

SPECIFICATION Foldable Wrapper

The invention relates to a foldable wrapper.

A known wrapper comprises a blank which has
5 an upper wall portion, two side wall portions and two base flap portions joined together by means of fold lines, one base flap portion having closure tags which can be folded up from said one base flap portion for engagement in associated
10 openings of the other base flap portion, the closure tags then being supported in position by supporting tags which can be folded up from the edges of the openings.

The articles which are to be packaged with
15 such foldable wrappers usually have in fact approximately the same dimensions. In practice, however the dimensional tolerances of the articles, which arise within an individual package, are relatively high. This applies especially to
20 multi-way bottles, because numerous types of bottles, whose dimensions are in fact similar but not absolutely identical, are in circulation. Manufacturing tolerances are not only the reason for this, but in particular there is also the fact that
25 there has not been hitherto an adequate standardization for bottle dimensions. Even after the introduction of a standard for the dimensions of bottles, bottles which differ from this standard and which have to be packaged with foldable
30 wrappers must still be expected to be in circulation for a relatively long period of time.

The closure tags of these foldable wrappers conventionally require that the two base flap portions which are to be joined be brought into an
35 accurately prescribed reciprocal position. At the same time the girth of the foldable wrapper is thereby prescribed.

In order to permit the tolerances in the articles to be compensated for, a weakened region has
40 been provided, for example, at a receiving opening for an article to be packaged and such a region permits the opening to be enlarged if the force, which is produced when the wrapper is closed, becomes too great because the articles to
45 be packaged are too large. These measures for compensating for the tolerances can, however, only permit dimensional changes in a relatively small tolerance range. If greater dimensional variations occur, there is the danger that the
50 wrapper will tear during closure if the dimensions of the articles are at the upper tolerance limit, or that the articles will drop out of the closed wrapper at the ends thereof when the dimensions of the articles are at the lower tolerance limit.

In a foldable wrapper of the initially mentioned type (US PS 3,508,699), it is also already known to compensate for tolerances by providing two engageable lateral projections at the edges of each closure tag, so that the two base flap
60 portions can be joined together in two different relative positions depending upon the dimensions of the articles to be packaged, one or other projection at each lateral edge of each tag engaging with an edge of the associated opening.

65 Even this measure, however, is not sufficient to increase substantially the permissible tolerance range because the two projections at each lateral edge of each closure tag must be situated relatively close together. Otherwise the foremost
70 projections of each closure tag would prevent engagement of the tag within the associated opening when the dimensions of the articles to be packaged are at the lower tolerance limit, because then the free ends of the tags are
75 prevented from moving into the associated openings because of the projections.

The object of the invention, therefore, is to design a foldable wrapper of the initially mentioned type so that, even if the articles to be
80 packaged have dimensions which vary in a broad tolerance range, compensation for the tolerances is possible.

According to the invention, there is provided a foldable wrapper for a plurality of articles, such as
85 bottles, cans or the like, disposed in rows, the wrapper being in the form of a blank which comprises an upper wall portion, two side wall portions and two base flap portions which can be joined to form a base wall, all interconnected by
90 means of fold lines, one base flap portion being provided with closure tags foldable away from said one base flap portion and engageable within openings of the other base flap portion to form the base wall of a package, the closure tags
95 having lateral edges which are of undulatory configuration over substantially their entire length, with the two undulatory lateral edge parts of each closure tag running parallel to each other over their whole length, and each opening having
100 lateral edges which diverge towards a base of a respective supporting tag provided at the opening for holding the associated closure tag engaged within the opening.

Because of the form of the openings for
105 receiving the closure tags, relatively long closure tags, can be introduced unhindered into these openings. Consequently, the closure tags can be made as long as is desirable for compensation of the tolerance range. For closing the wrapper, it is
110 sufficient to draw together the two base flap portions with a force which is defined by the strength of the foldable wrapper and to close the base flap portions in the relative position which is set by the articles.

115 The invention is described further, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a plan view of a blank providing a foldable wrapper according to the invention;

120 Figure 2 is a fragmentary view of the blank;

Figure 3 is a simplified vertical section through a package including the wrapper, the package being shown on a device for closing the wrapper;

Figure 4 shows a detail of Figure 3; and

125 Figure 5 is a simplified plan view of the parts of the device shown in Figures 2 and 3.

The blank shown in Figure 1 providing a foldable wrapper is made, for example, from pasteboard or cardboard and comprises an upper

wall portion 1 with a central section 1; 1 for the formation of a carrier handle, two side wall portions 2 and two base flap portions 3 and 4 which can be joined to one another to form a base wall. The portions 1 and 2 are connected to one another by fold lines 5 and the portions 2, 3 and 2, 4, are joined by strips 6, disposed between the side wall portions 2 and the base flap portions 3, 4, and fold lines 5. The strips 6 are each provided with three openings 7 for receiving portions of bottles 8 to be packaged (Figure 3).

Provided in one base flap portion 4 are location openings 9 which correspond with notches 10 in the other base flap portion 3, so that, when the wrapper is in the erected state as part of a package, centering pins (not shown) can protrude from a palette or the like carrying the package through the wrapper between the bottles 8 to retain the package in position.

Also provided in the two base flap portions 3 and 4 are substantially triangular handling openings 11 which may be used to draw the two base flap portions 3 and 4 towards one another prior to closing the wrapper.

Closure tags 12 are cut out in one base flap portion 4 and are foldably joined at one end to the base flap portion 4. Supporting tags 13 are cut out in the other base flap portion 3, at locations arranged so as to correspond with the tags 12 when the wrapper is in use, and provide openings 14.

Figures 3 and 4 show that the closure tags 12, when the wrapper is erected are folded upwards into the openings 14 and are supported in this position by the supporting tags 13.

The particular form of the closure tags 12 and the openings 14 can be seen in Figure 1 and is particularly clear in Figure 2. At their lateral edges 12.1 and 12.2, the closure tags 12 have corrugations 15 which are distributed over the entire length of the lateral edges 12.1 and 12.2 thereby rendering these edges undulatory. The lateral edges 14.1 of each opening 14 diverge towards the base of the supporting tag 13. These edges may be parallel at their ends remote from the base of each tag 13, as can clearly be seen from Figure 2.

The width of each opening 14 is selected so that one corrugation 15 of the associated tag 12 can engage behind the lateral edge 14.1 of the opening 14. If—as Figure 3 shows—the two base flap portions 3 and 4 overlap one another to a relatively large extent and the tags 12 penetrate far into the openings 14, the corrugations 15 adjacent to the tips of the tags 12, do not hinder the introduction of the tags 12 into the openings 14 by virtue of the divergent nature of the edges of the openings 14. It is therefore possible for the length of the lateral edges 12.1 and 12.2 of the sealing tags 12 to be substantially longer than the lateral edges 14.1 of the openings 14 so as to accommodate a large range of bottle sizes.

In the embodiment shown, it can be seen, especially from Figure 2, that the undulatory edges 12.1 and 12.2 of each tag 12 run parallel

to each other. The undulatory edges 12.1' and 12.2' of another tag 12 are also parallel to each other and are arranged in mirror image fashion relative to the edges 12.1 and 12.2.

Because the edges 12.1 and 12.2, or 12.1' and 12.2', respectively run parallel, the length of the tags engageable within the openings 14 is adjustable by an amount (hereinafter called "the engagement spacing") not equal to the distance a between two adjacent corrugations 15 but equal to the distance b which is half the distance a , because respective corrugations 15 on one edge of each tag engage during adjustment behind the associated edge of the respective opening 14 in alternate relationship with the engagement of respective corrugations 15 on the other edge of the tag behind the other edge of the opening 14. The inverse disposition of the lateral edges of the two tags 12, 12' also prevents the tags 12, 12' whose widths are identical at every point, from being able to withdraw from the openings 14. The small engagement spacing b renders it possible to provide relatively large corrugations 15 which may achieve an adequate closure of the wrapper even with low material strength. The entire acceptable adjustment range of package girth is denoted by c .

Weakened regions 16, in this case grooves, are provided in the region of the fold lines 5 between the base flap portion 4 and one side wall portion 2 adjacent to respective receiving openings 7 for accommodating and holding the bases of the bottles 8, and, if a prescribed tensile force is exceeded, the regions 16 tear open to enlarge the associated openings 7. In the case of the central opening 7 in the portion 4, the two grooves 16 actually lead from the opening 7 into the base flap portion 4. These grooves 16 tear open when a relatively slight force is applied. In contrast, the grooves 16 adjacent to the two outside openings 7 only extend beside and not into these openings so that a stronger force is required to widen these openings 7. This causes the outer bottles of the package to be held securely in the wrapper.

The enlargement of the central opening in the portion 4 may thus be effected with a low tensile force and/or to a greater extent than is the case with the outer openings.

The wrapper is closed in use, on a device whose parts are shown in a simplified manner in Figures 3, 4 and 5. Engageable within the openings 11 (Figure 1) of the two base flap portions 3 and 4 respectively are clamping hooks 17 and 18 which are arranged to move resiliently towards each other whilst also advancing the filled folded wrapper along the device as set out below. The clamping hooks 17 and 18, which lie opposite each other in pairs, are displaceably guided on rods 19 which, at their ends, are each joined to a link of a link or sprocket chain 20 (Figure 5). Movement of the two chains 20 causes the rods 19 to advance the filled folded wrappers by way of the hooks 17, 18. During this movement of the chains 20, which are shown in plan view in Figure 5, the clamping hooks 17 and

18, of which only one pair is shown in the figures, are acted on by guide rails 21, 22 through guide rollers 25 mounted on the hooks 17, 18. One guide rail 21, which is associated with the hook 17 engaging the base flap portion 3 is rigidly disposed on a frame of the device whilst the other guide rail 22 is movably connected to the frame by means of parallel guides 23 and is resiliently urged from the withdrawn position shown in Figure 5 by dash-dot lines into the position shown by solid lines by a pneumatic cylinder 24 with a predetermined force.

The guide rails 21 and 22 each have entries 21.1 and 22.1 inclined relative to the longitudinal direction of the rails. When the rollers 25 travel in contact with the inclined entries 21.1 and 22.2, the two clamping hooks 17 and 18 are moved towards each other in order to clamp the folded wrapper around the bottles 8. The clamping hook 17 moves automatically under the control of the guide rail 21 into a position wherein a finger 26 can press the closure tag 12 upwards through the opening 14. The clamping hook 18, which lies opposite the hook 17, is moved forward towards the hook 17 until the force on the hook 18, determined by the pressure in the pneumatic cylinder 24, reaches a predetermined limit which corresponds to the maximum desirable tensile force for the folded wrapper. Closure of the wrapper is effected in this position wherein the folded wrapper is clamped to the desired extent.

The tolerance range of the wrapper with respect to different sizes of bottles may be seen from a comparison of Figure 3 and Figure 4. In Figure 3, one bottle size limit is shown, i.e. the bottles 8 which are to be packaged lie at the lower limit of the possible dimensions. The two base flap portions 3 and 4 have a relatively large overlap and a large proportion of the length of each of the tags 12 extends through the associated opening 14. In contrast, the overlap of the portions 3, 4 with the greatest possible dimensions for the bottles to be packaged, is smaller and the tags 12 protrude only slightly through the openings 14.

Claims

1. A foldable wrapper for a plurality of articles,

such as bottles, cans or the like, disposed in rows, the wrapper being in the form of a blank which comprises an upper wall portion, two side wall portions and two base flap portions which can be joined to form a base wall, all interconnected by means of fold lines, one base flap portion being provided with closure tags foldable away from said one base flap portion and engageable within openings of the other base flap portion to form the base wall of a package, the closure tags having lateral edges which are of undulatory configuration over substantially their entire length, with the two undulatory lateral edge parts of each closure tag running parallel to each other over their whole length, and each opening having lateral edges which diverge towards a base of a respective supporting tag provided at the opening for holding the associated closure tag engaged within the opening.

2. A wrapper as claimed in claim 1, in which the lateral edges of the closure tags are longer than the lateral edges of the openings.

3. A wrapper as claimed in claim 1 or 2 in which the undulatory lateral edges of one closure tag are arranged in mirror image fashion relative to the undulatory lateral edges of another closure tag.

4. A wrapper as claimed in claim 1, 2 or 3, in which weakened regions are provided in one base flap portion adjacent to a respective one of the fold lines and adjacent to receiving openings for the articles to be packaged, the weakened regions being arranged to tear if a predetermined tensile force is exceeded whereby to enlarge the receiving openings.

5. A wrapper as claimed in claim 4 wherein at least three of said receiving openings arranged in a row are provided in said one base flap portion, and wherein the weakened regions are arranged to tear to enlarge the central opening or openings at a lower tensile force than is required to enlarge the outer openings.

6. A foldable wrapper substantially as herein particularly described with reference to and as illustrated in Figures 1 to 4 of the accompanying drawings.



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18, of which only one pair is shown in the figures, are acted on by guide rails 21, 22 through guide rollers 25 mounted on the hooks 17, 18. One guide rail 21, which is associated with the hook 5 17 engaging the base flap portion 3 is rigidly disposed on a frame of the device whilst the other guide rail 22 is movably connected to the frame by means of parallel guides 23 and is resiliently urged from the withdrawn position shown in 10 Figure 5 by dash-dot lines into the position shown by solid lines by a pneumatic cylinder 24 with a predetermined force.

The guide rails 21 and 22 each have entries 21.1 and 22.1 inclined relative to the longitudinal 15 direction of the rails. When the rollers 25 travel in contact with the inclined entries 21.1 and 22.2, the two clamping hooks 17 and 18 are moved towards each other in order to clamp the folded wrapper around the bottles 8. The clamping hook 20 17 moves automatically under the control of the guide rail 21 into a position wherein a finger 26 can press the closure tag 12 upward through the opening 14. The clamping hook 18, which lies opposite the hook 17, is moved forward towards 25 the hook 17 until the force on the hook 18, determined by the pressure in the pneumatic cylinder 24, reaches a predetermined limit which corresponds to the maximum desirable tensile force for the folded wrapper. Closure of the 30 wrapper is effected in this position wherein the folded wrapper is clamped to the desired extent.

The tolerance range of the wrapper with respect to different sizes of bottles may be seen from a comparison of Figure 3 and Figure 4. In 35 Figure 3, one bottle size limit is shown, i.e. the bottles 8 which are to be packaged lie at the lower limit of the possible dimensions. The two base flap portions 3 and 4 have a relatively large overlap and a large proportion of the length of 40 each of the tags 12 extends through the associated opening 14. In contrast, the overlap of the portions 3, 4 with the greatest possible dimensions for the bottles to be packaged, is smaller and the tags 12 protrude only slightly 45 through the openings 14.

Claims

1. A foldable wrapper for a plurality of articles,

such as bottles, cans or the like, disposed in rows, the wrapper being in the form of a blank which 50 comprises an upper wall portion, two side wall portions and two base flap portions which can be joined to form a base wall, all interconnected by means of fold lines, one base flap portion being provided with closure tags foldable away from 55 said one base flap portion and engageable within openings of the other base flap portion to form the base wall of a package, the closure tags having lateral edges which are of undulatory configuration over substantially their entire 60 length, with the two undulatory lateral edge parts of each closure tag running parallel to each other over their whole length, and each opening having lateral edges which diverge towards a base of a respective supporting tag provided at the opening 65 for holding the associated closure tag engaged within the opening.

2. A wrapper as claimed in claim 1, in which the lateral edges of the closure tags are longer than the lateral edges of the openings.

70 3. A wrapper as claimed in claim 1 or 2 in which the undulatory lateral edges of one closure tag are arranged in mirror image fashion relative to the undulatory lateral edges of another closure tag.

75 4. A wrapper as claimed in claim 1, 2 or 3, in which weakened regions are provided in one base flap portion adjacent to a respective one of the fold lines and adjacent to receiving openings for the articles to be packaged, the weakened 80 regions being arranged to tear if a predetermined tensile force is exceeded whereby to enlarge the receiving openings.

5. A wrapper as claimed in claim 4 wherein at least three of said receiving openings arranged in 85 a row are provided in said one base flap portion, and wherein the weakened regions are arranged to tear to enlarge the central opening or openings at a lower tensile force than is required to enlarge the outer openings.

90 6. A foldable wrapper substantially as herein particularly described with reference to and as illustrated in Figures 1 to 4 of the accompanying drawings.