

Jan. 11, 1966

P. E. GRINDROD ET AL
METHOD OF FORMING PACKAGES

3,228,168

Original Filed Dec. 28, 1960

3 Sheets-Sheet 1

Fig. 1

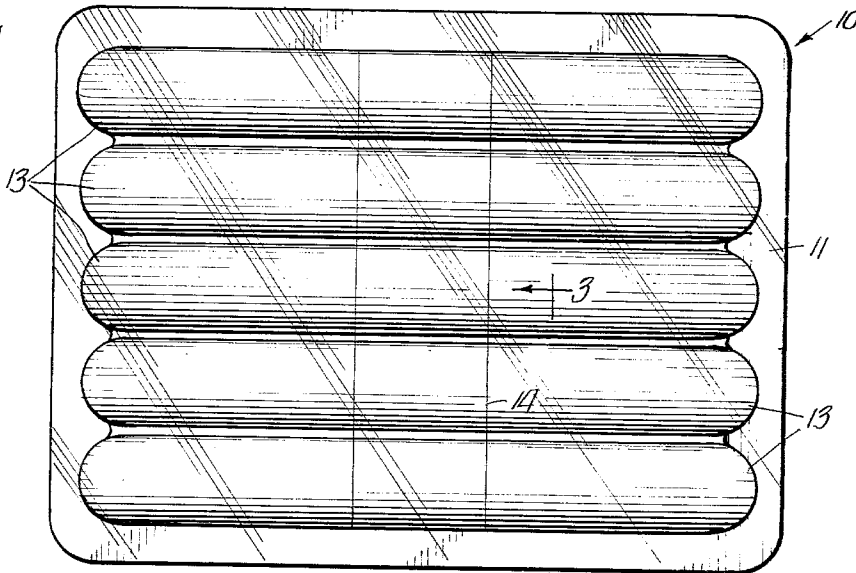


Fig. 2



Fig. 3

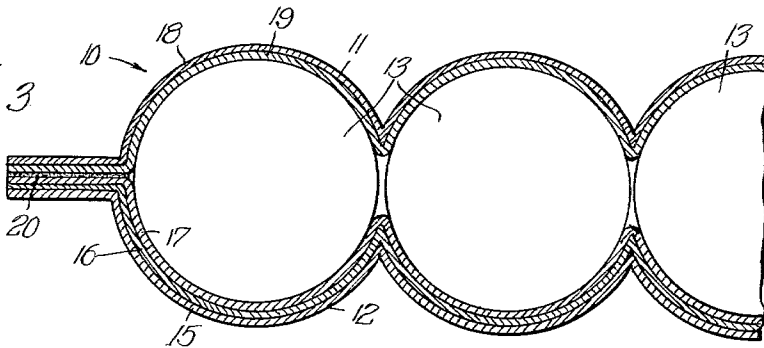
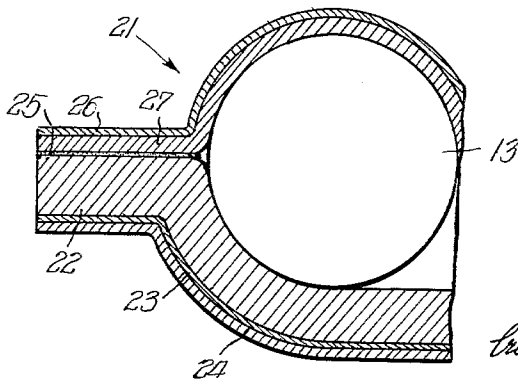


Fig. 4



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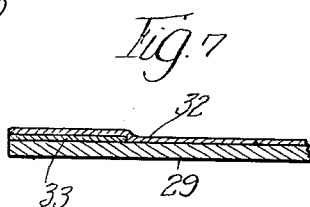
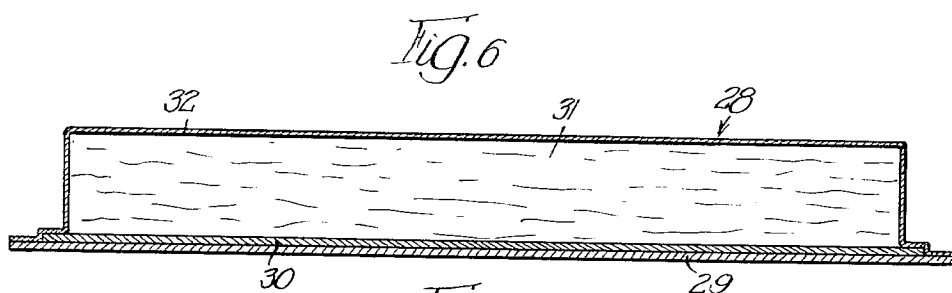
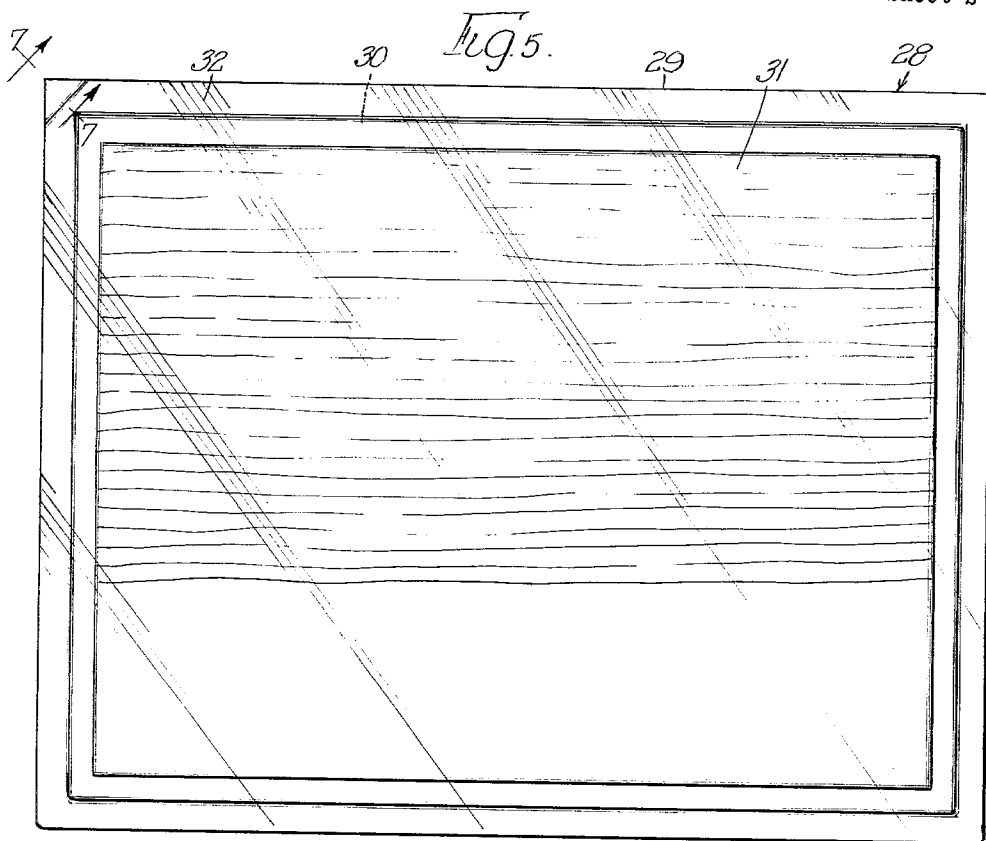
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Fig. 8.

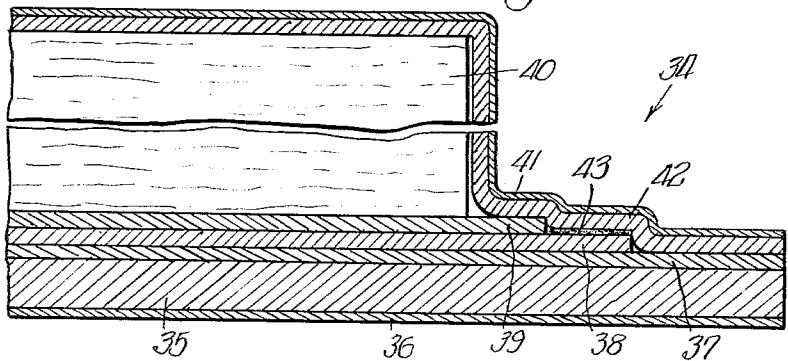


Fig. 9

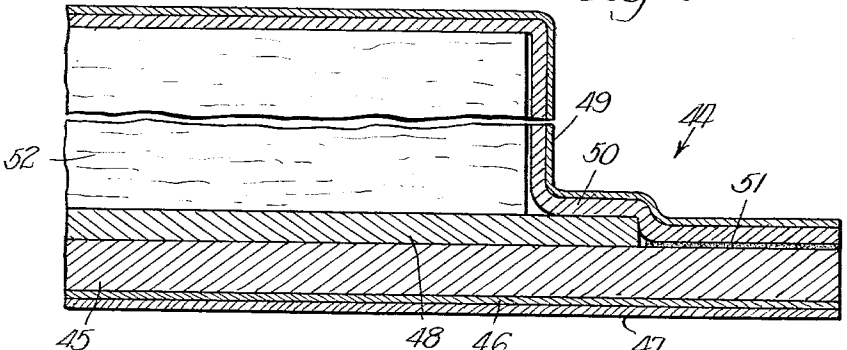


Fig. 10

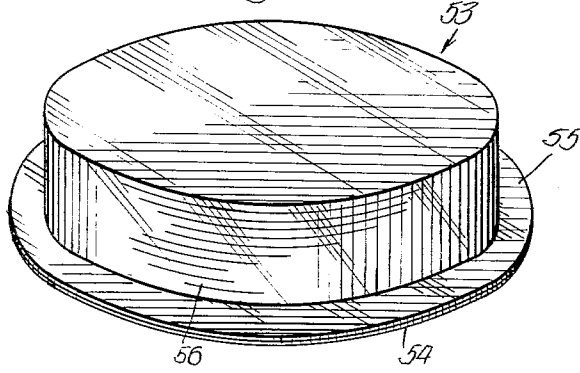
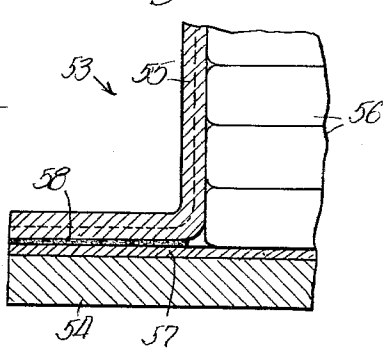


Fig. 11.



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3,228,168

METHOD OF FORMING PACKAGES

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Continuation of application Ser. No. 79,070, Dec. 28,
1960. This application Sept. 27, 1963, Ser. No. 312,147
4 Claims. (Cl. 53—32)

This is a continuation of our copending application
Serial No. 79,070 filed December 28, 1960, now aban-
doned.

The present invention relates to a method of forming
new and improved packages which are particularly adapt-
ed for use in the storing and merchandising of products
which are subject to spoilage or other types of undesirable
deterioration. More specifically, the present invention is
directed to the packaging of meat products.

It is an object of the invention to provide a new and
improved method of forming packages, the packages being
particularly adapted for use with food products and the
like subject to spoilage and deterioration, although it will
be understood that the various packages disclosed are
readily adapted for use with other types of products where
the presence of their unusual characteristics are considered
desirable.

Another object is to provide a new and improved meth-
od of forming packages capable of establishing and main-
taining hermetic sealing conditions.

Still another object is to provide a new and improved
method of forming packages capable of being readily
opened for access to the product enclosed thereby, and
further being reclosable to an extent that the product may
be continuously protected by the package.

A further object is to provide a new and improved
method of forming packages which make use of at least
a semi-rigid base on or in which a product is received,
the product being completely covered and sealed by an
enclosing film which is peripherally sealed to the base.

Still another object is to form new and improved pack-
ages from specially selected materials, especially film
materials capable of exhibiting the formability and sealing
characteristics of polyvinylidene chloride film, the inven-
tion encompassing in its scope the use of supercooled poly-
vinylidene chloride film or any other film capable of
exhibiting the essential characteristics and properties of
this film.

An important object of the present invention taken in
conjunction with the foregoing objects is to provide pack-
ages which utilize a unique seal forming arrangement,
this arrangement involving the utilization of an adhesive
interface which functions to seal together or adhere film
and substrate material portions of the package. This
important object also involves the utilization of the unique
properties of supercooled polyvinylidene chloride film or
an equivalent.

Other objects not specifically set forth will become
apparent from the following detailed description of the
invention made in conjunction with the accompanying
drawings wherein:

FIG. 1 is a plan view of one form of wiener-type prod-
uct package made in accordance with the principles of the
present invention;

FIG. 2 is an elevation of the package of FIG. 1;

FIG. 3 is an enlarged fragmentary section of the pack-
age of FIG. 1 taken along line 3—3 therein and illustrat-
ing the particular combination of films and materials used
in forming the same, it being understood that this view,
as in the case of a number of subsequent views to be
described, is basically schematic for the purpose of best
describing the inventive concepts;

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FIG. 4 is a view similar to FIG. 3 illustrating a modi-
fication of the package of FIG. 1;

FIG. 5 is a schematic plan view of a special form of
bacon-type package which makes use of the principles of
the present invention;

FIG. 6 is a cross section of the package of FIG. 5;

FIG. 7 is an enlarged fragmentary section of a portion
of the package of FIG. 5 taken generally along line 7—7
therein;

FIG. 8 is an enlarged fragmentary section of a modified
form of package related to the type of package shown in
FIG. 5;

FIG. 9 is a view similar to FIG. 8 illustrating still
another modification of the package of FIG. 5;

FIG. 10 is a perspective of another basic package struc-
ture which incorporates the principles of the present in-
vention; and

FIG. 11 is a substantially enlarged fragmentary section
of a portion of the seal area of the package of FIG. 10.

A basic concept of the present invention involves the
utilization of the unique properties of polyvinylidene chlo-
ride film or its equivalent in its supercooled or essentially
amorphous state. Polyvinylidene chloride, normally in
the copolymer form of vinylidene chloride and vinyl chlo-
ride, can readily be extruded into film or sheet form of
varying thickness. As the hot film is formed at the ex-
truder, the film is in a molten, amorphous state and will
solidify upon cooling, becoming crystalline after the ex-
piration of a relatively short period of time. To this
extent polyvinylidene chloride film is quite similar to a
number of known films but it has been found that poly-
vinylidene chloride film exhibits the unusual character-
istics of being susceptible to retention of the amorphous
state if the film is subjected to adequate supercooling fol-
lowing formation. The hot amorphous film is imme-
diately passed through a supercooling bath of water or
the like in which the temperature of the film is quickly
reduced to a much lower and cooler temperature. The
temperature of the supercooling bath may vary consider-
ably depending upon film requirements and it has been
found that, by way of example only, room temperature
or below is quite adequate to make full utilization of the
unique properties of the film. With immediate tempera-
ture quenching of the film to pass the same into a super-
cooled state, the film remains amorphous and exhibits sub-
stantial formability while in this state. Any very sub-
stantial stretching of the film may materially induce crys-
tallization and complete stretching of the supercooled film
to form tube-like packages and the like has been practiced.
However, with substantial stretching or forming of the
film, it has been found that the crystalline structure estab-
lished by the working becomes oriented.

By avoiding excessive stretching or forming of the
supercooled film while maintaining the same in its super-
cooled state, it has been found that the film is readily self-
adhering even to the extent that a fused-type seal can be
obtained when portions of film are contacted. This
phenomena has been used to advantage in the forming
of various types of packages. A procedure followed in-
volves the insertion of a product between two super-
cooled films, the combining of the films brought about by
evacuation of the product area between the same, and sub-
sequent crystallization of the combined films to remove
the unique adherence properties thereof and permit ready
handling of the finished package. This procedure results
in an economical and efficient package forming operation.
The supercooled film is readily formable and can be
drawn about a product to conform to the shape thereof
without the formation of folds or pleats which would
normally establish potential leakage areas. Controlled
stretching or forming of the film while in the supercooled
state can be practiced without accompanying crystalliza-

tion of the film to an extent that the supercooled properties thereof are retained in order to make full utilization of the self-sealing characteristics of the film.

In accordance with an important concept of the present invention, it has been found that supercooled polyvinylidene chloride film can be combined with other packaging films through a pressure-sensitive adhesive interface to form a unique hermetic seal. The seal is of a type which can be readily broken by peeling back or otherwise separating one or more of the films sealed together through the interface. The breaking of the seal is very readily obtained without destruction of the packaging film and this film in the area of seal breakage can be recombined for resealing of the package following removal of a portion of the product therefrom. Basically, the seal comprises and is formed from at least two layers of packaging material adhered to one another through an adhesive interface, one of the film layers being polyvinylidene chloride film or an equivalent thereof which is adhered to the other layer of packaging material through the interface while in an amorphous or supercooled state, the polyvinylidene chloride film in the finished condition of the package exhibiting at least substantially random crystal arrangement.

While the use of an adhesive in adhering materials is well known, adhesive seals have not been widely used in the forming of hermetic packages such as required with food products and the like. Known packaging film materials, to the exclusion of supercooled polyvinylidene chloride film, are not adequately formable for use in the forming of a hermetically sealed package wherein the seal is defined by an adhesive interface. As is widely practiced, standard packaging films are combined by heat sealing during which operation the contacting film portions are heated to the point of fusion and the film portions lose their identity and become integrally bonded together. The packaging film itself must be broken or ruptured in order to gain access into the package and considerable care must be exercised in order to obtain complete fusing of the contacting film portions in the areas of film folds or pleats. In certain instances, mechanical elements such as film locking rings and the like have actually been used to guard against leakage in fused film areas, particularly areas having folded or pleated portions.

Supercooled polyvinylidene chloride film is uniquely formable in its supercooled state to an extent that a film layer can be readily drawn down over a product into intimate contour-conforming relation therewith without the formation of any folded, pleated or overlapping film areas. Thus it has been found that upon contacting portions of separate films of supercooled polyvinylidene chloride, an immediate fused seal is obtained in the absence of heat and in the absence of any substantial applied pressure. The seal area is completely smooth (no pleats or folds present) and is completely uniform throughout in establishing and maintaining a highly effective hermetic seal. In line with the discovery of the present invention, it has been found that supercooled polyvinylidene chloride film exhibits unusual results and unexpected functions when applied to a pressure-sensitive adhesive interface in forming a hermetic seal. The unusual formability of the supercooled film apparently results in the film actually "wetting" the adhesive surface to an extent that a greatly improved seal is obtained when comparison of this seal is made with known types of packaging material adhesive seals. Deformation of the supercooled film is so complete and formability is so unusual that film tension in the seal area does not exist to an extent that any subsequent warping of the package will occur. Wrinkling of the supercooled film or the formation of folds or pleats is completely eliminated and the seal formed is capable of withstanding normal package handling without the development of leakage areas.

Following package forming, the polyvinylidene chlo-

ride film is permitted to transform to its crystalline state and it has been found that the film does not exhibit any undesirable properties of "memory" or the like. Thus during the package forming operation, the polyvinylidene chloride film while in its supercooled state is permanently "deformed" and the adhesive seal formed therewith may be readily broken and reestablished at will without film destruction in any respect and without any detrimental package shape variation.

The accompanying drawings illustrate a number of different types of packages which can be advantageously formed by practicing the principles of the present invention. The packages illustrated are basically food packages which have been selected as best illustrating the advantages of the invention in view of the unusual ability of the supercooled polyvinylidene chloride film to form with an adhesive interface a highly efficient hermetic seal. However, it will be understood that the principles of the present invention may be readily used with many different types of packages enclosing a variety of products not falling within the general classification of food products.

FIGS. 1-3 illustrate a weiner-type package 10 which is formed from the combining of laminated films. For description purposes package 10 includes a top laminate 11 and a bottom laminate 12 which cooperatively enclose therebetween a plurality of weiners or weiner-type products 13, these products being placed in side-by-side relation. The laminates 11 and 12 are combined peripherally about the products 13 to form a continuous edge seal. The laminates are also drawn inwardly about the products to conform to the contour thereof. FIG. 1 illustrates the use of a weiner band 14 which is commonly used in grouping a plurality of weiners, but this band need not be incorporated in the package if desired. By reason of the laminates 11 and 12 intimately engaging and surrounding the products 13 and conforming to the shape thereof, the package 10 is adequately rigid for efficient handling.

Referring specifically to FIG. 3, the bottom laminate 12 is formed from combined films 15 of polyvinylidene chloride, 16 of polyvinyl chloride, and 17 of polyvinylidene chloride. The top laminate 11 is formed from an oxygen barrier polyvinylidene chloride film 18 combined with a flexible layer of polyvinylidene chloride 19. A suitable oxygen barrier polyvinylidene chloride film may have a composition of approximately 85% vinylidene chloride and 15% vinyl chloride. A suitable flexible film of polyvinylidene chloride may be prepared from a copolymer of 68% vinylidene chloride and 32% vinyl chloride.

The laminates 11 and 12 are formed while the polyvinylidene chloride films thereof are in their supercooled state and this state is maintained while an adhesive coating 20 is applied to the peripheral top surface portion of the bottom laminate 12. Any suitable pressure-sensitive adhesive may be used, the manner of application of such adhesives as a coating being well known. Basically, the adhesive is applied in solution form with the appropriate solvent or solvents used evaporating from the coating prior to seal forming use thereof. Adhesive application and solvent removal may be attended to in a relatively short time it being borne in mind that polyvinylidene chloride film may be maintained in its supercooled condition indefinitely merely by proper low temperature maintenance.

Following application of the adhesive coating 20 to the bottom laminate 12, the products 13 are placed between the top and bottom laminates and suitable means are used to seal off the product area and evacuate this area between the laminates 11 and 12. During evacuation the laminates are drawn into intimate contour-conforming relation with the products 13 and the peripheral edge seal is automatically formed. In this respect the supercooled films of polyvinylidene chloride exhibit unique formability to obtain the shape of a final package

as illustrated and the supercooled film 19 of the top laminate 11 is brought into contact with the adhesive interface 20 to form therewith and with the bottom laminate 12 in a hermetic seal.

In forming the package 10 there is adequate adherence between the various films which are combined to form the top and bottom laminates. The combined films of these laminates each contribute certain characteristics which provide for an overall package of adequate flexibility, toughness and oxygen impermeability. By way of example, the polyvinylidene chloride film layer 15 may be an oxygen barrier material whereas the film layer 17 may be of a composition which provides desirable flexibility. The flexibility aids in the forming of the package and further prevents subsequent package breakage as a result of handling. The seal formed through interface 20 can be readily separated by peeling back the top or bottom laminate to thus gain access into the package. Separation of the laminates does not result in the loss of adequate sealing properties to prevent effective resealing of the package. Resealing characteristics are quite important in that any oxygen bearing material which enters the package during temporary opening thereof is not trapped in any large quantity in the package following resealing, the quantity trapped being insufficient to materially effect the product. Furthermore, no continuous supply of fresh oxygen bearing air is available to the product within the package through any permanently broken seal area. Any suitable means, such as a tab of the type to be described, may be used in the seal area to permit ready separation of the top and bottom laminates for access into the package.

The films used in forming the laminates 11 and 12 of the package 10 may be varied considerably. By way of example, polyethylene film may be substituted for the polyvinyl chloride film layer 16. Soluble polyvinylidene chloride may be used as a substitute for the outer films 15 and 18. This material is in the form of a lacquer with the copolymers of vinyl and vinylidene chloride being dissolved in selected solvents such as tetrahydrofuran, cyclohexanone, cyclopentanone, 1,4-dioxane, isophrone and o-dichlorobenzene. By substituting an acrylonitrile monomer for the vinyl chloride monomer in polymerization with vinylidene chloride, a copolymer is produced which is soluble in common lacquer solvents such as acetone, methyl ethyl ketone and toluene. The soluble materials may be applied as coatings to any other materials such as polyethylene, polyvinyl chloride, paper and cellophane in very thin coatings such as between $\frac{1}{10}$ to $\frac{1}{20}$ of a mil thick. Such a coating improves the oxygen barrier properties of the materials rather substantially. For example, polyethylene film which is normally rather porous to oxygen will exhibit a markedly improved oxygen impermeability when coated with soluble polyvinylidene chloride or suitable polymeric materials of the type described. The soluble materials are applied in solution and the solvent is evaporated leaving a dry flexible film.

FIG. 4 illustrates a similar type package 21 including a rigid or at least substantially rigid base member 22. By way of example, the base member 22 may be formed from 10 mil thick polyvinyl chloride sheeting. This type of vinyl sheeting is known and is generally referred to as calendered food-approved sheeting. The bottom of the base member 22 has applied thereto an oxygen barrier film 23. This film is adhered to the base 22 by an adhesive or glue coating 24. The flange seal surface of the base 22 has applied thereto a thin coating of pressure-sensitive adhesive 25 which adheres thereto a top laminate polyvinylidene chloride films 26 and 27. The top film laminate may consist of combined layers of oxygen barrier supercooled polyvinylidene chloride 26 and flexible supercooled polyvinylidene chloride 27. The layer 26 may have a thickness of about 1 mil whereas the layer 27 may have a thickness of from 2 to 3 mils.

In considering the packages described above, and fur-

ther in conjunction with the packages to be described, it will be understood that the adhesive interface will preferably be very thin although the adhesive layers illustrated are greatly enlarged out of proportion merely to establish their location in a diagrammatic or schematic manner. Preferably, the adhesive coating will be only a few molecules thick. Such a thin coating is possible only due to the unique properties of supercooled polyvinylidene chloride film. As illustrative of the unusual characteristics of supercooled polyvinylidene chloride film, it has been found that where a package of the type described is formed by being confined in a package forming die and the area about the product between the base material and covering film is evacuated in the die, a negative pressure of as little as or even less than 15 p.s.i. may be used in forming an efficient seal. This fact illustrates the complete formability and unusual cooperative action of supercooled polyvinylidene chloride film with a pressure-sensitive adhesive in forming a hermetic seal.

FIGS. 5 and 6 illustrate a package prepared in accordance with the principles of the present invention and particularly adapted for use with a bacon product. The package 28 comprises a baseboard or member 29 which has mounted centrally thereon a product board or member 30 having in turn the bacon product 31 mounted thereon. The bacon product is in the form of a plurality of stacked bacon slices which extend along the product board 30 in an inclined position. The package is completed by a top film 32 which completely covers the product 31, extends downwardly along the edges thereof in intimate contact, extends over the product board 30 and into sealed engagement with the exposed peripheral top surface of the baseboard 29. Referring to FIGS. 5 and 7, a corner portion of the baseboard 29 carries a triangular insert 33 placed on the top thereof and formed from material which is not adherent to the covering film 32. A corner of the film extends over the insert 33 and is not adhered thereto. In this manner, a corner of the film may be readily lifted and grasped for subsequent peeling of the film from the surface of the baseboard 29 to which it is adhered for access into the package. A suitable pressure-sensitive adhesive coating (not shown) is applied to the exposed peripheral top surface of the baseboard 29 and provides the interface by means of which the top film 32 is sealed to the baseboard.

The baseboard 29 of the package 28 may be formed from any suitable relatively rigid material such as bleached kraft paperboard having a thickness of from 0.01 to 0.020 of an inch. The bottom surface of the baseboard 29 may be provided with a coating of microcrystalline paraffin wax for protection and at least partial sealing of the baseboard. The top surface of the baseboard 29 may have applied thereto a continuous suitable oxygen barrier material such as aluminum foil. In this manner the baseboard is sealed against oxygen leakage therethrough into the package. The oxygen barrier material in the form of aluminum foil or the like is secured by adhesive or glue to the baseboard and the pressure-sensitive adhesive interface coating is applied to the outer top surface of the oxygen barrier material for sealing co-action with the packaging film 32 which is formed from supercooled polyvinylidene chloride. The product board 30 is received on top of the oxygen barrier material forming a part of the baseboard 29. The product board may be formed from waxed paperboard having a thickness of from about 0.0015 to 0.007 of an inch. The covering film 32 may be in the form of a laminate including oxygen barrier supercooled polyvinylidene chloride film fused with flexible supercooled polyvinylidene chloride film of the type previously described. The formability of the packaging film 32 permits ready conformation thereof to the peripheral edge portion of the product board 30 and the peripheral edge portion of the baseboard 29 when the film is drawn down over the product 31 during the package forming operation.

FIG. 8 illustrates a modified package 34 the construction of which includes a baseboard member 35 formed from 0.012 to 0.020 of an inch thick bleached kraft paperboard. The bottom surface of paperboard 35 has applied thereto a suitable wax coating 36. The top surface of the board 35 has applied thereto a clay coating 37 of known type. The board structure described is commercially available, this coating 37 constituting a resinous clay coating to which supercooled polyvinylidene chloride film will adhere although not necessarily form a hermetic seal.

Supported on the top surface of the baseboard is a layer of oxygen barrier material 38 which need not be fixed to the clay coating 37 of the baseboard. This barrier may be formed from oriented polyvinylidene chloride film, such as having a thickness of 50 gauge, or paper mounted aluminum foil lacquered on the aluminum side with polyvinyl chloride at a rate of approximately 1 pound per 1000 square feet. Where aluminum foil is used, the thickness may be approximately 0.00035 of an inch.

A product board 39 is placed on top of the barrier board or layer 38 and receives the bacon product 40 thereon. The product board 39 may be waxed paperboard having a thickness ranging from about 0.0015 to 0.007 of an inch.

The top film drawn down over the product constitutes a laminate of supercooled polyvinylidene chloride films having an outer oxygen barrier film 41 and an inner flexible film 42. A pressure-sensitive adhesive coating 43 is applied to the top peripheral surface of the barrier board 38 and the film laminate is adhered through the adhesive interface to the base structure of the package to form the peelable hermetic seal. The baseboard structure may be adhered to the barrier board 38 if desired or the adherence between the supercooled polyvinylidene chloride film and the clay coating of the baseboard may be relied upon in holding the baseboard to the package structure.

The package 44 of FIG. 9 is constructed much along the same lines as the package 28 previously described. This package is formed from a baseboard 45 of bleached kraft paperboard having a thickness of about 0.015 of an inch. The bottom surface of this board is provided with an inner coating 46 of adhesive or glue which adheres to the board a layer 47 of aluminum foil. The layer 47 may also be formed from oriented polyvinylidene chloride film.

It will be noted that the top surface of the board 45 is not covered with an oxygen barrier material. While any suitable oxygen barrier material may be applied to the top surface of this board, the inside of the package may also be protected from oxygen permeation through the board 45 by impregnating at least the outer edge portion of the board 45 with a plastic material such as polyethylene, vinyl lacquer or other suitable material. The impregnation is carried out to an extent that the board in this area is impermeable to oxygen thus preventing air from diffusing through the edge of the board and discoloring the bacon.

The board 45 carries on the top thereof a product board 48 of waxed paperboard or the like of the type previously described. The top film is a laminate of supercooled polyvinylidene chloride having an outer oxygen barrier film layer 49 and an inner flexible film layer 50. The hermetic seal is obtained through a pressure-sensitive adhesive coating 51 applied to the top surface edge portion of the board 45. Here again, a suitable product 52 such as bacon or the like is enclosed in the package.

FIGS. 10 and 11 deal with another type of package which is well known under the name "Slice-Pak." The basic type of package under consideration is disclosed in U.S. Patent No. 2,200,200 with the exception that the package of the present invention makes advantageous use of the seal forming properties of supercooled polyvinylidene chloride film in combination with an adhesive to

eliminate the use of a rim-like clamping member to seal the package. The package 53 is formed from a baseboard 54 of relatively rigid material which has sealed thereto a film 55 which includes supercooled polyvinylidene chloride film. A suitable product 56 such as stacked slices of bologna is mounted centrally on the baseboard 54 and is fully covered and sealed by the film 55.

FIG. 11 illustrates the package 53 in detail. The baseboard may be formed from metal or from bleached kraft paperboard of the type previously described. A layer of aluminum foil 57 or any other suitable oxygen barrier material is suitably fixed to the top surface of the baseboard 54. In the event that the baseboard 54 is adequately oxygen impermeable, such as with the use of metal or the like, the barrier layer 57 may be eliminated. Examples of other oxygen barrier materials are oriented polyvinylidene chloride, supercooled polyvinylidene chloride, polyvinylidene lacquers or polyvinyl chloride lacquer. A coating of pressure-sensitive adhesive 58 is carried on the outer peripheral top surface of the barrier material 57 and the top film 55 including supercooled polyvinylidene chloride as at least the inner surface layer thereof is drawn down over the product and into hermetically sealed engagement with the base of the package through the adhesive interface. As identified by the broken lines in the film 55 in FIG. 11, this film may be formed from a suitable laminate of any type previously described.

While several different types of packages have been described above, the principles of the present invention are equally applicable to other forms of packages as previously mentioned. By way of example, the known form of cup or dish-shaped rigid or semi-rigid package provided with a continuous radial flange at the top edge thereof and into which a product is placed can also be sealed with an overlying film of supercooled polyvinylidene chloride by use of a pressure-sensitive adhesive interface applied to the top surface of the rim or the flange. Any suitable pressure-sensitive adhesive may be used in carrying out the principles of the present invention. Examples of such adhesives are plasticized polyisobutylene; colloidal solutions of polyvinyl ether, glycerin ester of hydrogenated rosin and 2,5-di-tert-amylhydroquinone in a petroleum naphtha base; polyethylene-vinyl acetate copolymers; and ethyl cellulose plasticized with plasticizers such as diphenyl-2-ethylhexyl phosphate, dibutyl sebacate, diisobutyl adipate or acetyl tributyl citrate. In packages where the adhesive is so located as to possibly come into contact with food products enclosed by the package, the adhesive used must be non-toxic and preferably fat insoluble. Such an adhesive is available under the trade designation of "Pyroxylin 18-274-18" which is composed of polyamides, polyester plasticizers and polymerized castor oils. An adhesive of this type may be diluted for application with a mixture of aromatic solvent and aliphatic alcohol.

Obviously certain modifications and variations of the invention as hereinbefore set forth may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

We claim:

1. The method of forming a hermetic package comprising applying a continuous coating of a pressure-sensitive adhesive to a package substrate material peripherally of a product receiving area of said substrate material, placing a product on said product receiving area, enclosing said product with amorphous supercooled polyvinylidene chloride film in overlying relation with said substrate material, and contacting said film continuously with said adhesive about said product while said film is still in its amorphous supercooled state.

2. The method of claim 1 wherein the portion of said film contacting said adhesive is smoothly applied without attendant wrinkling or folding.

3. The method of claim 1 wherein said film is stretched about said product in intimate contact with portions of

said product exposed from said substrate material, the stretching of said film being accompanied by uniform contacting of the portion thereof with said adhesive without wrinkling or folding.

4. The method of claim 1 wherein said adhesive is 5 applied as a thin coating of only about a few molecules in thickness.

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FRANK E. BAILEY, *Primary Examiner.*