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STRIPPABLE AND NONSTRIPPABLE LABEL COMBINATION AND METHOD

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Fig. 1.

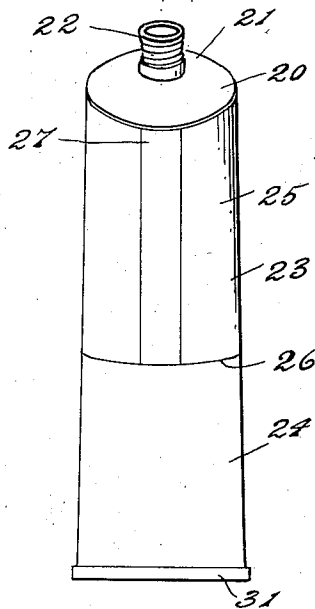


Fig. 2.

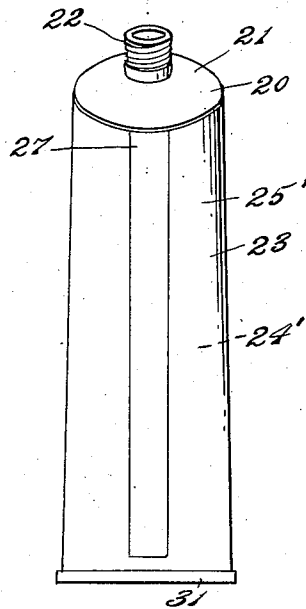


Fig. 3.

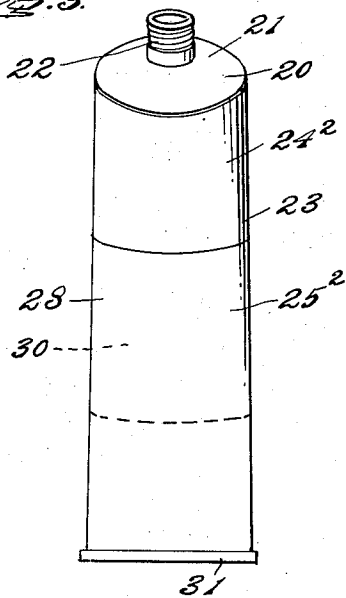
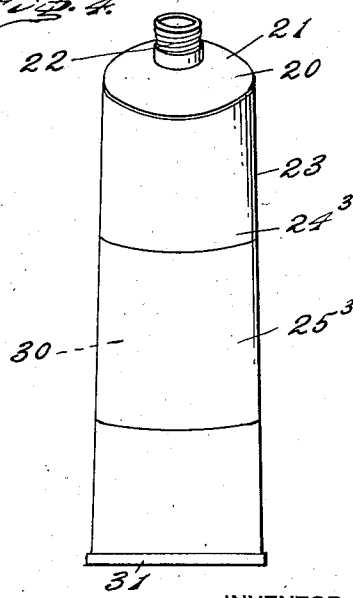


Fig. 4.



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2,825,159

STRIPPABLE AND NONSTRIPPABLE LABEL COMBINATION AND METHOD

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6 Claims. (Cl. 40—2)

The present invention relates to container labels and methods of producing the same, particularly for pharmaceutical purposes, and especially for collapsible tubes and other containers having relatively smooth exterior surfaces.

A purpose of the invention is to apply a coating to form an adhesively bonded label on a container, and also to apply on the same container, preferably in overlying relation to the adhesively bonded label, a plastic strippable label which will strip off to leave the adhesively bonded label, but will remain in place as long as desired.

A further purpose is to extend the strippable label completely around the collapsible tube or other container so that the adherence of the film to itself will hold it in place as an endless band completely conforming to the outside of the container and the adhesively bonded layer, without tack and without solvent attack on the adhesively bonded layer.

A further purpose is to mask a portion of the label information on an adhesively bonded label by a strippable plastic label so that the adhesively bonded label can be used with the masked information visible by stripping off the strippable label.

Further purposes appear in the specification and in the claims.

In the drawings I have chosen to illustrate a few only of the numerous embodiments in which my invention may appear, selecting the forms shown from the standpoints of convenience in illustration, satisfactory operation and clear demonstration of the principles involved.

Figures 1 to 4 are diagrammatic perspectives of collapsible tubes to which the invention may conveniently be applied.

Describing in illustration but not in limitation and referring to the drawings:

In the pharmaceutical trade, many products are packaged by the drug manufacturer and supplied to the druggist bearing the drug manufacturer's label which designates the product and often includes a trade name, as well as information as to dosage, recommended use, code number, and the like.

There are many cases, however, in which the product is prescribed by a physician and also cases in which the product is sold by the druggist without a prescription, and in which it is not desired to have the manufacturer's trade name, or other information of that character appear. It is normal practice in such cases to remove a paper label applied by the drug manufacturer and substitute the druggist's label which often bears special information such as the name of the patient, the particular dosage prescribed by the physician, the prescription number, the precautions for storage, the precautions for use, and the physician's name. In view of this practice it has not been possible to use collapsible tubes with printed labels applied by adhesive coating directly to the tube surface, and it has been necessary for the drug manufacturer to use special paper labels. These paper labels

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are susceptible to damage from moisture, insects and the like, and they also are troublesome to remove, often necessitating scraping, steaming, soaking or the like. Such paper labels initially supplied are not very satisfactory for collapsible tubes because they do not remain in contact with the wall when the tube is squeezed and are likely to pull away and tear. Paper labels are also subject to accidental removal. These difficulties have in many cases prevented the use of collapsible tubes for packaging pharmaceuticals.

By my U. S. patent application Serial No. 372,963, filed August 7, 1953, for Strippable Label and Method, I have disclosed a label which completely surrounds a smooth container such as a collapsible tube, bottle or jar, and "fits it like a glove," but which is readily strippable therefrom. Thus the cohesion of the plastic layer to itself holds the layer in place on the collapsible tube until the user desires to remove the label, and then, as the label is not adhesively bonded and does not have tack with respect to the container wall, the layer peels off readily to produce a clean container surface on which a new label can be applied or which can be used unlabeled. This, however, necessitates that any data which is to be available subsequent to the removal of the strippable label must be applied by a later label such as a pasted label, which is relatively poorly adhering. This is a limitation on the use of a strippable label in certain types of service.

In accordance with the present invention, I apply an adhesive coated label to the container and also a strippable label. The adhesive coating label can be fully visible or partially visible when the strippable label is in place, or it can be wholly concealed by the strippable label and rendered visible by stripping off the strippable label.

Thus according to one embodiment of the invention, information which is intended to be on the label in any case, such as precautions for storage, warning about toxicity, and the like can be applied on the adhesively coated label, and made visible even while the strippable label is in place. Information which may not be desired is placed on the strippable label and when the strippable label is taken off the adhesively coated label is retained with or without a further label such as a paper label.

In some cases information is placed on the adhesively coated label and masked by the strippable label but made visible by removing the strippable label. This information may relate to dosage, information as to specialized uses not always needed, or trade mark information which might not be desired when sold under the chemical name. The degree of masking of the adhesively coated label by the strippable label will depend upon whether it is desired to have some information appear on the adhesively coated label even before the strippable label is removed.

In some cases the purpose of the strippable label will be not primarily to carry information itself but to mask certain information which it will ordinarily not be desired to have appear unless for example the physician directs that the particular instructions be made visible.

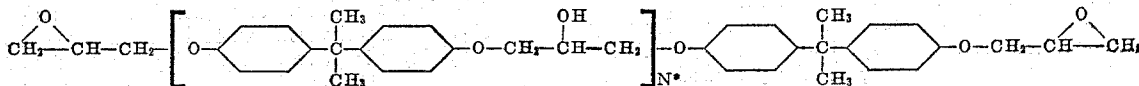
The adhesively coated label may desirably be of any suitable character which will not be subject to attack by the solvents, plasticizers, and resins present in the strippable label when the strippable label is coated over.

Thus, for example, the adhesively coated label may be a coating of epichlorohydrin and p,p' dihydroxydiphenyldimethyl methane reacted together, or a urea-formaldehyde coating or a mixture thereof in a suitable solvent, desirably in the proportions between 100 and 70 percent, and 0 and 30 percent of urea-formaldehyde resin by weight of total resin, preferably 20 percent,

The adhesive coating should be suitably dried before the strippable film is applied, especially if there is to be any lateral or overlying contact.

For the strippable coating, any suitable thermoplastic resin may be used, the preferred resin being a vinyl resin such as a copolymer of vinyl chloride and vinyl acetate or vinyl chloride polymer, other suitable thermoplastic resins being acrylic ester resins or vinylidene chloride emulsion in water.

The strippable layer resin is formulated to make it strip by over plasticizing, using from 25 to 75 percent by weight and preferably from 50 to 60 percent by weight of the vinyl solids, as plasticizers. Oleyl amide may desirably be used as a blocking compound to suppress tack. The adhesive coating and also the strippable film may be supplied in any suitable way, preferably by roller coating on a usual roller coating machine, when label-



ling collapsible tubes, but also by spraying, dipping, and the like.

The adhesive coating is preferably dried at about 325° F. for three minutes. The strippable coating is preferably dried or baked at a temperature between 50 and 400° F. Time is in inverse relation to temperature, the time suitably being 8 to 24 hours at room temperature, about twenty minutes at 255° F., about three minutes at 300° F., and less than a minute at 400° F.

Printing will be desirably employed over both the adhesive coating layer after it has dried and also over the strippable layer after it has dried, and the printing on the adhesive coating layer should of course dry before the strippable layer is overprinted. The printing may contain such information as the name of the product and its maker, the trade mark, instructions of various kinds, code number and ornamentation. The printing ink should preferably be dried like the label coating.

It will be understood of course that the strippable label can go through to the ultimate user if desired. It adheres much more closely to the tube than a paper label when the tube is squeezed, since it is more pliable and more intimately associated in the first place and it is resistant to water and insects.

If however, the druggist or any intermediate processor wishes to strip off the strippable label he simply tears it with the fingernail and peels it off by the fingers. The information can be supplemented by a paper label as desired.

Figure 1 shows a collapsible tube 20 having a shoulder 21, a nozzle 22 adapted to be provided with a cap, side walls 23 and a back seal 31. The collapsible tube is desirably made of tin, lead alloy, aluminum or aluminum alloy, plastic, or other suitable material.

In the form of Figure 1, an adhesively bonded label 24 is provided over the lower half of the tube extending fully around and adhering firmly to the outer metallic surface. The upper portion of the tube only is in this case coated by a strippable label 25 which meets the adhesively bonded label at 26. The strippable label can be peeled off by tearing out a strip 27 with the fingernail and then the strippable label is peeled off by the fingers, leaving the adhesively bonded label and permitting the application of a paper label to replace the strippable label.

In the case of Figure 2, the adhesively bonded label 24' covers the entire tube under the strippable label 25'.

In the form of Figure 3, the adhesively bonded label 24² is on the upper portion of the tube and the strippable label 25² is on the lower portion and the two overlap at 28, at which point the strippable label shields the band portion 30 of the adhesively bonded label.

In the form of Figure 4, the adhesively bonded label 24³ covers the entire tube and a band 25³ of adhesively

bonded label covers and masks out the information at 30 on the adhesively bonded label.

Each of the labels is preferably of the order of 0.0004 to 0.008 inch in thickness.

Where the druggist desires to remove the strippable label, he simply tears it off and uses the container without the strippable label, relying on the adhesively bonded label, but adds a paper label which may partially or wholly mask the adhesively bonded label.

A suitable composition for the adhesively bonded label, of which many possible compositions might be given, is as follows:

EXAMPLE A

The resin employed is a mixture of 70 percent by weight of the condensation product of epichlorohydrin and p,p'-dihydroxydiphenyl-dimethyl methane having the structural formula:

* N may vary from a small digit to many thousands.

and 30 percent by weight of urea-formaldehyde resin. The urea-formaldehyde resin may be produced according to U. S. patent to Lanter, 1,633,337, granted June 21, 1927, dissolved in high flash naphtha to make a solution containing 60 percent by weight of the urea-formaldehyde resin in the naphtha.

The condensation product just mentioned is preferably Epon 1007 (Shell Chemical Company) having a melting point of between 125 and 135° F. and an equivalent weight of 188.

The urea-formaldehyde resin is preferably Uformite F-240 N (Rohm & Haas Company) having an acid number between 2 and 5 and a specific gravity of about 1.03.

The resins are mixed together with an equal weight of a solvent combination which is preferably as follows: Ethylene glycol monoethyl ether acetate (Carbide & Carbon Chemical Co. Cellosolve Acetate) 60 percent by weight; high flash naphtha (Standard Oil Co. Solvesso 100) 40 percent by weight.

If desired, the coating solution may be pigmented, for example, by adding 4 pounds of finely divided rutile (titania) per gallon of the mixture of resin and solvent.

This adhesively bonded coating material can be roller coated or sprayed or dipped, and dried at a temperature of 325° F. for 3 minutes, as earlier explained.

STRIPPABLE COATING

The following is an example of the compounding of the strippable label base layer:

Example I

Material:	Parts by weight
Vinyl resin VYNS	190
Vinyd resin VYLF	180
Di(2 ethylhexyl) phthalate	100
Pigment (titanium dioxide)	165
Solvent (isophorone)	1000

The vinyl resin VYNS is 90 percent vinyl chloride and 10 percent vinyl acetate copolymerized. The vinyl resin VYLF is 87 percent vinyl chloride and 13 percent vinyl acetate copolymerized. The VYNS can be replaced wholly or partly by VYCM.

Instead of the plasticizer mentioned, di(2 ethylhexyl) phthalate, any suitable plasticizer compatible with vinyl resins may be used, other examples being dibutyl phthalate, tricresyl phosphate, dioctyl adipate may be used.

The vinyl resin may be either vinyl chloride polymerized or a copolymer of from 87 percent to 91 percent vinyl chloride with vinyl acetate.

Instead of titanium dioxide any suitable pigment may be employed, other examples being barium sulphate,

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lithopone, iron oxide, chromic oxide, phthalocyanine green or blue and the like. The quantity of pigment will vary with the desired coverage, and will normally range between 10 and 40 percent by weight of the total solids and preferably between 15 and 40 percent.

Where desired the strippable coating can be unpigmented, and in some cases this is advantageous.

While the preferred solvent is isophorone, which is desirable because of its relatively high boiling point and low volatility, which suits it for roller coating, other suitable solvents are cyclohexanone, methylisobutyl ketone, ethyl-butyl ketone or other solvents for the particular resin. For spraying purposes methyl-ethyl ketone can be used, or other appropriate solvent.

The strippable coating may be as concentrated as 50 percent solids, or as dilute as 20 percent solids by weight.

Example II

Material:	Parts by weight
Vinyl resin VYNS	190
Vinyl resin VYLF	180
Diocetyl phthalate	120
Pigment (titanium dioxide)	160
Solvent (isophorone)	825

In this example the increase in plasticizer tends to make the coating strip more easily although there is a slight increase in tack.

Example III

Material:	Parts by weight
Vinyl resin VYCM	20
Acrylic resin (ethyl acrylate polymer) 48% by weight in toluene	240
Plasticizer (dioctyl phthalate)	15
Pigment (titanium dioxide)	150
Solvent (isophorone)	200

Example IV

The preferable formulation based on the weight of solids as follows:

	Percent
Vinyl resin VYNS	33.3
Diocetyl phthalate	16.7
TiO ₂	50.0
Isophorone	66.6

The plasticizer is combined with the resin and the mixture is then ground with the pigment and the entire combination is then dissolved in the solvent.

For better hiding power the pigment can be increased but the strength of the film is correspondingly reduced.

In order to obtain differences in film strength, flow characteristics and heat resistance the plasticizer can be changed or the dioctyl phthalate can be mixed with other plasticizers such as dibutyl phthalate, and the quantity of the plasticizer can be varied within the range specified above. It will of course be understood that the increase in plasticizer content increases the flexibility of the base layer. Generally the higher the content of the plasticizer the greater the strippability of the base layer, but too much plasticizer may cause the ink to smear. A grossly excessive content of plasticizer tends to increase tack.

For various coating equipment the viscosity of the coating liquid for the base layer can be varied by changing the solvent and changing the amount of solvent.

A suitable nontacky strippable label can also be produced by employing acrylic resin in the range from 400 to 600 percent of the vinyl solids.

Example V

Material:	Parts by weight
Vinyl resin VYCM	110
Acrylic resin (ethyl acrylate polymer) 48% by weight in toluene	1180
Pigment (titanium dioxide)	675
Solvent (isophorone)	1200

The vinyl resin VYCM (91 percent vinyl chloride and 9 percent vinyl acetate by weight) can be replaced par-

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tially or wholly by VYNS or a combination of VYNS with VYLF up to 25 percent of the VYCM by weight. Where there is a partial replacement of VYCM with VYLF up to 25 percent of the vinyl solids the solid content can be increased to 130 parts without materially increasing the viscosity. At the expense of some reduction in film strength, the vinyl resin content can be reduced to 90 parts.

As already explained, the pigment content can be varied and different pigments can be used.

It is desirable in many cases to reduce the tack by employing oleyl amide in proportions of 1 to 5 percent of the total resin solids, and preferably 3 percent by weight. The total resin solids include the vinyl and the acrylic solids.

Example VI

Material:	Parts by weight
Vinyl resin VYNS	32
Acrylic resin (ethyl acrylate polymer 50% in toluol by weight)	65
Pigment (titanium dioxide)	30
Oleyl amide	3
Solvent (isophorone)	230

The vinyl resin can be increased with increase in viscosity to 40 parts and can be reduced to 25. VYNS can be replaced by VYLF up to 25 percent by weight of the resin. Oleyl amide can be increased to 5 percent, but it gives a slippery feel on the total resin.

Example VII

The preferred resin used is 90 percent by weight of vinyl chloride and 10 percent by weight of vinyl acetate copolymerized (VYNS). The preferred combination is as follows:

Material:	Parts by weight
Vinyl resin VYNS	55
Oleyl amide	2
Unmodified polyester resin based on long chain polybasic acid esterified with polyhydric alcohol	25
Di (2 ethylhexyl) phthalate	15
Titanium dioxide	15
Isophorone	220

The oleyl amide may vary from 1 to 5 percent on the basis of the resin solids. The unmodified polyester resin based on a long chain polybasic acid esterified with polyhydric alcohol may vary 25 to 80 percent on the basis of the resin solids. The vinyl resin can be increased slightly but any appreciable increase will make the solution too viscous. The vinyl resin (VYNS) can be replaced by using 25 percent on the weight of the solids of vinyl resin VYLF (a copolymer of 87 percent vinyl chloride and 13 percent vinyl acetate). The total of the vinyl resin can be increased to approximately 70 parts under these conditions without increasing the viscosity materially. The total quantity of vinyl resin can be reduced to 45 parts.

The titanium dioxide can be increased to 25 parts or reduced to 10 parts. Other opaque pigments, such as blues, blacks and reds can replace the titanium dioxide.

Solvents as mentioned, such as cyclohexanone, methyl isobutyl ketone or other vinyl solvents may be used, keeping in mind that for roller coating high boiling solvents are desired.

In some cases the strippable coating may be air dried, and in that case it is preferable to substitute a light solvent combination such as 50 percent by weight of diisobutyl ketone, 30 percent by weight of toluol and 20 percent by weight of ethylene glycol monoethyl ether (Cello-solve).

Plasticizers such as di(2 ethyl hexyl) phthalate can be replaced by unmodified polyester resin based on long chain polybasic acid esterified with polyhydric alcohol. If the coating is to be baked at high temperature, above 350° F., a non-volatile plasticizer should be used but for

low baking temperature a more volatile plasticizer such as dibutyl phthalate can be used.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention without copying the method and structure shown, and I, therefore, claim all such insofar as they fall within the reasonable spirit and scope of my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of labelling a container, which comprises adhesively bonding a label plastic film on the container, printing label information on the adhesively bonded label film, drying the same, coating the container with a non-tacky film-forming resinous film extending completely around the container, strippable therefrom by tearing the film and free from attack on the adhesively bonded film and the printing thereon, and printing label information on the non-tacky film, whereby the strippable film can be removed to leave the adhesively bonded label.

2. The method according to claim 1, in which the strippable film at least partially overlies the adhesively bonded film on the container.

3. The method according to claim 2, in which the strippable film completely overlies the adhesively bonded film.

4. The method of claim 2, in which the strippable film

forms a band surrounding and overlying the adhesively bonded film.

5. A smooth container, in combination with a layer of plastic film adhesively bonded to the container and having label information thereon, and a layer of plastic film-forming resin extending around the circumference of the container and free from adhesive adherence to the container and also free from adhesive adherence to the adhesively bonded layer, the layer of plastic film-forming resin having printing ink applied and containing label information thereon and being strippable from the container and the adhesively bonded label by tearing and peeling.

6. A container according to claim 5, in which the plastic film-forming resin overlies the adhesively bonded layer and is free from attack thereon.

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