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METHOD OF MAKING SELF-STERILIZING BRUSHES

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7 Claims. (Cl. 300—21)

Our present invention relates to brushes, particularly toilet brushes, and has for its object to provide an improved antiseptic or self-sterilizing brush.

In an application for United States Letters Patent filed by Warren E. Hill and Clifford L. McArthur, April 7, 1933, Serial No. 664,894, there is described an antiseptic or self-sterilizing brush and method of producing it, the brush being rendered antiseptic or self-sterilizing by treating its bristles with a solution of phenyl mercuric salt. The present invention is in certain respects an improvement on the brush and process therein described and in certain other aspects an alternative for them. A particular object of the present invention is to prevent any tendency for the bristles or bristle substitutes, namely, hair, vegetable fibers and synthetic filaments, which have been rendered antiseptic or self-sterilizing becoming discolored or losing their sterile strength substantially within the period of normal useful life of the brush.

We have discovered that if the bristles contain small amounts of reducing agents, such as sulphites, which tend to reduce the antiseptic in the bristles, discoloration will be caused. The present invention contemplates a method of treating bristles whereby they will maintain more permanently their self-sterilizing properties throughout their normal useful life and will not become discolored to any material extent.

In accordance with the method of the invention the brush bristles may be treated either before or after assembly with the brush handle. Our present process includes primarily two novel features, the first of which consists in treating the bristles, before or simultaneously with the application of the antiseptic solution, with an oxidizing agent, the effect of which is to oxidize any reducing agents which may have been left on the surface of the bristle during the process of cleaning, bleaching or preparing the bristles, and the second, the stabilization of the antiseptic solution by the treatment during or subsequent to the application of the antiseptic solution. A suitable oxidizing agent is hydrogen peroxide. Suitable stabilizing agents are salts of a halogen and a metal, such as sodium iodide or sodium chloride. While with certain kinds of bristles it may not be necessary to wash or treat them with an oxidizing agent, it is usually desirable to insure uniform treatment regardless of the types or kinds of bristles used.

Various antiseptics or germicides are available for use in the practice of the invention, such for example, as phenyl mercuric nitrate, phenyl mercuric chloride, or other phenyl mercuric salts, oxyquinoline sulfate, parachlorothymol or hexylresorcinol dissolved in a suitable solvent. The most satisfactory results have so far been obtained with a solution of a phenyl mercuric salt, such as nitrate or chloride, in water. We have also found that for permanent results water is much the best solvent, perhaps because better penetration occurs.

In accordance with the preferred practice of the invention, the bristles are washed thoroughly with a suitable soap, and rinsed. They are then soaked in a 1% aqueous solution of hydrogen peroxide, and may be dried or immersed directly in a saturated aqueous solution of phenyl mercuric nitrate or chloride for about fifteen minutes at about 100° F. Thereafter, the bristles are immersed in a 1% solution of sodium iodide in water for five minutes and then dried at about 125° F. for about thirty minutes. The phenyl mercuric nitrate or chloride which has penetrated the bristles is converted by treatment with the sodium iodide solution to phenyl mercuric iodide which is less soluble in water.

While we prefer to treat the bristle first with the oxidizing agent, then with the antiseptic and finally with the stabilizing agent, we believe that in certain cases it may be preferable to combine the oxidizing agent and antiseptic in a single bath, or possibly all three in a single bath, the essential thing being that the finished bristle will have been penetrated by antiseptic which has been stabilized by a proper stabilizer and which is not deteriorated by the presence of any reducing agent except possibly such sulphur compounds as may be contained in the protein of the bristle itself.

Bristles may be treated in accordance with the invention at low cost to render them self-sterilizing throughout the practical useful life of the tooth brush. The treated brush is odorless, tasteless and non-toxic and the treatment has no corrosive effect and does not distort the bristles. Discoloration is practically neglible.

We claim:

1. The method of making a self-sterilizing brush which comprises treating the bristles with a solution of a phenyl mercuric salt, and treating the bristles with an agent adapted to react with the phenyl mercuric salt to form a phenyl mercuric salt which is less soluble in water.

2. The method of making a self-sterilizing brush which comprises treating the bristles with an oxidizing agent and a solution of a phenyl mercuric salt, and treating the bristles with an

agent adapted to react with the phenyl mercuric salt to form a phenyl mercuric salt which is less soluble in water.

3. The method of making a self-sterilizing brush which comprises treating the bristles with a solution of a phenyl mercuric salt, and subjecting the bristles so treated to the action of a solution of a salt of a halogen to convert the phenyl mercuric salt to a phenyl mercuric salt less soluble in water.

4. The method of making a self-sterilizing brush which comprises treating the bristles with an oxidizing agent and a solution of a phenyl mercuric salt, and subjecting the bristles so treated to the action of a solution of a salt of a halogen to convert the phenyl mercuric salt to a phenyl mercuric salt less soluble in water.

5. The method of making a self-sterilizing brush which comprises treating the bristles with a solution of a phenyl mercuric salt, and subjecting the bristles so treated to the action of a solution of a metallic iodide to convert the phenyl mercuric salt to a phenyl mercuric salt less soluble in water.

6. The method of making a self-sterilizing brush which comprises treating the bristles with an oxidizing agent and a solution of a phenyl mercuric salt, and subjecting the bristles so treated to the action of a solution of a metallic iodide to convert the phenyl mercuric salt to a phenyl mercuric salt less soluble in water.

7. The method of making a self-sterilizing brush which comprises treating the bristles with an aqueous solution of a phenyl mercuric salt, and subjecting the bristles so treated to the action of a solution of a halogen containing compound to convert the phenyl mercuric salt to a phenyl mercuric salt less soluble in water.

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