

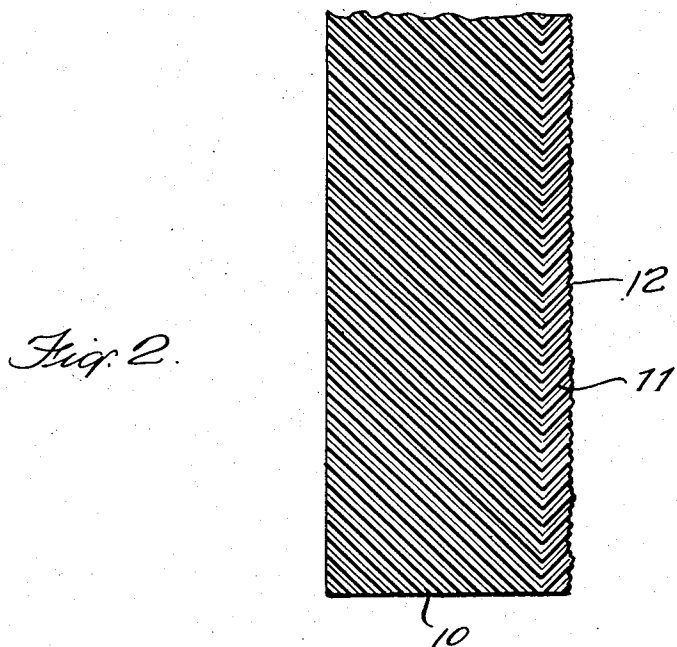
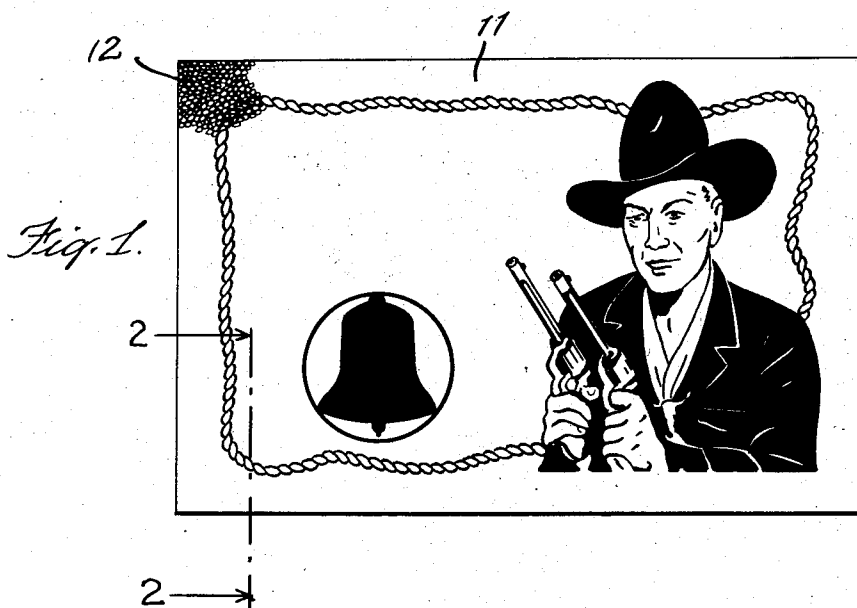
Dec. 8, 1953

C. M. ANDREW

2,662,033

PROCESS OF MAKING A LABEL

Filed Dec. 1, 1950



Inventor
CLYDE M. ANDREW
By *Victor N. Borst*
Attorney

UNITED STATES PATENT OFFICE

2,662,033

PROCESS OF MAKING A LABEL

Clyde M. Andrew, Greensboro, N. C., assignor to
Blue Bell, Inc., Greensboro, N. C., a corporation
of North Carolina

Application December 1, 1950, Serial No. 198,705

6 Claims. (Cl. 117—8)

1

The present invention relates to a new and improved process for producing a label which will have particular utility in connection with garments.

It is customary to sew labels on garments or articles of attire to describe source, authenticity of design, styling, construction, workmanship, etc. Certain types of rugged garments as, for example, jeans, overalls, riding habits and western garbs require sturdy labels, especially where the garments are to be laundered or frequently cleaned. For that purpose, it has been customary to apply labels made of leather, since these blend effectively with the outdoor appearance of the garments. These labels, however, lack the desired serviceability because of the destructive effect of water, detergents and chemical cleaning fluids thereon in laundering and cleaning and because of their sensitivity to aging, wear, etc. Moreover, it is difficult to apply a clean-cut, wash-fast print or design on these labels. Also, these leather labels cannot be made uniform due to hide cut variations from pelt to pelt and to chemical deterioration from lot to lot resulting from the tanning and other chemical operations thereon.

An object of the present invention is to provide a process which will produce a new and improved label which is durable and resistant to the action of water, detergents and chemical cleaning fluids, which can effectively withstand aging, weathering and sunlight, which has high color stability, which permanently retains printing and/or design matter thereon, which lends itself to uniform manufacture as to physical properties, appearance, size and shape, and which, compared with leather labels, is inexpensive to make.

In accordance with certain aspects of the present invention, the base sheet of the label is made in essence of synthetic resin of the thermoplastic type, and more specifically of a resin of the vinyl family. A suitable vinyl plastic for the purpose is vinyl chloride, vinyl acetate or vinyl chloride-vinyl acetate copolymer, compounded for the attainment of the necessary resiliency, flexibility and toughness.

One difficulty with vinyl plastics is the fact that they do not lend themselves satisfactorily to conventional label printing processes. Color-applying or printing processes commonly employed in connection with paper, textiles and plastic would not produce the dull adhering color patterns on vinyl plastic necessary to meet the standard of legibility and permanency. Imprinting on vinyl plastics by commonly known processes produces deposits of color without strong

2

bond or adhesion and subject to removal by the slightest abrasive contact therewith. Moreover, washing and cleaning with chemical fluids removes the imprinted patterns or designs applied by these known methods.

In accordance with the present invention, the imprinting of the resin base sheet of the label is effected by applying a solvent to the sheet to partially liquefy its surface. While the surface is in this partially liquefied state, printing is applied thereon with a thermoplastic resin of the general character of the base resin material of the stock or sheet but containing the necessary printing dye or pigment. As a result, the printed layer and the base stock become united into a single or integrated whole.

As another feature, the base sheet and the applied print layer are subjected to heat and pressure to decoratively emboss the printed surface of the resulting label.

Various other objects, features and advantages of the invention will be apparent from the following particular description and from an inspection of the accompanying drawings, in which—

Figure 1 is a face view of a label embodying the present invention and made in accordance with the process of the present invention; and

Figure 2 is a cross section of the label, taken on line 2—2 of Figure 1 but on a larger scale, the printing layer being shown exaggerated in thickness in comparison with the thickness of the base sheet of the label.

In carrying out the process exemplification of the present invention, a label stock made of a vinyl resin and desirably of vinyl chloride, vinyl acetate or vinyl chloride-vinyl acetate copolymer is calendered to the required thickness, which for ordinary label purposes is preferably 30 to 40 gauge and more specifically 40 gauge to produce a base sheet or blank 10. This vinyl resin is compounded with the necessary pigment or dye, lubricant, diluent resin and filler as required, to attain the desired properties and appearances. Since the label is desirably highly flexible to permit it to be folded with the garment to which it is to be applied, the label stock contains a high percentage of plasticizer. Although the possibilities of formulation are many, a typical formula for the stock material may be as follows:

	Percent by weight
Vinyl resin (vinyl chloride)	65
Lubricant	1
Stabilizer	2
Plasticizer	32
Pigment or dye—(whatever is necessary according to color required).	

3

After the label stock has been made to the required gauge by calendering or other suitable process, the surface to be printed is partially liquefied by a solvent. The ketones are desirable for the purpose. These should have a boiling point low enough so that residual traces could be driven off by evaporation at a temperature of 160° F. Ethyl methyl ketone is particularly suitable, although other ketones, as for example, acetone, may be used.

For rendering the surface of the base sheet 10 to be printed partially liquefied with the solvent, the sheet is exposed to the vapors of the solvent at an elevated temperature of about 110° F. and the sheet is exposed to the action of the solvent vapor for a period of about one second before coming in contact with the printing composition.

The printing composition comprises a pigment dispersed in finely divided form in a vinyl resin vehicle to form a vinyl clear. In the specific formulation used, the pigment resin vehicle corresponds to the resin in the base sheet and is vinyl chloride, vinyl acetate or vinyl chloride-vinyl acetate copolymer. In the specific formulation employed, the pigmented resin is vinyl chloride.

The pigment resin vehicle desirably contains a plasticizer but this need not be as much as in the base sheet. About 3 per cent of plasticizer in this resin vehicle is sufficient. A typical formulation for a printing composition for a black figure design may, for example, comprise 85 per cent of a vinyl resin compounded with the necessary plasticizer and other ingredients and 15 per cent carbon black dispersed therein.

After the surface of the base sheet or blank 10 has been exposed to the solvent vapors for about one second at a temperature of about 110° F. to partially liquefy the surface, the pigmented resin printing composition is applied by any suitable printing process in any required design or pattern to form a print layer 11. This vinyl printing composition containing pigment becomes dissolved in the base resin itself and causes the base sheet 10 and the print layer 11 to merge into a single mass of substantially the same constituency.

After the application of the printing and/or design to the dissolved surface of the base sheet 10, the resulting printed label is subjected to further heat to a temperature of approximately 160° F. to drive off residual traces of the solvent.

To produce a decorative embossed grain surface on the label, the label is subjected to heat and pressure. For that purpose, after the printing operation described, the printed label is heated to approximately 265° to 275° F. At this temperature, the surface material, including the printing resin but not the pigment dispersed in this resin, is in soft plastic condition. While in this condition, the label is passed through the field of action of a pair of nip rolls adapted to apply a pressure of about 100 pounds to the label. The surface of one of the nip rolls is designed to impart a leathery embossed pattern to the soft label surface. This pressure action not only molds the label surface to produce the required cell-like structure 12, but also presses the superposed base sheet 10 and print layer 11 more firmly together into a composite unitary structure. The label is cooled after the roll molding operation described and causes the impressed surface pattern to become a permanent part of the label at normal temperatures.

The labels as described may be produced by a continuous operation in which the base sheet is

4

formed as a continuous strip, the printing applied thereto in successive sections, the strip subjected to heat and pressure for decorative surfacing and the printed strip cut between the successive prints to produce the individual labels.

In the resulting label, the printing pigments, inks or dyes do not merely adhere to the outer surface of the base sheet but become a part integrally of the resinous mass. The labels will all be uniform and will have color and stock stability to home and commercial type laundering treatments. Moreover, the label will not be subjected to deterioration due to aging or the action of sunlight exposure, since no part of the label is of oxidizable character. Also, none of the usual hydrocarbon types of dry cleaning fluids have any effect on the label, so that these fluids could be used to remove obstinate grease spots which cannot be completely eliminated by wet solvent methods of cleaning. Moreover, the label can be directly sewn to the garment to which it is to be applied without the use of cloth or textile adjuncts.

The label produced by the present invention has a life expectancy which is a great deal more than that of leather labels and the printing colored detail is finer in character and definition than has ever been produced in woven or leather labels. Also, the label has the feel to touch of the natural product without semblance of imitation. Furthermore, the label is non-shrinkable in cold or boiling water containing suds, and no part of this label is soluble in the washing or cleaning fluid. Moreover, due to its thermoplastic characteristics, the label when immersed in boiling suds assumes such pliability that it exerts no forces damaging to the apparel to which it is sewn.

While the invention has been described with particular reference to a specific embodiment, it is to be understood that it is not to be limited thereto but is to be construed broadly and restricted solely to the scope of the appended claims.

What is claimed is:

1. The process of making garment labels and the like comprising preliminarily subjecting a surface of a flexible base sheet of vinyl resin to an organic solvent of relatively low boiling point in hot vapor form, thereby liquifying the immediate surface portion of the sheet, then substantially immediately thereafter printing upon said surface, while said surface is partially liquified, with an ink comprising a pigment in a compatible vinyl resin vehicle, whereby said vehicle dissolves in and integrally unites with the base sheet material, and thereafter removing residual traces of the solvent by drying.

2. The process as defined in claim 1, wherein the solvent vapor is methyl ethyl ketone.

3. The process as defined in claim 1, wherein the solvent vapor is at a temperature of about 110° F.

4. The process as defined in claim 1, wherein the base sheet is exposed to the solvent in hot vapor form for a period of substantially one second before printing thereon.

5. The process as defined in claim 1, followed by the steps of heating the printed sheet to a temperature high enough to render the sheet in soft plastic form and while in this condition subjecting the sheet to compression between embossing members.

6. The process of making garment labels or the like which comprises forming a flexible base sheet of a resin of the class consisting of vinyl

5

chloride, vinyl acetate and vinyl chloride-vinyl acetate copolymer, preliminarily subjecting a surface of the sheet to an organic solvent of relatively low boiling point in hot vapor form for a period of substantially one second, then substantially immediately thereafter printing upon said surface while the surface is partially liquified with a pigment in a resin vehicle of the class consisting of vinyl chloride, vinyl acetate and vinyl chloride-vinyl acetate copolymer, whereby said vehicle dissolves in and integrally unites with the base sheet material and subjecting the resulting product to heat sufficient to drive off the residual solvent.

CLYDE M. ANDREW. 15

6

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,677,475	Gunnell	July 17, 1928
2,013,194	Vaughn	Sept. 3, 1935
2,351,174	Whitehead	June 13, 1944
2,486,259	Chavannes	Oct. 25, 1949
2,561,513	Horback	July 24, 1951
2,561,894	Wallich	July 24, 1951

OTHER REFERENCES

"Printing on Vinyl Film," Chester M. Robbins, Rubber Age, Nov. 1946, pages 203-205.