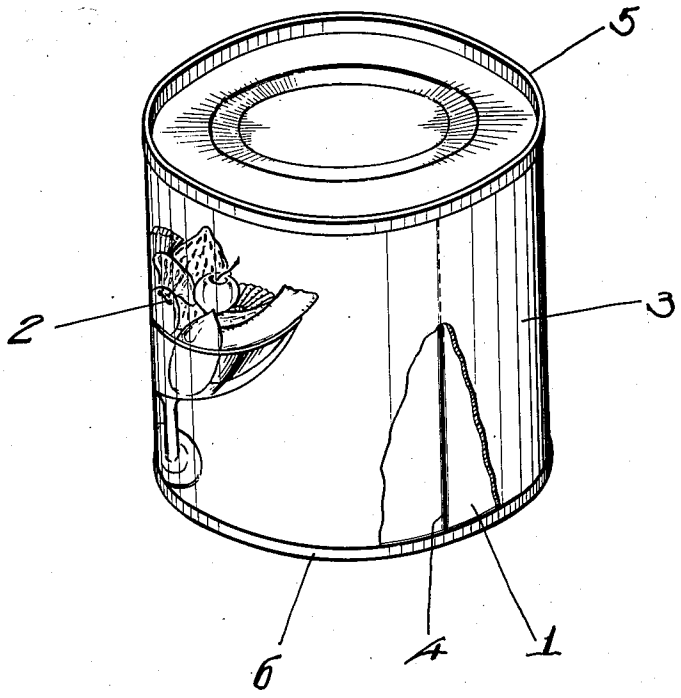
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METHOD FOR LABELING PACKAGES

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METHOD FOR LABELING PACKAGES

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The present invention relates to a method of identifying the contents of a vessel or package and the labeled container obtained thereby. The labeling of cans, bottles and other containers is generally accomplished either by printing directly on the surface or by adhering a printed paper, i.e. label, on said surface.

The labeling of cans, e.g. those containing foodstuffs, presents particular problems. If the external surface of the can is itself printed prior to canning, there is considerable danger that the printing will be sufficiently damaged during the canning procedure to render the product either unsalable or salable only at a reduced price. A fair number of "unqualified" canned goods are regularly produced. In cases where metal sheet is printed prior to making a can for canned goods, damage to the printed surface occurs during the shaping operation. Moreover, the area where both ends of the sheet are soldered into a seam must necessarily be left unprinted, presenting an effect which is not pleasing to the eye.

The printing of can surfaces also has the defect that mobility of operation is encumbered. Cans so printed cannot thereafter be employed for contents other than that initially intended. This can result in a delay in accommodating a shifting demand.

Identification of packaged goods by the application of paper labels thereto also has many defects. Such labels are often torn or damaged, detracting from the eye-appeal of the package. When paper labels are torn completely from a package, e.g. canned food, it may be impossible to identify the contents without opening the package and thus completely destroying its salability. Moreover, paper labels are hygroscopic and permit the easy corrosion of the metal cylinder body of cans, especially along the seam.

It is a purpose of this invention to overcome the defects of labeling means noted above. More particularly, it is a purpose of the instant invention to label packages, especially canned food packages, in such a manner as to provide an aesthetically attractive product, to provide an essentially permanent label which protects the metal of metal cans against corrosion, to provide a label which can be applied after the container is formed and filled and to provide a label which can be printed in such a manner as to render the printed matter essentially permanent. It is further an object of the instant invention to provide canned goods with a label formed from a printed cylindrical and preferably endless film of thermocontractive synthetic resin material. An additional object is to provide a synthetic resin film, as referred to above, which cooperates with the upper and lower lips of a can to maintain the metal surface thereof free from moisture and oxidation and to preclude the accidental removal of said film. Still further objects will be apparent from the complete description of the instant invention which follows:

According to the present invention, a printed cylindrical film of thermocontractive synthetic resin material is heat-shrunk in such a manner as to cover the cylindrical surface of a can. The cylindrical film may be a flat film, the ends of which are adhered together to form a cylinder. The printed matter thereon may be on either or both sides thereof. Alternatively, a plurality of concentric endless films can be thermocontracted to adhere simply to the surface of a can. In this embodiment the printing is preferably placed on a surface between the several films. It is preferred to have printed matter on the side of the film adjacent to the can to preclude its removal or any damage to it by abrasion. The cylindrical film permits continuous printing around the entire surface.

Cylindrical films of thermocontractive synthetic resin material can be applied to cans after canning is finished, thus reducing the number of "unqualified" goods. Said resin material is stronger than paper, sits firmly on the base and provides a water-resisting film which protects the can, particularly the seam thereof, from oxidation. Canned foods may be sterilized concurrently with shrinking the thermocontractive synthetic resin material firmly about the cylindrical surface, thus labeling and sterilizing in a single operation.

The invention may be better understood after consideration is given to the illustrative embodiment illustrated in the drawing wherein:

A cylindrical can **1** of food is identified by printed matter **2** on an endless cylindrical film body of thermocontractive synthetic resin material **3** and may comprise letters, figures, pictures and other identifying indicia. When printing is placed on the side of the film closest to the can, it is preferred to employ a transparent film, but partially transparent films may also be used in this way. It is readily understood that opaque films as well as films varying in transparency will suffice when the printing is on the outside of the film.

Printing on the inner surface of the film must be reversed so as to give the same appearance as printing on the outer surface.

According to the present invention, a printed thermocontractive synthetic resin film, preferably of a uniform thickness, is processed into a tubular body having a diameter only slightly, e.g. from about 3 to about 10 millimeters, larger than that of the container to be labeled. When said container is one for canned food, such as is illustrated on the drawing, the diameter of the tubular body must be sufficient to slide over the lips **5** and **6**.

The print is on the inside and/or outside surface to identify the goods to be labeled and may be placed on the film either before or after processing into a tubular body.

The tubular body is then cut into sections of prescribed lengths to accommodate the containers **1** (stuffed and sealed) to be labeled. The cut sections **3** are placed over the cylindrical portion of said containers, which are then subjected to thermal sterilization. The temperature of the thermal sterilization contracts the cylindrical film **3** sufficiently to make it adhere firmly to the surface of the container. Cans, e.g. of canned foods, labeled in this way are free from corrosion, even at the seam **4**.

Firm fixing of labels **3** on the surface of vessels **1** for identification of contents is accomplished without adhesive merely by subjecting the labels (in position) to the action of heat. A hot atmosphere, such as hot water, oven heat, infrared radiation, is all that is necessary. Temperatures from about 70° C. to about 90° C. may be used, but a temperature of about 85° C. is preferred. The time the film is subjected to this temperature is ordinarily from 3 to 6 minutes, but 5 minutes is preferred.

There are numerous resin materials which are thermocontractive and suitable for use according to the instant invention. Any thermocontractive resin which can be formed into film and printed on can be employed. Examples of such resins are polyvinylidene chloride, such as that sold commercially under the trademark "Cry-a-Vac" or under the trademark "Saran"; rubber hydrochloride, such as that sold commercially under the trademark "Pliofilm"; polyethylene; polyethylene terephthalate, such

as that sold commercially under the trademark "Mylar"; nitrile rubbers (see U.S. Patents, 2,234,994 and 2,502,-240); and ethylene terephthalate/ethylene isophthalate copolymers, particularly 60/40 (see British Patent 766,290 of the Goodyear Tire and Rubber Company).

The thickness of the resin film may vary considerably. For easy handling the thickness may be, e.g., between 0.01 and 0.09 millimeter, but a preferred thickness is about 0.06 millimeter.

When the endless resin film is made of thermocontractive resin which has "memory," said film is unidirectionally prestretched so as to increase the circumference of said film to the desired length. By "memory" is meant that the stretched film will essentially return to its unstretched condition under the application of heat. Those resin films which must be prestressed to be thermocontractive are well known; the stretching or prestressing per se is not part of the instant invention which applies generally to thermocontractable films, whether or not prestretching is a prerequisite. Those films which require prestretching can be prestretched either before or after the continuous film is formed and before or after the film is printed. Thus, for example, polyvinylidene chloride film will be prestretched.

The instant invention is independent of the shape of the container to be labeled and dispenses with special printing machinery for unusual shapes, since the printing is on the label prior to application to the container rather than on the container. The printing may be placed on either surface of the resin film. If desired, the printing can be placed in reverse on the outside of said film and the film reversed prior to application to the container to be labeled. The printing on either or both surfaces of the label is permanent and bright in luster, thus adding to the value of the product involved.

Example I

A flat film of polyvinylidene chloride (such as that sold under the trademark "Cry-a-Vac") is formed having a uniform thickness of 0.09 millimeter. The ends of the film are overlapped and sealed together by high frequency electrical power to form a continuous film. The film is printed (in reverse) on the external surface thereof with suitable words, pictures and other indicia to identify the goods to be labeled. The printed film is then turned inside-out so that the print is on the inner surface.

The printed tubular film, which is about 8 millimeters larger in diameter than the can 1 to which it is to be applied, is cut into lengths equal to the distance between the lower 5 and the upper 6 lips of said can. A single such length is so placed over a No. 2 can 1 filled with fruit salad and sealed so that it is directly adjacent to the cylindrical portion of the can between the upper and lower lips. The can, with the tubular film in place, is sterilized at 212° F. When the sterilization is complete, the printed tubular film adheres tightly to the cylindrical portion of the can and is contained between the lips thereof. The contraction of the film expels any moisture on the surface of the can. Since the print is adjacent to the surface of the can, it is not damaged by abrasion of the outer surface of the film.

Example II

A flat film of rubber hydrochloride (such as that sold under the trademark "Pliofilm") is formed having a thickness of 0.06 millimeter. This film is printed correspondingly on both surfaces with suitable words, pictures and other indicia to identify the contents of the container to be labeled. The printed film is cut to a length 15 millimeters greater than the circumference of said container and to a height equal to the distance between the lips 5 and 6 of said container. The printed and cut film is then wrapped around the cylindrical portion of the container between the lips thereof so that the ends overlap about 7 millimeters. A heat-sealing bar is applied to the overlapping ends along the entire overlap so as to join said ends and make a continuous film.

The container is the one illustrated in the drawing. At the time the ends of the film are sealed together, the container has been filled, sealed and sterilized. The container and film are subjected to a temperature of 85° C. in a forced draft oven for five minutes. When the container is removed thereafter, the film 3 is firmly affixed to the can.

Example III

The process described in Example I is repeated except the polyvinylidene chloride is replaced by polyethylene. The results are similar.

Example IV

The process of Example II is repeated except the rubber hydrochloride is replaced by polyethylene terephthalate (such os that sold under the trademark "Mylar"). The results are similar.

Example V

A flat film of polyvinylidene chloride (such as that sold under the trademark "Saran") is formed having a uniform thickness of 0.04 millimeter. This film is printed on the outer surface thereof with suitable words, pictures and other indicia to identify the contents of the container to be labeled. The printed film is cut to a length about 15 millimeters greater than the circumference of said container and to a height equal to the distance between the lips 5 and 6 of said container. The printed and cut film is then wrapped around the cylindrical portion of the container between the lips thereof so that the ends overlap about 7 millimeters. A heat-sealing bar is applied to the overlapping ends along the entire overlap so as to join said ends and make a continuous film.

The container is the one illustrated in the drawing. At the time the ends of the film are sealed together, the container has been filled, sealed and sterilized. The container and film are subjected to a temperature of 70° C. for 3 minutes.

A second flat film of polyvinylidene chloride (such as that sold under the trademark "Saran") is formed in identical manner, having the same uniform thickness, length and height. This second film, however, is not printed, but is made into a continuous film by sealing the ends together with a heat-sealing bar as set forth above.

The second unprinted continuous film is placed concentrically around the first film so that the height of said second film is directly adjacent that of the first film. The container with the two films about it is then subjected to a temperature of 90° C. for five minutes. When the container is removed from the heat thereafter, the two films are firmly adhered to each other and to said container, and the print is well protected between the two films.

Any thermocontractive resin material which can be printed on and which can be formed into a thin, nonbrittle film can be employed according to this invention. Each of the thermocontractive resin materials disclosed supra can be employed according to either the process of Example I, that of Example II, or that of Example V.

It is thought that the invention and its advantages will be understood from the foregoing description, and it is apparent that various changes may be made in the process and the products obtained therefrom without departing from the spirit and scope of the invention or sacrificing its material advantages, the process and products hereinbefore described being merely illustrative or preferred embodiments of the invention.

Having described the invention, what is claimed is:

1. A method which comprises forming an endless film of thermocontractive synthetic resin, printing identifying indicia on a surface of said film, placing the printed film around a portion of a container, retaining the relative positions of the film and the container while applying suf-

ficient heat to said film to shrink it so that it adheres closely to the portion of the container it surrounds.

2. A process which comprises: (*a*) forming an endless film of thermocontractive synthetic resin, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting said printed film into lengths, (*d*) placing a length around the cylindrical surface of an essentially right circular cylindrical can having parallel bases which overlap the right circular cylindrical surface to form parallel circular lips, the length being equal to the distance between the parallel circular lips, and (*e*) applying sufficient heat to the surface of the length of film to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

3. A process which comprises: (*a*) forming an endless film of polyvinylidene chloride, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting said printed film into lengths, (*d*) placing a length around the cylindrical surface of an essentially right circular cylindrical surface to form parallel circular lips, the length being equal to the distance between the parallel circular lips, and (*e*) applying sufficient heat to the surface of the length of film to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

4. A process which comprises: (*a*) forming an endless film of rubber hydrochloride, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting said printed film into lengths, (*d*) placing a length around the cylindrical surface of an essentially right circular cylindrical surface to form parallel circular lips, the length being equal to the distance between the parallel circular lips, and (*e*) applying sufficient heat to the surface of the length of film to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

5. A process which comprises: (*a*) forming an endless film of polyvinylidene chloride, said film having a uniform thickness of from 0.01 to 0.09 millimeter, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting said printed film into lengths, (*d*) placing a length around the cylindical surface of an essentially right circular cylindrical can having parallel bases which overlap the right circular cylindrical surface to form parallel circular lips, the length being equal to the distance between the parallel circular lips, heating said film to a temperature from 70° to 90° C. for a period of from 3 and 6 minutes to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

6. A process which comprises: (*a*) forming an endless film of polyethylene, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting said printing film into lengths, (*d*) placing a length around the cylindrical surface of an essentially right circular cylindrical can having parallel bases which overlap the right circular cylindrical surface to form parallel circular lips, the length being equal to the distance between the parallel circular lips, and (*e*) applying sufficient heat to the surface of the length of film to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

7. A process which comprises: (*a*) forming a film of polyvinylidene chloride, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting the printed film into lengths and widths, the lengths being in excess of the circumference of an essentially right circular cylindrical can having parallel bases which overlap the right circular cylindrical surface thereof to form parallel circular lips and the widths being equal to the distance between the parallel circular lips, (*d*) placing the film between the parallel lips and around the cylindrical surface so that the ends of the film overlaps, (*e*) applying sufficient heat to the entire overlap to make an endless film, and applying sufficient heat to the entire surface of the film to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

8. A process which comprises: (*a*) forming a film of rubber hydrochloride, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting the printed film into lengths and widths, the lengths being in excess of the circumference of an essentially right circular cylindrical can having parallel bases which overlap the right circular cylindrical surface thereof to form parallel circular lips and the widths being equal to the distance between the parallel circular lips, (*d*) placing the film between the parallel lips and around the cylindrical surface so that the ends of the film overlap, (*e*) applying sufficient heat to the entire surface of the film to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

9. A process which comprises: (*a*) forming a film of polyethylene, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting the printed film into lengths and widths, the lengths being in excess of the circumference of an essentially right circular cylindrical can having parallel bases which overlap the right circular cylindrical surface thereof to form parallel circular lips and the widths being equal to the distance between the parallel circular lips, (*d*) placing the film between the parallel lips and around the cylindrical surface so that the ends of the film overlaps, (*e*) applying sufficient heat to the entire overlap to make an endless film, and applying sufficient heat to the entire surface of the film to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

10. A process which comprises: (*a*) forming a film of polyethylene terephthalate, (*b*) printing identifying indicia on a surface of said film, (*c*) cutting the printed film into lengths and widths, the lengths being in execess of the circumference of an essentially right circular cylindrical can having parallel bases which overlap the right circular cylindrical surface thereof to form parallel circular lips and the widths being equal to the distance between the parallel circular lips, (*d*) placing the film between the parallel lips and around the cylindrical surface so that the ends of the film overlap, (*e*) applying sufficient heat to the entire overlap to make an endless film, and applying sufficient heat to the entire surface of the film to shrink the film so that it adheres closely to the cylindrical surface and is retained between the parallel lips.

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