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[33] Great Britain

[31] 49027/68

[54] FLEXIBLE POUCHES AND BAGS
6 Claims, 8 Drawing Figs.

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229/55, 229/68, 206/41 F

[51] Int. Cl. B65d 33/22

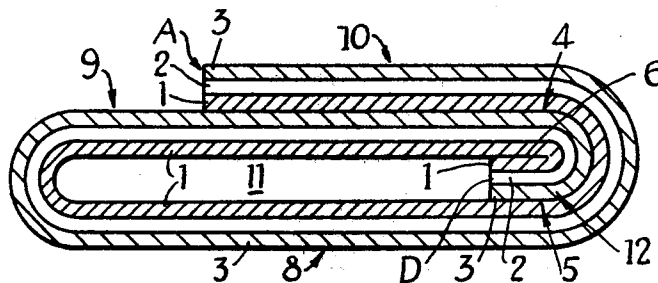
[50] Field of Search. 229/48 T,
62, 55, 68, 3.5 MF; 206/41 F

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ABSTRACT: A flexible pouch, such as a tobacco pouch, comprises two layers of heat-sealable thermoplastic plastics materials adherent to opposite surfaces of a layer of metal foil. The materials of the said two layers have limited compatibility with each other and the pouch is sealed, where it will require to be opened, at a line of contact between surfaces of different layers of the plastics materials. Thus a peelable seal can be so formed between the backwall of the pouch and an inwardly folded portion at the marginal edge of the front wall thereof and/or between the front wall of the pouch and a flap folded over the said front wall.



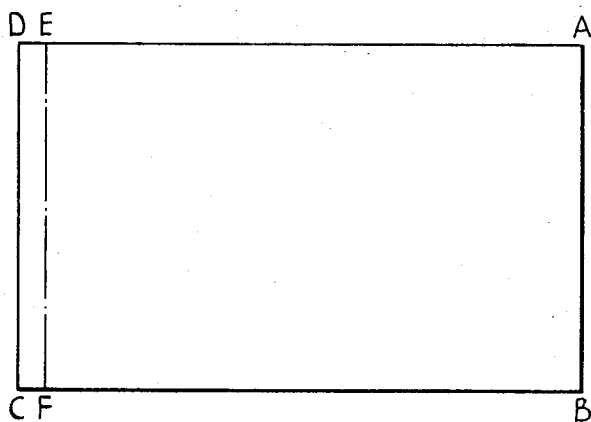


FIG. 1

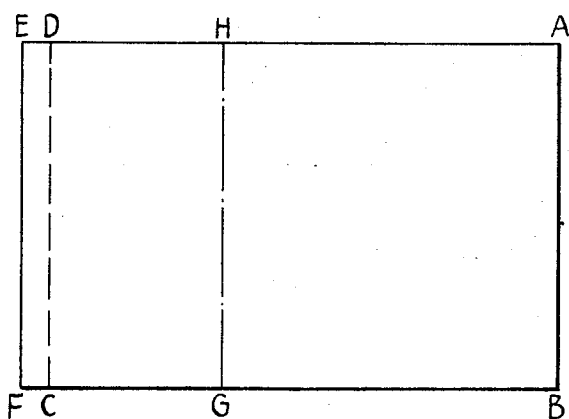


FIG. 2

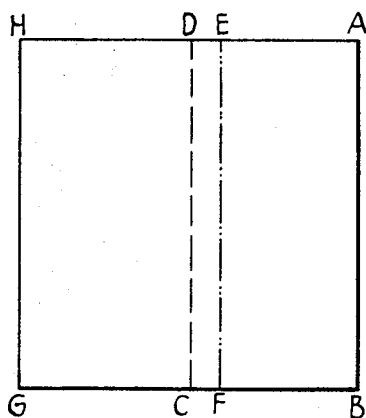


FIG. 3

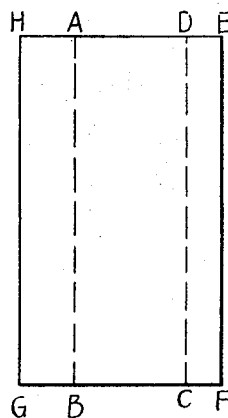


FIG. 4

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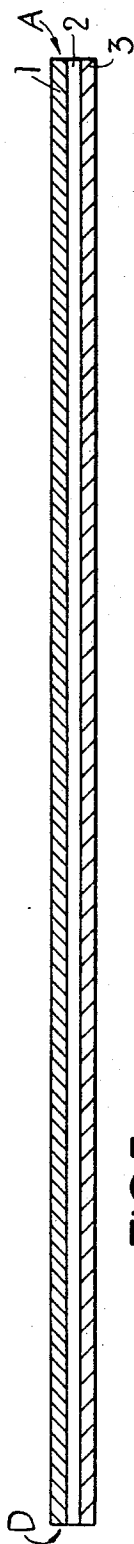


FIG. 5

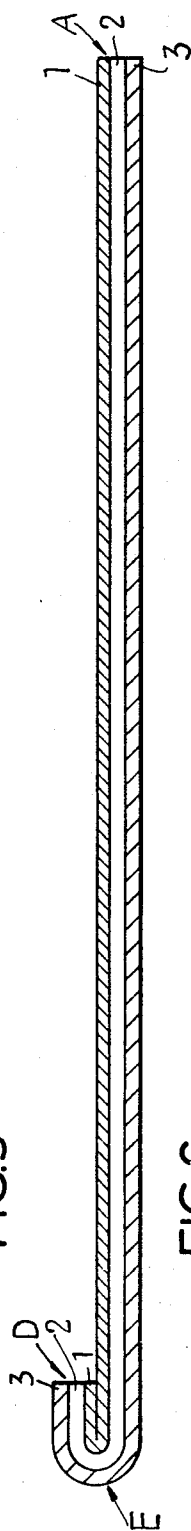


FIG. 6

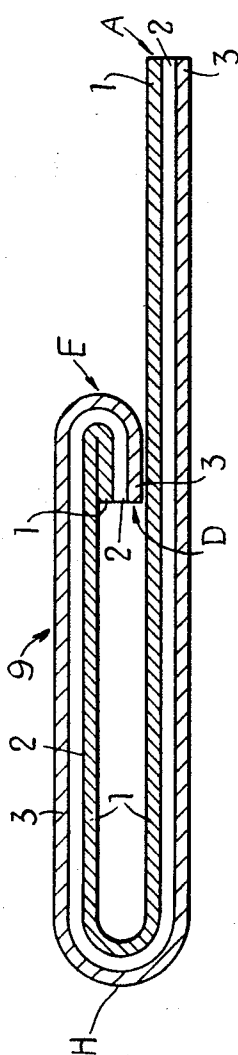


FIG. 7

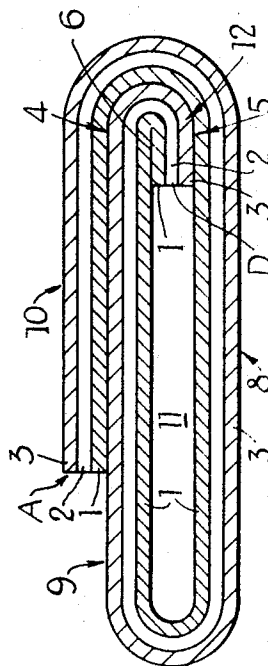


FIG. 8

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FLEXIBLE POUCHES AND BAGS

This invention concerns improvements relating to flexible pouches and like bags, hereinafter referred to as pouches. It is particularly concerned with tobacco pouches, but is applicable with advantage to pouches for other purposes, for example for containing food products such as potato crisps, roasted nuts, and so forth.

According to the invention, a flexible pouch is made from a sheet comprising two layers of heat-sealable thermoplastic plastics materials adherent to opposite surfaces of a layer of metal foil, the materials of the said two layers having limited compatibility with each other, and the pouch being sealed, where it will require to be opened, at a line or lines of contact between surfaces of different layers of the plastics materials. By limited compatibility is meant compatibility such that seals produced between surfaces of the two materials on melting the said surfaces under predetermined conditions of temperature, time, and pressure are, although hermetic, capable of being peeled open.

The plastics layers, which may be of basically the same composition, for example different types of polyethylene, or of different compositions, for example an inner layer of a low-melting copolymer of ethylene vinyl acetate and an outer layer of a low-density polyethylene on the one hand and a low or medium-density, higher melting, polyethylene on the other hand, preferably comprise an outer layer of harder, higher melting point, material and an inner layer of softer, lower melting point, material.

The layers may be produced as a triple laminate or one of the plastics layers may be coextruded with the metal foil and the other subsequently laminated onto the foil. If the outer layer is thus laminated, it may additionally serve to protect printed matter applied to the foil.

One manner of carrying the invention into effect, as applied to a tobacco pouch, will now be more fully described by way of example, and with reference to the accompanying drawings, in which:

FIG. 1 is a plan view of a blank,

FIGS. 2 to 4 are comparable views illustrating successive folding stages, and

FIGS. 5 to 8 are diagrammatic side views of the blank at stages corresponding to those of FIGS. 1 to 4, the thickness of its layers being shown greatly exaggerated.

In this example, the pouch is to be made from a single rectangular blank A B C D (FIG. 1) of a flexible sheet (FIG. 5) comprising a layer 1 of a low-melting point polyethylene-based material laminated to one surface of a sheet 2 of soft-tempered aluminum foil and a layer 3 of a higher melting point polyethylene material laminated to the other surface of the aluminum foil. The low-melting point material may be, for example, a copolymer of ethylene and vinyl acetate which has a density of 0.940–0.945 g./cc. and melting range of 100°–105° C. The higher melting point material for example, an ethylene homopolymer with a density within the range of 0.920 and 0.960 g./cc. and a melting range of 105°–125° C. The material of the layer 1, which is to become the inner layer of the pouch, is such that it will heat-seal to itself to form a permanent seal and the material of the layer 3 is such that, under predetermined conditions, it will heat-seal to the low-melting point material to form a peelable or strippable seal.

The blank (FIGS. 1 and 5) is first folded on the line E F to the condition of FIGS. 2 and 6 and then on the line G H to the condition of FIGS. 3 and 7. At this stage the only part of the layer 1 visible is a rectangle of the area A B F E in FIG. 3. Heat seals are then formed along the side edges E H and F G (FIG. 3). The seals, between unlike layers 1 and 3, from E to D and from F to C are peelable and the seals between like layers 1 from D to H and C to G are permanent. At this stage, the pouch is filled with a required quantity of tobacco. What is to become the flap of the pouch, i.e., the rectangle A B F E in FIG. 3 is folded, in the opposite direction to the two previous

folds, on the line E F to the condition shown in FIGS. 4 and 8 and is heat-sealed along and within the rectangle C D E F (FIG. 4), the nearer edge of the seal parallel to the line E F being at a distance, say one-eighth inch, from the line E F.

This seal is formed under conditions of temperature and pressure, namely 180° C. and 9 pounds per square inch, such that strippable seals are formed between the unlike layers 1 and 3 in the area of said rectangle C D E F at 4 and 5 (FIG. 8). These seals can be produced in one operation if heat is applied simultaneously from both sides of the pouch over the said area. A permanent seal is formed between the like layers 1 at 6 (FIG. 8) in the area of the said rectangle. When access to the tobacco is required, the flap is opened and pulled firmly away from the body of the pouch to peel the transverse seals at 4 and 5. The permanent side-edge seals produced from D to H and C to G as described above at the stage of FIG. 3 remain unaffected, as does also the permanent seal at 6. Access is thus simple and convenient. After as much of the tobacco as is required has been removed, the pouch can be closed by simply folding it. Normal pouch protection continues to be given to the tobacco.

Pouches produced in the aforesaid manner have been stored for varying periods of time under a range of climatic conditions and the quality of the tobacco assessed. Under storage, at a temperature of 38° C. and 90 percent relative humidity, the tobacco gained 1 percent moisture in about 200 days, which shows that the seals provided adequate protection against moisture pickup by the tobacco. In addition, due to the substantially hermetic sealing, not only did the pouches protect the tobacco against moisture changes under adverse climatic conditions and against contamination from outside, but loss of aromatic constituents from the tobacco was prevented.

Testing of samples cut from the pouches showed that the permanent seals had an average tensile strength of 800 g./cm.² of sealed area and that the trippable seals an average tensile strength of 160 g./cm.² of sealed area.

The resultant pouch is of a conventional rectangular pouch shape, i.e. with a rear wall 8 (FIG. 8) of the full height of the pouch, a slightly shorter front wall 9 and a front flap 10 integral with the rear wall and overlapping rather more than the upper half of the front wall. The tobacco is contained in the space, indicated at 11, between the front and rear walls. The front wall has an inwardly folded short portion 12 at its upper edge permanently sealed back at 6 onto the inside of the said wall. There are peelable seals at 4 and 5 at about the same level. The seals 4 and 5 are adequate to prevent escape of moisture and aroma from the tobacco and contamination or deterioration thereof by outside influences, but capable of being readily peeled open without either destroying the continuity of the plastics layers or films or detaching them from the metal foil. The above-described seals from D to H and C to G form side seams between the insides of the front and rear walls, which are permanent except where the inwardly folded portion 12 intervenes. This arrangement has the advantage that an opening the pouch, after breaking the seal 4 between the flap 10 and front wall 9 and lifting the flap, the wall 9 and edge portion 12 can be pressed outwardly away from the charge of tobacco, so as to rupture the side seams for the height of the said edge portion 12 and provide a convenient point of attack for breaking the inner seal at 5 between the edge portion 12 of the front wall and the rear wall 8.

The thicknesses of the layers 1, 2, and 3 will depend on the total thickness required for the laminated pouch material in order to secure desired physical and/or mechanical properties. Suitably the thicknesses of the layers in thousandths of an inch may be as follows: Inner layer 1 from 1 to 3 thou., foil 2 from 0.5 to 1.2 thou. and outer layer at least 1 thou.

The temperatures to be used for the heat sealing will depend upon the thicknesses of the layers and the compositions of the materials. For the permanent heat seals, the sealing conditions should be such that the bond strength in the seal is greater than the bond strength of the inner, low-melting, polyethylene layer 1 to the aluminum sheet 2. For the peelable seals, the

sealing conditions should be such that the bond strength of the layer 1 to the higher melting polyethylene layer 3 is less than the bond strength of both of the layers 1 and 3 to the aluminum sheet 2. Simple seals between two layers only can be produced by jaws heated to between 110° and 150° C., preferably 120° C., in the case of a permanent seal. The temperatures required for obtaining a peelable seal, i.e. to seal through a number of layers giving one permanent and two peelable seals, are 164°—208° C., preferably 182° C. The temperatures can be readily determined in any particular case.

Various modifications are possible; thus, for example, although the seal at 4 affords an additional safeguard to the tobacco, it may be dispensed with.

Preferably, the inner layer 1 with the lower melting point is of a softer material than the outer layer 3. This, however, is not essential. Furthermore, a pouch could be produced from the same materials and in the same manner as has been described above, but with the layer of higher melting point on the inside. The strength of the seal at 6 would be weak or nonexistent. Although generally undesirable, this may be advantageous in some cases.

If desired, a tear strip, for instance in the form of a natural or synthetic thread or film, may be included at one or both of the peelable seals 4 and 5. It may be incorporated in one or other of the layers 1 and 3. A tape serving for closure or convenience of manipulation may be provided at the free edge of the flap 10.

We claim:

1. A flexible pouch comprising two layers of heat-sealable thermoplastics materials adherent to opposite sides of a layer of metal foil, the materials of said two layers having differing melting points and having limited compatibility with each

other, the said pouch being sealed along zones along its lateral edges in which one of the said two layers are in face to face contact with each other to form a permanent seal along said zone and said pouch having a peelable sealed access opening, the peelable seal being formed by contacting both of said two layers thereby forming a bond which is peelable and of less strength than the bond formed by the zones along the lateral edges of the pouch.

2. A pouch as claimed in claim 1, wherein a peelable seal between materials of limited compatibility is formed between the backwall of the pouch and an inwardly folded portion at the marginal edge of the front wall thereof.

3. A pouch as claimed in claim 1, wherein a peelable seal between materials of limited compatibility is formed between the front wall of the pouch and a flap folded over the said front wall.

4. A pouch as claimed in claim 1, wherein the metal foil is of aluminum, the inner layer is of a low-melting polyethylene material and the outer layer of a higher melting polyethylene material.

5. A pouch as claimed in claim 1, wherein the inner and outer layers are of plastics materials of basically different composition.

6. A flexible pouch comprising two layers of heat-sealable thermoplastic plastics materials adherent to opposite surfaces of a layer of metal foil, the materials of the said two layers having different melting points and the pouch having an access opening which is hermetically sealed along at least one line of contact between opposite surfaces of said two layers of heat-sealable thermoplastics materials whereby said hermetic seal is readily peelable.

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