

[54] **RELEASABLE MEDICAMENT DENTAL CARRIER AND METHOD**

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[51] Int. Cl. **A61c 3/00**

[58] Field of Search **128/260, 136 R, 132 R; 32/2 R**

[56] **References Cited**
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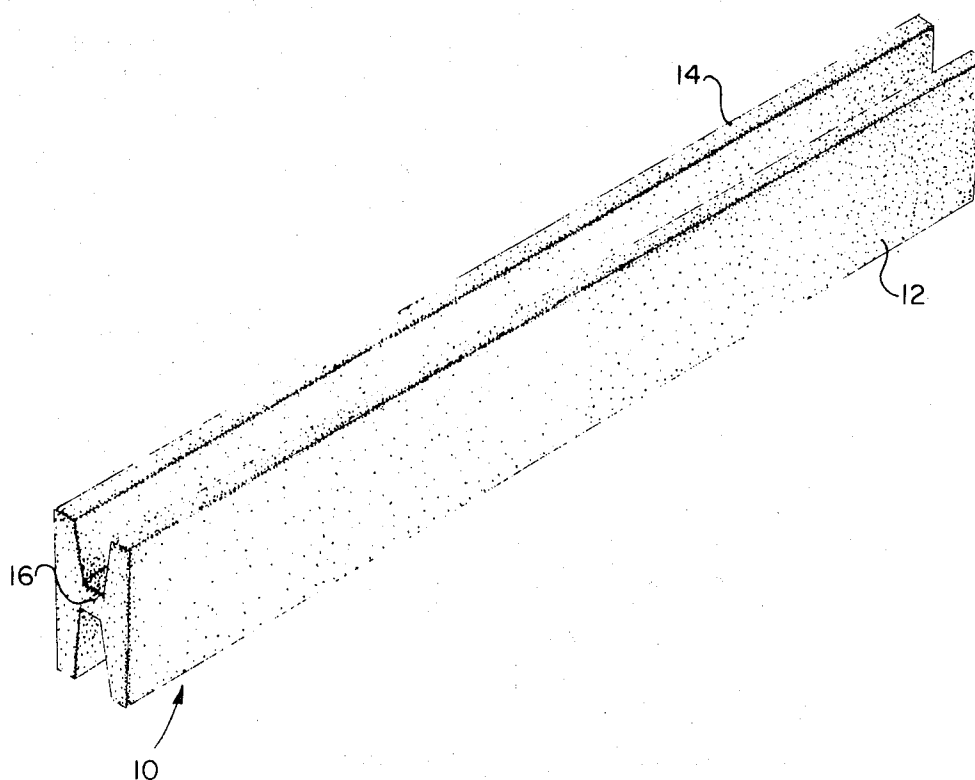
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[57] **ABSTRACT**

A flexible foam I-beam shaped carrier is disclosed having a medicament disposed within channel portions thereof for release during dental treatment. The present invention provides a structure for dental treatment and is especially adaptable for home usage.

6 Claims, 4 Drawing Figures



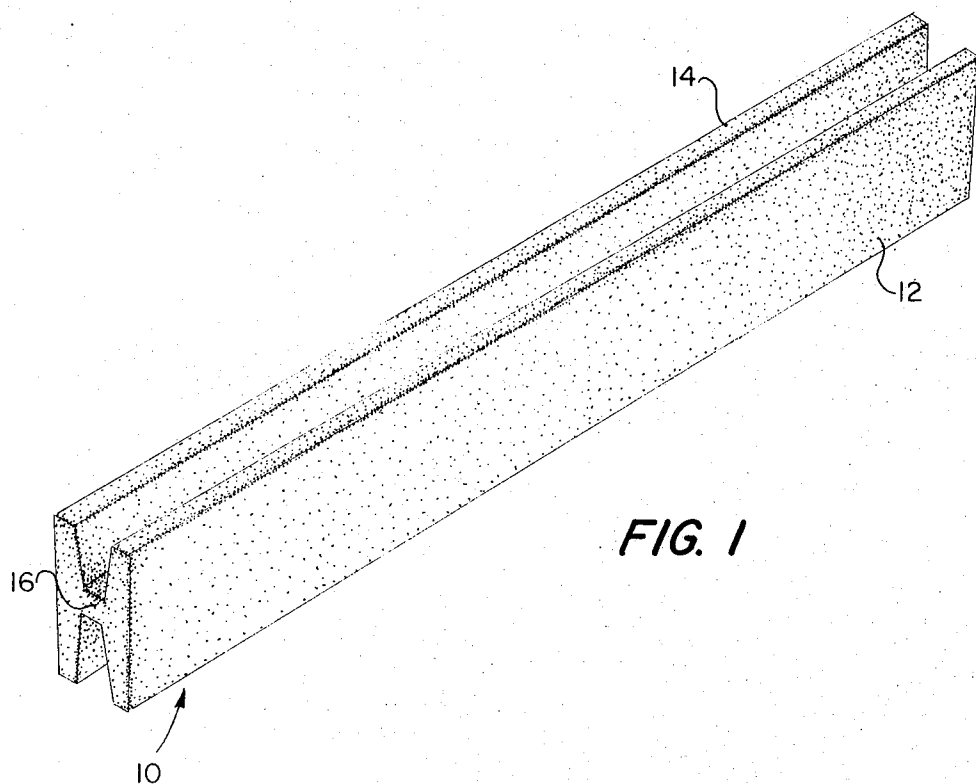
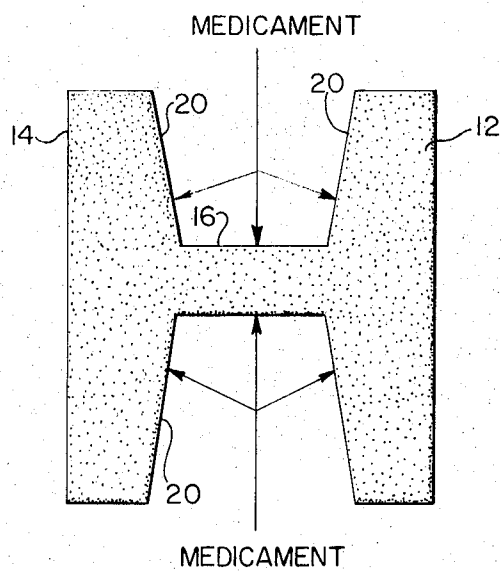


FIG. 2



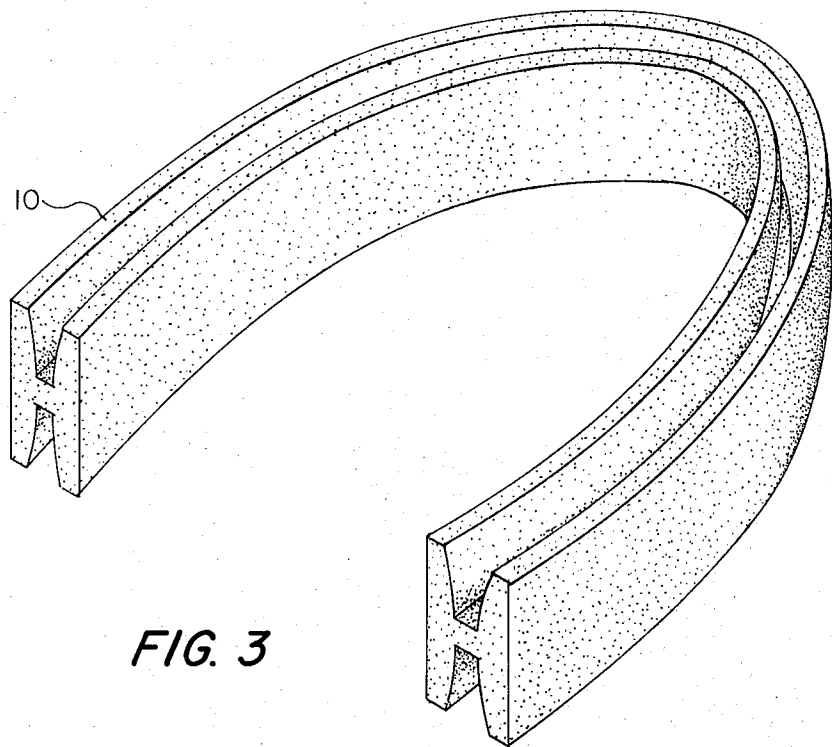


FIG. 3

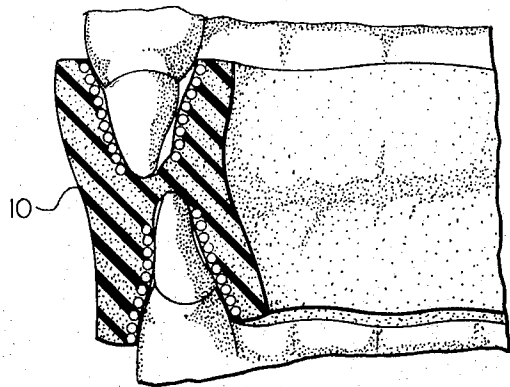


FIG. 4

RELEASABLE MEDICAMENT DENTAL CARRIER AND METHOD

This invention relates to a foam carrier having a releasable medicament contained within channel portions thereof for use in dental treatment. More particularly the present invention provides a foam carrier which releases limited amounts of a medicament such as a fluoride, directly to the teeth in the oral cavity during dental treatment.

A variety of dental treatment devices are known in the art for treatment of diseases such as dental caries, pyorrhea, gingivitis and trench mouth. Proper treatment of these diseases requires that a medicament be in solution and in direct contact with the teeth and gums. Typically, prior art devices provide means for jacketing treating solutions thus requiring separate application of solution and device. Also, controlled amounts of solution must be employed which is difficult in actual practice with the likelihood of spillage being significant.

More importantly, because of the requirement in prior art devices that the treating solution be separately prepared at the use location, it becomes impractical to apply such devices for home usage since such would require a patient to formulate the treating solution. Also, in instances when the patient is required to prepare the treating solution, the likelihood of either under dosage or over dosage treatments becomes significant.

Liquid acid phosphate-fluoride solutions have been clinically employed by dentists for topical application to teeth for the purpose of preventing or reducing dental caries. Clinical studies have shown the caries-reducing effectiveness of a single application of liquid acid phosphate-fluoride preparations. In practice these solutions have been applied by the dentist who makes a wax impression of the patient's teeth which is used as a mold in which the liquid acid phosphate-fluoride preparation is placed before applying the impression bring the preparation into intimate contact with the teeth. However, this practice has been found unsatisfactory in that the available liquid preparations tend to run out from the wax impression, particularly where the teeth in the lower jaw are being treated. There is no assurance that the necessary intimate contact is achieved between the liquid preparation and all surfaces of the teeth.

It has now been found that by practice of the present invention, there is provided a new improved dental device having a pre-disposed medicament in non-liquid state dispersed such that active portions thereof may be controllably released for dental treatment by the fluids of the oral cavity adjacent to the surfaces of the teeth, and by a slight bite pressure into the foam carrier. Thus, the present device overcomes numerous difficulties and disadvantages of prior art devices which require separate application of treating solution and means for holding the solution in relation to the teeth and gums being treated.

Generally stated, the present dental carrier has a flexible foam I-beam configuration with medicament disposed on channel portions thereof. The device is conveniently prepared in a continuous strip which, because of the flexibility of the foam, may be readily severed to size and applied to the teeth. Also, the carrier may be supplied in a roll and severed by the dentist to a convenient size as desired. More importantly, the present de-

vice with pre-determined amount of medicament in proper location is readily adaptable to home usage.

Practice of the present invention will become more apparent from the following detailed description taken in conjunction with the figures wherein:

FIG. 1 illustrates in perspective the present flexible foam I-beam shape carrier as it normally appears;

FIG. 2 is a side elevational view of the present carrier into which is channeled a medicament disposed for subsequent release;

FIG. 3 illustrates the present device in the configuration prior to introduction into the mouth of a patient;

and

FIG. 4 illustrates in partial section, the present device in contact with teeth and gum tissue during treatment.

Referring to the drawings, FIGS. 1 and 2 illustrate foam carrier 10 having side walls 12 and 14 joined by intermediate ridge portion 16. In FIG. 2, a medicament is disposed onto the foam carrier within channel portions defined by walls 20, by most any convenient means.

The medicament may be disposed onto the channel portions of the carrier by a number of different means. For example, finely divided particles of medicament may be incorporated in a soluble adhesive. Alternately, a solution of medicament may be prepared and dried on the foam carrier.

The present carrier may be made of open cell or closed cell foam cushioning material. Such material includes for example, latex, polystyrene, polyurethane or related open cell foams. Polyurethane foam has been found to be a good open cell material for use in making the carrier and is preferred.

The fluoride compound component must be substantially soluble in water and ionize by fluids adjacent the teeth to provide a source of fluoride ions. Fluoride compounds which have been found satisfactory include sodium fluoride, potassium fluoride, ammonium fluoride, sodium bifluoride, potassium bifluoride, ammonium bifluoride and sodium silicofluoride. Other fluoride compounds including combined chemical compounds which yield fluoride ions in dilute aqueous solutions may be also utilized. The device of this invention contains a sufficient amount of such a fluoride compound to provide about 0.25 to about 5.0 percent of fluoride ions and preferably about 1.25 percent in contact with the teeth.

When acid phosphate is used, it must also be substantially water-soluble and provide the desired phosphate ions. Examples of such acid phosphate compounds which may be used include orthophosphoric acid, monosodium phosphate, monopotassium phosphate, disodium phosphate, dipotassium phosphate, monoammonium phosphate, hemisodium phosphate and the like. It will be understood that other water soluble compounds may also be used.

A number of antibiotics in water soluble powder form may be also incorporated in the present carrier for release when in contact with the teeth and/or gums.

The resultant shape of the carrier has an I-beam configuration including vertically tapering inner walls 20 which permit more effective contact with the upper teeth and gum portions during treatment.

Prior to introduction of device 10 into the mouth of a patient, the device is first configured such as illustrated in FIG. 3.

The treatment is illustrated in FIG. 4 where the treating process is accomplished with slight pressure of the teeth into the intermediate ridge 16 while device 10 includes solvent of the teeth for the medicament. Because carrier 10 includes the solvent, i.e., the oral fluids in limited contact with the soluble medicament within the channel portions of the carrier, the activity is effectively released for application only to the teeth and gum areas.

Because of the inexpensive nature of the present device, it may be discarded after each treatment and is especially adaptable to home usage. Also, it will be appreciated that the present device avoids the disadvantage of multiple step treatment required in prior art devices.

It will be further apparent from the foregoing that numerous variations may be made in the present invention without departing from the scope as defined.

What is claimed is:

1. A dental device which comprises a linear flexible foam carrier having an I-beam configuration with channel portions, and a water-soluble medicament disposed on walls of said channel portions for release when in

contact with oral fluids whereby the said carrier is bent to an arcuate configuration adaptable to the oral cavity of a user.

2. The device of claim 1 wherein the medicament is a fluoride containing compound which releases fluoride in contact with teeth.

3. The device of claim 2 wherein the fluoride containing compound is selected from the group consisting of sodium fluoride, potassium fluoride, ammonium fluoride, sodium bifluoride, potassium bifluoride, ammonium bifluoride and sodium silicofluoride.

4. The device of claim 2 wherein the amount of medicament is sufficient to provide about 0.25 percent to about 5.0 percent by weight of fluoride ions in contact with teeth.

5. The device of claim 4 wherein the amount of medicament is about 1.25 percent by weight in contact with teeth.

6. A method of treating teeth which comprises applying a medicament to channel portions of a linear flexible foam carrier having an I-beam configuration, bending the carrier to an accurate configuration and inserting the carrier into the oral cavity, and releasing medicament in contact with teeth by contact of the medicament within the channel portions with oral fluids.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,844,286

Dated October 29, 1974

Inventor(s) Samuel H. Cowen and Jack Nater

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Inventor on Letters Patent now reading:

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Should be corrected to read:

Samuel H. Cowen
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AND

Jack Nater
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Signed and sealed this 13th day of May 1975.

(SEAL)
Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks