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(54) **Closure for closing a flexible packaging**

(57) The invention relates primarily to an elongate closure 10 for closing an access side of a flexible packaging, comprising an elongate plastic strip 12 which has a central body 14 and is provided with thickened longitudinal edges 16 which are spaced apart in the width direction of the strip 12, with the strip having a closure side 20 which is turned towards the access side of the flexible packaging in a closed position, with at least one of the longitudinal edges 16 on the closure side 20 being provided with a longitudinal rib 24 having a clamping edge 26) which is turned towards the packaging..

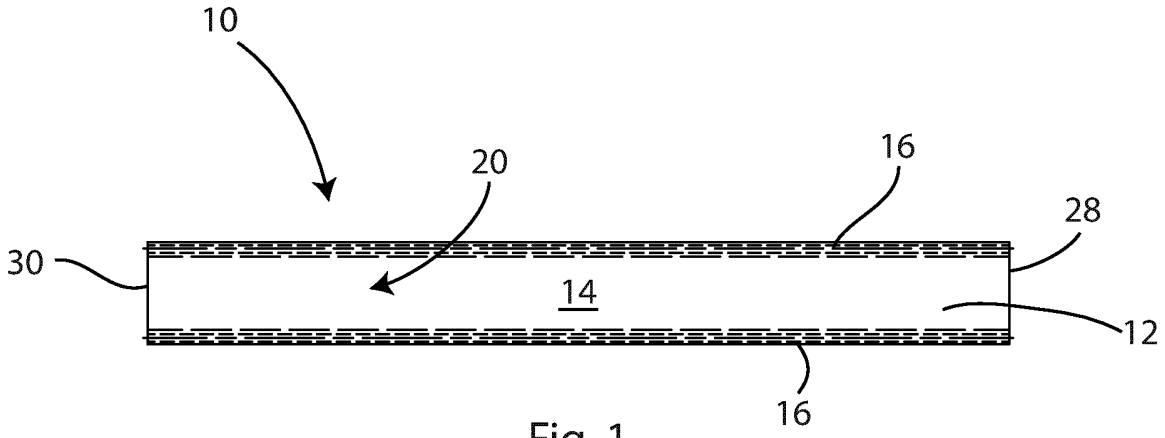


Fig. 1

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Description

[0001] The invention primarily relates to a closure for closing an opening side of a flexible packaging which comprises an elongate plastic strip which is provided, on the longitudinal edges, with reinforcing wires embedded in plastic, in which the strip comprises a closure side which, in a closed position, is turned towards the access side of the flexible packaging.

[0002] Such a closure, often referred to as a "clipband closure", is known in the field. After the packaging has been filled, in particular with food stuffs, such as bakery products or confectionery, for example bread, gingerbread, sugar, sweets and the like, the access side is folded together to form a neck which can, if desired, be twisted. A closure is folded around the neck and bent, so that the ends of the closure overlap one another. This defines the closed position, in which the closure side of the closure is turned towards the packaging. The traditional closure consists of an elongate strip made of plastic, such as polypropylene, with metal wire being embedded in the plastic on both longitudinal edges. The metal wire imparts clamping force to the closure , so that the closure remains in the closed position and engages and clamps the locally gathered neck of the packaging, even when being re-used, including reclosing the same packaging using the same closure.

[0003] Clipband closures are usually fitted by machine. To this end, the closure material is wound onto a bobbin or coil as a virtually continuous length (for example 600 m), a portion of which (in the order of magnitude of centimetres) is in each case cut off in the packaging device and is used as a separate closure.

[0004] It is a known problem that in some cases, the closure moves slightly or even moves completely from the gathered neck of the packaging, as a result of which the contents of the packaging are accessible, in addition to the fact that the presentation of the packaged product is adversely affected. This is also undesirable. A solution which is known in the field comprises increasing the forces in the packaging device in order to make the ends of the closure overlap one another (even) more tightly. However, this solution has appeared to be insufficient, as the closure itself has some flexibility and the metal wires cannot be folded at a very sharp angle, but follow a certain bend or curve. An increase in the bending/folding forces applied in the packaging device itself therefore does not result in a further improvement of the closing action.

[0005] DE 7615537 U discloses a clipband closure, comprising a plastic strip having reinforcing wires which are embedded along the longitudinal edges and which is provided with a longitudinal plastic rib on the closure side, approximately in the centre of the central body, between the reinforced longitudinal edges, parallel to the longitudinal edges with reinforcing wires, having a height which is such that the top side of the longitudinal rib is situated in one plane with the two top sides of the reinforcing wires. It is stated that this longitudinal rib increases the grip of the closure and the stability of the closure.

[0006] A drawback of this closure known from DE 7615537 U is the fact that the clamping force still leaves something to be desired. No closures according to DE 7615537 U are commercially available either. An additional drawback is the fact that, due to its asymmetry, the closure can only be placed in one position in order to achieve the stated increased clamping force in (semi-)automatic packaging machines.

[0007] In the field, there is therefore still a need for a closure of the clipband closure type with improved clamping force.

[0008] It is an object of the present invention to provide a closure of the clipband closure type which does not exhibit the above-described problems or to a lesser degree and/or fulfils the abovementioned need.

[0009] It is another object of the invention to provide such a closure which has an increased clamping force compared to the traditional closure.

[0010] Yet another object is to provide such a closure which can be used with (semi-)automatic packaging devices.

[0011] It is a further object of the invention to provide such a closure, in which the positioning of the closure in a (semi-) automatic packaging device is less critical.

[0012] To this end, the invention provides a closure as defined in claim 1. The elongate closure which usually has a length of a few centimetres, typically 3-10 cm, up to a few tens of centimetres, for example 75 cm, comprises a strip of plastic material. The width of the closure is usually in a range of 5-10 mm, such as 8 mm. The thickness of the central body, i.e. the part of the strip of material between the longitudinal edges, is usually a few tenths of a millimetre, such as 0.2-0.5 mm, for example 0.3 mm. Compared to the central body, the longitudinal edges have a greater thickness. In one embodiment the longitudinal edges comprise plastic-embedded reinforcing wires which are usually made of metal. Due to the extrusion process used for its production, the plastic covering the wires, also referred to below as "coating layer', usually has a thickness which is in the order of half the total thickness of the central body. The usually round metal wires have a diameter of 0.5-1 mm, such as 0.6, 0.7 or 0.8 mm. Said dimensions of the closure depend greatly on the intended use of the closure. In the case of the abovementioned embodiment, the metal wires, which are protected by the plastic coating layer, provide the clamping force which is required after the closure has been fitted. With another embodiment, the thickened longitudinal edges are entirely made of plastic, with the type of plastic and the thickened longitudinal edge providing the required clamping force. An example of such a plastic is a modified polyethylene terephthalate, as described, for example, in NL 1027637 C. According to the invention, one or more additional longitudinal ribs are provided at the thickened longitudinal edges, at least on that closure side of the closure which is turned towards the packaging in the

closed position. The free end of a longitudinal rib which is turned towards the packaging works as a clamping edge. The vertical position of this clamping edge is at a distance which is greater than the distance of such a thickened longitudinal edge without an additional longitudinal rib. It has been found that with a closure according to the invention, the clamping action is improved to such an extent that the closure does not move across the access side of the packaging, such as the neck of a bag. It is assumed that the longitudinal ribs increase the slip resistance between the closure and the packaging due to the force per unit area being larger compared to the known closure without a longitudinal rib. In addition, the longitudinal rib functions as a "barb" behind which the packaging is caught.

[0013] Compared to the known closure from DE 7615537 U1, the closure according to the invention has a higher clamping force, as the longitudinal ribs are directly supported by the relatively stiff thickened longitudinal edges, such as the reinforcing wires, unlike the longitudinal rib according to DE 7615537 U1 which is supported by the relatively thin and flexible central body of the plastic strip. With the known closure, the additional longitudinal rib does not primarily result in an increase in the clamping force, but in an increase in the contact area. With the invention, the clamping force of the respective thickened longitudinal edge is exerted on the packaging via the longitudinal rib without the use of the central body. In the case of a thickened longitudinal edge which comprises a plastic-embedded reinforcing wire, transmission of the clamping force thereof takes place via the plastic coating layer and longitudinal rib. More particularly, the position of the longitudinal rib with respect to a thickened longitudinal edge, for example the reinforcing wire, is such that a longitudinal axis of the longitudinal rib intersects the respective thickened longitudinal edge, for example the reinforcing wire, in a direction substantially at right angles to the closure side. This embodiment ensures a direct path for the transmission of the clamping force from the thickened longitudinal edge, such as the reinforcing wire, to the packaging via the longitudinal rib. In a further preferred embodiment, the longitudinal rib is provided in the same width position as a thickened longitudinal edge, such as the reinforcing wire. In other words, in cross section, a centre line of the longitudinal rib runs through the centre of the thickened longitudinal edge in a direction substantially perpendicular to the closure side. Another advantage of this position of the longitudinal rib is that relatively little additional material is required for a longitudinal rib, resulting in relatively low manufacturing costs.

[0014] The closure according to the invention is usually produced by extruding plastic using an extrusion die through which the reinforcing wires may also be passed, if desired. Due to the shape of the die orifice, a longitudinal rib which is produced in this way, has a rounded clamping edge. Advantageously, the radius of the rounding of the clamping edge is smaller than the imaginary radius of the thickened longitudinal edge and, if applicable, smaller than the radius of the reinforcing wire. As a result thereof, the contact area between the clamping edge and the packaging is smaller than the contact area between the packaging and the longitudinal edge of the known closure and therefore the clamping force per unit area is greater in an otherwise identical embodiment of the thickened longitudinal edge and the plastic.

[0015] In a further preferred embodiment, each longitudinal edge on the closure side is provided with a longitudinal rib having a clamping edge which is turned towards the packaging. With this embodiment, the clamping action of each longitudinal edge is improved.

[0016] Advantageously, the closure has a plane of symmetry which is parallel to the closure side, so that there are one or more longitudinal ribs on the closure side as well as on the opposite free side of the closure. More advantageously, the closure also has a plane of symmetry which is at right angles to the closure side. With such a symmetrical closure, it is irrelevant how a strip, from which the individual closures are cut, is introduced into the packaging device.

[0017] In yet a further preferred embodiment, a longitudinal rib is made from the same plastic as the strip of the closure itself. This facilitates production of the closure, as it is not necessary to use different plastics for the various parts of the closure. Advantageously, the plastic parts of the closure form a single entity.

[0018] The side of the closure which is situated opposite the closure side may be provided with data regarding the ingredients of the product or the manufacturer, for example manufacturing date or best before date and the like.

[0019] The invention furthermore relates to a coil having an elongate plastic strip wound onto it for use in a packaging device having a central body, which strip is provided with thickened longitudinal edges (which are spaced apart in the width direction of the central body), for example with reinforcing wires embedded in the plastic coating layer, with the strip having a closure side which is turned towards the access side of the flexible packaging upon closing, with at least one of the longitudinal edges on the closure side being provided with a longitudinal rib having a clamping edge which is turned towards the packaging. Onto such a coil, an elongate strip of closures according to the invention which adjoin one another in an imaginary manner is wound, although the individual closures are not visible thereon. In the (semi-) automatic packaging device, a closure is cut off at the desired length and used for closing the packaging.

[0020] The invention also provides the use of a closure according to the invention for closing the access side of a flexible packaging.

[0021] The invention will be explained below with reference to the attached drawing, in which:

Fig 1 shows an embodiment of a clipband closure according to the invention; and
Fig. 2 shows an enlarged cross section of the embodiment according to claim 1.

[0022] A preferred embodiment of a clipband closure 10 according to the invention, as illustrated in these figures, comprises an elongate strip 12 made of plastic, typically PP, having a length and width of, for example, 3-6 cm by 0.8 cm and a thickness in the range of 0.2-0.8 mm. The strip 12 comprises a central body 14 and thickened longitudinal edges 16, into which metal reinforcing wires 18 with a diameter of, for example, 0.6 mm have been incorporated in such a manner that the plastic coating layer covers the reinforcing wires 18. Due to the presence of said reinforcing wires 18, the longitudinal edges 16 of the strip 12 are rounded and slightly thicker than the central body 14.

[0023] In this embodiment of a clipband closure according to the invention, the spaced-apart parallel thickened longitudinal edges 16 are provided on either side of the closure 10, i.e. on a closure side 20 and an opposite side 22, with longitudinal ribs 24 which are relatively small and pointed compared to these edges and which extend along the length of the closure 10. The free end of a longitudinal rib 24 forms a clamping edge 26. The longitudinal ribs 24 are positioned and oriented in such a way that the centre line of a longitudinal rib 24 is perpendicular to the centre line of the central body 14 and runs through the centre of the respective metal wire.

[0024] The closure is made by extrusion using an extrusion die through which the reinforcing wires are passed. Due to the shape of the die, the longitudinal ribs 24 have a rounded end 26. However, the radius of the rounding of this end 26 is much smaller than the radius of the metal wire.

[0025] When a flexible packaging is being closed, the ends 28 and 30 are bent in such a way that they overlap one another, if desired along creases (not shown) forming preferred bending positions, so that a folded opening side of a flexible packaging, such as the neck of a bread bag, is closed off and clamped. The presence of the longitudinal ribs 24 increases the clamping action of the clipband closure 10 on the flexible packaging.

Experiment

[0026] In a comparative test, closures according to the invention as described above with reference to the attached figure were tested and compared to traditional clip band closures (without additional longitudinal rib).

[0027] Cut bread was packaged in a bread factory and the bag was closed mechanically with a closure using a Hartmann-clip machine (setting clip size type 1). The loafs of bread thus surrounded by a closed packaging were distributed in the customary manner to the retail trade and subsequently taken off the shelves. On a number of the bags thus closed, a visual assessment was carried out and the sliding force on the clip was measured using a Chantillon™ tensile tester. To this end, the bottom of the bag was cut and the bread was removed. The ends of the empty closed bag, the closure of which had not been opened since the initial closing operation, were fixed in the tensile tester. Then, the longitudinal edge of a closure was pulled by hand, without exerting pressure on the closure in a direction transversely to the direction of pulling, until the closure started to slide. The value at which the moving occurred is given in Table 1 below.

Table 1.

Bag ID (1= invention; R = reference)	Type of cut bread	Sliding force (N)	
I1	Wholemeal, whole loaf	23	
I2	Wholemeal, whole loaf	26	
I3	Wholemeal, whole loaf	24	
I4	Wholemeal, whole loaf	25	
R1	Wholemeal, whole loaf	12	
R2	Wholemeal, whole loaf	13	
R3	Wholemeal, whole loaf	12	
R4	Wholemeal, whole loaf	13	
I5	Wholemeal, half loaf	23	
I6	Wholemeal, half loaf	19	
I7	Wholemeal, half loaf	21	
I8	Wholemeal, half loaf	19	

(continued)

Bag ID (1= invention; R = reference)	Type of cut bread	Sliding force (N)	
R5	Wholemeal, half loaf	13	
R6	Wholemeal, half loaf	12	
R7	Wholemeal, half loaf	10	
R8	Wholemeal, half loaf	11	

[0028] As can be inferred from the results given in Table 1, the closure according to the invention has a much higher sliding resistance with both types of packaging, namely an average of 24.5 N for the invention compared to an average of 12. 5 N for the prior art for a whole loaf of bread and an average of 20.5 N compared to an average of 12.5 N for half a loaf of bread, respectively. Furthermore, it was concluded that with a machine with less than optimal settings with regard to packaging and product to be packaged, the closure according to the invention performed significantly better than a prior-art closure.

[0029] Upon visual assessment, it was found that the packagings closed using a closure according to the invention still appeared to be in good shape, in particular the packagings of the half loaves where the type of bread plays a more important part with regard to firmness and shape than packagings of whole loaves.

Claims

1. Elongate closure (10) for closing an access side of a flexible packaging which comprises an elongate plastic strip (12) which has a central body (14) and is provided with thickened longitudinal edges (16) which are spaced apart in the width direction of the central body (14), with the strip (12) having a closure side (20) which is turned towards the access side of the flexible packaging in a closed position, with at least one of the longitudinal edges (16) on the closure side (20) being provided with a longitudinal rib (24) having a clamping edge (26) which is turned towards the packaging.

2. Closure according to claim 1, wherein the position of a longitudinal rib (24) with respect to a thickened longitudinal edge (16) is such that a centre line of the longitudinal rib (24), intersects the thickened longitudinal edge (16) in a plane substantially perpendicular to the closure side of the closure.

3. Closure according to one of the preceding claims, wherein the position of a longitudinal rib (26) with respect to a thickened longitudinal edge (16) is such that a centre line of the longitudinal rib (24) intersects the centre of the thickened longitudinal edge (16) in a plane substantially perpendicular to the closure side of the closure.

4. Closure according to one of the preceding claims, wherein the clamping edge (26) has a rounding with a radius which is smaller than the radius of a thickened longitudinal edge (16).

5. Closure according to claim 1, wherein the thickened longitudinal edges (16) comprise plastic-embedded reinforcing wires (18).

6. Closure according to claim 5, wherein the clamping edge (26) has a rounding with a radius which is smaller than the radius of the reinforcing wire (18).

7. Closure according to one of the preceding claims 1-6, wherein the closure side (20) is provided with two longitudinal ribs (24) having a clamping edge (26) which is turned towards the packaging, which longitudinal ribs (24) are each situated near another longitudinal edge (16).

8. Closure according to one of the preceding claims 1-7, wherein the closure (10) has a plane of symmetry which is parallel to the closure side (20).

9. Closure according to one of the preceding claims 1-8, wherein the closure (10) has a plane of symmetry which is perpendicular to the closure side (20).

10. Closure according to one of the preceding claims 1-9, wherein a longitudinal rib (24) is made from the same plastic as the strip (12) itself.

11. Closure according to one of the preceding claims 1-10, wherein the strip (12) and the longitudinal rib (24) form a single entity.

12. Coil with an elongate plastic strip (12) wound onto it for use in a packaging device, which strip (12) is provided with plastic-embedded reinforcing wires (18) on the longitudinal edges (16) which are spaced apart in the width direction of the strip, wherein the strip (12) has a closure side (20) which is turned towards the access side of the flexible packaging in the closed position, wherein at least one of the longitudinal edges (16) on the closure side (20), is provided with a longitudinal rib (24) having a clamping edge (26) which is turned towards the packaging.

13. Use of a closure (10) according to one of the preceding claims 1-11 in the closing of the access side of a flexible packaging.

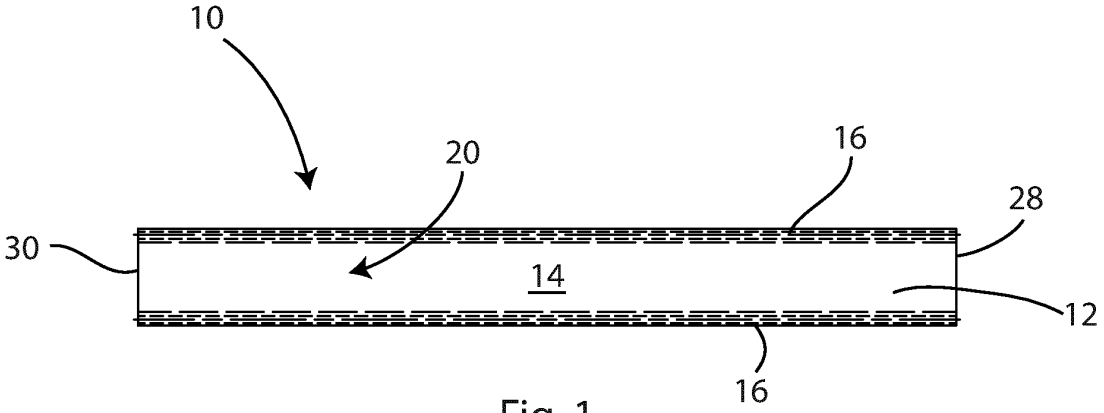


Fig. 1

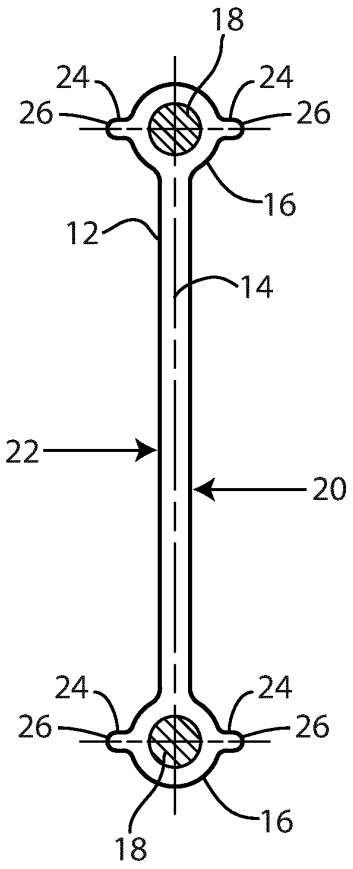


Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 11 18 9123

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 February 2012	Balz, Oliver

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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