

Description

The present invention relates to an assembly of an elongated container and a plug therefor such as, for example, an assembly or a vacuum bottle and a plug therefor designed to maintain the desired temperature of contents.

A conventional container and plug assembly such as is disclosed in US-A-2934231 and EP-A-147165, which is part of the state of the art according to Article 54.3 EPC, comprises an elongated container having a closed longitudinal one end and the other longitudinal end and a plug for the container. The container has a receiving space defined at the longitudinal one end for receiving contents such as, for example, hot or cold drinks, and an opening defined at the other longitudinal end. The contents are filled into the receiving space and are discharged therefrom through the opening. An annular ridge having a rounded annular top is formed between the opening and the receiving space and has a circumferential sealing surface defined at a flank of the annular ridge which faces to the opening.

The plug has one and the other axial ends and is threadedly engageable with the container so as to open and close the opening by the axial one end of the plug. An annular sealing member is carried on the other axial end of the plug.

The annular ridge having defined on the flank thereof the circumferential sealing surface is formed at a location spaced from the opening toward the receiving space a predetermined distance sufficient to provide a satisfactory heat insulation. With the opening being closed by the axial one end of the plug, the sealing member carried on the other axial end of the plug is in sealing contact with the circumferential sealing surface on the annular ridge, to thereby provide the heat insulation together with a fluid tightness.

However, in order to bring the sealing member carried on the other axial end of the plug into sealing contact with the circumferential sealing surface on the annular ridge simultaneously with the closure of the opening by the axial one end of the plug, it is required to manufacture the container and the plug so as to accurately position the annular ridge with respect to the opening and so as to accurately position the sealing member with respect to the axial one end of the plug. This inevitably necessitates severe manufacturing tolerances for the container and the plug, resulting in the increase in manufacturing cost of the container and plug assembly.

Accordingly, the present invention provides a container and plug assembly comprising: an elongated container having a first closed longitudinal end and a second longitudinal end, said con-

tainer having a receiving space defined at said first longitudinal end for receiving therein contents, an opening defined at said second longitudinal end, the contents being filled into said receiving space and discharged therefrom through said opening, and an annular ridge formed at a location spaced a predetermined distance from said opening toward said receiving space, said annular ridge defining a throat having a diameter less than that of said opening, said receiving space being in communication with said opening through said throat, said ridge having a first, circumferentially continuous, planar sealing surface extending substantially longitudinally of said container over a predetermined distance; a plug having first and second axial ends and being threadedly engageable with said container so as to open and close said opening by the first axial end of said plug, said plug having first annular resilient sealing means carried on the second axial end of said plug for sealing contact with said planar sealing surface, a circumferentially continuous, second sealing surface formed on said container adjacent to said opening and second sealing means carried on said plug adjacent to the first axial end thereof, said first sealing means being in sealing contact with said first-mentioned sealing surface with said second sealing means being in sealing contact with said second sealing surface to close said opening; characterized in that the first sealing means is of cruciform cross-section and comprises an annular body fitted in the second axial end of said plug, an annular projection extending radially inwardly from the body in perpendicular relation thereto, and a resilient annular projection of slightly larger diameter than that of said throat extending radially outwardly from said annular body and having an annular free end in intimate contact with the first sealing surface, the first sealing means being of sufficient flexibility and resiliency and being configured and dimensioned such that first sealing means is subject only to a force directed substantially radially inwardly from the first sealing surface with said second sealing means being in sealing contact with said second sealing surface to close said opening.

The present invention is further described hereinafter, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a partially broken-away, cross-sectional view showing a container and plug assembly in accordance with an embodiment of the present invention;

Fig. 2 is a fragmental cross-sectional view showing the container and plug assembly illustrated in Fig. 1 in which an opening in a container is opened by the loosening of a plug, with the cup-shaped closure being removed;

Fig. 3 is a fragmental cross-sectional view show-

ing a container and plug assembly in accordance with another embodiment of the present invention, with a cup-shaped closure being removed; and

Fig. 4 is a fragmental cross-sectional view showing a container and plug assembly in accordance with a still further embodiment of the present invention.

Referring to Figs. 1 and 2, a container and plug assembly in accordance with an embodiment of the present invention comprises an elongated container, generally designated by the reference numeral 10, and a plug, generally designated by the reference numeral 50. The container and plug assembly is illustrated as being assembly of a portable vacuum bottle and a plug therefor.

The container 10 includes a container body, generally designated by the reference numeral 11, which comprises a metallic inner wall member 12 having a closed longitudinal one end 13 or bottom and a metallic outer wall member 14 having a closed longitudinal one end 15 or bottom. The inner and outer wall members 12 and 14 are made of stainless steel, for example, and are welded to each other at an annular projection 16 and cooperate with each other to define therebetween a vacuum heat-insulating space 17, a receiving space 18 for contents such as hot or cold drinks, and a cylindrical head portion 19 defining therein a portion of a mouth 20. A body portion 7 of the wall 12 is gradually reduced in diameter and is connected to the head portion 19 in an integral manner to form a tapered portion 21. An annular ridge 22 is formed at the connection between the head portion 19 and the body portion 7 and defines a throat 23 through which the mouth 20 is in communication with the receiving space 18. The throat 23 has a circumferentially continuous, planar sealing surface 24 extending substantially longitudinally of the container 10 a predetermined distance L. The planar sealing surface 24 may have a cylindrical shape or may be slightly tapered so as to converge toward the receiving space 18.

A generally frusto-conical shoulder member made of synthetic resin, generally designated by the reference numeral 30, has at axial one end thereof an annular groove 31 which is snap-fitted on an annular bead 32 on the outer wall member 14. The shoulder member 30 has at the other axial end thereof an end wall 33 having formed thereon a circumferentially continuous sealing surface 34 slightly tapered so as to converge toward the container body 11, and a pair of inner and outer cylindrical walls 35 and 36 extending from the end wall 33 toward the container body 11 in concentric relation to each other. The inner and outer walls 35 and 36 define therebetween an annular channel into which the annular projection 16 of the con-

tainer body 11 is snugly fitted through an annular resilient sealing member 37 having a U-shaped cross-section. Thus, the shoulder member 30 is fluid-tightly mounted on the container body 11. The inner cylindrical wall 35 of the shoulder member 30 has an inner surface which defines the remaining portion of the mouth 20. A female thread 38 is formed on the inner surface of the inner cylindrical wall 35. An opening 40 is defined at the junction between the sealing surface 34 and the inner surface of the inner cylindrical wall 35. The opening 40 is in communication with the receiving space 18 through the mouth 20 and the throat 23 so that the contents are filled into the receiving space 18 and are discharged therefrom through the opening 40. The annular ridge 22 having formed thereon the annular sealing surface 24 is formed on the inner wall member 12 at a location spaced from the opening 40 toward the receiving space 18 a predetermined distance sufficient to provide a satisfactory heat insulation. The throat 23 defined by the annular ridge 22 is disposed in coaxial relation to the opening 40 and has a diameter less than that of the opening 40.

The plug 50 comprises a cylindrical body 51 and an enlarged disc-like head 52 integrally connected to axial one end thereof. The cylindrical body 51 has formed on a circumferential surface thereof a male thread 53 which is threadedly engageable with the female thread 38 on the shoulder member 30. The enlarged head 52 has a cylindrical gripping surface which is adapted to be gripped by a user's hand when it is desired to loosen or tighten the plug 50 threadedly engaged with the shoulder member 30, to open or close the opening 40, respectively. An O-ring seal 55 made of resilient material is snugly fitted in an annular groove 56 formed at the connection between the enlarged head 52 and the cylindrical body 51. The O-ring seal 55 is into sealing contact with the sealing surface 34 when the plug 50 threadedly engaged with the shoulder member 30 is tightened, to fluid-tightly close the opening 40. The cylindrical body 51 has the other axial free end which is reduced in diameter to form a cylindrical tip 57 having a diameter less than that of the throat 23. The cylindrical tip 57 has formed in a circumferential surface thereof an annular groove 58 which has a rectangular cross-sectional shape. An integral annular sealing member, generally designated by the reference numeral 60, made of natural rubber or synthetic rubber such as, for example, silicone rubber, has a cylindrical body 61, an annular projection 62 extending radially inwardly from the body 61 in perpendicular relation thereto and an annular projection 63 extending radially outwardly from the body 61 in perpendicular relation thereto. The annular projection 63 has an annular free end

which has a free diameter slightly greater than that of the throat 23 and which is in sealing contact with the planar sealing surface 24 on the throat 23 with the O-ring seal 55 being in sealing contact with the sealing surface 34 on the shoulder member 50 to close the opening 40. The annular projection 63 of the sealing member 60 has sufficient flexibility and resiliency and is configured and dimensioned such that the annular projection 63 is subjected only to a force directed substantially radially inwardly from the sealing surface 24 when the annular projection 63 is in sealing contact with the planar sealing surface 24 with the O-ring seal 55 being in sealing contact with the sealing surface 34 to close the opening 40.

The cylindrical body 51 of the plug 50 has formed in the circumferential surface of the cylindrical body 51 an axial recess which defines a passage 65 allowing the contents to be discharged from the receiving space 18 through the throat 23, the passage 65 and the opening 40 when the plug 50 threadedly engaged with the shoulder member 30 is slightly loosened to move the O-ring seal 55 and the sealing member 60 out of contact with the sealing surfaces 34 and 24, respectively, as shown in Fig. 2.

Referring again to Fig. 1, a cup-shaped closure 70 made of synthetic resin has an open end thereof which is threadedly engageable at 71 with the shoulder member 30. When the cup-shaped closure 70 is loosened and removed from the shoulder member 30, the closure 70 can serve as a cup. The closure 70 has formed on the open end a pair of diametrically opposed lugs 72 for the attachment of a strap, not shown.

Fig. 3 shows a container and plug assembly in accordance with another embodiment of the present invention. In Fig. 3, like reference numerals are used to designate components and parts like those of the embodiment shown in Figs. 1 and 2, and the description of such like components and parts will be omitted for the purpose of simplification.

A plug 150 comprises a cylindrical body 151 and an enlarged disc-like head 152 integrally connected to axial one end of the body 151. The enlarged head 152 has formed on a cylindrical circumferential surface thereof a male thread 153. A shoulder member 130 includes a substantially cylindrical wall 139 projecting from an end wall 133 in the direction opposite to the container body 11. The cylindrical wall 139 has formed on an inner surface thereof a female thread 138 which is threadedly engageable with the male thread 153 on the plug 150. The cylindrical body 151 of the plug 150 has a diameter less than that of the mouth 20 defined by the head portion 19 of the inner wall member 12 of the container body 11 and an inner

surface of a cylindrical wall 135 of the plug 130, to thereby define an annular passage 165 for allowing the contents to be discharged from the receiving space 18 through the throat 23, the passage 165 and an opening 140 defined at the junction between a sealing surface 134 and the inner surface of the cylindrical wall 135 of the shoulder member 130, when the plug 130 is slightly loosened to move the O-ring seal 55 and the sealing member 60 out of contact with the sealing surfaces 134 and 24, respectively.

Fig. 4 shows a still further embodiment of the present invention. In Fig. 4, like reference numerals are used to designate components and parts like those of the embodiment shown in Figs. 1 and 2, and the description of such like components and parts will be omitted for the purpose of simplification.

A container body 211 comprises inner and outer stainless steel wall members 212 and 214 which are welded at 216 to each other and cooperate with each other to define therebetween a vacuum heat-insulating space 217. The inner wall member 212 defines therein a receiving space 218, a throat 233 and a mouth 220. A shoulder member 230 does not include a wall corresponding to the inner cylindrical wall of the shoulder member 30 shown in Figs. 1 and 2, and the shoulder member 230 defines therein only an opening 240 which is closed by the O-ring seal 55 carried on the plug 50 when the O-ring seal 55 and the sealing member 60 are in sealing contact with a sealing surface 234 formed on an end wall 233 of the shoulder member 230 and a planar sealing surface 224 defined at the throat 223 by an annular ridge 222, respectively. The mouth 220 has formed thereon a female thread 238 with which the male thread 53 on the plug 50 is threadedly engageable.

Experimental Results

Experiments were conducted to ascertain heat insulation and liquid tightness of the container and plug assembly shown in Fig. 4 in which the receiving space 218 has a volume of 0.5 liter and the inner and outer wall members 212 and 214 are made of stainless steel.

(1) Heat Insulation

The container was filled with hot water of 95 degrees C and was closed by the plug 50. The container and plug assembly was left under room temperature of 20 ± 2 degrees C for 24 hours. Thereafter, the temperature of the hot water was measured. The experiments were conducted on each of a case (A) where the container was maintained upstanding, i.e., at a normal attitude and a

case (B) where the case was maintained laid down. The measured temperature of the hot water in the case (A) was 53 degrees C and the measured temperature of the hot water in the case (B) was also 53 degrees C. From the experimental results, it was able to be ascertained that the container and plug assembly shown in Fig. 4 had a superior heat insulation even in the case where the container and plug assembly was maintained laid down and was particularly useful as a container and plug assembly of a portable type.

(2) Liquid Tightness

The container was filled with water, and the plug was tightened under a normal tightening force. The container and plug assembly was set on a vibratory testing machine with the assembly being maintained laid down thereon and, thereafter, vertical vibration was imparted to the assembly 10,000 times under the conditions of 1G and 8 to 50 Hz. After the experiments, it was inspected whether or not water leaked out of the container and plug assembly. The inspection did not indicate any water leakage, and it was able to be ascertained that the container and plug assembly had a superior liquid tightness.

As described above, the container and plug assembly in accordance with the present invention is constructed such that the throat 23, 223 has the planar sealing surface 24, 224 extending substantially longitudinally of the container 10 a predetermined distance L, and the sealing member 60 carried on axial one end of the plug 50, 150 is in sealing contact with the planar sealing surface 24, 224 with the opening 40, 140, 240 of the container being closed by the other axial end of the plug 50, 150. This construction of the present invention accommodates manufacturing dimensional errors in the position of the annular ridge 22, 122 from the opening 40, 140, 240 and the position of the sealing member 60 from the other axial end of the plug 50, 150, to the extent corresponding to the predetermined distance L of the planar sealing surface 24, 224. This enables the manufacture of the container and plug assembly to be rendered easy to reduce the manufacturing cost.

In addition, in the embodiments shown in Figs. 1 through 4, the O-ring seal 55 is carried on the plug 50, 150 at a location adjacent to an axial end of the plug opposite to an axial end thereof on which the sealing member 60 is carried. The sealing member 60 is in sealing contact with the planar sealing surface 24, 224 with the O-ring seal 55 being in sealing contact with the sealing surface 34, 134, 234 defined adjacent to the opening 40, 140, 240, to thereby provide reliable heat insulation and fluid tightness.

Furthermore, in the embodiment illustrated in Figs. 1 through 4, the sealing member 60 is constructed so as to comprise the cylindrical body 61 snugly fitted on the cylindrical tip 57 of the body 51, 151 of the plug 50, 150, and the annular projection 62 snugly fitted in the annular groove 58. This construction of the sealing member 60 enables the same to be reliably retained on the plug 50, 150 even if the annular projection 63 of the sealing member 60 is subjected to a force longitudinally of the container 10.

Moreover, in the embodiments shown in Figs. 1 through 3 in which the plug 50, 150 is threadedly engageable with the female thread 38, 138 on the shoulder member 30, 130, a reaction force due to the resilient contact of the sealing member 60 with the planar sealing surface 24 is not substantially transmitted to the shoulder member 30, 130 through the plug 50, 150 when the sealing member 60 is in sealing contact with the planar sealing surface 24. This is because the annular projection 63 extending radially outwardly from the annular body 61 of the sealing member 60 has the annular free end in intimate contact with the planar sealing surface 24 such that the sealing member 60 is subjected only to a force directed substantially radially inwardly from the planar sealing surface 24 with the O-ring seal 55 being in sealing contact with the sealing surface 34, 134 to close the opening 40, 140. Thus, the shoulder member 30, 130 threadedly engaged with the plug 50, 150 can be prevented from being urged away from the container body 11 by the reaction force from the sealing surface 24 to damage the fluid tightness between the shoulder member 30, 130 and the container body 11 at the sealing member 16.

Additionally, in the embodiment shown in Fig. 4 in which the female thread 238 with which the male thread 53 on the plug 50 engages is formed on the inner wall member 214 of the container body 211, the plug 50 can be threadedly engaged with the inner wall member 214 such that the axis of the plug 50 is aligned with the longitudinal axis of the inner wall member 212, to thereby make reliable the sealing contact of the sealing member 60 with the planar sealing surface 224.

The preferred embodiments of the present invention have been described. However, the present invention should not be limited to the above embodiments. It should be appreciated that various changes and modifications can be made to the illustrated embodiments.

For example, the outer wall member 14, 214 may be made of synthetic resin.

Claims

1. A container and plug assembly comprising:



case (B) where the case was maintained laid down. The measured temperature of the hot water in the case (A) was 53 degrees C and the measured temperature of the hot water in the case (B) was also 53 degrees C. From the experimental results, it was able to be ascertained that the container and plug assembly shown in Fig. 4 had a superior heat insulation even in the case where the container and plug assembly was maintained laid down and was particularly useful as a container and plug assembly of a portable type.

(2) Liquid Tightness

The container was filled with water, and the plug was tightened under a normal tightening force. The container and plug assembly was set on a vibratory testing machine with the assembly being maintained laid down thereon and, thereafter, vertical vibration was imparted to the assembly 10,000 times under the conditions of 1G and 8 to 50 Hz. After the experiments, it was inspected whether or not water leaked out of the container and plug assembly. The inspection did not indicate any water leakage, and it was able to be ascertained that the container and plug assembly had a superior liquid tightness.

As described above, the container and plug assembly in accordance with the present invention is constructed such that the throat 23, 223 has the planar sealing surface 24, 224 extending substantially longitudinally of the container 10 a predetermined distance L , and the sealing member 60 carried on axial one end of the plug 50, 150 is in sealing contact with the planar sealing surface 24, 224 with the opening 40, 140, 240 of the container being closed by the other axial end of the plug 50, 150. This construction of the present invention accommodates manufacturing dimensional errors in the position of the annular ridge 22, 122 from the opening 40, 140, 240 and the position of the sealing member 60 from the other axial end of the plug 50, 150, to the extent corresponding to the predetermined distance L of the planar sealing surface 24, 224. This enables the manufacture of the container and plug assembly to be rendered easy to reduce the manufacturing cost.

In addition, in the embodiments shown in Figs. 1 through 4, the O-ring seal 55 is carried on the plug 50, 150 at a location adjacent to an axial end of the plug opposite to an axial end thereof on which the sealing member 60 is carried. The sealing member 60 is in sealing contact with the planar sealing surface 24, 224 with the O-ring seal 55 being in sealing contact with the sealing surface 34, 134, 234 defined adjacent to the opening 40, 140, 240, to thereby provide reliable heat insulation and fluid tightness.

Furthermore, in the embodiment illustrated in Figs. 1 through 4, the sealing member 60 is constructed so as to comprise the cylindrical body 61 snugly fitted on the cylindrical tip 57 of the body 51, 151 of the plug 50, 150, and the annular projection 62 snugly fitted in the annular groove 58. This construction of the sealing member 60 enables the same to be reliably retained on the plug 50, 150 even if the annular projection 63 of the sealing member 60 is subjected to a force longitudinally of the container 10.

Moreover, in the embodiments shown in Figs. 1 through 3 in which the plug 50, 150 is threadedly engageable with the female thread 38, 138 on the shoulder member 30, 130, a reaction force due to the resilient contact of the sealing member 60 with the planar sealing surface 24 is not substantially transmitted to the shoulder member 30, 130 through the plug 50, 150 when the sealing member 60 is in sealing contact with the planar sealing surface 24. This is because the annular projection 63 extending radially outwardly from the annular body 61 of the sealing member 60 has the annular free end in intimate contact with the planar sealing surface 24 such that the sealing member 60 is subjected only to a force directed substantially radially inwardly from the planar sealing surface 24 with the O-ring seal 55 being in sealing contact with the sealing surface 34, 134 to close the opening 40, 140. Thus, the shoulder member 30, 130 threadedly engaged with the plug 50, 150 can be prevented from being urged away from the container body 11 by the reaction force from the sealing surface 24 to damage the fluid tightness between the shoulder member 30, 130 and the container body 11 at the sealing member 16.

Additionally, in the embodiment shown in Fig. 4 in which the female thread 238 with which the male thread 53 on the plug 50 engages is formed on the inner wall member 214 of the container body 211, the plug 50 can be threadedly engaged with the inner wall member 214 such that the axis of the plug 50 is aligned with the longitudinal axis of the inner wall member 212, to thereby make reliable the sealing contact of the sealing member 60 with the planar sealing surface 224.

The preferred embodiments of the present invention have been described. However, the present invention should not be limited to the above embodiments. It should be appreciated that various changes and modifications can be made to the illustrated embodiments.

For example, the outer wall member 14, 214 may be made of synthetic resin.

Claims

1. A container and plug assembly comprising:



an elongated container (10) having a first closed longitudinal end (13) and a second longitudinal end (19), said container having a receiving space (18) defined at said first longitudinal end for receiving therein contents, an opening (40) defined at said second longitudinal end, the contents being filled into said receiving space and discharged therefrom through said opening, and an annular ridge (22) formed at a location spaced a predetermined distance from said opening (29) toward said receiving space, said annular ridge defining a throat (23) having a diameter less than that of said opening (40), said receiving space (18) being in communication with said opening through said throat (23), said ridge (22) having a first, circumferentially continuous, planar sealing surface (24) extending substantially longitudinally of said container over a predetermined distance; a plug (50) having first and second axial ends and being threadedly engageable with said container (10) so as to open and close said opening (40) by the first axial end of said plug, said plug having first annular resilient sealing means (60) carried on the second axial end of said plug for sealing contact with said planar sealing surface (24), a circumferentially continuous, second sealing surface (34) formed on said container adjacent to said opening (40) and second sealing means (55) carried on said plug adjacent to the first axial end thereof, said first sealing means (60) being in sealing contact with said first-mentioned sealing surface (24) with said second sealing means (55) being in sealing contact with said second sealing surface (34) to close said opening (20); characterized in that the first sealing means (60) is of cruciform cross-section and comprises an annular body (61) fitted in the second axial end of said plug, an annular projection (62) extending radially inwardly from the body (61) in perpendicular relation thereto, and a resilient annular projection (63) of slightly larger diameter than that of said throat (23) extending radially outwardly from said annular body and having an annular free end in intimate contact with the first sealing surface (24), the first sealing means (60) being of sufficient flexibility and resiliency and being configured and dimensioned such that said first sealing means (60) is subject only to a force directed substantially radially inwardly from the first sealing surface (24) with said second sealing means (55) being in sealing contact with said second sealing surface (34) to close said opening.

2. A container and plug assembly defined in Claim 1, wherein said container has a substantially cylindrical mouth (20) extending between said opening (40) and said throat (23) and female thread (38) formed on said mouth, said plug (50) being threadedly engageable with said thread on said mouth.
3. A container and plug assembly defined in Claim 2, wherein said container comprises a container body (11) having defined therein said receiving space (18), said throat (23) and a portion of said mouth (20), and a shoulder member (30) fluid-tightly mounted on said container body (11) so as to define said opening and the remaining portion of said mouth, said second sealing surface (34) and said female thread (38) being formed on said shoulder member (30).
4. A container and plug assembly defined in Claim 3, wherein said plug (50) comprises a cylindrical body (51) and an enlarged head (52) connected to one end of said cylindrical body, the first sealing means (60) being carried on the other axial end of said cylindrical body, said second sealing means (55) being carried at a connection between said cylindrical body (51) and said enlarged head (52), said cylindrical body having formed on a circumferential surface thereof a male thread (53) threadedly engageable with said female thread (38) on said shoulder member (30).
5. A container and plug assembly defined in claim 4, wherein said cylindrical body (51) of said plug (50) has formed therein an axial recess (65) defining a passage for allowing the contents to be discharged from said receiving space (18) through said throat (23), said passage and said opening (40) when said plug is loosened to move the first sealing means (60) and said second sealing means (55) out of contact with the first sealing surface (24) and said second sealing surface (34), respectively.
6. A container and plug assembly defined in claim 1, wherein said container has a substantially cylindrical mouth (20) extending between said opening (40) and said throat (23), said container comprising a container body (11) having defined therein said receiving space (18), said throat (23) and a portion of said mouth (20), and a shoulder member (30) fluid-tightly mounted on said container body so as to define said opening and the remaining portion of said mouth, said shoulder member having formed thereon said second sealing sur-



face (34) and having a female thread (38) formed on that portion of said shoulder member which is located opposite to said mouth with respect to said opening, said plug (50) being threadedly engageable with said female thread on said shoulder member.

7. A container and plug assembly defined in claim 6, wherein said plug (150) comprises a cylindrical body (151) and an enlarged head (152) connected to one end of said cylindrical body, the first sealing means (60) being carried on the other axial end of said cylindrical body, said second sealing means (55) being carried at a connection between said cylindrical body (151) and said enlarged head (152), said enlarged head having formed on a cylindrical circumferential surface thereof a male thread (153) threadedly engageable with said female thread (138) on said shoulder member (130).
8. A container and plug assembly defined in claim 7, wherein said cylindrical body (151) of said plug (150) has a diameter less than that of said mouth (20) to define therebetween an annular passage (165) for allowing the contents to be discharged from said receiving space (18) through said throat (23), said annular passage and said opening when said plug is loosened to move the first sealing means (60) and said second sealing means (55) out of contact with the first sealing surface (24) and said second sealing surface (134), respectively.
9. A container and plug assembly defined in claim 2, wherein said container (10) comprises a container body (211) having defined therein said receiving space (218), said throat (223) and said mouth (220), and a shoulder member (230) fluid-tightly mounted on said container body so as to define said opening, said shoulder member having formed thereon said second sealing surface (234).
10. A container and plug assembly defined in claim 9 wherein said plug (50) comprises a cylindrical body and an enlarged head (51) connected to an axial one end of said cylindrical body, the first sealing means (60) being carried on the other axial end of said cylindrical body, said second sealing means (55) being carried at the connection between said cylindrical body and said enlarged head (51), said cylindrical body having formed on a circumferential surface thereof a male thread (53) threadedly engageable with said female thread (238) on said mouth (220) in said container

body.

11. A container and plug assembly defined in claim 10, wherein said cylindrical body of said plug (50) has formed therein an axial recess (65) defining a passage for allowing the contents to be discharged from said receiving space (218) through said throat (223), said passage and said opening (24) when said plug is loosened to move the first sealing means (60) and said second sealing means (55) out of contact with the first sealing surface (224) and said second sealing surface (234), respectively.
12. A container and plug assembly defined in any one of claims 5, 8 and 11, wherein said container body (11) comprises a metallic wall member (12, 112, 212) and a metallic outer member (14, 114, 214) connected to each other and cooperating with each other to define therebetween a vacuum heat-insulating space.
13. A container and plug assembly defined in claim 12, wherein said shoulder member (30, 130, 230) is made of a synthetic resin.
14. A container and plug assembly defined in claim 13, wherein the first sealing member (60) is made of any one of natural rubber and silicone rubber.
15. A container and plug assembly defined in claim 14, wherein the first sealing surface (24, 124, 224) has a cylindrical shape.
16. A container and plug assembly defined in claim 14, wherein the first sealing surface (24, 124, 224) is slightly tapered so as to converge toward said receiving space (18, 218).

Revendications

1. Ensemble à récipient et bouchon comprenant: un récipient allongé (10) présentant une première extrémité (13) longitudinale fermée et une deuxième extrémité (19) longitudinale, ledit récipient présentant un espace (18) de réception défini à ladite première extrémité longitudinale pour recevoir dans celui-ci un contenu, une ouverture (40) définie à ladite deuxième extrémité longitudinale, le contenu étant versé dans ledit espace de réception et en étant déversé à travers ladite ouverture, et une nervure annulaire (22) formée à un emplacement espacé par une distance prédéterminée de ladite ouverture (20) en direction dudit espace de réception, ladite nervure annulaire dé-



finissant une gorge (23) d'un diamètre inférieur à celui de ladite ouverture (40), ledit espace (18) de réception étant en communication avec ladite ouverture à travers ladite gorge (23), ladite nervure (22) présentant une première surface plane (24) d'étanchéité, continue de manière circonférentielle, s'étendant sensiblement longitudinalement par rapport audit récipient sur une distance prédéterminée ; un bouchon (50) présentant des première et deuxième extrémités axiales et étant capable d'engagement par filetage avec ledit récipient (10) de manière à ouvrir et fermer ladite ouverture (40) par la première extrémité axiale dudit bouchon, ledit bouchon présentant un premier moyen (60) d'étanchéité résilient annulaire porté sur la deuxième extrémité axiale dudit bouchon pour établir un contact d'étanchéité avec ladite surface plane (24) d'étanchéité, une deuxième surface plane (34) d'étanchéité, continue de manière circonférentielle, formée sur ledit récipient adjacent à ladite ouverture (40) et un deuxième moyen (55) d'étanchéité porté sur ledit bouchon adjacent à la première extrémité axiale de celui-ci, ledit premier moyen (60) d'étanchéité étant en contact d'étanchéité avec ladite première surface (24) d'étanchéité mentionnée, le deuxième moyen (55) d'étanchéité étant en contact d'étanchéité avec ladite deuxième surface (34) d'étanchéité pour fermer ladite ouverture (20) ; caractérisé en ce que le premier moyen (60) d'étanchéité présente une section transversale cruciforme et comprend un corps annulaire (61) monté dans la deuxième extrémité axiale dudit bouchon, une saillie annulaire (62) s'étendant radialement vers l'intérieur à partir du corps (61) en relation perpendiculaire par rapport à celui-ci, et une saillie (63) annulaire résiliente, de diamètre légèrement supérieur à celui de ladite gorge (23), s'étendant radialement vers l'extérieur à partir du corps annulaire et présentant une extrémité annulaire libre en contact intime avec la première surface (24) d'étanchéité, le premier moyen (60) d'étanchéité ayant une souplesse et une résilience suffisantes et étant configuré et dimensionné de telle sorte que ledit premier moyen (60) d'étanchéité est soumis uniquement à une force dirigée sensiblement radialement vers l'intérieur à partir de la première surface (24) d'étanchéité, ledit deuxième moyen (55) d'étanchéité étant en contact d'étanchéité avec ladite deuxième surface (34) d'étanchéité pour fermer ladite ouverture.

2. Ensemble à récipient et bouchon défini à la revendication 1, dans lequel ledit récipient pré-

sente une embouchure (20) sensiblement cylindrique s'étendant entre ladite ouverture (40) et ladite gorge (23) et un filetage (38) intérieur formé sur ladite embouchure, ledit bouchon (50) étant capable d'engagement par filetage avec ledit filetage sur ladite embouchure.

3. Ensemble à récipient et bouchon défini à la revendication 2, dans lequel ledit récipient comprend un corps (11) de récipient présentant, définis dans celui-ci, ledit espace (18) de réception, ladite gorge (23) et une partie de ladite embouchure (20), et un membre (30) d'épaulemont monté de manière hermétique sur ledit corps (11) de récipient de manière à définir ladite ouverture et la partie restante de ladite embouchure, ladite deuxième surface (34) d'étanchéité et ledit filetage (38) intérieur étant formés sur ledit membre (30) d'épaulemont.
4. Ensemble à récipient et bouchon défini à la revendication 3, dans lequel ledit bouchon (50) comprend un corps cylindrique (51) et une tête élargie (52) reliée à une extrémité dudit corps cylindrique, le premier moyen (60) d'étanchéité étant porté sur l'autre extrémité axiale dudit corps cylindrique, ledit deuxième moyen (55) d'étanchéité étant porté à une jonction entre ledit corps cylindrique (51) et ladite tête élargie (52), ledit corps cylindrique présentant, formé sur une surface circonférentielle de celui-ci, un filetage (53) extérieur capable d'engagement par filetage avec un filetage (38) intérieur sur ledit membre (30) d'épaulemont.
5. Ensemble à récipient et bouchon défini à la revendication 4, dans lequel ledit corps cylindrique (51) dudit bouchon (50) présente, formé dans celui-ci, un évidement axial (65) définissant un passage pour permettre au contenu d'être déversé dudit espace (18) de réception à travers ladite gorge (23), ledit passage et ladite ouverture (40) lorsque ledit bouchon est desserré pour déplacer le premier moyen (60) d'étanchéité et ledit deuxième moyen (55) d'étanchéité hors de contact avec la première surface (24) d'étanchéité et la deuxième surface (34) d'étanchéité, respectivement.
6. Ensemble à récipient et bouchon défini à la revendication 1, dans lequel ledit récipient présente une embouchure (20) sensiblement cylindrique s'étendant entre ladite ouverture (40) et ladite gorge (23), ledit récipient comprenant un corps (11) de récipient présentant, définis dans celui-ci, ledit espace (18) de réception, ladite gorge (23) et une partie de ladite em-



bouchure (20), et un membre (30) d'épaule-
ment monté de manière hermétique sur ledit
corps de récipient de manière à définir ladite
ouverture et la partie restante de ladite embou-
chure, ledit membre d'épaulement présentant,
formée sur celui-ci, ladite deuxième surface
(34) d'étanchéité et présentant un filetage (38)
intérieur formé sur la partie dudit membre
d'épaulement qui est située en face de ladite
embouchure par rapport à ladite ouverture, le-
dit bouchon (50) étant capable d'engagement
par filetage avec ledit filetage intérieur sur ledit
membre d'épaulement.

7. Ensemble à récipient et bouchon défini à la
revendication 6, dans lequel ledit bouchon
(150) comprend un corps cylindrique (151) et
une tête élargie (152) reliée à une extrémité
dudit corps cylindrique, le premier moyen (60)
d'étanchéité étant porté sur l'autre extrémité
axiale dudit corps cylindrique, ledit deuxième
moyen (55) d'étanchéité étant porté à une
jonction entre ledit corps cylindrique (151) et
ladite tête élargie (152), ladite tête élargie pré-
sentant, formé sur une surface circonférentielle
cylindrique de celle-ci, un filetage (153) exté-
rieur capable d'engagement par filetage avec
ledit filetage (138) intérieur sur ledit membre
(130) d'épaulement.

8. Ensemble à récipient et bouchon défini à la
revendication 7, dans lequel ledit corps cylin-
drique (151) dudit bouchon (150) est d'un dia-
mètre inférieur à celui de ladite embouchure
(20) pour définir entre ceux-ci un passage an-
nulaire (165) pour permettre au contenu d'être
déversé dudit espace (18) de réception à tra-
vers ladite gorge (23), ledit passage annulaire
et ladite ouverture lorsque ledit bouchon est
desserré pour déplacer le premier moyen (60)
d'étanchéité et ledit deuxième moyen (55)
d'étanchéité hors de contact avec la première
surface (24) d'étanchéité et ladite deuxième
surface (134) d'étanchéité respectivement.

9. Ensemble à récipient et bouchon défini à la
revendication 2, dans lequel ledit récipient (10)
comprend un corps (211) de récipient présen-
tant, définis dans celui-ci, ledit espace (218) de
réception, ladite gorge (223) et ladite embou-
chure (220), et un membre (230) d'épaulement
monté de manière hermétique sur ledit corps
de récipient de manière à définir ladite ouver-
ture, ledit membre d'épaulement présentant,
formée sur celui-ci, ladite deuxième surface
(234) d'étanchéité.

10. Ensemble à récipient et bouchon défini à la

revendication 9, dans lequel ledit bouchon (50)
comprend un corps cylindrique et une tête
élargie (51) reliée à l'une des extrémités axia-
les du corps cylindrique, le premier moyen
(60) d'étanchéité étant porté sur l'autre extré-
mité axiale dudit corps cylindrique, ledit
deuxième moyen (55) d'étanchéité étant porté
à la jonction entre ledit corps cylindrique et
ladite tête élargie (51), ledit corps cylindrique
présentant, formé sur une surface circonféren-
tielle de celui-ci, un filetage (53) extérieur ca-
pable d'engagement par filetage avec un fileta-
ge (238) intérieur sur ladite embouchure (220)
dans ledit corps de récipient.

11. Ensemble à récipient et bouchon défini à la
revendication 10, dans lequel ledit corps cylin-
drique dudit bouchon (50) présente, formé
dans celui-ci, un évidement axial (65) définis-
sant un passage pour permettre au contenu
d'être déversé dudit espace (218) de réception
à travers ladite gorge (223), ledit passage et
ladite ouverture (24) lorsque ledit bouchon est
desserré pour déplacer le premier moyen (60)
d'étanchéité et ledit deuxième moyen (55)
d'étanchéité hors de contact avec la première
surface (224) d'étanchéité et ladite deuxième
surface (234) d'étanchéité respectivement.

12. Ensemble à récipient et bouchon défini à l'une
quelconque des revendications 5, 8 et 11,
dans lequel ledit corps (11) de récipient com-
prend un membre (12, 112, 212) à paroi métal-
lique et un membre (14, 114, 214) extérieur
métallique reliés l'un à l'autre et coopérant l'un
avec l'autre pour définir entre eux un espace
calorifuge sous vide.

13. Ensemble à récipient et bouchon défini à la
revendication 12, dans lequel ledit membre
(30, 130, 230) d'épaulement est en une résine
synthétique.

14. Ensemble à récipient et bouchon défini à la
revendication 13, dans lequel le premier mem-
bre (60) d'étanchéité est en l'une quelconque
des matières suivantes: caoutchouc naturel et
caoutchouc silicone.

15. Ensemble à récipient et bouchon défini à la
revendication 14, dans lequel la première sur-
face (24, 124, 224) d'étanchéité a une forme
cylindrique.

16. Ensemble à récipient et bouchon défini à la
revendication 14, dans lequel la première sur-
face (24, 124, 224) d'étanchéité est légèrement
effilée de manière à converger vers ledit espa-



ce (18, 218) de réception.

Patentansprüche

1. Einheit aus Behälter und Stopfen, umfassend:
 einen langgestreckten Behälter (10) mit einem
 ersten geschlossenen Längsende (13) und ei-
 nem zweiten Längsende (19), wobei der Behäl-
 ter folgendes aufweist: Einen am ersten Läng-
 sende gebildeten Aufnahmeraum (18) zur Auf-
 nahme eines Inhalts, eine am zweiten Läng-
 sende gebildete Öffnung (40), wobei der Inhalt
 durch die Öffnung in den Aufnahmeraum ge-
 füllt und daraus abgegeben wird, und einen an
 einer von der Öffnung (20) in Richtung auf den
 Aufnahmeraum zu um eine vorbestimmte
 Strecke beabstandeten Position geformten
 ringförmigen Grat (22), wobei der ringförmige
 Grat einen Hals (23) mit einem geringeren
 Durchmesser als dem der Öffnung (40) bildet,
 wobei der Aufnahmeraum (18) mit der Öffnung
 durch den Hals (23) in Verbindung steht, wobei
 der Grat (22) eine erste, in Umfangsrichtung
 durchgehende ebene Dichtungsfläche (24) auf-
 weist, welche sich im wesentlichen in Längs-
 richtung des Behälters über eine vorbestimmte
 Strecke erstreckt; einen Stopfen (50) mit einem
 ersten und einem zweiten axialen Ende und
 mit dem Behälter (10) gewindemäßig in Ein-
 griff bringbar, um die Öffnung (40) durch das
 erste axiale Ende des Stopfens zu öffnen und
 zu schließen, wobei der Stopfen eine auf dem
 zweiten axialen Ende des Stopfens getragene
 erste ringförmige federnde Dichtungseinrich-
 tung (60) für einen Dichtungskontakt mit der
 ebenen Dichtungsfläche (24) aufweist, eine an
 dem Behälter neben der Öffnung (40) gebilde-
 te, in Umfangsrichtung durchgehende zweite
 Dichtungsfläche (34) und eine an dem Stopfen
 neben dessen ersten axialen Ende getragene
 zweite Dichtungseinrichtung (55), wobei zum
 Schließen der Öffnung (20) die erste Dich-
 tungseinrichtung (60) in Dichtungskontakt mit
 der erstgenannten Dichtungsfläche (24) und
 die zweite Dichtungseinrichtung (55) in Dich-
 tungskontakt mit der zweiten Dichtungsfläche
 (34) steht; dadurch gekennzeichnet, daß die
 erste Dichtungseinrichtung (60) einen kreuzför-
 migen Querschnitt aufweist und einen im zwei-
 ten axialen Ende des Stopfens befestigten
 ringförmigen Körper (61) umfaßt, wobei sich
 ein ringförmiger Vorsprung (62) vom Körper
 (61) in senkrechter Beziehung zu diesem radial
 nach innen erstreckt, und wobei sich ein fe-
 dernder ringförmiger Vorsprung (63) mit einem
 geringfügig größeren Durchmesser als dem
 des Halses (23) von dem ringförmigen Körper
 radial nach außen erstreckt und ein in innigem

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Kontakt mit der ersten Dichtungsfläche (24)
 stehendes ringförmiges freies Ende aufweist,
 wobei die erste Dichtungseinrichtung (60) eine
 genügend große Elastizität und Federkraft auf-
 weist und von solcher Konfiguration und Ab-
 messung ist, daß die erste Dichtungseinrich-
 tung (60) nur einer von der ersten Dichtungs-
 fläche (24) im wesentlichen radial nach innen
 gerichteten Kraft ausgesetzt ist, wobei die
 zweite Dichtungseinrichtung (55) zum Schlie-
 ßen der Öffnung mit der zweiten Dichtungsflä-
 che (34) in Dichtungskontakt steht.

2. Einheit aus Behälter und Stopfen nach An-
 spruch 1, wobei der Behälter eine sich zwis-
 chen der Öffnung (40) und dem Hals (23)
 erstreckende, im wesentlichen zylindrische
 Mündung (20), sowie ein auf der Mündung
 geformtes Innengewinde (38) aufweist, wobei
 der Stopfen (50) mit dem Gewinde auf der
 Mündung gewindemäßig in Eingriff bringbar
 ist.

3. Einheit aus Behälter und Stopfen nach An-
 spruch 2, wobei der Behälter einen Behälter-
 körper (11) und darin gebildet den Aufnahme-
 raum (18), den Hals (23) und einen Abschnitt
 der Mündung (20), sowie ein fluiddicht an dem
 Behälterkörper (11) angebrachtes Schulterglied
 (30) aufweist, um die Öffnung und den restli-
 chen Abschnitt der Mündung zu bilden, wobei
 die zweite Dichtungsfläche (34) und das Innen-
 gewinde (38) an dem Schulterglied (30) ge-
 formt sind.

4. Einheit aus Behälter und Stopfen nach An-
 spruch 3, wobei der Stopfen (50) einen zylin-
 drischen Körper (51) und einen mit einem
 Ende des zylindrischen Körpers verbundenen
 verbreiterten Kopf (52) umfaßt, wobei die erste
 Dichtungseinrichtung (60) am anderen axialen
 Ende des zylindrischen Körpers getragen wird,
 wobei die zweite Dichtungseinrichtung (55) an
 einer Verbindung zwischen dem zylindrischen
 Körper (51) und dem verbreiterten Kopf (52)
 getragen wird, wobei auf einer Umfangsfläche
 des zylindrischen Körpers ein Außengewinde
 (53) geformt ist, welches mit dem Innengewin-
 de (38) an dem Schulterglied (30) gewindemä-
 ßig in Eingriff bringbar ist.

5. Einheit aus Behälter und Stopfen nach An-
 spruch 4, wobei im zylindrischen Körper (51)
 des Stopfens (50) eine Axialaussparung (65)
 geformt ist, welche einen Durchgang zum Er-
 möglichen des Abgebens des Inhaltes aus
 dem Aufnahmeraum (18) durch den Hals (23),
 den Durchgang und die Öffnung (40) bildet,



wenn der Stopfen gelöst wird, um die erste Dichtungseinrichtung (60) und die zweite Dichtungseinrichtung (550) aus dem Kontakt mit der ersten Dichtungsfläche (24) bzw. der zweiten Dichtungsfläche (34) zu bringen.

6. Einheit aus Behälter und Stopfen nach Anspruch 1, wobei der Behälter folgendes aufweist: Eine sich zwischen der Öffnung (40) und dem Hals (23) erstreckende im wesentlichen zylindrische Mündung (20), wobei der Behälter einen Behälterkörper (11) umfaßt, in dem der Aufnahmeraum (18), der Hals (23) und ein Abschnitt der Mündung (20) gebildet sind, und ein fluiddicht an dem Behälterkörper angebrachtes Schulterglied (30) zum Bilden der Öffnung und des restlichen Abschnittes der Mündung, wobei auf dem Schulterglied die zweite Dichtungsfläche (34) geformt ist und auf dem in bezug auf die Öffnung gegenüber der Mündung angeordneten Abschnitt des Schultergliedes ein Innengewinde (38) geformt ist, wobei der Stopfen (50) mit dem Innengewinde auf dem Schulterglied gewindemäßig in Eingriff bringbar ist.

7. Einheit aus Behälter und Stopfen nach Anspruch 6, wobei der Stopfen (150) einen zylindrischen Körper (151) und einen mit einem Ende des zylindrischen Körpers verbundenen verbreiterten Kopf (152) umfaßt, wobei die erste Dichtungseinrichtung (60) am anderen axialen Ende des zylindrischen Körpers getragen wird, wobei die zweite Dichtungseinrichtung (55) an einer Verbindung zwischen dem zylindrischen Körper (151) und dem verbreiterten Kopf (152) getragen wird, wobei auf einer zylindrischen Umfangsfläche des verbreiterten Kopfes ein Außengewinde (153) geformt ist, welches mit dem Innengewinde (138) an dem Schulterglied (130) gewindemäßig in Eingriff bringbar ist.

8. Einheit aus Behälter und Stopfen nach Anspruch 7, wobei der zylindrische Körper (151) des Stopfens (150) einen geringeren Durchmesser als den der Mündung (20) aufweist, um dazwischen einen ringförmigen Durchgang (165) zum Ermöglichen des Abgebens des Inhaltes aus dem Aufnahmeraum (18) durch den Hals (23), den ringförmigen Durchgang und die Öffnung zu bilden, wenn der Stopfen gelöst wird, um die erste Dichtungseinrichtung (60) und die zweite Dichtungseinrichtung (55) aus dem Kontakt mit der ersten Dichtungsfläche (24) bzw. der zweiten Dichtungsfläche (134) zu bringen.

9. Einheit aus Behälter und Stopfen nach Anspruch 2, wobei der Behälter (10) einen Behälterkörper (211), in dem der Aufnahmeraum (218), der Hals (223) und die Mündung (220) gebildet sind, und ein fluiddicht an dem Behälterkörper angebrachtes Schulterglied (230) zum Bilden der Öffnung umfaßt, wobei auf dem Schulterglied die zweite Dichtungsfläche (234) geformt ist.

10. Einheit aus Behälter und Stopfen nach Anspruch 9, wobei der Stopfen (50) einen zylindrischen Körper und einen mit einem axialen Ende des zylindrischen Körpers verbundenen verbreiterten Kopf (51) umfaßt, wobei die erste Dichtungseinrichtung (60) am anderen axialen Ende des zylindrischen Körpers getragen wird, wobei die zweite Dichtungseinrichtung (55) an der Verbindung zwischen dem zylindrischen Körper und dem verbreiterten Kopf (51) getragen wird, wobei auf einer Umfangsfläche des zylindrischen Körpers ein Außengewinde (53) geformt ist, welches mit dem Innengewinde (238) an der Mündung (220) in dem Behälterkörper gewindemäßig in Eingriff bringbar ist.

11. Einheit aus Behälter und Stopfen nach Anspruch 10, wobei der zylindrische Körper des Stopfens (50) eine darin geformte Axialausnehmung (65) aufweist, welche einen Durchgang zum Ermöglichen des Abgebens des Inhaltes aus dem Aufnahmeraum (218) durch den Hals (223), den Durchgang und die Öffnung (24) bildet, wenn der Stopfen gelöst wird, um die erste Dichtungseinrichtung (60) und die zweite Dichtungseinrichtung (55) aus dem Kontakt mit der ersten Dichtungsfläche (224) bzw. der zweiten Dichtungsfläche (234) zu bringen.

12. Einheit aus Behälter und Stopfen nach einem der Ansprüche 5, 8 und 11, wobei der Behälterkörper (11) ein metallisches Wandglied (12, 112, 212) und ein metallisches Außenglied (14, 114, 214) umfaßt, die miteinander verbunden sind und zur Bildung eines zwischen ihnen befindlichen wärmeisolierenden Vakuumraumes zusammenwirken.

13. Einheit aus Behälter und Stopfen nach Anspruch 12, wobei das Schulterglied (30, 130, 230) aus einem Kunstharz besteht.

14. Einheit aus Behälter und Stopfen nach Anspruch 13, wobei das erste Dichtungsglied (60) aus einem beliebigen Natur- oder Silikongummi besteht.



15. Einheit aus Behälter und Stopfen nach Anspruch 14, wobei die erste Dichtungsfläche (24, 124, 224) eine zylindrische Form aufweist.

16. Einheit aus Behälter und Stopfen nach Anspruch 14, wobei die erste Dichtungsfläche (24, 124, 224) leicht kegelförmig ausgebildet ist, um in Richtung auf den Aufnahmeraum (18, 218) zu konvergieren.

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