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J. M. RAMSBOTTOM ET AL
PACKAGING (VACUUM) MEAT ITEMS

2,621,129

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3 Sheets-Sheet 1

Fig. 1

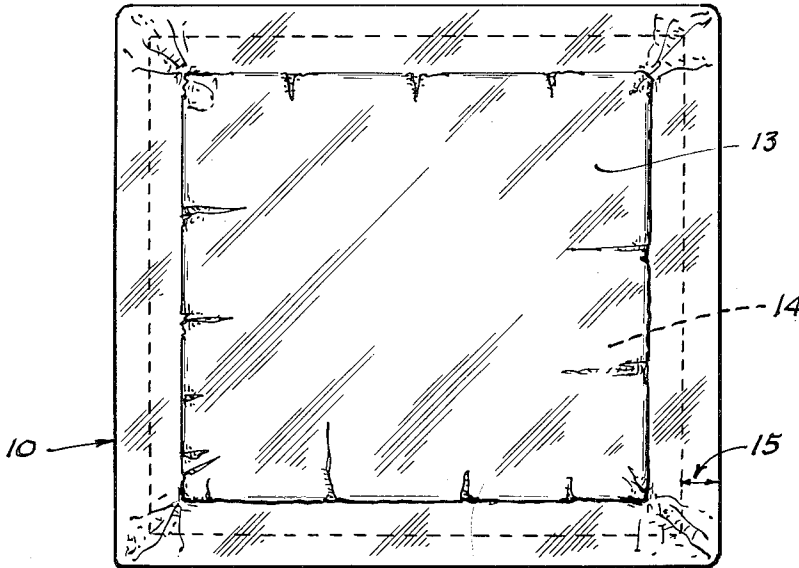
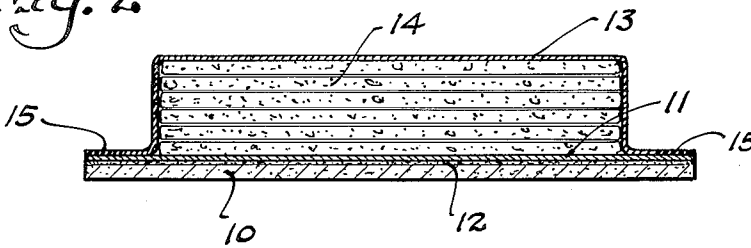


Fig. 2



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3 Sheets-Sheet 2

Fig. 3

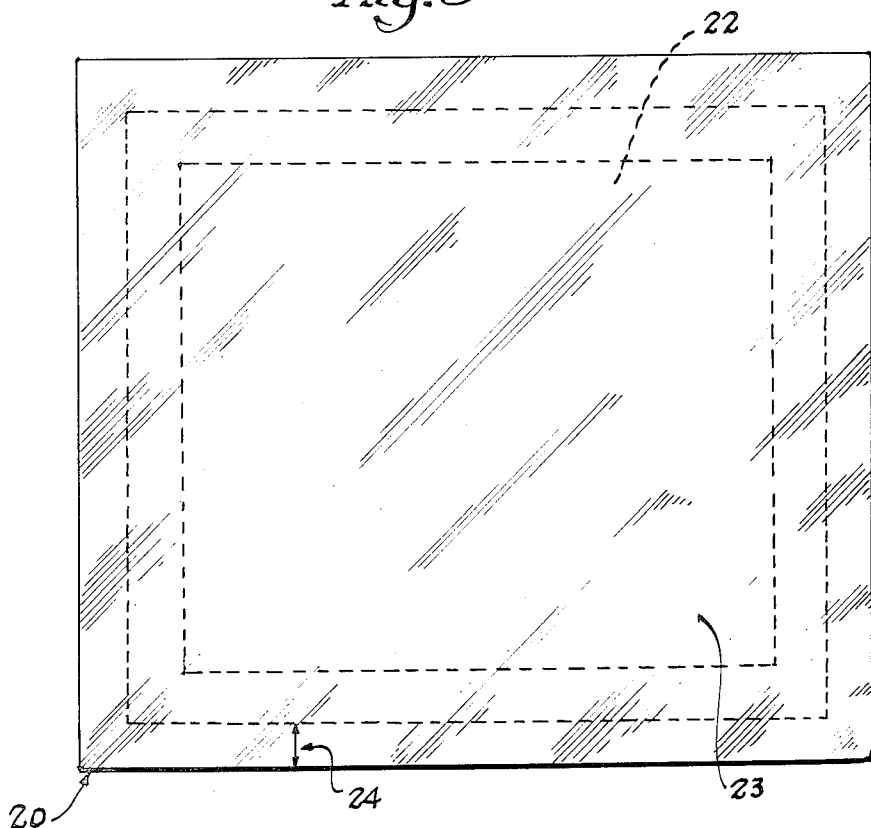
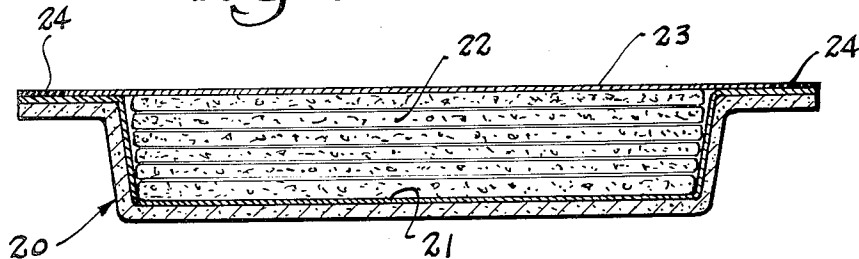


Fig. 4



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3 Sheets-Sheet 3

Fig. 5

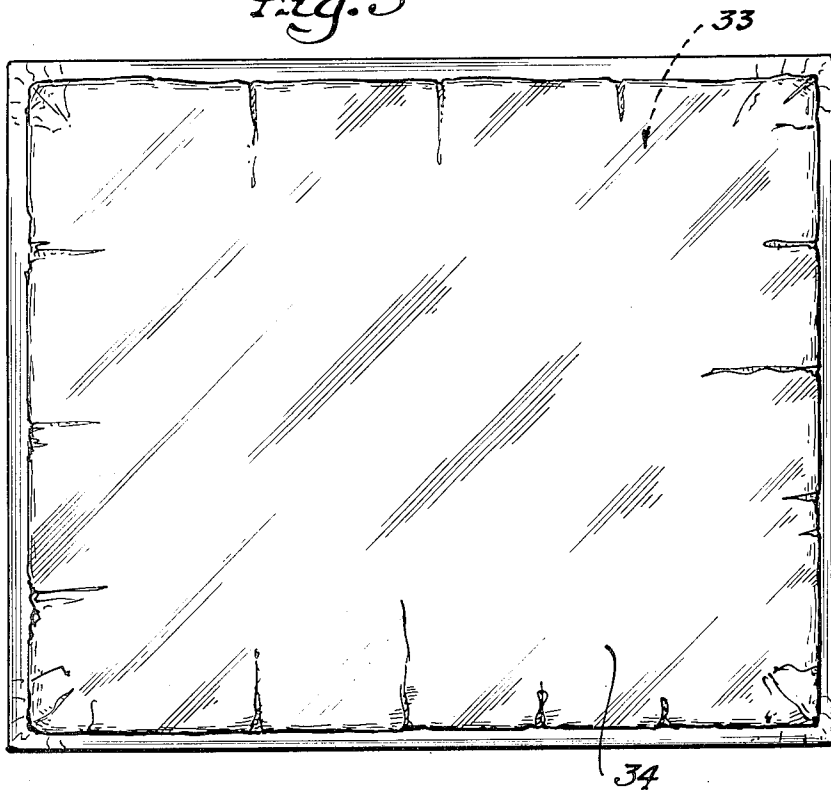
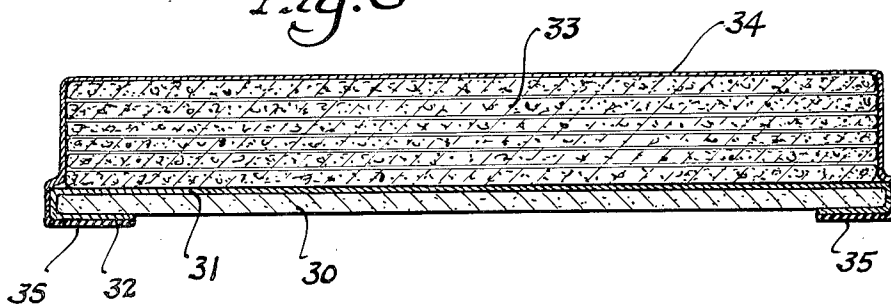


Fig. 6



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PACKAGING (VACUUM) MEAT ITEMS

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11 Claims. (Cl. 99-171)

1

The present invention relates in general to gas-proof packaging food products and more particularly to a method of forming a gas-proof packaged food product and the package produced thereby.

In the food processing art many advances have been made in recent years in methods of vacuum and inert gas packaging of food products. The advantages of vacuum or inert gas packaging of foods, such as retention of color, flavor, and other properties, are common knowledge to those skilled in the art of food packaging. Because of the desirability of providing adequate visibility of the packaged food products, it has heretofore been common practice to utilize transparent films or laminates as vacuum packaging materials. One of the inherent disadvantages of such films or laminates, however, has been the flexibility of the peripheral film of the packages made therefrom and the consequent tendency of the side walls, corners and heat seals of such packages to fail due to the excessive stresses set up in the packages by flexing, deformation and the like in normal commercial handling. Failure of the package and subsequent introduction of air through pin holes, fractures, split seals or the like results in a loss of the advantages which accrue from vacuum or inert gas packaging.

It is therefore an object of the present invention to provide a method of gas-proof packaging which overcomes the disadvantages of the prior art.

It is a further object of this invention to provide a package which is relatively rigid, yet still permits adequate visibility of the enclosed product.

An additional object of the invention is to provide a package which is capable of retaining a vacuum or an inert gas atmosphere therein, and to be at the same time relatively rigid.

Additional objects not specifically set forth herein will be readily apparent to one skilled in the art from the following detailed description of the invention.

In the drawings:

Figure 1 represents a top view of one type of package embodying the present invention.

Figure 2 is a vertical sectional view of the package shown in Figure 1.

Figure 3 represents a plan view of a modified package embodying the present invention.

Figure 4 is a vertical sectional view of the package shown in Figure 3.

Figure 5 illustrates a plan view of a further modified package embodying the present invention.

2

Figure 6 is a vertical sectional view of the package shown in Figure 5.

Generally the present invention contemplates providing a package having a gas-proof film secured to a relatively rigid backing member and a transparent, flexible, gas-proof wrapping material sealed directly to the gas-proof film secured to the backing member, and enclosing between it and said layer secured to the backing member the product to be packaged.

More specifically, in the package referred to in Figure 1 and 2 of the drawings, numeral ten (10) designates a relatively rigid backing member composed of paperboard, pressed fiber, plastic cardboard, or the like. Fixedly secured to the upper surface of backing member 10 is a thin film 11 of a gas-proof material forming the lower surface of the enclosure for the product. This film, which may be any of the gas-proof, film-forming materials such as saran (a vinylidene chloride polymer) and other thermoplastic resins, saran-coated cellophane, laminations of cellophane and Pliofilm or the like, may be applied to the member 10 as a film secured by the application of heat or by coating with a suitable layer of adhesive 12 or the like, or alternatively it may be applied in liquid form as by coating, spraying, dipping, etc., and allowed to harden into an adhesive coating on the surface of member 10. A transparent upper gas-proof film 13 which may be of the same type as the film 11 completes the enclosure for the product 14 and is disposed around the product 14 in such a manner as to contact substantially all the upper and the vertical or lateral surfaces of the product 14. This upper or cover film 13 is sealed around all four sides of the package to the backing film layer 11 as at 15, thus providing after vacuumizing an oxygen-free enclosure for the product 14. Obviously, if desired, an atmosphere of inert gas may be used in place of the vacuum in the conventional manner to provide a product sealed in the absence of oxygen.

Although the actual apparatus does not form part of the present invention, it is preferred to simultaneously seal all four sides of the package with a sealing bar which is a hollow die, shaped to the peripheral contour of the package while the film 13 is held in a tucked condition around the vertical or lateral surfaces of the product 14. Of course, the seals 15 along the four sides of the package may be made in any order while the film 13 is held in a tucked condition around the vertical or lateral surfaces of the product 14. For example, individual seals may be made on all four

sides of the package, one seal at a time, or two sets of parallel seals might be effected one set at a time. Of necessity, the final closure or closures are made in the vacuum chamber.

In assembling the proposed package shown in Figures 1 and 2, it has been found that a tucking operation is essential to prevent bowing of the backing board where, as in these figures, the backing board does not conform substantially to the size and shape of the bottom and/or lateral surfaces of the product being packaged. In other words, in this package the dimensions of the cover film 13 should be sufficiently larger than those of the backing member under the product to allow the cover film to closely contact the lateral surfaces of the product 14 in addition to the exposed top surfaces. An auxiliary tucking device may be attached to the inner surface of the sealing bar die to hold the film 13 in contact with the lateral surfaces of the product 14 until the seal is effected.

A modification of the package of the present invention is illustrated in Figures 3 and 4 of the drawings. Referring to Figures 3 and 4, numeral twenty (20) designates a tray formed from paperboard or the like conforming generally to the size and shape of the product being packaged. Secured to the upper surface of tray 20 is a film member 21 composed of a gas-proof material. As discussed previously, this film may be applied by means of an adhesive or alternatively may be formed directly on the backing material by dipping or the like. The product 22 is then placed in the tray 20 upon the upper surface of the film 21. A cover film of gas-proof material 23 is then sealed as at 24 directly to the film 21 under a vacuum or with an atmosphere of inert gas.

In the modification of the package shown in Figures 3 and 4, tucking with the aid of an auxiliary device will generally be unnecessary as the backing board itself is shaped to allow for the height dimension of the product and will generally conform to the lateral surfaces of the product being packaged. In this modification the protruding lips or edges of the tray are the surfaces on which the seals are made.

Figures 5 and 6 of the drawings show a further modification of the package. In some instances it may be desirable to extend the layer of gas-proof material applied to the backing member to more than one surface of the backing member. Of course, if the gas-proof material is applied in liquid form, as by dipping the member into a solution of the gas-proof material, the backing member would be equally coated on all sides. In the modification illustrated in Figures 5 and 6, the backing member 30 has fixedly secured thereto, in any of the ways heretofore disclosed, a layer of gas-proof material 31. In this instance, the gas-proof layer should extend over at least a portion of the lower surface of member 30 as shown at 32 as well as over the entire upper surface thereof 31. The product 33 is completely enclosed by the cover film 34 which is sealed directly to the gas-proof laminate as at 35.

A further modification of the method of forming the improved gas-proof package described herein comprises enclosing the product between upper and lower films of sealable, gas-proof film material and vacuumizing in any of the conventional ways familiar to those skilled in the art and then securing substantially the entire lower surface of the enclosure, including the sealed edges or lines of closure thereof, to a relatively

rigid backing member which may or may not be coated with a film of sealable, gas-impervious material. The lower surface of the above vacuumized enclosure may be secured to the rigid backing member by applying heat to at least one of the surfaces as in heat sealing, or by applying a thin coat of glue or adhesive to one of the contacted surfaces and bringing these surfaces together to provide a relatively rigid gas-proof package as described heretofore.

A package formed according to the present invention, namely, of a rigid backing material having secured to substantially the entire upper surface thereof a gas-proof film forming the lower enclosure surface to which a cover film of gas-proof material is sealed, provides the advantage of adequate visibility of the product along with greatly improved stability resulting from the use of a rigid backing member having the entire lower enclosure surface secured thereto. Such a package eliminates the possibility of fractures in the film due to flexing of the package or dimensional stresses set up in the film itself. Furthermore, the seals in the improved package of the present invention, being associated directly with the rigid backing material, are themselves relatively rigid and therefore much less likely to fail due to flexing of the package.

For example, in laboratory tests made to simulate actual shipping conditions, the vacuum package shown in Figures 1 and 2, when made from 200 gauge saran laminated to 16 point solid sulphite paperboard and covered with 200 gauge saran, will withstand an average of twenty-five times more vibration without producing leaking packages than will a vacuum package of two sheets of 200 gauge saran film only. The packages were vibrated by placing them with 1½ inch clearance in the compartment of a Precision Scientific Company shaking machine which operated at 285 cycles per minute with a 1½ inch stroke. The tests were carried out at 40° F.

In a second test a vacuum package consisting of a laminated film of No. 300 cellophane and 120 gauge Pliofilm glued to a 20-point solid-sulphite paperboard with the same cellophane-Pliofilm laminate as the cover film was compared with a vacuum package made of two sheets of the cellophane-Pliofilm laminate by vibrating in the same apparatus and at the same rate as in the previous test. The vacuum in the paperboard-supported packages was retained three times longer under the conditions simulating actual shipping conditions than was the vacuum in the non-supported packages.

As pointed out above, any sealable, gas-proof, film-forming material may be used to provide the lamination with the relatively rigid backing member. However, since the invention is directed primarily to packaging of food products and the like, it is preferred that the film-forming material be non-toxic and of such a nature as not to impart undesirable odors or tastes to the enclosed product. A suitable type of gas-proof material is transparent film having an O₂ transmission rate of about 0.6 cu. cm., per 100 sq. inches, per 24 hours, per mil thickness, at 77° F. and 760 mm. Hg. Since the relatively rigid backing material is usually opaque in nature, there is no necessity for the laminated gas-proof film laminated to its surface to be transparent. Therefore, if desired this film may be opaque in nature and suitably colored to provide an attrac-

tive background for the packaged product. The gas-proof film which is secured to, laminated to, or coated on the backing material should, however, be sealable. The cover film which is secured to the laminated, gas-proof film to form a completed package is preferably transparent and may be composed of any suitable sealable, gas-proof, film material known in the art. In order to prevent bowing of the relatively rigid backing member when the package is formed by employing a backing member which does not conform to the shape of the product being packaged and then sealed under vacuum, the cover film should have a substantially greater surface area than the area of the backing member underneath the product. In other words, the dimensions of the cover film should be sufficiently larger than those of the backing member to permit tucking as described heretofore.

In forming the seals between the laminated gas-proof film and the gas-proof covering material, it has been found that either heat, electric impulse, or electronic sealing provides effective and satisfactory seals. One of the important features of the invention is the ability to seal directly to the relatively rigid backing member and retain a completely gas-proof package by so doing.

Although the package of the present invention has been illustrated only with respect to a flat backing member and a tray-shaped backing member, it is obvious that the invention may be applied to any shape of package as, for example, a carton or the like.

It should further be understood that the present invention is not restricted to packaging any particular food product or a food product having a particular form. Also, the food product within the package may be arranged in any desired manner. For example, when a sliced product is being packaged, the slices may be superimposed one directly over the other, or the slices may be arranged in a single thickness or in slightly overlapping arrangement.

Obviously, many 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 method of forming a gas-proof package for food products which comprises: fixedly applying a layer of gas-proof material to at least one surface of a relatively rigid backing member said layer being in contact with said backing member over at least one entire surface thereof; placing the product to be packaged on said gas-proof layer immediately above said backing member; placing a gas-proof cover material over said product; and thereafter sealing said gas-proof cover material directly to the gas-proof layer on said backing member.

2. A method of forming a gas-proof package for food products which comprises providing a rigid supporting surface by: fixedly applying a layer of gas-proof material to at least one surface of a relatively rigid backing member; placing the product to be packaged on said gas-proof layer immediately above said backing member with at least one entire surface of which said gas-proof layer is in contact; placing a gas-proof cover material over said product; and thereafter sealing said gas-proof cover material,

in the absence of oxygen, directly to the gas-proof layer on said backing member.

3. A method of forming a gas-proof package for food products which comprises: fixedly applying a layer of gas-proof material to at least one surface of a relatively rigid backing member, said gas-proof material being in contact with said backing member over at least one entire surface thereof; placing the product to be packaged on said gas-proof layer; placing a gas-proof cover material over said product; tucking said gas-proof cover material along the lateral surfaces of the product; and thereafter sealing said gas-proof cover material directly to the gas-proof layer on said backing member.

4. A method of forming a gas-proof package for food products which comprises: fixedly applying a layer of gas-proof material to at least one surface of a relatively rigid backing member, said gas-proof material being in contact with said backing member over at least one entire surface thereof; placing the product to be packaged on said gas-proof layer; placing a gas-proof cover material over said product; tucking said gas-proof cover material along the lateral surfaces of the product; and thereafter sealing said gas-proof cover material, in the absence of oxygen, directly to the gas-proof layer on said backing member.

5. In a method of forming a gas-proof package for food products, wherein a food product is completely enclosed within upper and lower films of gas-proof material, the step comprising fixedly securing substantially the entire outer surface of the lower of said gas-proof films to a relatively rigid backing member, said backing member having at least the overall dimensions of the lower portion of said food product, said lower gas-proof film being in contact with at least one surface of said backing member over at least the area covered by the lower portion of said food product.

6. A gas-proof package which comprises in combination with a food product: a relatively rigid backing material; a layer of gas-proof material fixedly secured to said backing material and in contact with at least one entire surface thereof, said layer of gas-proof material providing a laminated support with said backing material for said food product; a food product disposed on said laminated support; and a second layer of gas-proof material in contact with substantially all of the top and lateral surfaces of said product, said second layer being sealed directly to said first layer to completely enclose said product therebetween.

7. A gas-proof package which comprises in combination with a food product: a relatively rigid backing material having at least the overall dimensions of the lower portion of said food product; a layer of gas-proof material fixedly secured to said backing material and in contact with at least one surface thereof over at least the area covered by the lower portion of said food product; a food product disposed on said layer of gas-proof material; and a second layer of gas-proof material sealed directly to said first-mentioned layer, said second layer completely enclosing between it and said first-mentioned layer said food product.

8. A gas-proof package which comprises in combination with a food product: a relatively rigid backing material; a layer of gas-proof material fixedly secured to at least one side of said backing material and in contact with at least one entire surface thereof; a food product dis-

7

posed on said layer of gas-proof material; and a second layer of gas-proof material sealed directly to said first-mentioned layer, said second layer completely enclosing between it and said first-mentioned layer said food product.

9. A gas-proof package which comprises in combination with a food product: a relatively rigid backing material having substantially the same configuration as the lower portion of said food product; a layer of gas-proof material fixedly secured to said backing material and in contact with at least one surface thereof over at least the area covered by the lower portion of said food product; a food product disposed on said layer of gas-proof material; and a second layer of gas-proof material sealed directly to said first-mentioned layer completely enclosing between it and said first-mentioned layer said food product.

10. A package as in claim 9 wherein said relatively rigid backing material is in the form of a tray.

11. A gas-proof package which comprises in combination with a food product: a relatively rigid backing material; a layer of gas-proof material fixedly secured to the surface of said backing material and in contact with substantially the entire surface thereof; a food product disposed on said layer of gas-proof material; and a second layer of gas-proof material in contact

8

with substantially all of the top and lateral surfaces of said product; said second layer being sealed directly to said first layer to completely enclose said product therebetween.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,773,080	Birdseye	Aug. 12, 1930
1,929,217	Rosen	Oct. 3, 1933
2,012,529	Eldredge	Aug. 27, 1935
2,134,908	Copeman	Nov. 1, 1938
2,438,089	Carson	Mar. 16, 1948
2,491,423	Snyder	Dec. 13, 1949
2,501,570	Larsen	Mar. 21, 1950
2,533,051	Saunders	Dec. 5, 1950
2,596,514	Uehlein	May 13, 1952

OTHER REFERENCES

"Modern Packaging," May 1950, pages 99, 100, and 101, article entitled "Vacuum Pre-Packaged Meats."

"Modern Packaging," September 1950, pages 93 and 94.