Nov. 11, 1941. F. W. FARRELL 2,262,492

LABEL

Filed June 6, 1939

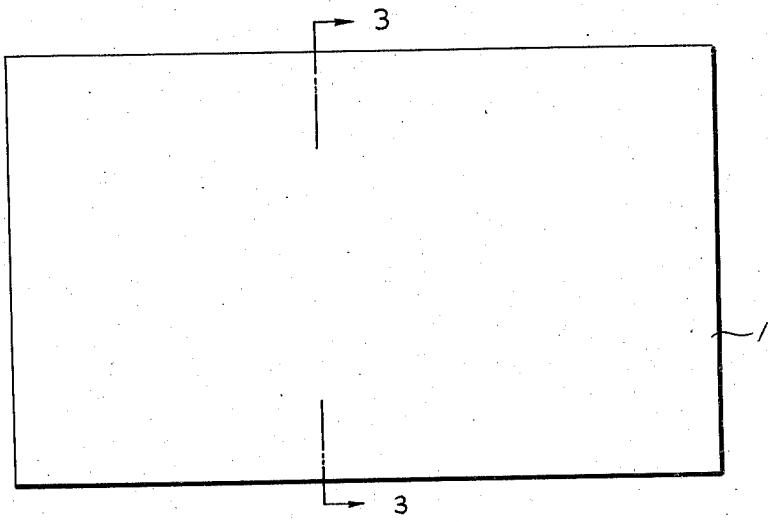


Fig. 1

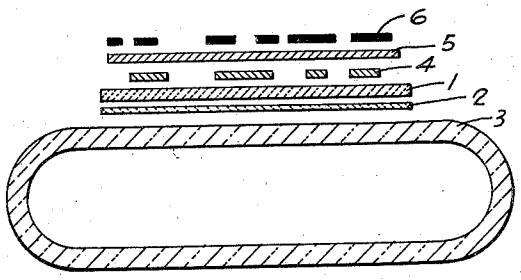


Fig. 2

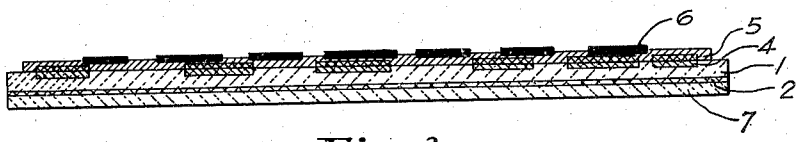


Fig. 3

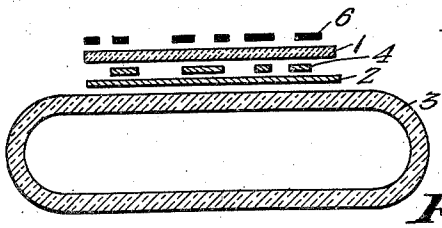


Fig. 4

INVENTOR.
Frederick W. Farrell

BY Everett E. Kent
ATTORNEY.

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LABEL

Frederick W. Farrell, West Brookfield, Mass., assignor to Plymouth Cordage Company, North Plymouth, Mass., a corporation of Massachusetts

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6 Claims. (Cl. 40—2)

This invention relates to improvements in labels.

More especially it relates to printed paper labels, and the like, such as are used in commerce to indicate the contents of bottles and other containers, and to show the name or trade-mark of the maker.

The labels of well-reputed makers are sometimes counterfeited, for dispensing goods of the counterfeiter as being those having the high reputation, or for fraud in some other respect.

For the detecting of such frauds, the stock held for sale by retailers to the public has to be examined. It is difficult to inspect a retailer's stock in trade to determine whether it is genuine, as labelled, or is spurious, because the visual aspect of goods and label can be copied very exactly by the counterfeiter. When a maker of the genuine employs inspectors for this purpose, he finds their work expensive, because the containers have to be purchased and opened; and even then the available tests for comparing the counterfeit with the genuine product may be uncertain, because of the cleverness of imitation.

A device useful in this situation has been disclosed in the patent granted to Dr. Ernest H. Huntress No. 1,822,098, of September 8, 1931, by which an identifying mark can be applied for authenticating the package, in such a way that the presence of that mark would not ordinarily be suspected because it may be invisible, except that it fluoresces to visibility under ultra violet rays. For best use to distinguish the genuine from the spurious, such a mark must avoid being itself counterfeited; and to this end it should be perfectly invisible under ordinary conditions. Preferably, the marking substance applied to a label would either have the same shade as the background of the label, or would be so colorless that the aspect of the background is unchanged by it. But the fluorescing substances found convenient to be applied for this purpose sometimes effect a slight change in the surface of the label, either in texture, or in shade, so that a close inspection in ordinary light, of the genuine label thus authenticated, would discern the presence of that mark.

The present invention provides means by which such a mark, authenticating the label on which it stands, can be made perfectly invisible to any ordinary handler of the labelled package, and yet be so clearly readable by an inspector, equipped with apparatus for producing ultra violet rays, as to assure the inspector that the label is genuine. If the maker has thus marked all of his output, of the kind in question, the finding of a similar package on a retailer's shelf having a label which appears normal, but which is found to be really not bearing such a mark, unequivocally detects that as a counterfeit. It remains, however, that an invention such as this would be most useful if the authenticated mark could also be safe against being itself counterfeited. The invention provides restrictions which offer safeguard in this respect also.

For goods having quality, high enough to carry a risk of being counterfeited, makers are accustomed to use labels of high quality; and these are printed on coated paper. I have discovered that it is possible to apply an authenticating mark to such labels, so that it can serve in the manner above indicated, and to conceal the slight difference of shade or surface texture, so that a masked means is provided for discerning whether articles offered for sale are genuine in accordance with their label or are spurious. This detecting of counterfeit labels can be an important step toward the eliminating of this variety of fraud on the public and on the maker.

To counterfeit the authenticating mark the would-be counterfeiter must first know that such a mark is present; and then, in order to produce it, he must be able to command the services of a paper mill capable of executing the counterfeit. Such mills are few in number, and are generally under a management control which would not participate in the making of a proposed counterfeit.

According to my discovery, the concealment of an effective authenticating mark can be accomplished, in a label printed on coated paper, by imposing the authenticating fluorescing mark on the raw paper stock of the label instead of on the surface which receives the ordinary ink imprint of the label. The mark may be made by a solution containing any substance which will be adsorbed on the paper as a dye, or as ink is adsorbed, and will fluoresce under ultra violet rays, providing it does not make a greater change in the surface aspect of that paper than will be masked by the coating which is normally to be added in making the kind of coated paper of which the label is made. It therefore does not require to be undiscernible on the raw stock in ordinary light; but the applying of the coating over it covers it so that such visibility as it has disappears. The coating by which its presence is thus made undiscernible in ordinary light may be the usual coating of clay and other substances, as satin white and casein in the example given

below, such as are ordinarily applied in the making of coated paper for labels; and by then printing this coated paper in the usual way of printing the particular style of label which is thus being authenticated and made identifiable as genuine. Having conceived that this might be done, I have discovered that the presence of the authenticating mark can be perfectly concealed by that normal coating of the paper, and yet be readily visible by fluorescence through that coating when ultra violet rays are applied. This seems to be because the coating, although not permeable by ordinary light rays, is permeable by the impinging ultra violet rays, and is also permeable by the emanating visible fluorescent light rays which become generated by reaction of the ultra violet rays on the fluorescing substance under the coating.

It is intended that, by suitable expression in the appended claims, the patent shall cover whatever of patentable novelty exists in the disclosure here made.

The accompanying drawing illustrates diagrammatically an embodiment of the invention.

In the drawing:

Figure 1 is a face view of a sheet of raw stock of paper, of which the label is to be made; and may be considered also as showing the outline, in face view, of a label embodying the invention;

Figure 2 is a diagrammatic representation of a section through a bottle labelled in accordance with the invention, the several elements of the label being separated from each other and exaggerated in thickness for diagrammatic showing;

Figure 3 is a section through a completed label prepared to be affixed to a container by a decalcomania process, the several elements constituting the label being exaggerated in thickness;

Figure 4 is a view similar to Figure 2 showing a modification.

In the drawing the numeral 1 designates the raw paper stock, which constitutes the principal body of the label, whose back side bears a coating of dextrine, casein, or other adhesive 2 for holding the label on the glass bottle 3. The numeral 4 indicates the said fluorescent material deposited in printed characters on the face of the paper 1, the separated rectangles being sections, through the lines composing those characters, exaggeratedly representing the thickness of the printed characters. Numeral 5 indicates the coating which, in the making of the label without the invention, would normally be combined with the raw stock 1 to make the finished paper on which the ordinary ink 6 is imprinted to constitute the label. In the completed label, as is indicated in Figure 3, these parts are all compressed together, the fluorescing substance 4 being on the surface of the raw paper and absorbed a little way into it, and being overlaid by and covered by the coating 5 on whose outer surface the printer's ink 6 of the label stands, partly absorbed, with its outer face exposed to view in the usual way.

Such a label may be applied to a container by the usual method of applying a gummed adhesive back of the paper to the container, as indicated in Figure 2; but Figure 3 shows how the label may be prepared for application to whatever is to receive it by having its back coating of adhesive covered with a layer of suitably porous paper 7 such as is used in decalcomania, which, when wetted, can be slipped out from under, leaving the label adhering to the surface of the container.

Material to constitute the fluorescent marking may be any of those substances in the nature of dyes mentioned in the said Huntress patent, selections being made so that the color shades of paper and of the fluorescent imprinted substance approximately agree, or, at will, a colorless substance capable of fluorescing may be used; or any other substances conforming to these standards and capable of being adsorbed by the paper, a considerable number of which are known. Instances are found in the stilbene derivatives which are known to fluoresce, for example the free acid or a water-soluble salt of 4:4' - dibenzoylaminostilbene - 2:2' - disulphonic acid or a substitution derivative thereof; also in anthracene, which may be dusted on, or applied in a suitable solvent.

For a safeguard against the fraud of soaking genuine labels off from their original bottles, and then applying them to bottles with spurious contents, a water-soluble fluorescent salt may be used. One such, which has the property of being invisible until ultra violet light is applied to it, is a sodium salt of 2-naphthol-3:6-disulphonic acid. Upon an attempt at removal of a label, so marked, the distinctive mark would be destroyed by the water applied for moving the paper from the bottle, or for washing the bottle with the label still on it.

On the other hand, by printing with petroleum jelly, carried in a suitable vehicle, for example, three times its volume of xylene, a mark is made which will not wash out in case the label of a bottle gets wet, and which is invisible under the finish coating of the paper until ultra violet light is applied.

The concentration or percentage of the fluorescing material in the fluid for printing the authenticating mark may depend upon the fluorescent characteristics of the particular material selected for use, easily ascertainable by trial according to whatever strength may be desired. An illustrative formula for a vehicle, for applying the marking material in fluid form is, by weight:

	Per cent
Water	45
Glycerine (specific gravity 1.25)	55
	100

to which is added the desired proportion of fluorescent substance for which in many instances 2% will be found satisfactory.

The mark may be applied either by printing it, or marking it by hand, as a signature or otherwise as may be convenient or preferred, on the paper 1 before the manufacture of the paper is completed by the adding of its finish coating. In some cases the mark may be a mere covering of the whole surface of the paper, or whatever sheet substance is used in the way in which paper is ordinarily used, with a substance which fluoresces distinctively. Or it may have a stippled or spotted aspect obtained by dusting a fine fluorescent substance, such as anthracene, on the paper before the outer coating is applied. Another method, which would offer marks in many distinctive combinations, is to mark the paper by printing lines of different width and spacing, using fluorescent ink before application of the coating.

For the coating 5 which is to cover and conceal

the slightly visible deposit thus made on the raw paper stock I, the methods and materials ordinarily used in making a finish coating, especially China clay, and satin white, plus appropriate dyes or pigments if desired, may be employed. Various formulae for this are well known; and I indicate the following as one which is illustrative for showing approximate proportions of ingredients which when applied in moderate thickness will mask the authenticating mark and yet will permit the in-passing of ultra violet rays to that mark, and of the out-passing of fluorescing rays that emanate from the mark, so that the mark itself becomes readily visible under those circumstances:

	Percent by weight
Satin white	10
China clay	30
Liquid casein (1–5)	40
Water	20

In this general art other materials with which the invention may be practiced, well known for coating paper, are titanium oxide and blanc fixé, as well as calcium carbonate. The coating is effected by first applying the covering pigment, white or with such pulps as may be used for color; then, if desired, brushing it smooth; and then calendering, all according to usual processes.

It is also possible, as illustrated in Figure 4 wherein corresponding elements are designated by the same reference characters, to mask a distinguishing mark of the class described by putting it between the raw paper stock and the coating of adhesive gum by which the paper is held on the bottle. In this case the aspect of the paper where the mark is may differ slightly from the aspect of the paper elsewhere, and that difference be non-discernible when the face side of the label is viewed, because from that viewpoint it is masked by the body of the paper, even though the paper is of the variety which has no finish coating on its face, but its presence may be found by the applying of ultra violet rays to the face of the label; or, the ultra violet rays may be applied, through the bottle and contents, to the back side of the label. In this case the mark can be masked against detection by ordinary vision by the coating of adhesive gum on the back of the label, which may have whatever tint and shade of color will serve that purpose for the particular variety of fluorescing material which is used. The mark may even be applied on the gum of the extreme back surface of the label, if the coating of gum affords a suitable color background against which the glass and contents of the bottle can constitute a masking of whatever differential of aspect is thus occasioned.

In all of the instances noted, it will be observed that the masking is by a coating which, as a coating, is transparent or at least translucent, to ultra violet rays and to the rays fluorescently regenerated thereby. These coatings first above mentioned have solids of finely powdered material, which may be individually opaque but are bound together by a film, as casein or ordinary glue, which the rays can permeate. And such rays can also permeate colored inks; and I believe that it is because the ultra violet rays are so short that they can get through the infinitesimally small spaces between the pigment particles, or between the flocculently deposited fibres of the paper, with more facility than the rays of ordinary light. But if the coating is one of a metallic foil which is continuous and opaque, the mark should be on the back of the label; as also is preferable when the words or pictures of the label are imprinted in heavy black, in which case the black solids of the ink absorb so much of the light that the seeing of the mark is difficult.

I claim as my invention:

1. A label comprising a print on a sheet of paper or the like, combined with a deposit on the label, constituting a mark, of material capable of fluorescing under ultra violet rays; there being a covering, and the said deposit being positioned between that covering and the paper sheet, said covering comprising a coating on the paper of the label, of material having the character that it obscures the mark in ordinary light when viewed through said covering but permits the passing of ultra violet rays, and rays of the consequent fluorescent emanations of the mark, rendering the mark visible when viewed through said covering.

2. A label as in claim 1, wherein the covering is a finish coating on the face side of the label.

3. A label as in claim 1, wherein the covering is a coating of adhesive gum on the back side of the label.

4. A label as in claim 1, wherein the covering is a finish coating of finely divided pigment.

5. A label as in claim 1, wherein the covering is a finish coating of finely divided discontinuous particles and a colloidal film holding them together.

6. A label as in claim 1, wherein the covering is a finish coating of finely divided coating materials of the recognized industrial type and class which includes china clay, satin white, blanc fixé, calcium carbonate and titanium oxide.

FREDERICK W. FARRELL.