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[54] **OPENING DEVICE**
2 Claims, 7 Drawing Figs.

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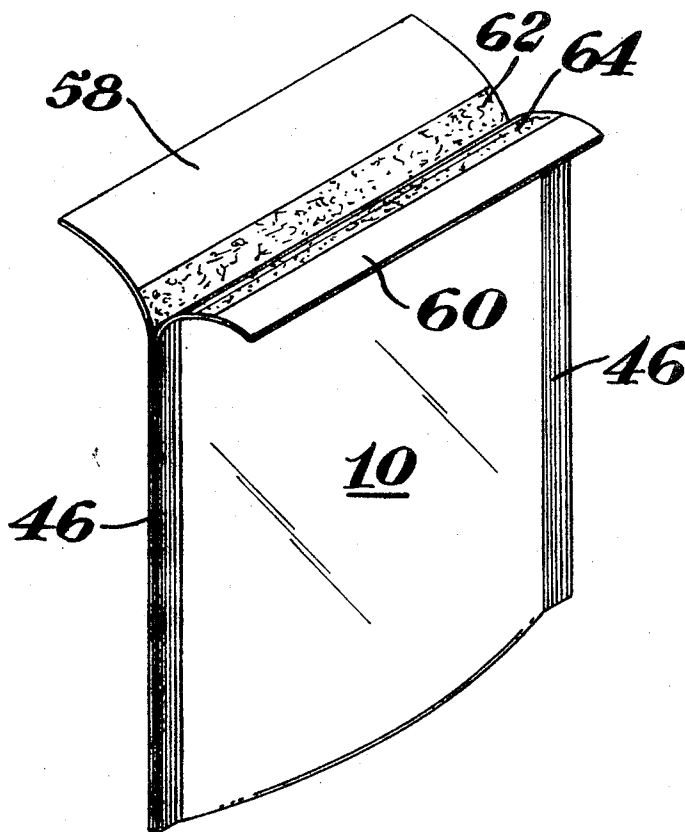
[51] Int. Cl. **B65d 5/70,**
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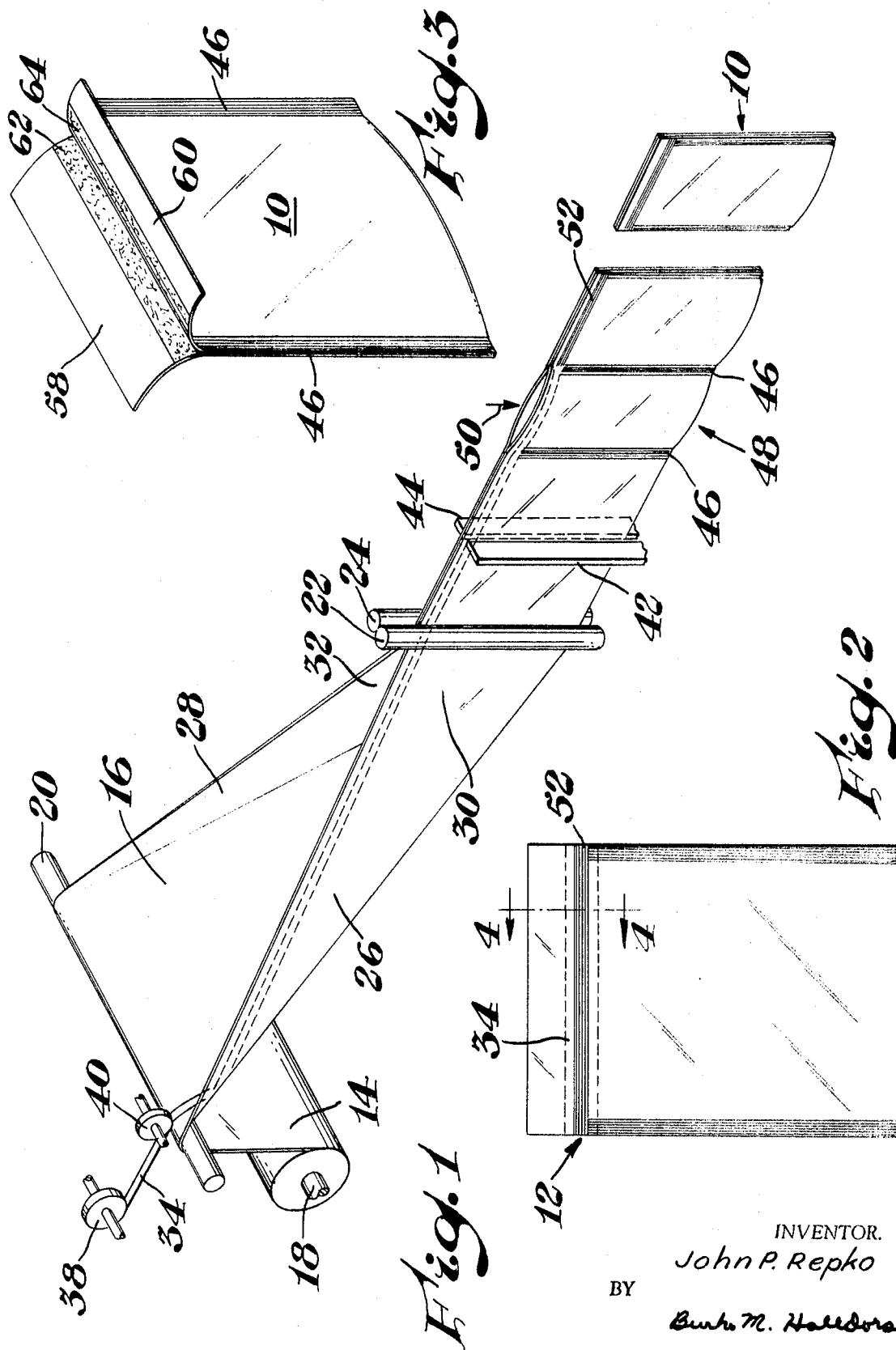
[50] Field of Search 229/62, 66,
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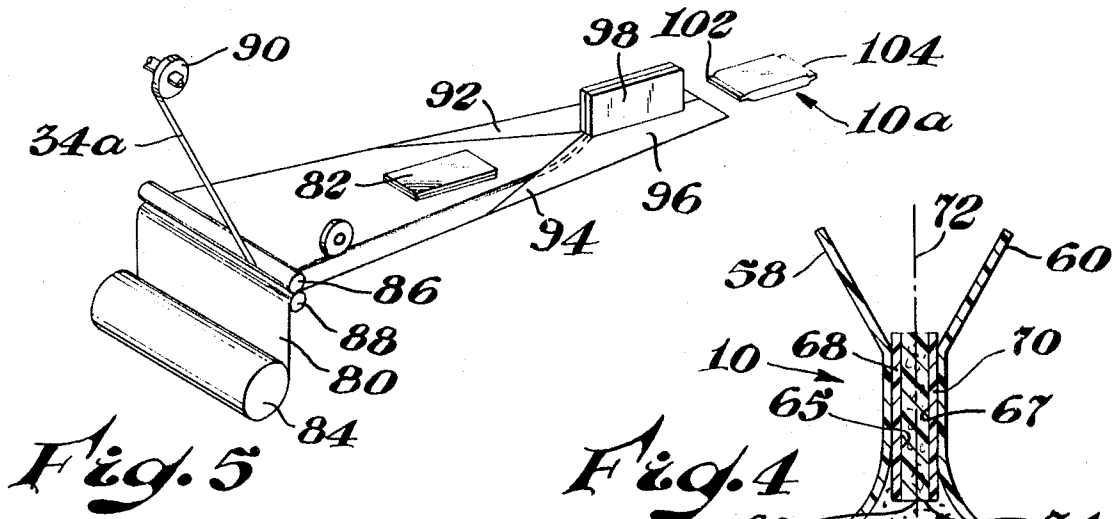
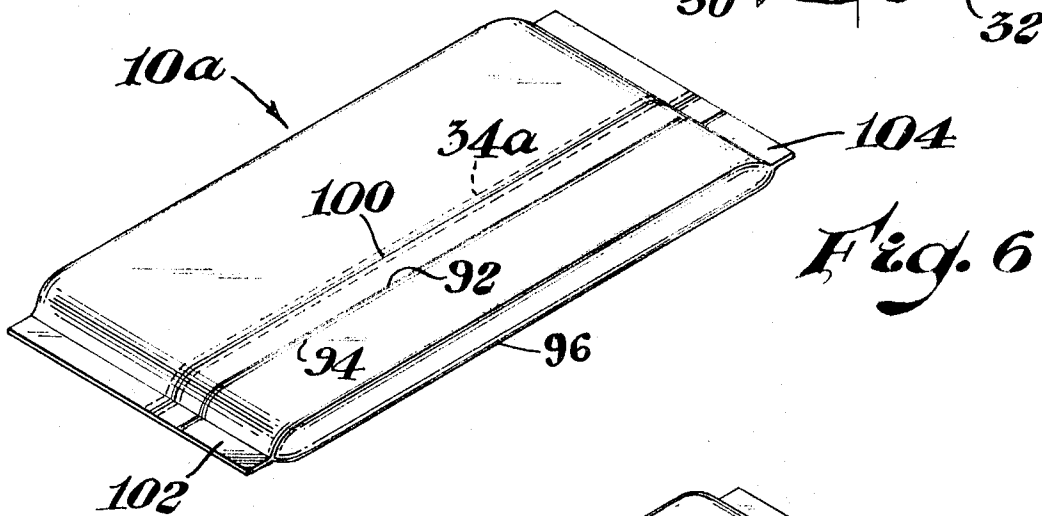
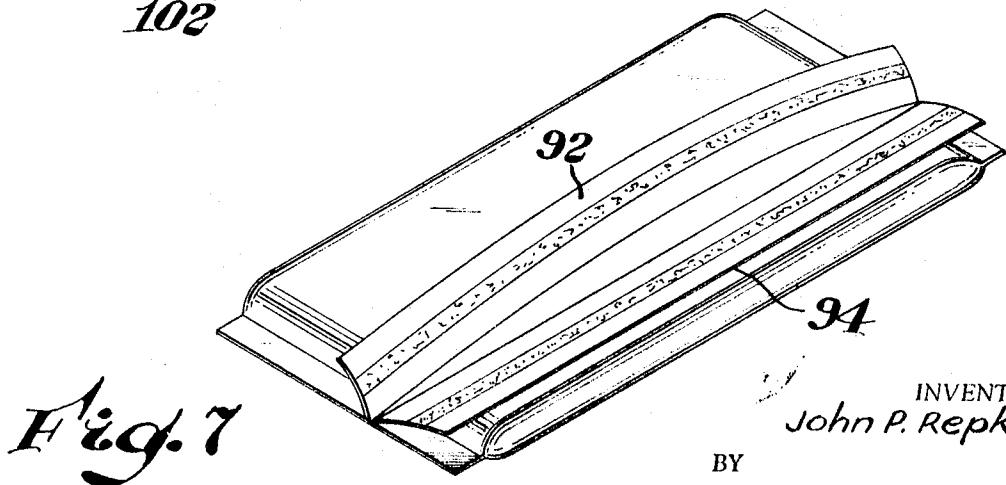
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ABSTRACT: An improved opening device is disclosed comprising a strip of material, preferably fibrous material such as paper, secured flatwise between opposite face portions of an item such as a film pouch. The face portions terminate in edges, i.e., the top edges of the pouch, which can be grasped as tabs to open the item by separating the face portions at the region of the strip. Separation can be at the interface of the strip and either face portion, or the strip can delaminate into layers associated with the face portions, respectively. Such an opening device, even if formed of paper, is useable in certain "boil-in-the-bag"-type packages.





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OPENING DEVICE

The present invention relates to an improved, convenient opening device for various receptaclelike items such as film pouches, and particularly relates to an opening device where a preferential separation of the layers of a strip of material is caused to open the item.

Accordingly, it is among the objects of the present invention to provide the following:

A new and improved opening device for various items such as film pouches wherein the device is economically practical for addition to the item, and moreover, can be reliably combined therewith on a mass production basis;

An opening device that is useable with numerous packaging materials, as for example, polyethylene or like stretchable films that do not tear or rupture evenly or along a regular path, and for which conventional opening devices, such as tear tapes are oftentimes less than fully satisfactory;

An opening device that is suitable for use on the more conventional packages as well as certain specialized ones, as, for example, certain boil-in-the-bag-type packages, i.e., packages such as for frozen foods when the food is prepared by immersing the package in boiling water;

An opening device wherein the same is readily incorporated into continuously operated overwrap and like packaging applications or systems, and

An opening device of tamper-proof character, i.e., one that is not subject to accidental or unintentional openings, and furthermore such an opening device wherein the same is of a construction that makes it consistently reliable as an opening feature.

Briefly, then, the invention contemplates an improved opening device comprising a strip of material, such as paper, secured in flatwise arrangement between oppositely disposed face portions of an item such as, for example, a film pouch. The face portions terminate in edges (i.e., such as top edges of the pouch) which can be grasped as tabs to open the item by pulling apart the face portions along the region of the strip. Opening normally involves a delamination of the strip, or in modified strip constructions the same involves a separation or opening at the vicinity of the interface between the strip and either of the aforesaid face portions.

Various preferred embodiments of the present invention are shown in the accompanying drawings in which wheresoever possible like characters of reference designate corresponding materials and parts throughout the several views thereof in which:

FIG. 1 is a schematic and diagrammatic representation of a method of continuously forming a package having the opening device of the present invention;

FIG. 2 is an elevational view of a package constructed according to the method illustrated in FIG. 1;

FIG. 3 is an isometric view of the package of FIG. 2 showing the package as opened;

FIG. 4 is an enlarged and partial cross-sectional view of the package of FIG. 2 taken along reference line 4-4 thereof;

FIG. 5 is a schematic and diagrammatic representation of an overwrap packaging process generally showing how the opening device of the present invention can be incorporated into such a process;

FIG. 6 is an isometric view of the overwrap package produced according to the process depicted in FIG. 5; and

FIG. 7 is a view like FIG. 6 only showing the package as opened.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to the drawings there is shown in FIG. 1 a process for continuously forming packages 10 each including a convenient opening device as will be discussed more fully hereinafter.

Specifically, in such a process, web stock 14 having a heat-sealable upper face 16 is fed from supply roll 18 to a horizontally mounted guide roller 20, and then to vertically mounted

nip rollers 22 and 24. Nip rollers 22 and 24 assisted by roller 20, and a forming member (not shown), fold the edges 26 and 28 of web 14 upwardly so as to provide oppositely disposed web or wall sections 30 and 32, respectively.

Simultaneously, a heat-sealable strip or tape 34 comprising the aforesaid opening device, is fed onto web face 16 from a supply roll 38. A rotary heat-sealing mechanism 40 is employed to heat seal the strip and web face together. Vertically disposed sealing bars 42 and 44 thereafter form seals 46 at regularly spaced intervals on web 14 to compartment the same into a strip or plurality of connected bag elements or pouches 48.

Pouches 48 are then directed to a filling station denoted generally as being at arrow 50, where a product fill is placed in each pouch in a conventional manner.

Horizontally mounted sealing bars (not shown) are thereafter useable for closing the pouch tops such as by heat sealing wall sections 30 and 32 together along the center region of strip 34, as is denoted by seal 52 in FIG. 2. Packages 10 are then cut apart along the midregion of seals 46 and packed for shipping, or alternately such packages can be packed and shipped in strip form.

FIGS. 2-4 illustrate package 10 structure in somewhat more detail wherein strips 34 is shown as being flatwise secured between opposed inner face portions 54 and 56 of walls 30 and 32, respectively (see FIG. 4). Face portions 54 and 56, in turn connect to the top edges 58 and 60, respectively, of pouch 48 such as to provide grasping tabs for opening. Thus, edges 58 and 60 can be separately grasped and pulled apart to delaminate or otherwise separate strip 34 into layers 62 and 64 associated with face portions 54 and 56, respectively, as is illustrated in FIG. 3. In other words, the bond strength joining strip 34 to face portions 54 and 56 is greater than the cohesiveness of the strip 34 material. Thus, the above-indicated delamination or separation of strip 34 results upon application of force to edges 58 and 60. It is important, of course, that edges 58 and 60 are of sufficient thickness or structural integrity to permit application of such opening forces to strip 34.

In the preferred construction, strip 34 comprises a central or inner ply 66 of fibrous material (see FIG. 4). Each side of central ply 66 is extrusion coated or otherwise suitably joined together with exterior or face plies 68 and 70, respectively, of heat-sealable thermoplastic material. Conventional primers can be employed to enhance the bond between the fibrous material or ply 66 and plies 68 and 70.

Specifically, the foregoing arrangement of plies provides a heat-sealing media (i.e. glue plies 68 and 70) for securing or heat sealing strip 34 to face portions 54 and 56, respectively. Moreover there is provided in central fibrous ply 66 a material of relatively low cohesive strength. Such central ply 66 character permits the desired delamination of strip 34 to occur generally along the midregion thereof as indicated generally by imaginary plane 72 shown by dot-dash lines in FIG. 4. Such delamination, however, can be uneven or irregular, with some separation, for example, occurring at either or both of the interfaces 65 and 67 between plies 66, 68 and 70.

For exemplary purposes only such fibrous material as comprises inner layer 54 can be paper of either natural or synthetic based fibers or other suitable fibrous materials such as the spun-bonded olefin materials; the latter is a product formed by a random distribution of very fine continuous filament polyethylene fibers, as for example, bonded together by heat and pressure. Such fibrous material can be either laminate or single ply in construction.

For further exemplary purposes, various other applicable materials that can comprise strip 34 are nonfibrous materials comprising laminates of intimately joined layers. One such applicable laminate material comprises the following arrangement of five plies: Low-density polyethylene/ethylene vinyl acetate copolymer/saran (a vinylidene chloride copolymer)/ethylene vinyl acetate copolymer/low-density polyethylene. Such a laminate can be formed by coextrusion

technique (see British Pat. No. 1,146,647). It has been discovered that when heat is applied to such a laminate, i.e., to form closure seal 52, there is apparently a breakdown in laminate structure or bond strength at the region of the saran ply and to a degree that permits delamination of the strip at and along the vicinity of the ethylene vinyl acetate copolymer and saran interfaces.

Strip 34 can further comprise a nonlaminate material, as for example, a noncoated fibrous material. Such material can be for all practical purposes noncompatible or nonheat sealable to face portions 54 and 56, even though a mechanical bond can be effected therewith by fiber entanglement. Thus, the material comprising face portions 54 and 56 flows around such fibers under application of appropriate amounts of heat and/or pressure such that a mechanical bond between the strip and face portion results. In this latter construction, separation or opening will normally occur at interface regions between strip 34 and face portions 54 and 56. Alternately, a delamination-type opening or opening strip 34 at its midregion as indicated in FIG. 4, i.e., along plane 72, is obtainable provided a sufficient strong bond can be effected between strip 34 and face portions 54 and 56, respectively. Such a bond can be resulted, for example, by using appropriate adhesives or solvents, or the like, or as mentioned hereinbefore, glue layers in the form of heat-sealable plies 68 and 70.

FIG. 5 through 7 illustrate modified forms of the invention wherein a strip 34a is incorporated into a package 10a formed by overwrapping a film or web 80 about a product fill 82 such as cheese, luncheon meat or the like. Specifically, film 80 is fed from a supply roll 84 to nip rollers 86 and 88 whereat the strip 34a is received from a supply roll 90. A suitable rotary sealing mechanism, as denoted generally at 92, heat seals the strip 34a to web 80.

The product fill 82 is then placed on web 80 and web edges 92 and 94 brought together over the fill in conventional overlap fashion to enclose the product in a tubular body of film 96. A conventional type heat-sealing mechanism indicated generally at 98 thereafter joins edges 92 and 94 together along the midregion of strip 34a as denoted by the area comprising seal lines 100 in FIG. 6. End closure seals 102 and 104 are then made by suitable means (not shown) to close the ends of tubular body 96, and thereby produce a hermetically sealed package.

Package 10a is openable by grasping edges 92 and 94 and breaking open the package as is illustrated in FIG. 7.

The following examples I and II illustrate the invention wherein a fibrous strip of material 34 is applied as an opening device to a test package comprising a boil-in-the-bag-type pouch. Surprisingly, the fibrous strip functions properly even though in both instances, the pouches prior to opening are placed in boiling water for periods of 15 minutes, respectively,

to prepare the food product therein for serving.

EXAMPLE I

A pouch comprising a laminate of ½-mill Mylar® (a polyester film) outer surface, 2-mill low-density polyethylene (inner surface) is fitted with a strip 34 comprising a central ply 66 of 50-pound. Kraft paper extrusion coated on each side with ½-mill thick plies, respectively of low-density polyethylene. Canned gravy is placed in the pouch and a closure formed by heat sealing the pouch closed along the strip 34 area as described above. The package is then placed in boiling water for 15 minutes to prepare the gravy for serving. Some puffing of the package is noted during the boiling period indicating internal pressure. No leakage at the strip 34 region is detected. The package is then removed from the boiling water and opened. No "wicking" of the fibrous central ply 66 of strip 34 is observed at regions above the lower edge of the closure seal.

EXAMPLE II

The experiment is repeated as described in example I except frozen peas including a butter sauce mixture is the subject product. Boiling is for 15 minutes. The package in the strip region remains substantially liquidtight as evidenced by no noticeable leakage. Following removal the package is opened and the fibrous layer examined for "wicking." No wicking is visibly detectable.

While certain representative 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.

What I claim is:

1. A convenient opening device for an item having oppositely disposed face portions and openable by separating said face portions, said opening device comprising a strip of material sandwiched between and secured together with said face portions, respectively, said strip comprising a laminate of intimately joined layers of thermoplastic material including at least a layer of vinylidene chloride copolymer, and immediately adjacent thereto, a layer of ethylene vinyl acetate copolymer, said strip defining a region of preferential separation formed by applying heat to said strip, means associated with at least one of said face portions to permit a separating force to be applied to said strip to open said item along said region of preferential separation.

2. The opening device of claim 1 wherein said strip comprises a laminate of polyethylene/ethylene vinyl acetate copolymer/vinylidene chloride copolymer/ethylene vinyl acetate copolymer/polyethylene.

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