A container assembly for transporting and storing flowable materials according to one embodiment of the present invention comprises a drum including a lip edge defining a top opening, a lid constructed and arranged to fit over and close the top opening, a closing ring constructed and arranged for securing the lid to the lip edge, and an elastomeric gasket positioned between the lip edge and the lid, the lip edge being constructed and arranged for the formed sidewall, shaped to define a hollow interior, said sidewall including an outwardly facing, concave section.
Fig. 1
(PRIOR ART)

Fig. 2
(PRIOR ART)
Fig. 3
(PRIOR ART)

Fig. 3A
(PRIOR ART)
Fig. 7
(PRIOR ART)

Fig. 8
(PRIOR ART)

Fig. 9
(PRIOR ART)
CONTAINER AND LID COMBINATION WITH A SEALING GASKET AND CLOSING RING

BACKGROUND OF THE INVENTION

[0001] The present invention relates in general to a container and lid combination that includes a sealing gasket and uses a closing ring assembly. The closing ring is of the open-loop style that can be used for open head drum-styled containers. Containers of the type disclosed herein may range from the smaller pail sizes of approximately 1 gallon up to much larger industrial drum sizes. The container material may be either plastic or metal. The closing ring is used to securely attach a matching closing lid to the open end of the container. The sealing gasket is positioned between the closing lid and the open end of the container. Containers of the type disclosed herein are formed as generally cylindrical structures with an upper, generally circular open end. The circular open end is defined by an upper peripheral lip of the container. The container is closed by tightly securing a matching closing lid over the open end of the container. The sealing gasket is annular in form and positioned between the lid edge and container lip edge in an effort to try and create a sealed interface. These component parts are axially clamped together as the closing ring us reduced in circumference. It is important to tightly connect the lid to the container in order to close and seal in the container contents and prevent any loss or leakage of those contents. The closing ring and gasket are used in cooperation with the lid and container structures for this purpose.

[0002] Since the entire contents of the container may not always be dispensed when the drum (container) is first opened after initial filling, it is important to be able to re-close the container with the matching lid with substantially the same degree of security and tightness that was achieved at the time of initial filling and closing. Presently, the two most commonly-used closing ring structures employ either a tightening bolt arrangement or an over-center lever and linkage arrangement. The bolt arrangement requires manual tightening and untightening of the bolt into or out of a nut or at least an internally-threaded block. The torque applied to the bolt and the relative sizing of the ring body relative to the diameter of the lid dictates the degree of tightness and thus the degree of gasket compression and the security of the lid-to-container connection.

[0003] The over-center lever and linkage arrangement uses a linkage with multiple pivots and a lever handle that is folded to close the container and unfolded or pivoted outwardly. This opening action allows the ring circumference to expand and this removes or relieves the clamping forces on the lid and drum lip. This in turn allows the container to be "opened" by removing the lid. The lever handle in cooperation with the pivot points and linkage members makes use of the mechanical advantage and leverage of the structure to enable a tight closing operation, while still being performed manually. By enabling the manual folding of the lever handle to apply a sufficient clamping force by means of the closing ring to properly compress the gasket and secure the lid to the container, the time required to unthread or thread the clamping bolt of the other (first referenced) configuration is eliminated. The tighter the clamping force applied by the closing ring, the greater the level of manual force that must be applied to the lever handle. However, the relative force levels depend in part on the configuration of the linkage and it would be an improvement to what presently exists to be able to achieve the same ring clamping (closing) force with less lever force. The relative force levels also depend in part on the construction and arrangement of the sealing gasket and the shaped of the lid edge and of the container lip edge.

[0004] The configuration of the linkage is the subject of pending U.S. patent application Ser. No. 11/542,529, filed Oct. 3, 2006, entitled CONTAINER AND LID COMBINATION WITH CLOSING RING ASSEMBLY, and this application is incorporated by reference herein, in its entirety.

[0005] The construction and arrangement of the sealing gasket, including its specific outer peripheral shape and interior construction, is one of the subjects of the present disclosure. The construction and arrangement of the container lip edge, including its shape and construction, is also one of the subjects of the present disclosure. Importantly, the interface and cooperation between the sealing gasket and the container lip edge is a part of the present disclosure. While the lid and the lid edge construction and arrangement are important, they are not the primary focus of the present disclosure. However, due to interior pressurization and inversion of the lid, there are force dynamics that play a part in the construction and arrangement of the gasket and edge lip interface, and these force dynamics are important. In a similar manner, the design and construction of the closing ring is not the primary focus of the present disclosure. Nevertheless, it is important to the overall assembly and it is the tightening action of that closing ring that secures the lid onto the drum and compresses the sealing gasket in the desired manner.

[0006] According to the present disclosure, there is a new sealing gasket design, a new plastic container (drum) lip edge design, and a new metal container (drum) lip edge design. The current gasket design is included since its use and performance are improved by applying it to either of the new container lip edge designs. Similarly, the new gasket can be used with the current container lip edge designs and still provide improved use and performance. The improvements provided by the structures disclosed herein are considered to be novel and unobvious.

BRIEF SUMMARY

[0007] A container assembly for transporting and storing flowable materials according to one embodiment of the present invention comprises a drum including a lip edge defining a top opening, a lid constructed and arranged to fit over and close the top opening, a closing ring constructed and arranged for securing the lid to the lip edge, and an elastic gasket positioned between the lip edge and the lid, the lip edge being constructed and arranged with a formed sidewall, shaped to define a hollow interior, the formed sidewall including an outwardly facing, concave section.

[0008] One object of the present disclosure is to provide an improved container assembly.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0009] FIG. 1 is an exploded, perspective view of a prior art container that is suitable for being modified with the improvements provided by the present disclosure.

[0010] FIG. 2 is a partial, side elevational view, in full section, of the FIG. 1 container.

[0011] FIG. 3 is a partial, side elevational view, of a prior art plastic container similar in certain respects to the prior art container of FIG. 1.
FIG. 3A is a partial, side elevational view, in full section, of an alternative prior art plastic container.

FIG. 4 is a partial, side elevational view, in full section, of a prior art elastomeric gasket.

FIG. 5 is a partial, side elevational view of the FIG. 4 prior art gasket as installed in a prior art container according to FIG. 1.

FIG. 6 is a partial, side elevational view, in full section, of another prior art elastomeric gasket.

FIG. 7 is a partial, side elevational view of the FIG. 6 prior art gasket as installed in a prior art container according to FIG. 1.

FIG. 8 is a partial, side elevational view, in full section, of yet another prior art elastomeric gasket.

FIG. 9 is a partial, side elevational view of the FIG. 8 prior art gasket as installed in a prior art container according to FIG. 1.

FIG. 10 is a partial, front elevational view of a container according to a typical embodiment of the present invention.

FIG. 11 is a partial, front elevational view of the FIG. 10 container as assembled with a lid, gasket, and closing ring.

FIG. 12 is a partial, front elevational view, in full section, of the FIG. 11 construction after the closing ring has been tightened into position so as to compress the gasket.

FIG. 13 is a partial, front elevational view, in full section, in diagrammatic form, showing the compression of the gasket and the higher density and lower density compression zones.

FIG. 14 is a diagrammatic representation of the FIG. 13 container assembly without the benefit of the FIG. 10 container design showing the nature of gasket compression at the time of internal pressurization.

FIG. 15 is a side elevational view, in full section, of an annular sealing gasket for use in combination with both the FIG. 10 container design and the FIG. 14 container design according to a typical embodiment of the present invention.

FIG. 16 is a partial, side elevational view, of the FIG. 15 gasket as used with the FIG. 14 container.

FIG. 17 is a partial, side elevational view, in full section, of the FIG. 15 gasket as used with the FIG. 10 container.

FIG. 18 is a partial, side elevational view of the FIG. 17 assembly after the closing ring has been tightened into position so as to compress the gasket.

FIG. 19 is a diagrammatic illustration of gasket compression based on the FIG. 18 construction after container pressurization.

FIG. 20 is a partial, side elevational view, in full section, of a plastic container lip edge according to the present invention.

FIG. 21 is a partial, side elevational view, in full section, of the FIG. 20 plastic container as used with the FIG. 15 gasket prior to container pressurization.

FIG. 22 corresponds to the FIG. 21 illustration and diagrammatically discloses the container pressurization and movement of the lid.

FIG. 23 is a partial, side elevational view, in full section, of the FIG. 20 container in combination with a prior art gasket and further including the FIG. 21 lid and FIG. 21 closing ring.

FIG. 24 is a diagrammatic illustration based on FIG. 23 with the container pressurized.

FIG. 25 is a side elevational view, in full section, of an annular sealing gasket according to another embodiment of the present invention.

FIG. 26 is a partial, front elevational view, in full section, of a container assembly using the FIG. 25 gasket.

FIG. 27 is a partial, front elevational view, in full section, of another container assembly using the FIG. 25 gasket.

DETAILED DESCRIPTION

For the purposes of promoting an understanding of the disclosure, reference will now be made to the embodiments illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the disclosure is thereby intended, such alternations and further modifications in the illustrated device and its use, and such further applications of the principles of the disclosure as illustrated therein being contemplated as would normally occur to one skilled in the art to which the disclosure relates.

Referring to FIGS. 1 and 2, there is illustrated a steel drum and lid assembly 20 according to the prior art. Assembly 20 includes a generally cylindrical drum 21, an annular sealing gasket 22, a closing lid 23, and a closing ring 24. This prior art assembly 20 (see FIG. 2) includes an annular drum lip edge 25 that has a generally circular form in lateral cross section with a hollow interior. As illustrated, the gasket 22 is positioned on the curved upper surface 26 of edge 25 below the curved edge 27 of lid 23. The closing ring 24 includes spaced-apart upper and lower flanges 28 and 29, respectively. Upper flange 28 fits over lid edge 27 and lower flange 29 fits below lip edge 25.

Referring now to FIG. 3, a prior art plastic drum and lid assembly 32 is illustrated. Assembly 32 includes a generally cylindrical plastic drum 33, an annular sealing gasket 34, a closing lid 35, and a closing ring 36. The construction of assembly 32 is substantially the same as that of assembly 20 in terms of the arrangement of the component parts. The plastic construction does result in various changes to the shapes and material thicknesses of the drum, the lid, and the gasket. A comparison between FIGS. 2 and 3 makes clear both the similarities and the overall arrangement of the component parts of assemblies 20 and 32 as well as the differences in the shapes and material thicknesses due to the differences between metal (assembly 20) and plastic (assembly 32).

FIG. 3A illustrates an alternative prior art lip edge 37 design for a plastic container suitable for use as part of assembly 32 as a replacement for the FIG. 3 plastic drum 33.

Referring to FIGS. 4-9, three different prior art annular sealing gaskets 39, 40, and 41 (see FIGS. 4, 6 and 8) are illustrated. In the companion assembly drawings of FIGS. 5, 7, and 9, the positioning and appearance of the corresponding gaskets is illustrated at the start of the assembly process, prior to any significant or noticeable gasket compression. The only differences between assemblies 42, 43, and 44 is the gasket selection. The metal drum 45, closing lid 46, and closing ring 47 are the same in each assembly 42, 43, and 44. Gasket 39 has a generally rectangular shape in lateral cross section. Gasket 40 has a generally circular shape in lateral cross section. Gasket 41 has a semicircular sleeve shape in lateral cross section.

With this description and explanation of the prior art assemblies, drums (containers) and gaskets as a starting point, the new designs for and for use with metal containers
are illustrated in FIGS. 10-13 and 15-18. The new designs for and for use with plastic containers are illustrated in FIGS. 20-24.

[0043] Referring first to FIG. 10, a new steel drum construction is illustrated according to the present disclosure. In FIGS. 11 and 12 the current (i.e., prior art) gasket 51 style is used in combination with new drum 50 as part of assembly 52. FIG. 11 illustrates the start of the assembly process for assembly 52, prior to full gasket compression. FIG. 12 illustrates the completed assembly 52. The closing lid 46 and closing ring 47 are the same as used with the prior art assemblies of FIGS. 5, 7, and 9.

[0044] With continued reference to FIG. 10, the drum 50 includes a generally cylindrical body 50a with a formed lip edge 54 that defines opening 50b. The annular lip edge 54 of drum 50 has a formed sidewall with a hollow, tubular shape with a concave section 55. The sidewall material is coiled in a counterclockwise direction back into body 50a. Section 55 is located on what would be understood as the upper and outer portion or quadrant of the tubular form of lip edge 54 based on this lateral cross sectional view. If a circle in a mathematical sense this would be a second quadrant location. The depth of the concavity of section 55 is significant in comparison to a full circle or cylinder. The inward curvature, i.e., the concavity, faces upwardly and outwardly. Concave section 55 is bounded by transition edges 56 and 57 where the concave form changes to a convex form or shape, representing the remainder of lip edge 54. This lip edge, but for the concave section 55, would be viewed as being substantially circular in lateral cross section or cylindrical if linear. It is also to be understood that the lip edge 54 defines the open end of the drum and that in the majority of designs that opening will be generally circular. Importantly, the concave section 55 in combination and cooperation with lid 46 creates a capturing pocket 58 that captures a portion of gasket 51 as the closing ring 47 is secured in position (see FIG. 12). In terms of circular geometry, section 55 has a circumferential extent or are length of between 60 and 90 degrees.

[0045] Referring to FIG. 11, it will be seen that the starting positioning of gasket 51 within assembly 52 is generally centered on transition edge 56. Importantly, the capturing pocket 58 creates a gasket-receiving area or volume that is significantly larger than the height of clearance gap 62 located between transition edge 56 and the inner surface 63 of lid 46, see FIG. 12.

[0046] Containers of the type described herein, once filled with the selected contents, typically experience an internal pressure build up (i.e., pressurization). This pressurization causes the lid 46 or edge panel of the final assembly to invert in shape in terms of actually bowing out as illustrated, for example, in FIG. 13. The inner panel 64 of lid 46 is actually re-shaped into the FIG. 13 form due to pressurization and this movement of the lid 46, in terms of inverting and re-shaping itself, causes the outer edge 65 of lid 46 to actually be pulled on and rolled inwardly. This action with regard to edge 65 in turn pulls inwardly on the gasket material that is captured in pocket 58 and actually attempts to pull that larger mass of elastomeric material through a significantly smaller clearance gap 62. The concave curvature of section 55 also creates something of an abutment to retard or restrict such motion and this abutment is facilitated by the limited movement of gasket material through gap 62. As a result of this abutment and the limited passage of elastomeric material through gap 62, there is actually created a high density compression zone 66 on one side of transition edge 56 with section 55 comprising the inner or lower side of compression zone 66. On the other (inward) side of transition edge 56, the gasket material is not compressed as much and is actually part of a lower density compression zone 67. This reference to “density” means the degree of compression experienced by the portions of gasket 51 that are either radially outwardly of transition edge 56 (high density compression) or radially inwardly of transition edge 56 (low density compression) and the pressure of the gasket against the confining surfaces. The new container annular lip edge shape represented in part by concave section 55 helps to hold the gasket in position and facilitates maintaining the necessary seal when the container end panel (i.e., lid 46) reverses direction (inverts) due to interior pressurization.

[0047] When the closing ring is being closed or tightened, typically by a linkage and lever arrangement, its circumference is reduced and in turn the diameter is reduced. This tightening movement of closing ring 47 has the effect of drawing or pushing the closed end of the concave form inwardly toward the lid 46, gasket 51, and the container or drum lip edge 25. The degree of axial separation between flanges 28 and 29 becomes smaller in the direction of the closed end 70. The reduction in the axial separation or spacing between flanges 28 and 29 draws the lid 46 down onto the gasket 51 and compresses the elastomeric gasket material against the drum lip edge 55. The presence of concave section 55 creates an enlarged, annular pocket or cavity for movement of a portion of the gasket as it is compressed. The gasket requires less compression before being fully seated.

[0048] In FIG. 14, a prior art drum 73 is illustrated in partial form with a lid 46 inverted due to pressurization. The gasket 51 is pushed more, as compared to FIG. 13, into the drum interior and it loses surface pressure. The result is leakage. Without the shaped drum lip edge, specifically concave section 55, there is nothing to help capture and hold the gasket and retain it in the desired position. As more of the gasket material is able to displace toward the interior of the drum, there is nothing significant in terms of gasket compression and there is no high density compression zone. As the lid inverts and the edge of the lid pulls and rolls inwardly, the outer portion of the gasket is pulled inwardly, but without any significant abutment surface or narrow gap to help hold or capture the gasket. This in turn causes the loss of surface pressure and the resulting leakage.

[0049] Referring now to FIGS. 15-19, a new annular gasket 77 is illustrated and is disclosed as it is used on a prior art drum lip edge 78 and on the newly styled drum lip edge 25 that includes concave section 55 and transition edges 56 and 57. The new gasket 77 is described in FIG. 15 as being a lateral cross sectional view. Since the gasket 77 is preferably annular in form, the illustrated section is created by a radial cutting plane through the gasket body along one side portion. Gasket 77 is an extruded rubber member and this process permits a wide range of shapes.

[0050] With continued reference to FIG. 15, unitary, elastomeric gasket 77 includes a hollow body 79 comprised of a side wall 80 defining the hollow interior 81. The sidewall 80 includes, in lateral section, a generally semicircular, convex upper portion 80a and a lower portion 80b including curvilinear section 80a and concave section 80b. The shape of the hollow interior 81 follows the general shaping of portions 80a and 80b, meaning that the wall thickness of gasket 77 is substantially uniform. The only exceptions to this uniform...
thickness are “corners” 82 and 83 that are thicker than the remainder of the sidewall 80. As noted, gasket 77 can be used with the prior art drum lip edge 78 (see FIG. 16) as well with a new style of drum lip edge 25, as disclosed herein, see FIGS. 17 and 18.

[0051] The precise initial positioning of gasket 77 on top of transition edge 56 and around lip edge 25 is illustrated in FIG. 17. The gasket edge 84 between section 80e and section 80d provides an additional abutment up against transition edge 56 for capturing gasket 77 in position, creating a high density compression zone 66, as has been described.

[0052] In terms of this disclosure and its use of “compression”, part of what happens is the deforming of the gasket material into a conforming shape that matches the surrounding space that receives the gasket. Rubber gaskets are generally not “compressible” as one would think of for foam material gaskets. Otherwise, the integrity of the sealed interface is influenced by how tightly the gasket is clamped between the capturing surfaces. For a foam material, compression can occur as air pockets are closed. This action increases the density of the compressed portion.

[0053] In FIG. 18, a gasket 77 is compressed to an intermediate stage or degree prior to pressurization of the container and lid inversion (see FIG. 13). When the lid 46 inverts, the lid 46 outer edge pulls and rolls inwardly and creates, relative to gasket 77, what is illustrated in FIG. 13 for gasket 55. In FIGS. 16 and 19, gasket 77 is used in cooperation with drum lip edge 78. As compression begins with the tightening of the closing ring 47, the concave section 80d seats itself in a conforming manner onto the upper curvature of edge 78. As closing ring tightening and gasket compression continue, the radially outer portion of gasket 77 shifts to the outer surface of edge 78 and uses gasket edge 84 as a way to help seat and capture gasket 77 in that position. As the lid 46 inverts, the gasket 77 stays in position, a result facilitated by the outer peripheral shaping of gasket 77. The result is illustrated in FIG. 19 wherein there is a higher density compression zone 88 and a lower density compression zone 89.

[0054] Using an elastomeric material for gasket 77 that has a higher durometer than the material for gasket 51 permits more controlled gasket shaping and contouring to be maintained. Creating hollow interior 81 provides added flexibility and compressibility to offset the higher durometer (i.e., harder) elastomeric material used for gasket 77. Otherwise, the compression of gasket 77, the action of lid 46 under pressurization, and the creation of the higher density and lower density compression zones are all substantially the same as described for gasket 51 and illustrated in FIGS. 11-13. This substantially similar result applies whether gasket 77 is used with drum lip edge 25 or is used with drum lip edge 78. The higher density and lower density compression zones are thus created and enhanced sealing is achieved. Suitable materials for gasket 51 include both foam and a soft grade of rubber, likely less than a 40 Shore A hardness. A foam material would preferably be a urethane foam sponge. For gasket 77, the shaping to require an extruding process and a rubber material with a 40-60 Shore A hardness is preferred.

[0055] The gasket and drum combinations that are suitable for what has been described include the new gasket 77 with either a prior art drum lip edge 78 or with the newly styled drum lip edge 25 and the prior art gasket 51 with the newly styled drum lip edge 25. Each of these combinations pertain to metal drums. There are though improvement options for plastic drums and plastic pails in terms of reshaping the drum lip edge and reshaping the gasket. These combinations are illustrated in FIGS. 20-24.

[0056] Referring first to FIG. 20, the new plastic drum 92 sidewall 93 is illustrated in lateral section with the newly shaped annular drum lip edge 94. Drum lip edge 94 includes a substantially straight inner axial wall 95 which, in its full annular form, would be considered cylindrical. Outwardly, curved recess 96 extends into lower shelf 97. Shelf 97 extends into first wall section 100. Second wall section 101 is radially inset and axially spaced from section 100 by ramp section 102. The slight inl ine to section 101 causes the combination of section 101 and section 102 to create a concave appearance in lateral cross section. Top edge 103 is substantially planar and separated from wall section 101 by curved section 104. Section 104 has a generally concave shape.

[0057] Referring now to FIG. 21, container assembly 105 is illustrated as a partial view, in full section, including the new plastic drum 92 and lip edge 94 in combination with new gasket (hollow) 77, current lid 107, and the current closing ring 108. FIG. 21 represents the starting condition and position of the individual parts of assembly 105. In FIG. 22, the condition and position of the individual parts of assembly 105 are illustrated when pressurized. The lid 107 has shifted its position due to pressurization and the inverted movement causes outer edge 109 to pull and roll inwardly. This action pulls on gasket 77 and captures it in a compressed condition against the outer surface of lip edge 94. Virtually the entire mass of gasket 77 is captured against the outer surface of lip edge 94, thereby creating the previously referenced and described higher density compression zone. While there is a lower density compression zone, located on the inner side of top edge 103, the amount of gasket material that is pulled into that zone is quite limited and constitutes a very small percentage of the overall mass of gasket 77.

[0058] Referring now to FIGS. 23 and 24, the assembly 112 includes the conventional (prior art) gasket 51. In FIG. 23, the starting position of the component parts that comprise assembly 112 are illustrated. In FIG. 24, that same assembly 112 is illustrated with the drum interior pressurized and the outer lip of lid 107 being pulled and rolled inwardly. FIGS. 23 and 24 correspond to FIGS. 21 and 22, respectively, except for the change in gaskets. Current gasket 51 is used in assembly 112, while new gasket 77 is used in assembly 105.

[0059] As should be understood from the present disclosure, if the gasket shape (in lateral cross section) begins in its free form closer to its final (net) shape as compressed between the lid and drum, then there would be less movement of the gasket required. This concept of less movement occurs axially in terms of lid movement, radially in terms of gasket compression and movement, and circumferentially in terms of ring closing.

[0060] Another example of a gasket that is suitable for this disclosed application and assembly is illustrated in FIG. 25. Gasket 120 has a “peanut” shape in lateral cross section and can be fabricated from a urethane foam sponge, but preferably from an extruded rubber in the 40-60 Shore A hardness range. The reduced size center portion 121 is constructed and arranged to fit over and to be centered generally on transition edge 56 of assembly 122. FIG. 26. When used with a prior art drum, this center portion 121 is centered over the uppermost portion of the circular shape, as illustrated for assembly 123 (see FIG. 27).
10. The container assembly of claim 1 wherein said gasket is constructed and arranged in lateral cross section with a surrounding wall that defines a hollow interior.

11. The container assembly of claim 10 wherein said surrounding wall has an outer peripheral shape that includes a curved section, a linear section, and a concave section.

12. The container assembly of claim 11 wherein said lip edge includes a first transition edge between said concave section and the remainder of said lip edge and said first transition edge being positioned in a recessed space of said concave section.

13. The container assembly of claim 1 wherein said concave section having a circumferential extent of approximately between 60 and 90 degrees.

14. The container assembly of claim 1 wherein said lip edge includes a part-circular section in lateral cross section in combination with said concave section.

15. The container assembly of claim 14 wherein said lip edge includes a first transition edge between a first side of said concave section and said part-circular section and a second transition edge between a second side of said concave section and said part-circular section.

16. The container assembly of claim 1 wherein said lid includes a curved outer lip constructed and arranged to lay over said drum lip edge and to define with said concave section a gasket capturing pocket.

17. The container assembly of claim 1 wherein said closing ring is tightenable for clamping together said lid outer lip and said drum edge lip with said gasket positioned between the lid outer lip and the drum edge lip, the gasket being compressed by said clamping together, said compressed gasket having a higher density portion and a lower density portion.

18. The container assembly of claim 17 wherein said higher density portion being radially outwardly of said first transition edge.

19. A container assembly comprising:
   a drum including a lip edge defining a top opening;
   a lid constructed and arranged to fit over and close said top opening;
   a closing ring constructed and arranged for securing said lid to said lip edge; and
   an elastomeric gasket positioned between said lip edge and said lid, said lip edge being constructed and arranged with a formed sidewall, said formed sidewall being shaped to define a hollow interior, said sidewall including an outwardly-facing, concave section.

20. A container assembly comprising:
   a drum including a lip edge defining a top opening;
   a lid constructed and arranged to fit over and close said top opening;
   a closing ring constructed and arranged for securing said lid to said lip edge; and
   an elastomeric gasket positioned between said lip edge and said lid, said gasket having a lateral cross section shape and construction that includes a surrounding wall that defines a hollow interior, said surrounding wall having a peripheral shape that includes a curved section, a linear section, and a concave section.

21. The container assembly of claim 20 wherein said curved section in cooperation with said lid define a capturing pocket for said gasket.

22. The container assembly of claim 21 wherein said closing ring is tightenable for clamping together a lid outer lip and
said drum lip edge with said gasket positioned between the lid outer lip and the drum lip edge, the gasket being compressed by said clamping together, said compressed gasket having a higher density portion and a lower density portion.

23. The container assembly of claim 22 wherein said higher density portion being radially outwardly of said top edge and said lower density portion being radially inwardly of said top edge.

24. The container assembly of claim 23 wherein said gasket is constructed and arranged in lateral cross section with a surrounding wall that defines a hollow interior.

25. The container assembly of claim 24 wherein said surrounding wall has an outer peripheral shape that includes a curved section, a linear section, and a concave section.

26. The container assembly of claim 20 wherein said gasket is constructed and arranged in lateral cross section with a surrounding wall that defines a hollow interior.

27. The container assembly of claim 26 wherein said surrounding wall has an outer peripheral shape that includes a curved section, a linear section, and a concave section.