United States Patent [19]

DiPaolo

[11] **3,904,362**

[45] **Sept. 9, 1975**

[54] **TOOTHBRUSH STERILIZATION HOLDER AND CONTAINER**

[76] Inventor: **Edmund C. DiPaolo,** 111 Rancocas Blvd., Rancocas Woods, N.J. 08073

[22] Filed: **Feb. 8, 1974**

[21] Appl. No.: **440,712**

[52] **U.S. Cl.** ..... **21/87;** 21/82 R; 21/83; 206/209; 206/362; 220/17; 220/20; 312/206

[51] **Int. Cl.** **A61l 3/00;** A46b 17/06

[58] **Field of Search** ..... 21/82 R, 87 R, 86, 83, 21/99; 206/209, 362; 220/17, 20; 312/206

[56] **References Cited**

UNITED STATES PATENTS

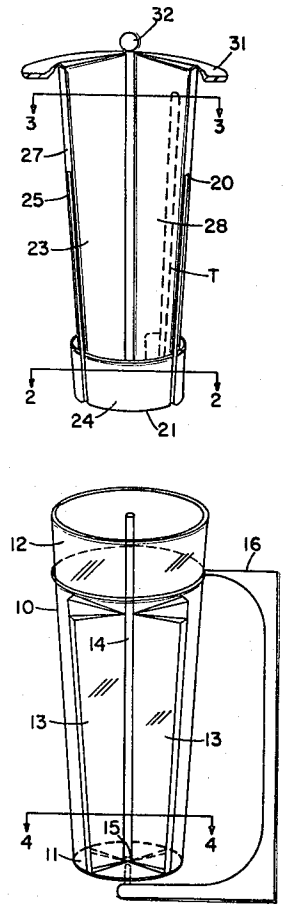
880,432	2/1908	Weidhaas	312/206
1,361,842	12/1920	Evslin	312/206 X
1,465,627	8/1923	Fisher et al.	21/83
1,507,466	9/1924	Collins	21/83
1,553,648	9/1925	Thompson	312/206 X
1,566,860	12/1925	Hainzigianis	21/105
1,579,958	4/1926	Schwartz	312/206 X
1,584,261	5/1926	Vuolo	206/15.1
2,012,685	8/1935	Laposea	206/15.1
2,298,662	10/1942	Tetzlaff	21/87
3,141,712	7/1964	Holmes et al.	312/206

Primary Examiner—Barry S. Richman
Assistant Examiner—Dale Lovercheck
Attorney, Agent, or Firm—Michael B. Fein

[57] **ABSTRACT**

A toothbrush holder system for separation, sterilization and antiseptic soaking of toothbrushes. The toothbrush holder system includes a compartmentalized fluid separating cup-shaped body and individual toothbrush holders for each compartment to immerse the toothbrush bristles in the antiseptic fluid and allow for ready removal. The wall of the adjacent toothbrush holders extend vertically higher than the internal compartment walls and join together at a point higher than the internal compartment walls so as to form a unitary solid wall above the compartment wall.

4 Claims, 5 Drawing Figures



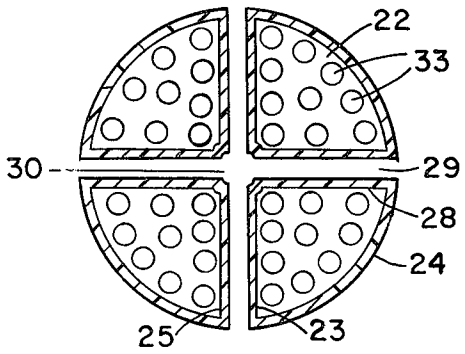


FIGURE 2

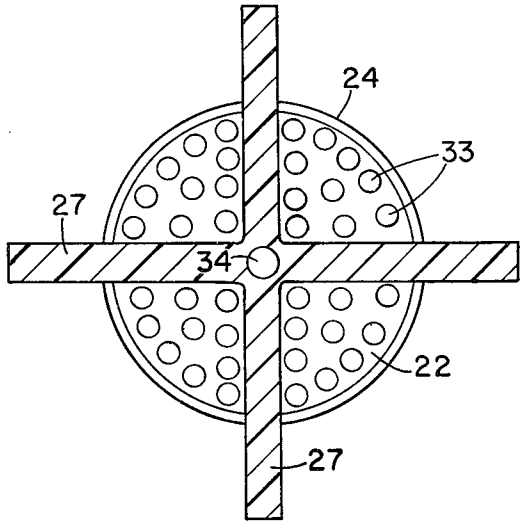


FIGURE 3

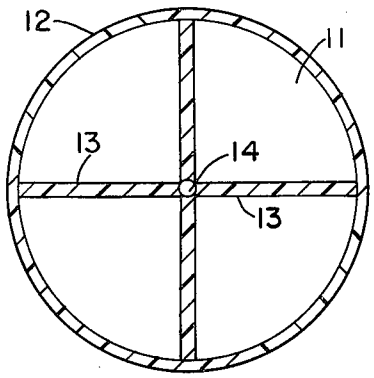
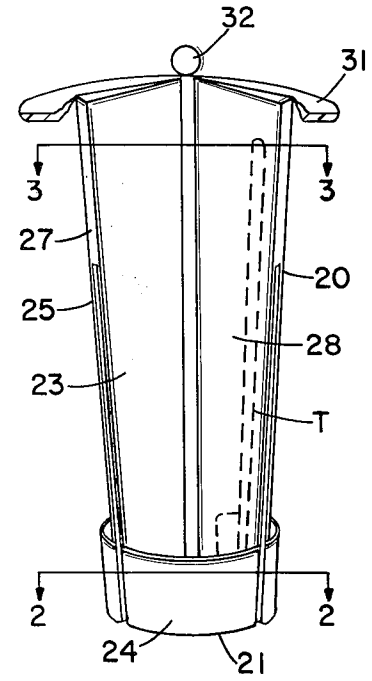


FIGURE 4



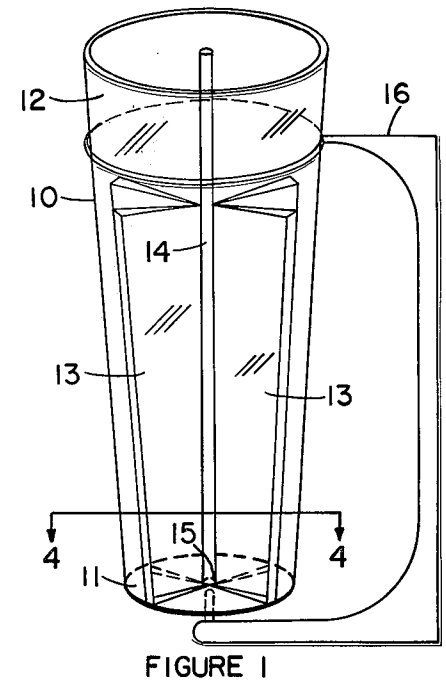


FIGURE 1

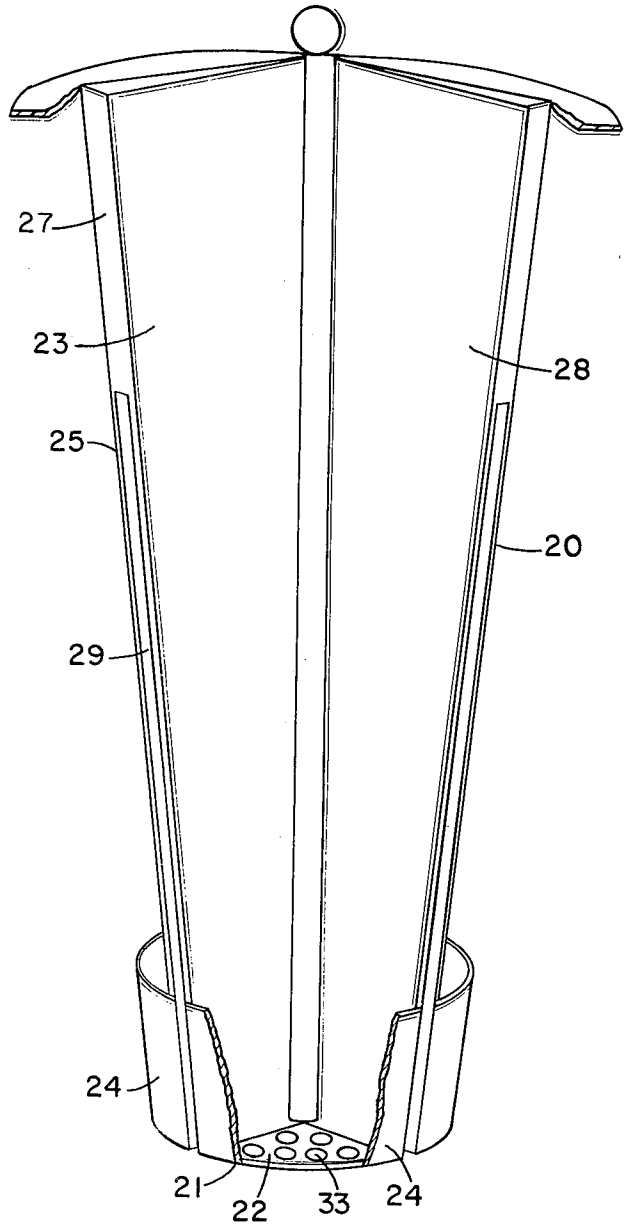


FIGURE 5

TOOTHBRUSH STERILIZATION HOLDER AND CONTAINER

BACKGROUND OF THE INVENTION

This invention relates to an improved receptacle for toothbrushes. In particular, this invention is directed to the problems with dental hygene of presently available equipment.

The bathroom of the typical home is a breeding place for bacteria. The typical toothbrush holder supplied with the house provides essentially no protection from surrounding bacteria. Small children may easily play with the toothbrushes of the family allowing them to contact germs and bacteria throughout the bathroom. When the toothbrush is replaced in the holder, the bacteria culture is left free to multiply and become a menace to health.

An additional object of this invention is directed to the toothbrush after use. After brushing the teeth, it is not uncommon for food particulate to remain on the toothbrush along with other deposits from the mouth. These deposits, if left alone, provide an efficient breeding ground for bacteria. Thus, the toothbrush itself is a source of contamination to the mouth.

In addition, this invention is directed to the harm that a dry toothbrush can inflict on the gums of the person brushing his teeth. A toothbrush left in the air for a number of hours will completely dry out leaving the bristles stiff and unyielding. It is recognized that if the toothbrush is not used in exactly the proper manner, the gums can be scratched and damaged by a rigid unyielding toothbrush bristle. It is therefore, an object to maintain the toothbrush bristles in a soft pliable condition between uses, and in combination protect the user from contamination of bacteria, molds and other forms of microscopic life which can breed on a damp toothbrush.

It is also an object to maintain complete separation of the toothbrushes of a family from each other. This prevents the spread of disease and contamination from member to member of the family. It is also an object to provide an antiseptic flushing action within the apparatus to clean the toothbrush.

Prior art devices have not solved the problems enumerated above. The typical toothbrush holder on the wall or in the wall of new homes fails to satisfy any of the needs described above. Other toothbrush holders satisfy some but not all of the needs enumerated above. Prior toothbrush holders include those described in U.S. Pat. Nos. 1,566,860 to Hainzigianis of Dec. 22, **1925, 2,012,685** to Laposea of Aug. 27, 1935, **2,474,621** to Federico of June 28, 1949, 3,141,712 to Holmes, et al of July 21, 1964, 880,432 to Weidhaas, Jr. of Feb. 25, 1908, 1,507,446 to Collins of Sept. 2, **1924** and 1,584,261 to Vuolo of May 11, 1926. Some of these patents disclose vapor sterilization but do not offer the advantage of the softened bristles. Others do not provide any sterilization at all but only provide compartmentalization. None provide a flushing action to remove sediment from the holder and clean the toothbrush.

While these holders do not satisfy the above needs, the invention described hereinbelow satisfies all the needs to provide a sanitized, separated, and pliable toothbrush for every brushing.

SUMMARY OF THE INVENTION

The toothbrush holder system of this invention is basically first a compartmentalized cup shaped body having a plurality of compartments which are adapted to contain antiseptic fluid and prevent the flow of the fluid between the compartments. Secondly, the invention includes toothbrush holders, one for each of the compartments, which are adapted to hold individual toothbrushes and allow the insertion of the toothbrushes into the individual compartments to immerse the bristles in the antiseptic fluid for storage between use. There are apertures provided in the bottom of each toothbrush holder to allow fluid flow of the antiseptic fluid into the toothbrush holder to flush and clean the toothbrush held therein and to clean out the holder of any sediment or food particulate that have settled in the holder. The toothbrush holders are kept from entering into any other compartments so as to prevent intermixing of the antiseptic fluid carried by the holders and brushes.

Therefore, this invention provides for complete separation of the toothbrushes and storage in an antiseptic fluid. It allows for removal of the toothbrush to be used and reinsertion into the holding system without intermixing between compartments.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded perspective view of a toothbrush holder and container of this invention.

FIG. **2** is an expanded horizontal cross-sectional view taken along line **2—2** of FIG. **1** showing the individual toothbrush holders.

FIG. **3** is an expanded horizontal cross-sectional view taken along lines **3—3** of the toothbrush holder of FIG. **1.**

FIG. **4** is a horizontal cross-sectional view of the compartmentalized container taken along line **4—4.**

FIG. **5** is an expanded perspective view of a toothbrush holder of this invention, cut out to show aperture-scrubber detail.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

This invention comprises a body generally in the form of a cup which may be constructed out of clear plastic to allow the user to easily see his toothbrush. In any case, the body is constructed with a solid bottom wall and vertical walls, which may be joined and curved to form a continuous vertical wall. Inside the body, there are provided a plurality of compartments sealed from each other such that there can be no fluid flow between the compartments. These compartments are adapted to contain antiseptic fluid, although one or more of the compartments may be left empty when not in use. Typically, these compartments are formed by internal vertical walls extending generally from the center of the body outwardly and joining with the outside wall of the body. At the center of the body, where the vertical compartment walls meet there preferably is a rod extending above the height of the compartment walls to provide a guide for a toothbrush holder system to slide upon. The height of the compartment walls is less than the outside body wall and is typically about two-thirds the length of the standard toothbrush. It is preferred that there be three to five compartments.

Into this body is fitted the toothbrush holder system which comprises a plurality of holders, one for each

compartment. Each holder is perforated at the bottom to allow the antiseptic fluid to flow and squirt through the apertures washing the brush and cleaning sediment and particulate out of the holder. The holder is preferably held off the bottom of the body so as to allow collection of sediment and particulate outside of the holder on the bottom of the body. It is preferred that the individual toothbrush holders, which may be generally described as baskets, have a cross-section that essentially completely fills the inside dimensions of each compartment, so as to increase the fluid flow through the apertures when the holder is emersed in the antiseptic fluid.

A preferred toothbrush holder system comprises a perforated bottom on which are attached sidewalls, which extend vertically and abut against the interior of the body walls. At least one of the sidewalls must extend higher than the compartment walls so as to join with other toothbrush holder walls above the compartment walls holding the antiseptic fluid for strength and stability, it is preferred that all interior walls of holder extend above the body walls and join with adjoining holder walls. Thus, in this preferred embodiment adjacent sidewalls of the toothbrush holders join at a height above the compartment walls and allow sufficient space between these adjacent sidewalls to allow them to slide over the compartment walls. Typically the joined adjacent sidewalls of the toothbrush holder extend upwardly and connect to a cover which fits over the cup opening of the body.

Where the sidewalls of the toothbrush holders approach the center of the compartment, sufficient room is left so as to allow space at that center for a guiding rod which extends vertically at the intersection of the compartment walls. Since this guide rod extends above the compartment walls, there is a provision of a hole in the center of the joined adjacent holder walls to allow the entire toothbrush holding system to slide over the guide rod and the compartment walls in and out of the antiseptic fluid.

Although the embodiment described hereinafter illustrates outside holder sidewalls abutting the inside surface of the outside wall of the body, these walls are clearly not necessary as the toothbrushes can easily be lifted out of the solution without these walls being present. It is preferred that that wall be present for rigidity of the system and to prevent of jamming. Obviously all walls of the holders may be perforated.

Referring now to FIG. **1** transparent body **10** consists of bottom **11** and vertical cylindrical sidewall **12.** Compartment walls **13** are sealed to bottom **11** and sidewall **12** such that each compartment is fluid tight. Guide rod **14** extends above the height of compartment walls **13** a sufficient distance to provide a guide for sliding toothbrush holder system **20** up and down so as to lift out and emerse the toothbrushes in antiseptic fluid present in the compartments. Guide rod **14** acts as a reinforcing rod sealably attached to compartment walls **13** and bottom **11.**

Body **10** can obviously be composed of one molded piece, typically of a plastic polymer. It is preferred that this entire body including the compartment walls be transparent to allow the user to easily pick his toothbrush, although this is not critical as when the toothbrushes are lifted out of the fluid the color is easily distinguished. The body may be composed of any material resistent to degradation in continuous contact with antiseptic fluids. Thermoplastic polymers are preferred such as polystyrene, polymethyl methacrylate, polycarbonate, and other generally rigid thermplastic polymers.

While the system may sit on a sink or a table, it is preferably mounted on the wall by providing an indentation **15** in the center of the bottom surface of bottom into which a rounded vertical rod (shadow) is seated. Body **10** rests on this rod and is prevented from falling by circular holder **16** around wall **12** but is allowed to rotate on the vertical rod for easy removal of the toothbrushes.

Continuing to refer to FIG. **1,** toothbrush holder system **20** is shown completely outside body **10.** In use, holder **20** is generally not removed from body **10** but is only lifted upwardly a sufficient distance to allow removal of a toothbrush. Typically, a stop is provided to prevent inadvertent removal of the toothbrush holder system **20.** However, the toothbrush holder system is entirely removable when it is necessary to change the antiseptic fluid and clean the holder.

The embodiment of FIG. **1** of the toothbrush holder system of this invention consists of four separate holders **21,** each fitting into the body compartments formed by walls **12** and **13.** Detail of the holders is provided in FIG. **2,** a cross-sectional view of lower holder system. Holders **21** consist of perforated bottom **22** and sidewalls **23** and **28.** In this embodiment sidewall **24** is also provided which extends only a short distance vertically and remains emersed in the antiseptic fluid. On the other hand vertical sidewalls **23** and **28** extend vertically to a height higher than the compartment walls **13.** At that height, it is preferred that the sidewalls of adjacent holders, such as **23** and **25** join together to form a solid single vertical wall **27.** This joining is further shown on FIG. **5** as an enlarged perspective view of these vertical walls **23** and **25** joining to form wall **27.** There is sufficient area of bottom **22** to allow a toothbrush to rest with the bristles placed downwardly in the holder. Toothbrush T rests on bottom walls **22** and is held vertically by resting against holder walls **23** and **28,** or the interior of body wall **12.** In this embodiment the toothbrush never touches wall **13,** although it would touch if only one of the holder walls were extended above the compartment walls.

Apertures **33** provided in bottom **22** are sufficient size to allow fluid flow in and out of the holder. The aperture size is chosen to provide sufficient resistance when holder **20** is inserted into the fluid to provide a violent agitation of the fluid through the apertures and around the toothbrush so as to clean the bristles and wash out the holder. When holder **20** is raised, the apertures should be of sufficient size to allow essentially complete drainage out of the holder so as to provide fluid for subsequent agitation when the holder is lowered. The drainage also carries sediment out of the holder to body **10.**

Referring to FIG. **2,** as well as FIG. **5,** space **29** between adjacent sidewalls of toothbrush holders **21** is sufficient to allow the holders to slide over and inside compartment walls **13.** It is preferred that space **29** be limited so as to allow the cross-section of each holder to essentially completely fill each compartment. Space **30** is provided to allow toothbrush holder **21** to slide over guide rod **14** both at a height above compartment walls **13** and below.

Again, referring to FIG. 1, wall 27 and other like walls extend vertically and attach to cover 31. Knob 32 is provided for ease of removal and is rigidly attached to cover 31 and walls 27.

The bottom of holders 21 are preferably not allowed to touch body bottom 11, so as to allow a space for collection of sediment. This may be accomplished by limiting the height of space 29 so that the top of the space rests on the top of compartment walls 13, or by providing a stop, like top 31 resting on the top of wall 12, or by both. Of course, projections, like bumps, may be provided on the bottom of holders 21 to allow for a space between bottom 11 and holder bottoms 22.

FIG. 3 is an expanded cross-sectional view of the upper portion of toothbrush holder system 20. Walls 27 are solid except for hole 34 which allows toothbrush holder system 20 to slide over guide rod 14.

FIG. 4 shows a cross-sectional view of body 10 wherein cylindrical wall 12 forms a cup shape with bottom wall 11 and compartment walls 13 join with wall 12 to form individual sealed compartments. The compartment walls 13 join at the center to guide rod 14.

The toothbrush holders 29 may be composed of one or two molded pieces. It is preferred that holder 20 be molded of thermoplastic polymer of the semi-rigid variety. It may be somewhat more flexible than body 10, but it may be composed of the same material. Typical satisfactory compositions for molding the toothbrush holder system include polystyrene, polypropylene, polyethylene, polyacrylonitrile-butadiene-styrene, and the like.

While this invention has been described with reference to the specific embodiments disclosed herein, it is not confined to the details set forth and the patent is intended to include modifications and changes which may come within and extend from the following claims.

I claim:

1. An article for storing toothbrushes immersed in separated antiseptic liquid environments comprising

a. a cup-shaped body formed by a solid bottom wall, a solid cylindrical vertical body wall having a circular cross-section, said solid cylindrical vertical body wall attached to said bottom wall, and vertical internal compartment walls attached to the bottom wall and the cylindrical vertical body wall so as to form a plurality of liquid-tight compartments, said cup-shaped body being open at the top thereof,

b. a toothbrush holding member having a plurality of toothbrush holders, said toothbrush holders formed of sidewalls and a bottom wall having apertures therein, wherein the toothbrush holders slideably fit the inside dimensions of the liquid-tight compartments, the sidewalls of each toothbrush holder being adapted to abut against the internal compartment walls of the cup-shaped body, the sidewalls of adjacent toothbrush holders extending vertically higher than the internal compartment walls, and each pair of adjacent sidewalls being joined together at a point higher than said internal compartment wall so as to form a unitary solid wall above its respective compartment wall.

2. The toothbrush holder system of claim 1 wherein said toothbrush holding member contains at least one guide rod extending vertically above the top of the vertical internal compartment walls, said toothbrush holding member contains at least one sleeve formed between adjacent walls of the toothbrush holders, said sleeve capable of sliding over the guide rod and internal compartment walls to allow the holders to be raised to facilitate a removal of the toothbrushes and reinsertion of the holders into the antiseptic fluid when not in use.

3. The toothbrush holder system of claim 1 wherein the joined adjacent walls of the toothbrush holders extend vertically above the height of the cylindrical vertical wall of the body to join with a cover which extends over the opening in the cup-shaped body to reduce evaporation and contamination of the antiseptic fluid and contamination of the toothbrushes.

4. The toothbrush holder system of claim 1 wherein the bottom wall of the cup-shaped body is provided with an axially inwardly directed indentation in the center of the bottom face thereof and a body holder means is provided comprising:

a. a circular ring having an inside diameter larger than the outside diameter of the vertical wall of the cup-shaped body,

b. a vertical member to extend into the indentation of such size and shape that when the cup-shaped body is allowed to rest on the vertical member, said vertical member prevents said cup-shaped body from sliding off the vertical member while allowing the body to rotate in a horizontal plane, and

c. means for attaching both said circular ring and said vertical member to a support wall, whereby said cup-shaped body may be rotatably supported on said vertical member and held in axial alignment therewith by said circular ring.

* * * * *