

June 11, 1968

R. L. BUTLER

3,387,640

TOBACCO POUCH

Filed Aug. 2, 1965

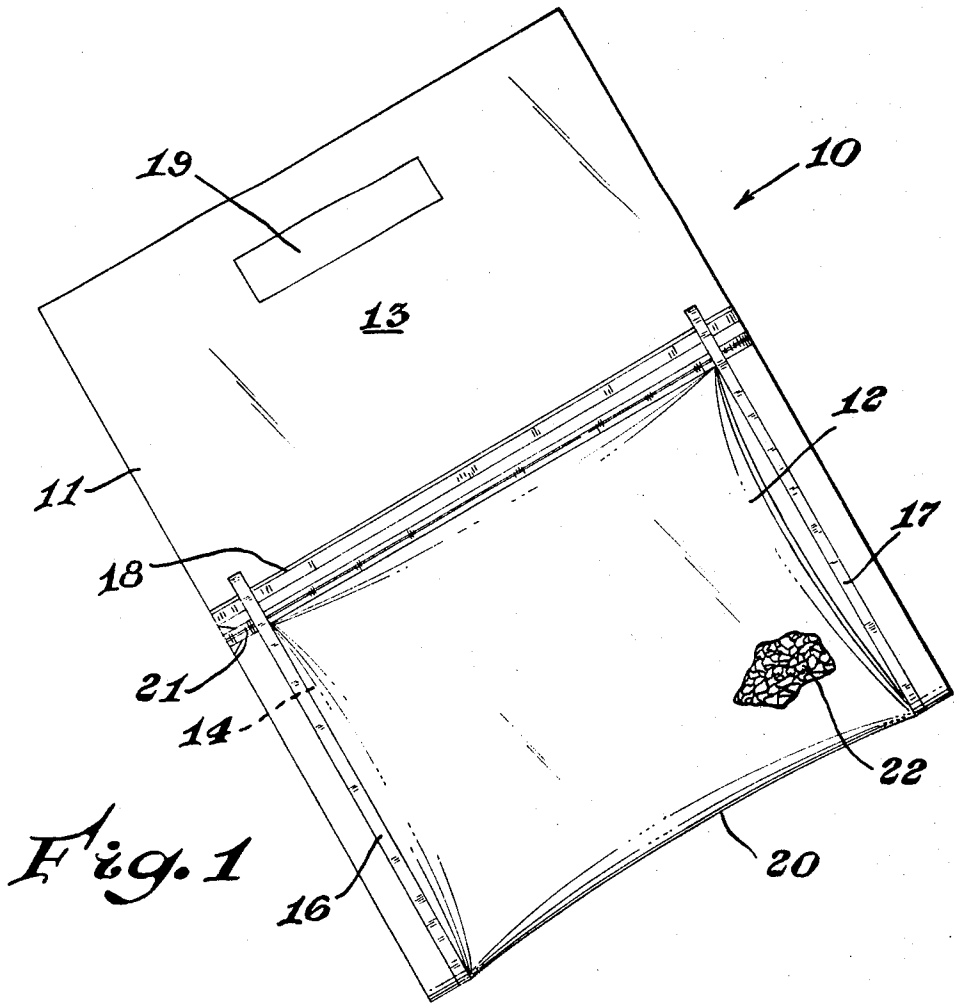


Fig. 1

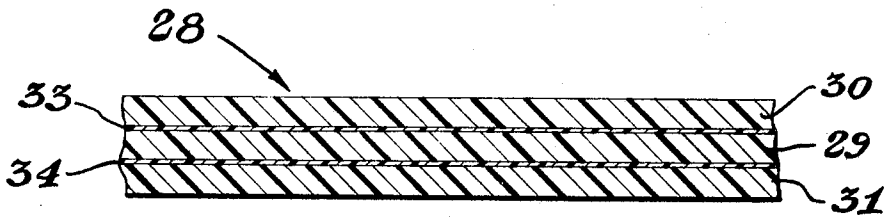


Fig. 2

INVENTOR
Russell L. Butler

BY *Robert B. Ingoshan*
AGENT

1

3,387,640

TOBACCO POUCH

Russell L. Butler, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed Aug. 2, 1965, Ser. No. 476,484

5 Claims. (Cl. 150-7)

ABSTRACT OF THE DISCLOSURE

An improved tobacco pouch being generally of conventional construction but having a tear strip and prepared from a composite thermoplastic resinous film, the film having at least five layers, two outer layers of a heat sealable polyolefin such as polyethylene, and an inner layer comprising a synthetic barrier resin which is a barrier for water vapor and oxygen.

This invention relates to the packaging of tobacco and an improved tobacco package and pouch, wherein the pouch is of synthetic resinous thermoplastic material.

In a tobacco pouch, certain characteristics are oftentimes desirable such as barrier properties to prevent the tobacco contained therein from losing moisture and becoming dry. Further a tobacco pouch or tobacco package, of the pouch type, should maintain its barrier characteristics as the contents are used and are carried about in the user's pocket. Many tobacco pouches fail on creasing and a substantial portion of the barrier property is lost. Oftentimes tobacco pouches or pouch type packages, which employ relatively rigid materials such as paper, metal foil and the like are undesirable because of the stiffness and noise produced when the pouch is moved or opened by the user. Oftentimes tobacco pouches are wholly opaque or translucent and do not afford means of viewing the contents.

It would be beneficial if there were available an improved tobacco pouch of the package variety which would prevent loss of moisture from the tobacco contained therein under normal storage condition. Further it would be advantageous if such a pouch were of a flexible material having a relatively soft hand. It would also be advantageous if such a pouch were wholly or partially transparent. It would also be advantageous if there were available a tobacco pouch of the type which could be used as a single use package or be reused several times.

These benefits and other advantages, in accordance with the present invention, are achieved in a tobacco pouch, in accordance with the present invention, which comprises a flexible synthetic resinous thermoplastic film having a thickness of from about 1.2 to about 8 mils, the film defining a first panel and a second panel, the first panel being substantially greater in size than the second panel, the first panel having a first end or pouch end and a flap, the second panel being affixed to the pouch end of the first panel and defining a hermetically sealed space therebetween, adapted to contain tobacco, a tear strip within the second panel adjacent the flap end of the first panel, the tear strip being disposed adjacent the bottom of the pouch thereby providing means to sever the second panel adjacent the flap portion of the first panel, wherein the film of the first and second panel comprises a plurality of layers, the outer or surface layers being a polyolefin and at least one inner layer is a barrier for water vapor, oxygen and the like.

Pouches, in accordance with the present invention, are readily prepared utilizing a variety of synthetic resinous materials, however, it is essential and critical that the material from which the tobacco pouch of the present invention is formed be a synthetic resinous film or sheet having a thickness of from about 1.2 mils to about 8

2

mils and preferably having a thickness of from about 2 to about 6 mils. When this material from which the pouch or package is formed is thinner than about 1.2 mils there is a relatively undesirable, flimsy flap end and the pouch does not offer sufficient mechanical protection for the tobacco or the desirable durability when carried by the user. When the thickness of the film exceeds about 8 mils, it is too stiff for convenience and handling, and oftentimes is uncomfortable for the user. Beneficially, films having a thickness of from about 2 to about 6 mils are preferred wherein the resultant package is neither too stiff nor too limp and provides adequate mechanical protection for the material therein. Advantageously, the film or sheet utilized in preparing the packages comprises at least three layers of synthetic resinous thermoplastic material. Beneficially, each of the layers is transparent to afford ready inspection of the product contained therein without the necessity of breaking the hermetic seal. Alternatively opaque film may be employed. The inner or central layer of the film is formed from an oxygen and moisture vapor barrier resin such as halogenated hydrocarbon resins such as polymers of vinylidene chloride containing minor proportions of other monomers copolymerizable therewith.

By the term "polyolefin" is meant polyethylene, polypropylene, resinous copolymers of ethylene and propylene, copolymers of ethylene and/or propylene with minor proportions of olefinically unsaturated monomers such as, for example, those alpha-olefins having from 2 to 8 carbon atoms such as 1-butene, 1-pentene, 1-hexene, 1-heptene, 1-octene and mixed higher alpha-olefins. Other hydrocarbons useful for making copolymers with ethylene and propylene include divinylbenzene, allene, dimethylallyl, and isopentene. Comonomers which can broadly be used include mono-substituted ethylenes such as 1-pentene, vinylcyclohexene, allyl benzene, C₈-C₁₄ mixed alpha-olefins, styrene, allyl naphthalene, and the like, 1,1-disubstituted ethylenes such as alpha-methyl styrene, 2-methylbutene-1, mixed alpha- and beta-pinenes, camphene and the like, 1,2-disubstituted ethylenes such as indene, acenaphthylene, cyclopentene, norbornylene, cyclohexene, trans-stilbene, 2-pentene and the like, conjugated dienes and trienes such as pentadiene-1,2, 1,2-dihydrobenzene, allo-ocimene, and cyclopentadiene, unconjugated dienes such as mixed octadienes, hecadiene-1,5, 2,5-dimethyl-hexadiene-1,5, 1,4-dihydrobenzene, bicycloheptadiene, bicyclopentadiene, 4-vinylcyclohexene-1, and 4,7-diphenyl decadiene-1,9, acetylenes such as isopropenyl acetylene and phenyl acetylene, chloroolefins such as beta-methylallyl chloride and chloromethyl norbornylene, and m-chlorostyrene, ethers and epoxides, esters such as vinyl butyrate, vinyl acetate, and methyl acrylate, and nitrogen compounds such as vinyl carbazole, 4-vinyl pyridine and acrylonitrile, and mixtures and blends thereof.

A wide variety of barrier materials may be employed in the central layer of films in accordance with the present invention. Particularly suited as barrier layers are combinations of vinylidene-chloride polymers, vinyl-chloride polymers, vinylidene-fluoride polymers and extrudable mixtures thereof. The requirement for the central layer is that the material be extrudable within a sheath of another polymer and that the composition have the desired gas and moisture vapor transmission barrier characteristics.

Particularly advantageous and beneficial are extrudable compositions of vinylidene-chloride polymers, wherein the polymers contain at least about 70 weight percent vinylidene-chloride, the remainder being one or more olefinically unsaturated monomers copolymerizable therewith. Suitable vinylidenechloride copolymers are prepared utilizing such comonomers as methyl, ethyl, isobutyl, butyl, octyl and 2-ethylhexyl acrylates and methacrylate; phenyl methacrylate, cyclohexyl methacrylate, p-cyclo-

hexylphenyl methacrylate, chloroethyl methacrylate, 2-nitro-2-methylpropyl methacrylate, and the corresponding esters of acrylic acid; methyl alpha-chloroacrylate, octyl alpha-chloroacrylate, methyl isopropenyl ketone, acrylonitrile, methacrylonitrile, methyl vinyl ketone, vinyl chloride, vinyl acetate, vinyl propionate, vinyl chloroacetate, vinyl bromide, styrene, vinyl naphthalene, ethyl vinyl ether, N-vinyl phthalimide, N-vinyl succinimide, N-vinyl carbazole, isopropenyl acetate, acrylamide, methacrylamide or monoalkyl substitution products thereof, phenyl vinyl ketone, diethyl fumarate, diethyl maleate, methylene diethyl malonate, dichlorovinylidene fluoride, dimethyl itaconate, diethyl itaconate, dibutyl itaconate, vinyl pyridine, maleic anhydride and allyl glycidyl ether. Commercially available light stabilizers may also be incorporated in the vinylidene chloride material such as tertiary-butyl salol. Other barrier compositions which may be used with benefit in films in accordance with the present invention are vinyl chloride polymers which contain a predominant amount of vinyl chloride therein and beneficially, fluorocarbon polymers, fluorohydrocarbon polymers and fluorohalohydrocarbon polymers may also be used with benefit. Such materials as polyvinyl chloride, polyvinylidene fluoride, chlorinated polyethylene and polymers of such materials as vinylidene fluoride, vinylidene fluoride and chlorotrifluoroethylene, chlorotrifluoroethylene and vinylidene fluoride, chlorotrifluoroethylene and vinyl chloride, chlorotrifluoroethylenevinylidene fluoride and tetrafluoroethylene and the like. Generally, for economic reasons, the vinylidene chloride polymers are employed, as they are most readily available at relatively low cost.

In the extrusion of the vinylidene polymers, it is frequently advantageous and beneficial to incorporate therein a minor portion of a plasticizer, oftentimes a heat stabilizer and a light stabilizer. Such additives are well known in the art and generally are found advantageous in that the temperature required for the extrusion is substantially reduced and the probability of decomposition of the polymer in the extruder is lowered. Typical plasticizers which are employed in the vinylidene or Saran combinations are acetyl tributyl citrate, epoxidized soyabean oil (commercially available under the trade designation of Paraplex G-60) and dibutyl sebacate.

Beneficially, in certain instances, it is desirable to add adhesive or bonding layers between the barrier layer and the outer polyolefin layer. The nature of such bonding or adhesive layers must be such that the adhesion between the outer and inner layer is increased as increased seal strength and resistance to delamination are to be obtained.

Many polymers may be employed for the purpose and coextruded simultaneously as the film is formed to provide five-layer films, wherein the outlayers are of a polyolefin layer, such as polyethylene, polypropylene and the resinous copolymers of ethylene and propylene.

The adhesive layer often will vary in thickness from about 0.05 to about 0.8 mil; however, generally the preferred range of adhesive layer thickness is from about 0.1 to about 0.3 mil in thickness. Oftentimes the strength of the bond between the inner or core layer and the outer or surface layer increases slowly as the thickness of the adhesive layer is increased, and generally little or no increase in the bond strengths occurs after the thickness of the bonding layer has reached 0.5 to 0.6.

A wide variety of polymers and polymeric compositions are useful to increase the adhesion between the polyolefin outer layer and the inner barrier layer. Suitable polymers or polymeric compositions are readily selected by determining the bonding strength of the composition being evaluated by forming a two-layer extrusion. The bond strength of the resultant two-layer laminate is readily determined by conventional peel strength tests. Similarly, the adhesive layer composition is evaluated by a similar extrusion utilizing the polyolefin material.

Of great help in selecting the proper adhesive layer material are the solubility parameters or δ values. Solu-

bility parameters or δ values are discussed in "Some Factors Affecting the Solubility of Polymers" by P. A. Small, *Journal of Applied Chemistry*, 3, 71 (1963) and also by Harry Burrell in the "Chemical Review," 14, 3-16, 31-46 (1955). For example, some δ values of typical polymers are polytetrafluoroethylene 6.2; polypropylene 7.2; polyethylene 7.9; butadiene/styrene 8.1; polystyrene 9.1; polyethyl acrylate 9.2; chlorinated polyethylene (35 weight percent chlorine) 9.3; polyvinylacetate 9.4; polyvinyl chloride 9.7; 76 percent styrene and 24 percent acrylonitrile 10.1; chlorostyrene 10.5; 85 percent vinylidene chloride and 15 percent vinyl chloride 12.2; and polyacrylonitrile 15.4. Generally, adhesion is obtained when a polymer is selected having δ values which are within about 3 units each of the materials to be adhered. For example, polyethylene and the vinylidene chloride polymer are readily adhered by copolymers having δ values between 9.2 and about 10.1. In the instance of adhering layers of polyolefins such as polyethylene and polypropylene to vinylidene chloride polymers, polymers which are particularly advantageous are copolymers from about 13 percent to about 35 weight percent vinyl acetate with from about 87 weight percent to about 65 weight percent ethylene, copolymers of from about 20 to 30 weight percent ethylacrylate with from about 80 to 70 weight percent ethylene, copolymers from about 20 to 30 weight percent isobutyl acrylate with from about 80 to 70 weight percent of ethylene, chlorinated polyethylene containing from about 25 to 40 weight percent chlorine and polyvinyl chloride.

Composite film for the practice of the present invention is readily prepared by heat-plastifying a core-forming polymer and heat-plastifying a polyolefin material, such as employed in the outer layers, i.e. while in the heat-plastified condition, deforming the polyolefin to form a layer of polyolefin resin disposed generally about the core forming resin in the absence of fluid, deforming the heat-plastified materials into a stream, deforming the stream into a film-like configuration, passing the resultant composite heat-plastified stream into a cooling zone and lowering the temperature of the stream below the thermoplastic temperature thereof. Beneficially apparatus such as illustrated in British Patent No. 985,310 may be employed to form the composite film.

Advantageously such a film is readily heat-sealable under a wide variety of conditions to provide an attractive seal with high resistance to the passage of moisture vapor, oxygen and like gases.

In FIGURE 1 there is illustrated a pouch or package, in accordance with the present invention.

In FIGURE 2 there is an enlarged, exaggerated cross-sectional view of a portion of the film employed to prepare a pouch of FIGURE 1.

In FIGURE 1 there is illustrated a pouch or package generally designated by the reference numeral 10. The pouch 10 comprises a first panel 11 and a second panel 12. The panel 11 comprises a flap 13 and a pouch portion 14. The panel 11 is a generally rectangular configuration as are the flap and pouch portions 13 and 14, respectively. The second panel 12 is disposed in generally face to face relationship with the pouch portion 14 of the panel 11 and is affixed thereto by means of a first edge seal 16 and a second edge seal 17. A generally transverse centrally disposed seal 18 secures the edge of the second panel 12 to the panel 11 generally adjacent the flap portion 13. Optionally, conventionally pressure sensitive adhesive 19 may be applied to the flap 13. Beneficially the second panel 12 is formed by folding over on itself a portion of a rectangular sheet such as is illustrated in FIGURE 1 or alternatively separate panels may be employed and joined at a location generally corresponding to a bottom portion of the pouch 20. Generally adjacent the seal 18 is disposed a tear strip 21, the tear strip 21 being disposed between the panel 12 and the pouch portion 13 of the panel 11 and being adapted to sever the panel 12 adjacent

the seal 18 remote from the flap 13, thus, providing access to the interior of the pouch and the contents thereof. Disposed within the pouch is smoking tobacco 22.

In FIGURE 2 there is illustrated a sectional view of a synthetic resinous thermoplastic film 28, the film 28 comprises an interior layer 29 of a transparent barrier material, a first outer layer 30 of a resinous polyolefin such as polyethylene, a second outer layer 31 also comprising a resinous polyolefin. A pair of adhesive layers 33 and 34 which serve to bond the outer layers 30 and 31 to the inner layer 29. Pouches, in accordance with the present invention, are readily prepared by heat sealing the thermoplastic resinous film into the configuration of FIGURE 1. Generally the sealing can be accomplished using conventional hot jaw heat sealers impulse sealers, hot roll sealers and ultrasonic sealers, wherein a stylus vibrating at ultrasonic frequencies presses the film together to cause bonding thereto. Beneficially the tear strip is incorporated in the second panel prior to sealing the portion of the second panel adjacent the flap 13 together with panel 11. A satisfactory and beneficial tear strip can be provided by various well known means including the provision of a strand such as a thread which is partly embedded within the face of the panel 12, which is to be disposed adjacent the panel 11 by means of heat sealing or the like, and, subsequently, heat sealing adjacent the thread. Gentle tension on the thread causes it to cut through the panel 12 and form a mouth or opening of the pouch, in the desired location.

By way of further illustration, a plurality of pouches are prepared having the configuration of FIGURE 1 by cutting a portion of a film to a suitable size, positioning a portion of a Number 50 cotton thread along a shorter side of the panel. Applying sufficient heat to the panel, remote from the thread to cause the thread to be partially embedded therein, a portion of the film containing the thread is then folded as is illustrated in FIGURE 1, to a configuration wherein the thread is adjacent a major portion of the film or first panel. Edge seals 16 and 17 are made by heating sealing. Three ounces of smoking tobacco are placed within the pouch and the second panel is sealed to the first panel by means of a heat seal generally adjacent the tear strip in such a manner that the tear strip is disposed within the compartment formed by the heat sealing of the second panel to the first. The resulting pouch has thermetically sealed therein the tobacco. The film employed consists of polyethylene outer layers having a thickness of 1.53 mils, an intermediate or bonding layer of a copolymer of 72 weight percent ethylene and 28 weight percent vinyl acetate having a thickness of 0.1 mil, a central or barrier layer 0.2 mil thick consisting of 93.75 parts by weight of a copolymer of 85 weight percent vinylidene chloride and 15 weight percent vinylidene chloride, 4.5 parts by weight acetyl tributylcitrate, 1 part by weight of an epoxidized soybean oil commercially available under the trade designation Paraplex G-60, 0.75 part by weight of 4-tertiary-butyl-salol, a similar 0.1 mil thick layer of ethylene-vinyl acetate copolymer and a 1.53 mil layer of polyethylene to provide a coherent five layer film. Evaluation of such pouches indicates exceptional resistance to drying on prolonged storage. Other pouches, prepared in a similar manner, have a pleasing soft hand and maintain tobacco

in desirable smoking condition after opening for periods of time in excess of that usually obtained employing commercially available single use tobacco pouch-type packages. Pouches in accordance with the present invention, are readily refilled and reused a number of times without loss of beneficial barrier characteristics or deterioration of the pouch. Pouches, in accordance with the present invention, withstand folding, bending, crumpling, abrasion and the like extremely well and are relatively inexpensive.

As is apparent from the foregoing specification, the present invention is susceptible of being embodied with various alterations and modifications which may differ particularly from those that have been described in the preceding specification and description. For this reason, it is to be fully understood that all of the foregoing is intended to be merely illustrative and is not to be construed or interpreted as being restrictive or otherwise limiting of the present invention, excepting as it is set forth and defined in the hereto appended claims.

What is claimed is:

1. In a tobacco pouch comprising a first panel and a second panel, a first panel comprising a pouch portion and a flap portion, the second panel peripherally sealed to the pouch portion of the second panel, the first panel and the second panel having a tobacco containing space therebetween, a tear strip positioned in the second panel generally adjacent the flap portion of the first panel and adapted to sever the second panel to provide access to the hermetically sealed space and the tobacco, the improvement which comprises the panels comprising synthetic resinous thermoplastic film having at least five layers, the film having a total thickness of from about 1.2 to about 8 mils, two outer layers comprising a heat sealable polyolefin film and an inner layer comprising a synthetic barrier resin which is a barrier for water vapor and oxygen, the outer layer and at least one inner layer being adhered together by means of resinous adhesive layers.

2. The pouch of claim 1, wherein at least a portion of the pouch is transparent.

3. The pouch of claim 1, wherein the outer layers of the first and second panels are polyethylene.

4. The pouch of claim 3, wherein at least one inner layer is a vinylidene chloride copolymer.

5. The pouch of claim 4 wherein the resinous adhesive layers comprise a copolymer of ethylene and vinyl acetate.

References Cited

UNITED STATES PATENTS

2,370,419	2/1945	Ray	229—3.5
3,125,273	3/1964	Ramm	229—3.5
3,231,411	1/1966	Tyler et al.	161—250 X
2,543,229	2/1951	Chapman	154—139 X

FOREIGN PATENTS

433,814	2/1941	Great Britain.
752,160	7/1956	Great Britain.

DONALD F. NORTON, *Primary Examiner.*

FRANKLIN T. GARRETT, *Examiner.*