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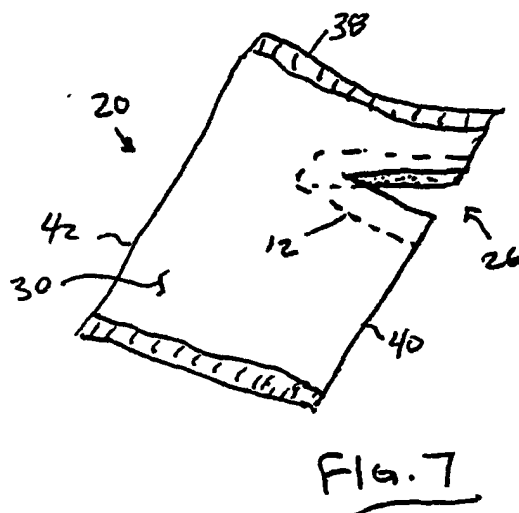
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(54) Reclosable bag

(57) The present invention relates to a bag (10) having a body with opposite faces (30,44) having side edges (40,42) and defining an interior (48), the bag comprising a reclosable fastener strip (12) secured to the bag body and arranged to form a reclosable face closure for accessing the bag interior (48) through an opening

defined in a face (30) of the bag, the fastener strip (12) including a loop component (16) with a band of hook-engageable loops (32), and a mating hook component (18) with a band of hooks (36); wherein both the loop component (16) and the hook component (18) are secured to a face of the bag body along opposite sides of the opening and mated in hook and loop engagement.



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Description

[0001] This invention relates to improved bag making, to bag products and to preformed material useful in the making of bags.

[0002] It has been known to provide to packers a packaging film to which an interlocked rib and groove closure is pre-applied in a strategically located position. See, for example, Yeager U.S. 6,079,878. Such film with pre-applied rib and groove closures has been introduced to a vertical form and fill machine to simultaneously form a bag and fill it with contents, with the bag being openable at the pre-applied closure.

[0003] Such a product has limitations. For example, on zipper style (interlocking rib and groove) products, in order to maintain alignment and the integrity of the seal once it is closed, the ends of such a closure are required to be permanently closed and sealed, to provide a beginning point for effecting closure. Other limitations relating to manufacture and use are also known.

[0004] WO 00/27721 A1 also discloses a composite touch fastener consisting of a loop strip and a loop-engageable strip, which can be applied to e.g. a reclosable bag, where the substrate of the bag has to be folded along a line between the loop and the fastener strip, in order to close the bag.

SUMMARY

[0005] According to one aspect of the invention, a bag has a body with opposite faces having side edges and defining an interior, the bag comprising a reclosable fastener strip secured to one of the bag faces and extending around one of the edges of the bag to form a reclosable bag closure for accessing the bag interior.

[0006] In some embodiments, the fastener strip is secured to an inside surface of the bag, and the bag body may have a frangible tear line for accessing the fastener strip. In some cases the fastener strip includes a loop component with a band of hook-engageable loops, and a mating hook component with a band of hooks, which may be integrally molded along an edge of the hook component.

[0007] In some configurations, the fastener strip comprises two mating components, both secured to an inside surface of a face of the bag.

[0008] The bag body in some cases comprises film, with the fastener strip welded to the film.

In some embodiments, the fastener strip extends across an entire front face of the bag and around opposite edges of the bag, such as to form a hinge.

[0009] In some cases the closure extends from a front face of the bag around one side edge of the bag to a back face of the bag to form a pour spout for pouring bag contents from a bag opening at the edge of the bag.

[0010] In some embodiments the ends of the closure are loose from each other. According to another aspect of the invention, a method of making a reclosable bag

is provided. The bag has a body with opposite faces having side edges and defining an interior. The method includes forming the bag on a bag making machine from a roll of film having pre-applied closure strips arranged so as to extend around one of the edges of the bag to form a reclosable bag closure for accessing the bag interior.

[0011] In some embodiments, the fastener strip is secured to an inside surface of the bag, and the bag body may have a frangible tear line for accessing the fastener strip. In some cases the hooks are integrally molded along an edge of the hook component. In some configurations, the fastener strip comprises two mating components, both secured to an inside surface of a face of the bag.

[0012] The bag body in some cases comprises film, with the fastener strip welded to the film.

In some embodiments, the fastener strip extends across an entire front face of the bag and around opposite edges of the bag, such as to form a hinge.

[0013] In some cases the closure extends from a front face of the bag around one side edge of the bag to a back face of the bag to form a pour spout for pouring bag contents from a bag opening at the edge of the bag.

[0014] In some embodiments the ends of the closure are loose from each other.

[0015] According to yet another aspect of the invention, a bag has a body with opposite faces having side edges and defining an interior, the bag comprising a reclosable fastener strip secured to the bag body and arranged to form a reclosable face closure for accessing the bag interior through a face of the bag. The fastener strip includes a loop component with a band of hook-engageable loops, and a mating hook component with a band of hooks.

[0016] In some embodiments, the fastener strip is secured to an inside surface of the bag, and the bag body may have a frangible tear line for accessing the fastener strip.

[0017] In some cases the hooks are integrally molded along an edge of the hook component.

The bag body in some cases comprises film, with the fastener strip welded to the film. According to yet another aspect of the invention, a method of making a reclosable bag is provided. The bag has a body with opposite faces having side edges and defining an interior. The method includes forming the bag on a bag making machine from a roll of film having a pre-applied closure strip arranged to form a reclosable face closure for accessing the bag interior through a face of the formed bag. The fastener strip includes a loop component with a band of hook-engageable loops, and a mating hook component with a band of hooks.

[0018] According to certain aspects of the invention, a hook and loop closure is pre-applied to packaging film. The closure involves a hook strip and a loop component, which are engaged by hook and loop fastening. In some cases, each component has an associated flange or

margin portion which is face welded to the bag film. In other cases, the components can be attached directly behind the closure features, such as the hooks or loops.

[0019] In some cases the hook component and the loop component are separate, but mated pieces in their pre-applied condition. In other cases, the two are formed as a unit, in which case a joining portion between the two parts of the closure may provide the "shelf seal" which is ruptured to initially open the bag.

[0020] Numerous advantages are obtained with such preforms.

[0021] The closure does not require spacing from the edges of the bag being formed.

[0022] The tolerances for the machine and for the location of the film-closure preform in the machine are relatively relaxed. Hook and loop alignment is also less critical than with rib and groove closures. For example, variations in positioning of up to 1/8 inch (3.2 millimeters) or more are generally tolerable with hook and loop fastening, while maintaining an acceptable closure performance.

[0023] Another aspect of the invention concerns bags in which the bag closure and opening extend the full width of the bag.

[0024] The closure need not be laminated to only one side of a bag spaced in from the edges, but can extend entirely to an edge or even around an edge to the opposite side, e.g., to form a pour spout or flip-top. Additionally, hook and loop closures can function at a transverse fold or corner, whereas folding or sharply bending zipper structures tend to cause the zipper features to distort or splay and can cause leakage or separation at the fold or bend.

[0025] More broadly another aspect of the invention is a pour spout for a bag or package realized by a hook and loop closure bent about an edge of a package.

[0026] Another aspect of the invention concerns bags which may be filled initially completely or with little headroom and can readily be reclosed by the hook and loop closure while the bag remains filled past the closure.

[0027] On the hook and loop closure shown, the ends of the closure can be loose from each other. This provides the ability to have a larger opening of the bag than in the case of a rib and groove seal, but, if desired, the ends of the closure can be sealed or welded to the bag film e.g. to avoid end leakage. The alignment required for closing the hook and loop closure is substantially less critical than for the interlocking rib and groove closure and therefore is an easier closure to activate or deactivate (open and close) with a full bag or with a very large opening.

[0028] Other features and advantages of the invention will be understood from the following description of preferred embodiments.

BRIEF DESCRIPTION OF DRAWINGS

[0029]

FIG. 1 shows a vertical form-filled bag with its front face orientated toward the viewer.

FIG. 2 is a cross-sectional view, taken along line 2-2 in FIG. 1.

FIG. 3 illustrates a similar bag, with the closure located on the front-face and around the side of the bag.

FIG. 4 is a cross-sectional view, taken along line 4-4 in FIG. 3.

FIG. 5 is a cross-sectional view, taken along line 5-5 in FIG. 4.

FIG. 6 is a view similar to FIG 4, but of a "flip top" bag in which the closure 12 extends across one entire face, and around to the bag face of the bag on both sides.

FIG. 7 illustrates the bag of FIG. 3 opened for pouring its contents through the opened closure.

FIG. 8 shows a roll of bag film with closures pre-applied for forming bags.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

[0030] FIG. 1 shows a vertical form-filled bag 10 with its front face orientated toward the viewer. Welded to the inside of the front face 30 of the bag is a hook and loop bag closure 12, shown in dashed outline. Along the closure, the bag film forming the front face 30 of the bag closure is provided with a frangible line 14, tear string, perforation, or other feature for forming an opening at the closure through the bag film. For perishable products, the bag film preferably forms a primary, airtight seal for maintaining the freshness of the bag contents.

[0031] FIG. 2 shows the closure 12 in side view. The top half of the closure is the loop component 16 with a band of hook-engageable loops 32 along its lower edge, and is welded to the inside surface 34 of the front face 30 of the bag along its upper edge. At a somewhat lower position of the bag, a mating hook component 18 has a band of integrally molded hooks 36 along its upper edge, mated with the loops 32 of the top half of the closure. This lower component is also welded to inside surface of the front face of the bag. Thus the front-face 30 of the bag carries both halves of the closure 12, attached to the bag film at weld lines 19, and mated in hook and loop engagement. The closure halves can also be welded to the front face bag film along their ends, if desired.

[0032] In the embodiment shown, the primary or shelf seal is the bag film itself. To open, the end user cuts through the film to access the inner multiple use closure 12, or a feature such as frangible line 14 is provided in the film so that a flap can be broken through the film. For example, a pressure sensitive adhesive web can be provided, such as to form a releasable flap (not shown) that can be lifted to access the inside of the bag. The

interior of the bag is thus opened, advantageously without tools such as scissors or knives. Contents can be removed from the bag, and the closure can then be pressed to close the bag in pantry-seal fashion. The hook and loop closure 12 can be closed with relatively low contact force, and can conform to debris caught within the closure. Additionally, for applications where the closure is on the face 30 of a bag, rather than along the top edge 38, for example, the hook and loop closure can be lightly closed without excess closure pressure that could damage underlying product within the bag. Potato chip bags, for example, can be provided with such a face closure.

[0033] FIG. 3 illustrates a bag 20 of the same construction as bag 10 of FIG. 1 except that instead of being extending on the centerline of the front face 30 of the vertical form filled bag, the closure 12 is shown extending around the side 40 of the bag. FIG. 4 shows a sectional view through the bag locating the longitudinal film seal 22 toward the back. The front face 30 is the clean side of the bag, or the side without longitudinal seal 22.

[0034] FIG. 5 is similar to FIG. 2 in that the top of the closure 12 is the loop section 16 welded to the inside surface of the film 24 and the hook section 18 is directly below it, welded to that surface of film 24. While the closure is welded to the same topologically- continuous surface of film, the closure 12 extends from the front face of the bag around one side edge of the bag to the other face. In other words, closure 12 is welded to the back face 44 of the bag as well as the front face 30.

[0035] FIG 6 shows, diagrammatically, the closure 12 extending across the entire front face 30 of the bag, and around both edges 40 and 42 to the back face 44 of the bag. With the substance of the bag walls being sufficiently stiff, the portion of the bag between the ends 46 of the closure define a hinge about which the entire top of the bag or package may turn as in a "flip top box," to provide full access to the interior 48 of the bag (or box). Obviously, this type of construction is useful for heavy duty packaging formed, for example, of heavy paper or composite bag or box materials, as well as of heavy film.

[0036] Thus, the closure may extend across the entire front face 30 of the bag, and even around the edges 40, 42 of the bag. The closure could be so positioned to provide a hinge line extending over the longitudinal seam 22 produced by the vertical form fill machine, to enable full opening of the bag, as shown in FIG. 6. Also, if the head-space of the bag is very small ("head space" being defined as the open volume above the product but inside the bag), the touch fastener hook and loop closure can still be opened, product can come out of the bag and then, to close the closure 12 only very soft activation force upon the closure is required, pressing from the outside against the product. This is unlike a zipper (interlocking rib and groove) closure, where an open volume is required at the closure to enable one to place fingers behind as well as in front of the closure to press it closed, to engage the male or rib component to enter the female

or groove component of the closure.

[0037] The hook and loop closure 12 is found to tolerate bent configurations, such as illustrated in FIGS. 3-6, the closure being under shear loading throughout its full extent when product within the bag 20 presses against the closure. In other words, pressure of the contents does not tend to push the top part of the bag away from the bottom part of the bag. The hook and loop closure 12 in this configuration is in its stronger strength mode. Additionally, forming the closure 12 into an arc or other shape extending out of the plane of the closure, as shown, can add bending stiffness or structural rigidity to the closure 12 for resisting concentrated separating loads.

[0038] As in the embodiment of FIG. 1, the primary or shelf seal in this embodiment is the bag film between the two closure components. But, as is also the case with FIG. 1, the primary seal can also be achieved by an integral hook and loop closure unit as disclosed in patent publication WO00/27721, published May 18, 2000. In such a case, when the hook and loop closure unit 12 is pre-applied to the web of film, before running on the vertical form-fill machine, a cut opening in the film itself is formed (e.g., at 14, while the closure 12 is being welded to the bag film). In this case the closure can be on the outside surface of the bag.

[0039] One can also provide a supplemental seal, such as a peelable seal, a tear seal, a tear string seal (not shown) either within the hook and loop closure unit or on the bag itself.

FIG. 7 shows that the structure of FIG. 3 enables the closure 12 to be opened as a pour spout to enable the user to pour the contents from a bag opening 26 at the side edge of the bag. Unlike the zipper profile products, if the hook and loop closure is creased or folded in any way across its face, or perpendicular to the longitudinal direction of the closure, the closing effect of the closure is maintained. In contrast, zipper rails (i.e., ribs engaged in grooves) tend to take on a permanent deformation or set when bent from front to side or back, causing the closure to be splayed open or shut. If splayed open, the rail is not held between the sides of the groove, and closure is defeated. Of course, with zipper closures, any opening along the zipper severely reduces the ability of the zipper to withstand a propagating separation.

[0040] FIG. 8 shows a roll 28 of bag film with closures 12 already welded in place, transversely to the longitudinal axis of the film, and ready to be unspooled into a bag making machine, to make either bag 10 of FIG. 1 or bag 20 of FIG. 3, depending on the length of closure 12 and where the film is transversely cut and joined to form top and bottom seals.

[0041] Other bag and closure constructions and bag-forming methods to which the above features are applicable are disclosed in our US. patent 6,202,260 and our provisional U.S. patent applications 60/159,489, 60/228,819 and 60/231,377 (filed October 14, 1999, April 16, 1999 and September 6, 2000, respectively), the

entire disclosures of which are hereby incorporated by reference as if completely set forth.

[0042] Further, the invention relates to a bag 20 having a body with opposite faces 30,44 having side edges 40,42 and defining an interior 48, the bag comprising areclosable, fastener strip 12 secured to one of the bag faces and extending around one of the edges 40 of the bag to form areclosable bag closure for accessing the bag interior 48, wherein the fastener strip 12 is preferably secured to an inside surface 34 of the bag, wherein the bag body preferably has a frangible tear line 14 for accessing the fastener strip 12, wherein the fastener strip 12 preferably includes a loop component 16 with a band of hookengageable loops 32, and a mating hook component 18 with a band of hooks 36, wherein the hooks 36 are preferably integrally molded along an edge of the hook component 18, wherein the fastener strip 12 preferably comprises two mating components 16,18, both secured to an inside surface of a face 30 of the bag, wherein the bag body preferably comprises film, and wherein the fastener strip 12 is preferably welded to the film, wherein the fastener strip 12 preferably extends across an entire front face 30 of the bag and around opposite edges 40,42 of the bag, wherein the closure 12 preferably extends from a front face 30 of the bag around one side edge 40 of the bag to a back face 44 the bag to form a pour spout for pouring bag contents from a bag opening 26 at the edge 40 of the bag, wherein ends of the closure 12 are preferably loose from each other.

[0043] The invention further relates to a method of making areclosable bag 20 having a body with opposite faces 30,44 having side edges 40,42 and defining an interior 48, the method comprising forming the bag on a bag making machine from a roll 28 of film 24 having pre-applied closure strips 12 arranged so as to extend around one of the edges 40 of the bag to form areclosable bag closure for accessing the bag interior 48, wherein the fastener strip 12 is preferably secured to an inside surface 34 of the bag. 13, wherein the bag body preferably has a frangible tear line 14 for accessing the fastener strip 12, wherein the fastener strip 12 preferably includes a loop component 16 with a band of hookengageable loops 32, and a mating hook component 18 with a band of hooks 36, wherein the hooks 36 are preferably integrally molded along an edge of the hook component 18, wherein the fastener strip 12 preferably comprises two mating components 16,18, both secured to an inside surface of a face 30 of the bag, wherein the bag body preferably comprises film, and wherein the fastener strip 12 is preferably welded to the film, wherein the fastener strip 12 preferably extends across an entire front face 30 of the bag and around opposite edges 40,42 of the bag, wherein the closure 12 preferably extends from a front face 30 of the bag around one side edge 40 of the bag to a back face 44 of the bag to form a pour spout for pouring bag contents from a bag opening 26 at the edge 40 of the bag, wherein ends of the closure 12 are preferably loose from each other.

[0044] A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, it is to be noted that many features disclosed here are applicable to attaching the closure during bag making as well as to pre-applying the closure. Accordingly, other embodiments are within the scope of the following claims.

Claims

1. A bag (10) having a body with opposite faces (30,44) having side edges (40,42) and defining an interior (48), the bag comprising a reclosable fastener strip (12) secured to the bag body and arranged to form a reclosable face closure for accessing the bag interior (48) through an opening defined in a face (30) of the bag, the fastener strip (12) including a loop component (16) with a band of hookengageable loops (32), and a mating hook component (18) with a band of hooks (36); wherein both the loop component (16) and the hook component (18) are secured to a face of the bag body along opposite sides of the opening and mated in hook and loop engagement.
2. The bag of claim 1, wherein the fastener strip (12) is secured to an inside surface (34) of a front face (30) of the bag.
3. The bag of claim 2 or 3, wherein the opening in the bag body is in the form of a frangible tear line (14) for accessing the fastener strip (12).
4. The bag of any of claims 1 through 3, wherein the hooks (36) are integrally molded along an edge of the hook component (18).
5. The bag of any of claims 1 through 4, wherein the bag body comprises film, and wherein the fastener strip (12) is welded to the film.
6. A method of making a reclosable bag (10) having a body with opposite faces (30,44) having side edges (40,42) and defining an interior (48), the method comprising forming the bag on a bag making machine from a roll (28) of film (24) having a pre-applied closure strip (12) arranged to form a reclosable face closure for accessing the bag interior (48) through an opening defined in a face (30) of the formed bag, the fastener strip including a loop component (16) with a band of hookengageable loops (32), and a mating hook component (16) with a band of hooks (36), wherein both the loop component (16) and the hook component (18) are secured to a face of the bag body along opposite sides of the

opening and mated in hook and loop engagement.

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