June 27, 1972 G. C. WIGGINS 3,672,915

PRESSURE RELEASE VALVE FOR FLEXIBLE POUCHES

Filed April 10, 1970 2 Sheets-Sheet 1

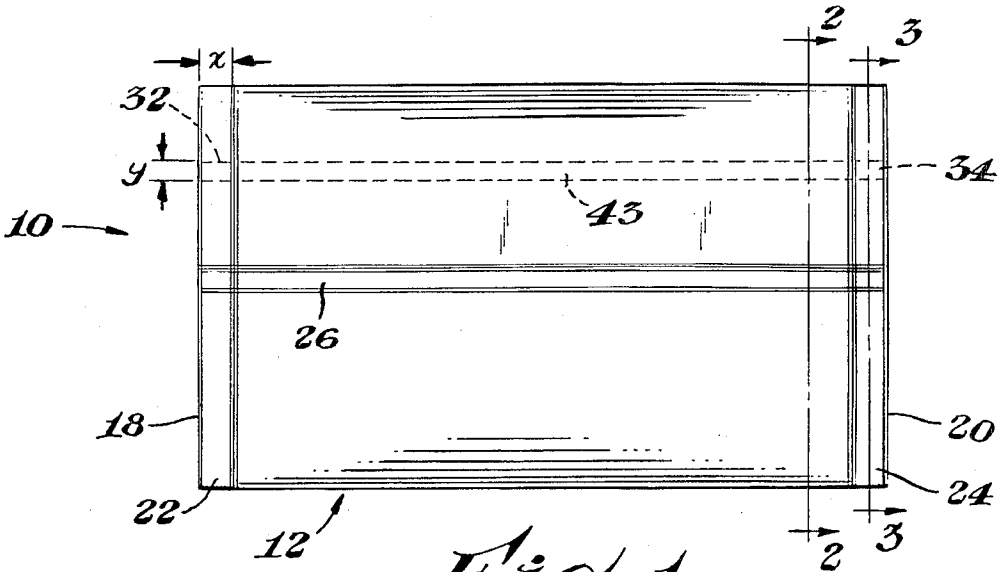


Fig. 1

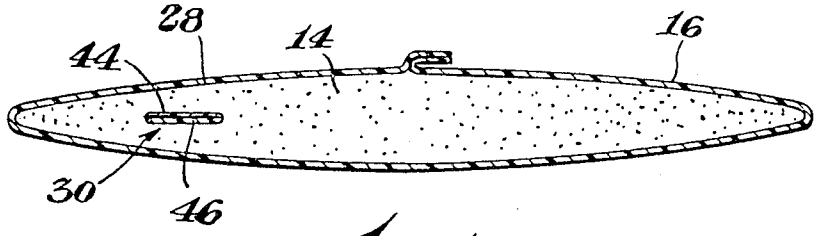


Fig. 2

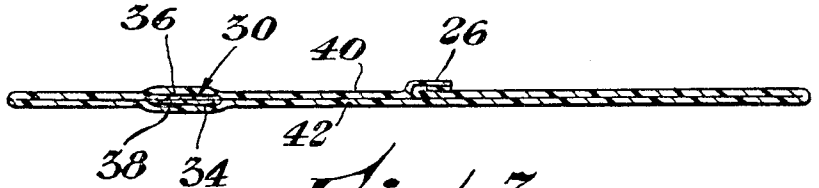


Fig. 3

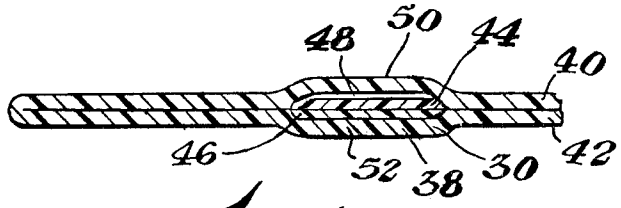


Fig. 4

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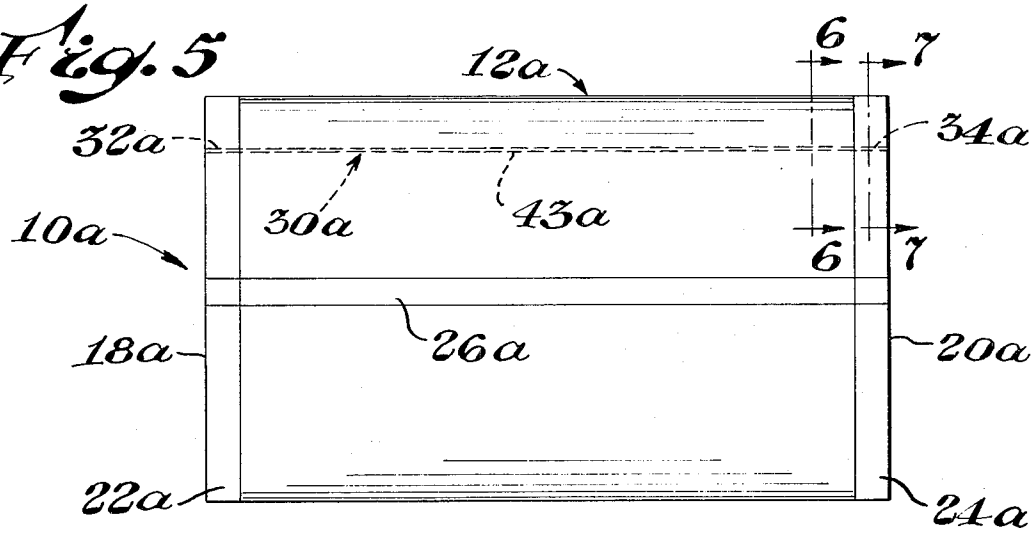
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PRESSURE RELEASE VALVE FOR FLEXIBLE POUCHES

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Fig. 5



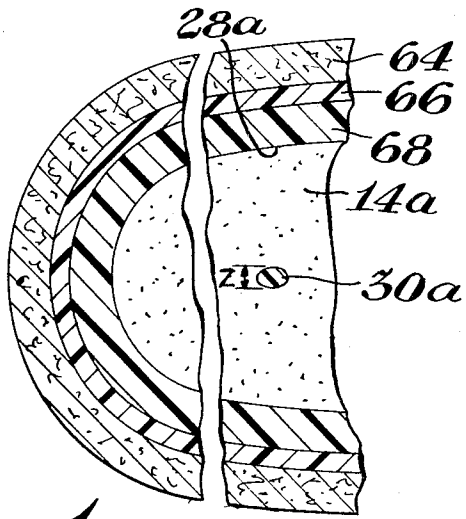


Fig. 6

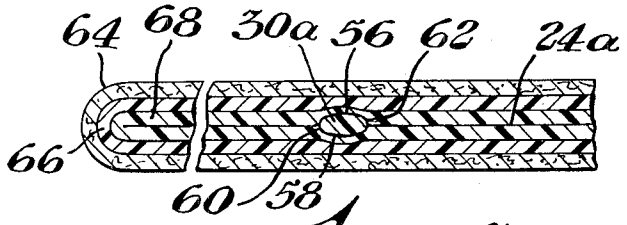


Fig. 7

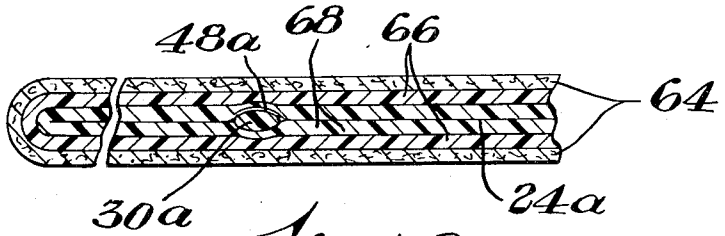


Fig. 8

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3,672,915

PRESSURE RELEASE VALVE FOR FLEXIBLE POUCHES

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Continuation-in-part of application Ser. No. 780,767, Dec. 3, 1968. This application Apr. 10, 1970, Ser. No. 27,412

Int. Cl. B65d *31/14, 85/00*

U.S. Cl. 99—171 LP 15 Claims

ABSTRACT OF THE DISCLOSURE

In a package including a flexible pouch, the pouch normally comprising a tubular body and strip seals closing the opposite ends of the tubular body, the improvement of which comprises, a one way pressure release valve comprising an interiorly disposed element such as a monofilament or strand anchored its opposite ends, respectively, by securement with the layers of the pouch at the strip seal areas. A valving or venting action occurs when a face region of one of the element ends releases from the adjacent layer in the seal.

This is a continuation-in-part application of my copending application Ser. No. 780,767, filed Dec. 3, 1968, now U.S. Patent 3,512,632.

DESCRIPTION OF THE INVENTION

The packaging of whole or ground coffee beans in flexible pouches in particularly troublesome because the product emits large quantities of carbon dioxide and small quantities of other gases. These gases can create internal pressures of a degree sufficient to burst even those pouches constructed of the strongest practical materials. The gases are produced during the processes employed to roast the beans and are trapped under pressure in small cells in the bean structure. With whole coffee beans, diffusion of the gases from the cells is relatively slow. Grinding opens up the cells allowing the bases to escape at a more rapid rate.

Purging methods can be employed whereby the gases are substantially driven off from the product prior to its being placed in the pouch. Venting the pouch, as for example, by perforating a wall of the same, is another somewhat more obvious solution to the problem. In the former, the expense of purging is a drawback, while in the latter, it is impossible to control the internal environment of the package due to the perforate nature of the pouch. Oxygen and moisture vapor entering through the perforations effects a more rapid deterioration of the product which is recognized by consumers as "staleness" in the brewed beverage.

Accordingly, it is an object of the present invention to provide a package suitable for containing ground or whole coffee beans and like products which are characterized in that they emit gases and/or vapors.

It is a further object of the present invention to provide an improved pouch construction suitable for the packaging of whole or ground coffee beans and like products, wherein the pouch has integrally formed therein a one way pressure release valve operable to rid the package of built-up or excess gases.

Still another object of the present invention is to provide such a pouch wherein the cost of the same is maintained at a minimum such that the pouch is commercially attractive.

Yet another object of the present invention is to provide a package generally of the type indicated wherein a monofilament or strand is incorporated into the package construction to achieve such desirable improvements.

Briefly then, the present invention relates to a package of the type employing a pouch or bag constructed of flexible film or sheet, and more particularly to an improvement thereof wherein the package is fitted with a one-way pressure release valve for purposes of adapting the package for usage in handling gas or vapor dissipating products, as for example, roasted coffee beans in either ground or whole form. Normally the pouch comprises a tubular body secured closed at each end by strip seals (i.e., relatively wide seals). An element such as a floating ribbon or alternately a strand or monofilament is disposed within the pouch and is anchored at each end, respectively, by securement with the pouch layers at the strip seals. The opposite faces of the element each form an interface with the pouch layer adjacent thereto, and more specifically, that layer comprising the inner surface of the pouch. Each of these interfaces comprises a potential pressure release valve, and at least one is designed to release at an internal pressure below that at which the pouch would normally burst were it not for the provision of such a valve. Such release properties can be achieved by forming the element of a material characterized in that does not bond or seal as strongly to the inner surface material as does the inner surface material bond or seal to itself. The valve is substantially one way as will be explained in more detail hereinafter.

Yet additional objects and advantages of the present invention, and its numerous and cognate benefits, are even more apparent and manifest in and by the ensuing description and specification taken in conjunction with the accompanying drawing, in which, wheresoever possible, like characters of reference designate corresponding material and parts throughout the several views thereof in which:

FIG. 1 is a top view of a package having integrally formed therein a one way pressure release valve constructed according to the principles of the present invention;

FIG. 2 is a cross-sectional view of the package of FIG. 1 taken along reference line **2—2** thereof;

FIG. 3 is a cross-sectional view of the package of FIG. 1 taken along reference line **3—3** thereof;

FIG. 4 is a view like FIG. 3 only enlarged and fragmented and showing the pressure release valve activated whereby internal pressures are allowed to escape from the confines of the package to the atmosphere;

FIG. 5 is a view like FIG. 1, but shows a package construction comprising a modified form of the invention;

FIGS. 6 and 7 are enlarged fragmentary cross-sectional views of the package of FIG. 5 taken along reference lines **6—6** and **7—7**, respectively, thereof; and

FIG. 8 is a view like FIG. 7 only showing the pressure release valve activated.

Referring now more particularly to the drawings, there is shown in FIG. 1, a package **10** of generally "pillow" like configuration and including a pouch **12**. A product **14** is hermetically enclosed within the pouch **12**. Product **14** can represent, for example, ground or whole coffee beans or a like product characterized in that it emits gases and/or vapors.

The pouch **14** generally comprises a tubular body **16**. The opposite ends **18** and **20** of the tubular body **16** are secured closed along first and second edgewise disposed strip **22** and **24**, respectively, to provide the desired hermetically tight enclosure about product **14**. More specifically, strip seals **22** and **24** extend edgewise across the width of pouch **12** uniting or sealing together therealong the pouch layers **40** and **42**. With seals **22** and **24** in generally planar alignment with each other as shown in the drawings, the tubular body **16** of package **10** assumes a generally flatwise disposed configuration. If desired, the

seals 22 and 24 can be non-aligned, as for example, by forming the seals along planes at right angles to each other whereby the tubular body 16 shapes up somewhat differently in what can be described generally as a tetrahedral configuration (not shown).

Tubular body 16 can be formed from extruded tubular material, or from two webs of film or sheeting placed in superposed relationship and edgewise sealed together to form a tubular shape. Conventionally, however, packages of this sort are formed from a single web of material which is wrapped around a hollow mandrel such that the opposite edges of the web overlap each other.

The tubular body 16 is then formed by joining or sealing together the overlapped edges of the web. It is customary to locate the seam along a center portion of the package as depicted by center seam or seal 26 of package 10, as is best illustrated in FIG. 1. A conventional method of continuously forming and filling packages of the sort described above is set out in some detail in U.S. Pat. Nos. 2,260,064 and 2,257,823. Therein sophisticated package designs are illustrated where, for example, the tubular body is formed with inverse folds or gussets along the opposite sides thereof. Such designs can be employed in conjunction with the teachings of the present invention where suitably modified to conform to the principles thereof.

The material or web used to form the pouches of the present invention can comprise either single or multi-ply films or sheet material. In either case, the inner surface 28 of the pouch 14 comprises a material that can seal or bond to itself when subjected to applications of pressure and/or heat, as for example, when subjected to the usual heat sealing or ultrasonic sealing techniques.

Disposed in package 10 is a ribbon 30 which extends from one end 18 of the tubular body 16 to the opposite end 20 thereof. The opposite ends 32 and 34 of ribbon 30 are flatwise secured with layers 40 and 42 of pouch 12 in the strip seals 22 and 24 as shown in FIG. 3. The ribbon ends 30 and 32 extend substantially through the width of seals 22 and 24, respectively, with the width measurement being designated by the reference letter X in the drawings. Each ribbon end at its opposite surfaces or faces forms an interface with the inner surface 28 of the pouch 12, these interfaces being designated by reference numerals 36 and 38 for the ribbon end 34 which is secured in seal 24. Ribbon 30 can be characterized as a "floating" ribbon since the middle or intermediate portion 43 thereof is preferably free of an attachment to the pouch 14, the only attachment being at the ends 32 and 34 of the ribbon as is described more fully hereinafter.

Ribbon 30 can comprise a thermoplastic strip material formed of either single or multi-ply construction. The latter structure si shown in the drawings including a first ply 44 associated with interface 36, and a second ply 46 in intimately joined relationship with the first ply 44 and associated with interface 38. At least one of the plies 44 or 46 of the ribbon 30 is composed of a material dissimilar to the material forming the inner surface 28 of the pouch 14.

By a dissimilar material it is meant that the compatibility of such material to the inner surface 28 material is of a lesser degree than the compatibility of the inner surface 28 material to itself. Thus, when internal pressure from "built-up" gases and/or vapors becomes too great, the interface portion of the seal releases due to its lesser degree of bonding strength whereby an opening or port 48 to the atmosphere is provided, as is shown by the "blown" interface 36 in FIG. 4. Where both faces of the two ribbon ends comprise a dissimilar material of the class described hereinbefore, there is in effect four potential pressure release points or valves each corresponding to one of the four interfaces mentioned above.

The reason the valve construction of the present invention does not permit any substantial amounts of gas and vapor to enter the package is thought to reside in several factors. During the forming of seals 22 and 24, it is known that the heat and pressure applied causes thermal plasticity and flowing between the opposite faces or the ribbon ends and the inner surface 28. An extremely tight intimate fit is thereby thought to be obtained at the four interfaces of a block or nearly block tolerances. That is, the surfaces forming these interfaces tend to cling to each other to prevent the inward penetration of gases once the pressure equilibrium is established. The natural resilience or memory oftentimes inherent especially in thremoplastic materials is also thought to play a part. In other words, layers 40 and 42 seem to form lips 50 and 52 about the ribbon ends 32 and 34 that apparently tend to close once the excess gases have escaped. Obviously, some materials have more of this character (i.e., resilience or memory) than others. Pouches 14 having paper exteriors and thermoplastic interiors or inner surfaces 28 seem to function well in this regard, and the relatively stiff quality of such pouch materials seems to be a major contributing factor in obtaining a maximum degree of closure of lips 50 and 52 about ribbon ends 32 and 34. Correspondingly, thermoplastic materials like polypropylene or polyethylene terephalates which are relatively stiff, hard thermoplastics in comparison to those of a "limp," soft nature such as low density polyethylene, are most beneficially employed to form the exterior of pouches 14.

Oftentimes, the stiffer, hard thermoplastic material such as the aforementioned polyethylene terephthalates, are highly crystalline in structure and exhibit a relatviely sharply defined melting point. Accordingly, the temperature range at which these materials seal to themselves, or to materials they are compatible with, is usually quite narrow. To obtain a more practical temperature sealing range, such materials can be coated on one side with materials that seal at a relatively wider range of temperatures as for example, a low density polyethylene which would form the inner surface 28 of the pouch 14. Intermediate or core plies or coatings of barrier material to minimize gas and vapor transmission rates through the walls of pouch 14 can also be employed in combination with the foregoing exterior and interior constructions as will be discussed more fully hereinafter.

At least one face or side or ribbon 30 can also comprise a material generally considered as non-compatible with the material comprising the inner surface 28 of pouch 12. For example, an aluminum coating or foil is generally considered non-compatible (that is, non-heat sealable) with polyethylene, a material suitable for forming the inner surface 28. It has been found in practice, however, that some clinging, be it an actual fusing or bonding together or not, does appear to occur between a ribbon end of metal foil and a polyethylene inner surface 28. A tight fit at the interface is also seemingly obtained by the aforementioned action of "flow" whereby at least close to gauge block tolerances between the aluminum face and the inner surface 28 of the pouch seemingly results.

For exemplary purposes, a suitable width Y dimension for ribbon 30 is usually in the range of from about 1/32 of an inch to about 1 inch, with the most preferred range being from about 1/16 of an inch to about 3/4 of an inch. A ribbon thickness in the range of between about 0.3 mils to about one mil is generally satisfactory.

As a general relationship, all other things being equal, the wider the ribbon the lower the internal pressure at which the interface releases.

As a particular illustration of the invention, pouch 12 is formed of a laminate construction comprising a paper/low density polyethylene/saran (a polyvinylidene chloride/vinyl chloride copolymer)/low density polyethylene combination with the polyethylene side of the laminate forming the inner heat sealable surface 28.

Ribbon 30 in conjunction with a tubular body 16 having a polyethylene inner surface 28 can comprise, as for examples only, saran, plasticized polyvinyl chloride,

cellophane (regenerated cellulose), polyethylene terephthalate or a like material generally characterized as having less compatibility to polyethylene than does the polyethylene have to itself. Laminated combinations of materials corresponding to plies **44** and **46** can also form ribbon **30**, as for example, a cellophane ribbon coated on one side with saran. If only two pressure release points are desired, the cellophane can be coated on one side with polyethylene, or in more general terms, the same material as comprises the inner surface **28** of the pouch which in this case happens to be polyethylene. This latter arrangement wherein only two pressure release points are formed is the most preferred form of the invention. In this preferred construction, one side or face of both ribbon ends (in the above illustration the polyethylene face) is securely attached to the inner surface **28** to positively avoid a "pull-out" of the ends **34** and **36** from the seal occasioned by abusive or rough handling as is frequently normal procedure in package distributions and sales.

By way of still further illustrations of the present invention, a suitable two-pound coffee package **10** includes a pouch **14** fabricated from fourteen-inch wide web stock. The web comprises a plurality of layers of materials arranged in relation to each other in the following order: a layer of kraft paper, either plane or super calendered, having a weight basis of 25 pounds per 3000 sq. feet; a polyethylene layer, thickness 1.75 mils, density 0.930, melt index 3.8; a layer of a copolymer of 72 weight percent ethylene, 28 weight percent vinyl acetate, thickness 0.15 mil, melt index 3.0; a layer of saran, thickness 0.25 mil, having a formulation comprising 93.75 parts by weight of a copolymer of 85 weight percent vinylidene chloride and 15 weight percent vinyl chloride and mixed with 4.50 parts by weight acetyltributyl citrate, 1.00 part by weight of an epoxidized soyabean oil commercially available under the trade designation of Paraplex G–60, 0.75 part by weight of 4-tertiarybutyl salol; a layer of a copolymer of 72 weight percent ethylene, 28 weight percent vinyl acetate, thickness 0.15 mil, melt index 3.0; a polyethylene layer, thickness 1.75 mils, density 0.930, melt index 3.8.

The last-mentioned polyethylene layer forms the inner heat sealable surface **28** of pouch **14**. The plastic portion of the laminate (excluding the exterior layer of kraft paper) can be prepared by conventional coextrusion techniques, as for example, a technique like that illustrated in Belgian Pat. No. 683,208, French Pat. No. 1,484,153, Italian Pat. No. 771,743, Mexican Pat. No. 88,521, and Spanish Pat. No. 328,596.

The foregoing patents teach, in some depth, various formulations and preparations for multi-layered films having a common ply or layer arrangement of polyethylene/saran/polyethylene or polyethylene/adhesive/saran/adhesive/polyethylene whereby a film highly beneficial for packaging coffee and like products is obtained. Such films can be combined with the kraft paper layer by suitable and conventional methods, as for example, by employing a suitable glue layer such as a polyethyleneimine.

In conjunction with a pounch **14** construction as described above, a suitable ribbon **30** comprises a saran substrate or ply **44** coated on one side with a copolymer of 72 weight percent ethylene, 28 weight percent vinyl acetate. Still more specifically, one example of a suitable formulation for the saran ply **44** is 93.275 parts by weight of a copolymer of 85 weight percent vinylidene chloride and 15 weight percent vinyl chloride, and mixed with 4.5 parts by weight of acetyltributyl citrate, 1 part by weight Paraplex G–60, 0.75 part by weight tertiarybutyl salol, 0.10 part by weight finely divided tetrasodium pyrophosphate, and 0.375 part by weight of a mixed fatty acid amide containing a major portion of stearamide. A proper ribbon **30** thickness is in the range of from about .5 mils to about one mil with the saran ply **44** comprising from about 75 percent to about 93 percent of the total thickness of the ribbon. A satisfactory width Y for ribbon **30** is between from about ¼ to about ½ inch. Seals **22** and **24** closing the ends **18** and **20** of the package are suitably formed by applications of pressure and heat with X dimension of the same measuring approximately ½ inch. In the foregoing example, the saran face of the ribbon ends **32** and **34** comprises the release material, while the ethylene-vinyl acetate copolymer faces of ends **32** and **34** form a tight or strong bond with the inner surface **28** to positively insure against a "pull-out" of one of the ribbon ends from the seal as was discussed generally above.

As yet another illustration of the present invention, a suitable pouch **14** for use in packaging **2** pound lots of ground coffee beans is formed of a multilayered film comprising a 1.25 mil thick exterior layer of polypropylene, a 0.10 mil thick core layer of saran, and a 0.5 mil thick inner surface **28** layer of low density polyethylene. A saran/ethylene-vinyl acetate copolymer ribbon **30** of the character as set out specifically above is beneficially employed in combination with the aforementioned package construction to obtain the desired pressure release valve of the general type disclosed hereinbefore.

Referring now to FIGS. 5–8, the same show a modified form of the invention comprising a package **10***a* including a pouch **12***a* of preferably multilayer construction, as will be described more fully hereinafter. The valve of package **10***a* includes a strand **30***a* comprising preferably a monofilament or a plurality of filaments or fibers desirably tightly bonded together such as to form a unitary body of material. The cross section of strand **30***a* is preferably oval, but the same can be circular, for example, or even might be tubular in shape. An oval or circular strand of solid material as opposed to tubular or like construction, however, is most desirably employed and preferably comprises a thermoplastic material such as saran; a polyamide such as nylon 6 or nylon 11; a polyester such as polyethylene terephthalate (Mylar®); or an olefin such as polyethylene depending on the material comprising the inner surface **28***a* of pouch **12***a*, as explained above.

Referring now to FIG. 8, it can be observed that end portions **32***a* and **34***a* of strand **46***a*; that is, the portion of the strand **30***a* in the vicinity of seals **22***a* and **24***a*, is of a more flattened out configuration than mid-region portions **43***a* of the strand, as the later is best shown in FIG. 6. This beneficial result is affected by heat and/or pressure deformation of the ends **32***a* and **34***a* accompanying the formation of seals **22***a* and **24***a* such as by heat and/or pressure, and is realized in instances where strand **30***a* construction comprises a thermoplastic type material. Somewhat larger strand face regions **56** and **58** are thereby provided that more easily enable the valve to controllably release at the desired level of internal pressure within pouch **12***a*. In addition, end portions **32***a* and **34***a* tend to embed in the pouch material as a result of the application of heat and/or pressure in forming seals **22***a* and **24***a*. This, in turn, squeezes or forces heat sealable material from an area initially disposed immediately adajcent the opposed face regions **56** and **58** of strand **30***a*, to an area more adjacent the side portions **60** and **62** thereof such that the pouch hermetically seals peripherally about end portions **32***a* and **34***a*.

As indicated above, the material comprising pouch **12***a* is preferably a laminate or multilayer structure and can be similar to that described for pouch **10** such as for applications for packaging coffee products, for example. Pouch **12***a*, therefore, might comprise an exterior or outer layer **64** of paper or alternately a plastic material such as cellophane. In addition, and for exemplary purposes only, a polyamide such as nylon 6 or nylon 11, or a polyester such as polyethylene terephalate might desirably comprise exterior layer **64**. An intermediate layer **66** of pounch **12***a* preferably comprises a barrier material such as a layer or coating of saran. Normally, this layer will be proportionately thinner than exterior layer **64**, as is generally indi-

cated in the drawing. The inner heat sealable layer **68** of pouch **12***a* desirably comprises, for example, a low density polyethylene material.

As a specific example, a suitable pouch **12***a* for packaging coffee products can, therefore, comprise an exterior layer of paper such as 25 lb. plain or calendered kraft paper. This layer in turn can be adhered to a coating or thin layer of saran of approximately ½ mil thickness. Heat sealable layer **68** can be a low density polyethylene of preferably about 2 to 4 mils in thickness. The polyethylene and saran layers, for example, can be simultaneously extruded to form a multilayer film which can then be attached to the exterior layer **64** such as by means of a suitable glue layer (not shown). Alternately, the separate layers for pouch **12***a* or at least exterior layer **64** can be left free of layers **66** and **68** except at the seal regions **22***a*, **24***a* and **26***a*.

Yet another desirable embodiment for pouch **12***a* might be a cellophane coated saran comprising layers **64** and **66** and available from the Avisco Division of FMC Corp., under the trade designation RS 18. A polyethylene inner layer, for example, could then be combined by a glue layer to the coated side of the cellophane.

A suitable strand **30***a* for use with the aforementioned pouch **12***a* constructions including a heat sealable layer **68** of low density polyethylene, for example, can comprise a monofilament of saran, preferably oval or circular in cross sectional shape. The vertical height Z of such a monofilament, as is denoted in FIG. 6, would most desirably be in a range of from about .5 to 40 mils. Normally, a polyethylene heat sealable layer **68** of about 2 to 4 mils in thickness, for example, could accommodate a monofilament having a Z dimension in the range of approximately between about 1 to about 10 mils, depending, of course, on the extent the monofilament flattens out in the region of seals **32***a* and **34***a*. As a general rule, the smaller the filament diameter, the greater the pressure that will be required to release the valve. Desirably, the monofilament would be received in seals **32***a* and **34***a* without the filament "breaking through" to barrier layer **66** during the formation of the seals.

However, as a related concept, the monofilament might advantageously be designed to break through to barrier layer **66** such that opposite faces **56** and **58** of the same would then seal or cling to the barrier layer. Barrier layer **66** in such instances would thus form the inner surface **28***a* of pouch **12***a* in the regions of contact between the barrier layer and monofilament. That is, in the region adjacent opposite faces **56** and **58** of end portions **32***a* and **34***a*. This would permit the monofilament to comprise a material similar to heat sealable layer **68** such as, for example, a monofilament comprised of polyethylene. The region of attachment between such a polyethylene monofilament and barrier layer **66** where the latter comprises a saran, for example, would therefore provide a weak point for obtaining the desired valving action. However, along side regions **56** and **58**, a polyethylene monofilament could generally tightly bond to a polyethylene heat sealable layer **68**, for example, to more positively prevent the monofilament from accidentally "pulling out" from either seal **32***a* or **34***a* such as when the package is handled roughly or abused during shipment or the like. Alternately, strand **30***a* might desirably comprise several filaments, at least one of which comprises a material which tightly bonds together with pouch **12***a* to prevent pull out of the strand from the seal region.

FIG. 8 shows the vent or opening **48***a* formed at one face **56** of strand **30***a* on release from the adjacent pouch layer, whereby package **10***a* provides a valving action in a manner as indicated generally with regard to package **10**.

While certain representatives embodiments and details have been shown for the purpose of illustrating the invention it will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope of the invention. Such changes can be in other structures and materials which serve to achieve the principles of this invention.

Accordingly what is claimed as new is:

1. In a package wherein there is provided a pouch constructed of flexible material and which is sealed closed substantially hermetically tight and contains a product therewithin, the seals of the pouch comprising first and second generally edgewise disposed seals joining together the layers of the pouch at respectively positioned edge portions thereof, the product at least in its initial condition within said pouch being characterized by its diffusion of gases and/or vapors in sufficient quantities to inflate said pouch if permitted to remain therewithin, the improvement of which comprises, a pressure release valve comprising a thread-like element of substantially non-wicking character disposed interiorly within said pouch, the opposite ends of said element being secured in said seals with one of said opposite ends being in said first seal and the other of said opposite ends being in said second seal, the middle portion of said element extending continuously between said first and second seals, the degree of adherence between a portion of one of said ends and said pouch being less than that in regions of said seal where areas of the inner surface of said pouch are joined together, said portion being operable to release from the pouch responsive to pressure build-up of said gases and/or vapors and to form a vent to release the same to the atmosphere.

2. The package of claim **1** wherein said product comprises roasted coffee beans in either ground or whole form.

3. The package of claim **2** wherein said element is anchored at each end in said first and second seals, respectively, with the middle portion of the element being free of the pouch so that said middle portion is floating between said seals.

4. The package of claim **3** wherein said element comprises a monofilament.

5. The package of claim **4** wherein said monofilament is generally oval in cross-sectional configuration.

6. The package of claim **4** wherein said monofilament is generally circular in cross-sectional configuration.

7. The package of claim **4** wherein said monofilament is generally tubular in cross-sectional configuration.

8. The package of claim **2** wherein said element comprises a plurality of filaments.

9. The package of claim **8** wherein said filaments are tightly bonded together to form an element of substantially unitary structure.

10. The package of claim **2** wherein said element comprises a plurality of fibers.

11. The package of claim **10** wherein said fibers are tightly bonded together to form an element of substantially unitary structure.

12. In a package including a pouch constructed of flexible material and forming a substantially hermetically tight enclosure about a product, the pouch comprising an envelope and first and second seals joining together the layers of said envelope at edge regions thereof, respectively, so as to close said edge regions, said product at least in its initial condition within said pouch being characterized by its diffusion of gases and/or vapors in sufficient quantity to inflate said pouch if permitted to remain therewithin, a pressure release valve comprising a thread-like element of substantially non-wicking character disposed within said pouch and extending between said first and second seals, the opposite ends of said element being secured in said seals with one of said ends being in said first seal and the other of said ends being in said second seal, whereby said ends, respectively, engage the inner surface of said envelope and are attached thereto, the degree of adherence between a portion of at least one of said ends and said inner surface being less than the adherence

in regions of said seal where areas of said inner surface are joined together, said portion extending substantially through said seal.

13. The package of claim 12 wherein said product comprises roasted coffee beans in either ground or whole form.

14. The package of claim 13 wherein the middle portion of said element floats between the anchored ends of the element.

15. The package of claim 14 wherein said element comprises a monofilament.

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