Oct. 27, 1953 W. J. SCHEPP 2,656,647

DOLL OR THE LIKE

Filed Feb. 14, 1951

FIG. 1.

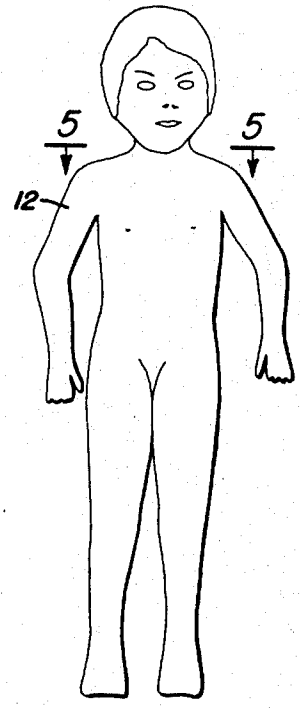


FIG. 2.

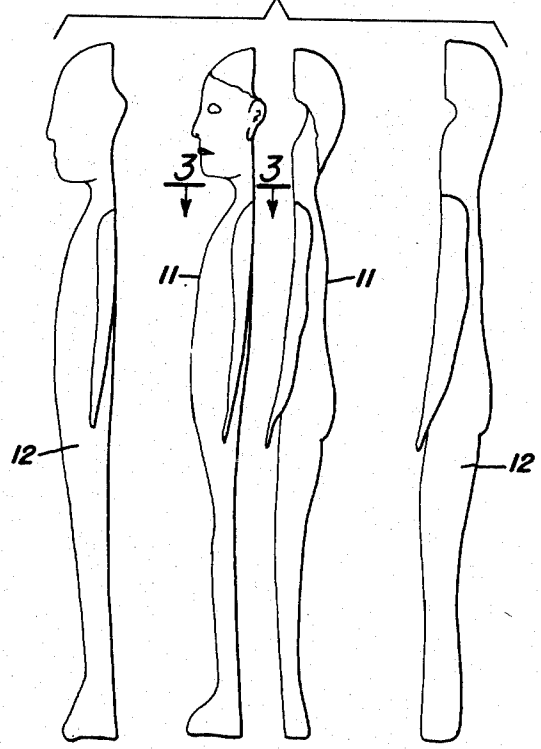


FIG. 3.

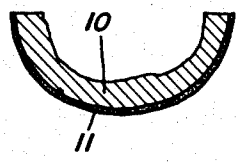


FIG. 5.

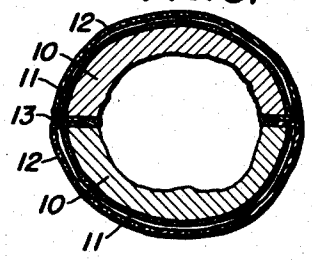


FIG. 4.



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Patented Oct. 27, 1953

2,656,647

UNITED STATES PATENT OFFICE

2,656,647

DOLL OR THE LIKE

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Application February 14, 1951, Serial No. 210,882

5 Claims. (Cl. 46—156)

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This invention relates to dolls and, and more particularly, to the animated variety thereof, one object of the invention being to provide a doll or the like having a natural skin color, but adapted on exposure to sunlight to develop a sun tan and then to resume its natural color when the exposure to sunlight is discontinued.

Another object is to provide a doll which is adapted to develop a sun tan and return to natural color in an automatic and relatively rapid manner.

A further object is to provide a doll of the character described in which the light-responsive portions are protected against handling and other external contacts, as well as against moisture and other contaminations.

Still a further object is to provide a doll having the above advantages in a form capable of being readily and economically manufactured in commercial form.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a face elevation of a doll embodying the present invention;

Fig. 2 is a side view of the same with the portions thereof in exploded relation to better illustrate the component parts;

Fig. 3 is an enlarged, fragmentary, sectional view on the line 3—3 of Fig. 2 and illustrating the body and phototropic coating portions;

Fig. 4 is a similar view illustrating a cover portion detached, and

Fig. 5 is a similar view on the line 5—5 in Fig. 1, illustrating the assembly of the several portions.

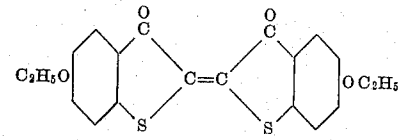
The invention is embodied, in the present instance, by way of illustration, in a doll having a main body portion, or base, 10 made of plastic, plaster of Paris, or other known and suitable material, pressed or molded to form the figure of the doll which, in the present instance, is shown as of rigid construction throughout, although it will be understood that one or more of the head and limbs may be flexibly connected to the body, as well understood in the art. A part or all of the figure on which it is desired to develop the sun tan is formed with a water-proof and non-absorbent surface, as by the application of a lacquer finish, and such surface or surface portions are coated with a phototropic substance having a normal or natural skin color, but adapted to develop a sun tan by hydrolysis upon

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exposure to sunlight, such substance being adapted to return to the natural untanned color upon removal from exposure to the light. The surface so treated and coated may comprise the head only, or the head and limb portions normally exposed to view, or the entire body, as desired. Such coated area is preferably covered by a thin, transparent casing of plastic material or the like molded to loosely fit the coated area in a moisture-proof manner to protect the coating against handling or other external contacts, moisture and the like.

Referring more particularly to the drawings, the base portion 10 of the body is preferably pressed or molded in back and front halves for assembly to complete the figure, as well understood in the art. In the present instance, the whole figure is made phototropic and the entire outer surface of the base portion 10 is rendered water-proof and non-absorbent by a finishing treatment of lacquer or the like (not shown), as well understood in the art. Over this surface is applied the phototropic coating, which will now be described.

The coating 11 (Figs. 3 and 5) for producing photochromic change by hydrolysis, with automatic reversal in subdued light, comprises, preferably, an ingredient or ingredients for producing the normal or natural skin color, containing suitable pigments, dyes or other coloring matters. For this purpose, I may employ a mixture of a major portion of white pigment such as zinc or titanium oxide tending to produce a natural skin color by admixture with suitable proportions of red and yellow iron oxides. This coloring matter, however, may be prepared with suitable dyes and I have found it more simple and preferable to employ for this purpose a major proportion of titanium dioxide WD together with the phototropic sensitive dye supplied by the American Cyanamid Company and known as Calcoloid Orange RD Double pdr., having the formula of $C_2OH_{16}O_4S_2$, or 6:6'-diethoxy-2-2'-bis-thionaphthen-indigo, the structural formula being



These ingredients are preferably mixed in the proportions of one part of the orange dye to twenty parts of the titanium dioxide WD.

The light-responsive activating portion of the coating may comprise one or more substances

subject to hydrolysis by light, such as the halogen salts of cobalt, silver, copper, manganese, mercury, iron and other metals. Such salts, while effective for the present purpose, vary in desirability as to cost, toxic properties and the like, and I have successfully employed and prefer the cobaltous iodide. To reduce the cost of cobaltous iodide, I preferably produce it by interaction between cobaltous chloride and sodium iodide, employing, say, two parts of cobaltous chloride to one of sodium iodide. These are used to prepare an aqueous solution of 25% concentration and the products of the reaction include sufficient cobaltous iodide to liberate a substantial quantity of iodine gas under hydrolysis by sunlight. This gaseous iodide is adapted to react with the above described coloring matter to yield a brownish coat affording a realistic sun tan appearance. Upon discontinuing the exposure to light, the iodine is dissipated and recombined with the coating so as to free the coloring matter from its tanning effect, with the result that the coating soon returns automatically to its initial natural skin color. Research efforts have been heretofore directed more intensively to the production of coloring materials having a high resistance to hydrolysis by light, rather than to coloring matter markedly subject to such hydrolysis, but I have found that phototropic materials such as described may be effectively employed in combination with suitable coloring matter for producing desired photolysis effects.

The phototropic coating is preferably made with the addition of a suitable adhesive in a 10% aqueous solution, such as methyl cellulose, gelatin, algin, gum arabic, or the like. I have successfully employed and prefer a solution of methyl cellulose and in compounding the coating I have found it preferable to prepare the cobaltous iodide solution, mix and work the coloring matter into this vehicle and then add it to the adhesive solution in a colloidal dispersion, to produce a fluid compound which may be readily applied as a coating over the doll surface to be treated.

A typical example of the coating compound is as follows:

	Dry parts by weight
Titanium dioxide WD	80
6:6′ - diethoxy - 2-2′-bis-thio-naphthen-indigo	4
Aqueous solution (25% concentration):	
Cobaltous chloride, dry weight equivalent	5
Sodium iodide, dry weight equivalent	2.5
Aqueous solution (10% concentration):	
methyl cellulose, dry weight equivalent	8.5

The base of the figure having been thus coated and allowed to dry, I then preferably enclose it in a thin, transparent shell or casing 12 (Figs. 4 and 5), to make the coating inaccessible to external contact and to protect it against injury by contact, wetting and the like. A satisfactory casing for this purpose may be made of thin, transparent material, such as an acetate plastic, or one with similar ultra-violet transmission properties. This outer casing or shell need be only thick enough to withstand handling and I have found, for example, that an acetate plastic shell of 0.003 inch thickness may be satisfactorily employed. When the base of the doll body is molded or pressed from a plastic material, for example, then a shell may be preformed with a slightly larger dye or mold, to form corresponding parts each provided with inturned flanges 13 which may be brought together between the abutting edges of the parts of the base 10, as shown in Fig. 5. These meeting parts are sealed together and made moisture-proof, as by means of a suitable interposed adhesive (not shown), or a fusing operation, or the like, to complete the assembly. The shell 12 conforms closely to the outer coated surface of the base 10 but is not adhered thereto, so that a slight free space is left between the shell and the coating in which the gaseous iodine liberated from the coating reacts with the coloring matter in the surface of the coating under exposure to sunlight. The term "loosely fitted" herein elsewhere applied to this shell is intended to describe this separate or slightly spaced relation of the shell to the coating.

The operation of this embodiment of the invention is apparent from the above description of its construction. When the coated portions of the doll figure are exposed to sunlight, the resulting photolysis releases iodine gas which circulates under the shell in contact with the surface of the coating, so as to react with the phototropic sensitive coloring matter to develop a brownish surface tinge realistically resembling sun tan. On removal of the figure from the sunlight and its ultra-violet and infrared rays, such reaction ceases and the iodine is automatically and rapidly dissipated and recombined, leaving additional coloring matter in the surface of the coating 11 for repetitions of the reaction.

While I have described the invention in the present instance in an illustrative way, as applied to use with a doll or similar figure, it is contemplated that the principles of the invention may be applied as well to the development and reversal of other color effects and in combination with a wide variety of advertising specialties, novelties and the like.

The invention thus provides a doll or the like having the animated function of automatically developing a sun tan and returning to a natural skin color on removal from the sun and this surprisingly realistic and appealing function is accomplished by a form of construction which is automatic and reliable in operation and adapted to be readily manufactured and assembled at a relatively low cost.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of a preferred embodiment, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. A doll comprising a body portion having a surface area provided with a coating containing a mixture of titanium dioxide and 6:6′-diethoxy-2-2′-bis-thio-naphthen-indigo, to afford a natural skin color and a phototropic material containing a substantial proportion of cobaltous iodide for producing a constituent adapted to react with said coloring mixture.

2. A doll comprising a body portion having a surface area provided with a coating consisting substantially of the reaction product of 80% of

titanium dioxide WD, 4% of 6:6'-diethoxy-2-2'-bis-thio-naphthen-indigo, 5% of cobaltous chloride, 2.5% of sodium iodide, said cobaltous chloride and sodium iodide being added in a 25% aqueous solution and 8.5% of methyl cellulose added in a 10% aqueous solution.

3. A doll comprising a body portion having a surface area provided with a light-sensitive coating, said coating having as the main constituent thereof a halogen metal salt subject to hydrolysis by light in combination with a coloring matter normally imparting the conventional skin color to the doll and reversibly reactable with a halogen gas to impart a tan color to the doll.

4. A doll as specified in claim 3 having a moisture-proof shell of thin, transparent material loosely fitted to said coated surface.

5. A doll as specified in claim 3 comprising an adhesive ingredient for producing adhesion of said coating to said surface area and a moisture-proof shell of thin, transparent material loosely fitted to said surface area.

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