Abstract: According to the invention, a patch is provided to be attached to the outside of the wall of the bag over the profile strip fastener assembly that is attached to the front panel of the package. The patch is made from a gas barrier type of substrate as to prevent oxygen and other gases from entering or leaving the perforations within the opening feature used to access the fastener assembly. The side of the patch that is in contact with the front panel of the bag includes an adhesive for securement to the package. A variety of adhesives can be utilized for securement depending on the arrangement of the perforations. Printing can be included on the outside of the patch to highlight the reclosable feature of the package thereby eliminating the need to modify the original printing on the package.
Declaration under Rule 4.17:
— of inventorship (Rule 4.17(iv))
Background of the Invention

[0001] Reclosable packaging is particularly well suited for packaging food products when it is desired to repeatedly remove relatively small quantities of the food product. Recent improvements in reclosable packaging have included configuring packages to have integral zipper-type fastener assemblies. In such arrangements, the package is typically opened by cutting or tearing a portion of the package to gain access to the fastener assembly, with opening and closing of the profile strips of the fastener assembly thereafter permitting the package to be selectively opened and closed.

[0002] While packages having the integrated profile strip fastener assemblies are becoming common in the market place, such arrangements have typically required specialized packaging machinery for forming and filling of such packages.

[0003] U.S. Patent No. 5,461,845 discloses a reclosable package, and method of formation, which is specifically configured to facilitate use on conventional, so called form, fill, and seal machinery. The package disclosed in the above referenced patent includes a profile fastener assembly which is configured such that a plurality of fastener assemblies can be provided on a continuous web of package forming material, with the web then stored in rolled form prior to use. The web of material with fastener assemblies can then be supplied to a conventional form, fill, and seal machine, with the machine operated in a generally conventional manner to package the product as desired. By the provision of the profile strip fastener assembly in the front wall portion of the package, convenient reclosability of the package is provided without resort to twist-tie fasteners, plastic clasps, or the like. The package disclosed includes a line of perforations in the front panel for accessing the fastener assembly. This access feature is necessary when the fastener assembly is in the front panel portion of the package since cutting or removing a portion of the top of the package would deem the reclosable fastener assembly useless.

[0004] U.S. Patent No. 5,806,984 also discloses a package in the form of a reclosable bag that includes a profile strip fastener assembly which is joined to the front wall of a bag body in a manner which permits formation of the bag in web form prior to use with a conventional form, fill, and seal machine. Notably, the profile strip fastener assembly includes a peelable seal, in addition to the closure formed by the interlocking profile strip of the assembly. In the preferred embodiment, the front wall of the bag body includes an elongated, frangibly removable portion which is substantially aligned with the fastener assembly. This removable portion provides access to the seal and interlocking profile strips of the fastener assembly after the portion is removed from the front wall of the bag. When
packaging perishable products that must be packaged in a manner which limits the amount of oxygen to which the products are exposed through the remove able portion, the flanges of the fastener assembly can be formed from material which is substantially different than polyethylene for relatively low oxygen transmission.

[0005] U.S. Patent No. 6,079,878 also discloses a package in the form of a reclosable bag that includes a profile strip fastener assembly which is joined to the front wall of a bag body in a manner which permits formation of the bag in web form prior to use with a conventional form, fill, and seal machine. Notably, the sealing arrangement of the profile strip fastener assembly in combination with an improved opening feature with accurate center region that when separated from the front panel forms a convenient tab for simultaneously pulling open said joint and said fastener strips. Additionally, the sealing arrangement in combination with improved opening feature reduces the area within the seal thereby reducing the amount of oxygen to which the packaged product is exposed. Although when the opening feature utilizes perforations in the front panel for accessing the fastener assembly, the addition of a peelable seal along with barrier flange materials are again required.

[0006] In summary the prior art teaches convenient front panel profile strip fastener assemblies that can be formed into reclosable packages using conventional form, fill, and seal machinery. When using front panel profile strip fastener assemblies some type of opening feature is necessary for accessing the fastener assemblies since the user of the package cannot merely remove the top portion of the package. When using opening features with front panel fastener arrangements that include perforations, the profile strip fastener assemblies must include additional features, such as barrier flanges and a peelable seal between the flanges, when making packages for use with products that are sensitive to oxygen transmission.

Summary of the Invention

[0007] According to the invention, a patch is provided to be attached to the outside of the wall of the bag over the profile strip fastener assembly that is attached to the front panel of the package. The patch is made from a gas barrier type of substrate as to prevent oxygen and other gases from entering or leaving the perforations within the opening feature used to access the fastener assembly. The side of the patch that is in contact with the front panel of the bag includes an adhesive for securement to the package. A variety of adhesives can be utilized for securement depending on the arrangement of the perforations. Printing can be included on the outside of the patch to highlight the reclosable feature of the package thereby eliminating the need to modify the original printing on the package. The
use of the patch not only solves the gas barrier problem that has plagued packages with 
front panel zipper arrangements, but also reduces the amount of time it takes to change an 
existing printed packaging over to new reclosable packaging graphics. The present 
invention is particularly well suited for packaging snack foods, such as, corn and potato 
chips which require gas barrier packaging. In addition the patch can be configured to 
eliminate tear propagation around the bag opening once the zipper has been accessed.

A package in the form of a reclosable bag embodying the principles of the 
present invention includes a profile strip fastener assembly which is joined to a front wall of 
a bag body. The profile strip fastener includes an openable mouth formed by interlocking 
profile strips, allowing access to the contents of the bag. The front wall includes a joint 
defined by a pattern of perforations, the joint in registry with the openable mouth of the 
profile strip fastener assembly and a protective patch covering the perforations. Notably, 
the protective patch, in addition to the closure formed by the interlocking profile strips of the 
assembly, enhances the sealing integrity of the fastener assembly during package 
formation, filling, and subsequent storage and use. Oxygen barrier packaging can be 
produced in accordance with the principles disclosed herein by the provision of protective 
patch and bag film materials exhibiting oxygen-barrier properties.

In accordance with the illustrated embodiment, the present reclosable bag 
includes a bag body formed from a rectangular sheet of film material, such as plastic film 
material or the like. The bag body has a top end, a bottom end, a front wall, and a back 
wall, wherein the front wall is joined to the back wall by upper and lower seams respectively 
provided at the top and bottom ends of the bag body. The bag and profile strip assembly 
are configured to be compatible with a conventional form, fill and seal machine.

A reclosable profile strip fastener assembly is joined to the front wall of the bag 
body and comprises first and second interlocking profile strips which respectively extend 
along the length of the fastener assembly. The profile strips are configured for releasable 
interlocking engagement with each other by the provision of at least one elongated 
protuberance on one of the profile strips, and at least one groove defined by the other of the 
profile strips for respectively releasably receiving the protuberance.

The fastener assembly is specifically configured for independent securement to 
the inside surface of the front wall of the bag body, and to this end, the first profile strip of 
the assembly includes a first body flange portion joined to an inside surface of the front wall. 
Similarly, the second profile strip includes a second body flange portion joined to the inside 
surface of the front wall of the bag body.
In the preferred embodiment, the front wall of the bag body includes an elongated, frangibly openable joint which is substantially aligned with the fastener assembly. This openable joint provides access to the openable mouth formed by the interlocking profile strips of the fastener assembly after the joint is opened on the front wall of the bag body. The provision of this openable joint in the bag body desirably provides tamper-evidence of opening of the bag. The joint can be a substantially linear arrangement of perforations or a rectangular or oval pattern of perforations which defines a removable or partially removable panel. The first and second body flange portions are sealed to the front wall with a continuous perimeter seal which surrounds the joint. The second profile strip body flange portion can also be sealed along its bottom edge region to the bag front wall. A protective patch completely covering the openable joint.

Other features and advantages of the present invention will become readily apparent from the following detailed description, the accompanying drawings, and the appended claim.

**Brief Description of the Drawings**

FIG. 1 is a perspective view of a package in the form of a reclosable bag with a first embodiment of a protective patch of the present invention;

FIG. 2 is a perspective view of a package with a first embodiment of a protective patch partially removed;

FIG. 3 is a cross-sectional view taken along lines 3-3 of FIG. 1;

FIG. 4 is a cross-sectional view taken along lines 4-4 of FIG. 1;

FIG. 5 is a perspective view of a package in the form of a reclosable bag with a second embodiment of a protective patch of the present invention;

FIG. 6 is a perspective view of a package with a second embodiment of a protective patch partially removed;

FIG. 7 is a cross-sectional view taken along lines 7-7 of FIG. 5;

FIG. 8 is a cross-sectional view taken along lines 8-8 of FIG. 5.

**Detailed Description**

While the present invention is susceptible of embodiment in various forms, there is shown in the drawings and will hereinafter be described a presently preferred embodiment of the invention, with the understanding that the present disclosure is to be considered as an exemplification of the invention, and is not intended to limit the invention to the specific embodiments illustrated.

With reference now to the drawings, a package in the form of a reclosable bag is illustrated which embodies the principles of the present invention. It is contemplated
that the bag 10 be formed from suitable plastic film materials or the like, but it is within the
purview of the present invention to form the bag from paper or paper-like materials. As will
hereinafter be described, bag 10 is specifically configured in a manner which facilitates
formation of the bag from a substantially continuous web of film material, to which fastener
assemblies have been previously applied, for use in a so-called form, fill, and seal apparatus
for packaging of food products, or non-food products. For example, the present package
can be configured for packaging of non-food items such as hardware articles or the like,
wherein repeated opening and closing of the package is desired.

[0024] The reclosable bag 10 is formed from a generally rectangular sheet of film
material, and includes a top end generally designated 12, a bottom end generally
designated 14, and front and back walls 16 and 18. The front and back walls are joined to
each other by upper and lower seams 20, 22 (shown schematically as tracks), respectively
provided at top and bottom ends 12 and 14 of the bag. Lateral edges of the rectangular
sheet of film material from which the bag body is formed are joined to each other along a
back seam 24 extending vertically along back wall 18. The seams 20, 22, and 24 can be
formed adhesively, or by heat-sealing as is known in the art. As will be appreciated, a bag
configured in accordance with the present invention can be formed from two rectangular
sheets of bag material joined at their peripheral regions to form a package, with the fastener
assembly having a length corresponding to the width of the sheet of bag material to which
the fastener assembly is joined.

[0025] Reclosable bag 10 includes profile strip fastener assembly 26 which is sealingly
mounted on the inside surface of front wall 16. In order to permit use of the present bag
with conventional packaging equipment, fastener assembly 26 has a length no more than
one-half the width of the rectangular sheet of film material from which the bag body is
formed. In practice, a substantially continuous sheet of film material is provided with a
plurality of the fastener assemblies 26 mounted thereon at spaced locations, which spacing
corresponds to the length dimension of the bags ultimately to be formed. For use, this web
of film material (with the fastener assemblies mounted thereon) is supplied to a form, fill,
and seal apparatus which operates to form a series of the bags 10, in end-to-end
relationship, by formation of back seam 24, bottom seam 22, and top seam 20, as food
product is supplied to the individual bags being formed. After formation and filling, the
individual bags are ordinarily separated from each other for packaging and shipment, as
may be required.

[0026] With particular reference to FIG. 3 the fastener assembly 26 includes a first
elongated profile strip 28, and a second elongated profile strip 30 which are configured for
releasable interlocking engagement with each other. While the specific configuration of the profile strips can be varied while keeping with the principles disclosed herein, it is contemplated that one of the profile strips (first strip 28 in the illustrated embodiment) includes a body 32 which defines at least one elongated groove 34, while the other profile strip (second strip 30) includes a body 36 which defines at least one protuberance 38, configured for respective interlocking engagement with the groove 34a. As will be recognized by those familiar with the art, the number of grooves and protuberances, and their respective disposition on the first and second profile strips, can be varied while keeping with the principles disclosed herein.

[0027] The fastener assembly 26 is sealingly mounted on the inside surface of the front wall 16 of the body of the reclosable bag 10, and to this end, each of the profile strips 28, 30, includes an elongated flange portion joined to the inside surface of the front wall. Specifically, first profile strip 28 includes a first body flange portion 40 which is joined to the inside surface of front wall 16 by elongated seal region 41. Similarly, second profile strip 30 includes a second body flange portion 42 (including upper and lower flange regions which respectively extend upwardly and downwardly from the body 36) which is joined to the inside surface of front wall 16 by lower elongated seal region 43 (shown schematically as tracks), and upper elongated seal region 44. Elongated seal regions 41, 44 may be arranged in the form of a continuous oval seal including end seal regions 50 (shown schematically as tracks) described below. It is within the purview of the present invention that seal regions 41, 43, 44, 50 may be formed with the use of suitable adhesive, but are preferably provided by heat-sealing (sometimes referred to as "lock-up" or "destruct" sealing). The seals 41, 43, 44, 50 are preferably continuous for strength and for sealing of the contents of the bags, but discontinuous seals may be suitable for some applications.

[0028] As illustrated in FIGS. 2 and 3, access to the fastener assembly 26 from the exterior of the package is preferably provided by the provision of an elongated, frangible region, substantially aligned with fastener assembly 26, and in particular in the region between seal 41 and seal 44. In the illustrated embodiment the frangible region comprises an elongated frangible joint 52 formed through the front wall 16 of the bag body.

[0029] The joint 52 is preferably defined by a preferentially weakened frangible portion of the bag front wall 16, such as by perforations 53, which when broken or ripped, result in formation of an elongated opening by which access to fastener assembly 26 is provided. An enlarged perforation 53a is preferably located at each end of the joint to prevent further ripping. As shown in FIG. 2, the joint has an arcuate center region 52c formed by perforations 53 which, when separated, forms a convenient tab 52d for handling by the user.
to pull apart the remainder of the opening and also thereafter to open the joint 52 of the bag. Perforators 53 in the center region 52c could be made longer (i.e., slits) so as to make them easier to grip and open.

[0030] Protective patch 31 is secured over joint 52 which is desirable for use with certain perishable products that when packaged in bag 10 in a manner which limits the amount of oxygen and moisture to which the products are exposed. The protective patch 31 includes a body portion 31a that is preferably formed from materials which exhibit relatively low oxygen transmission rates, such as materials including nylon, ethylene vinyl alcohol (EVOH), polyester (PET), Metallized foils, bi-oriented polypropylene (BOPP), Polypropylene, Polystyrene, Polyethylene, Saran (PUDC), or combinations thereof, or the like. The oxygen transmission rate through the protective patch should not be greater than 2.5cc-mil/100 square inches/24 hrs at 23degrees Celsius and 75% relative humidity. Although for or certain applications, the oxygen transmission rate should below 0.25 5cc-mil/100 square inches/24 hrs at 23degrees C and 90% relative humidity.

[0031] In addition, the body portion 31a can also be made from materials that exhibit relatively low moisture vapor transmission rates such as, Polyethylene, in particular high density polyethylene (HDPE), Oriented Polypropylene (OPP), Metallized PET, Polyester, or the like. The moisture vapor transmission rate through the protective patch 31 should not be greater than 1.1 gm-mil/100 square inches/24 hrs at 30 degrees Celsius and 90% relative humidity. Although for certain applications, the moisture vapor transmission rate should be below 0.5 gm-mil/100 square inches/24 hrs at 30 degrees Celsius and 90% relative humidity. One side of body portion 31a contains an adhesive 31b for use in securement to the front panel 16 of bag 10 completely covering joint 52. Adhesive 31b has a peelable strength so as to allow it to be removed from bag 10 without damaging front panel 16. Protective patch 131 is designed to securely cover joint 152 as to eliminate excessive amounts of water vapor and gases from entering bag 10, but allowing the user to peel patch 31 off when accessing the reclosable fastener 26 through joint 52. The adhesive 31b is preferably made from any suitable adhesive known in the art of making pressure sensitive labels such as Hot Melt, Acrylic Emulsions, Transfer Adhesives, glue, Chemical Reactive Type adhesives, but could also be formed from other suitable adhesives as well.

[0032] FIGS. 3-4 illustrate an alternate embodiment of the present invention. A reclosable bag 100 is formed from a generally rectangular sheet of film material, and includes a top end generally designated 112, a bottom end generally designated 114, and front and back walls 116 and 118. The front and back walls are joined to each other by
upper and lower seams 120, 122 (shown schematically as tracks), respectively provided at
top and bottom ends 112 and 114 of the bag. Lateral edges of the rectangular sheet of film
material from which the bag body is formed are joined to each other along a back seam 124
extending vertically along back wall 118. The seams 120, 122, and 124 can be formed
adhesively, or by heat-sealing as is known in the art. As will be appreciated, a bag
configured in accordance with the present invention can be formed from two rectangular
sheets of bag material joined at their peripheral regions to form a package, with the fastener
assembly having a length corresponding to the width of the sheet of bag material to which
the fastener assembly is joined.

Reclosable bag 100 includes profile strip fastener assembly 126 which is
sealingly mounted on the inside surface of front wall 116. The fastener assembly 126
includes a first elongated profile strip 128, and a second elongated profile strip 130 which
are configured for releasable interlocking engagement with each other. While the specific
configuration of the profile strips can be varied while keeping with the principles disclosed
herein, it is contemplated that one of the profile strips (first strip 128 in the illustrated
embodiment) includes a body 132 which defines at least one protuberance 134, while the
other profile strip (second strip 130) includes a body 136 which defines at least one groove
138 configured for respective interlocking engagement with the protuberance 134. As will
be recognized by those familiar with the art, the number of grooves and protuberances, and
their respective disposition on the first and second profile strips, can be varied while keeping
with the principles disclosed herein.

The fastener assembly 126 is sealingly mounted on the inside surface of the
front wall 116 of the body of the reclosable bag 110, and to this end, each of the profile
strips 128, 130, includes an elongated flange portion joined to the inside surface of the front
wall. Specifically, first profile strip 128 includes a first body flange portion 140 which is
joined to the inside surface of front wall 116 by elongated seal region 141 (shown
schematically as tracks). Similarly, second profile strip 130 includes a second body flange
portion 142 (including upper and lower flange regions which respectively extend upwardly
and downwardly from the body 136) which is joined to the inside surface of front wall 116 by
lower elongated seal region 144 (shown schematically as tracks). Elongated seal regions
141, 144 may be arranged in the form of a continuous oval seal including end seal regions
150 (shown schematically as tracks) described below. It is within the purview of the present
invention that seal regions 141, 144, 150 may be formed with the use of suitable adhesive,
but are preferably provided by heat-sealing (sometimes referred to as "lock-up" or "destruct")
sealing). The seals 141, 144, 150 are preferably continuous for strength and for sealing of
the contents of the bags, but discontinuous seals may be suitable for some applications.

[0035] The flange portions and the bodies of the first and second profile strips 128, 130 can be composed of similar materials and constructed as described for the previous embodiment.

[0036] The profile strips are sealed at opposite ends in similar fashion as described in the previous embodiment. The end seals 150 can be substantially identical to the configuration of the end seals 50 shown in FIG. 4. That is, the body flange portions 140, 142 are sealed to each other and each to the front wall 116 vertically between the seals 141, 144. The bodies 132, 136 can be compressed and sealed together as shown in FIG. 4 with regard to the bodies 32, 36. The fastener assembly embodying the principles of the present invention can include a secondary, peelable seal 147 which detachably joins the profile strips to each other, apart from the releasable engagement of protuberances 134 in the grooves 138.

[0037] As will be appreciated, the secondary peelable seal 147 preferably is configured to extend substantially the entire length of the fastener assembly 126, thus desirably acting to provide an additional seal for the contents of the bag 100 in addition to the seal provided by interlocked portions 134, 138 of the profile strips 128, 130. Further sealing of the contents of the bag against air and moisture transmission is preferably effected by the provision of the end seals 150 at respective opposite lateral ends of the fastener assembly 126.

[0038] As illustrated in FIGS. 5 and 6, access to the fastener assembly 126 from the exterior of the package is preferably provided by the provision of an elongated, frangible region, substantially aligned with fastener assembly 126, and in particular in the region between seal 141 and seal 144. In the illustrated embodiment the frangible region comprises an elongated substantially rectangular or oval frangible joint 152 formed through the front wall 116 of the bag body.

[0039] The joint 152 is preferably defined by a preferentially weakened frangible portion of the bag front wall 116, such as by perforations 153, which when broken or ripped, result in formation of an elongated opening 154 by which access to fastener assembly 126 is provided. As shown in FIG. 5, the joint has arcuate end regions 152c which, when separated, form convenient tabs 152d for handling by the user to pull apart the remainder of the opening 154. Alternatively, a single tab 152d can be provided at only one end of the joint 152. The joint 152 defines a removable panel 155 which, once removed, provides access to the profile strip assembly 126 as well as serving as tamper-indication.
Opening of the joint 152 and removal of the panel 155 permits opening of profile strips 128, 130, thus permitting access to the contents of the package.

Protective patch 131 is secured over joint 152 which is desirable for use with certain perishable products that when packaged in bag 110 in a manner which limits the amount of oxygen and moisture to which the products are exposed. The protective patch 131 includes a body portion 131a that is preferably formed from materials which exhibit relatively low oxygen transmission rates, such as materials including nylon, ethylene vinyl alcohol (EVOH), polyester (PET), Metallized foils, bi-oriented polypropylene (BOPP), Polypropylene, Polystyrene, Polyethylene, Saran (PUDC), or combinations thereof, or the like. The oxygen transmission rate through the protective patch should not be greater than 2.5cc-mil/100square inches/24 hrs at 23 degrees Celsius and 75% relative humidity. Although for or certain applications, the oxygen transmission rate should below 0.25 5cc-mil/100square inches/24 hrs at 23 degrees C and 90% relative humidity.

In addition, the body portion 131a can also be made from materials that exhibit relatively low moisture vapor transmission rates such as, Polyethylene, in particular high density polyethylene (HDPE), Oriented Polypropylene (OPP), Metallized PET, Polyester, or the like. The moisture vapor transmission rate through the protective patch 131 should not be greater than 1.1 gm-mil/100square inches/24hrs at 30 degrees Celsius and 90% relative humidity. Although for certain applications, the moisture vapor transmission rate should be below 0.5 gm-mil/100square inches/24hrs at 30 degrees Celsius and 90% relative humidity. One side of body portion 31a contains an adhesive 131b for use in securement to the front panel 116 of bag 110 completely covering joint 152. Adhesive 131b has a peelable strength so as to allow it to be removed from bag 10 without damaging front panel 116. Protective patch 131 is designed to securely cover joint 152 as to eliminate excessive amounts of water vapor and gases from entering bag 110, but allowing the user to peel patch 131 off when accessing the reclosable fastener 126 through joint 152. The adhesive 131b is preferably made from any suitable adhesive known in the art of making pressure sensitive labels such as Hot Melt, Acrylic Emulsions, Transfer Adhesives, glue, Chemical Reactive Type adhesives, but could also be formed from other suitable adhesives as well.
WHAT IS CLAIMED IS:

1. A bag, comprising:
   a bag body, formed from a rectangular sheet of film material, said bag body having a top end, a bottom end, a front wall, and a back wall, said front wall being joined to said back wall by upper and lower seams respectively provided at said top and bottom ends: and
   a reclosable fastener assembly joined to said front wall and comprising first and second interlocking profile strips respectively extending along the length of the fastener assembly, said profile strips being configured for releasable interlocking engagement with each other by the provision of at least one protuberance on one of said profile strips, and at least one groove defined by the other of said profile strips for respectively releasably receiving said protuberance,
   said first profile strip including a body flange portion joined at a first seal to said bag body, and said second profile strip including a second body flange portion joined at a second seal to the inside of the surface of said front wall of said bag body;
   said front wall including an openable joint being formed from a series of perforations between said first and second seals, said first and second seals formed around said joint; and
   a protective patch completely covering said joint to prevent gasses from entering and leaving said bag through said perforations.

2. The bag according to claim 1, wherein said protective patch is formed from a flexible substrate that has an oxygen transmission rate of between 2.5 cc-mil/100 square inches/24 hrs at 23 degrees Celsius and 75% relative humidity and 0.25 5 cc-mil/100 square inches/24 hrs at 23 degrees C and 75% relative humidity.

3. The bag of claim 1, wherein said protective patch includes an adhesive on one side as means of adhering to said bag.

4. The bag of claim 1, wherein said protective patch has two zones of adhesive on one side, an outer portion being more aggressive than the inner portion, thereby allowing the outer portion of the patch to be easily peeled away from the bag panel while the inner portion of said patch is aggressive enough to open said perforated joint when peeled away.

5. The bag of claim 1, wherein said protective patch is formed from two separate pieces of material, one being an outer piece and the other being an inner piece, whereby said outer piece remains on said bag panel when said inner piece of said protective patch is removed from bag, said outer piece acting as barrier to tear propagation around said joint.