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A Packaging with Improved Reclosable Opening

Field of Invention

This invention relates generally to the field of packaging and more particularly to a
5 packaging with improved reclosable opening which is suitable for household usage, especially
for use as packaging for foodstuff in microwave oven.

Background of the Invention

Frozen or shelf stable prepared foods that are intended to be reheated using microwave oven are
10 becoming increasingly popular. Excess food or food being prepared in advance can be packaged
and stored. Consumers only need to heat up those packaged food in the microwave oven prior to
consuming.

During the heating of the food in a microwave oven, the moisture content of the food is rapidly
15 heated and transformed into steam. As the temperature of the packaging increases during
heating, the pressure within the packaging increases. Consumers usually puncture holes or cut a
corner or pierce holes on the packaging to allow the steam to vent from the packaging during
heating.

20 Thus, a packaging having a weakened sealing or a valve which allow the steam to vent during
the process of heating would provide an improved method for heating food in microwave oven.
In the prior technology, packaging with weakened sealing or valve which allow the steam to

escape from the packaging are disclosed. However, these packaging are only suitable for the food manufacturer as it is not practical for a household user to have a thermal sealing machine or a heat sealer to seal it after putting the foodstuff into the packaging.

5 In the present invention, the packaging is modified to cater for the need of household users, who do not have access to a thermal sealing device, by having a reclosable opening, a diverting means and weakened sealing on the packaging. A reclosable opening functions as an opening for inserting the object, especially foodstuff into the packaging. The packaging can be closed up by reclosable opening to store, without using heat sealing or other adhesive. On the other hand, a
10 diverting means is predisposed in such a manner and having a dimension sufficient to cover the reclosable opening. The diverting means is joined with main packaging sheets at the upper portion to direct airflow away from the reclosable opening. When the increased internal air pressure builds up to a critical point, the weakened sealing ruptures to allow air to vent through.

15 **Brief Summary of the Invention**

The primary object of the invention is to provide a packaging with a reclosable opening, a diverting means and a weakened sealing which is suitable for the convenience of user who do not have a thermal sealing device, especially household user for use in microwave oven for reheating purpose.

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Other objects and advantages of the present invention will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of

illustration and example, an embodiment of the present invention is disclosed.

For the purpose of this patent application, the term "packaging" used throughout the specification includes all kind of pouches within the scope of the claims. It is to be understood that the use of
5 the term is not limiting the scope of the claims to certain designs and/or embodiments of the packaging according to the invention.

Accordingly, the current invention relates to a packaging with improved reclosable opening includes a diverting means which is predisposed in such a manner and having a dimension
10 sufficient to cover the reclosable opening, preferably a zipper, to direct airflow away from the zipper when there is an increase in internal air pressure and a weakened sealing._When the internal pressure has reached a critical point, the packaging will thus rupture at the weakened sealing where the air vents through.

15 The current invention can be used for heating food in a microwave oven. The reclosable opening enable consumers to insert objects, especially foodstuff into the packaging. The packaging can be closed up by using the reclosable opening without the need of heat sealer or other thermal sealing machine. The weakened sealing on the other hand provides a method without the need of puncturing the packaging prior to heating in microwave oven.

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In accordance with the present invention, there is disclosed a packaging includes an upper front packaging sheet, a lower front packaging sheet and a back packaging sheet which are sealed

- together to form an edge-to-edge sealing. The term “edge-to-edge sealing” is used in this specification to refer to the all-round sealing along the marginal edge of a packaging sheet as it is folded to enclose an object. One or more portion of the sealable edge may be made frangible or more specifically a weakened sealing, to vent increased internal pressure. The weakened sealing
- 5 can be created by:
- a) using a heat sealing temperature which is lower than the sealing temperature used for forming the rest of the edge-to-edge sealing.
 - b) having a designated sealing area smaller than the sealing area of the rest of the edge- to-edge sealing.
 - 10 c) forming a notch on part of the edge-to-edge sealing. d) disposing a film between the front and back main packaging sheets on part of the edge-to-edge sealing, wherein the film is made of second material.

In the preferred embodiment, the weakened sealing is created by disposing a film made of second

15 material between front and back main packaging sheets. The film includes all physical shapes, such as narrow tips, triangular or tapering shapes.

In one preferred embodiment, the material of the packaging sheet and film is selected from any one or in combination of polyethylene and its derivatives, polyester and its derivatives,

20 polypropylene and its derivatives, nylon and its derivatives or any suitable polymer. The upper front main packaging sheet, lower front main packaging sheet and back main packaging sheet are made of a first material, while the film, which creates a weakened sealing, is made of a second

material. Any one of main packaging sheet can be made of a third material, provided the sealing among the main packaging sheets are stronger than the weakened sealing.

5 The packaging includes any one of a flexible three-side sealed pouch, standing pouch and flexible six-side sealed pouch.

Embodiments of the invention will appear more clearly in the following description with reference to the accompanying drawings.

Brief Description of the Drawing

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The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms. It is to be understood that in some instances various aspects of the invention may be shown exaggerated or enlarged to facilitate an understanding of the invention.

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Figure 1 shows the top view of a flexible three-side-sealed pouch of the current invention illustrating the weakened sealing which is created by disposing of a film made of second material.

20 Figure 2 shows the top view of a flexible three-side-sealed pouch of the current invention illustrating the weakened sealing which is created by having top sealing with width smaller than

the sealing area of the rest of the edge-to-edge sealing.

Figure 2.1 shows the top view of a flexible three-side-sealed pouch of the current invention illustrating the weakened sealing which is created by having a designated sealing area smaller
5 than the sealing area of the rest of the edge-to-edge sealing.

Figure 3 shows the top view of a flexible three-side-sealed pouch of the current invention illustrating the weakened sealing which is created by forming of a notch.

10 Figure 4 shows the layers of the weakened sealing, which is created when a film made of second material disposed between the upper front packaging sheet and back packaging sheet.

Figure 5 illustrates the zipper as reclosable opening for inserting object into the packaging.

Figure 6 shows the cross-section of the pouch at the center.

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Figure 6.1 shows the cross-section of the pouch at the center wherein upper front packaging sheet and its extended part, the diverting means is made of a second material.

Figure 7 shows the cross-section of the pouch at the sealed edge.

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Figure 7.1 shows the cross-section of the pouch at the sealed edge wherein upper front packaging sheet and its extended part, the diverting means is made of a second material.

Figure 8 shows the layers of main packaging sheet, a diverting means, weakened sealing and the reclosable opening.

Figure 9 shows perspective view of a standing pouch according to the preferred embodiment of
5 the invention.

Figure 10 shows perspective view of a flexible six-side sealed pouch according to the preferred embodiment of the invention.

10 Detailed Description of the Preferred Embodiments

Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in
15 virtually any appropriately detailed system, structure or manner.

Figure 1 shows the top view of a packaging of the current invention. According to the present invention, flexible three-side-sealed pouch (100) is one form of the preferred embodiment. The flexible three-side-sealed pouch consists of a packaging body comprising an upper front main
20 packaging sheet (102), a lower front main packaging sheet (201) and a back main packaging sheet (not shown) which are sealed together to form an edge-to edge sealing, reclosable opening

(101) preferably zipper, a diverting means (103) and weakened sealing (104). The zipper (101) is predisposed in such a manner to be covered by the diverting means (103). In accordance with current invention, Figure 1 also illustrates a diverting means (103), which is predisposed in such a manner and having a dimension sufficient to cover the reclosable opening (101) to direct
5 airflow away from the reclosable opening (101) when there is an increase in internal air pressure. When the increased internal air pressure builds up to a critical point, packaging will rupture at the weakened sealing (104) to allow the air to vent through. The critical point is reached when the internal air pressure is greater than external air pressure to a sufficient extent to rupture the weakened sealing (104).

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In the practice of current invention, the diverting means (103) is an extended part from the upper front main packaging sheet (102). The diverting means (103) can also be another film, which sealed between the upper front main packaging sheet (102) and back main packaging sheet form a flange or flap. According to the current invention, the front main packaging sheet (102) and its
15 extended part, the diverting means (103) is made of a first material. In another preferred embodiment, front main packaging sheet (102) and its extended part, the diverting means (103), may be made of second material as shown in Figure 6.1. The sealing between the front main packaging sheet (102) and back main packaging sheet will thus become the weakened sealing (104) in Figure 6.1.

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To accomplish an important function of the invention, there is shown in Figure 1, a weakened sealing (104), created by disposing of a film made of a second material. The film is disposed

between two layers of the main packaging sheet, preferably on the top part of edge-to-edge sealing. The sealing between the second material with any one of main packaging sheet is weaker than the sealing among the main packaging sheets. The edge-to-edge sealing will be further discussed in Figure 8.

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The weakened sealing (104) can also be a seal with a width smaller than the sealing width of the rest of the edge-to-edge sealing as shown in Figure 2. Figure 2 shows the top sealing area, the weakened sealing (104) with sealing width smaller than other sealing area, wherein the sealing bar used to create top sealing is having a width smaller than the sealing bar for other sealing
10 areas. The smaller sealing width is weaker compared to a sealing, which is sealed by the same means but with wider sealing.

Figure 2.1 illustrates the weakened sealing (104) which is a sealing with area smaller than the sealing area of the rest of edge-to-edge sealing. This designated sealing area can be created by
15 indent of the sealing bar.

Another embodiment of weakened sealing (104) is shown in Figure 3. A weakened sealing (104) is created by forming a notch on part of edge-to-edge sealing.

20 Figure 4 figuratively shows layers of the weakened sealing (104), which is created when a film (202) made of second material is disposed between the upper front main packaging sheet (102) and back main packaging sheet (203). The weakened sealing (104) can be at any part of the

edge-to-edge sealing. However, the weakened sealing is preferably at the top part of edge-to-edge sealing. Note that when the weakened sealing is at the side part of edge-to-edge sealing, the film (202) is disposed in between lower front main packaging sheet (201) and back main packaging sheet (203). The main packaging sheets are made of first material. In another
5 embodiment, any one of the main packaging can be made of a third material.

In Figure 5, there is shown the reclosable opening (101), preferably a zipper which is made of a pair of male and female elements, 301 and 302, which interlock to each other. The zipper is openable and reclosable to allow user to insert the objects, especially foodstuffs. Thus, the
10 consumers can heat up the food in this packaging without the need of puncturing the packaging prior to heating in microwave oven. The female element (301) is on the lower front main packaging sheet (201) while the male element (302) is on the upper layer of the front main packaging sheet (102) or vice versa.

15 Figure 6 shows the cross-section of the pouch at the center, illustrating the position of the diverting means (103) and zipper (301 and 302), which are predisposed in such a manner that the zipper (301 and 302) is covered by the diverting means (103). The diverting means (103) direct airflow away from the zipper (301 and 302) when there is an increase in internal air pressure. When the increased air pressure has build up to a critical point, the packaging will rupture at the
20 weakened sealing (104) to allow the air to vent through but the zipper (301 and 302) remain intact as it is covered by diverting means (103). The critical point is reached when the internal air pressure is greater than external air pressure to a sufficient extent to rupture the weakened

sealing (104). According to the preferred embodiment of current invention, the diverting means (103) is extended from upper front main packaging sheet (102). A film made of second material (202) is sandwiched between upper front main packaging sheet (102) and back main packaging sheet (203). The sealing of the second material with the main packaging sheet is the weakened
5 sealing (104).

Figure 6.1 shows another embodiment of present invention, wherein upper front main packaging sheet (102) and its extended part, the diverting means (103) is made of a second material. Part of the front main packaging sheet (102) detaches from the rest of the packaging when an increase in
10 internal air pressure has build up to a critical point as the sealing between second material and main packaging sheet is the weakened sealing (104).

In accordance with an important feature of the present invention, there is shown in Figure 7 the cross-section of the pouch at the sealed edge. A film (202) is sandwiched between upper front
15 main packaging sheet (102) and back main packaging sheet (203) to create a weakened sealing. The film (202) is made of second material. The extended part of upper front main packaging sheet (102) is diverting means (103). The weakened sealing can be at any part of edge-to-edge sealing in which the film (202) can also be disposed between lower front main packaging sheet (201) and back main packaging sheet (203).

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In another embodiment, the upper front main packaging sheet (102) and its extended part, the diverting means (103) can be made of a second material as illustrated in Figure 6.1. The cross-

section of the pouch at the sealed edge is shown in Figure 7.1. The sealing between upper front main packaging sheet (102), which is made of a second material, and back main packaging sheet (203) is weaker than the rest of edge-to-edge sealing. When an increase in internal air pressure has build up to a critical point, part of said diverting means (103) or more specifically part of
5 front main packaging sheet (102) detaches from the rest of the packaging

Figure 8 shows the perspective view for different layers of packaging sheets of the current invention according to the preferred embodiment. The extension of upper front main packaging sheet (102) forms the diverting means (103) wherein the diverting means has a dimension
10 sufficient to covers the reclosable opening, or more particularly zipper (301 and 302), to direct airflow away from the zipper (301 and 302) when there is an increase in internal air pressure. The zipper (301 and 302) is openable and reclosable. The zipper is an opening for users to insert object into the packaging. There is shown in Figure 8, a film made of second material is disposed between upper front main packaging sheet (102) and back main packaging sheet (203). The
15 edge-to-edge sealing of the film (202) with upper front main packaging sheet (102) and back main packaging sheet (203) forms a weakened sealing. The edges the packaging are sealed to produce the edge-to-edge sealing at the area pointed with arrows.

The packaging is not only limited to three-side-sealed flexible pouch. Other forms of packaging
20 can also be used with the current invention such as standing pouch (400) as illustrated in Figure 9 and flexible six-side sealed pouch (500) as illustrated in Figure 10.

In Figure 9, there is shown a standing pouch (400) as one form of the preferred embodiment of current invention. Standing pouch (400) is formed by inserting a layer of packaging sheet (401) at the bottom of the pouch between lower front main packaging sheet (201) and back main packaging sheet (203). The layer of packaging sheet (401) is preferably made of first material.

5 The weakened sealing (104) is created at the top part of edge-to-edge sealing by using any one of the four methods described above.

Figure 10 shows a flexible six-side sealed pouch (500). A layer of first packaging sheet (501) is inserted at the bottom of the pouch between lower front main packaging sheet (201) and back

10 main packaging sheet (203). A second of packaging sheet (502) is inserted at the top between upper front main packaging sheet (102) and back main packaging sheet (203). The first packaging sheet (501) and the second packaging sheet (502) are preferably made of first material. According to the current invention of the preferred embodiments, the weakened sealing (104) is created at the top part of edge-to-edge sealing. The weakened sealing can be created by

15 any one of the four methods described above.

While the invention has been described in connection with a preferred embodiment, it is not intended to limit the scope of the invention to the particular form set forth, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within

20 the spirit and scope of the invention as defined by the appended claims.

Claims:

1. A packaging with improved reclosable opening comprising:
a packaging body comprising an upper front main packaging sheet, a lower front main packaging sheet and a back main packaging sheet which are sealed together to form an edge-to-edge
5 sealing;
a reclosable opening on said packaging for inserting objects into said packaging;
a diverting means covering said reclosable opening which is predisposed to direct airflow away from said reclosable opening when there is an increase in internal air pressure; and
a weakened sealing formed at part of said edge-to-edge sealing wherein said weakened sealing
10 ruptures when said increase in internal air pressure has build up to a critical point.
2. The packaging with improved reclosable opening according to claim 1 wherein said weakened sealing is created by using a heat sealing temperature which is lower than the sealing temperature used for forming the rest of said edge-to-edge sealing.
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3. The packaging with improved reclosable opening according to claim 1 wherein said weakened sealing is a designated sealing area smaller than the sealing area of the rest of said edge-to-edge sealing.
- 20 4. The packaging with improved reclosable opening according to claim 1 wherein said weakened sealing is created by forming a notch on part of said edge-to-edge sealing.

5. The packaging with improved reclosable opening according to claim 1 wherein said weakened sealing is created by disposing a film between said front and back main packaging sheets on part of said edge-to-edge sealing, wherein said film is made of material different from either said front or back main packaging sheets.

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6. The packaging with improved reclosable opening according to any one of claims 2 to 5, wherein said weakened sealing is at the top part of said edge-to-edge sealing.

7. The packaging with improved reclosable opening according to claim 1 wherein said critical point is reached when the internal air pressure is greater than external air pressure to a sufficient extent to rupture said weakened sealing.

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8. The packaging with improved reclosable opening according to claim 1 wherein said reclosable opening is a zipper.

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9. The packaging with improved reclosable opening according to claim 1 wherein said diverting means is an extended part of said upper front main packaging sheet.

10. A packaging with improved reclosable opening comprising:

20 a reclosable opening on said packaging for inserting objects into the packaging;
a diverting means covering said reclosable opening which is predisposed to direct airflow away from said reclosable opening and part of said diverting means detaches from the rest of the

packaging when an increase in internal air pressure has build up to a critical point;

a packaging body comprising an upper front main packaging sheet, a lower front main packaging sheet and a back main packaging sheet which are sealed together to form an edge-to-edge sealing; and

5 a weakened sealing formed at said edge-to-edge sealing of said upper front main packaging sheet and said back main packaging sheet, said upper front main packaging sheet is made of material different from said back main packaging sheet, wherein said weakened sealing ruptures when said increase in internal air pressure has build up to a critical point.

10 11. The packaging with improved reclosable opening according to claim 10 wherein said lower front main packaging sheet is made of a second material and said back main packaging sheet is made of third material, wherein said edge-to-edge sealing formed by said lower front main packaging sheet and said back main packaging sheet is stronger than said weakened sealing.

15 12. The packaging with improved reclosable opening according to claim 10 wherein said diverting means is an extended part of said upper front main packaging sheet.

13. The packaging with improved reclosable opening according to claim 10 wherein said critical point is reached when the internal air pressure is greater than external air pressure to a sufficient
20 extent to rupture said weakened sealing.

14. The packaging with improved reclosable opening according to claim 10 wherein said reclosable opening is a zipper.