

"Packaging for food products, method and corresponding device"

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Field of the invention

5 The invention concerns packages for food products.

Description of the related art

When packaging food products, different needs must be kept under consideration.

10 A particularly felt need is that of insuring that the product is maintained unaltered for as long a time as possible after packaging. In order to pursue such object, the use of flow-pack sealing wrappers, that is, VFFS/HFFS (acronym for Vertical or Horizontal Form Fill and Seal) has long been known, also for small sized
15 food products (such as chocolates, candies, pralines, etc.). The documents WO-A-99/58421 and EP-A-1 593 603 are representative of this technique. The latter document also illustrates the possibility of providing extremity (figure 1) or longitudinal (figure 2) package
20 welding lines with zigzag edges, allowing the package to be opened by tearing the sheet material of which the package is made along a longitudinal or transversal trajectory with respect to the package itself.

There is also a strong branch of research aimed at
25 providing traditional candy-like packages (that is, packages with one or both extremities twisted like a bow) with characteristics of improved isolation from the external environment. Representative of such branch are, for example, the documents GB-A-993 981, US-A-5
30 935 686, EP-A-0 816 229, EP-B-1 299 285 or WO-A-02/22445. The solution described in EP-B-1 477 423, uniting hermetic sealing characteristics with the appearance of a traditional candy-like wrapper, essentially falls in the same branch.

35 Object and summary of the present invention

As was said, in the case of flow pack packaging, the package is usually opened by tearing the wrapping material along a longitudinal or transverse trajectory with respect to the package itself. In the case of
5 candy-like packages, even when modified in various ways to insure hermetic sealing properties, the user tends to open the package starting by untwisting the bow or bows, rotating the central part of the wrapper itself, where the packaged product is located.

10 In both cases, the product could easily escape from the wrapper, making it difficult for the user to avoid its undesired falling. The risk of product dropping is even more evident in cases in which the product is of small size (for example, a small pastille
15 or confectionery product) and/or when the package is opened while the attention of the consumer is occupied by other operations, for example, while the consumer is walking.

Solutions such as the flow pack solution described
20 in WO-A-99/58421, in which a transverse pre-incision is present, could virtually solve the product dropping problem, but they are critical both for the generally reduced visibility of the pre-incision itself, and because the latter is susceptible to compromising
25 package sealing since it is provided on the welding.

The object of the present invention is providing a solution capable of overcoming such inconveniences.

According to the present invention, such object is achieved thanks to a package having the characteristics
30 set forth in claim 1. Advantageous developments of the invention are object of the subordinate claims. The invention concerns also a corresponding package realisation method as well as a corresponding device. The claims are integral parts of the disclosure of the
35 invention provided herein.

In the currently preferred embodiment, in addition to overcoming the inconveniences outlined above concerning the package opening operation, the invention allows the realisation of airtight sealed packages of the "hermetic" type: this being a characteristic very much appreciated in the case of products commercialised in humid areas, since it allows isolation of the product from the surrounding environment. Furthermore, such technology provides also, using appropriate films, isolation from oxygen and the migration of aromas.

Brief description of the attached drawings

The invention will now be described as a non-limiting example.

The description refers to the attached drawings, in which:

- figure 1 is a general prospective view of a package of the type described herein,
- figure 2 schematically illustrates the criteria of realisation of the package in figure 1,
- the figures 3 and 4 illustrate a possible sequence of the opening of the package in figures 1 and 2,
- figure 5 illustrates a possible variant realisation of the solution in the previous figures and
- figure 6 schematically illustrates a method and device useable for realising the packages in figures 1 to 5.

Detailed description of exemplary embodiments

In the figures in the attached drawings, the numeric reference 1 indicates a package in laminar or sheet material in its entirety, used to package the food product P such as, for example, a confectionery product, a candy, a chocolate, a praline or like product. Reference to these dimensional data should not be interpreted as limiting to the scope of the

invention; the solution described herein can be used also for products P of very small sizes, such as, for example, confectionery products of a few millimetres in length. Also, the product P can be either single or
5 multiple as is illustrated, for example, in EP-A-0 814 030.

The package 1 is essentially made of a laminar or film wrapping material (on which more will be said in the following) initially wrapped according to a general
10 U conformation around the product P as is schematically illustrated in figure 2.

Successively, a closing line 2, extending in a general arch-like trajectory so as to surround the product P, is provided around the product P. The above-
15 said sealing line 2 (also susceptible to having a certain length) has its extremities located in correspondence with the loop part of the sheet material folded in a U around the product P.

The extremity portions in the packaging intermediate thus realised (refer again to figure 2)
20 are then subjected to a general twisting movement in correspondence to one or both of the extremities (observe the arrows F in figure 2) so to confer the general "candy-like" appearance represented in figure 1
25 to the package 1, with a central part enclosing the product P (airtight sealed, thanks to the presence of the sealing line 2) and two extremity parts 3 twisted into a general bow-like conformation.

In a currently, less preferred embodiment, not
30 represented in the figures, the package 1 may have only one bow at the extremity 3.

The general realisation criteria of the package 1 described so far substantially correspond to the solution object of the document EP-B-1 477 423, already
35 cited in the introductory part of the present

description: therefore, all of the elements illustrated, described or in any way deducible from such prior art document will not be further described herein.

5 The fact that the distal edges 3a of the two bows 3 have a saw-like or zigzag trajectory creating a plurality of incisions in each distal edge 3a with V-shaped notches, instead of a general strait-line trajectory, is an important characteristic of the
10 solution described herein. Each of such parts having V-shaped notches can act as a triggering point for a wrapper-tearing phenomenon directed at freeing the product P from the package 1.

15 The sequence in figures 3 and 4 shows how, acting on one of the distal edges 3a, and in particular starting from one of the V-shaped notched points of the zigzag configuration, the user wanting to open the package 1 can trigger a gradual wrapper-tearing phenomenon. Starting at the previously cited trigger
20 point, generically indicated with 4, the tearing action proceeds along a trajectory 40 (indicated with a dotted line in figure 3 and instead, represented as a solid line in figure 4) so to determine the gradual lengthwise tearing of the package 1.

25 Experiments performed by the Applicant show that it is advantageous to realise the package 1 using "oriented film" sheet wrapping material with the oriented direction aligned longitudinally with respect to the package 1, that is, in the direction of the
30 ideal axis around which the wrapping material of the package is twisted to from the extremity bow or bows 3, although this solution must not be taken categorically (in particular in the presence of extremely thin wrapping materials).

35 The term "oriented film" meaning a film material

(typically a plastic material in, for example, a cyclo olefin copolymer (COC) and polyethylene) that, during production (usually by extrusion) is subjected to stretching in the longitudinally advancing direction of the extruder. Such stretching makes the structure of the film material more stable against possible successive stretching in the oriented direction: in other words, the film, after being stretched, has a higher resistance to stretching than before being subjected to stretching.

In a complementary way, the oriented-film material is easier to tear in the direction of the orientation. In practice, the film is less resistant to cutting attempts such to induce tearing in the oriented direction that the film was subjected to during its manufacturing phase.

In any case, both if it derives from an intrinsic characteristic of the film used for the wrapper or if the result is favoured by the use of an oriented-film material, it is possible to discover the fact that in the solution described herein the action of tearing along the line 40 triggered starting from one of the notched points of the zigzag profile (for example from the trigger point indicated with 4 in figure 3) the action propagates longitudinally with respect to the package. All of this (at least most of the time) without involving, if not to a relatively reduced extent, the untwisting of the bow-like part 3 involved in the tearing action.

In the case of the solution described herein, the tearing of the bow proceeds along a substantially longitudinal line with respect to the package, without inducing a marked twisting movement of the bow. Furthermore, while the bow 3 through which the tearing line 40 propagates can somehow be subjected to a slight

untwisting, the opposite bow 3, not involved in the propagation of the tearing line, remains essentially stably twisted.

The net result thus obtainable is represented in figure 4. Once the tearing action made along line 40 traverses the greater part, and then practically the entire central part of the package (the condition actually represented in figure 4), it is possible to observe that the product P is still found inside of the central part of the package 1, housed in a sufficiently stable and safe way in the residual part of the package having a general shell-like conformation, retained in such shell by the two longitudinal margins of the tearing line indicated with 40, which, as is schematically represented in figure 4, advances on both sides of the product P.

The presence of distal edge or distal edges 3a with a zigzag or similar pattern suggests to and allows the consumer, even in the presence of the twisted bow or bows, to open the package 1 not by untwisting the bows (as the consumer would tend to do with a normal candy-like package, but through a longitudinally induced tearing. In turn, such tearing occurs gradually thanks to the bow through which the tearing is propagated.

In this way, it is possible to open the package (which, recall that in the case described herein is an airtight sealed hermetic package) without running the undesired risks of product dispersion mentioned in the introductory part of the present description and without running into the possible problems that may be encountered if a technique according to the teachings of the document WO-A-99/58421 was adopted.

In this regard, it is also convenient to observe the following.

Experiments performed by the Applicant demonstrate that - other characteristics being equal (and in particular, with the same material and thickness of the wrapping sheet) - a package substantially identical to the one illustrated here as an example, but with distal edges 3a having a strait line pattern, lacking tear-triggering points 4, is very often impossible to tear in a longitudinal direction, without the application of a very significant effort.

Furthermore, the presence of a tear-triggering point, such as that provided by the zigzag pattern on the edges 3a, suggests to the consumer to tear the package 1 in the above described way. On the contrary, in the presence of edges 3a with strait-line patterns, the consumer is unavoidably led to try to open the package by untwisting the bows 3: an operation which, in the case of a hermetic package (see figure 3) in any case, does not give access to the product P.

The same experiments demonstrate that the use of an oriented type wrapping material helps both in triggering of tearing and in its propagation across the region of the twisted bow.

Also, it was possible to determine that the best result can be obtained when the length of the portion of wrapping subjected to twisting for formation of the or each bow, measured longitudinally with respect to the package (see figure 2), has a length A included between 5 millimetres and 5 millimetres plus X (the length of the product), protruding with respect to the length X of the product P.

Figure 5 highlights the possibility of realising the distal edge 3a, always having a general zigzag pattern, but with rounded incisions along the external perimeter and with V-shaped notches along the internal perimeter, so to form respective triggering points 4

for tearing of the package wrapper.

Therefore, it follows that for the distal edge 3a it is possible to adopt any configuration such to create wrapper tear-triggering points 4.

5 Figure 6 schematically illustrates the possible realisation criteria of a package of the type represented in the previous figures.

10 In particular, on the left side of figure 6, one sees the blank, indicated with 10, of wrapping material made of a sheet material folded in a general U conformation opened toward the top (ideally considered as moving from left to right).

15 The techniques allowing the realisation of a U-shaped blank of this type, starting from a roll of sheet material, are well known in flow-pack packaging methodology and therefore do not need describing herein.

20 The numeric reference 12 indicates a filling and sealing station in its entirety (itself also of known type) in which the products P are inserted in the tubular blank 10 inserting them inside the part of the loop of the blank through the upper edges not yet connected together. Co-ordinately with the filling operation, operating according to a method of the type
25 described in document EP-B-1 477 423 previously cited, the unit 12 makes the sealing line 2, which provides the hermetic seal around each product P inserted in the blank of sheet material.

30 Successively, the hermetic package thusly obtained is advanced (usually after a 90° rotation with respect to its advancing axis, indicated with X10, although such choice is obviously not compulsory) toward the cutting unit 14 (for example, with intermittent or rotating knives - itself also of known type) which
35 provides the cutting of the individual packages forming

the distal edges 3a with saw-like pattern (or analogous) visible in figures 1 to 4.

Next, a bow-realisation station indicated with reference 16 in which, operating in a way itself known
5 (for example, according to the method described in the document EP-B-1 299 285), the extremities of each package are subjected to twisting so to provide the extremity bows 3.

The products P housed in the now completed
10 packages 1 are then collected (usually by falling) in a container C.

The solution described herein is adaptable to a wide range of variants.

For example, according to the currently preferred
15 form of embodiment, the solution illustrated herein is designed so that the seal characteristic of the package around the product P, provided by the sealing line 2, tightly surround the product P, so that the opening pre-incisions provided on the distal edges 3a, as
20 already cited, do not compromise the sealing. Naturally, it would also be possible to delegate this function to terminal package sealing lines (realised according to widely known criteria in flow-pack type packaging technology) defining the distal edges 3a with
25 a zigzag pattern.

It follows that, keeping the principle of the invention constant, the details of realisation and the embodiments could be widely varied with respect to what was illustrated herein as a non-limiting example,
30 without departing from the scope of the invention, as defined in the attached claims. In particular, concerning the choice of material of which the wrapping film is constituted, different choices are possible, at least in principle, such as that of using a film of
35 polypropylene (PP), polyethylene (PE), polyethylene

- phthalate (PET), etc.. The use of a multi-layer cyclo olefin co-polymer (COC) and polyethylene based film was demonstrated to be a particularly advantageous choice. A film material of this type was found ideal for the
- 5 realisation of the solution described herein in the field of packaging of a wide range of products varying in size and genre, such as small confectionary products, chocolate eggs, wafer-like products.

CLAIMS

1. A package for food products (P) including a sheet of wrapping material air-tight sealed (2) around at least one product (P) and provided with at least one
5 bow-like twisted extremity portion (3) having a distal edge (3a), in which said distal edge (3a) has at least one triggering point (4) for the tearing of said wrapper.

2. A package according to claim 1, in which said
10 sheet material is constituted of an oriented film having the oriented direction longitudinal with respect to the package.

3. A package according to claim 1 or claim 2, in which said distal edge (3a) has a general zigzag
15 pattern with V-shaped incisions susceptible to providing triggering points (4) for the tearing of said wrapper.

4. A package according to any of the previous claims, in which said distal edge (3a) has a general
20 zigzag pattern, with rounded incisions along the external perimeter and V-shaped incisions along the internal perimeter so to provide respective triggering points (4) for the tearing of said wrapper.

5. A package according to any of the previous
25 claims, in which said distal edge (3a) has a configuration such to create a plurality of triggering points (4) for the tearing of said wrapper.

6. A package according to any of the previous claims, in which said wrapper has a sealing line (2)
30 extending in a general arch-like trajectory around said at least one product (P).

7. A package according to claim 6, in which said wrapper is wrapped around said at least one product (P) according to a general U-conformation with said product
35 (P) housed in the loop part of said U-configuration,

and in which said sealing line (2) has its extremities in correspondence with said loop part.

8. A package according to claim 1, in which said at least one extremity portion (3), has a minimum
5 length (A) equal to 5 millimetres and a maximum length (A) equal to 5 millimetres plus the dimension (X) of the wrapped product.

9. A method for packaging food products (P) in a wrapper of air-tight sealed sheet material (2) around
10 at least one product (P) and provided with at least one bow-like twisted extremity portion (3) having a distal edge (3a), the method including the operation of providing said distal edge (3a) with at least one triggering point (4) for the tearing of said wrapper.

15 10. A method according to claim 9, including the operation of using, as said sheet material, an oriented film with the oriented direction aligned longitudinally with respect to the package.

11. A method according to claim 9 or claim 10,
20 including the operation of providing said distal edge (3a) with a general zigzag pattern having V-shaped incisions susceptible to forming respective triggering points (4) for the tearing of said wrapper.

12. A method according to any of the claims 9 to
25 11, including the operation of providing said distal edge (3a) with said distal edge (3a) having a general zigzag pattern with rounded incisions along the external perimeter and V-shaped incisions along the internal perimeter so to form respective triggering
30 points (4) for the tearing of said wrapper.

13. A method according to any of the claims 9 to
12, including the operation of providing said distal edge (3a) with a configuration such to create a plurality of triggering points (4) for the tearing of
35 said wrapper.

14. A method according to any of the previous claims 9 to 13, including the operation of realising said sealing line (2) along a general arch-like trajectory around said at least one product (P).

5 15. A method according to claim 14, including the operation of wrapping said wrapper around said at least one product (P) according to a general U-conformation with said product (P) housed in the loop part of said U-configuration and the operation of providing said
10 sealing line (2) with its extremities in correspondence with said loop part.

16. Device for the packaging of food products (P) in a wrapper of sheet material airtight sealed (2) around at least one product (P) and provided with at
15 least one bow-like twisted extremity portion (3) having a distal edge (3a), the device including a unit (14) to provide said distal edge (3a) with at least one triggering point (4) for the tearing of said wrapper.

17. A device according to claim 16, including a
20 cutting unit (14) to provide said distal edge (3A) with a general zigzag pattern having V-shaped incisions susceptible to forming respective triggering points (4) for the tearing of said wrapper.

18. A device according to claim 16 or claim 17,
25 including a cutting unit (14) to provide said distal edge (3a) with a general zigzag pattern having rounded incisions along the external perimeter and V-shaped incisions along the internal perimeter so to form respective triggering points (4) for the tearing of
30 said wrapper.

19. A device according to any of the claims 16 to 18, including a cutting unit (14) to provide said
distal edge (3a) with a configuration such to create a plurality of triggering points (4) for the tearing of
35 said wrapper.

20. A device according to any of the claims 16 to 19, including a sealing unit (12) to realise said sealing line (2) according to a general arch-like trajectory around said at least one product (P).

5 21. A device according to claim 20, including a shaping tool to wrap said wrapper around said at least one product (P) according to a general U-conformation with said product (P) housed in the loop part of said U-configuration, with said sealing unit (12) providing
10 said sealing line (2), having its extremities in correspondence with said loop part.