

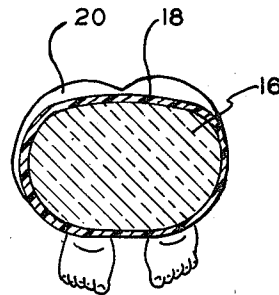
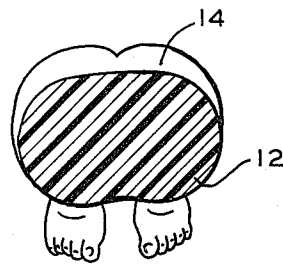
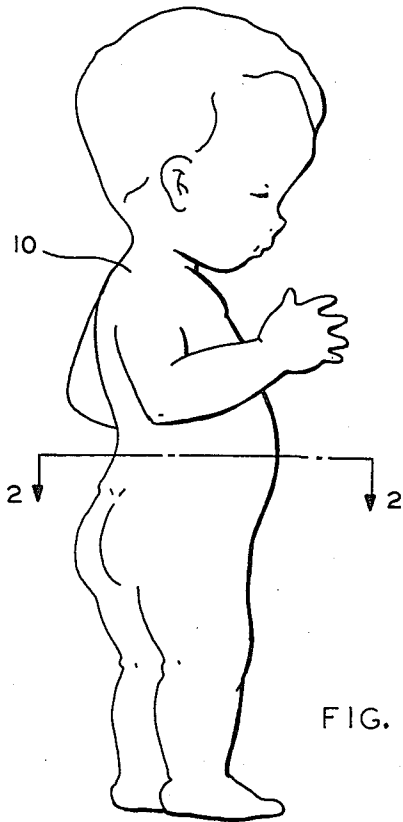
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2,921,407

SIMULATING SUNBURNING TOY DOLLS AND FIGURINES

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2,921,407

SIMULATING SUNBURNING TOY DOLLS AND FIGURINES

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5 Claims. (Cl. 46—156)

This invention is concerned with toy dolls and figurines capable of responding to irradiation from the sun or other light source by exhibiting a darkening in color, and simulating, in general appearance, the effect of sunlight in producing erythema or "sunburning" of the human skin. In particular the invention is concerned with toy dolls and figurines capable not only of responding, as stated above, by darkening upon exposure but capable also of gradually reverting to their initial, lighter color upon removal from such irradiation, as well. In particular, also, this invention is concerned with toy dolls and figurines capable not only of color change in either direction, as stated above, but capable also of repeatedly and indefinitely undergoing such cycles, in response to alternate exposure and shielding from irradiation.

The amusement and entertainment derived from toy dolls, and the like, is fundamentally related to their ability to mimic the physical geometry, facial expressions, movements, appearances, and physical functions of the human body. Illustrative of such effects presently incorporated in construction of such toys are "talking dolls," "weeping dolls," "sleeping dolls," "walking dolls," and so forth. Where a function such as talking, sleeping, weeping, or walking is performed it is necessary for practical use as a toy that the operations be repeatable.

We have conceived of the entertainment value of a toy doll or figurine that will upon exposure to radiation from the sun or other light source repeatedly simulate the darkening that is observed with the human skin, and that will, correspondingly, gradually revert to a lighter color when this irradiation ceases. We have also devised methods and compositions for manufacturing dolls and figurines showing these effects, and of, alternatively, treating conventional dolls so as to incorporate these properties.

It is therefore a primary object of the present invention to provide a novel sunburn simulating toy doll.

Another object of the present invention is to provide a novel sunburn simulating doll employing a phototropic substance in combination with a polymeric carrier.

These and further objects and advantages of the invention will be more apparent upon reference to the following specification, claims and appended drawings wherein:

Figure 1 is a perspective view of the novel sunburn simulating toy doll of the present invention;

Figure 2 is a horizontal cross section through the doll of Figure 1 taken along lines 2—2 of Figure 1; and

Figure 3 is a similar horizontal cross section taken through a modified embodiment of a doll constructed in accordance with the present invention.

Fundamentally, our invention is accomplished through incorporation of certain phototropic dyes in appropriate transparent bodies or coatings. We have selected and formulated these materials so as to obtain visible, distinct, and appropriate changes in color upon irradiation and cessation of irradiation, and so as to obtain appropriate stability in providing for repeated use.

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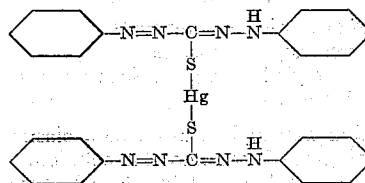
Referring to the drawings, Figure 1 shows in perspective a novel sunburn simulating doll generally indicated at 10. As best seen in Figure 2, doll 10 is made up of a polymeric or plastic carrier 12 in which is dissolved the phototropic substance to produce the sunburn simulating effect. This construction enables the doll to exhibit a relatively tough skin or surface 14 about its periphery.

Figure 3 shows a modified doll construction in accordance with the present invention wherein the doll comprises a glass body 16 surrounded by a polymeric coating 18 impregnated with a phototropic substance in the manner of the material 12 shown in Figure 2. Coating 18 similarly exhibits a relatively tough outer surface 20 constituting the surface of the doll.

The following may be cited as examples of the practice of this invention, although it will be understood that these examples are merely illustrative and do not limit or define the scope of the invention.

Example 1

0.5 gram of mercuric bis-dithizonate having the following structural formula was dissolved in 1000 grams of dioctyl phthalate.



1550 grams of a high molecular weight polyvinyl chloride polymer, in powdered form, were dispersed in this solution by stirring for ten to fifteen minutes. The latter material was specifically Bakelite Company QYNV polymer. Thus a plastisol formulation containing the phototropic dye dissolved in the liquid dioctyl phthalate (plasticizer phase) was obtained. About 120 grams of this plastisol formulation were then poured into a two piece steel mold, this having its inner surface previously coated with a silicone oil release film. This was then placed in an oven at 140 degrees centigrade and held at this temperature for eight minutes to allow solution of the polyvinyl chloride polymer phase. The mold and contents were then removed from the oven, cooled to room temperature, and the now solid form of the doll figure removed.

The figure thus produced was transparent and red in color. Upon exposure to sunlight a progressive darkening to a brown, then blue-black color occurred during a period of about three to four minutes, simulating a "sunburning" effect. When the doll was shielded from the sun a return to the original color took place, being visually complete after a period of eight to ten minutes. This action was repeatable with no detectable change in functional characteristics being noted after several dozen cycles.

Example 2

The following composition was prepared.

- 0.45 gram of mercuric bis-dithizonate
- 15.0 grams of cellulose acetate butyrate polymer
- 80 grams toluene
- 5 grams ethyl alcohol
- 0.4 gram hydroquinone

This solution was applied to a small glass doll figurine by dipping the latter into this solution. This was subsequently allowed to dry by solvent evaporation at room temperature, a yellow-red coating or "skin" being left on the doll. Upon exposure to sunlight, or artificial lighting, this showed a gradual darkening to a dark brown color,

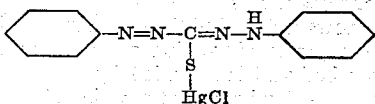
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and likewise showed the same reversibility and ability to undergo repeated cycles noted in Example 1.

Example 3

The following composition was prepared.

0.45 gram of mono-dithizone mercuric chloride having the structural formula shown herebelow
15.0 grams cellulose acetate butyrate polymer
80.0 grams toluene
5.0 grams ethyl alcohol



This solution was applied to a small glass doll figurine by dipping the latter into this solution. This was subsequently allowed to dry by solvent evaporation at room temperature, a yellow-red coating or "skin" being left on the doll.

Upon exposure to sunlight, or artificial lighting, this showed a gradual darkening to a dark brown color, and likewise showed the same reversibility and ability to undergo repeated cycles as noted in Example 1.

Example 4

The following composition was prepared:

0.45 gram of mercuric bis-dithizonate
15.0 grams of polystyrene polymer
4.0 grams of dioctyl phthalate plasticizer
85.0 grams of toluene

This solution was applied to a small, plastic doll figurine by dipping the latter into this solution. This was subsequently allowed to dry by solvent evaporation at room temperature, a yellow-red coating or "skin" being left on the doll. Upon exposure to sunlight, or artificial lighting, this showed a gradual darkening to a dark brown color, and likewise showed the same reversibility and ability to undergo repeated cycles noted in Example 1.

We have found that other carriers for the phototropic dyes, in addition to the polymers noted above, may be used. Among these are polymethyl methacrylate, polybutyl methacrylate, polyvinyl chloride-acetate, and other vinyl type polymers, cellulose acetate, cellulose propionate, and acid-cured epoxy-type polymers. Certain other polymers, such as nitrocellulose, containing reactive groups, toward which the phototropic dyes are not stable, may not be used. Plasticizers, additives, and impurities toward which the phototropic dyes are not stable may not be included in the compositions. Examples of these latter are: amino compounds, which may not be used as the catalysts, where epoxy-type polymers are used as the carrier; reactive monomers, such as styrene, which may not be present as impurities; and high boiling compounds containing the hydroxyl group, such as

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glycerine, which remain in the carrier and inhibit the color change of the phototropic dyes.

It has been found possible also to modify the pre-exposure and post-exposure color characteristics by addition of non-photosensitive dyes to the formulations. Examples of such dyes are the Sudan yellows, greens, reds, and diazobenzene. It has been found possible, also, to modify these color characteristics, in the case of the coating application, by selection of variously colored substrates (doll or figure surfaces) over which the coating is applied.

It is apparent that variations in selection of phototropic compound, carrier, and mode of application and assembly may be made by those skilled in the art, without departing from the essential features and concepts of this invention. The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A doll comprising a body portion having a surface area containing a phototropic substance which contains a dithizone compound incorporated in solution within a polymeric carrier forming a relatively tough surface on the doll.

2. A doll comprising a body portion having a surface area containing a phototropic substance selected from the group consisting of mercuric bis-dithizonate and mono-dithizone mercuric chloride incorporated within a polymeric carrier forming a relatively tough surface on the doll.

3. A doll as set out in claim 1 wherein said polymeric carrier is selected from the group consisting of styrene polymer, polyvinyl chloride, polyvinyl acetate, polyvinyl chloride-acetate, polymethyl methacrylate, polybutyl methacrylate, polymethyl acrylate, polybutyl acrylate, cellulose acetate, cellulose propionate, cellulose acetate butyrate, and acid-cured epoxy polymers.

4. A doll as set out in claim 3 wherein said doll is formed of said polymeric carrier in which said phototropic substance is dissolved.

5. A doll as set out in claim 3 wherein said polymeric carrier containing said phototropic substance forms a surface on said doll.

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