

UNITED STATES PATENT OFFICE.

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MUCIN-SOLVENT TOOTH PASTE.

No Drawing.

Application filed August 12, 1926. Serial No. 128,914.

The present invention relates to a tooth paste, and more particularly to a tooth paste which is an efficient solvent for the mucin plaques which accumulate upon the teeth.

5 Tooth pastes as heretofore made may be divided into two general classes, first, the so-called acid pastes, and second, the so-called soap pastes. The acid pastes are made up of a powdered abrasive with some jelling agent, as gum tragacanth, together with glycerine and water as an excipient.

The soap pastes are made up of a powdered abrasive and neutral soap, together with glycerine and water as an excipient.

15 All of these tooth pastes depend primarily upon the abrasive action of the powdered abrasive for their cleansing action upon the teeth, assisted by the emulsifying or detergent effect of the neutral soap in the case of soap pastes. The soap, while assisting the abrasive powder in cleansing the teeth by the scrubbing action of the tooth brush, is not a practicable solvent in itself for the mucin. This is probably due to three causes, first, because the p_H value of a neutral soap is too low to cause the conversion of the mucin to soluble sodium mucinate; second, because of the chemical analogy between the negative radicals of the soap and the mucin, the soap being formed from a fatty acid and the mucin from an amino-fatty acid; and third, because of the small solubility of soap in water.

I have discovered that a tooth paste may be made an efficient solvent of mucin, and may be so compounded as to remain in stable form. This may be done by incorporating into the tooth paste a salt of an alkali metal of sufficient alkalinity so that when the paste is used in the mouth, the mucin plaques will be dissolved. I have found, however, that if an attempt be made to incorporate the alkaline salt into the soap tooth pastes now on the market, a paste will be made which will separate into a coagulated mass and free water or water and glycerine. I have found, however, that this may be prevented by substituting pure glycerine for the water and glycerine now present in the soap tooth pastes.

As an example of a good tooth paste embodying my invention, I combine 12 ounces glycerine, 1 ounce trisodium phosphate, $2\frac{1}{2}$

ounces of solid neutral soap and 6 ounces of precipitated chalk (calcium carbonate).

In compounding the tooth paste, I first dissolve the trisodium phosphate, then add to this mixture, first, the soap and then the chalk, the mixture being heated and thoroughly mixed. The mixture upon cooling forms a jelly of about the right consistency for the tooth paste. While the ingredients may be added in various orders, I prefer to dissolve the trisodium phosphate in the glycerine while the glycerine has its initial fluidity and before it is thickened by the addition of the soap, thus permitting the trisodium phosphate to be quickly and thoroughly dissolved. I prefer next to add the soap before the mixture becomes thickened by the addition of the chalk.

While other salts or mixtures of salts giving sufficient alkalinity may be used, I prefer to use a normal or tertiary phosphate of an alkali metal, preferably trisodium phosphate. The trisodium phosphate when hydrolyzed upon the dissolving of the tooth paste in the saliva or water on the tooth brush, or water otherwise present in the mouth, forms a water solution having a p_H value of about 11.5, which is sufficiently high to serve as an efficient mucin solvent. The trisodium phosphate serves as a reservoir yielding up further hydroxyl ions as the hydroxyl ions are used up in forming the soluble sodium mucinate from the coagulated acid mucin plaques. The p_H value, however, is sufficiently low so as not to be an irritant to the mucous membranes of the mouth.

While, as above stated, I prefer to use the trisodium phosphate, other salts or mixtures of salts or other alkaline compounds, such for example, as hydroxides, may be used which will give the desired alkalinity. If an alkalinity somewhat lower than that of trisodium phosphate is desired, the trisodium phosphate may be tempered by the addition of a small proportion of disodium phosphate, or sodium carbonate, or a mixture of sodium bicarbonate with sodium carbonate or other salt less alkaline than sodium carbonate may be employed.

The alkaline salt is preferably such as to give a p_H value to the water solution formed

in the mouth greater than that which would be given by a soap alone in the tooth paste. An alkali metal salt of even the same alkalinity as soap is a more efficient solvent for mucin than soap alone, because it is more soluble than soap. It is not analogous chemically to the organic mucin, and it is more mobile or less viscous than soap. Therefore, while I much prefer to use a salt, such as trisodium phosphate, which materially increases the p_H value of the water solution formed by the paste, I have found that an alkali metal salt having an alkalinity approximately that of soap tends to increase the mucin solvent properties of a tooth paste over soap alone.

The soap is used in my paste, as in the present soap pastes, because of its jelling, lathering, emulsifying and detergent effects, but in my tooth paste, I do not depend upon any tendency of the soap to dissolve mucin because this tendency is altogether too slight to give a practicable effect.

A small amount of sodium chloride, say one-fourth ounce in the proportions given in the formula set forth above may be added along with the trisodium phosphate so as to make the solution formed in the mouth saline.

Tooth paste is a compact and commercially convenient form for applying a mucin solvent to the teeth. A mucin solvent such as trisodium phosphate may be applied probably most efficiently in the form of a liquid, but liquid is bulky and is not as conveniently carried as a tooth paste, and the public has shown a preference for paste dentifrices in preference to powders and liquids.

When my tooth paste is dissolved in water which is usually carried to the mouth by dipping the tooth brush in water, the trisodium phosphate, which is present in a relatively concentrated form in the paste, dissolves into a water solution of sufficient dilution to dissolve the mucin plaques from the teeth.

In the case of a soap paste, trisodium phosphate or other alkali metal salt would, if water were present to a material extent, tend to cause the soap to become salted out upon standing, according to the well known action of salts in "salting out" soap from water solutions. The amount of water present in the soap tooth pastes now on the market, I have found to be sufficient to permit this salting out action to take place and free water to be present after standing for several months. This, of course, must be guarded against, since months and even years may elapse between the time they are put on the apothecary's shelves to the time they are sold. While I have found glycerine to be the most efficient and pleasing solvent or excipient agent to prevent the salting out of the soap or other jelling agent, other solvents or excipients may be used in which the salting out effect will not take place. Also, while I prefer to use soap as the jelling agent, other jell-

ing agents might be used, such as gum tragacanth, gum arabic or starch glycerite. While I prefer to use precipitated chalk as the polishing agent or abrasive, other of the well known polishing agents used in tooth pastes and powders may be used, such for example, as tricalcium phosphate or calcium sulphate.

The tooth paste is preferably flavored with the usual essential flavoring oils employed in dentifrices, such as oil of peppermint, wintergreen or the like. There may also be added small quantities of mild aromatic antiseptics, such as menthol, thymol, eucalyptol or the like, which will impart germicidal qualities and impart a pleasing taste.

While I have described the preferred embodiment of my invention, it is to be understood that the invention is not limited to the details hereinbefore set forth, but may be otherwise embodied within the scope of the following claims.

I claim:

1. A mucin-dissolving tooth paste containing powdered abrasive, soap, glycerine and trisodium phosphate.
2. A mucin-dissolving tooth paste containing a powdered abrasive, soap, glycerine and a normal or tertiary phosphate of an alkali metal.
3. A mucin-dissolving tooth paste, containing a powdered abrasive, soap, glycerine and a mucin-dissolving compound of an alkali metal which produces in water solution a p_H value greater than that which would be produced by the soap alone.
4. A mucin-dissolving tooth paste containing approximately twelve parts glycerine, one part trisodium phosphate, two and one-half parts soap and six parts of a powdered abrasive.
5. The method of making the herein described tooth paste, which consists in adding to glycerine a mucin-dissolving compound of an alkali metal which produces in water solution a p_H value greater than that which would be produced by soap alone, and dissolving it therein, thereafter adding soap and a powdered abrasive to the mixture, and thoroughly mixing the materials.
6. The method of making the herein described tooth paste which consists in dissolving trisodium phosphate in glycerine, thereafter adding to the mixture soap and a powdered abrasive, and thoroughly mixing the materials.
7. A mucin-dissolving tooth paste containing a powdered abrasive, soap, a mucin-dissolving compound of an alkali metal which produces in water solution a p_H value greater than that which would be produced by the soap alone, and an excipient from which the soap is not salted out.
8. A mucin-dissolving tooth paste containing a powdered abrasive, soap, a normal or tertiary phosphate of an alkali metal which

produces in water solution a p_H value greater than that which would be produced by the soap alone, and an excipient from which the soap is not salted out.

8 9. A mucin-dissolving tooth paste containing a powdered abrasive, soap, trisodium phosphate, and an excipient from which the soap is not salted out.

10 10. A mucin-dissolving tooth paste containing a powdered abrasive, soap, a mucin-dissolving compound of an alkali metal having a p_H value not substantially less than that of the soap but having a greater solvent ac-

tion for mucin than the soap alone, and an excipient from which the soap is not salted out. 15

11. A mucin-dissolving tooth paste containing a powdered abrasive, soap, a mucin-dissolving compound of an alkali metal having a p_H value not substantially less than 20 that of the soap but having a greater solvent action for mucin than the soap alone, and glycerine.

In testimony whereof I have hereunto set my hand.

CLARENCE C. VOGT.

CERTIFICATE OF CORRECTION.

Patent No. 1,691,504.

Granted November 13, 1928, to

CLARENCE C. VOGT.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 97, for the word "carbonate" read "bicarbonate", and line 98, for the word "bicarbonate" read "carbonate"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office .

Signed and sealed this 11th day of December, A. D. 1928.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.

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