinding, whereas a permanent dressing is preferably used for sealing or protecting cavities. However, the protective film may also be used as a permanent dressing in the case of grinding wounds for keeping off germs and for insulating the wounds against thermal and electrical influences when crowns, supports for bridges and the like are present. The dressing according to the present invention can also be used as a lining for plastic dentures made of autopolymeric materials, which lining protects the mucous membranes against smarting and cauterizing effects. In open wounds of the mucous membrane of the mouth and the jaw-bones, such as may occur after operations or accidents, the plastic film serves as a bacteria-proof temporary wound dressing having the advantage of being easily removable in a relatively painless manner. The feared complications sometimes occurring in such wounds can be avoided, owing to the wall stability and the tight sealing effect of the film. The film may also serve for temporary insulation of wounds against salivation in cases where fillings are to be made and for sealing bleeding papillas; it may also be used for covering fresh fillings to protect them temporarily during the hardening process against the influence of moisture, etc. in the mouth.



In specific embodiments of the invention dressings were formulated as follows:

1 part polyamide
1 part water
1 part $C_6H_6$
1 part $CHCl_3$
7 parts $C_2H_5OH$

The mixture was refluxed for several hours at a temperature above 50° C. until the polyamid was completely dissolved.

For polyamide each of the following was employed:

Ultramid A
Ultramid B
Ultramid 85*b*
Ultramid 40*b*
Ultramid 50*b*
Ultramid 1*c*

The products are synthesized in the following way:

Ultramid A by polycondensation of adipic acid with hexamethylene-diamine; molecular weight is about 12,000–15,000;

Ultramid B by polymerization of ε-caprolactam;

Ultramid 85*b* is prepared from 85% ε-caprolactam and 15% ketopimelic acid hexamethylenediamine;

Ultramid 40*b* is a condensation product of 60% ε-caprolactam and 40% keto-pimelic acid hexamethylenediamine;

Ultramid 50*b* is prepared from 40% ε-caprolactam, 35% hexamethlenediammonium adipate, and 25% ketopimelic acid hexamethylenediamine;

Ultramid 1*c*, which yielded the best results, consists of copolymerization product of equal parts of adipic acid 4,4 diaminodicyclohexylmethane, adipic acid hexamethylenediamine, and ε-caprolactam.

The preferred mode of preparing the dressing is as follows:

The resinous copolymerization product of adipic acid hexamethylenediamine, ε-caprolactam, and adipic acid diamino-dicyclohexylmethane in the proportions of 1:1:1 is heated under reflux in a mixture of ethanol, chloroform, and water to about 70° C. for several hours until completely dissolved. The proportions of ethanol, chloroform, and water are 7:2:1. A roughly 20% solution is obtained which remains liquid for days and weeks at room temperature. In this case the addition of the chloroform has neither a solvent nor a swelling effect, but merely serves to increase the polarity and hence to increase the solvent properties of the alcohol-water mixture.

Without this addition the solution would form a gel in a very short time. A very small addition of plasticizer can be made to improve the adhesive property of the plastic. The film obtained upon evaporation of the solvents combines high mechanical strength with absolute imperviousness to the plasma toxins and acids contained in dental fillings. The film is also impervious to bacteria.

Of course, various changes may be made in the details disclosed in the foregoing specification without departing from the invention and the claims annexed hereto.

I claim:

1. A composition for treatment of a wound in the mouth of a person, said composition consisting of the solution obtained by refluxing for several hours at a temperature above 50° C. a composition comprising one part by weight of a synthetic linear polymeric carbonamide containing recurring carbonamide groups as an integral part of the main polymer chain separated by at least two carbon atoms, one part by weight of water, one part by weight of benzol, one part by weight of chloroform, and seven parts by weight of ethyl alcohol.

2. A composition for treatment of a wound in the



mouth of a person, said composition consisting of the solution obtained by refluxing for several hours at a temperature above 50° C. a composition comprising one part by weight of a synthetic linear polymeric carbonamide containing recurring carbonamide groups as an integral part of the main polymer chain separated by at least two carbon atoms, one part by weight of water, one part by weight of benzol, one part by weight of chloroform, and seven parts by weight of an alcoholic solvent selected from the group consisting of ethyl alcohol, propyl alcohol and mixtures thereof.

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