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METHOD OF TREATING ADHESIVE COATED BLANKS TO NULLIFY
THE ADHESIVE EFFECT IN SELECTED AREAS
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Fig. 1

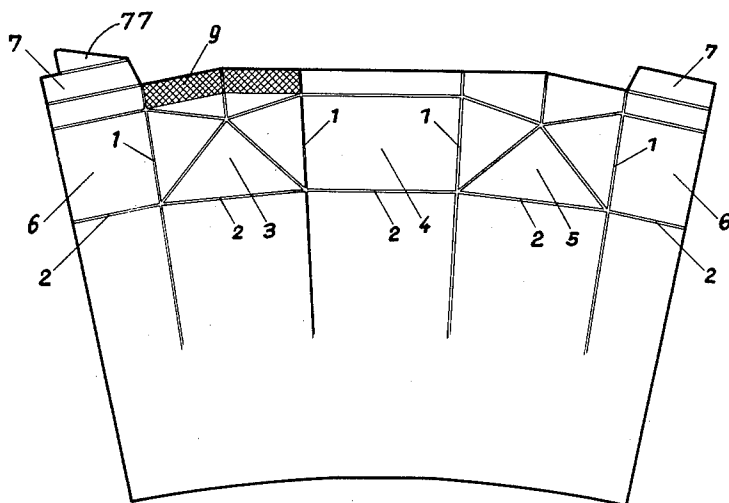


Fig. 2

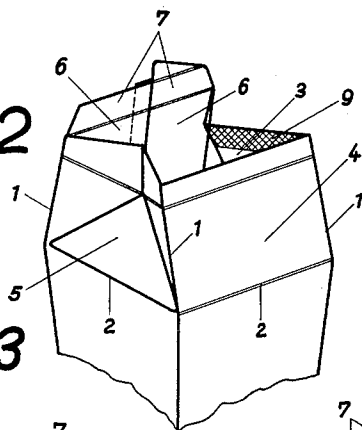


Fig. 3

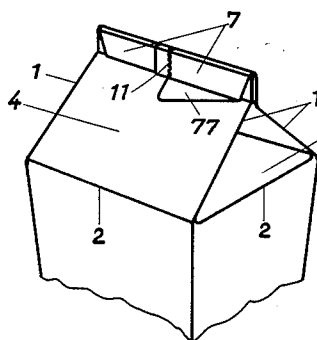
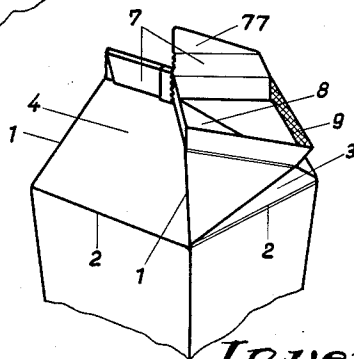


Fig. 4



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METHOD OF TREATING ADHESIVE COATED BLANKS TO NULLIFY THE ADHESIVE EFFECT IN SELECTED AREAS

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4 Claims. (Cl. 117-63)

The present invention relates broadly to the art of treating surface-coated workpieces, more particularly, those that have been coated over at least one entire surface with a thermoplastic material.

The invention specifically relates to the art of container manufacture and is directed to a method of treating surface-coated cut blanks of paper, cardboard or the like carton-forming material that is to be utilized for manufacturing cartons, containers or packages. The invention also relates to a cut container-forming blank of paper, cardboard or the like material treated in accordance with the method of the invention.

In the manufacture of cartons, containers or packages adapted to hold liquids or other material it is necessary, if paper or cardboard or similar carton-forming material is used to produce the container, to apply to the material or to the container or to the cut blank from which it is made a coating of a substance which will render the subsequently produced container leak-proof or liquid-tight. In order to avoid the subsequent treatment of each individual container or carton blank, or individually treating each finished container, it is preferred, in the production of container blanks, to utilize surface coated stock and cut the blanks from this stock. Proceeding in this fashion, blanks are obtained which are coated over one entire surface and thus the subsequent formation of the containers from these blanks provides substantial economic advantages when compared with a procedure in which the blanks are first cut and then coated or uncoated blanks are assembled into containers and the latter coated with the desired thermoplastic material. By thermoplastic material is meant a substance which not only possesses the desired impregnating properties but is also one that has adhesive properties when subjected to the influence of heat and pressure.

In processing blanks that are completely surface coated on one face, it is frequently desirable, depending on the type and shape of the carton or the container to be made, that an adhesive effect does not exist in certain areas of the blank, which during production of the container or during the closing thereof are exposed to the influence of heat and pressure. As an example, blanks utilized for producing containers having a bellows-like or roof-shaped folded closure and inwardly folded gabled portion and in which one of the gabled portions can be extended to form a pouring spout, it is necessary to offset or nullify the adhesive effect of the surface coating on the blank in the area of the upper rim of that blank panel that forms that inwardly folded gabled portion that it to be subsequently extended to provide a pouring spout.

It has previously been proposed to attach a strip of paper or of non-adhesive tape to the upper rim of one of the gabled-forming panel portions of such a closure in order to blank out the underlying portion of the surface coated blank so that the adhesive effect of the coating is not applicable in that portion covered by the strip. Obviously, this proposal involves a disproportionately high expenditure of labor and material since the strips must be cut to size and very carefully applied to the blank. From an economic standpoint, proceeding in this fashion is too costly.

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Therefore, the present invention has for an object to provide an economical method of treating blanks that have been completely surface coated on one face thereof by subjecting a limited surface area of that blank to a local treatment which nullifies the adhesive effect of that limited surface area.

More particularly, the invention provides a method of locally treating a limited surface area of a carton-forming blank, completely surface coated with a thermoplastic material by subjecting such limited surface area to radiation to effect such change in condition in the coating that the adhesive capacity of the coating in the so treated limited surface area is nullified. Depending upon the particular kind and properties of the thermoplastic coating material, the radiation treatment can be either a heat radiation treatment or a corpuscular radiation depending upon which effects the desired nullification of the adhesive capacity in the limited surface area being treated.

The invention further provides for the elimination of the adhesive capacity in a limited surface area of a thermoplastically coated carton-forming blank by subjecting such limited surface area to the influence of a liquid medium which eliminates the adhesive power of the coating in that limited area by a chemical action. As a further feature of the invention, the said limited surface area of the thermoplastically coated carton-forming blank can be treated by applying a liquid medium to such limited area of such nature that it will harden after application and thus provide a coating layer effective over such limited surface area as to cover the underlying thermoplastic coating and render the same ineffective in the treated limited surface area.

It is a specific object of the invention to provide a method of treating a thermoplastically coated carton-forming blank of paper, cardboard or the like carton-forming material which is cut and scored to define body panels and bellows-fold closure panels including two panel portions adapted to provide inwardly folded gable structures by subjecting the upper rim portion of one of said gable-forming panel portions of the blank to a local treatment along such rim portion to nullify the adhesive effect of the thermoplastic coating in such local surface area.

Further and more specific objects of the invention will be apparent from the following description taken in connection with the accompanying drawing in which:

FIGURE 1 is a plan view of a cut and scored blank of the type capable of producing a carton having a roof-shaped or bellows-like folded closure and illustrating the limited surface area subjected to the treatment of the invention,

FIGURE 2 is a fragmentary view in elevation illustrating a container erected into tubular form and prior to completion of the steps necessary to effect the folded-closure,

FIGURE 3 is a similar view but illustrating the upper portion of the container made from the blank shown in FIGURE 1 in closed and sealed condition,

FIGURE 4 is a fragmentary perspective view illustrating the container shown in FIGURE 3 with a pouring spout extended.

For the purpose of illustrating the application of the method according to the invention, a type of container known in the art is illustrated in the drawings. Such a container or carton has an upper portion that is square in cross section, tapers downwardly to a round bottom that receives an inserted disc type closure and includes a roof-shaped or bellows-like folded closure. Containers of this character are shown in United States Patent 2,344,359 to Lehmann. Another example of the closure which includes a gable top is shown in U.S. Patent 2,750,095 to Alden dated June 12, 1956, and entitled

"Dispensing Container With Extensible Pouring Spout."

The blank illustrated in FIGURE 1 has been cut, scored and grooved to define the various wall and closure forming portions. The score lines 1 define the various side panels 3, 4, 5 and the composite side panel 6, 6'. When these wall-forming portions are folded about score lines 1 and panels 6 and 6' arranged in overlapping relation and subjected to heat and pressure along the overlapped portions, a tubular body results. The lower end of the body is closed by a round disc or inserted rimmed closure piece, not shown.

In other words, the bottom closure can be circular, have a peripheral flange and be inserted into the lower end of the body with the flange secured to the interior of the body by the application of heat and pressure. The upper portions of the blank above score lines 2 are scored to define the bellows-like folded closure which includes two gable-forming portions 3', 5' which are folded inwards in a manner known in the art so that they can be covered by overlapping the extension portion 7 over the upper rim forming portion 40 above closure panel portion 4'. An extension 77 projects beyond one of the flap-forming portions 7 so as to form a tongue to facilitate opening of the carton. When the closure has been folded into the position shown in FIGURE 3, heat and pressure is applied to opposite sides of the folded closure and the carton is sealed. A weakened line 11 is provided through one of the flap-forming portions 7 so that the extension 77 can be grasped and torn upwards to facilitate opening of the container.

As shown in FIGURE 4, the container of the invention is one in which the gabled-forming portion 3' is to be extended outwards to form a pouring spout opening 8.

In order to readily permit the formation of the pouring spout, it is necessary that the coating of thermoplastic substance that is applied over the entire face of the blank be nullified in the area comprised by a strip 9 along the upper rim of gable-forming portion 3'. Thus, when the container closure is folded and subjected to heat and pressure, the portions of gable-forming portion 3 delimited by the hatch lines at 9 will not stick together because, in accordance with this invention, this limited surface area has been subjected to a treatment such that will nullify the adhesive effect of the thermoplastic coating.

As mentioned previously, the strip 9 along the upper rim of portion 3' of the blank can be subjected to radiation or can receive a liquid medium which will produce such a change in condition of the thermoplastic coating that the adhesive capacity in the area 9 is nullified. It is likewise possible to coat the area 9 with a liquid medium capable of hardening after application so as to provide a protective or covering layer over the thermoplastic coating so as to nullify the adhesive effect.

As already mentioned in the introductory description, the individual blanks are produced from a material web which has already been coated with thermo-plastic material so that after blanking out of the work pieces from the material web, these blanks are already coated over their full surface and treated in the manner previously described. The coating medium for the material web is a material possessing impregnating properties as well as adhesive properties, the latter under the influence of pressure and heat. A further requirement of the coating

material is its compatibility with the subsequent contents of the container and the absence of taste or odour of the medium. Preferably polyethylene is used for this purpose but other suitable materials, e.g. polyvinylidene chloride can be used.

In the treatment of limited areas of the blank by radiation, heat rays could for instance be used through whose intensity the adhesive properties could be destroyed and therefore eliminated. To attain the desired effect, rays having an ionising effect, as for instance gamma rays, could also be used.

In the treatment of limited areas of the blank by the application of a medium causing a chemical reaction, solvents could be used as for instance tetrahydrofuran, acetone or the like. A further possibility for destroying and thereby eliminating the adhesive property in said areas consists in the application of etching substances such as sulphuric acid or the like.

For the creation of a coating covering the thermoplastic coating in the manner of a liquid which hardens after application, silicone emulsions and/or silicone lacquers are suitable. An emulsion of a highly disperse silicic acid or of polytetrafluoro-ethylene could also be applied with the same effect.

What is claimed is:

1. A method of treating workpieces of paper, cardboard or the like material that have been completely surface-coated on one face thereof with a thermoplastic synthetic resin selected from the group consisting of polyethylene and polyvinylidene chloride capable of providing an adhesive effect under the action of heat and pressure, said method comprising subjecting a limited surface area of the coated face of said workpiece to a local treatment with a liquid penetrant selected from the group consisting of tetrahydrofuran, acetone and sulfuric acid to react with the thermoplastic synthetic resin and cause such a change in the condition of said thermoplastic synthetic resin that the sealing properties of said thermoplastic substance are completely nullified.
2. The method as claimed in claim 1 in which the adhesive capacity of said limited surface area is nullified by applying acetone to such limited surface.
3. The method as claimed in claim 1 in which the adhesive capacity of said limited surface area is nullified by applying tetrahydrofuran to such limited surface.
4. The method as claimed in claim 1 in which the adhesive capacity of said limited surface area is nullified by applying sulfuric acid to such limited surface.

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