United States Patent [19]

Weiss et al.

[11] **3,833,419**

[45] **Sept. 3, 1974**

[54] **SOLUTION MEANS FOR REMOVING HAIR FROM HAIR BRUSHES**

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[22] Filed: **Nov. 20, 1972**

[21] Appl. No.: **308,102**

[52] **U.S. Cl.**..... **134/42,** 8/94.16, 8/127.51, 132/163, 134/2, 252/156

[51] **Int. Cl.**..... **A45d 24/40,** B08b 3/08, B08b 3/10

[58] **Field of Search**..... 134/2, 42; 8/161, 94.16, 8/127.51; 424/72; 252/99, 156; 206/84; 132/163

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[57] **ABSTRACT**

Hair brushes are cleaned of matted hair by soaking them in a solution derived from a solid oxidizing agent, preferably one capable of providing available chlorine in defined concentrations. Hypochlorites, especially lithium hypochlorite, is preferred.

6 Claims, No Drawings

SOLUTION MEANS FOR REMOVING HAIR FROM HAIR BRUSHES

BACKGROUND OF THE INVENTION

The accumulation of hair on hair brushes and the like used for conditioning hair, and the difficulty of thereafter cleaning the brushes is a quite common experience in life. The hair and dust and dirt carried along with it when brushing become entangled in the bristles of the brushes as well as finding their way to the internal portions thereof. When one tries to clean the brushes it requires a considerable effort to attempt to individually remove strands of hair and occluded material from their entangled stage within the bristles and brush structure; an effort which is both time consuming and invariably considerably short of complete success in cleaning and removal of hair. Mere conventional soaking in soapy water, ammonia or the like does not overcome this problem and indeed, may make it more difficult to remove hairs.

The problem is aggravated in the case of professional beautician and barber shops and the like, when due to the large number of women and/or men being treated and the necessity of maintaining brushes, combs and the like in sanitary condition, a great deal of effort is expended in cleaning of hair brushes, etc. While several mechanical brush-cleaning devices have been taught in the prior art, they are relatively complicated, capable of mechanical breakdown and in general, are not capable of removing the finer particles and smaller hair strands deeply imbedded in the bristles of brushes as is commonly encountered.

The present invention is concerned with improved means for cleaning hair brushes of matted hair and the like in a manner which is capable of being used by the average housewife in her home as well as being of utility to the professional beautician and barbering trades. More particularly, means are taught whereby hair brushes, particularly those having synthetic bristles such as nylon bristles on a plastic base, e.g., typically acrylic, polystyrene, polypropylene and polystyrene/acrylonitrile are cleaned by immersing the brushes in a solution having the properties indicated below.

SUMMARY OF THE INVENTION

More particularly, in accordance with the present invention, hair brushes, particularly those having synthetic (non-protein) bristles such as nylon, are cleaned of occluded hair by soaking said brushes in a solution containing an oxidizing agent capable of dissolving the hair strands. The solution of oxidizing agent must be capable of dissolving the hair in periods of less than 24, preferably less than 12 hours (overnight) and must not be so toxic or strong as to constitute a danger within the home. The solution must permit the homemaker to be able to place her hands briefly in it to put the brushes in solution as well as to remove them after the brush treating step. It should be noted, however, that the user should avoid excessive contact with the skin and follow any such contact by flushing the skin with water. Additionally, the oxidizing compound used in making the solution must be available in sufficiently concentrated form so as to not require extremely large amounts in order to dissolve the hair particles. In other words, the oxidizing agent in amounts of no more than 50 grams of pure compound per liter of tap water should be capable of dissolving the hair without attacking the synthetic bristles.

More particularly, it has been found that oxidizing agents containing available chlorine are especially suitable for the practice of the present invention. For typical home use such chlorine supplying oxidizing agents, when added in relatively minor amounts to tap water, should be capable of providing "available chlorine" in solution in an amount of about 0.1 to 20, preferably 0.5 to 10, especially 0.5 to 5 grams per liter of solution. The hypochlorites are particularly suitable in this regard since they are capable of providing substantial amounts of available chlorine per gram of compound added to water. The alkali hypochlorites, e.g., a lithium hypochlorite, potassium hypochlorite and sodium hypochlorites are especially useful, although alkaline earth hypochlorites such as calcium and magnesium can be used although they tend to give some precipitation in hard water. Lithium hypochlorite is particularly preferred due to its ready solubility, good stability characteristics as a powder and high available chlorine content.

Although not necessary, in some cases it may be desirable to add a second agent to the oxidizing agent containing available chlorine to modify its characteristics in one way or another. Though not necessary for lithium hypochlorite, by way of example, when employing sodium hypochlorite various materials such as alkalies, alkali silicates, alkali polyphosphates, potassium carbonates, etc., may be added in suitable amounts, e.g., of about 10 to 50 wt. percent of the hypochlorite in order to further stabilize same.

Similarly, it may be desirable to add a second material as a means of reducing the amount of chlorine supplying oxidizing agent required by providing a pH value in solution which will tend to liberate chlorine faster and therefore reduce the necessary time period for treatment. Typical of such materials might be the addition of sodium bisulfate to lithium hypochlorite in amounts of 15 to 40 wt. percent thereof as a means of giving a pH of 7 to 8.5 to the solution which enhances the liberation of available chlorine from solution and reduces either the time period for treatment with a given amount of hypochlorite, or reducing the amount of hypochlorite for a given time period treatment.

In addition to the hypochlorites, other chlorinated oxidizing agents such as chlorinated isocyanurates, chlorinated trisodium phosphate and the like can be used as a source of available chlorine.

While oxidizing agents giving off available chlorine are particularly preferred in terms of requiring a reduced amount of material and/or shorter time periods for treatment, other oxidizing agents such as potassium monopersulfate, potassium persulfate and sodium percarbonate can be used but at relatively high concentrations and lower effective rates as compared to hypochlorites.

As used in the present specification, the term "available chlorine" serves as a measure of the oxidizing potential of a chlorine-containing compound, and generally reflects the proportion of chlorine in its molecule. It is determined by titration with thiosulfate or arsenious acid, as described in "Technical Methods of Analysis," pg 44, Griffen, Second Edition (McGraw-Hill, New York).

One must bear in mind that commercially available oxidizing agents capable of liberating chlorine gener-

ally are not available in the pure state and thus one must correct for this when considering the actual amounts of commercially available material to be added to give the desired available chlorine. Thus, for example, commercially available lithium hypochlorite has an available chlorine content of 35 percent, and thus use of 1 gram per liter of the commercially available material would only give you an available chlorine content of 0.35 grams per liter of solution.

The various aspects and modifications of the present invention will be made more clearly apparent by reference to the following description and accompanying examples.

In each of the following examples a typically available plastic hairbrush comprising nylon bristles on a plastic base of acrylic plastic was used for brushing womens ' hair until it contained substantial matted hair and other occluded material imbedded therein. The plastic hairbrush was then treated by immersing same in a solution formed from the indicated oxidizing agents dissolved in sufficient home tap water to cover the brushes to be treated. Typically, this varies from 1.25 to 2 liters. In the examples 1400 ccs of tap water was used.

EXAMPLES 1 to 7

Table 1 summarizes the concentrations at which the designated compounds in solution were found to completely remove hair from the soiled brushes for the time period of immersion in cool soft water. No residue of destroyed hair had to be removed. In some cases, the pH was varied to see what effect it had on the cleaning of the brushes. At the conditions shown, the hair brushes were fully cleaned of hair, etc. and when removed from solution had the appearance of a new brush.

Additionally, the advantage of using compounds having a relatively high available chlorine (as a solid) is also illustrated.

EXAMPLES 8 to 12

Examples 1 to 7 indicate the desirability of using hypochlorites for the practice of the present invention. Accordingly, a series of further tests were made using tap water, and hair brushes of synthetic bristles (nylon on an acrylic base) matted with hair as in the previous test to evaluate various amounts of hypochlorites which could be added by the homemaker to about 1.4 liters of cold tap water (150 parts per million of hardness). The amount of water used conforms to a typical bathroom sink volume sufficient to cover hair brushes with the treating solutions.

The solutions were prepared by adding lithium hypochlorite, commercial grade (as a powder having 35 weight percent available chlorine and sold by Lithium Corporation of America). The use of a small amount of powder is of particular interest regarding home use and storage.

TABLE 2

LITHIUM HYPOCHLORITE

Example	Wt. % in solution	Weight of available Chlorine in solution gr./liter	Time to completely dissolve hair and clean brush, hrs.
8	0.5	1.75	Overnight
9	1.0	3.50	4
10	1.5	5.25	2
11[1]	1.0	3.50	2
12[2]	1.5	5.25	1.5

Footnotes:
(1) With addition of 0.25 wt. % sodium bisulfate to adjust pH to 7.5.
(2) With addition of 0.25 wt. % sodium bisulfate to adjust pH to 8.2.

TABLE 1

OXIDIZING AGENTS

Ex.	Compound (Available chlorine as commerically available wt.%)	Wt. % Solution	Time to Dissolve Hair, Hrs.	Available Chlorine,[1] grams per liter of solution
1	Sodium hypochlorite (varies)	Used solution having 13% available chlorine in quantity of 15% (Effective at pH ranging from 6.3 to 11.5)	16	2.00
		Concentrate increase five fold	7	10.00
2	Chlorinated trisodium (4.5) phosphate	5 (at pH 11.5)	20	2.25
3	Chlorinated trisodium (4.5) phosphate	2 (at pH 10.3 with monopersulfate in amounts of 1.0)	20	0.90
4	[2]Calcium hypochlorite (35)	2 (at pH of 12.1)	less than 24	7.00
5	Calcium hypochlorite (35)	4.5 (at pH of 11.5)	less than 16	15.75
6	Lithium hypochlorite (35)	1	4	3.50
7	Potassium monopersulfate (0)	10 (pH 11.8 to 13.0)	20	0

Footnotes:
(1) correcting for impurities per weight of commercially available compound.
(2) gives precipitate in water which does not affect performance.

As shown in Table 1, various oxidizing agents have been found to dissolve hair from hair brushes and return the brush to a clean "store bought" appearance. The advantage of using an oxidizing agent capable of supplying available chlorine is shown by the fact that a 10 percent solution of potassium monopersulfate was equivalent to only a 1 percent solution of sodium or lithium hypochlorite (or potassium hypochlorite, not shown). In all cases but Example 4, the solution was clear when the brush was immersed as well as at the end of the treating period.

As shown in Table 2, a solution of lithium hypochlorite (which is readily available in stable powder form) is quite effective in cleaning hair brushes over a range of concentrations. A range of 2 to 4 grams per liter of available chlorine is particularly effective, the concentrations varying with the time period desired for completion of the brush cleaning process.

The use of a material to adjust the pH to 7.0 to 8.5, e.g., sodium bisulfate, to increase the rate of release of available chlorine can serve to reduce treating time or

the concentration of hypochlorite, although it is not necessary.

In its most preferred form the present invention contemplates a packet of powdery oxidizing agent having the ability to liberate available chlorine when in solution, and which can be readily purchased in a supermarket or the like by the consumer. Such a package contains a premeasured quantity of oxidizing agent, e.g., alkali or alkaline earth hypochlorite, with directions for its being added to a measured volume of tap water. In its most preferred form the packets would comprise an aluminum foil package having a polyethylene inner liner having contained therein measured quantities of the oxidizing agent in a powder or solid form. The solid, of course, could comprise a pill or molded solid which dissolves readily in water.

By way of specific example, the package could contain five to thirty grams of lithium hypochlorite, which when added to a typical volume of water sufficient to cover the hair brushes to be treated in a bathroom sink would give a 0.5 to 1.5 weight percent solution of lithium hypochlorite. These pre-packaged containers containing oxidizing agents in relatively small amounts are a unique article of commerce and would take the form of the type of package used for hand washing towellettes or the like.

It should be noted that the present invention is concerned with the cleaning of hair and associated foreign matter which has been matted and/or dispersed in hair brushes although it can, of course, be similarly used to dissolve hair from combs and the like. It is thus clearly distinguished from the use of oxidizing agents as a means of bleaching or sanitizing various articles such as milk tanks, processing of textiles, etc. Similarly, it is distinguished from the use of oxidizing agents for removal of food or tobacco stains as well as food particles since obviously this is not the type of problem faced when cleaning hair from hair brushes. The latter presents some unique problems due to the intertwining of the strands of hair and bristles as well as imbedding within an entangled mass.

Various modifications can be made to the present invention. For example, the solution can be made from a liquid source of oxidizing agent, such as a bottled concentrate. However, a powder or tablet form is preferred.

Having described the present invention, that which is sought to be protected is set forth in the following claims.

What is claimed is:

1. A process for cleaning a hairbrush or other article used for conditioning hair containing hair matted therein, which comprises the user dissolving a measured quantity of a water soluble solid oxidizing agent in a reservoir of water sufficient to cover at least a major portion of said article, the resulting solution being capable of dissolving hair without substantially deteriorating non-protein bristles over a period of up to 24 hours, immersing a substantial portion of said hair-containing article in said reservoir solution for a period of up to 24 hours, and then removing said article thus cleaned of hair from said reservoir solution.

2. The process of claim **1** wherein said solid oxidizing agent is capable of liberating available chlorine when dissolved in water.

3. The process of claim **1** wherein said solid oxidizing agent is added by the user in a pre-packaged, premeasured quantity to form said contacting solution.

4. The process of claim **1** wherein said solid oxidizing agent consists essentially of a member of the group consisting of solid alkali and alkaline earth hypochlorites.

5. The process of claim **4** wherein said solid oxidizing agent is lithium hypochlorite.

6. The process of claim **5** wherein said lithium hypochlorite is added in sufficient quantities to give 0.1 to 20 grams of available chlorine per liter of treating solution, said contact period being from 0.5 to 12 hours.

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