

Title: OPTICAL FIBER WITH A HOLLOW CHANNEL ALONG THE CENTER OF THE FIBER CORE FOR RECEIVING A SAMPLE

The present invention relates to a packaging for storing and/or cooking a food product, the packaging comprising a container for holding the food product, and a cover removably fastened to an upper rim of the container to be opened by a consumer upon use. Further aspects of the invention are the cover as well as the packaged food product.

10 Consumers often face difficulties in peeling open packaging films, lids or covers which seal food containers. Most often, users need to first identify an existing peel tab in the cover to initiate the tear. The packaging cover may then tear or split in an unintended direction while the user is tearing it, leading to difficult or partial opening and spilling of food. 15 The peel tab may have also been torn off or crumpled before it reaches the consumer due to package mishandling throughout the supply chain. Consumers are then tempted to using knives or other sharp articles for opening the cover, increasing the risk of harming themselves and spilling even more food. 20

Furthermore, for certain food products which can be cooked or heated in the packaging container as provided, they may first need to be opened by a consumer, for example to add water to the food product in the container and then temporarily be 25 resealed again during the cooking to minimise spilling. The cooking can be done through the addition of hot water or through heating in a microwave oven. Examples of such food products are instant noodles or instant soup products very popular mainly in Asia. Users may then need to find an object to cover the brim of the food container to ensure that the boiling liquid food product does not spill over. 30

Still furthermore, elderly consumers and people suffering from arthritis are more and more unable to open modern packaging containers which are sealed with a removable film or cover even when provided with a peel tab. It becomes more and more difficult to securely grab and pull those small tabs and safely open such sealed packaging containers. Many times, elderly people therefore make use of kitchen tools such as forks or knives to try to open those packages with a risk of hurting themselves.

Some of these problems have already been addressed by prior art solutions. For example, US2012/0237713 describes a thin packaging film having a closed contour and which is surrounded over its entire periphery by a tear-off area, an incipient tear being precut in this film so as to intercept this contour while leading into the latter while forming a gripping portion capable of being pulled away from the plane of this thin film. The film involves two materials, a pre-cut and underlying material to create a swirl effect. The film enables partial separation beyond 180 degrees.

EP2662309 describes a film with a weakening line for tearing open the film. A pressing region is provided adjacent to a section of the weakening line and has the size of a fingertip. The pressing region is limited by a tearing line at a side of a surface. The tearing line projects from the weakening line starting in a region of the film and is provided adjacent to a tongue-shaped section of the film, where the section is detachable along the weakening film. The film is formed from a multi-layered laminated compound and includes a curl produced by stresses in layers of the compound.

EP1544127 describes a polymer film secured to the rim of a food packaging by a peripheral weld. The sealing film carries a weakened line for a circular section to be pulled clear by a tab. The peripheral weld has a stronger hold than the

5 resistance of the weakened film line.

There is still a need in the art and the food industry to find alternative and/or better packaging solutions for storing and/or cooking food products which can be opened easily and

10 conveniently by consumers.

Therefore, the object of the present invention is to improve the state of the art and to provide an improved and/or alternative packaging solution for storing and/or cooking a

15 food product which can be opened easily and conveniently by a consumer.

Particularly, the object of the present invention is also to provide such an improved and/or alternative packaging solution

20 where the packaging can be opened only partly, convenient for adding further ingredients to a food product, to limit spilling of a liquid food product upon cooking, and where after cooking the packing can then be opened completely in a convenient way for ease of consumption.

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More particularly, the object of the present invention is to provide such an improved and/or alternative packaging solution where the packaging can be opened to about 1/4 to 3/4 of its potential opening surface, in order to be very convenient for

30 adding hot or cold water, milk or other ingredients to a food product, to limit spilling of a liquid food product upon cooking and where after cooking the packaging can then be opened completely in a convenient way.

The object of the present invention is achieved by the subject matter of the independent claims. The dependent claims further develop the idea of the present invention.

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Accordingly, the present invention relates in a first aspect to a packaging for storing and/or cooking a food product, the packaging comprising a container for holding the food product, and a cover removably fastened to an upper rim of the

10 container;

characterized in that the cover comprises a weakening line forming a spiral, the spiral starting in a central part of the cover and running towards the rim of the cover, and wherein the spiral winds at least one-and-a-half times around a

15 central axis of said spiral.

In a second aspect, the invention relates to a packaged food product comprising the said packaging for storing and/or cooking a food product, and a food product comprised in the

20 container.

A further aspect of the present invention pertains to a cover for use on a container for storage and/or cooking a food product, the cover characterized in that it comprises a

25 weakening line forming a spiral, the spiral starting in a central part of the cover and running towards the rim of the cover, and wherein the spiral winds at least one-and-a-half times around a central axis of said spiral.

30 It has been found by the inventors, that when providing a packaging such as for example a cup with a removably sealed lid or cover which comprises a scored weakening line forming a spiral, it can be easily opened by a user by simply poking

with one finger into the middle of the spiral and peeling open the lid or cover membrane along the scored weakening line. A main advantage of the invention is that it enables a user to peel a membrane with minimum effort. The spiral scored

5 weakening line enables easy, intuitive opening with a graphic indication to guide consumers. It also enables a clean peel, without leaving any torn packaging laminate on pack. Opening of such a packaging is also particularly simple, convenient and advantageous for all consumers who are somewhat clumsy,
10 maladroit, or have joint inflammation or arthritis problems with their fingers or are simply elderly with all inherent problems which come with age.

Another advantage of the present invention is that when used
15 for cooking a liquid food product, such as for example an instant noodle soup, directly in the packaging cup, a consumer will not need to use an additional object such as e.g. a saucer, plate or a further cover, to cover the brim of the packaging cup in order to prevent spilling of the soup.

20 Consumers will just poke open the tearing hole at the spiral centre of the cover with a finger. The centre of the cover, i.e. the depression zone, is then pinched by the consumer using thumb and forefinger and peeled open about half-way along the spiral to allow the addition of water to e.g. a dry
25 noodle soup product, if needed, and then to cook the soup, e.g. in a microwave oven for 2-5 minutes, directly in the noodle cup. Spilling is prevented by the rim formed by the cover still safely sealed around the total circumference of the noodle cup. After the cooking, the cover can then be
30 peeled away fully towards the periphery of the cup for ease of consumption.

The invention can be used for a variety of food product packaging applications, preferably however for dry food products. These applications include instant soups, instant noodles, biscuits, cookies, confectionery products or other dehydrated products, and powdered beverages such as coffee, tea and chocolate drinks.

Brief Description of the Drawings

Figure 1: Covers with different weakening line design

10 Figure 2: Cover with a preferred weakening line design

Figure 3: Way of opening the packaging of the present invention

Detailed Description of the invention

15 The present invention pertains to a packaging for storing and/or cooking a food product, the packaging comprising:

- a container for holding the food product, and
- a cover removably fastened to an upper rim of the container;

characterized in that the cover comprises a weakening line

20 forming a spiral, the spiral starting in a central part of the cover and running towards the rim of the cover, and wherein the spiral winds at least one-and-a-half times around a central axis of said spiral. Preferably, the spiral winds at least two times around a central axis of said spiral. More

25 preferably, the spiral winds at least two-and-a-half times around a central axis of said spiral. To properly and completely open and remove the cover from the container a minimal complete 360° turn of the spiral around its own axis is necessary. However, in order to provide a solution where

30 the cover can be opened at least partly in such a way that at least about 1/4 of the cover surface can be opened without removing any parts of the ultimate last ring of the spiral attached to the upper rim of the food container all along its

circumference, at least a one-and-a-half times turn (i.e. 540°) of the spiral around its own axis is required. This last spiral ring of the cover still attached to the upper rim of the container forms the barrier rim which prevents any liquid or hot food to spill over the container rim upon heating or cooking of said food product. Preferably and for an easier handling, the spiral winds at least two times around its own axis. The most practical and convenient application has been found where the spiral winds around the axis for about 2.5 to 3.5 times (i.e. about 900° - 1260°). Preferably, the spiral does not wind around its own axis more than about 10 times, or more than about 5 times.

A "cover" of the present invention is a means to removably cover a container suitable for holding a food product. Such a "cover" can be a lid, a film, a laminated sheet, a membrane or a cap.

"Removably fastened" of the present invention means that the cover is sealed, glued or otherwise fixed to the upper rim of a container in such a way that the cover can be removed again from said container by a consumer.

In a preferred embodiment, the cover of the present invention comprises only one single weakening line.

A "single line" is defined and understood herein as one single continuous line having two ends. The line can be curved, straight, in spiral form, or in any combination thereof. The single line is not the combined product of two lines crossing each other, nor is it a line which is branched into two lines.

The advantage of having only one single weakening line within the cover is that any tear or force to tear, e.g. when poking into the cover with a finger, only and inevitably results in the tearing of this one only single weakening line. Tearing of this single weakening line will always be limited to just this one only existing weakening line and tearing of that line will be complete. This has the advantage that it always results in a proper tearing of the weakening line even when torn across by e.g. a clumsy consumer.

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In an embodiment, the weakening line of the present invention is a score. The score in the cover material can be made by mechanical scoring, by edging, die cutting and/or laser cutting. A preferred solution is by laser cutting.

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In a preferred embodiment, the weakening line of the present invention is continuously winding around the central axis of the spiral, with having no straight or liner inter-sections. It has been found by the inventors that a peeling action of such a continuous spiral is smoother and more consistent than when straight or liner stretches are present in the spiral form.

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The cover of the present invention comprises a depression zone having at least the size of a fingertip. Preferably, this depression zone overlaps with the central axis of the spiral formed by the weakening line. This allows optimal and straight forward opening of the packaging of the present invention.

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In a preferred embodiment, the cover and the upper rim of the container of the present invention are round. Round is obviously the optimal form for an opening system based on a spiral system. Furthermore, most single serve food products

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such as instant soups, instant noodles or beverage products are typically offered for sale packaged in round cups. Hence, advantageously, the cover and the upper rim of the container are round. Thereby, preferably, the central axis of the spiral is in the center of the cover.

In one embodiment, the cover of the present invention does not comprise a separate peel tab. As the cover now comprises a new and different opening system, a separate peel tab for removing the cover from the upper rim of the container is not necessary anymore. An extra separate peel tab may only be confusing to a consumer; it may add up to additional production costs and it may be encumbering in the packing and stacking of the packagings and/or packaged food products of the present invention.

In a preferred embodiment, the cover of the present invention is made of a multi-layer laminate, preferably of an aluminium containing or a plastic containing laminate. More preferably, the multi-layer laminate comprises: a base layer selected from the group consisting of aluminium, paper, polyester (PET), oriented polypropylene (OPP) and oriented polyamide (OPA); and a sealing layer selected from the group consisting of polyethylene (PE), polypropylene (PP), and a homo- or co-polymer of ethylene vinyl acetate (EVA). Alternatively, the cover comprises an intermediate layer having barrier properties, for example an aluminium foil or a metallized polymer layer.

The aluminium containing laminates have the advantage that they provide a best smooth peeling and tearing for opening the cover along the scored weakening line. Furthermore, they result typically in a nice continuous cut after the tearing

with clean and smooth edges. Plastic containing laminates have a similar effect as aluminium containing laminates and furthermore have the advantage that they can also be used for cooking of a food product in the packaging of the present

5 invention e.g. in a micro-wave oven.

The container of the present invention is preferably made of a plastic material. Preferably, the container of the present invention is rigid and in particular freestanding so that it
10 retains its form whether or not it is filled with a food product. The container is for example consisting of a plastic outer support layer material, for example polypropylene (PP), polystyrene (PS), or a complex of amorphous polyester (APET)/polyethylene (PE). Alternatively, the container is a
15 paper container of heat-sealable coated surface-protected cardboard which includes a wound container wall and a container bottom connected therewith.

Alternatively, the container of the present invention can be
20 made of a glass material.

Another aspect of the present invention relates to a packaged food product comprising the packaging of the present invention and a food product comprised in the container. In a preferred
25 embodiment, the food product is a dried soup, an instant noodle product, a dried coffee and/or milk drink, or a dried chocolate drink.

A still further aspect of the present invention pertains to a
30 cover for use on a container for storage and/or cooking a food product, the cover characterized in that it comprises a weakening line forming a spiral, the spiral starting in a central part of the cover and running towards the rim of the

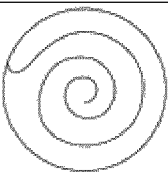
cover, and wherein the spiral winds at least one-and-a-half times around a central axis of said spiral. Preferably, the cover comprises only one single weakening line.

5 Those skilled in the art will understand that they can freely combine all features of the present invention disclosed herein. In particular, features described for the packaging for storing and/or cooking a food product of the present invention may be combined with the packaged food product as
10 well as the cover of the present invention, and vice versa. Further advantages and features of the present invention are apparent from the figures and examples.

Example 1:

15 Several packaging film designs have been produced and tested, as described in Figure 1. A Graphtec cutting plotter (FC2250) with a versatile moving head secured with a cutting blade in a holder was used to cut the spiral weakening line into several different substrates and to compare the performance of half-
20 cutting. Illustration files containing the spiral designs according to Figure 1 were sent to the plotter software to initiate the scoring operations. The cover materials selected for testing were an aluminium-containing laminate (polyester (PET)/aluminium/polyester (PET)/polyethylene (PE)) (Daibochi
25 Plastic & Packaging Ind. Bhd.), a paper-containing laminate (Paper/polyester (PET)/polyethylene (PE)) (Amcor Flexibles Sarrebourg), and a plastic laminate as indicated in table 1.

Table 1.

Substrate design	Material Structure Properties	Axis setting X,Y	Cutting Speed (mm/s)	Cutting Force (N)
	Aluminium-containing (Polyethylene/ Aluminium/ Polyethylene/ Polyethylene)	16, 18	40	Below 4.9 N
	Paper-containing (Paper / Metalized Polyethylene / Polyethylene)	16, 16	40	Below 4.9 N
	Plastic - containing Polyethylene/ Oriented Polypropylene/ Polypropylene	20,20	40	20N - 28N

"Axis setting" is the movement direction (X horizontal, Y vertical) of the cutting blade. The higher the axis setting,
 5 the higher is the pressure of the cutting force.

The following results were observed. The aluminium-based material enabled smooth peeling effect and an easier tearing, peeling action in one continuous motion compared with paper-based material. Paper-containing film resulted in a
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discontinuous cut, leading to multiple gaps and difficulty in poking through the tearing hole. The peeling of the packaging film also caused uneven edges compared with aluminium-containing film. However, this issue can be resolved through the use of laser scoring.

The plastic-containing film enabled a smooth peeling effect and easier tearing, peeling action in one continuous motion. However, this film requires more strength to poke through the film compared to both paper-containing film and aluminium-containing film. The gestures performed by a consumer result in a clear sound during poking and peeling action along the adjacent of film towards the brim of container.

The plastic laminate cover as of Table 1 was further tested on a plastic container comprising some liquid food for microwave heating. Before placing the packaging inside a standard household microwave oven, the center of the cover was poked open and the cover opened about half-way through the spiral, in order to allow the addition of some water to the container. Thereafter, the opened packaging was heated for 2 minutes in the microwave oven. It was noticed that the opening tab was further released by the steam generated by the microwave cooking in the container, and thereby further facilitating the peeling and complete removal of the cover along the weakening line after the cooking step.

Example 2:

A good working example and preferred embodiment of the present invention has the spiral design and dimensions as shown in Figure 2.

Example 3:

The packaging of the present invention can be opened in the following way as shown in Figure 3:

Step 3.1 - Poke at centre of the cover to break initial

5 opening

Step 3.2 - Pull released tab to peel open

Step 3.3 - Pull tab higher to reveal product

Step 3.4 - Pull tab along the brim of packaging for complete
 opening.

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Claims

1. Packaging for storing and/or cooking a food product, the packaging comprising:
 - 5 - a container for holding the food product, and
 - a cover removably fastened to an upper rim of the container;characterized in that the cover comprises a weakening line forming a spiral, the spiral starting in a central part of
10 the cover and running towards the rim of the cover, and wherein the spiral winds at least one-and-a-half times around a central axis of said spiral.
2. The packaging according to claim 1, wherein the spiral
15 winds at least two times around a central axis of said spiral.
3. The packaging according to claim 1 or 2, wherein the spiral winds at least two-and-a-half time around a
20 central axis of said spiral.
4. The packaging according to one of the claims 1-3, wherein the cover comprises only one single weakening line.
- 25 5. The packaging according to one of the claims 1-4, wherein the weakening line is a score.
6. The packaging according to one of the claims 1-5, wherein the cover comprises a depression zone having at least the
30 size of a fingertip and where the depression zone overlaps with the central axis of the spiral.

7. The packaging according to one of the claims 1-6, wherein the cover and the upper rim of the container are round.
- 5 8. The packaging according to one of the claims 1-7, wherein the central axis of the spiral is in the center of the cover.
9. The packaging according to one of the claims 1-8, wherein the cover does not comprise a separate peel tab.
- 10 10. The packaging according to one of the claims 1-9, wherein the cover is made of an aluminium containing laminate or a plastic containing laminate.
- 15 11. The packaging according to one of the claims 1-10, wherein the container is made of a plastic or glass material.
- 20 12. A packaged food product comprising the packaging according to one of the claims 1-11 and a food product comprised in the container.
- 25 13. The packaged food product according to claim 12, wherein the food product is a dried soup, an instant noodle, a dried coffee and/or milk drink, or a dried chocolate drink.
- 30 14. A cover for use on a container for storage and/or cooking a food product, the cover characterized in that it comprises a weakening line forming a spiral, the spiral starting in a central part of the cover and running towards the rim of the cover, and wherein the spiral

winds at least one-and-a-half times around a central axis
of said spiral.

15. The cover according to claim 14, comprising only one
5 single weakening line.

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