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(71) Applicant *(for all designated States except US)*: **THE HUDSON-SHARP MACHINE CO.** [US/US]; 975 Lombardi Avenue, Green Bay, WI 54304 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **DESMEDT, Eric** [US/US]; 975 Lombardi Avenue, Green Bay, WI 54304 (US). **ALLAMPRESE, Michele** [US/US]; 975 Lombardi Avenue, Green Bay, WI 54304 (US).

(74) Agents: **GEIMER, Stephen, D.** et al.; Wood, Phillips, Katz, Clark & Mortimer, 500 West Madison Street, Suite 3800, Chicago, IL 60661 (US).

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[Continued on next page]

(54) Title: EXPANDABLE PACKAGE

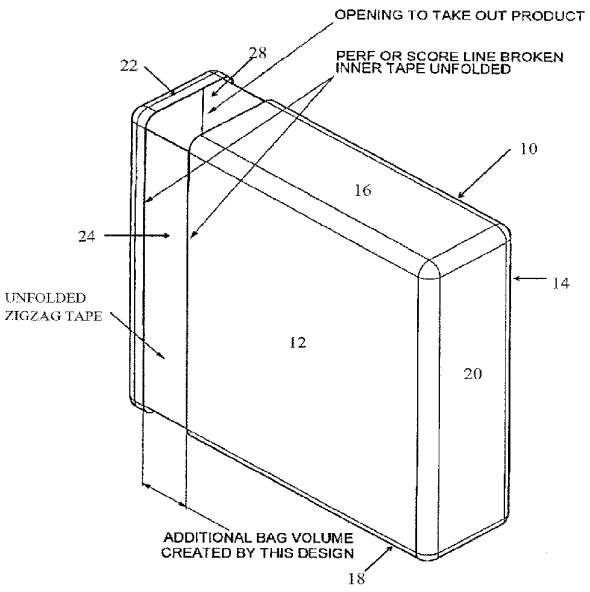

FIG_2

(57) Abstract: The present invention was directed to an expandable package which facilitates packaging of compressible articles, such as sanitary products, disposable diapers and the like. The expandable package includes an outer bag body, and at least one inner expansion element, which is maintained in a folded condition so that articles within the package are maintained in a compressed state. The package includes at least one preferentially weakened area in the outer bag body, which when opened, permits the inner expansion elements to unfold, thus facilitating convenient separation and removal of individual articles from within the package by consumers.

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EXPANDABLE PACKAGE

TECHNICAL FIELD

[0001] The present invention relates generally to flexible packaging for compressible articles, such as sanitary protection products, disposable diapers, and the like, and more particularly to an expandable package which facilitates storage and shipment by permitting articles therein to be maintained in a compressed state, with the package being expandable upon opening to facilitate removal of articles therefrom.

BACKGROUND OF THE INVENTION

[0002] Flexible packaging arrangements, typically formed from heat-sealable polymeric film materials, are in wide-spread use by virtue of the efficiency with which they can be manufactured and filled, and the convenience that they provide to consumers for handling and storage of articles therein. For some types of articles, such as sanitary protection products, disposable diapers, and the like, articles within the package are typically maintained in a compressed state to thereby desirably reduce costs associated with storage and shipment.

[0003] During packaging, products of this nature are typically packed vertically within an associated package, with the articles subjected to compression in the cross-direction, with respect to the filling machine. While these types of machines are capable of applying a relatively high degree of compression to articles being packaged in this fashion, the degree of compression is limited, in certain respects, by convenience for the end user. In particular, when such articles are subjected to relatively high compression, upon opening of the package, the package can tend "explode", and the articles therein can be inconveniently discharged from the package. In the event that the products do not "pop out" in this fashion, they may be retained within the package in a highly compressed state, detracting from convenient removal of the first few articles from within the package by consumers.

[0004] Thus, it is desirable to provide an improved form of package which facilitates higher compression of articles therein to facilitate efficient shipments and storage, while avoiding drawbacks associated with convenient removal of such articles by consumers.

SUMMARY OF THE INVENTION

[0005] The present invention is directed to an improved package formed from flexible material, which notably is configured to expand upon initial opening, thereby greatly facilitating convenient removal of individual articles from within the package by consumers.

The expandability of the package can be provided in an efficient fashion, without excessive expense, and can be filled on conventional filling machines without significant or expensive modifications.

[0006] In accordance with the illustrated embodiment, the present expandable package includes an outer bag body including front and rear body panels, and a pair of opposite ends between which the body panels longitudinally extend. The bag body is preferably formed from flexible material, such heat-sealable polymeric film. However, it is within the preview of the present invention that other flexible packaging materials can be employed for manufacture of the present package.

[0007] In accordance with the present invention, the present expandable package includes at least one inner, folded expansion element positioned within and joined to the outer bag body of the package. The expansion element is joined to the bag body at two longitudinally spaced regions of the bag body, with the expansion element having an unfolded, longitudinal dimension greater than the longitudinal spacing of these regions. As used herein, the term folded is intended to encompass any configuration of the inner expansion element which effectively reduces its overall length, including folding, fan-folding, coiling, bunching or the like.

[0008] The bag body defines a preferentially weakened area positioned generally between the longitudinally spaced regions of the bag body to which the inner expansion element is secured. By this arrangement, upon opening of the bag body at the weakened area, the ends of the bag body can separate from each other as the inner expansion element unfolds. In this fashion, removal of articles from within the packages is facilitated.

[0009] In the illustrated embodiment, the bag body includes front and rear longitudinally extending body panels, and is provided with a pair of inner expansion elements positioned in respective association with the front and rear body panels. The expansion elements are spaced from each other, generally at the top of the package between the front and rear body panels. The weakened area of the package is preferably provided so that it extends substantially continuously about the periphery of the bag body.

[0010] Upon opening the weakened area, each of the pair of the expansion elements is permitted to unfold as the package is opened. This permits articles within the package to be removed generally through the top thereof, generally from between the pair of expansion elements.

[0011] A method of forming an expandable package in accordance with the present invention includes providing a web of flexible material, and forming a series of spaced apart weakened regions which extend generally transversely of the web. The weakened regions may each be provided in the form of a perforation or scored area. The method further contemplates that the expansion elements, such as in the form of zig zag tape, are thereafter joined to the web of material, with each expansion element joined to the web at longitudinally spaced regions, generally so that each expansion element overlies and is connected across a respective one of the weakened areas. The web of plastic material can thereafter be formed into packages, in a conventional fashion, with compressed articles positioned therein. The filled packages can be handled in a conventional fashion for subsequent packaging, storage, and shipment.

[0012] After purchase, each individual package can be expanded by opening of the weakened area, whereby the ends of the package move away from each other, under the influence of the compressed articles therein, as the one or more expansion elements within the package unfold and longitudinally extend. Consumers can then conveniently remove articles from within the package.

[0013] Other features and advantages of the present invention will become readily apparent from the accompanying drawings, and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Figure 1 is a diagrammatic, perspective view of an expandable package embodying the principles of the present invention;

[0015] Figure 2 is a diagrammatic, perspective view of the package of Figure 1, showing the package in an expanded condition;

[0016] Figure 3 is a diagrammatic view illustrating manufacture of the present package from a web of plastic fill material; and

[0017] Figure 4 is a cross-sectional, diagrammatic view illustrating securement of an expansion element to an associated flexible web of material.

DETAILED DESCRIPTION

[0018] 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, with the understanding that the present disclosure is to be considered as

an exemplification of the invention, not intended to limit the invention to specific embodiment illustrated.

[0019] With reference now to Figures 1 and 2, therein is illustrated an expandable package 10 embodying the principles of the present invention. In the illustrated embodiment, the expandable package 10 has a generally rectangular configuration, including front and rear panels 12 and 14, top and bottom panels 16 and 18, and opposite end panels 20 and 22. As will be further described, package 10 is expandable such that the front, rear, top, and bottom panels can be expanded or lengthened, as the opposite end panels 20 and 22 are moved away from each other.

[0020] In order to configure the package 10 for expandability, the package includes an outer bag body, and at least one inner expansion element 24 joined to the bag body at two longitudinally spaced regions of the bag body. Prior to expansion of the package 10, the expansion element 24 is maintained in a folded condition, that is, any configuration of the inner expansion element which effectively reduces its overall length, including folding, fan-folding, coiling, bunching and the like.

[0021] The bag body of the package 10 defines a preferentially weakened area 26 which extends about the outer periphery of the bag body, including front and rear panels 12 and 14, and top and bottom panels 16 and 18, preferably in closely spaced relationship to one of the end panels of the package, such as end panel 22 in the illustrated embodiment. The preferentially weakened area can be provided in the form of a perforation, score line, or the like, and acts to releasably maintain the package in its unexpanded condition, with the inner expansion element maintained in its folded configuration.

[0022] Figure 1 illustrates expandable package 10 in its unexpanded condition, in which condition articles within the package, such as disposable diapers, sanitary napkins, and like articles which can be compressed, are maintained in a compressed condition, thus facilitating efficient storage and shipment of the package 10.

[0023] In order to facilitate access to the contents of the package 10 by consumers, it is desirable that the compressed articles within the package be uncompressed, thus facilitating separation and withdrawal of the articles from within the package. To this end, package 10 can be readily reconfigured to its expanded configuration, shown in Figure 2, by fracture, breaking, tearing, or other opening of the package at the preferentially weakened area 26. Upon opening in this fashion, end

panel 22 can move generally outwardly of the remainder of the package, as the one or more inner expansion elements 24 unfold and extend. It is preferred that the inner expansion element not extend about the inner periphery of the package, to thereby define a product opening 27 at which the uncompressed products within the package can be easily removed. In a current embodiment, a pair of the expansion elements 24 are provided in respective association with the front and rear panels 12, 14, so that the expansion elements are spaced from each other at the top and bottom panels 16, 18, thus providing product opening 27 upon expansion of the package.

[0024] Figures 3 and 4 illustrate a method by which the expandable package 10 of the present invention can be readily fabricated. Package 10 can be efficiently formed from a plastic film web 28, or like material, which is preferably heat-sealable. A series of the preferentially weakened areas 26 are formed transversely of the web of material 28, with the weakened regions spaced along the longitudinal axis of the web at intervals corresponding to the length of each package being formed.

[0025] Formation of the present package is next effected by the provision of a plurality of the expansion elements 24, with each of the expansion elements joined to the web at a pair of longitudinally spaced regions of the web so that each expansion element extends across one of the preferentially weakened areas 26 between the respective longitudinally spaced regions. As shown in Figure 4, such longitudinally spaced regions can be provided in the form of suitable seals 30, 32, which may be formed by heat-seals, adhesive seals, or like techniques as are known in the art.

[0026] As noted, each expansion element 24 has an unfolded longitudinal dimension greater than the longitudinal spacing between the respective ones of the longitudinally spaced regions i.e., seals 30, 32.

[0027] Package formation is further effected by providing a plurality of articles to be placed in each of the packages being formed, and thereafter folding the web of material to form a series of packages. Each package thus-formed includes an outer bag body having front and rear panels, and a pair of opposite ends between which the body panels extend. At least one of each of the expansion elements 24 is positioned interiorly of each of the packages being formed, with the formation method including positioning the plurality of articles, under compression, in the package being formed.

[0028] By this arrangement, upon opening of each package at the preferentially weakened area, the ends of the bag body can separate from each other as the one or

more expansion elements unfold, thereby facilitating removal of articles from within the package.

[0029] In order to form an expandable package configured in accordance with the embodiment illustrated in Figure 1, it is preferred that a pair of the expansion elements 24 be joined to the web of material to respectively extend across each one of the preferentially weakened areas, so that each of the expansion elements is positioned in respective association with the front and rear panels of the respective outer bag body. Thus, a pair of expansion elements are spaced from each other, in a direction transversely of the web of material, generally at the top of the package being formed, so that upon opening of the package at the preferentially weakened area thereof, the articles can be removed from the package generally through the top thereof, such as through product opening 28, generally from between the pair of expansion elements 24.

[0030] From the foregoing, it will be observed that numerous modifications and variations can be effected without departing from the true spirit and scope of a novel concept of the present invention. It is to be understood that no limitation with respect to the specific embodiment illustrated herein is intended or should be inferred. The disclosure is intended to cover by the appended claims all such modifications well within the scope of the claims.

CLAIMS

What Is Claimed Is:

1. An expandable package, comprising:

an outer bag body including front and rear body panels, and a pair of opposite ends between which said body panels longitudinally extend, said bag body being formed from flexible material; and

at least one inner, folded expansion element positioned within and joined to said outer bag body, said expansion element being joined to said bag body at two longitudinally spaced regions of said bag body, said expansion element having an unfolded longitudinal dimension greater than the longitudinal spacing of said regions,

said bag body defining a preferentially weakened area positioned generally between said longitudinally spaced regions, so that upon opening of said bag body at said weakened area, the ends of the bag body can separate from each other as said inner expansion element unfolds, thereby facilitating removal of articles from within said package.

2. An expandable package in accordance with claim 1, wherein

said bag body includes front and rear longitudinally extending body panels, and said package includes a pair of said inner expansion elements positioned in respective association with said front and rear body panels, said expansion elements being spaced from each other generally at the top of said package between said front and rear body panels, whereby opening of said weakened area of the bag body, permits each of said expansion elements to unfold, and permits articles within the package to be removed generally through the top thereof, generally from between said pair of expansion elements.

3. An expandable package in accordance with claim 1, wherein

said weakened area comprises a perforation.

4. An expandable package in accordance with claim 1, wherein

said weakened area comprises a scored area of said bag body.

5. An expandable package in accordance with claim 1, wherein

said weakened area extends substantially continuously about the periphery of said bag body.

6. An expandable package in accordance with claim 1, wherein

said bag body in formed from a web of heat-sealable material, and said expansion

element comprises zigzag tape heat-sealed to the web of material at the interior of the bag body at said longitudinally space regions.

7. A method of making an expandable package, comprising the steps of:

providing a web of flexible material;

forming a series of preferentially weakened areas transversely of the web of material, spaced along the longitudinal axis of said web at intervals corresponding to the length of each package being formed;

providing a plurality of expansion elements;

joining each one of said expansion elements to said web of material at a pair of longitudinally spaced regions of said web of material so that the expansion element extends across one of said preferentially weakened areas between the respective longitudinally spaced regions, each said expansion element having an unfolded longitudinal dimension greater than the spacing between the respective ones of the pair of longitudinally spaced regions;

providing a plurality of articles to placed in each of the packages being formed; and

folding said web of material to forming a series of said packages, each including an outer bag body having front and rear panels, and a pair of opposite ends between which said body panels extend, with at least one of said expansion elements positioned interiorly of each of the packages being formed, including positioning the plurality of said articles, under compression, in the package being formed,

so that upon opening of each package at the preferentially weakened area, the ends of the bag body can separate from each other as the expansion element unfolds, thereby facilitating removal of articles from within the package.

8. A method of making an expandable package in accordance with claim 7, including

joining a pair of said expansion elements to said web of material to extend across each one of said preferentially weakened areas so that said expansion elements are positioned in respective association with the front and rear panels of the respective outer bag body,

said pair of expansion elements being spaced from each other, in a direction transversely of said web of material, generally at the top of the package being formed, so that upon opening of the package at the preferentially weakened area thereof, the articles can be removed from the package generally through the top thereof, generally from between said pair of expansion elements.

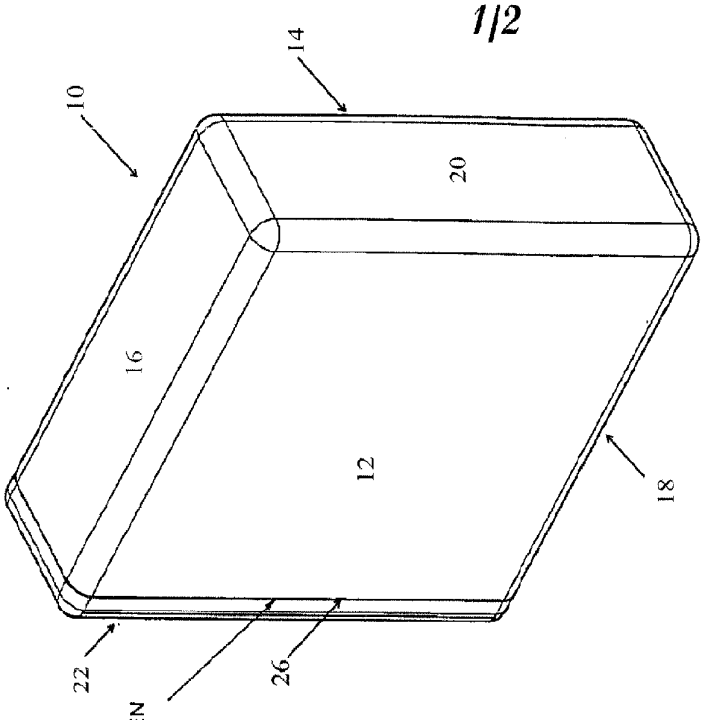

10
14
20
16
12
18
22
26

FIG_1

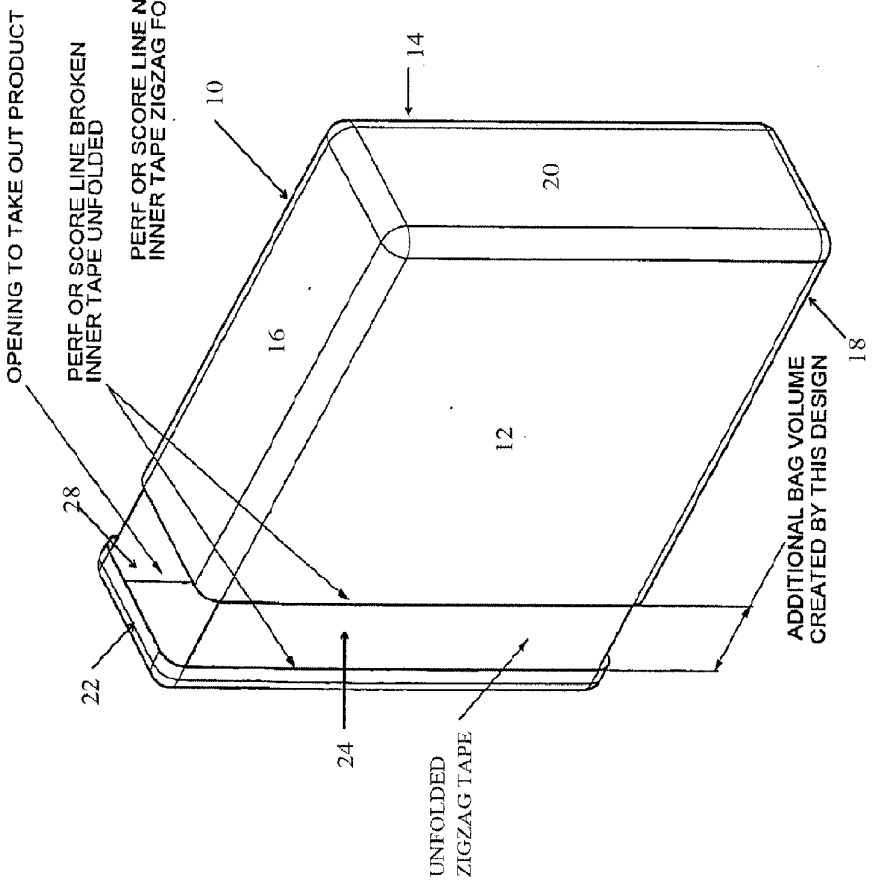

OPENING TO TAKE OUT PRODUCT
PERF OR SCORE LINE BROKEN
INNER TAPE UNFOLDED
PERF OR SCORE LINE NOT BROKEN
INNER TAPE ZIGZAG FOLDED
10
14
20
16
12
18
28
22
24
UNFOLDED
ZIGZAG TAPE
ADDITIONAL BAG VOLUME
CREATED BY THIS DESIGN

FIG_2

FIG_3

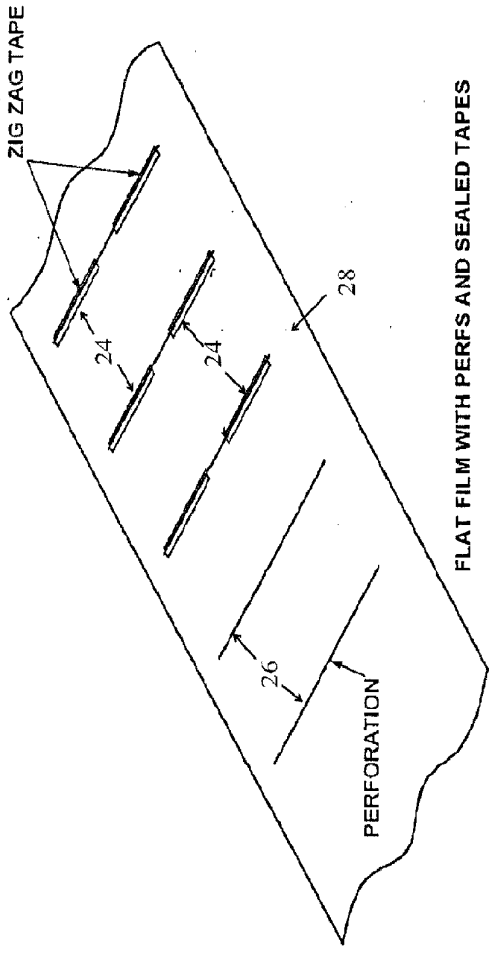
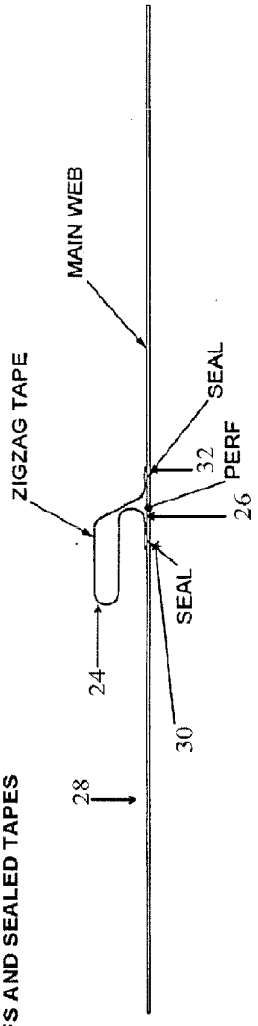

ZIG ZAG TAPE
24
24
28
26
PERFORATION
FLAT FILM WITH PERFS AND SEALED TAPES

FIG_4


MAIN WEB
ZIGZAG TAPE
SEAL
32
PERF
26
SEAL
24
30
28