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The invention relates to a packaging means for fluent contents, according to the earlier EP-A-052 261.

That type of packaging means which at the present time is most widely used for transporting fluids, in particular milk and fruit juices, is a parallelepiped packaging means comprising a tube member formed by a carrier material which is coated on both sides with plastics and which is closed at its ends in the region of its end walls by transverse closure ribs, being made into a parallelepiped form, so that there are two oppositely disposed, double-thickness triangular flaps at each end wall. The triangular flaps initially project outwardly from the end walls of the packaging means and are finally folded over against adjacent side wall portions or the end walls of the packaging means.

Suggestions are repeatedly made in an effort to improve pouring openings, more particularly in the carrier material of paper, cardboard or the like, which is coated on both sides with the thermoplastic material, with perforation lines or other weakening lines, in regard to packaging means with covers only comprising plastics material without a carrier material, with fold-type closure arrangements, stoppers or plugs which can be torn off, or the like.

The manufacturers of packaging means for fluent materials and of the type mentioned at the outset strive for optimum savings on synthetic plastics material and seek to have simple manufacturing and filling machines, satisfactory sealing tightness and ease of opening of the packaging means. In the case of the invention, design and use are directed at producing the packaging means for fluent materials, perfect sealing tightness and satisfactory opening and set out to provide, disposed in the cover, a pouring means which, like the cover wall portion, consists entirely of thermoplastics material without any carrier material.

It is known to shape the most widely diverse types of pourer means and in the case of packaging means for fluent material, according to the earlier EP-A-052 261, it has also already been suggested that the cover be injection moulded together with the pourer device in such a shape as the user or consumer subsequently uses the packaging means for pouring. During the injection moulding process and also until the next stage in manufacture, therefore, the cover is in the form in which it will subsequently be used, i.e. the form in which the end user opens the packaging means, shakes out the contents and may possibly close the packaging means again. In this connection, it is advantageous that the thermoplastics material, by virtue of its inherent tendency, seeks to return to its original form in which it was injection moulded during manufacture, if it was previously deformed. In that case, a housewife can for instance move the cover from the position of transportation in which the pouring means was folded inwardly of the outer contours of the packaging means, back into the configuration in which it was injection moulded during the course of manufacture, by pulling and pushing, the force required necessitating a certain amount of expenditure which one would very much like to reduce.

In comparison with the packaging means according to the aforesaid prior EP-A-0 052 261, the object of the invention is to provide a still further improved packaging means with a particularly expedient pouring means which permits of even easier opening and folding of the cover, prevents spilling or forcing of liquid out of the packaging means after this has been opened and which is suitable for further practical applications such as for example aseptic filling and aseptic closure for liquid baby foods.

According to the invention, this problem is resolved in that the frustoconical annular surface preferably on the inside of the packaging means has at least one circular weakening groove. By virtue of the adhesion of possibly

unintentionally emerging fluid in the grooves, it is preferable for the said weakening grooves to be provided on the side of the cover which subsequently faces the interior of the packaging means. The aim and purpose of the weakening groove is to weaken the cover wall portion at the appropriate location: e.g. in the vicinity of the outer edge and in the vicinity of the inwardly disposed flange portion of cylindrical configuration, so that after injection moulding, folding of the cover with its pouring means into the position for transportation and later folding of it the opposite way when the end user folds it into the position of use and simultaneously into the shape in which it was moulded is facilitated. Therefore, even the provision of two concentric weakening grooves on the inside and outside is expedient.

While favourably using particularly simple manufacturing tools, the configuration of the cover according to the invention also permits of satisfactory opening in that the cover which is folded out of the transportation position into the position of use has the effect of enlarging the volume of the packaging means so that when the closure means is opened, the fluid is prevented from splashing out in the first moment.

In a further development of the invention, there is on the outer periphery of the frustoconical annular surface, inwardly offset from the outer edge, a further cylindrical flange member. This accommodates the adjacent free end of the tube, for which latter it represents not only a satisfactory attachment surface but also a stiffening, so that the packaging means according to the invention consequently acquires particularly good stability. Also manufacture is facilitated because geometrically clearly defined and not too small surfaces are available for the connection between the plastics coated cardboard tube on the one hand and the cover which is made solely from thermoplastics material, on the other.

According to the invention, it is also favourable if the edge of the tube which is towards the cover is completely masked by the outwardly projecting edge of the cover. Particularly when packing fluids, the manufacturer seeks to ensure that cut edges which are no longer covered with synthetic plastics material by reason of having been cut, are masked by folds or other overlapping walls so that the fluid cannot penetrate and soften the carrier material. If, then, shifting the cylindrically shaped flange or shoulder member to the periphery of the cover is used in order to construct a step as is envisaged according to the invention, then the size of the step can be so constructed that the end of the tube fits into it flush. In this way, the free edge of the tube which is unprotected prior to the tube being connected to the cover can on the cover side be masked by sealing.

According to the invention, it is further advantageous if the rim of the spout portion has an outwardly raised dome with a closure member which seals off the central aperture, the closure member preferably having a weakened continuation of the dome wall with an adjacent handle. A packaging means provided with such a pouring means can be constructed as a baby's drinking bottle because the shape of the dome can be satisfactorily adapted to the shape of a sucking teat or dummy. At the uppermost part of the dome which is therefore at the greatest distance from the bottom of the packaging means when the cover is folded out into the position of use, there is in the case of the last mentioned embodiment a weakened point which is connected to the adjacent dome wall and to an integrally moulded handle. This handle which is in the form of a ring, arm, plate or the like permits easy gripping and lifting of the arrangement, as a result of which the pouring hole is formed at the weakened location. This hole can be as fine as that which is provided in a dummy or teat, so that the packaging means can be used as a drinking bottle for babies.

The configuration of the packaging means with the cover according to the invention is very expedient if the bottom of the packaging means has the shape of the per se known block bottom with a transverse sealing seam and triangular flaps. It is known that such an end wall arrangement may be converted from its quadrangular configuration to the form of the end of a tube by lifting up the triangular flaps which are attached to the adjacent side wall, after which the end of the packaging means is then compressed.

If the packaging means with the cover according to the invention has such a bottom arrangement, then the baby can empty the contents by sucking even if no air is introduced into the packaging means from the outside in order to compensate for the liquid which has been emptied out. For practical purposes, compensation is achieved by compressing the packaging means in the same way as toothpaste is removed from a tube by the end of the tube being compressed. To this extent, the packaging means with the cover according to the invention is superior to a glass drinking bottle for babies.

Such a packaging means opens up new areas of use if one thinks for instance of the provision of liquid baby foods in general and especially in Third World countries.

Furthermore, it is particularly advantageous if, according to the invention, the annular surface with the dome is folded inwardly of the outer contours of the packaging means, a cover plate being fixed flat on the outer edge of the cover, possibly in an aseptically sealing fashion. Not only materials to aid and relieve areas in a state of emergency but generally baby food in liquid form can be supplied in an aseptic condition by means of such a pouring arrangement, e.g. the sterilising of the cover wall portion can be carried out impeccably by suitable means, e.g. electron beam irradiation, also in the course of mass production, and the sterile state can be satisfactorily

maintained by the cover plate or sheet portion even over a lengthy period of time. Tearing off a cover sheet is very easy and permits of extremely hygienic nourishment of small children.

Further advantages, features and possible applications of the present invention will emerge from the ensuing description of preferred examples of embodiment, in conjunction with the accompanying drawings in which:

Fig. 1 shows a perspective view of the closed and ready-for-use packaging means in a first preferred embodiment of the invention,

Fig. 2 shows a broken-away sectional view of the end wall at the cover end of the embodiment shown in Fig. 1, in its transportation form, no portions of the arrangement projecting beyond the outer contours of the packaging means,

Fig. 3 shows the same embodiment as Fig. 2 but with the cover of the broken-away end of the tube disposed separately and being shown in the condition in which it will be used by the final consumer, where the pouring opening projects upwardly,

Fig. 4 shows the bottom of the packaging means in Fig. 1 in a perspective view prior to completion of the transverse sealing seam but after folding of the block bottom configuration,

Fig. 5 is a sectional view of an assembled packaging means with a cover according to a second embodiment of the invention in which once again there are no portions which project beyond the overall contours of the packaging means,

Fig. 6 is a view similar to that in Fig. 3 but showing the other second embodiment of pouring opening shown in Fig. 5,

Fig. 7 is a perspective view of a third preferred embodiment of the packaging means according to the invention in a closed condition in which it is ready for use and with a handle,

Fig. 8 is a sectional view of the packaging means according to Fig. 7 with the pouring spout or mouthpiece in the same closed condition but projecting upwardly beyond the outer contours of the packaging means, as in Fig. 7,

Fig. 9 is a sectional view of an assembled packaging means with a cover according to a fourth embodiment of the invention with an outwardly upstanding dome as a compensating means,

Fig. 10 shows the same kind of view and embodiment as in Fig. 9, the cover however being folded inwardly into the transport position and with a cover sheet or plate member in position on the packaging means and

Fig. 11 shows a plan view of the cover in Fig. 9 with an annular gripping portion fitted thereto.

The finished packaging means shown in Fig. 1 and intended for fluent contents, here for example preferably milk, consists of side walls designated 1 because in this special embodiment which is also found in the other drawings, a round cross-section is envisaged in the region of the cover 2. By virtue of the fact that the tubular side walls 1 have in the region of the cover 2 a circular cross-section, it is possible to make a distinction between the four sides at the end wall which forms the bottom 3 of the packaging means.

The side walls 1 are formed into a tubular member and are joined along the longitudinal sealing seam 4 which for the sake of simplicity is no longer shown in Figs. 7 to 10, in order definitively to form the closed tube. Fig. 4 shows that the longitudinal sealing seam 4 extends into the

bottom 3. While the end of the tube (at the edge) is designated 5, the drawing shows the outer edge 6 of the cover on the opposite side which so to speak forms the top edge of the upper surface of the overall contour in the transport configuration of the cover (Figs. 2 and 5).

The top edge or surface of the finished packaging means arises on the side of the bottom 3 from the line in Fig. 4 which is designated 7 in which can also be seen the double-layer cardboard strip 8 when the bottom is of a block bottom configuration. Fig. 4 also shows the triangular flaps 10 which, in the position shown in Fig. 4, initially still project out on both sides of the bottom 3, in the same plane, and which are subsequently folded over onto any adjacent side surface where they are secured in position as if by adhesive.

Before the operation of forming the block bottom, the cover 2 is injection moulded in liquid tight fashion onto the edge 12 (Figs. 3 and 6) at the cover end of the tubular member or side walls 1. In contrast to the quadrangular bottom 3, in the novel packaging means, the cover 2 which is preferably but not necessarily of round configuration, is only of thermoplastics material without a carrier material being used. In the manner shown particularly clearly in Figs. 2 and 5, the cover 2 is placed on the edge 12 of the tubular member 1, on the cover side, where it is sealed into position. During this sealing or injecting operation, when the cover is therefore injection moulded onto this edge 12 to mask the cut edge 12 of the tubular member 1, the cover 2 is in its position of use, as shown in Figs. 3, 6 and 7 to 9.

In contrast, Figs. 2, 5 and 10 show the transportation configuration in which the pouring means, generally designated 13, is so folded inwardly of the outer contours of the packaging means that no individual parts of the pouring means 13 project beyond the outer edge 6 of the

cover 2. Thus, a perfect stability and ready repackaging (by means of shrink-on films or the like) can be guaranteed.

In the case of the first embodiment shown in Figs. 1 to 4, the pouring means 13 is disposed centrally on the cover 2 in the form of an outwardly and upwardly projecting spout or mouthpiece edge 14 which is of slightly frustoconical configuration and which therefore, as broadly viewed, can also be approximately cylindrical in shape. The upper edge 15 forms the closure means while in the embodiment shown in Figs. 5 and 6, the upper edge 15 is connected to a closure plug member 16. All embodiments have a gripping ring 17 welded thereto.

The precise shape after injection moulding of the cover 2 on the first embodiment according to Figs. 1 to 3 can be seen particularly clearly in Fig. 3. The outer edge 6 of the cover 2 is for practical purposes only a narrow ring, while displaced inwardly from the outer edge 30 thereof there is a further flange portion 18 of cylindrical configuration, so to speak a support member, such that the edge 12 of the tubular member 1, at the cover end thereof, is completely covered by the outwardly projecting outer edge 30 of the cover 2.

In the case of the embodiments according to Figs. 5 and 6, the foregoing remarks also apply to the last mentioned covering of the edge 12; only the outer edge 6 of the cover 2 is a wider ring. In all the embodiments, the top of the tubular member with its edge 12 and thus the upper edge of the side wall 1 comes to lie around the flange portion 18 to serve as a supporting arrangement. This provides a particularly strong and stiff connection between cover 2 and side wall 1.

It will further be seen that in all the embodiments of the cover 2 this latter has a cover wall portion 20 which tapers towards the centre and which is specifically a frustoconical annular surface. It converges outwardly and

upwardly in tapered fashion, in the form of the frustoconical annular surface. In the transportation configuration according to Figs. 2, 5 and 10, the frustoconical portion projects inwardly at approximately the same angle.

Figs. 1 to 3, 7 and 8 show that the gripper ring 17 is attached by means of a thin retaining strip 51 to the wider strip-like hinge 52 which is in turn integrally moulded on the frustoconical spout rim portion 14. On the side opposite the holding strip 51, the gripper ring 17 is rigidly mounted on the closure member 13 by means of a bar portion 53. The closure member 13 is in turn disposed on the rim portion 14, at the top thereof, via an annular weakening line 54, as can be clearly seen in Fig. 3. The bar portion 53 furthermore projects (Fig. 3) a little farther beyond the upper edge of the spout rim 14, in order thereby to provide a satisfactory grip. On the side opposite the bar portion 53, the closure member 13 is in turn attached to the rim portion 14 by a hinge 52. The hinge 52 constitutes a rigid connection between the rim portion 14 and the closure member 13, is nevertheless flexible and permits of an upwards pivoting of the closure member 13, so that the edge 15 thereof can be moved out of the horizontal position shown in Fig. 3 into a tipped, possibly even vertical position. In this respect, the ease of re-closing will be readily appreciated.

In the case of the embodiment shown in Figs. 5 and 6, reference numeral 21 denotes a location at the top of the edge 15 of the rim portion 14 which in this case is of cylindrical configuration. This portion 21 is of relatively strong construction while the arrangement also has an annular weakening line 22 similarly to the line 54 in the embodiment according to Figs. 1 to 3. These lines of weakness 52 and 54 extend around almost 360° as a point of weakness around the spout rim portion 14 or according to Fig. 6 around the closure plug-like member 16 so that the latter does not need to be torn out in order to open the

packaging means. In addition to the location on the weakening line which is designated 22 in Fig. 6, on the left, there is a connecting point not designated in greater detail of the gripping ring 17 beside which a convexly curved portion 24 is so provided which protrudes inwardly from the rim portion 14 towards the centre that the walls of this portion 24 according to Fig. 6 extend inwardly being separated from the environment by the line of weakness 22. In fact, when the user by tearing the gripper ring 17 (according to Fig. 6, at the top) tears open the line of weakness 22, then this latter first breaks in the region of the curvature 24 so that air rushes into the space under the cover 2 after which, by raising the cover 2 into the position shown in Fig. 6, it is possible to enlarge the volume of the packaging means.

In the case of the embodiment shown in Figs. 1 to 3, this special curved configuration must not be forgotten. In this case, it is sufficient if the user tears the adhesive strip 51, raises the gripper strip 17 and by means of the bar portion 53, tears open the closure means 13 along the line of weakness 54 completely through 360°. Further raising of the handle portion 17 then guarantees the above described oblique positioning of the closure member 13 or the edge 15 so that the opening can be more or less completely exposed in order to pour out the contents.

In the case of the embodiment shown in Figs. 5 and 6, diametrically opposite the portion 24 as shown in Fig. 6, on the right hand side of the closure plug member 16, in the vicinity of the location 21, there is the hinge 25 for the closure plug member 16. This latter may accordingly be moved about the hinge 25 in a clockwise direction, i.e. in the opening direction, without the closure plug member 16 being immediately torn off. By virtue of this arrangement, the embodiment shown in Figs. 5 and 6 also affords the possibility of being re-closable, especially as the closure plug member 16 has an edge or rim portion 26 which extends

approximately towards the spout rim portion 14 and which is only closed off by the flat bottom portion 27.

In the case of the embodiments shown in Figs. 1 to 8, it will be seen that the frustoconical annular surface 20 is provided on the side of the cover 2 which is subsequently facing the inner side of the packaging means, has two concentrically disposed circular grooves of weakness 31 and 32 (expressly shown in Figs. 3 and 6).

The embodiment shown in Figs. 7 and 8 differs from that shown in Figs. 1 to 4 only by reason of the handle 55 which is mounted by way of a reinforcing strip 56 applied to the packaging means, to the side of the packaging means which is opposite to the bar portion 53, that is to say, on the same side as the hinge 52, at the upper end of the side walls 1. The upper end of the handle 55 is desirably disposed in the vicinity of the edges 12 and 30. The spout rim portion 14 with the closure member 13 is otherwise of the same design as was described in greater detail hereinbefore with reference to Fig. 3.

Figs. 9 to 11 show the fourth embodiment of the cover 2, wherein the pouring means has an outwardly upwardly projecting dome 33 with a closure member 35 for sealingly closing a central opening 34 in the top of the dome. The closure member 35 represents the wall of the dome 33, with a punctiform weakened location for forming the opening 34, wherein the handle or gripping member 17 which is of an oval configuration as shown in Fig. 11 is injected at the same time on the closure member 35.

Directly after the injection operation, the cover 2 is of the configuration shown in Figs. 9 and 11, in which the annular cover wall portion 20 projects outwardly and upwardly.

While the closure member 13 in the other embodiments is only folded inwardly of the outside contour of the

packaging means for transportation, without further steps being taken, the broken lines in the view shown in Fig. 10 show the cover in the inwardly folded condition, with a cover plate or sheet member 36 as shown in solid lines, which is secured evenly to the outside edge 6 of the cover 2. Therefore, for the purposes of opening the package, the cover plate or sheet member 36 which is possibly secured in position by a sealing action so as to form an aseptic seal must first be destroyed, and the cover 2 can then be moved into its position of use, by gripping the ring 17; when the consumer then continues to pull the gripping ring 17 upwardly until the opening 34 is exposed, the dome member 33 can be immediately put to the mouth of an infant without the user touching the surfaces of the dome member 33 with a hand or contaminating it in some other fashion.

The user produces the tubular configuration at the bottom end of the packaging means by altering the packaging means from the state thereof shown in Fig 9 or Fig. 10 at the bottom end thereof, in such a way that (see Fig. 4) the triangular flaps 10 are pivoted out into the plane of the bottom 3. The consumer then presses on the corners transversely with respect to the direction of the double cardboard ply 8 so that the quadrangular shape becomes a rectangular shape or substantially even the shape of the lower closure seam which in Fig. 4 is formed by the double layer of cardboard 8.



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Patent Claims

1. A packaging means for fluent materials, comprising side walls which are connected together in a tubular configuration by way of at least one longitudinal sealing seam and which comprise coated cardboard or the like, and end walls (2, 3) which are mounted on the ends of the tube, wherein one end wall which forms the cover (2) of the packaging means is of thermoplastics material without a carrier material, is sealed to the side walls (1) along its outside edge (30) and has a pouring means (13) which can be folded in within the inner contours of the side walls while the other end wall forming the bottom (3) is of rectangular configuration and has a transverse sealing seam (8) with triangular flaps (10) which are folded over onto an adjacent wall, the round cover (2) having, converging taperingly towards the centre and leaving a central aperture (34), a cover wall (20) with a centrally disposed raised cylindrical rim portion (14) with a closure member (13, 35) fixed thereon, the frustoconical annular face (20) preferably having on the inside of the packaging means at least one circular weakening groove (31, 32).
2. A packaging means according to Claim 1, characterised in that on the outer periphery of the frustoconical annular face (20) there is a further cylindrically shaped shoulder or flange (18) which is inwardly offset in respect of the outer edge (30).
3. A packaging means according to one of Claims 1 to 2, characterised in that the edge (12) of the tubular member (1) which is towards the cover is completely masked by the outwardly projecting outer rim (30) of the cover (2).



4. A packaging means according to one of Claims 1 to 3, characterised in that the rim portion (14) has an outwardly raised dome (33) with a closure member (35) which seals off the central aperture (34).
5. A packaging means according to Claim 4, characterised in that the closure member (35) has a weakened extension to the dome wall (33) which has a fitted handle (17).
6. A packaging means according to Claim 4 or 5, characterised in that the annular surface (20) with the dome (33) can be folded inwardly of the outer contours of the packaging means and in that a cover sheet (36) is fixed flat on the outer edge (30) of the cover (2), possibly in an aseptically sealing tight fashion.