

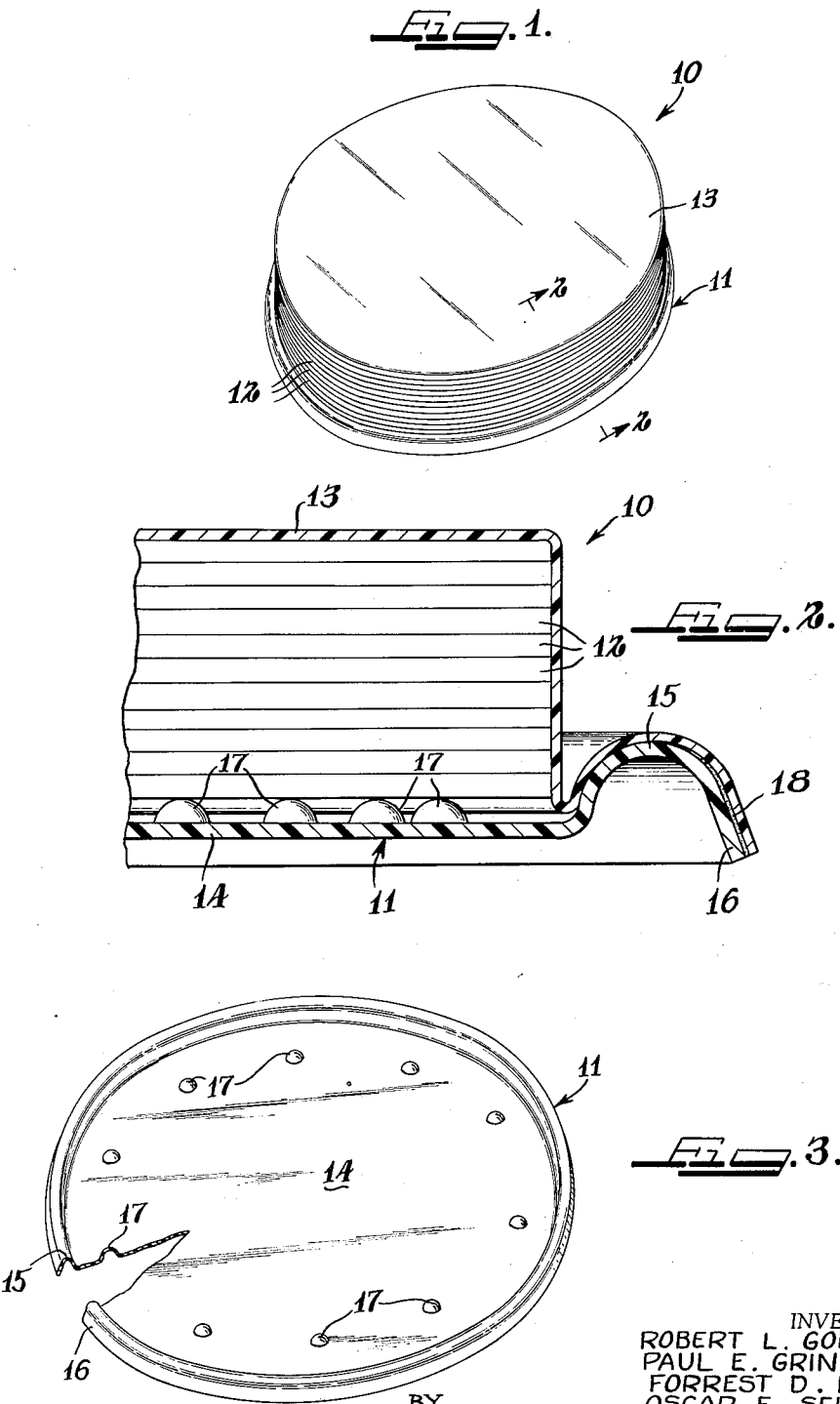
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R. L. GOLLER ET AL
PACKAGES

3,229,810

Filed July 29, 1963

2 Sheets-Sheet 1



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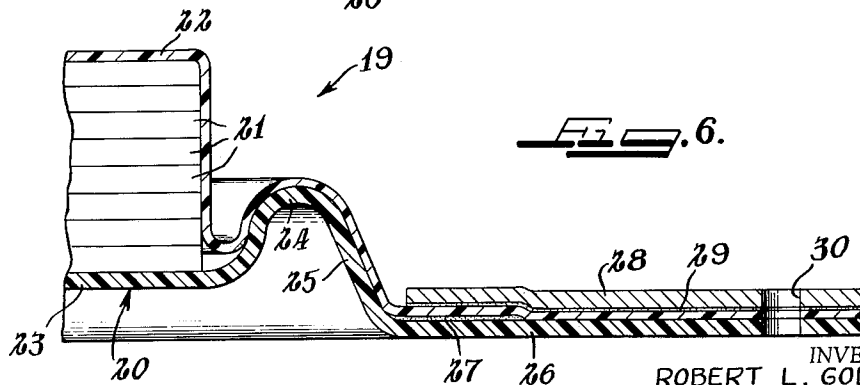
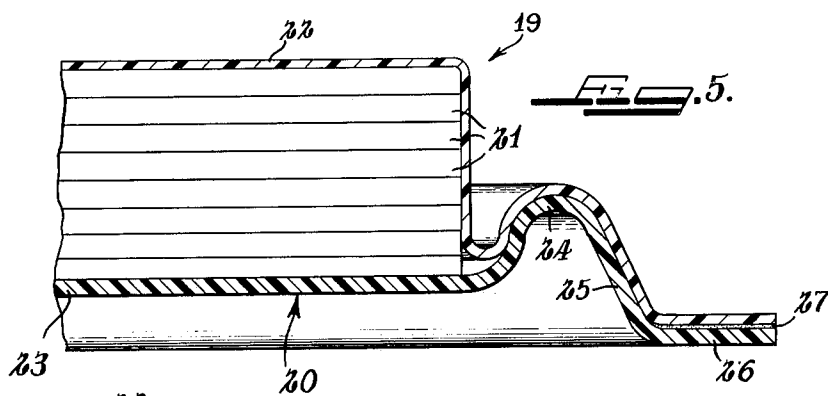
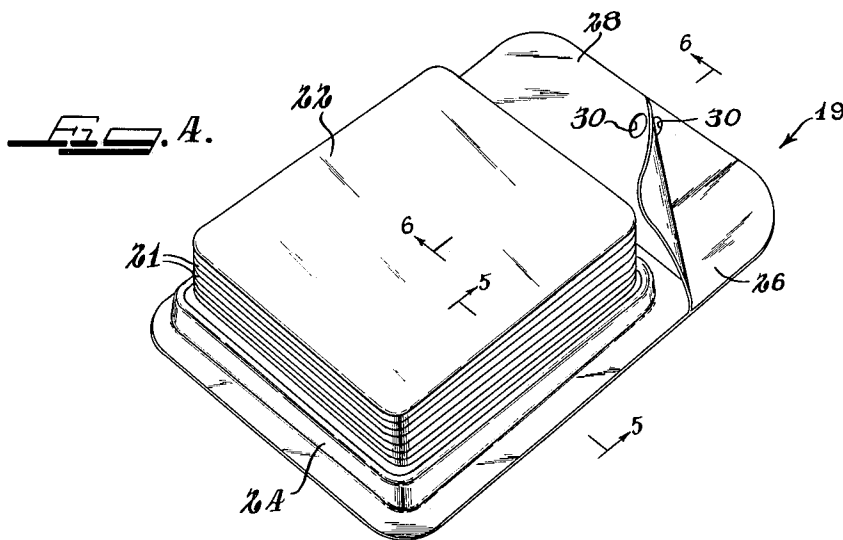
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PACKAGES

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1

2

3,229,810 PACKAGES

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10 Claims. (Cl. 206—45.34)

The invention relates to new and improved forms of
packages and specially configured components thereof.
More specifically, the invention is directed to new and
improved forms of packages which basically include a
special base member constituting a part of the invention
and on which a product is supported and to which a prod-
uct covering film is sealed in a new and improved manner.

Substantial advances have been made in improving
product containing packages due largely to the use of the
unique properties of polyvinylidene chloride film in its
supercooled amorphous state. Such film upon extrusion
and while still in the amorphous condition can be sus-
pended in such condition as a result of immediate super-
cooling which basically consists of reducing the tempera-
ture of the film to about room temperature or somewhat
above. The film in the supercooled state is essentially
non-crystalline and exhibits ready formability, including
stretchability, and unique sealing properties not only
with itself but also with diverse materials under appro-
priate conditions. This type of film permits ready con-
formance to the shape of a product being packaged thus
eliminating the problems attendant to establishing and
maintaining a seal in creased and film fold areas. In this
respect supercooled polyvinylidene chloride film is suffi-
ciently formable to permit automatic establishment of a
completely flat or smooth, non-folded and non-creased
seal area in adherence with itself or diverse materials such
as a base material including an interface of a suitable
plasticizer or adhesive.

A package including a base member supporting a prod-
uct, such as a food product including stacked slices of
bologna or the like, covered by a film in intimate contact
with the product and sealed to the base member is a desir-
able type of package particularly from the standpoint of
compactness and ready product observance through the
packaging film. Supercooled polyvinylidene chloride
film is particularly adapted for use in forming such a
package in view of its ready formability and its complete
and tight conformance with the exposed surfaces of the
product as well as its inherent strength and product keep-
ing properties. However, a basic problem which must be
overcome in connection with this type of package resides
in the forming of a seal area which cannot be readily
broken or destroyed as a result of handling during package
shipment and merchandising. Numerous attempts have
been made to provide a virtually indestructible seal area
and such attempts have largely included the provision of
mechanical means constituting a part of the base member
and made available to physically clamp the film against
the base member in the area of sealing contact. Such
packages are somewhat expensive and often difficult to
fabricate in connection with continuous and automatic
manufacturing procedures.

It is an object of the present invention to provide new
and improved forms of packages and components thereof
of the type described which include a unique package seal
area configuration and arrangement permitting ready
package forming and sealing operation while minimizing
seal destruction during handling.

Another object is to provide new and improved packages
consisting essentially of a uniquely formed relatively rigid
base member supporting thereon a product and having

adhered thereto a film which covers the product, the seal
established between the base member and film being of a
new and improved nature.

Still a further object is to provide a new and improved
form of base member for use in a package of the type
described, which base member is formed from initially
relatively flexible material provided with a configuration
rigidifying the material and establishing an uncomplicated
sealing portion capable of establishing an efficient, un-
complicated and strong seal with a packaging film.

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

FIG. 1 is a perspective of one form of package of the
invention;

FIG. 2 is an enlarged fragmentary section of the pack-
age of FIG. 1 illustrating an edge portion thereof as viewed
along line 2—2 in FIG. 1;

FIG. 3 is a perspective of the base member of the pack-
age of FIG. 1 illustrating the same with a portion thereof
removed;

FIG. 4 is a perspective of another form of package
constituting a part of the invention;

FIG. 5 is an enlarged fragmentary section of an edge
portion of the package of FIG. 4 as viewed along line
5—5 therein; and

FIG. 6 is an enlarged fragmentary section of another
portion of the package of FIG. 4 is viewed along line
6—6 therein.

The basic package design of the present invention in-
volves a unique combination of packaging film and base
member including a seal configuration and arrangement
wherein the film coextensively overlies and adheres with
a flange portion of the base member which is inclined
relative to the vertical axis of the package thus requiring
a substantial stretching of the film before the same can
be separated from the base member to thereby destroy
the effectiveness of the seal. In obtaining this special
seal configuration and arrangement, additional advan-
tages are realized as a result of the provision of a spe-
cially configured rigidifying portion on the base mem-
ber instrumental in establishing this special seal and fur-
ther permitting ready fabrication of the base member
from readily flexible material. While the invention will
be described in its preferred embodiment both with re-
spect to the utilization of supercooled polyvinylidene chlo-
ride film and the forming of meat product or other types
of food product packages, it will be understood that the
film material as well as the base material and the prod-
uct confined thereby may be of any suitable types capa-
ble of carrying out the basic purposes and realizing the
basic advantages of the invention.

FIGS. 1 and 2 illustrate a circular disc type package
10 including a base member 11 constituting a part of the
invention, a product consisting of stacked meat slices 12
such as bologna or the like, and a transparent flexible
film 13 which encloses the product and is sealed peri-
pherally to the base member. As best shown in FIGS.
2 and 3, the base member 11 includes a flat central por-
tion 14 on which the product 12 is received. A circum-
ferentially continuous, upwardly projecting rim 15 is
formed integrally with the central portion 14 and sur-
rounds the product 12 in outwardly projecting relation
thereto. The rim 15 constitutes a rigidifying portion for
the base member 11 and in an upwardly direction pre-
sents a convex top surface. The rim 15 terminates out-
wardly of the base member in an outwardly and down-
wardly inclined, basically frusto-conical flange portion 16
which is peripherally continuous. The central portion
14 of the base member 11 preferably includes a plurality
of circumferentially arranged upwardly projecting nodes
17 which are located just inwardly of the rim 15 and or

which the product 12 is received preferably in slightly spaced relation from the top surface of the central portion 14 as illustrated in FIG. 2 at least prior to package evacuation.

The preferred form of the package 10 will be described without limiting the invention to the specific materials mentioned. Preferably, the film 13 includes at least an inner laminant of polyvinylidene chloride which when applied to the product 12 and the base 11 is in its amorphous supercooled condition. While the film 13 illustrated is a single ply, it will be understood that laminated film stock may be used, such as a laminate including an outer ply of plasticized polyvinyl chloride film having a thickness of about 1.0 mil and including approximately 75 parts of plasticizer for each 100 parts of resin, and an inner ply of supercooled polyvinylidene chloride film having a thickness of approximately 1.0 mil, this ply constituting a copolymer of approximately 85% vinylidene chloride and 15% vinyl chloride. However, for purposes of description, only the single ply film 13 is illustrated and this film is fully and intimately collapsed or drawn over the exposed surfaces of the product 12 in tight conforming relation therewith such as by use of any suitable known package forming evacuation technique whereby a vacuum is formed within the package to draw the film in tight adherence to the product and base member of the package. When supercooled polyvinylidene chloride film, or other adequately formable and stretchable amorphous film in heated condition, is drawn tightly downwardly over the product 12 and collapsed against the rim 15 and flange portion 16 of the base member 11, the film smoothly acquires the configuration of the rim 15 and tightly and intimately adheres thereto throughout the entire periphery of the base member 11.

The base member 11 may be formed from any suitable material to which the film 13 can be sealed. For example, the base member 11 may preferably be formed from polyvinyl chloride sheeting having a thickness on the order of at least about 0.011 of an inch or greater. Such material in its flat condition prior to shaping is quite flexible and ordinarily is not considered to provide adequate rigidity to a package of the type illustrated. However, this material can be readily heat formed to the configuration of the base member 11 and the peripherally continuous rim 15 substantially rigidifies the material to an extent that the base member 11 is quite capable of supporting the product 12 and stabilizing the film 13 in conjunction with the product 12 against flexing which might result in film rupture. The configuration of the base member 11 constitutes a basic aspect of the invention not only from the standpoint of permitting the forming of an uncomplicated and highly efficient seal, but also with regard to permitting use of normally flexible material in establishing an adequately rigid package. Other materials may be used in forming the base member 11, such as crystallized polyvinylidene chloride, polystyrene, or various polyvinylidene chloride coated materials, the basic requirement for such materials being the capability of forming a seal with the film 13 in some reasonable and efficient manner.

Again referring to the preferred form of the invention, the supercooled polyvinylidene chloride film 13 is capable of establishing sufficient adherence with the polyvinyl chloride base member 11 to create a hermetic seal without the necessity of relying on heat sealing. In this respect the package 10 can be formed cold without the application of heat thereby readily adapting the same for use in the packaging of heat sensitive materials and permitting use of heat sensitive package forming materials. However, in order to improve upon the seal established between the film 13 and the base member 11, the outer surface of the flange portion 16 will preferably include thereon a thin, basically microscopic coating 18 of a suitable sealant such as a plasticizer or pressure-sensitive adhesive. Suitable plasticizers include commercially avail-

able and widely used "Santicizer 141" which is basically 2-ethylhexyldiphenyl phosphate. Other suitable plasticizers include diisobutyl adipate, dibutyl sebacate, "Citroflex A-4" (acetyl tributyl citrate), dioctyl adipate, diethyl phthalate, and "Santicizer E-15" (ethyl phthalyl ethyl glycolate). Many different types of pressure-sensitive adhesives are available for package forming purposes in the manner described. Where the product is a food product such adhesives may be limited with regard to use and a suitable fat insoluble and non-toxic adhesive is available under the trade designation of "Pyroxylin 18-274-18" which is composed of polyamides, polyester plasticizers and polymerized ester oils. An adhesive of this type may be diluted for application with a mixture of aromatic solvent and aliphatic alcohol. However, even where the product packaged is a food product it will be noted that the area of application of the sealant 18 is remote from the area of contact of the product with the base member 11 and film 13. The adherent properties of supercooled polyvinylidene chloride film with a suitable plastic base member such as polyvinyl chloride or polystyrene establishes an intermediate seal area between the rim 15 and film inwardly of the flange portion 16 on which the coating 18 is carried.

The special film and base seal defined by the interface coating 18 establishes a high strength seal. For example, where the coating 18 is a plasticizer establishing a seal between supercooled polyvinylidene chloride film and a polyvinyl chloride base member, the peel strength of the seal can range from 1½ pounds per inch to 3 pounds per inch of width. By comparison, no peel strength reading has been obtained when attempting to determine the strength of a seal established solely by direct adherence between supercooled polyvinylidene chloride film and a polyvinyl chloride base member such as occurs inwardly of the coating 18 along the rim 15. However, the seal established inwardly of the coating 18 is nevertheless a hermetic seal and provides an important contribution to the keeping qualities of the package 10.

The illustration of the seal as well as the components of the package 10 in FIG. 2 is of course exaggerated for better understanding of the invention. The seal established along the rigidifying portion or rim 15 of the base member is, in effect, a double purpose and double acting seal. The exposed edge of the film 13 overlying the exposed edge of the base member flange portion 16 cannot be readily separated from the flange portion by reason of the shape of the rim 15 and the inclination of the flange portion 16. Any attempt to peel the film from the flange portion 16 necessitates substantial stretching of the film. Any suitable film used will, after the seal forming operation, become fully crystallized in the area of the seal and will exhibit substantial resistance to stretching. This is particularly true of polyvinylidene chloride film as this film even though applied in the amorphous supercooled condition will crystallize and exhibit substantial toughness and resistance to stretching. When the preferred supercooled polyvinylidene chloride film is used in forming the package of the invention, subsequent crystallization of the same will result in the film exhibiting substantially random crystal distribution throughout. This is another unique aspect of supercooled polyvinylidene chloride film and such random crystal distribution does not create any directional weaknesses in the film or tendencies of the film to stretch in any one particular direction when fully crystallized. The seal arrangement described in effect creates a primary high strength outer seal established along the inclined flange portion 16 of the base member 11, and an inner secondary seal which is available to adequately protect the product 12 in the event that the primary seal should be ruptured through gross mishandling of the package. The convex configuration of the rim 15 of the base member discourages ready peeling of the film therefrom thus co-

operating with the aspect of providing both a primary and a secondary seal.

The base member 11 is configured so that its primary strength or rigidity is available in the seal defining area. This feature in combination with the tight engagement of the film 13 about the product 12 establishes an adequately rigid package. The base member is readily heat drawn from flexible sheet material and may be automatically trimmed along its edge following package formation and accompanied by automatic trimming of the film to thus provide a smooth well defined edge. The central portion 14 of the package is still somewhat flexible in view of the nature of the material used and the node-like projections 17 not only add to the peripheral rigidity of the base member and the package but also can be used to support the product 12 peripherally thereof in the area of greatest strength of the base member and package thus not only relieving the inner relatively flexible central portion 14 from the weight of the product but also permitting complete evacuation of the package between the product and base. Depending upon evacuation conditions, the base can be drawn into tight contact with the product with the nodes becoming impressed in the product.

The package 10 is readily subject to stacking for shipping and merchandising purposes and in this respect the peripheral inclined flange portion 16 is preferably extended downwardly below the central portion 14 of the base member. Thus the placing of one package on top of another will result in the central portion 14 of the base member being engaged with the top surface of the film 13 overlying the product 12 and the depending flange portion 16 will center the top package on the supporting package. The support of the product basically on the node-like projections 17 will prevent downward bulging of the center area of the central portion 14 thus permitting ready nesting of a plurality of packages.

FIGS. 4-6 illustrate a modified form of package 19. This package basically comprises a generally rectangular base member 20 supporting a product thereon which again is illustrated in the form of a plurality of stacked slices 21 of bologna or the like and a covering transparent film 22 intimately surrounding and engaging the product 21 and in peripherally sealed contact with the base member 20. As is shown in FIGS. 5 and 6, the base member includes a generally flat central portion 23 surrounded by a rigidifying peripherally continuous upstanding rim 24 which is of top surface convex configuration. The rim 24 includes an outwardly and downwardly inclined flange portion 25 joined with an outwardly extending flat flange portion 26. At the upper end of the package as viewed in FIGS. 4 and 6, the flat flange portion 26 is elongated and extends substantially outwardly beyond the rim 24.

As best shown in FIGS. 5 and 6, the flat flange portion 26 along the top surface thereof immediately outwardly of the inclined flange portion 25 carries thereon a peripherally continuous thin coating 27 of suitable sealant such as a plasticizer or pressure-sensitive adhesive. The film 22 extends intimately along the rim 24 and flange portions 25 and 26 and the primary high strength seal of the package is established in the area of the coating 27. At the upper end of the package as viewed the extension of the flat flange portion 26 carries thereover a similar extension of the film coextensive therewith to the top edge of the package. The extended portion of the film 22 includes a label 28 suitably adhered to the outer face of the film by an intermediate adhesive coating 29, the label 28 extending transversely of the package as best shown in FIG. 4. The label 28 may be formed from any suitable material such as paper or the like and materially thickens the portion of the film which it overlies so that the film can be readily separated from the extended flat flange portion 26 of the base member 20 to permit peeling of the film 22 from the base member 20 to any extent desired as illustrated in FIG. 4.

The extended flat flange portion 26 of the base member and the overlying film and label include aligned apertures 30 by means of which the package 19 may be suspended from a hook-like member of a display rack or the like for merchandising purposes.

The base member 20 of the package 19 provides all of the basic advantages described above in connection with the base member 11 of the package 10. However, the base member 20 is further rigidified by reason of the provision of the peripherally continuous flat flange portion 26 thus particularly adapting the package 19 for suspension for merchandising purposes. In the past it has been often found necessary to provide a finished package with an outer envelope in order to permit suspension of the package for merchandising purposes. In other words the materials used in forming the basic product containing package have not been of sufficient strength or have been incapable of imparting adequate rigidity to the over-all structure to permit ready suspension. With the specially formed base member 20 adequate rigidity is imparted to the package to permit ready suspension thereof thus eliminating the added cost of providing an outer envelope for suspension purposes. The provision of the flat flange portion 26 not only imparts added rigidity to the package but also readily permits extension of the top portion of the package to provide an area for suspension of the package. This extended top portion additionally permits the package 19 to be readily opened without the necessity of destroying, damaging or stretching the film 22.

As previously described, the seal defined by the interface coating of plasticizer or adhesive is a high strength seal. However, this seal can be overcome by separation of the film from the base member as long as a means is provided to permit ready grasping of the film. With the package 10 the peripheral edge portion of the film 13 is completely adhered to the inclined flange portion 16 of the base member 11 and no ready means is provided to permit grasping of the film for separation from the base member. Furthermore, the circular configuration of the base member including the flange portion 16 and film requires stretching of the film even if an edge portion of the film were to be rather laboriously separated from the base member. This arrangement discourages film separation either inadvertently or purposely. The package 19, however, is specifically designed for ready film separation when such is carried out purposely.

The provision of a complete, primary, high strength interface seal as well as a secondary seal formed along the inclined flange portion 25 of the base member 20 prevents inadvertent rupture of the seal of the package during handling thereof. While an edge portion of the film 22 can be peeled from the underlying flat flange portion 26 without necessitating stretching of the film, the extensive areas of the primary and secondary seals prevent inadvertent rupture of the package seal. The extended top portion of the package as shown in FIGS. 4 and 6 establishes another secondary seal area due to the inherent adherence of the supercooled polyvinylidene chloride film 22 with the polyvinyl chloride base material. The extensiveness of this additional secondary seal area guards against inadvertent stripping of the film and it will be borne in mind that this secondary seal area is protected by the basic high strength seal area intermediate the same and the product.

The package 19 can be readily opened by grasping the label portion 28 and attached film, the thickness of the label applied to the film permitting ready separation of the film from the base member. The label portion and attached film can then be peeled downwardly from the top edge of the package as illustrated in FIG. 4 so that upon the reaching of the adjacent high strength seal area a substantial amount of film reinforced by the label 28 is available for grasping to overcome the strength of the seal defined by the interface coating 27. In this respect then

the film can be peeled downwardly to any extent desired for ready access to the product 21. Upon removal of selected portions of the product 21 the film may be re-applied in product covering relation and the residue of the interface coating 27 will reestablish an adequate seal with the film. The particular rectangular configuration of the base member accommodates ready peeling and re-application of the film as distinguished from the circular configuration of the base member of the package 10. Preferably a pressure-sensitive adhesive will be used to define the high strength seal coating 27 of the package 19 thus better accommodating resealing of the product. As described, the package 10 is not susceptible to film peeling for opening purposes. However, this package may be readily opened by the insertion of a knife or the like immediately inward of the rim 15 against the downwardly drawn film 13 accompanied by slicing of the film about the edge of the product 12. The package 19 can of course similarly be opened, but the package is designed for film peeling and for reclosing as described above.

While the packages illustrated have been described in connection with use in the merchandising of a food product, it will be appreciated that any suitable type product may be enclosed therein. For example, the packages are particularly adapted for the merchandising of washers or gaskets thus utilizing the circular shape of the package 10 for compact confinement of an annular product. The packaging of sponges can take advantage of the rectangular shape of the package 19. The packaging of a plurality of loose articles, such as screws or the like, is readily accommodated by the package 19 thus permitting access for selective product removal and reclosing for convenient multiple product confinement. The total list of products suitable for packaging in accordance with the teachings of the present invention is quite extensive and the foregoing are merely representative examples. Polyvinyl chloride and polystyrene films are examples of additional types of film which may be used in forming the package of the invention. Preferably the film used will be adequately formable either in the cold or heated condition to fully conform with the seal areas of the base member to establish a smooth, unwrinkled and unfolded seal.

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. A package comprising in combination a relatively rigid base member, a product supported centrally on said base member, and a flexible film covering said product and peripherally sealed with said base member, said base member being formed from flexible material and including a substantially horizontally extending central portion on which said product is received and a peripherally continuous rigidifying portion located outwardly of said product continuously about the same, said rigidifying portion including an upstanding convex rim immediately outwardly of said product and said central portion and having an outwardly and downwardly inclined peripherally continuous film sealing flange portion to which said film is sealed, said film flatly engaging said rim including the inner upwardly extending surface thereof and over the top and downwardly along the flange portion thereof.

2. The package of claim 1 wherein said film includes polyvinylidene chloride crystallized with substantially random crystal distribution throughout as a result of application to said package while in the supercooled amorphous state.

3. The package of claim 1 wherein said film includes polyvinylidene chloride crystallized with substantially random crystal distribution throughout as a result of application to said package while in the supercooled amorphous state, said rigidifying portion of said base member including an interface coating of film adherent material to establish a seal with said film.

4. The package of claim 1 wherein said film includes polyvinylidene chloride crystallized with substantially random crystal distribution throughout as a result of application to said package while in the supercooled amorphous state, said base member being formed from polyvinyl chloride and having a thickness of at least about 0.011 of an inch, said rigidifying portion including an interface coating of film adherent to establish a seal with said film.

5. The package of claim 1 wherein said base member is of circular disc shape.

6. The package of claim 1 wherein said base member is of generally rectangular shape.

7. The package of claim 1 wherein said flange portion extends below said central portion.

8. The package of claim 1 wherein a part of said central portion of said base member is upset to rigidify said central portion.

9. A package comprising in combination a relatively rigid base member, a product supported centrally on said base member, and a flexible film covering said product and peripherally sealed with said base member, said base member being formed from flexible material and including a substantially horizontally extending central portion on which said product is received and a peripherally continuous rigidifying portion located outwardly of said product continuously about the same, said rigidifying portion including an upstanding convex rim immediately outwardly of said product and said central portion and having an outwardly and downwardly inclined peripherally continuous film sealing flange portion to which said film is sealed, said flange portion then extending horizontally outwardly from its lowest extension to provide a peripherally continuous projecting flat flange portion, said film flatly engaging said rim including the inner upwardly extending surface thereof and over the top and downwardly and outwardly along the flange portion thereof.

10. The package of claim 9 wherein said base member is of generally rectangular shape, said flat flange portion along one side of said product being extended outwardly therefrom and including an overlying extension of film, said extensions being apertured for package support in suspended position.

References Cited by the Examiner

UNITED STATES PATENTS

1,978,299	10/1934	Fegley et al.	248—346
2,138,364	11/1938	Wassell	206—45.32
2,784,577	3/1957	Beaham.	
2,864,710	12/1958	Pottle et al.	206—45.34
2,874,836	2/1959	Wertepny.	
3,013,656	12/1961	Murphy	206—72
3,066,845	12/1962	Mattaway	229—55
3,127,698	4/1964	Smithers	229—2.5 X

FOREIGN PATENTS

1,254,689	1/1961	France.
11,310	1905	Great Britain.

THERON E. CONDON, *Primary Examiner*.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,229,810

January 18, 1966

Robert L. Goller et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 28, for "is" read -- as --; column 6, lines 10 and 24, for "fiange", each occurrence, read -- flange --; column 8, line 15, after "adherent" insert -- material --.

Signed and sealed this 6th day of December 1966.

SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents