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(54) **PACKAGING FOR RECEIVING A FILLING MATERIAL**

(57) It is provided a packaging (10) for receiving a filling material, comprising a container (12) for storing the filling material, wherein the container (12) comprises a collar (16) for bordering an opening (14) for providing access to the filling material, a lid (20) for covering the opening (14) in closed state and a gasket (26) made from an elastic material for sealing the opening (14), wherein the gasket (26) is connected to the lid (20), wherein the gasket (26) is elastically deformed by the collar (16) in the closed state and the gasket (26) provides a first sealing force (34, 40) in radial direction onto the collar (16) in the closed state, wherein the first sealing force (34, 40) is provided by a resilient force of the gasket (26) due to the deformation of the gasket (26) by means of the collar (16) only. Since the collar (16) of the container (12) bends and deforms the gasket (26) in the closed state, a radial press fit between the gasket (26) and the collar (16) is provided without the need of applying a clamping force be means of a clamping mechanism so that a good and cost-efficient sealing of a packaging (10) is enabled.

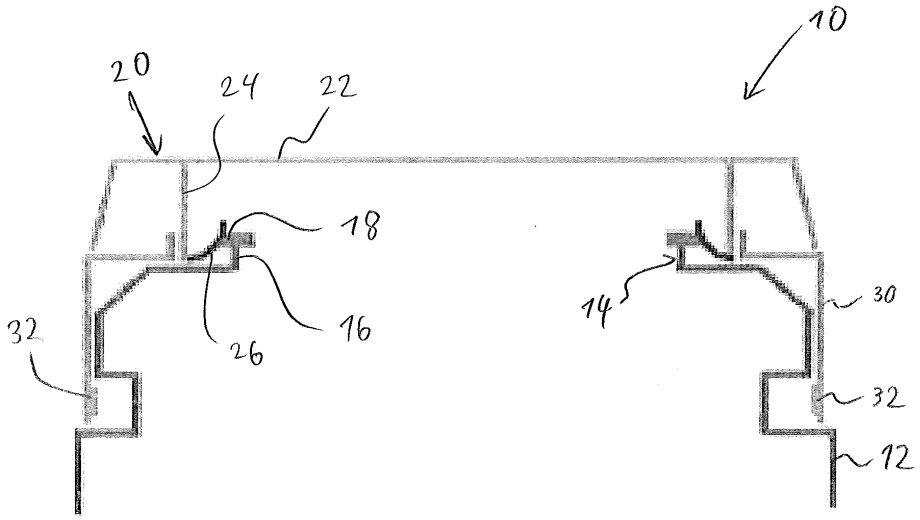

Fig. 2

EP 3 342 725 A1

Description

[0001] The invention relates to a packaging by which a filling material can be received and securely transported as well as stored over extended periods of time.

[0002] WO 2009/147194 A2 discloses a packaging suitable for storing a hygroscopic powder, wherein an opening of a container for storing the hygroscopic powder can be sealed by means of a metal foil glued to a front face of a collar of the container which borders the opening.

[0003] US 9,108,776 B2 discloses a packaging with a lid comprising a gasket. The gasket comprises an axially protruding part which can be clamped between a front face of a glass vessel and the lid when the lid is clamped to the glass vessel and provides a suitable clamping force. The gasket comprises a spring part protruding in radial direction and downwards which is configured to flex easily to absorb the variability of the vessel seal surface at the axial front face of the vessel.

[0004] There is a permanent need for a good and cost-efficient sealing of a packaging.

[0005] It is an object of the invention providing measures enabling a good and cost-efficient sealing of a packaging. Particularly, it is an object of the invention enabling a sealing that protects the filling material for environmental influences, like humidity, particularly after the disposal of a sealing foil during the first removal of a part of the filling material. More particularly, it is an object of the invention to improve the tightness after first opening or removing the sealing foil.

[0006] The solution of this object is provided according to the invention by a packaging according to the features of claim 1. Preferred embodiments of the invention are given by the dependent claims and the following description, which can constitute each solely or in combination an aspect of the invention.

[0007] According to the invention a packaging for receiving a filling material is provided comprising a container for storing the filling material, wherein the container comprises a collar for bordering an opening for providing access to the filling material, a lid for covering the opening in closed state and a gasket made from an elastic material for sealing the opening, wherein the gasket is connected to the lid, wherein the gasket is elastically deformed by the collar in the closed state and the gasket provides a first sealing force in radial direction onto the collar in the closed state, wherein the first sealing force is provided by a resilient force of the gasket due to the deformation of the gasket by means of the collar only.

[0008] The gasket may be pressed against the collar along the whole circumference of the collar with a sufficient first sealing force. Particularly the gasket may provide a moisture-proof sealing with the container via the collar of the container. Due to the elastic material of the gasket the gasket may be sufficiently deformed for providing the intended first sealing force. It is used the insight that the resilient force of the gasket when deformed by the collar may provide a sufficient sealing force. The elasticity and the three-dimensional shape of the gasket may be suitably chosen for providing the intended minimum first sealing force so that it is not necessary providing a clamping mechanism for providing the intended sealing force by means of the applied clamping force. Only the resilient force of the deformed gasket provides the first sealing force. This means, no other force, particularly no clamping force, is applied to provide the first sealing force. In addition, the presence of the collar may be utilized for applying the first sealing force. Particularly the gasket may overlap the collar so that the gasket meets the collar when the lid is closing. In a preferred embodiment the gasket is arranged in one radial plane of the lid, so that the gasket protrudes from a side wall of the lid in radial direction only in the non-biased state, when the lid is positioned in its open state. The collar may bend the gasket away when the lid is further closed elastically deforming the gasket. Particularly a part of the gasket is bent by the collar by nearly $90° \pm 5°$. In the closed state, the deformed gasket rests on the lateral area of the collar, wherein only the resilient force of the elastically deformed gasket provides the first sealing force in radial direction. The gasket may be press-fitted onto the collar. Since the collar of the container bends and deforms the gasket in the closed state, a radial press fit between the gasket and the collar is provided without the need of applying a clamping force by means of a clamping mechanism so that a good and cost-efficient sealing of a packaging is enabled.

[0009] In addition, a user feels a specific back force when the lid is moved in the closed state so that the user experiences a haptic feedback that the packaging is closed. The handling of the packaging is facilitated, particularly for providing a sufficient sealing. Further, a sufficient sealing cannot be accidentally omitted, when the lid is closed but not clamped, since a clamping is not necessary for providing the sufficient sealing. The geometry of the gasket may be easily chosen in respect to the geometry of the collar for providing a specific minimum deformation and in turn a definite minimum first sealing force between the gasket and the collar of the container. For instance an inner diameter of the gasket may be chosen sufficiently smaller than an outer diameter of the lateral contact face of the collar. Further the thickness and/or the elastic material of the gasket may be chosen with respect to the collar in order to provide an intended resilient force in the closed state of the lid for providing the intended sealing quality. This minimum sealing force can be guaranteed easily even when low requirements in respect to fabrication tolerances apply. This enables a good and cost-efficient sealing between the gasket and the collar of the container. The filling material inside the container may be sufficiently protected for environmental impacts, for instance humidity or other influences. Due to the elasticity of the gasket the gasket may be biased and may provide a sufficient resilient force. At the same time the gasket may compensate a displacement of the

lid relative to the collar of the container. The gasket may be bent more or less depending on the displacement of the lid and the relative position of each part of the gasket to the collar. A higher or a lower resilient force may be provided from the gasket depending on the distance of the side wall of the lid to the collar and the gap between the side wall of the lid and the collar bridged by the gasket. Due to the different resilient forces of the gasket the lid may be centered with respect to the collar into a relative position where the resilient forces of the gasket are mainly even along the circumference of the collar. A displacement of the lid relative to the collar may be compensated automatically due to the elastic deformation of the gasket in the closed state of the lid. Again, a specific minimum sealing force of the gasket to the collar in the closed state of the lid can be guaranteed at a given position tolerance, which may also associate to a given manufacturing tolerance particularly of the lid. The minimum sealing force between the gasket and the collar can be sufficient for providing a specific quality of the sealing, particularly a moisture-proof sealing. The three-dimensional design of the gasket allows a tight sealing as well as an elastic compensation of tolerances, so that a good and cost-efficient sealing of the packaging is enabled.

[0010] The gasket may contact the collar of the container in a two-dimensional manner so that a large contact area is provided. The sealing effect between the gasket and the collar may be increased. The side wall of the lid may be arrange mainly in parallel to the collar in the closed state of the lid. The gasket may be connected, particularly glued and/or welded, to the lid, particularly to the side wall of the lid, via its outer lateral face or via a part of its axial face. Particularly a top part of the lid may abut the collar so that the front face of the collar provides a stop for the closing movement of the lid. A defined maximum closed state can be provided, when the top part of the lid meets the collar front face. The container, particularly together with the collar, may be produced from a plastic material, particularly by blow molding or by plastic injection molding. The container may be made from a thermoplastic material, particularly polypropylene. The lid may be connected to the container directly or indirectly. Preferably the lid is one-piece with the container and connected to the container via a film hinge. The packaging may be designed further as disclosed in WO 2009/147194 A2 whose content is herewith incorporated as part of the invention.

[0011] Particularly the collar comprises a rim protruding radially outwards, wherein the first sealing force applies onto the lateral area of the rim and/or onto the lateral area of an undercut of the collar bordered by the rim. The rim may comprise a predefined thickness in axial direction so that a mainly constant sealing force may apply to the lateral face of the rim even at different axial distances of the lid to the container. When the gasket engages into the undercut, a form fit between the elastic gasket and the collar may be provided which can be overcome by a sufficient opening force applied to the lid for deforming the gasket such, that the positive fit engagement of the gasket is resolved. Further, the gasket may contact the lateral face of the undercut of the collar in addition or in alternate to the contact of the gasket to the lateral face of the rim.

[0012] Preferably the gasket is formed such, that the gasket meets an axial collar front face of the collar in the closed state. The gasket may not only seal the collar at its lateral face but may provide in addition the functionality of a stop which defines the maximum closed position of the lid. Due to the elasticity of the gasket the gasket may damp the hit at the end of the closing movement when the lid reaches its closed state. Further a rattling of the lid may be damped by the gasket meeting the collar front face.

[0013] Particularly preferred the gasket is clamped between the lid and the collar front face in the closed state for providing the third sealing force. When the lid should be locked with the container anyway, then the locking mechanism can be used to clamp the gasket between the lid and the collar front face. A clamping of the gasket between the lid and the lateral face of the collar is not necessary and hence not provided.

[0014] Particularly preferred the gasket provides a second sealing force onto the collar front face in the closed state, wherein the second sealing force is provided by a resilient force of the gasket due to the deformation of the gasket by means of the collar only. The gasket may not only seal the collar at its lateral face but may provide in addition a sealing at the collar front face. The sealing effect and the sealing quality may be improved. In the alternate a clamping of the gasket between the lid and the collar front face is omitted.

[0015] Particularly the container comprises an axial container front face from which the collar protrudes in axial direction, wherein the gasket meets the container front face in the closed state. The gasket may not only seal the collar at its lateral face but may provide in addition the functionality of a stop which defines the maximum closed position of the lid. Due to the elasticity of the gasket the gasket may damp the hit at the end of the closing movement when the lid reaches its closed state. Further a rattling of the lid may be damped by the gasket meeting the container front face.

[0016] Preferably the gasket provides a third sealing force onto the container front face in the closed state. The gasket may provide in addition a sealing at the container front face. Due to the further sealing face the sealing effect and the sealing quality may be improved.

[0017] Particularly preferred the gasket is clamped between the lid and the container front face in the closed state for providing the third sealing force. When the lid should be locked with the container anyway, then the locking mechanism can be used to clamp the gasket between the lid and the container front face. A clamping of the gasket between the lid and the lateral face of the collar is not necessary and hence not provided.

[0018] Particularly a sealing foil is connected to the col-

lar, particularly to the collar front face. The opening may be sealed in addition by means of the sealing foil. The sealing foil may be glued and/or welded to the collar front face. The container may preferably receive hydrophilic materials and/or hygroscopic materials, for example bleaching powder. The sealing foil may protect the filling material from environmental influences until first use of the filing material so that no humidity may enter the container and contact the filling material. The sealing foil may be made from a metal material, particularly comprising aluminium.

[0019] Preferably the gasket is designed as a mainly flat ring. Particularly the gasket is a circumferential ring of any suitable shape. The extension of the gasket in radial direction may be significantly larger than its thickness. The gasket may comprise a quite simple three-dimensional design so that the gasket may be cost efficient manufactured. The gasket may be bent such in closed state that one flat axial face is pressed in radial direction onto the lateral face of the collar, wherein the gasket may be connected to the lid via its outer lateral face or via a part of the other flat axial face.

[0020] Particularly preferred the lid comprises a ring-shaped side wall protruding towards the collar from a top part of the lid, wherein the side wall surrounds the collar in the closed state, wherein the gasket is connected to the side wall. The gasket may be arranged at least partially, preferably as whole, in radial direction between the side wall and the collar. The gasket may be pressed between the side wall and the collar in radial direction so that a sufficient sealing force in radial direction can be applied to the collar. The gasket may be radially supported by the side wall when the collar bends and/or stretches the gasket radially outwards.

[0021] Preferably a closure part is connected to the container, wherein the lid is centered to the closure part. The gasket may be centered with respect to the closure part and the collar also by centering the lid to the closure part. The closure part may comprise a tube part protruding upwards in axial direction, by means of which the lid may be centered. The side wall of the lid may be put onto the tube part in closed state. The tube part may comprise a chamfer or the like for facilitating the insertion of the tube part into the lid. Particularly the lid may be releasably clamped to the closure part, preferably by means of a press fit between the tube part of the closure part and the side wall of the lid. The lid may be secured against unintentional opening.

[0022] Particularly the lid is releasably connected, particularly clamped, to the container in the closed state, particularly via a clip connector, wherein particularly the side wall is clamped to the container. Generally the lid may be clamped to the container by means of the friction between the gasket and the collar. Preferably the lid is releasably connected to the container by means of a separate connection means, particularly adapted for providing a form fit and/or a positive fit of the lid with the container. The lid may be locked with the container so that an accidentally opening of the packaging may be prevented. Particularly the connection means may provide a significant axial clearance in the locked state so that a closing of the packaging is facilitated.

[0023] Preferably the lid meets the container via a stopper face in the closed state. A maximum closed state may be defined by a relative position where the stopper face of the lid meets a corresponding face of the container. This in turn may define a relative position of the gasket to the collar so that it can be prevented that the gasket is pulled a longer way than necessary onto the collar. The handling of the packaging may be improved.

[0024] Particularly preferred the gasket is made from an elastomer material, particularly silicone, thermoplastic elastomer or rubber. Due to this material the gasket can be deformed by means of the closing lid and may provide a sufficient resilient force for providing a tight sealing.

[0025] Particularly the gasket comprises a hardness h in Shore A according to DIN ISO 7619-1:2010 at 23°C of $5 \leq h \leq 90$. This hardness allows a sufficient deforming of the gasket when the lid is closed. At the same time the gasket may provide a sufficient resilient force against the deformation for providing a sealing force which leads to a tight sealing.

[0026] Preferably a material sensitive to the environmental atmosphere, particularly a hygroscopic material, is provided inside the container, wherein particularly the material comprises or consists of a cosmetic product, particularly a bleaching powder. Due to the tight sealing such kind of a filling material may be stored inside the container without the risk that the filling material is affected by environmental influences. For example, an agglomeration of a hygroscopic material due to environmental humidity may be prevented.

[0027] These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter, wherein the described features can constitute each solely or in combination an independent aspect of the invention. In the drawings:

Fig.1: is a schematic cross sectional view of a part of a first embodiment of a packaging in open state,
Fig. 2: is a schematic cross sectional view of the packaging of Fig. 1 in closed state,
Fig. 3: is a schematic cross sectional detailed view of the packaging of Fig. 2,
Fig. 4: is a schematic cross sectional detailed view of a second embodiment of a packaging,
Fig. 5: is a schematic cross sectional detailed view of a third embodiment of a packaging and
Fig.6: is a schematic cross sectional detailed view of a fourth embodiment of a packaging.

[0028] The packaging as illustrated in fig. 1 comprises a container 12 with an opening 14 bordered by a collar 16. The collar 16 comprises a rim 18 protruding radially outwards. The opening 14 can be closed by means of a lid 20. The lid 20 comprises a top part 22 from which a

ring-shaped side wall 24 protrudes axially downwards. A gasket 26 arranged radially inwards to the side wall 24 is connected to the side wall 24 along its whole circumference. The gasket 26 is designed ring-shaped. The whole gasket 26 is arranged in a radial plane of the lid 20 in the illustrated open state of the packaging 10.

[0029] When the packaging 10 is closed as illustrated in fig. 2 an axial stopper face 28 of the lid 20 may meet the container 12 directly or indirectly via a closure part 30 connected to the container 12 via clip connectors 32. In the alternate the closure part 30 may be fixed to the lid 20 or may be one-piece with the lid 20. Since the outer diameter of the collar 16 and/or the outer diameter of the rim 18 is larger than the inner diameter of the gasket, collar 16 and/or the rim 18 bends the gasket 26 upwards in the illustrated closed state so that the gasket 26 lies against the collar 16 and/or the rim 18.

[0030] As illustrated in fig. 3 the gasket 26 provides an axial first sealing force 34 to the rim 18 of the collar 16 due to a resilient force of the gasket 26 caused by the elastic deformation of the gasket 26 by means of the collar 16 pressed into the gasket 26 during the closing movement of the lid 20. In the alternate the gasket 26 provides an axial first sealing force 34 to the lateral face of the collar 16 below the rim 18 only or both to the lateral face of the rim 18 and the lateral face of the collar 16 below the rim 18.

[0031] The gasket 26 of the packaging 10 as illustrated in fig. 4 provides compared to the packaging 10 as illustrated in fig. 3 an additional third sealing force 36 in axial direction against a container front face of the container 12. Particularly the gasket 26 is arranged between the side wall 24 and the container front face so that it is possible to clamp the gasket 26 between the side wall 24 and the container front face for providing the third sealing force 36 in axial direction.

[0032] The gasket 26 of the packaging 10 as illustrated in fig. 5 provides compared to the packaging 10 as illustrated in fig. 4 a second sealing force 38 in axial direction against a collar front face of the collar 16 which may or may not be provided by the rim 18. Due to the three-dimensional design of the gasket 26 a part of the gasket 26 may meet the collar front face of the collar 16 for increasing the sealing effect. The second sealing force of gasket 26 applied to the collar front face of the collar 16 is also provided only by means of a resilient force of the gasket 26 caused by the elastic deformation of the gasket 26 by means of the collar 16 pressed into the gasket 26 during the closing movement of the lid 20. If so, the gasket may be connected to the lid like illustrated in fig. 4 so that the third sealing force 36 may be omitted.

[0033] The gasket 26 of the packaging 10 as illustrated in fig. 6 provides compared to the packaging 10 as illustrated in fig. 5 a further first sealing force 40 in radial direction against a lateral face of the collar 16 positioned in an undercut of the collar 16 between the rim 18 and the container front face of the container 12. Particularly when the first sealing force 34, the second sealing force 38 and/or the third sealing force 36 should be also applied, the gasket 26 may be designed as a ring-shaped body which a more block-like cross section compared to the more flat cross section of the ring shaped gasket 26 in the other illustrated embodiments. The cross section of the gasket 26 illustrated in fig. 6 may be mainly B-like. Particularly the rim may be releasably engaged, particularly clipped, into the gasket 26 between the protrusions of the mainly B-like cross section of the gasket 26. Due to the elasticity of the gasket 26 the rim 18 of the collar 16 may be part of a snap-on connection with the gasket 26.

Claims

1. Packaging for receiving a filling material, comprising a container (12) for storing the filling material,
wherein the container (12) comprises a collar (16) for bordering an opening (14) for providing access to the filling material,
a lid (20) for covering the opening (14) in closed state and
a gasket (26) made from an elastic material for sealing the opening (14), wherein the gasket (26) is connected to the lid (20),
wherein the gasket (26) is elastically deformed by the collar (16) in the closed state and the gasket (26) provides a first sealing force (34, 40) in radial direction onto the collar (16) in the closed state,
wherein the first sealing force (34, 40) is provided by a resilient force of the gasket (26) due to the deformation of the gasket (26) by means of the collar (16) only.

2. Packaging according to claim 1 wherein the collar (16) comprises a rim (18) protruding radially outwards, wherein the first sealing force (34, 40) applies onto the lateral area of the rim (18) and/or onto the lateral area of an undercut of the collar (16) bordered by the rim (18).

3. Packaging according to claim 1 or 2 wherein the gasket (26) is formed such, that the gasket (26) meets an axial collar front face of the collar (16) in the closed state.

4. Packaging according to claim 3 wherein the gasket (26) provides a second sealing force (38) onto the collar front face in the closed state, wherein the second sealing force (38) is provided by a resilient force of the gasket (26) due to the deformation of the gasket (26) by means of the collar (16) only.

5. Packaging according to anyone of claims 1 to 4 wherein the container (12) comprises an axial container front face from which the collar (16) protrudes in axial direction, wherein the gasket (26) meets the

container front face in the closed state.

6. Packaging according to claim 5 wherein the gasket (26) provides a third sealing force (36) onto the container front face in the closed state.

7. Packaging according to claim 6 wherein the gasket (26) is clamped between the lid (20) and the container front face in the closed state for providing the third sealing force (36).

8. Packaging according to anyone of claims 1 to 7 wherein a sealing foil is connected to the collar, particularly to the collar front face.

9. Packaging according to anyone of claims 1 to 8 wherein the lid (20) comprises a ring-shaped side wall (24) protruding towards the collar (16) from a top part (22) of the lid (20), wherein the side wall (24) surrounds the collar (16) in the closed state, wherein the gasket (26) is connected to the side wall (24).

10. Packaging according to anyone of claims 1 to 9 wherein a closure part (30) is connected to the container (12), wherein the lid (20) is centered to the closure part (30).

11. Packaging according to anyone of claims 1 to 10 wherein the lid (20) is releasably connected, particularly clamped, to the container (12) in the closed state, particularly via a clip connector (32), wherein particularly the side wall (24) is clamped to the container (12).

12. Packaging according to anyone of claims 1 to 11 wherein the lid (20) meets the container (12) via a stopper face (28) in the closed state.

13. Packaging according to anyone of claims 1 to 12 wherein the gasket (26) is made from an elastomer material, particularly silicone, thermoplastic elastomer or rubber.

14. Packaging according to anyone of claims 1 to 13 wherein the gasket (26) comprises a hardness h in Shore A according to DIN ISO 7619-1:2010 at 23°C of $5 \leq h \leq 90$.

15. Packaging according to anyone of claims 1 to 14 wherein a material sensitive to the environmental atmosphere, particularly a hygroscopic material, is provided inside the container (12), wherein particularly the material comprises or consists of a cosmetic product, particularly a bleaching powder.

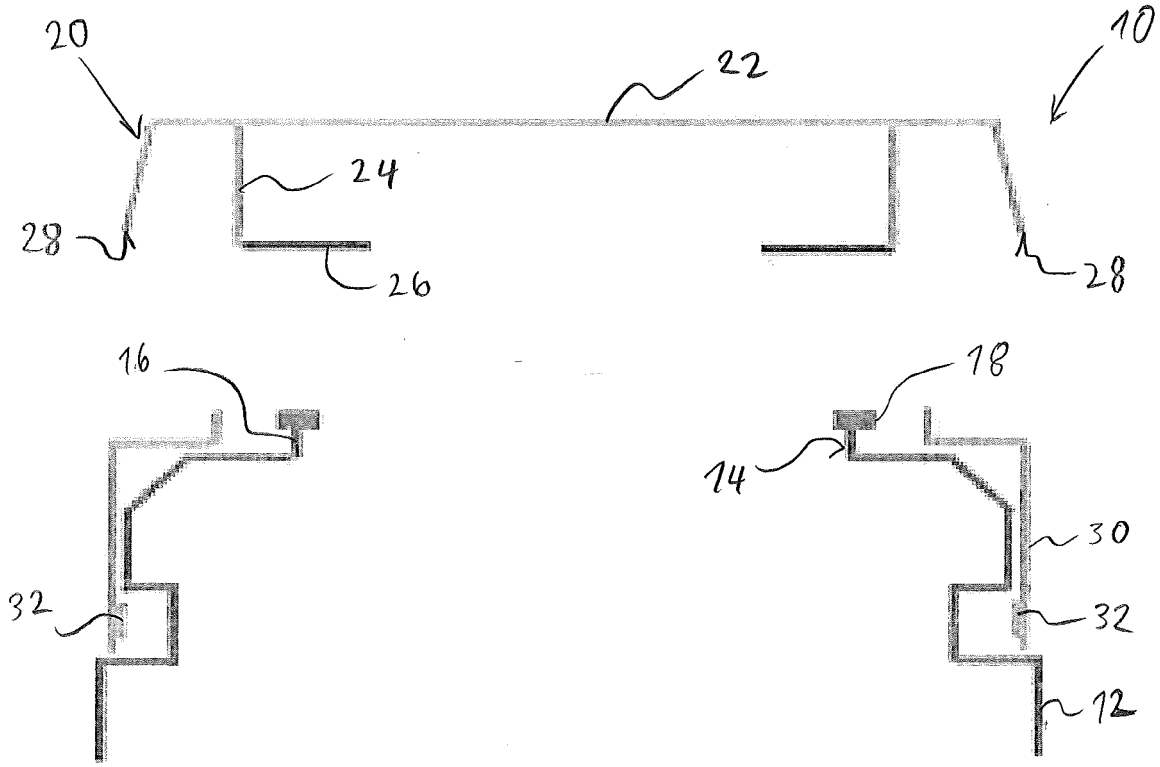
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Fig. 1

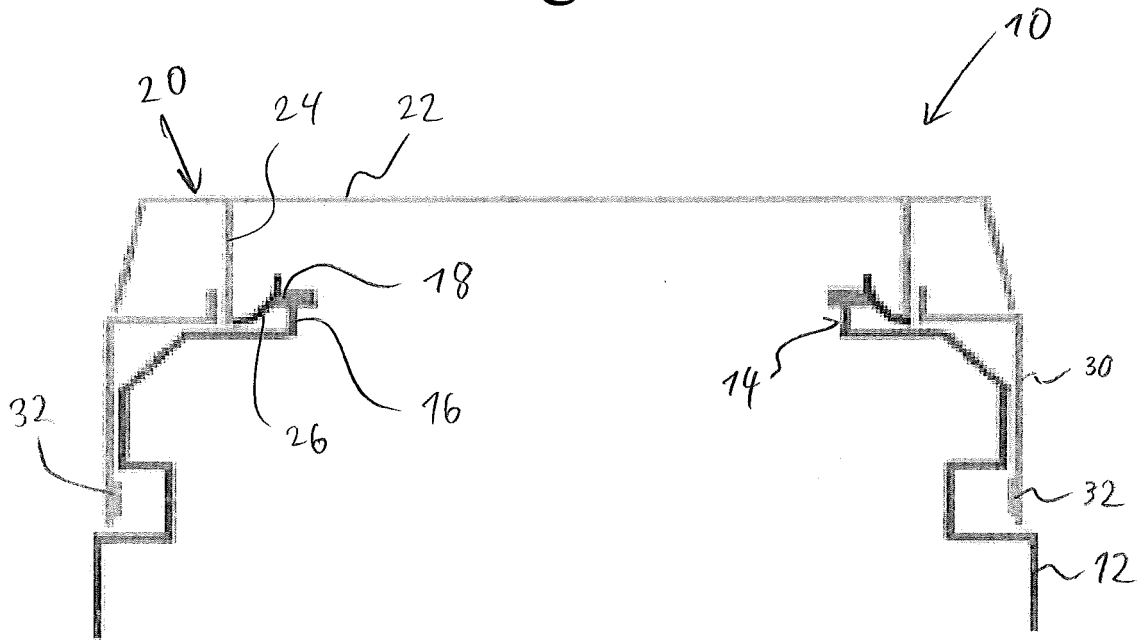
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Fig. 2

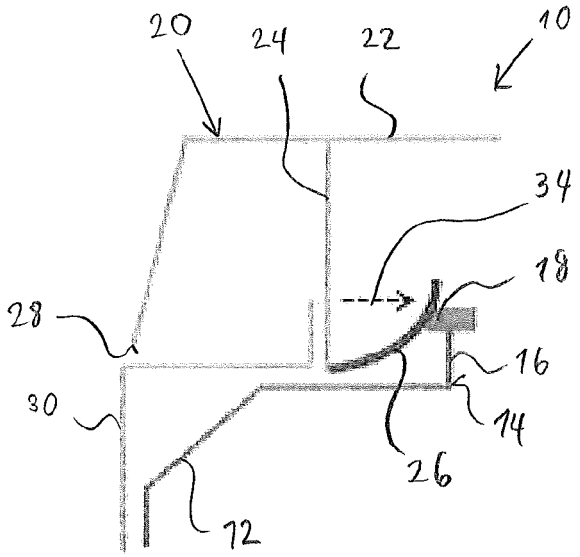

Fig. 3

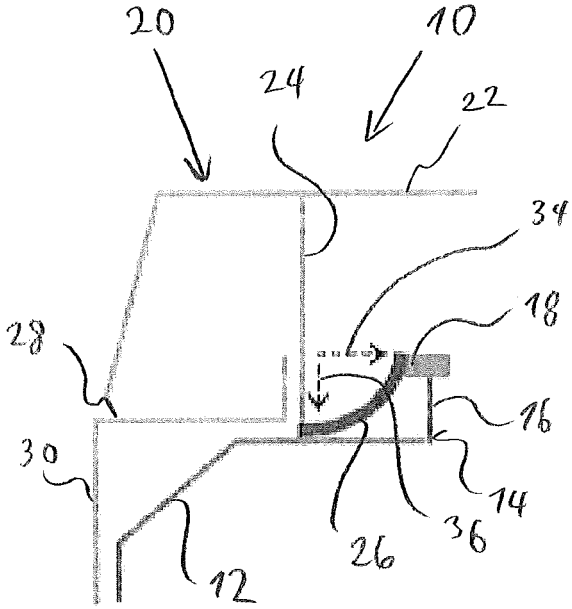

Fig. 4

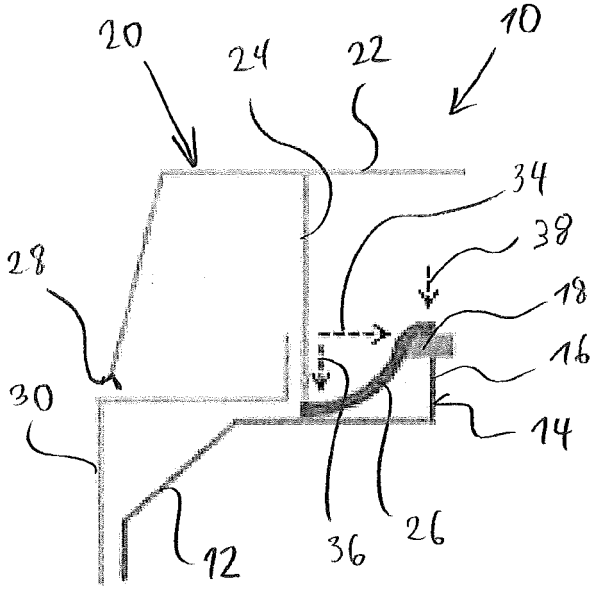

Fig. 5

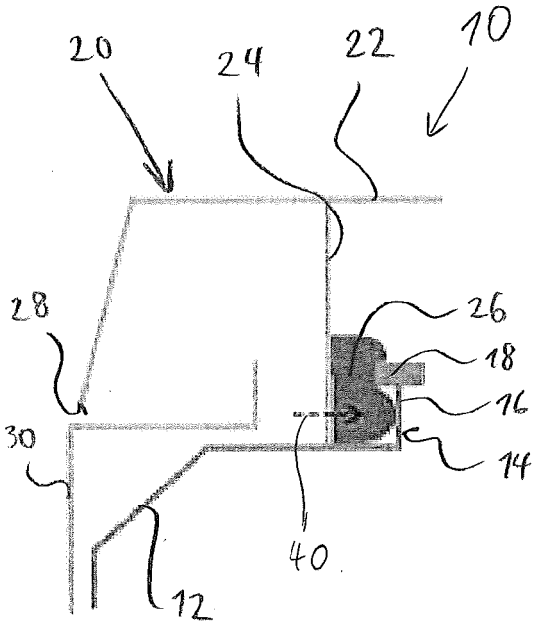

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 16 20 7335

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 1 186 787 A (VERRERIE SOUCHON NEUVESEL) 1 September 1959 (1959-09-01)	1-4,8-15	INV. B65D43/02
A	* page 2, left-hand column, lines 20-28; figures * * page 2, right-hand column, lines 15-23 *	5-7	B65D53/02
X	WO 2010/121295 A1 (DECOR CORP PTY LTD [AU]; SAMARTGIS JIM [AU]) 28 October 2010 (2010-10-28) * abstract; figures 3,6 *	1,3,9, 11-15	
A	NL 62 653 C (C.A.MEIERS) 15 March 1949 (1949-03-15) * figures *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	5 April 2017	Zanghi, Amedeo

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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05-04-2017

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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