

Description

The present invention relates to a flexible weblike package containing suction tubes of the type comprising two straight tube parts joined to one another flexibly by means of a bellows-type tubular intermediate part, the package comprising two flexible material webs which are joined to one another along repeated longitudinal and transversal sealing joints which in pairs jointly form closed spaces wherein, in each of said closed spaces, a suction tube is arranged. Such a package is known.

So-called nonreturnable packages e.g. for juice, at present are frequently provided with a detachable suction tube (drinking straw) applied to the outside of the package which is intended to facilitate the emptying of the contents of the packing container. The suction tube is manufactured from a flexible, but relatively rigid plastic material and may be used, therefore, to break open the packing container, e.g. by pushing the suction tube through a thinned or weakened part of the container wall.

On application of suction tubes to conventional substantially parallelepipedic packing containers the suction tube, which for reasons of hygiene is wrapped in a flexible protective envelope, is usually fixed diagonally over one of the plane, rectangular side walls of the packing container. So as not to be in the way when handling the packing containers in connection with transport and storage and also to protect it against mechanical damages during such handling it is important that the suction tube should be applied in such a manner that it does not with any part project outside the lateral edges of the container walls. However, this restricts the length of the suction tube which is not allowed, therefore, to measure more than the diagonal distance between opposite corners on the largest side wall of the packing container. When the suction tube has been disengaged from this side wall and is used for emptying the contents of the packing container, the length of the suction tube, therefore, may be inconveniently short, especially in case of packing containers of a certain shape and size.

In order to overcome this problem and to make possible the application of suction tubes of greater length within the contours of the largest plane lateral surface of the packing container it has been suggested, among other things, that the suction tube should be manufactured to comprise a flexible bellows-type central portion, so that the suction tube, prior to being wrapped in the flexible protective envelope, may be doubled up and thus can be accommodated with good margin inside the lateral edges of the container wall. One problem with such suction tubes is, however, that they are relatively difficult to pack in doubled up condition, and that in practice it is almost impossible to pack them in a

flexible, weblike package which is required so as to permit, among other things, a rational handling of the suction tubes in connection with mechanical application to the packing containers. Furthermore, the known suction tubes packed in doubled up condition are quite difficult to release from their outer envelope in a simple manner when they are to be used and they are considered by the consumer, therefore, to be awkward to handle.

The said disadvantages are effectively overcome in accordance with the invention in that a package of the type described in the introduction is given the characteristics which are defined in claim 1.

Preferred embodiments of the suction tube package in accordance with the invention have been given, moreover, the characteristics defined in the subsidiary claims.

The invention will now be described and explained in greater detail with special reference to the attached schematic drawing wherein,

Figure 1 shows a conventional suction tube of the bellows-folded type,

Figure 2 shows the ringed area in Figure 1 somewhat enlarged and partly in section,

Figure 3 shows a part of a weblike suction tube package in accordance with the invention,

Figures 4-6 show sectional views of the suction tube package in Figure 3 along lines IV-IV, V-V and VI-VI respectively, and

Figure 7 finally shows how an individual suction tube package in accordance with the invention can be applied to a packing container of a known type.

In Figure 1 is shown accordingly an example of a conventional suction tube 1 of the type comprising two straight tube parts 1a and 1b joined to one another flexibly by means of a flexible tubular intermediate part 1c. The suction tube 1 is manufactured from flexible, but dimensionally relatively rigid plastic material by extrusion, the flexible intermediate part 1c being produced through heating and mechanical processing in a manner known to those versed in the art, so as to form the annular bellows-folded outer configuration which is shown in greater detail in Figure 2. One of the two straight tubes parts, 1a, of the suction tube 1 is somewhat longer and is intended to function as the insertion end when the suction tube is to be used for emptying the contents of a packing container. In order to facilitate the penetration of the tube part 1a through the container wall its free end 1a' appropriately is cut obliquely so as to form a sharp edge. The other or shorter suction tube part 1b has a straight cut free end 1b'. The dimensions of the suction tube 1 may vary, of course, depending on which type of packing container the suction tube is intended for, but it can be said in general that the

longer straight tube part 1a, inserted into the packing container, e.g. through a suction tube hole provided in the top wall of the container, ought to be sufficiently long, at least to reach as far as the bottom of the packing container. As an example functioning well in practice of a suction tube in a conventional parallel-epipedic packing container of the Tetra Brik (registered trademark) type of 250 ml volume a suction tube may be mentioned of a total straight length of 150 mm, whereof the longer straight tube part 1a takes up 106 mm and the shorter tube part 1b measures 35 mm, whilst the flexible intermediate part 1c, which in the example shown here comprises 9 annular bellows folds 1c' - (Figure 2) takes up approx. 9 mm. The suction tube 1 here is of a substantially circular geometric outer shape with a diameter of 4 mm (but one or more millimetres larger in the region of the bellows-folded portion 1c), the material thickness d, which preferably is uniform along the whole length of the suction tube, amounts to approx. 0.2 mm. The choice of material for the manufacture of the suction tube 1, as mentioned previously, falls on a flexible, dimensionally relatively stable plastic material, such as for example polypropylene, polystyrene or HDPE (high density polyethylene). The longer straight tube part 1a is cut off appropriately along a line which forms an angle of approximately 30° to the horizontal, since an insertion end so formed is sufficiently sharp in order to penetrate readily a weakened portion of the container wall whilst at the same time it is sufficiently rigid not to buckle or be deformed in any other way on insertion.

Figure 3 shows a part of a weblike package 2 in accordance with the invention for suction tubes 1 of the type as described above. As is evident from the Figure the package 2 comprises two flexible material webs 3 and 4 between which the suction tubes 1 are placed with equal spacing transversely to the longitudinal edges 5 and 5' of the webs. The material webs 3 and 4 which preferably consist of a sealable plastic material, such as polypropylene, are joined to each other (preferably through so-called heat sealing) to form narrow axial sealing joints 6 and 6' along the web edges 5 and 5' respectively and transverse sealing joints 7 in the regions between the individual suction tubes 1. The sealing between the material webs 3 and 4 is realized so that the said sealing joints 6, 6' and 7 in pairs jointly delimit closed spaces 8 wherein the suction pipes 1 are arranged. As is evident from Figure 3, the suction pipes 1 are oriented straight with their free ends 1a' and 1b' directed away from one another towards the respective web edges 5' and 5.

Individual packing units 10 clipped off or cut off from the weblike package 2 along dividing lines 9

in between the suction tubes 1 are intended to be fixed detachably to the outside of consumer packages 11 for beverages, e.g. juice, in the manner as shown in detail in Figure 7. The packing container 11 shown in this example is assumed to be a conventional parallelepipedic container of the Tetra Brik (registered trade-mark) type comprising plane rectangular side walls (whereof only one of the two larger side walls 12 of the container 11 is shown in Figure 7). On application, which is performed mechanically with the help of a so-called suction tube applicator, the packing container 11 or the unfolded packing unit 10 is oriented so that the longer straight suction tube part 1a of the suction tube 1 will be located wholly within the boundary lines 13 and 14 of the container wall 12, with the free end 1a' of the suction tube part pointing towards a lower container corner 15 and with the bellows-folded intermediate portion 1c of the suction tube 1 located in the region of the diagonally opposite upper package corner 16. The shorter straight tube part 1b of the suction tube is then folded down to parallel alignment with the top boundary line 13 of the package wall 12. The package unit 10, which accordingly is in the shape of a reversed figure seven, is then attached to the package wall 12 with the help of spots of glue (at 17), e.g. so-called hot-melt, applied to the wall 12.

In order to make the said folding down of the shorter straight tube part 1b of the suction tube 1 altogether possible without "bursting" the package unit 10 at the bent intermediate portion 1c, the space 8 is provided with a space portion 8a (fig.5) of a somewhat larger cross-sectional area in the region of the bellows-folded intermediate part 1c of the suction tube 1. Owing to this "enlarged" free space 8a, the necessary relative displacement between the suction tube 1 and the surrounding envelope, which inevitably occurs when the shorter straight tube part 1b is bent, is made possible, or is made easier. As is evident from Figure 3 this space 8a also comprises neighbouring portions of the two straight tube parts 1a and 1b of the suction tube 1. The said folding is facilitated further in accordance with the invention in that the space portion 8b of the space 8 located in the region of the shorter straight suction tube part extends axially beyond this suction tube part so as to form a free expansion space between the free end 1b' of the tube part and the neighbouring axial sealing joint 6 adjacent to the web edge 5. The space portion 8b is provided with a cross-sectional area which is slightly larger than the outer diameter of the suction tube part 1b, but smaller than the cross-sectional area of the aforementioned space portion 8a in the region of the bellows-folded intermediate part 1c of the suction tube 1. To achieve a reasonably good fixing in position of the longer

straight tube part 1a of the packed suction tube 1, the transverse sealing joints 7 are preferably realized so that the corresponding space portion 8c has a cross-sectional area which substantially corresponds to the geometrical outer configuration of the longer straight suction tube part 1a and, moreover, extends axially beyond this suction tube part so as to form a corresponding axially free expansion space between the free end 1a' of the suction tube part 1a and the neighbouring axial sealing joint 6 adjoining the web edge 5.

Claims

1. A flexible, weblike package containing suction tubes (1) of the type comprising two straight tube parts (1a and 1b) joined to one another flexibly by means of a bellows-folded, tubular intermediate part (1c), the package comprising two flexible material webs (3 and 4) which are joined to one another along repeated longitudinal and transversal sealing joints (6 and 7 respectively) which in pairs jointly form closed spaces (8) wherein, in each of said closed spaces, a suction tube (1) is arranged, **characterized in that** the suction tubes (1) are oriented straight with the free ends (1a and 1b') of both their straight tube parts (1a and 1b) directed away from one another towards the neighbouring longitudinal edges (5 and 5') of the material webs, and that each of the closed spaces (8) is provided with portions (8a, 8b and 8c) of mutually differing cross-sectional areas, the space portion (8a) in the region of the bellows-folded intermediate part (1c) having the largest cross-sectional area and comprising also the nearest parts of the two straight suction tube parts (1a and 1b) on either side of the bellows-folded intermediate part (1c).
2. A package in accordance with claim 1, **characterized in that** the space portion (8b) in the region of the one, preferably shorter straight suction tube part (1b) has a cross-sectional area which is slightly greater than the geometrical outer configuration of the suction tube part (1b), but smaller than the cross-sectional area of the space portion (8a) in the region of the bellows-folded intermediate part (c).
3. A package in accordance with claim 2, **characterized in that** the space portion (8b) for the said shorter straight suction tube part (1b) extends axially a bit beyond the free end (1b') of the suction tube part (1b) so as to form a free expansion space between the free end (1b') and the web edge (5).

4. A package in accordance with anyone of the preceding claims, **characterized in that** the space portion (8c) in the region of the preferably longer straight suction tube part (1a) has a cross-sectional area which is smaller than the cross-sectional areas of the said two other space portions (8a and 8b) and which closely corresponds to the geometrical outer configuration of the straight suction tube (1a).
5. A package in accordance with claim 4, **characterized in that** the space portion (8c) for the said longer straight suction tube part (1a) extends axially beyond the free end (1a') of the suction tube part (1a) so as to form a free expansion space between the free end (1a') and the web edge (5).

Revendications

1. Emballage flexible en forme de bande contenant des tubes d'aspiration (1) du type qui comprend deux parties tubulaires rectilignes (1a et 1b) reliées l'une à l'autre de façon flexible par une partie tubulaire intermédiaire à plis en soufflet (1c), l'emballage comprenant deux bandes de matière flexible (3 et 4) qui sont reliées l'une à l'autre le long de soudures longitudinales et transversales répétées (6 et 7 respectivement) qui définissent conjointement en paires des espaces fermés (8), un tube d'aspiration (1) étant placé dans chacun desdits espaces fermés, caractérisé en ce que les tubes d'aspiration (1) sont orientés en ligne droite, les extrémités libres (1a' et 1b') de leurs deux parties tubulaires rectilignes (1a et 1b) étant dirigées à l'opposé l'une de l'autre et vers les bords longitudinaux voisins (5 et 5') des bandes de matière, et en ce que chacun des espaces fermés (8) comprend des portions (8a, 8b et 8c) de sections transversales mutuellement différentes, la portion d'espace (8a) dans la région de la partie intermédiaire à soufflet (1c) ayant la plus grande section transversale et contenant également les parties les plus proches des deux parties rectilignes (1a et 1b) du tube d'aspiration de part et d'autre de la partie intermédiaire à soufflet (1c).
2. Emballage suivant la revendication 1, caractérisé en ce que la portion d'espace (8b) dans la région d'une partie tubulaire rectiligne, de préférence la plus courte (1b), a une section transversale qui est légèrement plus grande que la configuration géométrique extérieure de la partie (1b) du tube d'aspiration, mais plus petite que la section transversale de la portion d'espace (8a) dans la région de la partie intermédiaire à soufflet (1c).



straight tube part 1a of the packed suction tube 1, the transverse sealing joints 7 are preferably realized so that the corresponding space portion 8c has a cross-sectional area which substantially corresponds to the geometrical outer configuration of the longer straight suction tube part 1a and, moreover, extends axially beyond this suction tube part so as to form a corresponding axially free expansion space between the free end 1a' of the suction tube part 1a and the neighbouring axial sealing joint 6' adjoining the web edge 5'.

Claims

1. A flexible, weblike package containing suction tubes (1) of the type comprising two straight tube parts (1a and 1b) joined to one another flexibly by means of a bellows-folded, tubular intermediate part (1c), the package comprising two flexible material webs (3 and 4) which are joined to one another along repeated longitudinal and transversal sealing joints (6 and 7 respectively) which in pairs jointly form closed spaces (8) wherein, in each of said closed spaces, a suction tube (1) is arranged, **characterized in that** the suction tubes (1) are oriented straight with the free ends (1a and 1b') of both their straight tube parts (1a and 1b) directed away from one another towards the neighbouring longitudinal edges (5 and 5') of the material webs, and that each of the closed spaces (8) is provided with portions (8a, 8b and 8c) of mutually differing cross-sectional areas, the space portion (8a) in the region of the bellows-folded intermediate part (1c) having the largest cross-sectional area and comprising also the nearest parts of the two straight suction tube parts (1a and 1b) on either side of the bellows-folded intermediate part (1c).
2. A package in accordance with claim 1, **characterized in that** the space portion (8b) in the region of the one, preferably shorter straight suction tube part (1b) has a cross-sectional area which is slightly greater than the geometrical outer configuration of the suction tube part (1b), but smaller than the cross-sectional area of the space portion (8a) in the region of the bellows-folded intermediate part (c).
3. A package in accordance with claim 2, **characterized in that** the space portion (8b) for the said shorter straight suction tube part (1b) extends axially a bit beyond the free end (1b') of the suction tube part (1b) so as to form a free expansion space between the free end (1b') and the web edge (5).

4. A package in accordance with anyone of the preceding claims, **characterized in that** the space portion (8c) in the region of the preferably longer straight suction tube part (1a) has a cross-sectional area which is smaller than the cross-sectional areas of the said two other space portions (8a and 8b) and which closely corresponds to the geometrical outer configuration of the straight suction tube (1a).

5. A package in accordance with claim 4, **characterized in that** the space portion (8c) for the said longer straight suction tube part (1a) extends axially beyond the free end (1a') of the suction tube part (1a) so as to form a free expansion space between the free end (1a') and the web edge (5).

Revendications

1. Emballage flexible en forme de bande contenant des tubes d'aspiration (1) du type qui comprend deux parties tubulaires rectilignes (1a et 1b) reliées l'une à l'autre de façon flexible par une partie tubulaire intermédiaire à plis en soufflet (1c), l'emballage comprenant deux bandes de matière flexible (3 et 4) qui sont reliées l'une à l'autre le long de soudures longitudinales et transversales répétées (6 et 7 respectivement) qui définissent conjointement en paires des espaces fermés (8), un tube d'aspiration (1) étant placé dans chacun desdits espaces fermés, caractérisé en ce que les tubes d'aspiration (1) sont orientés en ligne droite, les extrémités libres (1a' et 1b') de leurs deux parties tubulaires rectilignes (1a et 1b) étant dirigées à l'opposé l'une de l'autre et vers les bords longitudinaux voisins (5 et 5') des bandes de matière, et en ce que chacun des espaces fermés (8) comprend des portions (8a, 8b et 8c) de sections transversales mutuellement différentes, la portion d'espace (8a) dans la région de la partie intermédiaire à soufflet (1c) ayant la plus grande section transversale et contenant également les parties les plus proches des deux parties rectilignes (1a et 1b) du tube d'aspiration de part et d'autre de la partie intermédiaire à soufflet (1c).
2. Emballage suivant la revendication 1, caractérisé en ce que la portion d'espace (8b) dans la région d'une partie tubulaire rectiligne, de préférence la plus courte (1b), a une section transversale qui est légèrement plus grande que la configuration géométrique extérieure de la partie (1b) du tube d'aspiration, mais plus petite que la section transversale de la portion d'espace (8a) dans la région de la partie intermédiaire à soufflet (1c).



diaire à soufflet (1c).

3. Emballage suivant la revendication 2, caractérisé en ce que la portion d'espace (8b) pour ladite partie rectiligne plus courte (1b) du tube d'aspiration s'étend axialement un peu au-delà de l'extrémité libre (1b') de la partie de tube d'aspiration (1b) de façon à former un espace d'expansion libre entre l'extrémité libre (1b') et le bord (5) de la bande. 5
4. Emballage suivant l'une quelconque des revendications précédentes, caractérisé en ce que la portion d'espace (8c) dans la région de la partie rectiligne, de préférence plus longue (1a) du tube d'aspiration, a une section transversale qui est plus petite que les sections transversales desdites deux autres portions d'espace (8a et 8b) et qui correspond étroitement à la configuration géométrique extérieure de la partie rectiligne (1a) du tube d'aspiration. 10
5. Emballage suivant la revendication 4, caractérisé en ce que la portion d'espace (8c) pour la dite partie rectiligne plus longue (1a) du tube d'aspiration s'étend axialement au-delà de l'extrémité libre (1a') de la partie (1a) du tube d'aspiration, de façon à former un espace d'expansion libre entre l'extrémité libre (1a') et le bord (5') de la bande. 15

Patentansprüche

1. Flexible bahnartige Verpackung, die Saugröhrchen (1) des Typs mit zwei geraden Röhrchenteilen (1a und 1b), die über einen faltenbalgartigen rohrförmigen Zwischenteil (1c) flexibel miteinander verbunden sind, enthält, wobei die Verpackung zwei biegsame Materialbahnen (3 und 4) aufweist, die miteinander entlang sich wiederholenden Längs- und Querschweißverbindungen (6 bzw. 7) verbunden sind, die paarweise gemeinsam geschlossene Räume (8) bilden, wobei in jedem dieser geschlossenen Räume ein Saugröhrchen (1) angeordnet ist, 20
dadurch gekennzeichnet,
daß die Saugröhrchen (1) gerade ausgerichtet und die freien Enden (1a' und 1b') ihrer beiden geraden Röhrchenteile (1a und 1b) voneinander weg zu den benachbarten Längsrändern (5 und 5') der Materialbahnen gerichtet sind, und daß jeder geschlossene Raum (8) mit Abschnitten (8a, 8b und 8c) jeweils verschiedener Querschnittsfläche versehen ist, wobei der Raumabschnitt (8a) im Bereich des faltenbalgartigen Zwischenteils (1c) die größte Querschnittsfläche hat und außerdem die nächstlie-

genden Abschnitte der beiden geraden Saugröhrchenteile (1a und 1b) auf beiden Seiten des faltenbalgartigen Zwischenteils (1c) umfaßt.

2. Verpackung nach Anspruch 1,
dadurch gekennzeichnet,
daß der Raumabschnitt (8b) im Bereich des einen, bevorzugt kürzeren geraden Saugröhrchenteils (1b) eine Querschnittsfläche hat, die geringfügig größer als die geometrische Außenkonfiguration des Saugröhrchenteils (1b), aber kleiner als die Querschnittsfläche des Raumabschnitts (8a) im Bereich des faltenbalgartigen Zwischenteils (1c) ist.
3. Verpackung nach Anspruch 2,
dadurch gekennzeichnet,
daß der Raumabschnitt (8b) für den kürzeren geraden Röhrchenteil (1b) in Axialrichtung etwas über das freie Ende (1b') des Saugröhrchenteils (1b) hinausverläuft unter Bildung eines freien Ausdehnungsraums zwischen dem freien Ende (1b') und der Bahnkante (5).
4. Verpackung nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet,
daß der Raumabschnitt (8c) im Bereich des bevorzugt längeren geraden Saugröhrchenteils (1a) eine Querschnittsfläche hat, die kleiner als die Querschnittsflächen der beiden anderen Raumabschnitte (8a und 8b) ist und der geometrischen Außenkonfiguration des geraden Saugröhrchenteils (1a) weitgehend entspricht.
5. Verpackung nach Anspruch 4,
dadurch gekennzeichnet,
daß der Raumabschnitt (8c) für den längeren geraden Saugröhrchenteil (1a) in Axialrichtung über das freie Ende (1a') des Saugröhrchenteils (1a) hinausverläuft unter Bildung eines freien Ausdehnungsraums zwischen dem freien Ende (1a') und der Bahnkante (5').