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FLEXIBLE PACKAGING SYSTEM

Abstract

A packaging assembly including a panel component with a plurality of fold lines formed therein and along which the panel component is foldable, defining a plurality of panel regions. A plurality of impact absorbing molded pulp standoff components are fixed on the panel component, wherein each one of a multiplicity of the panel regions includes at least one of the molded pulp standoff components fixed thereto. The panel component is changeable between a laid flat configuration and a folded configuration, wherein, in the laid flat configuration, the panel regions lie in a substantially common plane and the molded pulp standoff components project in a substantially common direction from the panel component, wherein, in the folded configuration, the panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other.

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Background/Summary

TECHNICAL FIELD

[0001] The present application relates generally to packaging assemblies for packaging and shipment of products and, more particularly, to a flexible packaging system adaptable to various products.

BACKGROUND

[0002] Packaging of products to reduce likelihood of product damage during shipping is an important aspect of the ability to ship products. A large variety of existing packaging arrangements are known and are, to some degree, successful. As environmental impact issues become more important to businesses and the general population, the need for the use of recycled or recyclable materials in packaging increases.

[0003] Accordingly, new packaging systems and assemblies that more effectively utilize recycled materials are desirable.

SUMMARY

[0004] In one aspect, a packaging assembly includes a panel component including a plurality of fold lines formed therein and along which the panel component is foldable, the fold lines collectively defining a plurality of panel regions, and a plurality of impact absorbing molded pulp standoff components fixed on the panel component, wherein each one of a multiplicity of the panel regions includes at least one of the molded pulp standoff components fixed thereto. The panel component is changeable between a laid flat configuration and a folded configuration, wherein, in the laid flat configuration, the panel regions lie in a substantially common plane and the molded pulp standoff components project in a substantially common direction from the panel component, wherein, in the folded configuration, the panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other.

[0005] In another aspect, a packaged product assembly includes first and second combination panel and standoff component assemblies and a packaged product. The first combination panel and standoff component assembly includes: a first panel component including a plurality of first fold lines formed therein and along which the first panel component is foldable, the first fold lines collectively defining a plurality of first panel regions; a plurality of first impact absorbing molded pulp standoff components fixed on the first panel component, wherein each one of a multiplicity of the first panel regions includes at least one of the first molded pulp standoff components fixed thereto; wherein the first panel component is changeable between a first laid flat configuration and a first folded configuration, wherein, in the first laid flat configuration, the first panel regions lie in a substantially common first plane and the first molded pulp standoff components project in a substantially common first direction from the first panel component, wherein, in the first folded configuration, the first panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other. The second combination panel and standoff component assembly includes: a second panel component including a plurality of second fold lines formed therein and along which the second panel component is foldable, the second fold lines collectively defining a plurality of second panel regions; a plurality of second impact absorbing molded pulp standoff components fixed on the second panel component, wherein each one of a multiplicity of the second panel regions includes at least one of the second molded pulp standoff components fixed thereto; wherein the second panel component is changeable between a second laid flat configuration and a second folded configuration, wherein, in the second laid flat

configuration, the second panel regions lie in a substantially common second plane and the second molded pulp standoff components project in a substantially common second direction from the second panel component, wherein, in the second folded configuration, the second panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other. The packaged product is engaged (i) on a first side or end by the first combination panel and standoff component assembly in the first folded configuration and (ii) on a second side or end by the second combination panel and standoff component assembly in the second folded configuration.

[0006] In another aspect, a method of producing a packaging component for use in packaging a product for shipment, where the method involves: utilizing a panel component that includes a plurality of fold lines formed therein and along which the panel component is foldable, the fold lines collectively defining a plurality of panel regions; utilizing a plurality of impact absorbing molded pulp standoff components; and selectively fixing each of the impact absorbing molded pulp standoff components onto the panel component in positions such that each one of a multiplicity of the panel regions includes at least one of the molded pulp standoff components fixed thereto.

[0007] The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features, objects, and advantages will be apparent from the description and drawings, and from the claims.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a perspective view of one embodiment of a packaging assembly;

[0009] FIGS. **2**A-**2**E show perspective views of molded pulp standoff components of different configurations;

[0010] FIGS. **3** and **4** show a laid flat configuration of a combination panel and standoff component assembly;

[0011] FIGS. **5**A-**5**D show perspective views of a sequence of packaging a product;

[0012] FIGS. **6**-**9**C show another embodiment of a packaging assembly or portions thereof;

[0013] FIGS. **10**-**13**B show another embodiment of a packaging assembly or portions thereof; and

[0014] FIGS. **14**-**16**B show another embodiment of a packaging assembly or portions thereof.

DETAILED DESCRIPTION

[0015] Referring to FIGS. **1**-**5**D, a packaging assembly **10** is shown an includes two like panel components **12**, each of which includes a plurality of fold lines **14***a*-**14***d* formed therein and along which the panel component is foldable. The panel components **12** may be of the corrugated board type, not formed of molded pulp material. By way of example, the fold lines **14***a*-**14***d* may be compression lines, score lines, perforation lines or other configurations that define lines of weakness in the panel component that facilitate folding. The fold lines **14***a*-**14***d* collectively define (either alone or in combination with free end edges of the panel component) a plurality of panel regions **12***a*-**12***e*. A plurality of impact absorbing molded pulp standoff components **16** are fixed on the panel component **12**. A multiplicity of the panel regions **12***a*-**12***e* (here, all of the panel regions) each include at least one of the molded pulp standoff components **16** fixed thereto. The panel components **12** are changeable between a laid flat configuration (e.g., FIG. **4**) and a folded configuration (e.g., FIG. **5**C). In the laid flat configuration, the panel regions **12***a*-**12***e* lie in a substantially common plane, and the molded pulp standoff components **16** project in a substantially common direction from the panel component **12**. In the folded configuration, the panel regions **12***a*-**12***e* lie in multiple different planes, and the multiple different planes are angularly offset from each other to facilitate accommodation of a product **20** that is being packaged. Each panel component **12** with molded pulp standoff components **16** fixed thereto may be deemed or termed a

combination panel and standoff assembly **13**.
[0016] In one implementation, each of the molded pulp standoff components **16** is fixed on the panel component, in a respective desired location, by an adhesive. Thus, upon curing of the adhesive, the molded pulp standoff components **16** are not movable to other locations on the panel component. Notably, to further facilitate the folding, none of the molded pulp standoff components **16** are fixed to more than one of the panel regions (i.e., none of the components **16** span over any of the fold lines **14***a*-**14***d*).
[0017] Packaging assemblies of the type described herein may utilize molded pulp standoff components **16** having a variety of different configurations. By way of example, standoff components **16***a*-**16***e* are shown in FIG. **2**. Each standoff component includes a base part **16***a***1**-**16***e***1** and one or more projecting parts **16***a***2**-**16***e***2** projecting therefrom. Here, the base part **16***a***1**-**16***e***1** defines a largest perimeter of the component (in top plan view) and the bottom surface of the base part acts as the surface portion that becomes adhered to the surface of the panel component. The projecting part **16***a***2**-**16***e***2** is hollow. In particular, the upwardly projecting side walls (e.g., **16***a***3**) and the top wall (e.g., **16***a***4**) of each projecting part define a hollow cavity that is open at the bottom side of the base part. Here, each projecting part **16***a***2**-**16***e***2** is of cross-shaped perimeter configuration, and the top wall is substantially planar. However, other configurations are possible.
[0018] In respect of the packaging assembly **10**, both standoff components **16***a* and standoff components **16***b* are fixed to the panel component **12**, with standoff components **16***a* located in each of panel regions **12***a* and **12***c*, and standoff components **16***b* located in each of panel regions **12***b*, **12***d* and **12***e*. In implementations, only a single type of molded pulp standoff component may be used. For example, the illustrated configuration of the combination panel and standoff assembly **13** could be implemented using only standoff components **16***a*. However, by also utilizing standoff components **16***b*, the number of steps required to form each combination panel and standoff assembly **13** is reduced (e.g., a single step of fixing of a component **16***b* to the panel component **12** avoids the need to use two steps to fix two components **16***a* side-by-side on the panel component **12**).
[0019] In other embodiments, more than two different configurations of the standoff components **16** might be included on a single panel component **12**. For example, a standoff component **16***e* might also be used, per the dashed line representation in FIG. **4**.
[0020] As per FIG. **5**C, in the packaging assembly **10**, in the folded configuration of each individual combination panel and standoff assembly **13**, each of the panel regions **12***a*-**12***e* lies in a different respective plane, with the planes in which panel regions **12***a* and **12***c* lie being substantially parallel to each other, the planes in which panel regions **12***d* and **12***e* lie being substantially parallel to each other, and with panel region **12***b* interconnecting panel regions **12***a* and **12***c* and lying in a plane that is substantially perpendicular to the planes in which panel regions **12***a* and **12***c* lie. In the folded configuration, the standoff components **16***a* of panel region **12***c* project toward panel region **12***a* and the standoff components **16***a* of panel region **12***a* project toward panel region **12***c*. Likewise, the standoff component **16***b* of panel region **12***d* projects toward panel region **12***e*, and the standoff component **16***b* of panel region **12***e* projected toward panel region **12***d*.
[0021] Here, all of the molded pulp standoff components **16** of each combination panel and standoff assembly **13** project into a product capture space **13***a* of the assembly, such that the molded pulp standoff components engage, or are engageable with, respective side or edge regions of the product **20** for fixing or stabilizing the position of the product. Here, the end region of the product **20**, which may be, for example a laptop computer or tablet, is fitted into the capture space **13***a* of an assembly **13** to form a packaged product insert **22** that can then be placed within an interior of a box **24** that is closeable (e.g., via lid **26** with flaps **26***a*-**26***c*).
[0022] Notably, the packaging system is quite versatile and useful for many different products. For example, if the thickness of the product **20** was, for example twice as thick as that shown, the only

change needed would be to provide the panel region **12***b* with a dimension that is slightly larger running in the direction between panel regions **12***a* and **12***c*. As die cutting the panel component and creating the fold lines therein is fairly straightforward from a manufacturing perspective, the implementation of a large number of different configurations of combination panel and standoff assemblies for use with different products is facilitated with the described system.

[0023] Referring now to FIGS. **6**-**9**C, another embodiment of a packaging assembly **110** for a product **120** (e.g., a microwave oven) is shown and includes two like combination panel and standoff assemblies **113**, each formed of a panel component **112**, with fold lines **114***a*-**114***f* to define multiple panel regions **112***a*-**112***g* and multiple impact absorbing molded pulp standoff components **16**. Here, panel regions **112***a*, **112***b*, **112***d* and **112***e* include molded pulp standoff components **16***b*, and panel region **112***c* includes molded pulp standoff components **16***e*. Panel regions **112***f* and **112***g* do not include any standoffs, as these panel regions are folded alongside the panel regions **112***d* and **112***e* in the folded configuration that receives the product **120**.

[0024] Here, in the folded configuration of each of the combination panel and standoff assemblies **113**, panel regions **112***a*, **112***c* and **112***d* are oriented relative to each other to define a three-dimensional corner **115***a*, where molded pulp standoff component **16***b* on panel region **112***a* projects outward from the corner **115***a* in a first direction, molded pulp standoff component **16***e* on the panel region **112***c* projects outward from the corner **115***a* in a second direction that is different from the first direction, and molded pulp standoff component **16***b* on the panel region **112***d* projects outward from the corner **115***a* in a third direction that is different from both the first direction and the second direction. Here, panel region **112***c* and panel region **112***a* are directly connected along fold line **114***a*, wherein panel region **112***c* and panel region **112***d* are directly connected along fold line **114***c*, and panel region **112***a* and panel region **112***d* are not directly connected along any fold line. Corners **115***b*-**115***d* are of a similar configuration to corner **115***a*.

[0025] In the packaging assembly **110**, the multi-sided product **120** is captured at top and bottom by respective combination panel and standoff assemblies **113**, with the top and bottom corner regions of the product disposed at an interior side of the three-dimensional corners **115***a*-**115***d* and in engagement with the panel regions forming the corners. Thus, in this arrangement, the distal ends of the molded pulp standoffs **16** do not directly contact the packaged product **120**, but instead contact interior surfaces of the panels of the box **124** in which the packaged product is placed for shipping.

[0026] Referring to FIGS. **10**-**13**B, another embodiment of a packaging assembly **210** for a product **220** (e.g., an air purifier) is shown. Here, the panel components **212** (with fold lines **214***a*-**214***d*) utilize molded pulp standoff components **16***b* and **16***c* in the panel regions. This embodiment is similar to packaging assembly **110**, in terms of how the corners of the folded combination panel and standoff assemblies **213** are formed and receive the top and bottom corner regions of the product **220** for placement in the box **224** for shipping.

[0027] Referring to FIGS. **14**-**16**, another embodiment of a packaging assembly **310** for a product **320** (e.g., a printer) is shown. Here, the panel components **312** (with fold lines **314***a*-**314***d*) utilize molded pulp standoff components **16***a*, **16***b* and **16***d* in the panel regions. This embodiment is similar to packaging assembly **110**, in terms of how the corners of the folded combination panel and standoff assemblies **313** are formed and receive the top and bottom corner regions of the product **320** for placement in the box **324** for shipping.

[0028] Notably, the described system provides for an advantageous method of producing a packaging component for use in packaging a product for shipment, where the method involves: utilizing a panel component that includes a plurality of fold lines formed therein and along which the panel component is foldable, the fold lines collectively defining a plurality of panel regions; utilizing a plurality of impact absorbing molded pulp standoff components; and selectively fixing each of the impact absorbing molded pulp standoff components onto the panel component in positions such that each one of a multiplicity of the panel regions includes at least one of the

molded pulp standoff components fixed thereto.
[0029] In implementations, the impact absorbing molded pulp standoff components are fixed onto the panel by use of an adhesive, and the panel component is a corrugated board panel that is not formed of molded pulp.
[0030] In implementations, the panel component is configured such that the panel component is changeable between a laid flat configuration and a folded configuration, wherein, in the laid flat configuration, the panel regions lie in a substantially common plane and the molded pulp standoff components project in a substantially common direction from the panel component, wherein, in the folded configuration, the panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other.
[0031] In implementations, the plurality of impact absorbing molded pulp standoff components comprise a plurality of first molded pulp standoff components having a first configuration and a plurality of second molded pulp standoff components having a second configuration that is different than the first configuration.
[0032] In implementations, the plurality of impact absorbing molded pulp standoff components comprise a first molded pulp standoff component having a first configuration, a second molded pulp standoff component having a second configuration that is different than the first configuration and a third molded pulp standoff component having a third configuration that is different than both the first configuration and the second configuration.
[0033] It is to be clearly understood that the above description is intended by way of illustration and example only and is not intended to be taken by way of limitation. Variations are possible.

Claims

1. A packaging assembly, comprising: a panel component including a plurality of fold lines formed therein and along which the panel component is foldable, the fold lines collectively defining a plurality of panel regions; a plurality of impact absorbing molded pulp standoff components fixed on the panel component, wherein each one of a multiplicity of the panel regions includes at least one of the molded pulp standoff components fixed thereto; wherein the panel component is changeable between a laid flat configuration and a folded configuration, wherein, in the laid flat configuration, the panel regions lie in a substantially common plane and the molded pulp standoff components project in a substantially common direction from the panel component, wherein, in the folded configuration, the panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other.
2. The packaging assembly of claim 1, wherein the molded pulp standoff components are fixed on the panel component by an adhesive.
3. The packaging assembly of claim 1, wherein the panel component is not formed of molded pulp.
4. The packaging assembly of claim 3, wherein the panel component is a corrugated board panel.
5. The packaging assembly of claim 1, wherein the packaging assembly lacks any molded pulp standoff components that are fixed to more than one of the panel regions.
6. The packaging assembly of claim 1, wherein: the plurality of panel regions include a first penal region and a second panel region; the plurality of molded pulp standoff components include a first molded pulp standoff component and a second molded pulp standoff component; the first molded pulp standoff component located on the first panel region, the second molded pulp standoff component located on the second panel region, wherein the second molded pulp standoff component has a different configuration than the first molded pulp standoff component.
7. The packaging assembly of claim 1, wherein: the plurality of panel regions include a first penal region and a second panel region; the plurality of molded pulp standoff components include a first molded pulp standoff component and a second molded pulp standoff component; in the folded configuration, at least the first panel region lies in a first plane, at least the second panel region lies

in a second plane that is spaced apart from and substantially parallel to the first plane, and the first molded pulp standoff component is located on the first panel region and projects toward the second panel region and the second molded pulp standoff component is located on the second panel region and projects toward the first panel region.

8. The packaging assembly of claim 7, wherein the first panel region and the second panel region are connected together by a third panel region, wherein, in the folded configuration, the third panel region runs in a third plane that is substantially perpendicular to both the first plane and the second plane, and a third molded pulp standoff component on the third panel region extends into a space between the first panel region and the second panel region.

9. The packaging assembly of claim 8, further comprising a multi-sided product, wherein the panel component is in the folded configuration and the multi-sided product is captured in a space between the first molded pulp standoff component and the second molded pulp standoff component, and the multi-sided product is also engaged by the third molded pulp standoff component.

10. The packaging assembly of claim 1, wherein: the plurality of panel regions include a first penal region, a second panel region and a third panel region; the plurality of molded pulp standoff components include a first molded pulp standoff component, a second molded pulp standoff component and a third molded pulp standoff component; in the folded configuration, the first, second and third panel regions are oriented relative to each other to define a three-dimensional corner, the first molded pulp standoff component is located on the first panel region and projects outward from the corner in a first direction, the second molded pulp standoff component is located on the second panel region and projects outward from the corner in a second direction that is different from the first direction, and the third molded pulp standoff component is located on the third panel region and projects outward from the corner in a third direction that is different from both the first direction and the second direction.

11. The packaging assembly of claim 10, wherein: the plurality of fold lines include a first fold line and a second fold line; the first panel region and the second panel region are directly connected along the first fold line, wherein the first panel region and the third panel region are directly connected along the second fold line, and the second panel region and the third panel region are not directly connected along any fold line.

12. The packaging assembly of claim 11, further comprising a multi-sided product, wherein the panel component is in the folded configuration, wherein a corner region of the multi-sided product is disposed at an interior side of the three-dimensional corner and in engagement with the first panel region, the second panel region and the third panel region.

13. A packaged product assembly, comprising: a first combination panel and standoff component assembly, comprising: a first panel component including a plurality of first fold lines formed therein and along which the first panel component is foldable, the first fold lines collectively defining a plurality of first panel regions; a plurality of first impact absorbing molded pulp standoff components fixed on the first panel component, wherein each one of a multiplicity of the first panel regions includes at least one of the first molded pulp standoff components fixed thereto; wherein the first panel component is changeable between a first laid flat configuration and a first folded configuration, wherein, in the first laid flat configuration, the first panel regions lie in a substantially common first plane and the first molded pulp standoff components project in a substantially common first direction from the first panel component, wherein, in the first folded configuration, the first panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other. a second combination panel and standoff component assembly, comprising: a second panel component including a plurality of second fold lines formed therein and along which the second panel component is foldable, the second fold lines collectively defining a plurality of second panel regions; a plurality of second impact absorbing molded pulp standoff components fixed on the second panel component, wherein

each one of a multiplicity of the second panel regions includes at least one of the second molded pulp standoff components fixed thereto; wherein the second panel component is changeable between a second laid flat configuration and a second folded configuration, wherein, in the second laid flat configuration, the second panel regions lie in a substantially common second plane and the second molded pulp standoff components project in a substantially common second direction from the second panel component, wherein, in the second folded configuration, the second panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other; a packaged product engaged (i) on a first side or end by the first combination panel and standoff component assembly in the first folded configuration and (ii) on a second side or end by the second combination panel and standoff component assembly in the second folded configuration.

14. The packaged product assembly of claim 13, further comprising: a box; wherein the packaged product, first combination panel and standoff component assembly and second combination panel and standoff component assembly are contained within the box.

15. A method of producing a packaging component for use in packaging a product for shipment, the method comprising: utilizing a panel component that includes a plurality of fold lines formed therein and along which the panel component is foldable, the fold lines collectively defining a plurality of panel regions; utilizing a plurality of impact absorbing molded pulp standoff components; selectively fixing each of the impact absorbing molded pulp standoff components onto the panel component in positions such that each one of a multiplicity of the panel regions includes at least one of the molded pulp standoff components fixed thereto.

16. The method of claim 15, wherein impact absorbing molded pulp standoff components are fixed onto the panel by use of an adhesive.

17. The method of claim 15, wherein the panel component is a corrugated board panel that is not formed of molded pulp.

18. The method of claim 15, wherein the panel component is configured such that the panel component is changeable between a laid flat configuration and a folded configuration, wherein, in the laid flat configuration, the panel regions lie in a substantially common plane and the molded pulp standoff components project in a substantially common direction from the panel component, wherein, in the folded configuration, the panel regions lie in multiple different planes, wherein at least some of the multiple different planes are angularly offset from each other.

19. The method of claim 15, wherein the plurality of impact absorbing molded pulp standoff components comprise a plurality of first molded pulp standoff components having a first configuration and a plurality of second molded pulp standoff components having a second configuration that is different than the first configuration.

20. The method of claim 15, wherein the plurality of impact absorbing molded pulp standoff components comprise a first molded pulp standoff component having a first configuration, a second molded pulp standoff component having a second configuration that is different than the first configuration and a third molded pulp standoff component having a third configuration that is different than both the first configuration and the second configuration.