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PACKAGED PRODUCT AND METHOD OF MAKING THE SAME

Filed Nov. 7, 1957

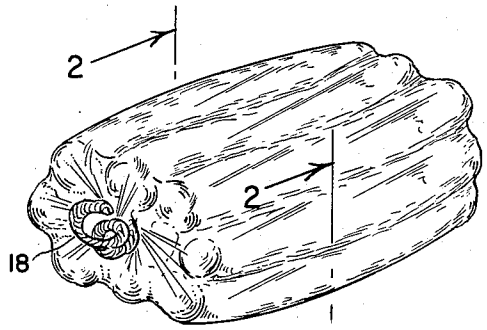



FIG. 1

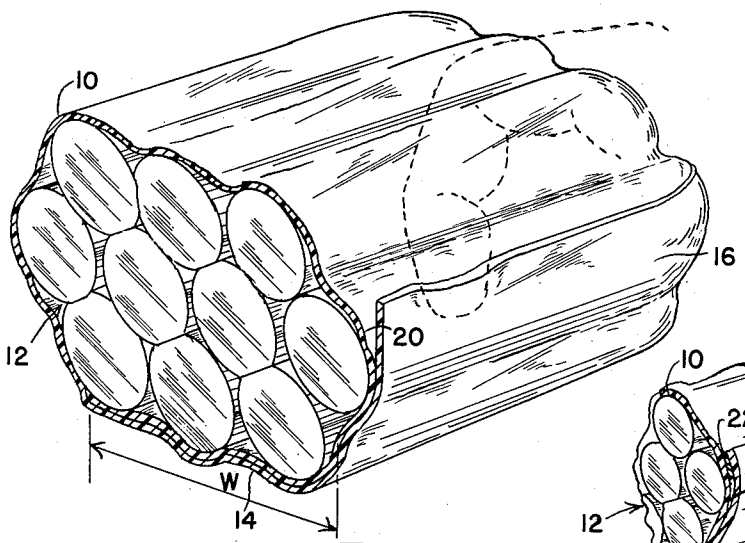



FIG. 2

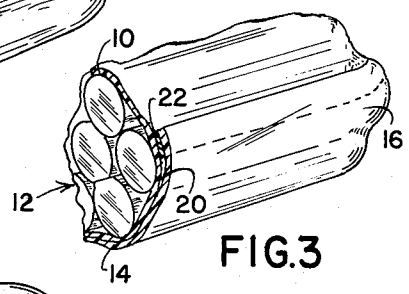



FIG. 3

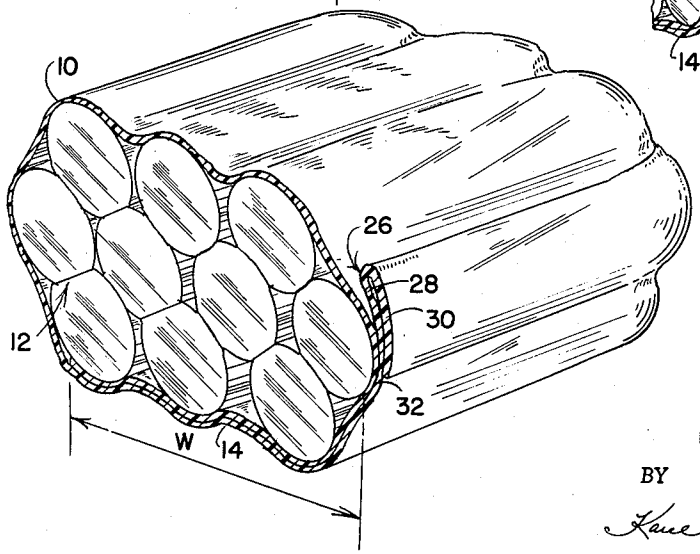



FIG. 4

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# PACKAGED PRODUCT AND METHOD OF MAKING THE SAME

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1 Claim. (Cl. 53—14)

This invention relates to an improved commercial packaged product and method of making the same.

It has become increasingly important and desirable that certain products be encased in attractive packages which display the product to the consumer, as well as affording protection to the encased product. It is necessary that the packaging material and the method of assembling the package be relatively inexpensive so as not to unduly increase the cost of the product. In addition, with many types of food products and other air-affected commercial products, it is essential that the wrapper be impervious to air and that a minimum amount of air be entrapped within the package in order that the durability of the product is enhanced. Furthermore, the package should be securely held in wrapped position by a simple and effective sealing means adaptable to mass production techniques.

In one type of packaging, the product is tightly encased in transparent plastic sheet material which is wrapped around the product, and subsequently closed and sealed. In certain instances this wrapped product is then subjected to a shrinking operation which eliminates wrinkles in the sheet material and consequently presents an attractive packaged product.

Experience has proven that packaged products fabricated in accordance with the above techniques and possessing the above desired characteristics are under certain circumstances relatively difficult to open by the consuming public.

Accordingly, a principal object of this invention is the provision of opening means and method for forming the same for a packaged product possessing the desired characteristics and fabricated according to the desired techniques.

Another object of this invention is to provide opening means for a packaged product which is an integral part of the encasing sheet material and which is substantially unaffected by the processing steps to which the encasing sheet material are desirably subjected.

A further object is the provision of a packaged product having opening means adapted to be formed by relatively inexpensive mass production methods and which is substantially free from any entrapped air, prevents any contaminating media from attacking the encased product, permits the product to be visible, features an attractive encasing material, and in which the cost of the product is not unduly increased.

A still further object is an integral opening means for a packaged product which readily adapts itself to printed advertising and instructional material.

Among others, the several objects of this invention are achieved by tightly encasing in an outer wrapping of plastic sheet material the desired commercial product. The sheet material functions to protect the encased product from contamination and aids in prolonging its shelf life. The sheet material is effectively sealed along certain zones in order that finger grasping portions are



presented which permit the product consumer to effectively and efficiently rupture the sealed zones.

In the accompanying drawings:

Fig. 1 is a perspective view of a completed packaged product embodying the teachings of my invention;

Fig. 2 is another perspective view of the packaged product illustrated in Fig. 1 with a section taken approximately along the lines 2—2 of the latter in somewhat enlarged scale and illustrating one form of the contemplated package opening means;

Fig. 3 is substantially similar to Fig. 2 with certain parts broken away but illustrating another form of package opening means; and

Fig. 4 is similar to Fig. 2 and illustrating a further form of the package opening means contemplated by my invention.

A complete packaged product embodying my invention is illustrated in Fig. 1 and preferably comprises a product encased in a wrapper made of relatively thin, flexible and transparent plastic sheet material which may be readily sealed. This material may be of such a nature that it can be shrunk around the product so that the encasing wrapper presents a neat and tight appearance substantially free from wrinkles and conforming generally to the contours of the product contained therein. Where the product is adversely affected by air, the air may be evacuated from the package and the package made substantially impervious to the ambient atmosphere.

The wrapped product may consist of a food product such as a smoked butt, boned ham, luncheon meat, bologna products, frankfurters, sausage products or the like, or various types of fruits and vegetables. The wrapped product may also take the form of a non-food product, such as tennis balls, golf balls, rubber goods and other articles which may be adversely affected by prolonged exposure to air.

For the wrapping material, I prefer to employ a heat sealable plastic material such as sheets made of polyvinylidene chloride or rubber hydrochloride. In this connection, I have found that plastic material of this type generally contains plasticizers which become tacky or viscous when heated to a temperature slightly lower than the boiling point of water, i.e., in the general vicinity of 200° F. If two surfaces of such material are placed in contact with each other and subjected to heat, as for instance, by means of hot water under pressure, they are caused to adhere together. This provides a convenient and readily controllable method of sealing two surfaces of wrapping material together without danger of volatilizing or burning through the entire sheet of wrapping material.

For these reason, it is desirable to use a plastic sheet wrapping material of the above-indicated type with plasticizers which will become tacky and viscous when subjected to temperatures of between 180° F. and 212° F. I have found that polyvinylidene chloride, sold commercially under the trademark "Cry-a-Vac," is particularly suitable. However, other plastic wrapping materials having the above-indicated characteristics may also be employed, such as polyvinylidene chloride, sold commercially under the trademark "Saran," and rubber hydrochloride, sold commercially under the trademark "Pliofilm."

Referring to Fig. 2, which is to be taken in conjunction with Fig. 1, the sheet of wrapping material **10**, having the above-indicated characteristics, and having a width greater than the circumference of the product to be wrapped and a length greater than the length of this product, is initially provided. For purposes of illustration only, the drawing discloses the product to be wrapped as that of a plurality of frankfurters referred to generally by the numeral **12**. The sheet of wrapping

material 10 is wrapped around the circumference of the product 12 with a marginal longitudinal edge portion thereof arranged in contacting overlapping relationship substantially as shown and with the end portions of the wrapping material 10 projecting beyond the ends of the product 12. Thereafter, the contacting marginal edge portions of the wrapping material 10 intermediate the ends thereof are suitably sealed together to provide a substantially hermetic juncture between these contacting marginal portions while still providing a finger grip opening means for rupturing this juncture.

Longitudinal overlapping marginal edge portions of the wrapping material 10 are preferably heat sealed substantially along a zone 14 embodying the width *w* which extends substantially along the entire length of the wrapping material 10, but not to such an extent that a subsequent air evacuation step will be prevented. The necessary heat may be applied to the desired zone 14 as by a hot air blast or by means of hot water at temperatures between 180° F. and 212° F. The hot water application may be accomplished by partly submerging a rotatable roller of sponge or foam rubber or suitable plastic material in a tank of water which is within the preferred temperature range. The width of this roller may embrace the width *w* of the zone 14 to be sealed; and by simply running the overlapping marginal edge portions of the wrapping material on this heated roller, the desired zone 14 may be heat sealed.

Thus the overlapping marginal edge portions are readily heat sealed together for substantially their entire length.

In view of the nature and extent of the above heat sealing of the overlapping marginal edge portions of sheet material 10, the outer exposed marginal edge portion presents a substantially free and readily graspable finger-grip portion 16 which extends substantially along the entire length of the wrapping material 10.

Before closing the protruding end portions of the wrapping material 10, I may evacuate the package of substantially all of the free air therein, especially when the enclosed product is adversely affected by air. In this connection, one of the protruding ends may be temporarily closed, as for example, by grasping it in the hand or employing other suitable means, while the opposite open protruding end portion of the wrapping material is connected to a suitable source of suction or vacuum. The free air may be readily evacuated from the entire length of the package, since the sheet wrapping material 10 as initially applied preferably fits around the product in such a manner that air between the closed protruding end portion and the adjacent end of the product is easily evacuated. To insure proper evacuation of air within the packaged product, the extent of overlapping of the marginal edge portions of wrapping material 10 may be varied as needed.

When the vacuum is drawn, the sheet wrapping material 10 is pulled in tightly against the product thereby tending to eliminate substantially a major portion of the undesirable wrinkles therein. The heat-sealed zone of the overlapping marginal edge portions preferably does not extend to the extreme ends of the protruding end portions but may do so with respect to that end portion sealed during the evacuation and removal of the entrapped air within the packaged product without substantially any detrimental effects.

The protruding end portions of the wrapping material 10 which extend beyond the ends of the encased product 12 may be simultaneously closed and sealed upon completion of the drawing of the vacuum. This may be accomplished by tightly twisting the protruding ends while the air is being evacuated or sequentially after the air has been removed. Upon completion of this twisting operation, the protruding end portions may be suitably positioned adjacent the ends of the encased product substantially as shown by the reference numeral 18 of Fig. 1.

It is apparent that a packaged product is provided which possesses the desired characteristics outlined above. This packaged product may be readily opened to expose the product by simply untwisting or severing the protruding end portions of the sheet material 10 and then grasping and pulling the outer exposed finger grip portion 16 of this sheet wrapping material to rupture and render ineffectual the seal 14 between the overlapping marginal edge portions.

The outer exposed finger grip portion 16 may suitably present or mount means featuring printed matter in the nature of advertising or instructions for removing the sheet material 10 from the encased product 12. This means for presenting the desired printed matter (not shown in Fig. 2) may be adjacent the inner surface of finger grip portion 16 or may be mounted on the latter or the exposed outer surface portion of wrapper 10. Obviously, in the embodiment of my invention illustrated in Fig. 2, the location of the desired printed matter may be varied.

In many instances because of the nature of the product to be wrapped, mere evacuation of the entrapped air within the packaged product will not tightly stretch and remove a major portion of wrinkles in the wrapping material 10. To overcome this, I prefer to shrink the wrapper 10 by subjecting it to heat, as for example, immersing or spraying the packaged product with hot water at approximately 200° F., or subjecting the package to hot air which is at approximately this temperature. The wrapper then shrinks sufficiently to eliminate the unsightly wrinkles. Additionally, this shrinking causes the wrapping material in the twisted protruding end portions of wrapper 10, as exemplified by numeral 18, to be stretched beyond its elastic limit—but short of its yield point—and further tends to pull this twisted material in tightly against the package as shown in Fig. 1, with the result that the tendency to untwist is substantially eliminated. The twisted ends are thus held against accidental untwisting, but adapted to be manually untwisted to facilitate opening the package when desired. Furthermore, this shrinking tends to insure and strengthen the heat seal 14 between the overlapping marginal edge portions.

However, when the packaged product illustrated in Fig. 2 is subjected to the heat shrinking step outlined above, the inner surfaces of finger grip portion 16 adhere to the opposed outer surfaces 20 of sheet material 10. This is a result of the co-action of the plasticizers in these portion which function to adhere the opposed surfaces together upon exposure to heat between 180° F. and 212° F., or substantially the boiling point of water. Therefore, I prefer to utilize the package of Fig. 2 without a heat shrinking application. If heat shrinking is considered desirable, I prefer to employ the forms of the invention illustrated in Figs. 3 and 4. To insure a graspable finger grip portion when heat shrinking is adopted, provisions are preferably made to prevent adhesion of surfaces of the finger grip portion 16 with the opposed portion of sheet material 10.

The packaged product of Fig. 3 is substantially similar to the form of the invention illustrated in Fig. 2. Accordingly, the material for wrapper 10 as well as the product to be wrapped is substantially the same as in the latter embodiment. The overlapping marginal edge portions may again be heat sealed along zone 14; and the protruding end portions of wrapper 10 may be twisted and sealed sequentially or simultaneously with evacuation of the air within the packaged product.

In Fig. 3, it will be observed that a layer or coating of material substantially unaffected by temperatures contemplated is interposed between the interior surfaces of finger grip portion 16 and the opposed surfaces 20 of sheet material 10. When a hot water shrinking process

is used, it is preferable that layer 22 be substantially insoluble in water. Consequently, a water insoluble ink or paint or strips of material possessing these essential characteristics may be disposed adjacent the interior of finger grip portion 16. This layer 22 insures a graspable finger grip portion 16 when the shrinking operation is employed by preventing any undesirable surface adhesion. As will be apparent, the length of layer 22 may be varied but preferably extends for a major portion of the selected length of sheet 10. Layer 22, in whatever form ultimately chosen, may be applied to sheet material 10 and secured to the interior surfaces of finger grip portion 16 at any time prior to wrapping sheet material 10 around product 12 and prior to the heat shrinking operation. The teachings of this invention further contemplate the proper application of layer 22 to the opposed surface portion 20 which is to lie adjacent the interior finger grip portion 16. Obviously, this can be accomplished at any time prior to the heat shrinking step. Layer 22 may conveniently embody suitable printed matter in the form of advertising or instructions for opening the packaged product.

In Fig. 4, I have shown another form of packaged product featuring a modified wrapper opening means advantageously employed when the packaged product is subjected to a heat shrinking operation. In all other respects the packaged product illustrated in Fig. 4 is similar to the forms of the invention heretofore described. Accordingly, the material of wrapper 10 may be that employed in the packaged product of Fig. 2; and the encased product may likewise be frankfurters. The heat sealed zone 14 having a width *w*, is again utilized for providing a hermetic juncture between the overlapping marginal edge portions. The protruding end portions of wrapper 10 may be twisted as indicated by numeral 18 in Fig. 1 after or simultaneously with the evacuation of the entrapped air within the packaged product.

The opening means of this embodiment presents a finger-grip portion 26. This finger grip portion 26 includes a length of wrapping material 28 which is part of the outer exposed marginal edge portion and extends from the sealed zone 14. Integral with the extending portion 28 and formed by folding the terminal edge portion thereof, is the super-imposed length of wrapping material 30. After the twisting step performed in accordance with this invention, the interior surfaces of the portion 28 or wrapping material will be adjacent and substantially contacting the outer surfaces of that portion of the wrapping material 10 indicated by numeral 32.

The folding of the length of material 30 into superimposed relationship with the length of material 28 is preferably performed prior to the twisting of the protruding end portions of wrapper 10. If desired, this folding operation can be accomplished after heat sealing the zone 14 or prior thereto, and may even be formed in the sheet of wrapping material 10 upon manufacture thereof or at a time prior to the initial wrapping step. In any event, prior to the desired heat shrinking step employed for the embodiment of Fig. 4, finger grip portion 26 will feature two layers of material 28 and 30 in opposed relationship with that portion of wrapper 10 indicated generally by numeral 32.

Upon subjecting the packaged product to heat shrinking, if such is considered necessary after evacuating air from the package and twisting the protruding end portions of wrapper 10, the latter will conform generally to the contours of the encased product and be substantially without any undesirable wrinkles. However, the duration and extent of this heat shrinking step is of such a nature that the juncture between layer 28 and opposed portion 32 will be substantially unaffected. In this connection, the amount of heat that ultimately reaches this juncture during the heat shrinking step is not sufficient to cause the plasticizers of the contacting surfaces to coact and firmly adhere the two layers 28 and 32 together. The length of material 28 and its superimposed folded portion 30 will in most instances adhere since a sufficient amount of heat will penetrate into the juncture between these two layers.

To remove the wrapper 10 from its product, the protruding end portions may be untwisted or suitably severed. The finger grip portion 26 may then be conveniently grasped and pulled to rupture the heat sealed zone 14.

The finger grip portion 26 may embody suitable indicia by way of advertising or instructions for opening the packaged product. This indicia may be printed or painted directly on or adjacent the finger grip portion 26 or may appear on any parts of the wrapping material 10. Additionally, a pre-formed layer having the desired indicia may be employed for this purpose and be advantageously located with respect to the sheet of wrapping material 10.

It is preferable that the folded portion 30 extend for substantially the entire length of wrapping material 10, but obviously this can be varied as long as the selected graspable finger grip portion is not adversely affected by the heat shrinking step.

It will be understood that in the various forms of my invention I may introduce preservative gases into the packaged product if desirable upon completion of my air-evacuation step. Although the heat shrinking of the packaged product may be eliminated, it is advantageous because it removes undesirable wrinkles in wrapping 10, provides a more positive seal at zone 14, and insures that the protruding end portions of wrapping material 10 will be substantially fixed in their twisted condition by permitting the plasticizers in the contacting surfaces thereof to function and intermix to cause some degree of surface adhesion.

When frankfurters, sausage products or similar shaped articles are packaged, a wrapping band may be used to hold these articles in a predetermined arrangement and prevent sliding of the articles with respect to each other especially during the sheet wrapping step.

It should be understood that modifications may be made in the illustrated and described embodiments of my invention, and therefore the spirit and scope of my invention is defined by the appended claim.

I claim:

A method of making a hermetically sealed packaged product substantially impervious to the ambient atmosphere comprising the steps of: providing a relatively thin, flexible and transparent sheet of wrapping material made of plastic material which seals when two surfaces thereof in contact with each other are subjected to heat and shrinks when subjected to heat; wrapping said sheet around a product to be so wrapped so that edge portions of said sheet are in overlapping relationship so as to provide longitudinally extending underlying and overlying layers and with two portions of said sheet projecting beyond said product; heat sealing the overlapping edge portions together along a longitudinally extending zone defining an enlarged area spaced from the outer exposed edge of the overlying layer; said exposed overlying edge portion of the overlying layer from the sealed zone to the outer exposed edge being provided with a fold along a zone intermediate the exposed edge of the overlying layer and the heat-sealed zone thereby providing a pair of superimposed overlying layers defining a juncture with said underlying layer and thereby providing a longitudinally extending finger-grip flap portion for rupturing the seal at said sealed zone; substantially evacuating the air from the package through one of said projecting portions and closing and sealing said two projecting portions in tightly twisted relationship; and subjecting the sheet to sufficient heat to cause it to shrink substantially uniformly and tightly around the package to substantially eliminate any wrinkles in said sheet and cause said sheet to conform to the contours of said product with said juncture being free from the effects of heat shrinking and with the superimposed layers being independent of the underlying layer

cooperating therewith to define said juncture whereby the finger-grip flap portion remains graspable.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,702,325 | Van Sickels | Feb. 19, 1929 |
| 2,289,668 | Mallory | July 14, 1942 |
| 2,331,762 | Brown | Oct. 12, 1943 |
| 2,400,390 | Clunan | May 14, 1946 |
| 2,545,243 | Rumsey | Mar. 13, 1951 |



| | | |
|---|---|---|
| 2,546,721 | Campbell | Mar. 27, 1951 |
| 2,622,053 | Clowe et al. | Dec. 16, 1952 |
| 2,638,724 | Harvey | May 19, 1953 |
| 2,668,403 | Rumsey | Feb. 9, 1954 |
| 2,776,216 | Thomas et al. | Jan. 1, 1957 |
| 2,816,652 | Clark | Dec. 17, 1957 |

OTHER REFERENCES

"New Cry-O-Vac," Modern Packaging, March 1948, pages 115–118.