

The invention relates to a pack for liquids comprising side walls which are connected together in a tubular configuration by way of at least one longitudinal sealing seam, and end walls which are disposed at the ends of the tube and which form a cover of round cross-section and a square bottom, wherein the side walls are formed from card which is coated with plastics material at least on one side while the cover comprises thermoplastic material without a backing material and is mounted along its outside edge to the side walls and wherein shape-transition fold lines are provided in the tube, starting from the four corners of the bottom and being arranged to extend from the bottom over one-third to two-thirds of the height of the tube in the direction of the cover.

For the transportation of flowing substances, in particular liquids such as milk and fruit juices, parallelepipedal packs currently exist which consist of a tube which has a backing material coated with plastics material on both sides, the ends of which backing material is sealed in the region of the end walls by means of transverse sealing ribs, and is brought into a parallelepipedal shape so that on each end wall there are two mutually oppositely disposed double-walled triangular flaps which protrude outwards from the end walls of the pack and are finally folded around adjacent side walls or the end walls of the pack.

A pack for liquids of the kind described in more detail in the introduction is already known from the European document EP-A-052 261. The pack described therein has shape transition fold lines in order to provide a good transition from the square bottom to the round cover. The shape transition fold lines are also favourable because during manufacture by means of a press die they lend a round cross-section to the material. This means that the material can be spread out transversely with respect to this kind of rounded moulded form (in a straight line), wherein the material acts like a spring. The shape transition fold lines are also responsible for letting the material accumulate around these lines, whereby the material retracts in the direction which is transverse with respect to these fold lines without the material becoming damaged. However, the known kind of pack cannot be

held very easily by the user because after the pack has been opened the thumb of the hand of the user who is holding the pack to pour out the contents thereof may very easily cause the side walls of the pack to become indented, with the unfortunate consequence that the contents e.g. the milk or fruit juice are caused to flow out too early. In addition, it is not possible to ensure that the liquid flows out in a precise direction if the pack should give way under the pressure of the user's grip.

An ice-cream container is known as well from Patent Specification GB-A-1 243 812 which has a square bottom and a round opening at the top which is formed from a cut-out section having two wall areas which are connected to one another along a fold line. These fold lines also extend over the entire height of the ice-cream container from the bottom thereof to the upper edge, but the fold line would be abandoned by the person skilled in the art of the manufacture thereof if another kind of cut-out section were used for the manufacture of the container. This other kind of cut-out section may be a piece where there is no symmetrical division into two wall areas, as described here. On the side which is oppositely disposed to this pivotable edge, the known pack has an adhesive strip which corresponds to the longitudinal sealing seam intended by the present invention. Furthermore, the known packing mentioned latterly does not have a bottom which is formed by triangular flaps and it is therefore particularly reliable to manufacture and is liquid-tight.

The aim of the present invention is therefore to create by simple means and without additional expenditure on material, a pack which may be better held by the user and which is more sturdy and stable.

The problem is solved according to the invention such that provided in oppositely disposed areas in the tube are long fold lines which extend over the entire height of the tube and parallel to the central axis thereof and which extend through the tips of two mutually oppositely disposed triangular flaps which are formed when the bottom is folded on a transverse sealing seam.

The long fold lines facilitate the formation of the tube because if the measures of the invention are implemented the core of the container does not necessarily have to have a round cross-section, but may also be oval or at least very flat at the edges, so that advantages are gained with respect to the manufacture thereof, but the shape of the tube which is sealed all around (by means of the transverse sealing seam) is obtainable because the long fold lines come to lie in the areas where the core of the container is curved to a greater extent, and they allow the fold to work efficiently.

It is expedient here if both the long fold lines are arranged so that they are diametrically oppositely disposed with respect to one another, and are preferably always between two shape transition fold lines. The symmetrical arrangement facilitates manufacture and it is even possible for an almost flat piece of metal to be used as the core when the tube is being shaped. Owing to the proportionate distancing of the fold lines, the material is distributed in a uniform manner, or it is possible to alter the configuration in a uniform manner.

Apart from the advantageously favourable manufacture of the pack for liquids according to the invention where there is a cut-out section having oppositely disposed triangular flaps, the elasticity which exists outwardly from the long fold lines on both sides has an effect over the entire surface area of the material as far as the tips of the triangular flaps.

In another advantageous embodiment of the invention the longitudinal sealing seam is arranged between two shape transition fold lines and at a distance from the long fold lines. The longitudinal sealing seam may, for example, be arranged somewhere in the middle between the pair of shape transition fold lines in such a way that the pair of long fold lines is arranged at a distance still further towards the outside.

Other advantages, features and possible applications of the present invention can be seen from the following description of a preferred embodiment in conjunction with the drawings.

Fig. 1 shows a view in perspective of the sealed pack ready for use with the round cover at the top,

Fig. 2 also shows the same pack in perspective, but with the bottom upwards wherein the cover which is arranged at the bottom in this instance and which is not visible is flattened in such a way that none of the parts of the opening arrangement project above the lower edge of the cover over the whole contour of the pack,

Fig. 3 shows the top view of a cut-out section,

Fig. 4 shows an embodiment of the bottom as in Fig. 2, but before the triangular flaps have been collapsed inwards, and

Fig. 5 shows a similar view to that in Fig. 2, wherein however the longitudinal sealing seam is in front as in Fig. 4 and the triangular flaps are not collapsed inwardly as in Fig. 2, but are collapsed outwardly onto the side walls, and are stuck there.

The pack for flowable contents shown in Figs. 1 and 2 which is ready for use consists as a whole of side walls numbered 1, wherein a distinction is made in Fig. 3 to the right and in Figs. 4 and 5 in the front between the area 1b and the side area 1a. In the region of the cover 2 the pack is round in cross-section because the top view of the cover 2 is also round. On the side of the end wall forming the bottom 3 it is not possible to distinguish between the four side walls because the cross-section there is round. The side walls 1 are shaped in a tube-like configuration and are connected along the longitudinal sealing seam 4 to give the final shape of the sealed tube. From Figs. 2, 4 and 5, it is possible to see that the longitudinal sealing seam 4 extends as far as the bottom 3. This is also what happens with the cut-out section shown in Fig. 3.

When the tube is in the configuration shown in Fig. 2 the height thereof is H which, in consideration of the way in which the bottom 3 is finished is

clearly less than the total height of the cut-out section of Fig. 3, when measured from bottom to top. The height H of the tube is measured from the upper edge 6 of the cover 2 to the folding edge 7 i.e. to the plane of the ready folded bottom block 3. Thus the height between the lines 5 and 7, as shown in Fig. 3, disappears.

The lower edge of the ready pack results from this line 7 which can be seen in Figures 2 and 3. By means of the different fold lines or embossed lines which are not described in any further detail, the double card strip 8 (Figs. 3 to 5) is formed on the block bottom configurations known "per se", in which is located a transverse sealing seam 9 which is to be found in Fig. 2 but which is barely visible, and which is indicated by a slashed short line in Figs. 3 to 5. Thereby, the triangular flaps 10 are also formed. After compressing the double strip of card 8 and applying the transverse sealing seam 9, the end wall at the bottom (the bottom 3) is brought into the position shown in Fig. 4, after which the triangular flaps 10 are placed down with the outer tips 21 onto the bottom 3 (as in Fig. 2) or onto the side walls (as shown in Fig. 5), and are stuck there by means of punctiform heating, for example.

After the pack has been filled it is sealed on the side of the bottom 3. The cover 2 is already sealed so that it is liquid tight before the pack is filled. The cover may either be pre-fabricated, taken from storage and sealed to the round tube, or extruded directly onto the round end of the tube. Contrary to the square bottom 3 the cover 2 is made of a thermoplastics material only and has no backing material. The cover is extruded into the configuration of the used form wherein the opening arrangement is collapsed outwardly as shown in Fig. 1. This facilitates the opening process during use.

The pouring arrangement is generally designated as 13 and after the extrusion or sealing processes, and before the pack is turned around so that it is in the state shown in Fig. 2, it is collapsed in such a way that no single parts of the pouring arrangement 13 project above the outer edge 6. Therefore this ensures efficient stability and that it is wrapped well (by means of shrink foil, or the like).

The pouring arrangement 13 is in the middle of the cover 2 and is in the form of a circular collar 14 projecting outwardly or upwardly according to Fig. 1, of which circular collar the upper edge 15 is connected to a sealing stopper 16 by means of a welded grip screw 17. The upper edge 6 of the cover 2 is practically only a ring, which is sealed or extruded on the upper side of the tube on the side which is oppositely disposed to the lower edge 5 in Fig. 3. A connection point 23 (Fig. 1) to the gripping ring 17 is situated next to a weakening line not shown in greater detail.

In the pack shown in the drawings, lines known as long fold lines 18 are arranged so that they are diametrically oppositely disposed with respect to one another in the tube 1, which fold lines 18 extend over the entire height H of the tube and parallel to the central axis thereof. In the drawings the central axis is not shown, but all the lines which run from the bottom to the cover of the pack, are parallel with respect to the central axis, and in the embodiment shown the longitudinal sealing seam 4 in particular also lies in the region of the height H. The long fold lines 18 also lie between two shape transition fold lines 20, as can be seen at the left tip 21 in Fig. 3 and in the same way at the right tip 21. These shape transition fold lines 20 extend from the four corners 19 of the bottom 3 and extend across approximately half of the height H of the tube, see Fig. 3. It can also be seen that the two long fold lines 18 extend through the tips 21 of the triangular flaps 10.

When viewed in another way the longitudinal sealing seam 4 - if Figs. 4 and 5 are considered for example - lies between the two adjacent shape transition fold lines 20, of which in Figs. 4 and 5 only the front right line indicated as the "short" line is shown, and at an equal distance from the long fold lines 18, of which only the front right line is shown in Figs. 4 and 5. The right edge 4' in Fig. 3 runs along the longitudinal sealing seam 4, so that the relative position assumed of the short shape transition lines 20 with respect to the long fold line 18 or to the longitudinal sealing seam 4 cannot be seen.

The long fold lines 18 alone and together with the shape transition fold lines 20 have the considerable advantage that they form a gripping

reinforcement for the user. If the direction of flow of the contents being poured out after the opening arrangement has been opened is considered, then the fold lines, in particular the long fold lines 18, lie in the area above where the user grips the container such that they are vertical to the direction of flow of the contents being poured out. Thereby, the new pack can be held in a considerably better way, and the user feels a greater security, and therefore keeps better hold of the new pack.

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CLAIMS

1. A pack for liquids comprising side walls (1, 1a, 1b) which are connected together in a tubular configuration by way of at least one longitudinal sealing seam (4), and end walls which are disposed at the ends of the tube (1) and which form a cover (2) of round cross-section and a square bottom (3), wherein the side walls (1) are formed from card which is coated with plastics material at least on one side while the cover (2) comprises thermoplastic material without a backing material and is mounted along its outside edge (6) to the side walls (1) and wherein shape-transition fold lines (20) are provided in the tube, starting from the four corners (19) of the bottom (3) and being arranged to extend from the bottom (3) over one-third to two-thirds of the height of the tube in the direction of the cover (2) characterised in that provided in oppositely disposed regions in the tube are long folding lines (18) which extend over the entire height (H) of the tube and parallel to the central axis thereof and which extend through the tips (21) of two mutually oppositely disposed triangular flaps (10) which are formed by folding of the bottom (3) with a transverse sealing seam (9).

2. A pack according to claim 1 characterised in that the longitudinal sealing seam (4) is arranged between two shape-transition fold lines (20) and at a spacing from the long folding lines (18).