CLOSING LOWER PART WITH A RETAINING RIB

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ABSTRACT

The present invention relates to a closure underpart with a tubular sleeve (2) and a fixing flange (3) arranged on the outside of the tubular sleeve (2), at least one projection (4) being provided on the inside of the tubular sleeve (2), which serves to hold the closure underpart (1) on a spike inserted into the tubular sleeve (2) when fixing to a vessel wall. In order to create a corresponding closure underpart, which can be held on a spike with a much greater play it is proposed according to the invention that the at least one projection (4) has the form of a bendable web which run inclined vis-à-vis the inner wall of the tubular sleeve (2) at an angle α which is smaller than 90° and greater than 0°.
CLOSING LOWER PART WITH A RETAINING RIB

The present invention relates to a closure underpart with a tubular sleeve and a fixing flange arranged on the outside of the tubular sleeve, at least one projection being provided on the inside of the tubular sleeve which serves to hold the closure underpart on a spike when fixing to a vessel wall.

Corresponding closure underparts have been known for some time and they are used above all for plastic closures of carton packs, e.g., for beverages or similar, where the closure or the closure underpart is guided from the (later) inside of the vessel through an opening in the wall of the vessel, the closure flange coming into contact with the inner surface of the vessel wall and then being welded or glued to it.

For this assembly, the housing of the closures and the transport of the same, “spikes” are generally used which fit into the inside of the tubular sleeve and mostly enter into greater or lesser frictional engagement with the inwardly-protruding projections.

It is understood that the corresponding spikes have to be matched to the internal diameter of the corresponding closure underparts or more precisely to the diameter defined by the projections, in order to on the one hand securely hold a closure underpart before and during assembly, but on the other hand so as to also be easily removable again from the assembled closure underpart.

A design is already known in which the projection is developed as a peripheral ring-shaped bead or lip along the bottom inner edge of the tubular sleeve. In another version, several separated, bead-like projections are provided which are distributed over the circumference of the tubular sleeve on its inside and near to the bottom inner edge.

If corresponding closures have different sizes, the spikes for holding these closures also have to be changed because a given closure size can be held only by a spike which is suitably matched to it, there being only slight play in order on the one hand to ensure the holding and transportation of the closure underpart on a spike, but on the other hand to also be able to easily remove the spike from the assembled closure again.

The changing of the spikes to adapt to different closure sizes is relatively time-consuming and tiresome and significantly reduces productivity during the production or attachment of such closures. Even slight tolerances during the production of one and the same type of closure can already lead to malfunctions during assembly, as the closure then either slides too easily from the spike or is held too tightly to the spike.

This problem is further aggravated by the fact that on many such closures closure seals are provided which completely cover the cross section of the tubular sleeve so that, under the closure seal, only a relative short section of the tubular sleeve is available for holding by a corresponding spike.

Compared with this state of the art the object of the present invention is to create a corresponding closure underpart which can be held on a spike with a much greater play:

This object is achieved in that the at least one projection has the form of a bendable web which runs inclined at an angle vis-à-vis the inner wall of the sleeve which is smaller than 90° and greater than 0°.

While traditionally the projections were compressed in radial direction by the engagement with a spike or the diameter defined by the projections was itself expanded by pressing together of the material, according to the invention, instead of the relatively rigid and only elastically compressible projections, bendable webs are provided which run inclined vis-à-vis the inner wall of the sleeve at an angle which is smaller than 90° and greater than 0°. The means effectively that a much greater elastic path of movement is available through the bending of the webs than was normally possible by the pressing together of the diameter expanding of the corresponding material. As a result, with the projection according to the invention in the form of a bendable web running inclined to the tubular sleeve wall, much greater deviations in play of the diameter of the spike vis-à-vis the diameter of the tubular sleeve can be absorbed so that one and the same spike can also be used with different closure types with slightly different tubular sleeve diameters in order to hold and assemble the closure underpart.

Expediently the webs run inclined, vis-à-vis the tubular sleeve wall (more precisely vis-à-vis a tangent to the tubular sleeve wall) at an angle between 20° and 70°, an angle in the range of roughly 45° being most preferred. Moreover the webs in the preferred version of the invention can run essentially axis-parallel, i.e., they are connected to the inner wall of the tubular sleeve along an essentially axis-parallel line and they are formed as short flat webs or small plates, the plane of these small plates or webs likewise running parallel to the axis of the tubular sleeve.

In principle it is also possible however that the webs are connected to the wall of the tubular sleeve along a line inclined to the axis, e.g., along a diagonally running line or however also along a line running in circumferential direction. The inclination of the webs vis-à-vis the wall of the cavity is then best determined in a plane which runs perpendicular to the fixing line of the web to the wall.

In particular if the fixing line of the webs has a considerable component in circumferential direction, these webs should extend only over relatively narrow angle ranges of less than 60° and preferably less than 30°, in particular for webs running only in circumferential direction. If the webs do extend over a greater angle range they acquire a greater rigidity through the curvature and are therefore not so easily bendable. As the webs are relatively easy to move if they extend only over relatively short sections in circumferential direction or if they are attached to the tubular sleeve along an axially-running line, they can also be designed with a greater length (measured perpendicular to their fixing line) so that, because of this fact also, a greater path of movement for the absorption of tolerances is available for the webs.

In a preferred version several e.g., three corresponding webs and preferably at least six webs are provided which are expediently distributed in equidistant angular distances along the circumference of the tubular sleeve and preferably along the lower end-section of the tubular sleeve.

Further advantages, features and application possibilities of the present invention will become clear by reference to a preferred version, such as is represented in the accompanying Figures. There are shown in
FIG. 1 an axial section through a closure underpart according to the invention,
FIG. 2 a view from below of the closure underpart according to FIG. 1 and
FIG. 3 an enlarged cut-out section from FIG. 2.

There can be seen in FIG. 1 the axial section through a closure underpart 1, consisting of a tubular sleeve 2 with external thread 5 and a fixing flange 3 joining onto the lower end of the tubular sleeve 2 on the outside. A normally likewise present closure seal, which is arranged inside the tubular sleeve 2 and closes its cross section, is not represented. Along the lower edge of the tubular sleeve there can also be seen three projections in total in each representation in the form of short webs 4 which, as can be seen better in FIG. 2, are inclined vis-à-vis the wall of the tubular sleeve 2.

For assembly a short spike, the diameter of which is somewhat smaller than the internal diameter of the tubular sleeve 2, is introduced from below into the tubular sleeve 2, the webs 4 being bent back, i.e., pressed in the direction of the tubular sleeve wall so that the closure underpart 1 is held securely on the spike via the elastic restoring force of the webs 4. The closure underpart is then guided with the help of this spike to the inner wall of a vessel, e.g., a carton pack, which has a corresponding opening to receive the tubular sleeve 2. The tubular sleeve 2 is guided through this opening from inside, the flange 3 being laid against the vessel inner wall and being welded or glued to it. The spike is then again pulled out of the tubular sleeve 2, the flange 3 holding the closure underpart 1 firm against the vessel in the vessel opening so that the spike can be pulled out of the tubular sleeve 2 in spite of the frictional engagement with the easily bendable webs 4. This process generally takes place before the development of the vessel on a continuous material web, from which the vessel is folded or formed after the closure is attached.

In FIG. 2 there can be seen in a view from below both the closure flange and the wall (indicated by a dotted line) of the tubular sleeve, out from which six projections in total extend in the form of narrow webs or legs, which run inclined vis-à-vis the wall of the tubular sleeve 2. This can be seen even more clearly in the enlarged cut-out section from FIG. 2, which is represented in FIG. 3. The length of the webs 4, measured from the point of attachment on the tubular sleeve wall to the free end, is between 0.5 and 1.5 mm and the thickness of these webs is expeditiously between 0.3 and 0.6 mm. The angle \( \alpha \) is roughly 45° in the preferred version, but can also be chosen to be smaller or greater if required, if e.g. greater tolerance deviations are to be absorbed.

1-7. (canceled).

8. A closure underpart having a tubular sleeve (2) and a fixing flange (3) arranged on the outside of the tubular sleeve (2), at least one projection (4) being arranged on an inside of the tubular sleeve (2), that serves to hold the closure underpart (1) on a spike inserted into the tubular sleeve (2) when fixing the closure underpart to a vessel wall, wherein the at least one projection (4) has the form of a bendable web that runs at an inclined angle \( \alpha \) with respect to an inner wall of the tubular sleeve (2), which angle \( \alpha \) is smaller than 90° and greater than 0°.

9. A closure underpart according to claim 8 wherein the angle \( \alpha \) is between 20° and 70°.

10. A closure underpart according to claim 8 wherein the angle \( \alpha \) is about 45°.

11. A closure underpart according to claim 8 wherein the web (4) runs essentially parallel to an axis of the tubular sleeve.

12. A closure underpart according to claim 9 wherein the web (4) runs essentially parallel to an axis of the tubular sleeve.

13. A closure underpart according to claim 8 wherein at least three projections (4) are provided at equidistant angular distances on an inner surface of the tubular sleeve and adjacent to a lower inner edge of the tubular sleeve.

14. A closure underpart according to claim 9 wherein at least three projections (4) are provided at equidistant angular distances on an inner surface of the tubular sleeve and adjacent to a lower inner edge of the tubular sleeve.

15. A closure underpart according to claim 10 wherein at least three projections (4) are provided at equidistant angular distances on an inner surface of the tubular sleeve and adjacent to a lower inner edge of the tubular sleeve.

16. A closure underpart according to claim 8 wherein the webs have a height, measured in a plane perpendicular to an axis of the closure underpart and at an angle \( \alpha \) to the tubular wall, of 0.5 to 1.5 mm.

17. A closure underpart according to claim 9 wherein the webs have a height, measured in a plane perpendicular to an axis of the closure underpart and at an angle \( \alpha \) to the tubular wall, of 0.5 to 1.5 mm.

18. A closure underpart according to claim 10 wherein the webs have a height, measured in a plane perpendicular to an axis of the closure underpart and at an angle \( \alpha \) to the tubular wall, of 0.5 to 1.5 mm.

19. A closure underpart according to claim 8 wherein the webs (4) are inclined relative to an axis of the sleeve (2).

20. A closure underpart according to claim 9 wherein the webs (4) are inclined relative to an axis of the sleeve (2).

21. A closure underpart according to claim 10 wherein the webs (4) are inclined relative to an axis of the sleeve (2).

22. A closure underpart according to claim 14 wherein the webs (4) are inclined relative to an axis of the sleeve (2).

23. A closure underpart according to claim 8 wherein the projections consist of web sections running in a circumferential direction each of which extend over an angle range of less than 90° and run inclined relative to the closure axis.

24. A closure underpart according to claim 9 wherein the projections consist of web sections running in a circumferential direction each of which extend over an angle range of less than 90° and run inclined relative to the closure axis.

25. The closure of claim 23 wherein the angle is less than 30°.

26. The closure of claim 24 wherein the angle is less than 30°.