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(54) **SELF OPENING T-SHIRT BAG PACK**

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(57) **ABSTRACT**

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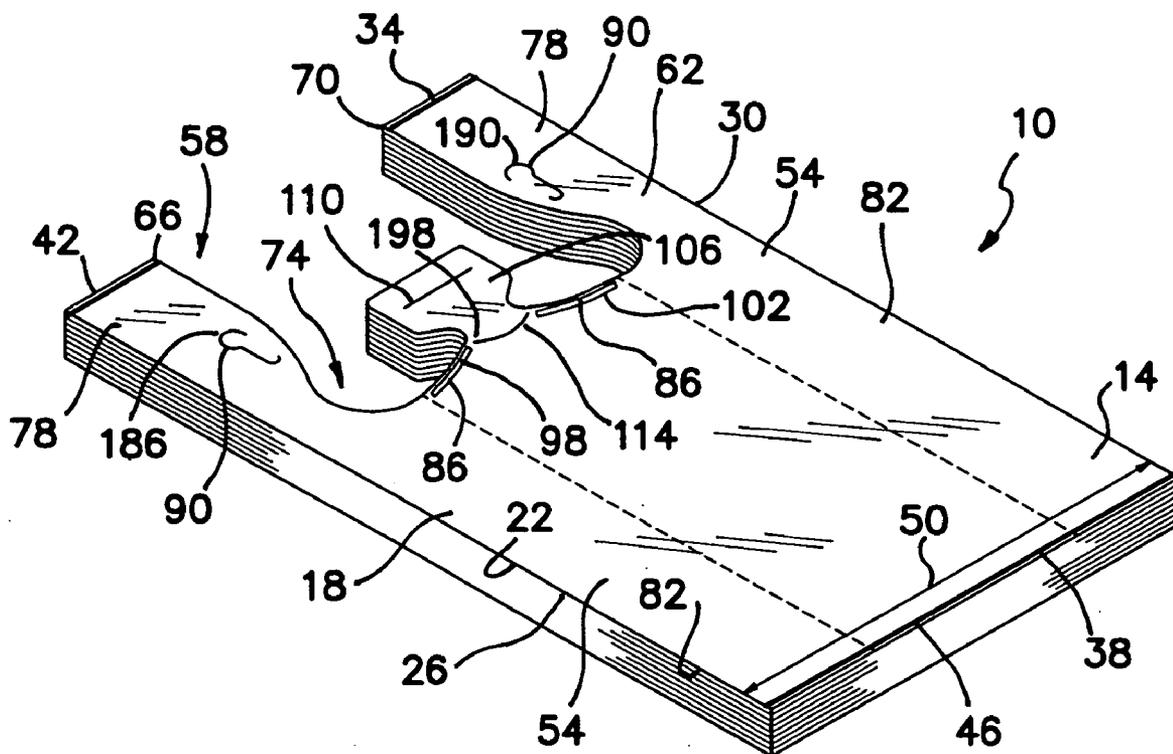
A self-opening bag pack includes a plurality of stacked thermoplastic film bags, each of the bags have longitudinal side gussets and a U-shaped cut-out in an upper portion of the bag forming an open mouth portion and a pair of bag handles. The front and rear walls of each of said bags are corona treated to improve adhesion. An impact line is located immediately adjacent at least a portion of the U-shaped cutout and adheres the rear wall of a first bag in the bag pack to the front wall of a subsequent bag in the pack. Hanging apertures attach the bag pack to a dispensing rack. When the pack is attached to the rack and the first bag is pulled outwardly from the pack, the front wall of a subsequent bag will be adhered to the rear wall of the first bag, thereby causing the first bag to open.

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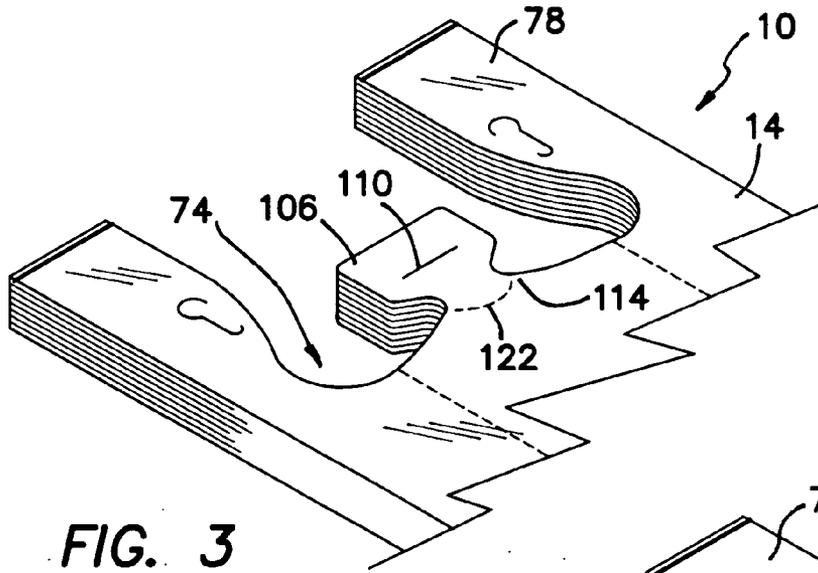


FIG. 3

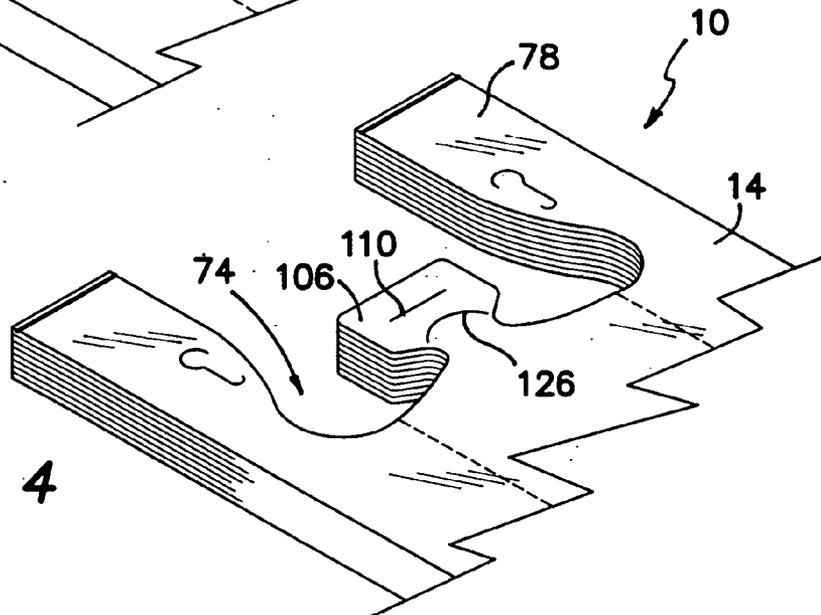


FIG. 4

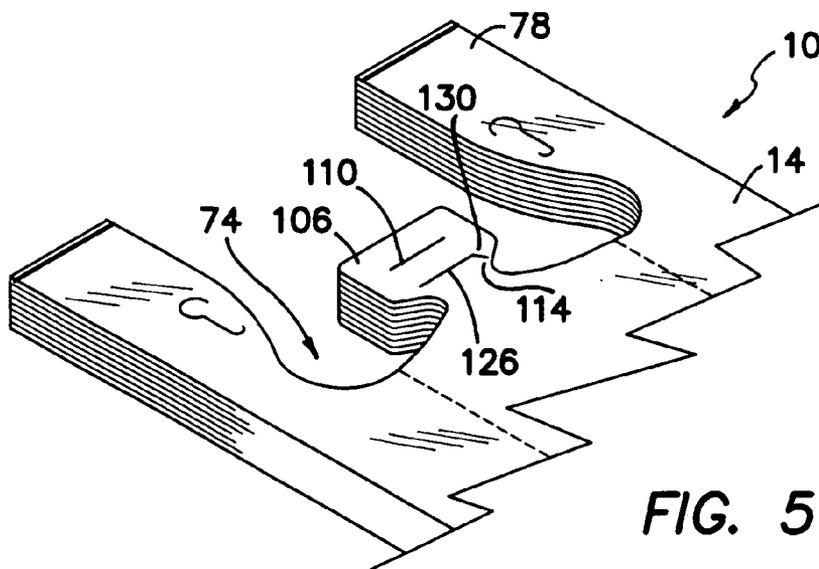
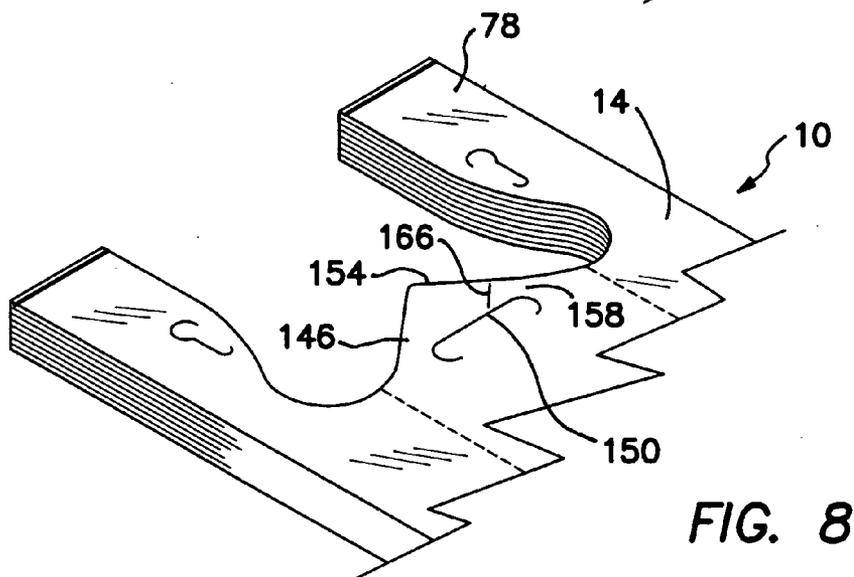
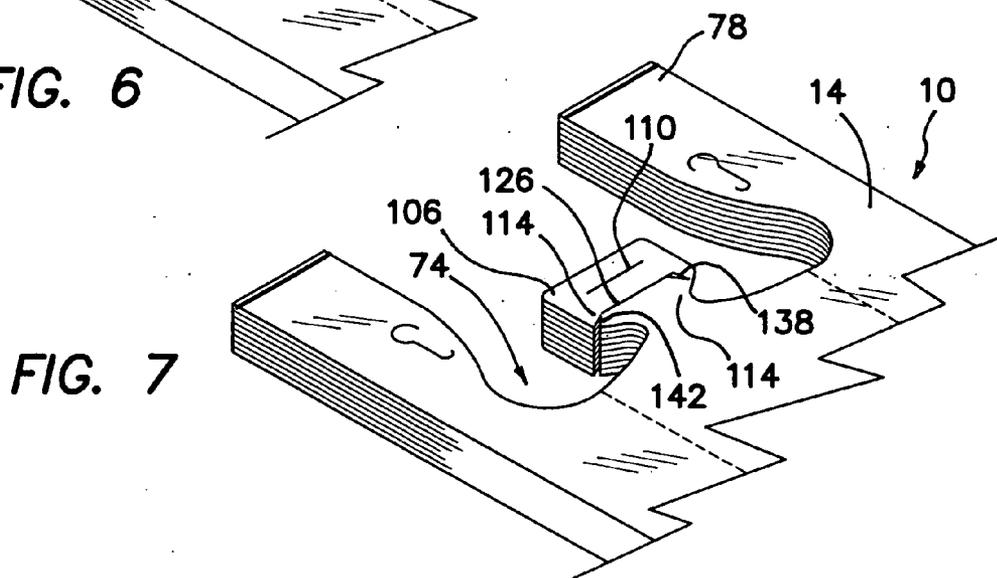
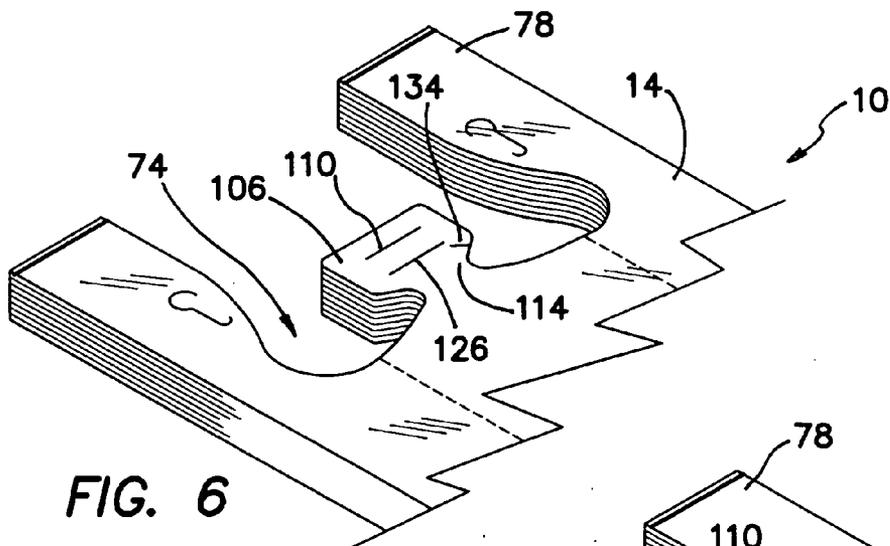


FIG. 5



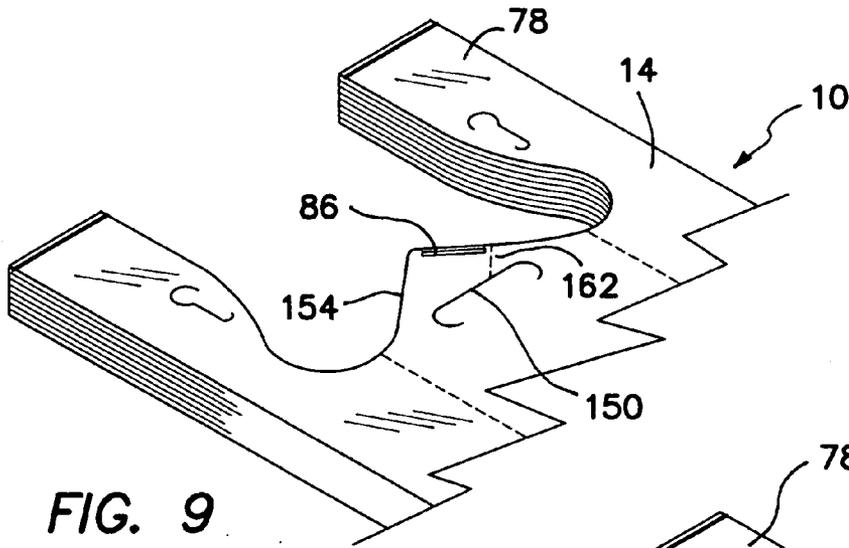


FIG. 9

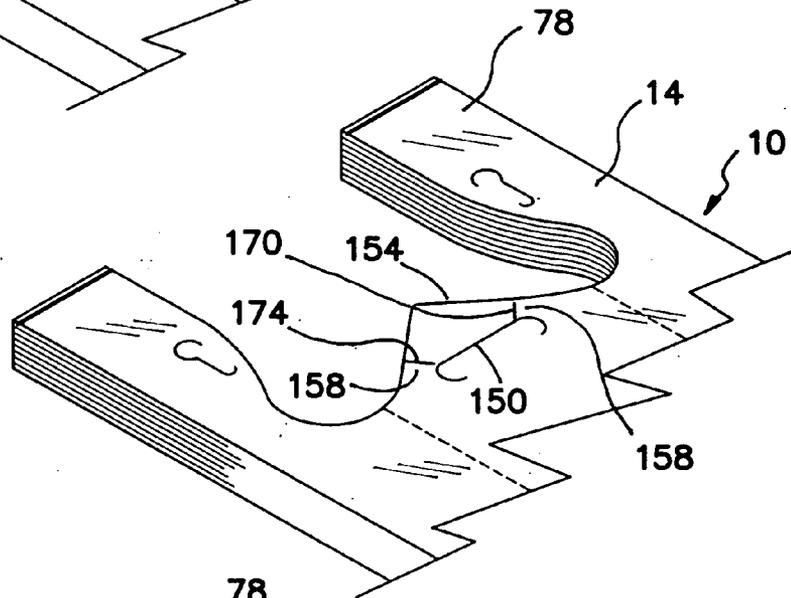


FIG. 10

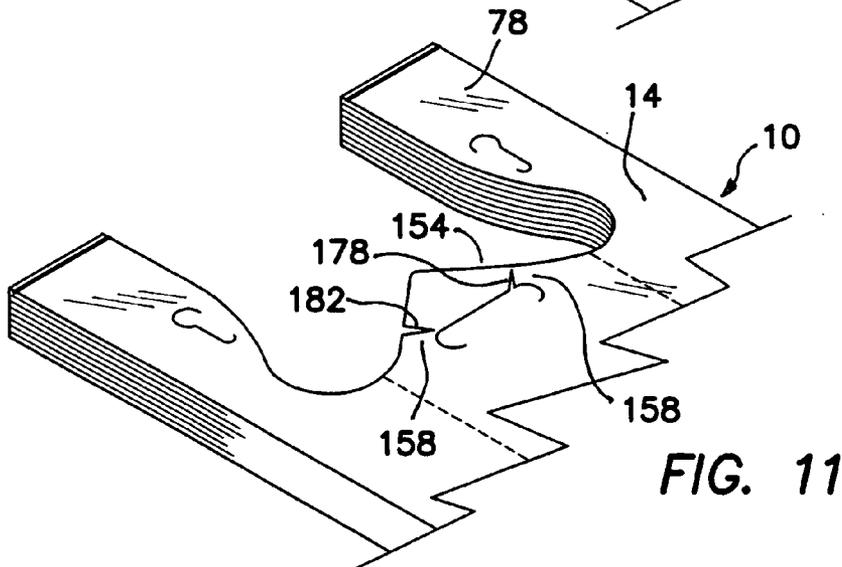


FIG. 11

**SELF OPENING T-SHIRT BAG PACK**

## FIELD OF INVENTION

[0001] The invention pertains to plastic bags typically used for groceries, produce or other merchandise. More particularly, the invention relates to plastic bags for use with dispensing racks that are designed to open as bags are pulled from the dispenser.

## BACKGROUND OF THE INVENTION

[0002] Plastic bags are commonly used in supermarkets, department stores and similar applications. These bags have advantages in that they are relatively inexpensive to produce, provide substantial carrying capacity and may include easily used handles. In order to make these bags easier to handle and easier to fill, they are usually used in combination with a dispensing rack or hook. Dispensing racks typically include a pair of horizontally oriented arms from which the bags are suspended by means of holes in upper portions of the bags. If the bags can be made to open as they are pulled from the dispensing rack or hook, they become substantially easier to use. Various techniques have been developed for causing plastic bags to open as they are removed from dispensing racks or hooks.

[0003] U.S. Pat. No. 5,507,713, issued to Glod, Sr. et al. is directed to a system for suspending a pack of thermoplastic bags, loading bags, removing loaded bags and for automatically opening the next bag preparatory to loading it by having a pack of handled bags suspended from laterally spaced elongated rods of a rack. The bags have been corona discharge treated to such an extent that the application of pressure will cause adjacently facing regions to releasably adhere together until a moderate force separates them. During removal of a bag from the bag pack at least a portion of the front wall of the next bag will follow the bag being removed for a short distance before separation thereby opening said next bag rendering it ready for loading.

[0004] U.S. Pat. No. 4,723,466 issued to Pottorff, discloses a self-sharpening hole punch for plastic bags includes a pneumatically operated punching apparatus for punching wicket pin receiving holes in a flexible film or plastic bag. If desired, a tear slit may be simultaneously formed to enable the bag to be quickly and readily torn free from the wicket pin upon which the bag is retained. A pneumatic air cylinder has a cylinder rod with a fitting affixed thereto, the fitting having an internal tapered thread. Interchangeable plastic cutting tools, having a complementary tapered thread, may be interchangeably screwed into the fitting to facilitate replacement as necessary. A resiliently compressible cylinder of foam plastic material is disposed in a circular void at the cutting side of each of the plastic cutting tools to expel the waste film discs that are punched out of the film or plastic bag material.

[0005] U.S. Pat. No. 5,830,118, issued to Nicholson describes a Longitudinally spaced pairs of laterally spaced openings are formed in a web of material prior to the web being folded into a pouch having a gusset bottom, the holes enabling the side panels of each pouch to be heat-sealed directly together at the side margins of the pouch and in the area of the gussets. To enable the lateral spacing between the openings of each pair to be easily changed and to enable the openings to be located extremely close to the longitudinal centerline of the web, the openings are formed by punches

supported by separate punch frames which may be independently adjusted in a direction laterally of the web. The punch frames also are adjustable relative to one another in a direction longitudinally of the web in order to enable the machine to make pouches of various widths.

[0006] U.S. Pat. No. 3,939,743, issued to Coombes is directed to an improved punch drive means and control means for a punch assembly adapted for preparation of flexible film products. The punch drive means includes a double acting cylinder with a piston and ram operatively associated therewith, and a film slug ejecting means is provided for utilization with the punch. The double acting cylinder for the punch drive means is provided with a control valve which receives compressed air from an air manifold for controlled actuation of the drive cylinder. The film slug ejecting means is provided with a separate control valve which is also coupled to the air manifold, and means are provided for controlling the delivery of compressed air from the manifold to the ejecting port located in the punch.

[0007] U.S. Pat. No. 6,149,562 issued to Meyers et al. is directed to a method of and an apparatus for producing stacks of bags where, instead of connecting the position of the foil web, a marking on the foil web is detected and used to correct the positions of the devices which operate on the web. These devices can include a cutter for removing a strip from the upper layer of the flattened blown tubular web, the punch for punching holes in the lower layer, and the device for infolding are among the devices controlled in response to the marking. The latter can be printed on the web as it is unrolled or formed during the extrusion or foil blowing process.

[0008] U.S. Pat. No. 5,967,662 issued to Chew discloses a stack of plastic T-shirt bags and method of making the same wherein the bags of the stack have been subjected to two corona treatments to increase the adhesion between the back wall of each bag and the front wall of the next ensuing bag with a row of pressure points being provided at the base of the central mounting tab in order to enable each bag as it is pulled open on the rack arms to initiate opening of the next ensuing bag. The mounting tab is cut to provide not only a central mounting slit, but also with a wave-like cut below the mounting slit to enable the mounting tab to be torn for removal from the central mounting element without the tear extending down into the bag walls.

[0009] U.S. Pat. No. 6,435,350, issued to Huang et al. describes a pack of self-opening plastic bags adapted for use with a bagging rack. Each plastic bag preferably has an extension portion extending above an open mouth of the bag. At least one bag pack suspension aperture is formed at an upper region of the bag and is adapted for use in suspending the bag pack on a bagging rack. A carrying handle aperture is formed through an upper region of the bag pack. Areas of compression bonds are formed adjacent upper regions of the bag pack, the handle carrying apertures, and/or the suspension aperture.

[0010] While other variations exist, the above-described designs for self-opening bag stacks are typical of those encountered in the prior art. It is an objective of the present invention to provide for a thermoplastic bag stack that is suitable for use with standardized dispensing racks and includes a self-opening feature. It is a further objective to provide this capability in a bag stack that includes bags that are durable, break-resistant and easily produced. It is a still further objective of the invention to provide the above-

described bag packs without the need for localized compressed areas in the bag stack.

**[0011]** While some of the objectives of the present invention are disclosed in the prior art, none of the inventions found include all of the requirements identified.

#### SUMMARY OF THE INVENTION

**[0012]** The present invention addresses all of the deficiencies of prior art self-opening bag stack inventions and satisfies all of the objectives described above.

**[0013]** (1) A self-opening bag pack providing the desired features may be constructed as follows. A plurality of stacked thermoplastic film bags is provided. Each of the bags has front and rear walls. Each of the front and rear walls have first and second side edges, a top edge and a bottom edge. The front and rear walls are integrally joined at their first and second side edges and secured together at their top and bottom edges by upper and lower seams across a width of the bags. Each of the bags has longitudinally oriented side gussets adjacent the first and second side edges. A U-shaped cut-out is provided. The U-shaped cut-out is located in an upper portion of the bag and commences at a first point along the upper seam spaced inwardly from the first side edge and extends to a second point along the upper seam spaced inwardly from the second side edge. The cut-out extends downwardly toward the bottom edges, thereby forming an open mouth portion and a pair of bag handles.

**[0014]** At least an upper portion of an outer surface of the front and rear walls of each of the bags has been corona treated. An impact line is provided. The impact line is located immediately adjacent at least a portion of the U-shaped cutout and adheres the rear wall of a first bag in the bag pack to the front wall of a subsequent bag in the bag pack. Means are provided for attaching the bag pack to a dispensing rack. When the bag pack is attached to the dispensing rack and the first bag is pulled outwardly from the bag pack, the front wall of the subsequent bag will be adhered to the rear wall of the first bag, thereby causing the first bag to open.

**[0015]** (2) In a variant of the invention, the impact line includes at least two separate portions.

**[0016]** (3) In another variant, the bags include a center tab. The center tab extends upwardly from the open mouth portion.

**[0017]** (4) In still another variant, the center tab includes a hanging aperture and is joined to the open mouth portion at a weakened area, thereby permitting the tab to be torn from the mouth portion as the bag is removed from the dispensing rack.

**[0018]** (5) In yet another variant, the impact line is located immediately adjacent at least a portion of an outer perimeter of the center tab on either side of the weakened area.

**[0019]** (6) In a further variant, the weakened area includes a perforation line disposed between the open mouth portion and the center tab.

**[0020]** (7) In still a further variant, the weakened area includes an opening. The opening is located between the open mouth portion and the center tab.

**[0021]** (8) In yet a further variant, the weakened area further includes a first cut. The first cut extends from the opening toward the open mouth portion.

**[0022]** (9) In another variant of the invention, the weakened area further includes a second cut, the second cut extending from the open mouth portion toward the opening.

**[0023]** (10) In still another variant, the weakened area further includes a first notch, the first notch extends from the opening toward the open mouth portion.

**[0024]** (11) In yet another variant, the weakened area further includes a second notch, the second notch extends from the open mouth portion toward the opening.

**[0025]** (12) In a further variant, the center tab includes a hanging aperture, upward pointing angled side walls and a weakened area located between the hanging aperture and at least one of the angled side walls.

**[0026]** (13) In still a further variant, the impact line is located immediately adjacent at least a portion of at least one of the angled side walls of the center tab on either side of the weakened area.

**[0027]** (14) In yet a further variant, the weakened area includes a perforation line extending from the hanging aperture to either of the angled side walls.

**[0028]** (15) In another variant of the invention, the weakened area includes an opening. The opening is located between the hanging aperture and either of the angled side walls.

**[0029]** (16) In still another variant, the weakened area includes a first cut. The first cut extends from the hanging aperture toward either of the angled side walls.

**[0030]** (17) In yet another variant, the weakened area includes a second cut. The second cut extends from either of the angled side walls toward the hanging aperture.

**[0031]** (18) In a further variant, the weakened area includes a first notch. The first notch extends from the hanging aperture toward either of the angled side walls.

**[0032]** (19) In still a further variant, the weakened area includes a second notch. The second notch extends from either of the angled side walls toward the hanging aperture.

**[0033]** (20) In yet a further variant, the means for attaching the bag stack to a dispensing rack includes first and second openings. The first and second openings penetrate and extend transversely through the bag pack in an upper portion of the bags. The openings are spaced downwardly from the top edge, spaced inwardly from the first and second side edges and serves to support the bag pack on horizontal arms of a dispensing rack.

**[0034]** (21) In a final variant of the invention, the central tab portion is located above an upper edge of the open mouth portion and attached thereto, thereby providing stress relief for the open mouth portion.

**[0035]** An appreciation of the other aims and objectives of the present invention and an understanding of it may be achieved by referring to the accompanying drawings and the detailed description of a preferred embodiment.

#### DESCRIPTION OF THE DRAWINGS

**[0036]** FIG. 1 is a perspective view of a gusseted handle bag pack with detachable central tab and impact lines at the bag mouth;

**[0037]** FIG. 2 a perspective view of an upper portion of a T-shirt style bag pack with detachable central tab and impact lines at the perimeter of the tab;

**[0038]** FIG. 3 a perspective view of an upper portion of a T-shirt style bag pack with detachable central tab attached at a perforation line;

**[0039]** FIG. 4 a perspective view of an upper portion of a T-shirt style bag pack with detachable central tab illustrating an opening adjacent the attachment of the tab to the bag;

[0040] FIG. 5 a perspective view of an upper portion of a T-shirt style bag pack with detachable central tab illustrating a first cut extending from the opening toward the bag mouth;

[0041] FIG. 6 a perspective view of an upper portion of a T-shirt style bag pack with detachable central tab illustrating a second cut extending from the bag mouth toward the opening;

[0042] FIG. 7 a perspective view of an upper portion of a T-shirt style bag pack with detachable central tab illustrating a first notch extending from the opening toward the bag mouth and a second notch extending from the bag mouth toward the opening, illustrating two alternative methods of making the bag;

[0043] FIG. 8 a perspective view of an upper portion of a T-shirt style bag pack with non-detachable central tab illustrating an opening acting as a weakened area between the hanging aperture and the angled side wall of the tab;

[0044] FIG. 9 a perspective view of an upper portion of a T-shirt style bag pack with non-detachable central tab illustrating a perforation acting as a weakened area between the hanging aperture and the angled side wall of the tab with an impact line along an edge of the tab;

[0045] FIG. 10 a perspective view of an upper portion of a T-shirt style bag pack with non-detachable central tab illustrating a first cut extending from the hanging aperture toward the bag mouth and a second cut extending from the bag mouth toward the hanging aperture, illustrating two alternative methods of making the bag;

[0046] FIG. 11 a perspective view of an upper portion of a T-shirt style bag pack with non-detachable central tab illustrating a first notch extending from the hanging aperture toward the bag mouth and a second notch extending from the bag mouth toward the hanging aperture, illustrating two alternative methods of making the bag;

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0047] The present invention addresses all of the deficiencies of prior art self-opening bag pack inventions and satisfies all of the objectives described above.

[0048] (1) A self-opening bag pack 10, as illustrated in FIG. 1, providing the desired features may be constructed as follows. A plurality of stacked thermoplastic film bags 14 is provided. Each of the bags 14 has front 18 and rear 22 walls. Each of the front 18 and rear 22 walls have first 26 and second 30 side edges, a top edge 34 and a bottom edge 38. The front 18 and rear 22 walls are integrally joined at their first 26 and second 30 side edges and secured together at their top 34 and bottom 38 edges by upper 42 and lower 46 seams across a width 50 of the bags 14. Each of the bags 14 has longitudinally oriented side gussets 54 adjacent the first 26 and second 30 side edges. A U-shaped cut-out 58 is provided. The U-shaped cut-out 58 is located in an upper portion 62 of the bag 14 and commences at a first point 66 along the upper seam 42 spaced inwardly from the first side edge 26 and extends to a second point 70 along the upper seam 42 spaced inwardly from the second side edge 30. The cut-out 58 extends downwardly toward the bottom edges 38, thereby forming an open mouth portion 74 and a pair of bag handles 78.

[0049] At least an upper portion of an outer surface 82 of the front 18 and 22 rear walls of each of the bags 14 has been corona treated. An impact line 86 is provided. The impact line 86 is located immediately adjacent at least a portion of

the U-shaped cutout 58 and adheres the rear wall 22 of a first bag 14 in the bag pack 10 to the front wall 18 of a subsequent bag 14 in the bag pack 10. Means 90 are provided for attaching the bag pack 10 to a dispensing rack (not shown). When the bag pack 10 is attached to the dispensing rack and the first bag 14 is pulled outwardly from the bag pack 10, the front wall 18 of the subsequent bag 14 will be adhered to the rear wall 22 of the first bag 14, thereby causing the first bag 14 to open.

[0050] (2) In a variant of the invention, the impact line 86 includes at least one two separate portions 98, 102.

[0051] (3) In another variant, the bags 14 include a center tab 106. The center tab 106 extends upwardly from the open mouth portion 74.

[0052] (4) In still another variant, the center tab 106 includes a hanging aperture 110 and is joined to the open mouth portion 74 at a weakened area 114, thereby permitting the tab 106 to be torn from the mouth portion 74 as the bag 14 is removed from the dispensing rack 94.

[0053] (5) In yet another variant, as illustrated in FIG. 2, the impact line 86 is located immediately adjacent at least a portion of an outer perimeter 118 of the center tab 106 on either side of the weakened area 114.

[0054] (6) In a further variant, as illustrated in FIG. 3, the weakened area 114 includes a perforation line 122 disposed between the open mouth portion 74 and the center tab 106.

[0055] (7) In still a further variant, as illustrated in FIG. 4, the weakened area 114 includes an opening 126. The opening 126 is located between the open mouth portion 74 and the center tab 106.

[0056] (8) In yet a further variant, as illustrated in FIG. 5, the weakened area 114 further includes a first cut 130. The first cut 130 extends from the opening 126 toward the open mouth portion 74.

[0057] (9) In another variant of the invention, as illustrated in FIG. 6, the weakened 114 area further includes a second cut 134, the second cut 134 extends from the open mouth portion 74 toward the opening 126.

[0058] (10) In still another variant, as illustrated in FIG. 7, the weakened 114 area further includes a first notch 138, the first notch 138 extends from the opening 126 toward the open mouth portion 74.

[0059] (11) In yet another variant, the weakened area 114 further includes a second notch 142, the second notch extends from the open mouth portion 74 toward the opening 126.

[0060] (12) In a further variant, as illustrated in FIG. 8, the center tab 146 includes a hanging aperture 150, upward pointing angled side walls 154 and a weakened area 158 located between the hanging aperture 150 and at least one of the angled side walls 154.

[0061] (13) In still a further variant, as illustrated in FIG. 9, the impact line 86 is located immediately adjacent at least a portion of at least one of the angled side walls 154 of the center tab 146 on either side of the weakened area 158.

[0062] (14) In yet a further variant, the weakened area 158 includes a perforation line 162 extending from the hanging aperture 150 to either of the angled side walls 154.

[0063] (15) In another variant of the invention, as illustrated in FIG. 8, the weakened area 158 includes an opening 166. The opening 166 is located between the hanging aperture 150 and either of the angled side walls 154.

**[0064]** (16) In still another variant, as illustrated in FIG. 10, the weakened area 158 includes a first cut 170. The first cut 170 extends from the hanging aperture 150 toward either of the angled side walls 154.

**[0065]** (17) In yet another variant, the weakened area 158 includes a second cut 174. The second cut 174 extends from either of the angled side walls 154 toward the hanging aperture 150.

**[0066]** (18) In a further variant, the weakened area 158 includes a first notch 178. The first notch 178 extends from the hanging aperture 150 toward either of the angled side walls 154.

**[0067]** (19) In still a further variant, the weakened area 158 includes a second notch 182. The second notch 182 extends from either of the angled side walls 154 toward the hanging aperture 150.

**[0068]** (20) In yet a further variant, as illustrated in FIG. 1, the means 90 for attaching the bag stack 10 to a dispensing rack 94 includes first 186 and second 190 openings. The first 186 and second 190 openings penetrate and extend transversely through the bag pack 10 in an upper portion 62 of the bags 14. The openings 186, 190 are spaced downwardly from the top edge 34, spaced inwardly from the first 26 and second 30 side edges and serves to support the bag pack 10 on horizontal arms 198 of a dispensing rack 94.

**[0069]** (21) In a final variant of the invention, the central tab portion 106 is located above an upper edge 198 of the open mouth portion 74 and attached thereto, thereby providing stress relief for the open mouth portion 74.

**[0070]** An appreciation of the other aims and objectives of the present invention and an understanding of it may be achieved by referring to the accompanying drawings and the detailed description of a preferred embodiment.

**1.** A self-opening bag pack comprising:

a plurality of stacked thermoplastic film bags, each of said bags having front and rear walls, each of said front and rear walls having first and second side edges, a top edge and a bottom edge;

said front and rear walls being integrally joined at their first and second side edges and secured together at their top and bottom edges by upper and lower seams across a width of said bags;

each of said bags having longitudinally oriented side gussets adjacent said first and second side edges;

a U-shaped cut-out, said U-shaped cut-out being disposed in an upper portion of said bag and commencing at a first point along said upper seam spaced inwardly from said first side edge and extending to a second point along the upper seam spaced inwardly from said second side edge, said cut-out extending downwardly toward said bottom edges, thereby forming an open mouth portion and a pair of bag handles.

at least an upper portion of an outer surface of said front and rear walls of each of said bags having been corona treated;

an impact line, said impact line being disposed immediately adjacent at least a portion of said U-shaped cutout and adhering said rear wall of a first bag in said bag pack to said front wall of a subsequent bag in said bag pack;

means for attaching said bag pack to a dispensing rack; whereby, when said bag pack is attached to said dispensing rack and said first bag is pulled outwardly from said bag pack, said front wall of said subsequent bag will be

adhered to said rear wall of said first bag, thereby causing said first bag to open.

**2.** The self-opening bag pack, as described in claim 1, wherein said impact line comprises at least one two separate portions.

**3.** The self-opening bag pack, as described in claim 1, wherein said bags further comprise a center tab, said center tab extending upwardly from said open mouth portion.

**4.** The self-opening bag pack, as described in claim 3, wherein said center tab comprises a hanging aperture and is joined to said open mouth portion at a weakened area, thereby permitting said tab to be torn from said mouth portion as said bag is removed from said dispensing rack.

**5.** The self-opening bag pack, as described in claim 4, wherein said impact line is disposed immediately adjacent at least a portion of an outer perimeter of said center tab on either side of said weakened area.

**6.** The self-opening bag pack, as described in claim 4, wherein said weakened area comprises a perforation line disposed between said open mouth portion and said center tab.

**7.** The self-opening bag pack, as described in claim 4, wherein said weakened area comprises an opening, said opening being disposed between said open mouth portion and said center tab.

**8.** The self-opening bag pack, as described in claim 7, wherein said weakened area further comprises a first cut, said first cut extending from said opening toward said open mouth portion.

**9.** The self-opening bag pack, as described in claim 7, wherein said weakened area further comprises a second cut, said second cut extending from said open mouth portion toward said opening.

**10.** The self-opening bag pack, as described in claim 7, wherein said weakened area further comprises a first notch, said first notch extending from said opening toward said open mouth portion.

**11.** The self-opening bag pack, as described in claim 7, wherein said weakened area further comprises a second notch, said second notch extending from said open mouth portion toward said opening.

**12.** The self-opening bag pack, as described in claim 3, wherein said center tab comprises a hanging aperture, upward pointing angled side walls and a weakened area disposed between said hanging aperture and at least one of said angled side walls.

**13.** The self-opening bag pack, as described in claim 12, wherein said impact line is disposed immediately adjacent at least a portion of at least one of said angled side walls of said center tab on either side of said weakened area.

**14.** The self-opening bag pack, as described in claim 12, wherein said wherein said weakened area comprises a perforation line extending from said hanging aperture to either of said angled side walls.

**15.** The self-opening bag pack, as described in claim 12 wherein said weakened area comprises an opening, said opening being disposed between said hanging aperture and either of said angled side walls.

**16.** The self-opening bag pack, as described in claim 12, wherein said weakened area comprises a first cut, said first cut extending from said hanging aperture toward either of said angled side walls.

**17.** The self-opening bag pack, as described in claim 12, wherein said weakened area comprises a second cut, said

second cut extending from either of said angled side walls toward said hanging aperture.

**18.** The self-opening bag pack, as described in claim **12**, wherein said weakened area comprises a first notch, said first notch extending from said hanging aperture toward either of said angled side walls.

**19.** The self-opening bag pack, as described in claim **12**, wherein said weakened area comprises a second notch, said second notch extending from either of said angled side walls toward said hanging aperture.

**20.** The self-opening bag pack, as described in claim **1**, wherein the means for attaching said bag pack to a dispensing rack further comprises:

first and second openings, said first and second openings penetrating and extending transversely through said bag pack in an upper portion of the bags; and said openings being spaced downwardly from said top edge, spaced inwardly from said first and second side edges and serving to support said bag pack on horizontal arms of a dispensing rack.

**21.** The self-opening bag pack, as described in claim **3**, wherein said central tab portion is disposed above an upper edge of said open mouth portion and attached thereto, thereby providing stress relief for said open mouth portion.

\* \* \* \* \*