

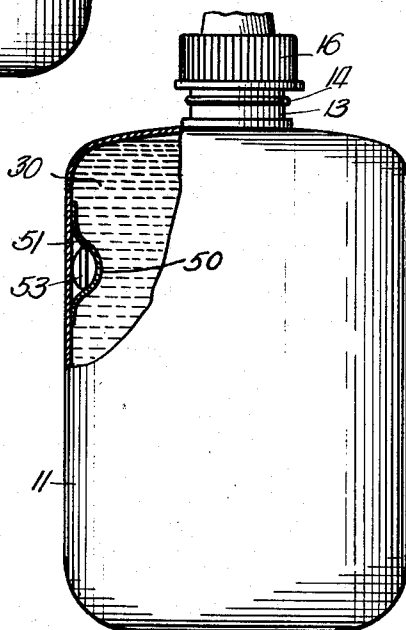
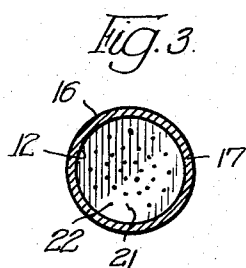
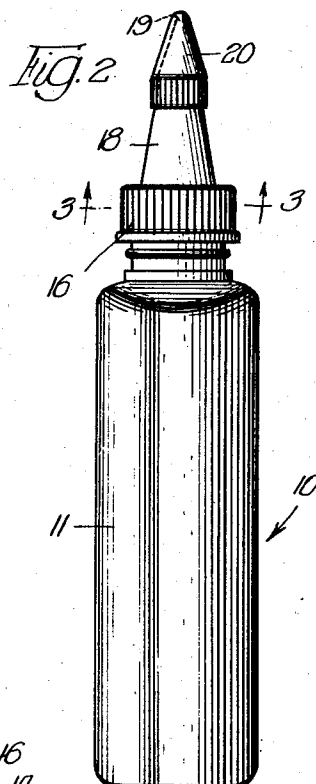
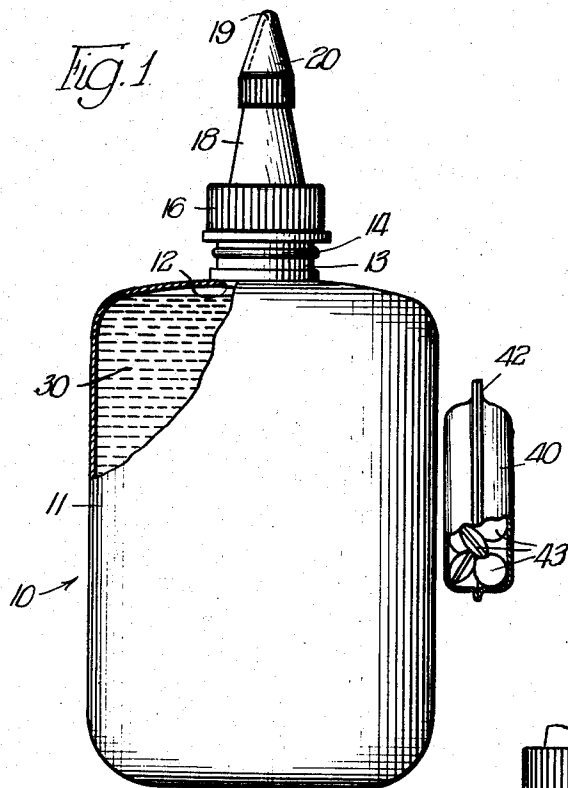
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METHOD OF DISPENSING NEUTRALIZING SOLUTION

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METHOD OF DISPENSING NEUTRALIZING SOLUTION

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2 Claims. (Cl. 132—7)

This invention relates, as indicated, to a dispenser for neutralizing solutions used in permanent waving of hair, and more particularly to a package which dispenses a solution under pressure.

In cold waving of hair, it is the usual practice to first apply a mild reducing solution, such as thioglycollic acid. After the hair has been moistened with cold wave solution and wound on curlers it is rewet with cold wave solution and the hair protein is reduced to the proper condition. The cold wave lotion is rinsed from the hair. The wave imparted to the hair by the reducing solution is fixed by then treating the hair on the curlers with an oxidizing or neutralizing solution. The oxidizing solution is allowed to remain on the curlers during the oxidizing reaction. It is then rinsed off with water and the hair is unwound from the curlers.

In the past, the neutralizing step has been accomplished by taking a wad of cotton in the hand, dipping the cotton into an open bowl containing a neutralizing solution, and then applying the solution to the hair by dabbing the wetted cotton against the mandrel.

The neutralizing step is cumbersome because it is necessary to replenish the solution by dipping each time in the bowl. It is also inconvenient, since the solution drips from the wad of cotton and runs down the arm of the operator.

It is common neutralizing practice to also apply the neutralizer solution from a collapsible tube or plastic container by squeezing the container and forcing the contents through a narrow outlet and dispensing on the curlers containing the hair in a reduced condition. This is fatiguing to the operator's arm and hand. It is desirable to eliminate this arm wearying chore.

It is, therefore, an object of this invention to provide a dispenser for a neutralizing solution which may be voided of its contents as it is held above the head.

It is a further object of the invention to provide a bottle for dispensing neutralizing solution under gas pressure, in which the gas is generated by a chemical reaction in the bottle.

It is a still further object of the invention to prevent the outlet orifice of the dispenser from becoming clogged with solid particles.

It is a yet further object of the invention to devise a chemical system that will delay a gas producing reaction for a time sufficient to allow the operator to replace the nozzle.

Further objects and advantages of this invention will become evident as the description proceeds and from an examination of the accompanying drawings which illustrate several embodiments of the invention and in which similar numerals refer to similar parts throughout the several views.

In the drawings:

Figure 1 is a view in side elevation of the dispenser embodying the invention and a container for tablets, with the bottle partly broken away to show the solution,

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and the container partially broken away to show the tablets.

Figure 2 is an end view of the device shown in Figure 1.

Figure 3 is a sectional view taken substantially along lines 3—3 of Figure 2.

Figure 4 is a view of an alternative form of the invention showing the bottle broken away to illustrate a construction in which the tablets are fastened to the interior surface of the wall of the bottle.

Referring now to the drawings, reference numeral 10 indicates generally a dispenser of the invention, in the form of a container having an opening 12 through a neck 13 provided with external threads 14. The container may be a bottle of flexible material, such as polyethylene plastic to reduce the danger if the bottle should break. A nozzle 16, having internal threads 17, is adapted to be removably threaded on the neck 13. A tapered spout 18 on the nozzle has an inner conduit of gradually reduced cross section that terminates in an outlet orifice 19.

A removable cap 20 fits on the spout of the nozzle over the outlet orifice 19. In use, the cap is kept on the nozzle until the gas has generated within the bottle, preventing escape of its contents, and is removed when desired to allow the contents to discharge under the gas pressure and may be replaced to stop stream at any time.

As shown in Figure 3, the nozzle is provided with a filter plate 21 which fits in the conduit communicating with the outlet orifice 19. The filter plate is snugly fitted between the walls of the conduit and has plurality of holes 2 the diameter of which is less than the diameter of the outlet orifice 19. The plurality of perforations in the filter plate allow the solution to pass but will catch any undissolved particles that would tend to clog or otherwise obstruct the outlet orifice 19. The filter plate with its small apertures 22 also reduces the pressure upon the contents at the outlet orifice and regulates the rate of discharge.

In the bottle is an aqueous solution 30 of a neutralizer for hair, and a compound capable of producing a gas when reacted with an acid. The neutralizer may be a water soluble salt, such as the ammonium, alkali, and alkaline earth metal bromates and iodates, with special preference given to sodium bromate. The gas producing compound is a water soluble inorganic salt of carbonic acid, preferably sodium bicarbonate. The solution of the neutralizer and gas producing compound has a pH from 7 to about 9.5. An aqueous solution of 10% to 25% by weight of sodium bromate and 1 to 4% by weight of sodium bicarbonate having a pH of about 8 has been found to be satisfactory for the purposes of this invention.

The bottle is supplied with a container 40, heat sealed at its edges 42, and holding a plurality of tablets 43. The tablets contain a solid, water soluble organic acid which will react with sodium bicarbonate in the solution in the bottle to produce carbon dioxide gas. Organic compounds which have been found to be satisfactory for this purpose include succinic, itaconic, citric, and tartaric acids, with preference given to tartaric acid.

The size and number of tablets may vary and depend on the size of the neutralizer container and the volume of neutralizer. It has been found that ten tablets containing 0.12 to 0.18 gram of organic acid to be optimum to dispense 5 fluid ounces of neutralizer from a 5 fluid ounce container. A number of tablets other than this size will also perform satisfactorily.

Tablets are used so that as they are introduced the reaction in the bottle will be delayed for a time suffi-

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cient to permit the operator to place the nozzle on the bottle. In order to generate the gas, the nozzle is removed and the tablets inserted. Because the tablets have a smaller surface area than a powder of equal weight, the reaction is delayed for a number of seconds, and enough time for the operator to replace the nozzle on the bottle with the cap 20 over the outlet orifice 19. The bottle is then shaken, which accelerates the solution of the tablets and the reaction occurs, producing the gas. Cap 20 is removed and the contents discharged from the bottle by gas under pressure when desired.

After the tablets have been added and the sodium bicarbonate neutralized, the pH of the solution will drop to a range from about 4 to 8. This is desirable since the neutralizer is most effective in an acid or only slightly alkaline solution of about this range.

Alternatively, the solution in the bottle may contain the neutralizer and an acid salt in amounts to maintain the pH within the range from about 4 to 8. The sodium bicarbonate is then added just prior to the neutralizing operation, in order to generate the necessary gas pressure.

In Figure 4 is shown an alternative form of the invention having a bottle somewhat similar to the one previously described. However, the tablets are mounted on the interior surface of the bottle within a container 50 of frangible material, having its edges fastened to the walls of bottle 11. The inner container 50 prevents the liquid solution from contacting the tablets, but can be ruptured by merely squeezing the flexible bottle in the hand. After the inner container 50 is broken, the tablets contact the solution in the bottle to form the gas.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims or the equivalent of such be employed.

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We, therefore, particularly point out and distinctly claim as our invention:

1. A method of neutralizing hair on the human head which previously has been treated with a reducing solution and wound: said method comprising adding a solid water-soluble organic acid to a water solution of a water-soluble alkaline carbonate and of a solid water-soluble oxidizing agent in a closed container having a discharge opening, said solution having a pH between 7 and about 9.5, whereby to engender the release of carbon dioxide so as to build up pressure within the container, and under such pressure of carbon dioxide discharging the solution of said oxidizing agent in a stream from the container through said opening while directing the stream at the wound hair.

2. A method as set forth in claim 1 wherein the solid water-soluble oxidizing agent is selected from the group consisting of ammonium and alkali bromates and iodates.

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