Jan. 30, 1951 H. JENETT 2,539,514

PROTECTIVE PACKAGE FOR FRAGILE ARTICLES

Filed April 19, 1947

Fig. 1.

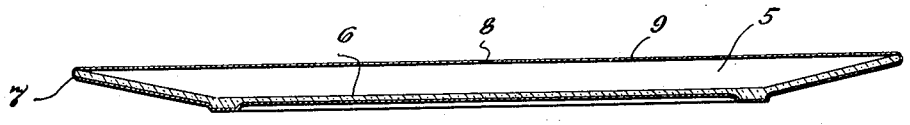


Fig. 2.

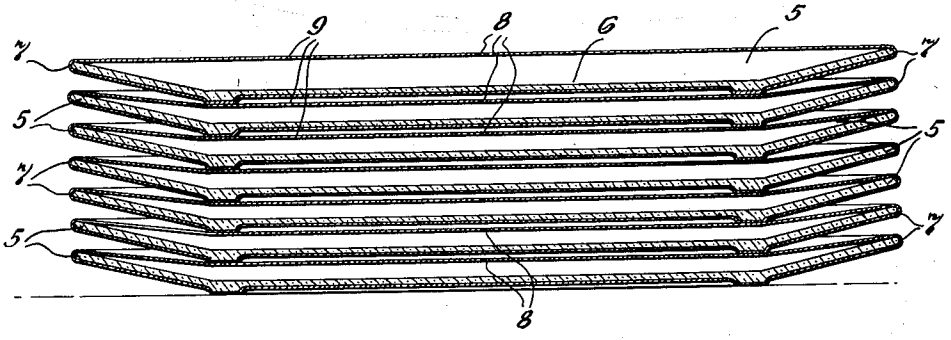
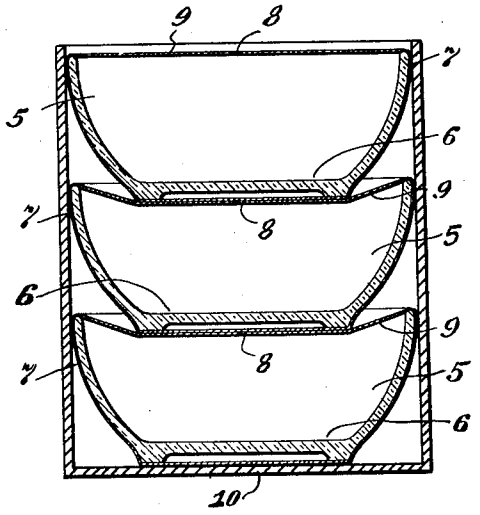


Fig. 3.



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PROTECTIVE PACKAGE FOR FRAGILE ARTICLES

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2 Claims. (Cl. 206—65)

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The present invention relates to packaging of material, and more especially to the packaging of fragile material, such as pottery, glass and dinnerware, and to the method of packing the same, which is more economical and desirable than present known methods.

At the present time it is customary to wrap pottery, glass and ceramic articles in paper and then pack such wrapped articles in excelsior or sawdust. The paper and loose packing is used essentially to prevent the dishes or glassware from rubbing against one another and chipping. This results, however, in large bulky packages of rather high cost from the standpoint of packing as well as increased shipping expense. Moreover, the paper and excelsior or sawdust, being of high inflammability has resulted in high insurance rates throughout the industry.

A further disadvantage resides in the fact that the sawdust and excelsior invariably slips through the paper wrapping necessitating unpacking and washing before the glassware or dishes, as the case may be, can be displayed or used. Not only does this handling involve labor costs but it increases the hazard of breakage and since unpacking and washing is necessary before damage can be ascertained, any chipping or breaking occurring during handling is invariably charged back to the shipping agent or manufacturer.

It is accordingly the primary object of the present invention to provide a cheap and effective package for fragile material such as glassware, dishes, pottery and the like which eliminates all the objections and hazards of prior art packages for such material.

Still further objects of the present invention will become obvious to those skilled in the art by reference to the accompanying drawing wherein:

Figure 1 is a cross-sectional view of a dinner plate provided with a protective coating in accordance with the present invention;

Figure 2 is a view showing stacking of the coated plates of Fig. 1, and

Figure 3 is a cross-sectional view of stacked deeper dishes than those shown in Fig. 1 and each provided with a protective strip-coating in accordance with the present invention.

I have discovered that a plastic film cast on to pottery, dinnerware, or the like, acts to protect it from contact with its neighbors as effectively as any present methods of packaging, while at the same time fully protecting the material against shock, which might otherwise cause chipping or breaking. Moreover, if certain types of plastic films are punctured in the semi-set stage, the plastic film dries as an elastic membrane instead of as a coating hugging the glassware or dishes, and these elastic membranes act to provide a cushioning and spacing effect which facilitates excellent stacking and packing, and at the same time completely obviates the necessity for additional filling material for the packages.

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Any of the commonly known strip-coating media may be used to produce the plastic film. These fall into three general categories, as follows:

(1) Hot melts, consisting of plastic compositions comprising varying proportions of cellulose esters or ethers, plasticizers, oils, waxes, gums or resins, colorants and other modifying agents, all of the components being substantially non-volatile in character, the masses becoming liquid upon the application of the relatively high temperature at which they are applied and solidifying on the articles upon cooling.

(2) Liquid coatings, comprising various proportions of plastic matter as above described and of volatile organic solvents, the compositions remaining liquid at room temperature and forming films or solid coatings on the articles upon the evaporation of the solvents.

(3) Reversible gels, comprising varying proportions of plastic matter and volatile solvents, the compositions being liquefiable at moderate temperature and reverting from this liquid state to a transitory gel stage upon application to the articles, then forming solid coherent films, upon evaporation of the solvents.

For purposes of the present invention I prefer to employ the reversible gel type of coating such as described and claimed in my co-pending application, Serial No. 737,431 filed March 26, 1947, now abandoned. This is because the hot melt type of coating sets so rapidly that it is difficult to form a drum-like membrane during the setting process. The liquid type of coating, as above mentioned, forms thin films which have the tendency to cling to the article and therefore do not lend themselves to the controlled formation of membranes. Consequently these latter two types of compositions are restricted to uses where the membrane formation is not desired.

A typical composition which may be used for a membranous coating is:

	Pounds
Methyl isobutyl ketone	52
Amsco "C" (petroleum hydro-carbon type of solvent)	13
Tricresyl phosphate	5
Methyl acetyl ricinoleate	4
Polymerized butyl acetyl ricinoleate	1.0
Vinyl copolymer consisting of 92% polyvinyl chloride and 8% polyvinyl acetate	25

A further example of another composition which forms a membranous coating is:

	Pounds
Polyvinyl chloride	13.5
Mixed plasticizer	6.5
Nitroethane	60
Hexane	20

The articles to be coated are dipped in the coating composition which, as above stated, is preferably of the reversible gel type and thus in a hot liquid state at the time of dipping. Upon withdrawal, the coating begins to cool, accompanied by evaporation of the solvent. When the articles are dinnerware or the like such as shown at 5 in the accompanying drawing, having concave surfaces 6, I find that by puncturing the coating 7 above the concave surface such as shown by the small vent opening 8, and while in the semi-set stage, continued evaporation of the solvent causes the coating to bridge across the periphery of the concave surface and form a drum-like membranous web 9, as hereinbefore mentioned. Also, if desired, the drum-like membranous web 9 may be just as readily formed over the concave surfaces without puncturing by rapid or "quick drying" simply through exposure of the coating film to temperatures approaching the boiling point of the solvent while the film is still moist or solvent-laden and hence in a contractible state.

At the same time the coating 7 adheres to all edges and flat surfaces, so that, upon stacking the dishes one on the other as shown in Figs. 2 and 3 the resilient drum-like membrane yields sufficiently to form a cushion, aided by the air beneath the membrane and within the concave area, thus adequately protecting one coated article from actual contact with its neighbors above and below in the stack. Moreover, the adhering coating at the edges and periphery tends to absorb shock and vibration during shipping which would otherwise cause breaking and chipping at such locations. Hence, after dipping and puncturing or "quick drying" and once the coating has set, the articles 5 may be stacked one on the other in sufficient quantity for a standard package and then appropriately boxed for shipment. Such box 10, such as shown in Fig. 3 need only be large enough to accommodate the number of articles making up the standard package and since no further packing in the way of shock-absorbing material, such as paper, sawdust, or excelsior, is required, the box or final shipping container is thus of minimum size and weight.

Upon receipt of the shipment the customer need only open the container and remove the articles for inspection and display, when they will be found to be as meticulously clean and perfect in every respect as when they left factory. The plastic coating can be left upon the articles, since it continues its protection from dirt and shock without impairing complete visual examination, until the article is sold to the ultimate consumer, who then strips the coating readily from the article.

It should accordingly be obvious from the foregoing that a package for fragile material, such as glassware, dinnerware, pottery and the like, is provided by the present invention wherein the articles are provided with a drum-like plastic membrane spanning concave surfaces and sufficiently resilient as to enable stacking of the articles one on the other. Moreover, due to the cushioning effect of the coating, the articles are protected from contact with each other, eliminating the hazards of breakage and chipping while confining the size and weight of a shipping container to a minimum, and at the same time protecting the articles from contamination from the time they leave the factory until received by the final purchaser.

Although one specific embodiment of the present invention and the method of forming has been shown and described, it is to be understood that still further modifications thereof may be made without departing from the spirit and scope of the appended claims.

I claim:

1. A package comprising a plurality of stacked articles in a container, each article having a concave surface and said articles being separated from each other by a resilient cushion formed of a membranous film of transparent strippable thermoplastic material bridging the concave surface of each article and adhering to the plane surface thereof with said membranous film being entirely free of reinforcing and supported solely by itself from the edges of the coated article.

2. A package comprising a plurality of stacked articles in a container with each article provided with a concave surface and being separated from each other by a resilient shock-absorbing cushion formed of a membranous film of transparent strippable thermoplastic material, said membranous film being provided with a small vent opening therein and bridging the concave surface of each article and adhering to the plane surface thereof to prevent contact between the stacked articles and possible cracking or breaking thereof, and said membranous film being entirely free of reinforcing and supported solely by itself from the edges of the coated article.

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