A disposable device for cleaning teeth is disclosed. The device is made of a high wet strength material which is shaped and sealed in the form of a "pocket" or flat thimble. Adhered to the outer surface of the device is encapsulated flavor and other suitable substances, such as polishing agent, bacteriostat, or the like. The thimble is slipped over a finger and rubbed over all the surfaces of the teeth to remove the adhering food and plaque films which cause stains and mouth odors.

5 Claims, 5 Drawing Figures
DISPOSABLE DEVICE FOR CLEANING TEETH

BACKGROUND OF THE INVENTION

This invention relates to a tooth cleaner and, more particularly, to an inexpensive, disposable tooth cleaner for use by travelers and others in situations where use of the ordinary tooth brushing equipment is not convenient.

Plaque which builds up on the teeth should be removed from the teeth as frequently as possible. Since plaque is responsible for harboring injurious organisms on the teeth, frequent removal is desirable. In addition, the feel of the teeth to the tongue is very pleasant after removal of plaque from the teeth.

At the present time, it is customary for people to rely upon toothbrushes and dental cream or tooth powder for the day to day cleansing of their teeth and gums. Toothbrushes are effective for this purpose, and, in the ordinary home environment, they are entirely satisfactory.

The tooth cleaning device of the present invention is in the form of a pocket or cot which is of any size and shape to be easily slipped over the finger. Because of a high-friction interior, the device will be retained on the finger during use irrespective of the shape of the device.

The device is fabricated from a high wet strength material such as high wet strength paper or woven or non-woven fabric, laminated to or coated with a water-imperious material. The inner material is preferably heat-sealable for ease of fabrication. Alternatively, the device can be fabricated from a high wet-strength, waterproof thermoplastic material such as polyethylene, in which case it will not require a coating of water-imperious material. The device is shaped and sealed in the form of a pocket or flat thimble, with the water-imperious material on the inside in the case of a two-piece material. Adhered to the outer surface of the device is encapsulated flavor and, if desired, other suitable substances for treating the teeth such as polishing agent, bacteriostat, soap or detergent, and the like. Typical substances include kaolin, precipitated chalk, commercial dental cream, fine pumice, iris root powder, magnesium oxide, water-soluble soap or detergents, etc. The adhesive may be any suitable binding agent such as natural or synthetic gums, starches, etc.

The pocket or flat thimble is slipped or entered over the finger and rubbed or drawn over the surface of the teeth, in essence on the visible flat surfaces, to remove the adhering food and plaque films which cause decay, stains, and mouth odors.

The water-imperious lining, whether used as a single ply material for the cot or as a lining, serves a dual purpose in the tooth cleaning device of the present invention; it maintains the strength of the device when wet, and it keeps the device from slipping off the finger when in use. The interior of the device feels much like a plastic glove, i.e., it is somewhat sticky. This high friction between the device and the finger is desirable, as it keeps the device on the finger during use. This enables the device to be of any convenient and esthetically appealing shape, as the device does not need to be shaped to fit the finger snugly. Additionally, as the device is kept on the finger by virtue of the high friction between the finger and the lining, there is no need to make the device in a wide variety of sizes to provide a perfect fit for the finger of each user.

An additional feature of the device of the present invention is that the edge of the lap bonding around the device is stiff enough to be useful for removing food that may be caught between the teeth. A border is formed when two sheets of material are bonded together to form the cot-shaped device which is stiff enough to function as a toothpick. The cot may be formed from the joining of two sheets or from folding one sheet over upon itself. The sheets to form the cot may be bonded together by heat-sealing when the interior of the device is a thermoplastic like polyethylene, or a hot melt adhesive may be provided on the inside surface for heat-sealing.

The disposable tooth cleaning devices of the present invention can be folded flat and assembled and packaged in a fashion similar to a matchbook. This is a very convenient method for carrying a supply of the devices. A single device can be removed when needed simply by lifting the cover of the book and removing the device from the enclosed folded stack of devices.

Other means of packaging the devices to protect them from contamination until the moment of use include enclosing the device in an envelope or protective covering of plastic film, cellophane, or cellulosic sheet, which may be sealed by heat or in another manner and may be stripped off just before use.

The outer surfaces of the tooth cleaning devices of the present invention can be fabricated from any material that has relatively high wet strength and will not disintegrate from abrasive contact with the teeth which occurs during use. Standard commercial high wet strength paper is satisfactory, as well as woven and non-woven fabrics. Additionally, high wet strength waterproof thermoplastics such as polyethylene may be used.

The surface of the paper, fabric, or plastic may be creped, embossed, or provided with any other suitable texture to provide additional abrasive action to aid in plaque removal.

The inside surfaces of the tooth cleaning device may be made from any suitable water-resistant or water-repellant material. Any plastic film, coating, or wax may be used, so long as it provides a water-resistant inner surface. Polyethylene film has been found to be particularly suitable lining material.

The flavor which is adhered to the outer surface of the device is encapsulated to protect it against changes in its physical and chemical properties. The encapsulating material used must be water-soluble in order to release the flavoring materials when the device is in contact with the moisture in the mouth. One example of an encapsulating medium is an aqueous hydrophilic colloid which may have as its sole major component a protein-based material such as casein, soy protein, or other vegetable or animal protein or proteins which are capable of forming colloidal dispersions in water, which can be gelled either by changes in temperature or by changes in concentration, and which when dehydrated form a substantially air-imperious capsule. Alternatively, the sole or major component of the hydrophilic colloid may be a non-protein based material such as vegetable gum, e.g., gum arabic, gum tragacanth, locust bean gum, and the like. These vegetable gums have the advantage of not reacting with the aldehydes contained in aromas, flavors, and the like, and, where only flavors are to be encapsulated, are preferable to a protein material as the major component of the capsule wall. Other materials which may comprise the hydro-
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philic colloid include cellulose and starch ethers, solubilized cellulose and starch products, carboxy-polyethylene, styrene-maleic acid reaction products, polyvinyl alcohols, polysaccharide B-1459, and dextran.

The stability of the encapsulated flavor can be further increased by incorporating into the flavor constituents an antioxidant before the flavor is emulsified in the colloid solution prior to encapsulation. The most effective and useful antioxidants are butylated hydroxytoluene and butylated hydroxyanisole, used either by themselves or in combination with each other or with other antioxidants, such as propyl gallate. The quantity of the antioxidants incorporated into the capsules depends on the stability requirements of the products in use and is limited only by their effect on the flavor of the final product.

The preferred flavoring materials for use in the devices of the present invention are those that will leave a fresh, clean taste in the mouth after use of the device, such as peppermint, spearmint, wintergreen, cloves, or anise. Other flavorings that may be used include fruit flavors such as cherry, lemon, lime, orange, etc.

Other materials that may be adhered to the outer surface of the device to aid in treating the teeth include bacteriostats, soap or detergents, dentifrices, and the like. Where a more positive abrasive action is desired, polishing agents which also aid in treating the teeth such as kaolin, precipitated chalk, fine pumice, iris root powder, and the like may be adhered to the device.

The devices can be produced in a wide variety of shapes, as they do not depend on their shape to remain on the finger during use. The sizes, flavors and colors of the devices may likewise be varied to broaden their acceptance and appeal. For example, certain flavors may be associated with certain colors for purposes of ready identification of flavors.

The device of the present invention is conveniently sized for carrying on the person so that it is readily at hand whenever cleaning of the teeth is necessary or desirable. Additionally, the device is very inexpensive and, because of its small size, is completely disposable.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, several preferred embodiments of the invention are illustrated. Obviously, changes in form may be made within the scope of the invention.

FIGS. 1A, 1B, 1C, and 1D illustrate some of the possible shapes which can be used for the tooth cleaning devices of the present invention.

FIG. 2 shows an assembly of a plurality of tooth cleaning devices of the present invention packaged in a fashion similar to matches in a matchbook.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring to FIG. 1A, a tooth cleaning device 11 is formed of two sheets of a high wet strength material which have been joined in such a manner at three sides as to provide stiff lap edges, 12. The stiff lap edges can be used to clean between the teeth in the manner of a toothpick or dental floss. The cut is of a size to fit over a finger at the opening at the bottom 13.

Referring to FIG. 1B, a tooth cleaning device 14 may be made from one sheet of high wet strength material which is folded over upon itself so that the water-imperious layer is on the inside and sealed at the top and one side to form stiff lap edges 15. The opening for the finger 16 is at the bottom of the device.

Referring to FIG. 1C, a tooth cleaning device having a pentagonal shape 17 is formed of two sheets of high wet strength material joined at four sides to provide stiff lap edges 18. The high wet strength material may be a layer of water-imperious material coated or laminated onto a high wet-strength paper, or may be a high wet-strength, waterproof thermoplastic material. The bottom of the device, which is not sealed, is the situs of the opening for the finger 19.

Referring to FIG. 1D, another tooth cleaning device 20 may be made from one sheet of high wet-strength material which is folded over upon itself so that the water-imperious surface is on the inside and sealed at the top and one side to form stiff lap edges 21. The opening for the finger 22 is at the bottom of the device.

Referring to FIG. 2, a plurality of tooth cleaning devices can be assembled and packaged in a matchbook-type folder 23 for conveniently carrying a supply of the devices. A single tooth cleaning device 11 can be removed by lifting the cover of the book and tearing it out along a perforated line 24.

What is claimed is:

1. A tooth cleaning device comprising a body of material shaped to provide a pocket having a sealed end, a pair of sealed edges, and an open end for receiving the finger tip of the user, said sealed end and edges forming a stiff lap edge comprising at least two layers of said material heat sealed together said body of material comprising a laminate of an outside layer of a high wet strength fibrous material and an inner layer of a water impervious thermoplastic material, said outer layer having adhered to its outer surface a substance selected from the group consisting of flavoring agents, polishing agents, bacteriostats, dentifrices, and mixtures thereof, said lap edges being adapted to physically remove foreign material from between the teeth of the user.

2. The tooth cleaning device of claim 1 wherein said foreign material is encapsulated flavoring agent.

3. The tooth cleaning device of claim 1 wherein said substance is an encapsulated flavoring agent.

4. A tooth cleaning device according to claim 1 wherein said pair of sealed edges are oppositely opposed and are separated at said closed end by at least one and not more than two straight line sealed members, said sealed members and said edges forming pointed junctions, suitable for removing foreign matter from between the teeth.

5. A tooth cleaning device according to claim 4 wherein said sealed member forms an angle of not more than 90° with at least one of said sealed edges.

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