BLANK FOR CONTAINER

PRIORITY CLAIM

[0001] This application claims priority under 35 U.S.C. § 119(e) to US Provisional Application Serial No. 61/737,406, filed December 14, 2012, which is expressly incorporated by reference herein.

BACKGROUND

[0002] The present disclosure relates to vessels, and in particular to blanks for containers. More particularly, the present disclosure relates to a blank for an insulated container formed from polymeric materials.

SUMMARY

[0003] A vessel in accordance with the present disclosure is configured to hold a product in an interior region formed in the vessel. In illustrative embodiments, the vessel is an insulated container such as a drink cup, a food-storage cup, or a dessert cup.

[0004] In illustrative embodiments, an insulative cup includes a body having a sleeve-shaped side wall and a floor coupled to the body to cooperate with the side wall to form an interior region for storing food, liquid, or any suitable product. The body also includes a rolled brim coupled to an upper end of the side wall and a floor mount interconnecting a lower end of the side wall and the floor.

[0005] The insulative cellular non-aromatic polymeric material included in the body is configured in accordance with the present disclosure to provide means for enabling localized plastic deformation in at least one selected region of the body (e.g., the floor mount and a floor-retaining flange included in the floor mount) to provide (1) a plastically deformed first material segment having a first density in a first portion of the selected region of the body and (2) a second material segment having a relatively lower second density in an adjacent second portion of the selected region of the body. In illustrative embodiments, the more dense first material segment is thinner than the second material segment.

[0006] A blank of polymeric material in accordance with the present disclosure is used to form a body of a cup. In illustrative embodiments, the blank

includes an upper band formed to include a curved top edge and a lower band formed to include a left-end edge, a right-end edge, and a curved bottom edge arranged to extend between the left-end and right-end edges. The lower band is appended to the upper band along a curved fold line to locate the curved fold line between the curved top and bottom edges. The upper band has a relatively long curved top edge and can be formed in a blank conversion process to provide a cup body having a rolled brim and a sleeve-shape side wall extending downwardly from the rolled brim. The lower band has a relatively short curved bottom edge and can be folded about the curved fold line during the blank conversion process to form a portion of a floor mount that is configured to mate with a cup floor to provide a cup.

[0007] In illustrative embodiments, the lower band is formed to include a series of high-density staves of a first density and low-density staves of a relatively lower second density. Each stave is arranged to extend from the curved bottom edge of the lower band toward the curved fold line. The high-density and low-density staves are arranged to lie in an alternating sequence extending from the let-end edge of the lower band to the right-end edge of the lower band to cause density to alternate from stave to stave along a length of the lower band.

[0008] In illustrative embodiments, each low-density stave in the lower band is relatively thick and wide. Each high-density stave in the lower band is relatively thin and narrow. In other illustrative embodiments, diamond density patterns, diagonal density patterns, and other density patterns are used instead of the high-density and low-density staves.

[0009] In illustrative embodiments, a connecting web is defined in the blank by polymeric material extending along and on either side of the curved fold line. After the blank conversion process is completed, the cup body will include a floor mount comprising an annular web-support ring defined by a bottom strip of the upper band, an annular floor-retaining flange surrounded by the annular web-support ring, and an annular connecting web extending along the curved fold line and joining together lower portions of the floor-retaining flange and the surrounding web-support ring to define an upwardly floor-receiving pocket. The connecting web is formed to have a high density that is about the same as the density of one of the high-density staves.

[0009A] In a first aspect, a blank of polymeric material used to form a body of a cup may be provided, the blank comprising: an upper band formed to include a curved top edge and a lower band formed to include a left-end edge, a right-end edge, and a curved bottom edge arranged to extend between the left-end and right-end edges, wherein the lower band is appended to the upper band along a curved fold line to locate the curved fold line between the curved top and bottom edges, the lower band is formed to include a series of high-density staves of a first density and low-density staves of a relatively lower second density, each stave is arranged to extend from the curved bottom edge of the lower band toward the curved fold line, and the high-density and low-density staves are arranged to lie in an alternating sequence extending from about the left-end edge of the lower band to the right-end edge of the lower band to cause density to alternate from stave to stave along a length of the lower band, and a set of parallel linear depressions, each along an independent linear axis, wherein at least some of the high-density staves intersecting at least some of the second set of linear depressions.

[0009B] In a second aspect, a blank used to form a body of a cup may be provided, the blank comprising a generally planar sheet of insulative cellular non-aromatic polymeric material having a first side and a second side, the sheet being defined by a first arcuate edge, a second arcuate edge, a first linear edge, and a second linear edge, the sheet including a first strip and a second strip, the first and second strips being separated by a first area of reduced thickness, the second strip having a plurality of second areas of reduced thickness positioned in the second strip, wherein the first area of reduced thickness comprises a first depression and the first depression has an arcuate axis with a radius that is centered on the common radial axis, wherein the second areas of reduced thickness comprises a plurality of second depressions, each second depression aligned along an independent linear axis, wherein the second depressions include at least two second depressions aligned in a first direction and at least two second depressions aligned in a second direction, at least one of the two second depressions aligned in the first direction intersecting at least one of the two second depressions aligned in the second direction.

[0009C] In a third aspect, a blank used to form a body of a cup may be provided, the blank comprising a generally planar sheet of insulative cellular non-

aromatic polymeric material having a first side and a second side and a nominal thickness, the sheet being defined by circular ring sector, the sheet including a first strip and a second strip, the first and second strips being separated by a first area of reduced thickness, and a plurality of second areas of reduced thickness positioned in the second strip, wherein second strip includes a first set of parallel linear depressions aligned in a first direction and a second set of parallel linear depressions aligned in a second direction, at least some of the first set of linear depressions intersecting at least some of the second set of linear depressions such that congruent areas of nominal thickness are formed between the intersecting linear depressions.

[0009D] In a fourth aspect, a blank used to form a body of a cup may be provided, the blank comprising a generally planar sheet of insulative cellular non-aromatic polymeric material having a first side and a second side, the sheet being defined by a first arcuate edge, a second arcuate edge, a first linear edge, and a second linear edge, an arcuately shaped area of reduced thickness being positioned between the first and second arcuate edges and parallel to at least one of the first and second arcuate edges, and a plurality of areas of reduced thickness being positioned between the arcuately shaped area of reduced thickness and at least one of the first arcuate edge and the second arcuate edge, wherein the plurality of areas of reduced thickness positioned between the arcuately shaped area of reduced thickness and at least one of the first arcuate edge and the second arcuate edge comprises a plurality of depressions and each depression is aligned along an independent linear axis, wherein the plurality of linear depressions positioned between the arcuately shaped area of reduced thickness and at least one of the first arcuate edge and the second arcuate edge include at least two depressions aligned along an independent linear axis, the independent axes of the depressions being parallel and aligned in first direction, and at least two depressions aligned along an independent linear axis, the independent axes of the depressions being parallel and aligned in the second direction, at least one of the two depressions aligned in the first direction intersecting at least one of the two depressions aligned in the second direction.

CLAIMS

1. A blank of polymeric material used to form a body of a cup, the blank comprising

an upper band formed to include a curved top edge and a lower band formed to include a left-end edge, a right-end edge, and a curved bottom edge arranged to extend between the left-end and right-end edges, wherein the lower band is appended to the upper band along a curved fold line to locate the curved fold line between the curved top and bottom edges, the lower band is formed to include a series of high-density staves of a first density and low-density staves of a relatively lower second density, each stave is arranged to extend from the curved bottom edge of the lower band toward the curved fold line, and the high-density and low-density staves are arranged to lie in an alternating sequence extending from about the left-end edge of the lower band to the right-end edge of the lower band to cause density to alternate from stave to stave along a length of the lower band,

and a set of parallel linear depressions, each along an independent linear axis,

wherein at least some of the high-density staves intersecting at least some of the second set of linear depressions.

2. The blank of claim 1, wherein the lower band has a first side and an opposite second side, each low-density stave has a first face on the first side of the lower band, a second face on the opposite second side of the lower band, and a first thickness defined by a distance between the first and second faces of the low-density stave, and each high-density stave has a first face on the first side of the lower band, a second face on the second side of the lower band, and a second thickness defined by a distance between the first and second faces of the high-density stave, and the second thickness is less than the first thickness.

3. The blank of claim 2, wherein the second thickness is about half of the first thickness.

4. The blank of claim 2, wherein the polymeric material is an insulative cellular non-aromatic polymeric material.

5. The blank of claim 1, wherein each high-density stave has a narrow width and each low-density stave has a relatively wider wide width.

6. The blank of claim 5, wherein the narrow width is about 0.028 inch (0.711 mm) and the relatively wider wide width is about 0.067 inch (1.702 mm).

7. The blank of claim 6, wherein the lower band includes a border section extending from the left-end edge to the right-end edge and lying between the curved fold line and an upper end of each of the high-density and low-density staves and the border section has a height of about 0.035 inch (0.889 mm).

8. The blank of claim 5, wherein the polymeric material is an insulative cellular non-aromatic polymeric material.

9. The blank of claim 1, wherein a connecting web is defined by polymeric material extending along and on either side of the curved fold line and the connecting web has a third density that is lower than the first density.

10. The blank of claim 9, wherein the third density of the connecting web is about equal to the second density of the low-density staves.

11. The blank of claim 10, wherein each low-density stave has a first thickness, each high-density stave has a relatively thinner second thickness, and the connecting web has a third thickness that is about equal to the relatively thinner second thickness.

12. The blank of claim 9, wherein the polymeric material is an insulative cellular non-aromatic polymeric material.

13. The blank of claim 1, wherein the upper band includes a left-end edge arranged to extend from the curved fold line to a first end of the curved top edge and a right-end edge arranged to extend from the curved fold line to an opposite second end of the curved top edge, the upper

band includes a top strip arranged to extend along the curved top edge from the left-end edge of the upper band to the right-end edge of the upper band, a bottom strip arranged to extend along the curved fold line from the left-end edge of the upper band to the right-end edge of the upper band, and a middle strip arranged to lie between and interconnect the top and bottom strips and extend from the left-end edge of the upper band to the right-end edge of the upper band, the top strip is configured to be moved relative to the middle strip during a blank conversion process to form a circular rolled brim, the middle strip is configured to be wrapped about a central vertical axis during the blank conversion process to provide a sleeve- shaped side wall coupled to the circular rolled brim, and the bottom strip of the upper band and the lower band cooperate to form a floor mount configured to provide means for receiving a portion of a floor during a cup formation process to cause the floor and the sleeve- shaped side wall to cooperate to form an interior region in response to folding movement of the lower band along the curved fold line while wrapping the upper band around a vertical central axis to establish an annular shape of the lower band to provide a ring-shaped floor-retaining flange and to establish an annular shape of the bottom strip of the upper band to provide a ring-shaped web-support ring surrounding the ring-shaped floor-retaining flange to provide an annular floor-receiving pocket therebetween.

14. The blank of claim 13, wherein the lower band has a first side and an opposite second side, each low-density stave has a first face on the first side of the lower band, a second face on the opposite second side of the lower band, and a first thickness defined by a distance between the first and second faces of the low-density stave, and each high-density stave has a first face on the first side of the lower band, a second face on the second side of the lower band, and a second thickness defined by a distance between the first and second faces of the high-density stave, and the second thickness is less than the first thickness.

15. The blank of claim 14, wherein the first face is formed to include a depression along the length of a high-density stave and between opposing edges of neighboring low-density staves and the depression is arranged to open in a direction away from the ring-shaped web support ring defined by the bottom strip of the upper band and arranged to surround high-density and low-density staves included in the floor-retaining flange defined by the lower band.

16. The blank of claim 15, wherein the polymeric material is an insulative cellular non-aromatic polymeric material.

17. The blank of claim 14, wherein the first face is formed to include a depression along the length of a high-density stave and between opposing edges of neighboring low-density staves and the depression is arranged to open in a direction toward the ring-shaped web support ring defined by the bottom strip of the upper band and arranged to surround high-density and low-density staves included in the floor-retaining flange defined by the lower band.

18. The blank of claim 17, wherein the polymeric material is an insulative cellular non-aromatic polymeric material.

19. The blank of claim 14, wherein a connecting web is defined by polymeric material extending along and on either side of the curved fold line and the connecting web has a third density that is lower than the first density and wherein the connecting web is appended to the web-support ring and to the floor-retaining flange.

20. The blank of claim 19, wherein the polymeric material is an insulative cellular non-aromatic polymeric material.

21. A blank used to form a body of a cup, the blank comprising a generally planar sheet of insulative cellular non-aromatic polymeric material having a first side and a second side, the sheet being defined by a first arcuate edge, a second arcuate edge, a first linear edge, and a second linear edge, the sheet including a first strip and a second strip, the first and second strips being separated by a first area of reduced thickness, the second strip having a plurality of second areas of reduced thickness positioned in the second strip,

wherein the first area of reduced thickness comprises a first depression and the first depression has an arcuate axis with a radius that is centered on the common radial axis,

wherein the second areas of reduced thickness comprises a plurality of second depressions, each second depression aligned along an independent linear axis,

wherein the second depressions include at least two second depressions aligned in a first direction and at least two second depressions aligned in a second direction, at least one of the two second depressions aligned in the first direction intersecting at least one of the two second depressions aligned in the second direction.

22. The blank of claim 21, wherein the first area of reduced thickness extends from the first linear edge to the second linear edge.

23. The blank of claim 21, wherein the first depression is reduced to about 50% of the nominal thickness.

24. The blank of claim 23, wherein the first depression is plastically deformed.

25. The blank of claim 23, wherein the first depression has been deformed to take a permanent set.

26. The blank of claim 21, wherein the first depression comprises a localized area of higher density.

27. The blank of claim 26, wherein cells of the insulative cellular non-aromatic polymeric material remain unbroken in the localized area of higher density.

28. The blank of claim 21, wherein the axes of least two of the second depressions are parallel.

29. The blank of claim 21, comprising at least three parallel and evenly spaced second depressions that form congruent areas of nominal thickness between the second depressions.

30. The blank of claim 21, wherein at least one of the first or second directions is not parallel to at least one of the first or second linear edges.

31. The blank of claim 30, wherein an angle between the first and second directions is between zero and ninety degrees.

32. The blank of claim 31, wherein the angle between the first and second directions is about forty- five degrees.

33. The blank of claim 21, comprising a plurality of arcuate third depressions parallel to the first and second arcuate edges, the arcuate third depressions intersecting at least one of the second depressions.

34. The blank of claim 33, wherein the first and second linear edges each lie along a ray emanating from the common radial axis of the first and second arcuate edges.

35. The blank of claim 33, wherein the sheet is defined by a circular ring sector.

36. The blank of claim 33, wherein an area adjacent one or more of the depressions has a non-uniform thickness that varies between the thickness of the respective depression and the nominal thickness.

37. A blank used to form a body of a cup, the blank comprising a generally planar sheet of insulative cellular non-aromatic polymeric material having a first side and a second side and a nominal thickness, the sheet being defined by circular ring sector, the sheet including a first strip and a second strip, the first and second strips being separated by a first area of reduced thickness, and a plurality of second areas of reduced thickness positioned in the second strip,

wherein second strip includes a first set of parallel linear depressions aligned in a first direction and a second set of parallel linear depressions aligned in a second direction, at least some of the first set of linear depressions intersecting at least some of the second set of linear depressions such that congruent areas of nominal thickness are formed between the intersecting linear depressions.

38. The blank of claim 37, wherein the circular ring sector comprises outer and inner arcuate edges that are each defined by a radius that is centered on common radial axis.

39. The blank of claim 37, wherein the first area of reduced thickness extends between two non-arcuate edges of the circular ring sector.

40. The blank of claim 39, wherein the first area of reduced thickness comprises a depression and the depression is arranged along an arc having a radius centered on the common radial axis.

41. The blank of claim 40, wherein the depression comprises a localized area of higher density.

42. The blank of claim 41, wherein cells of the insulative cellular non-aromatic polymeric material remain unbroken in the localized area of higher density.

43. The blank of claim 42, wherein the second areas of reduced thickness comprise spaced apart linear depressions.

44. The blank of claim 43, wherein the linear depressions are parallel.

45. The blank of claim 37, wherein angle between the first and second directions is between zero and ninety degrees.

46. The blank of claim 37, wherein the angle between the first and second directions is about forty- five degrees.

47. The blank of claim 37, further comprising a plurality of additional arcuate depressions parallel to the first and second arcuate edges, the additional arcuate depressions intersecting at least one of linear depressions.

48. The blank of claim 47, wherein an area adjacent one or more of the depressions has a non-uniform thickness that varies between the thickness of the respective depression and the nominal thickness.

49. The blank of claim 48, wherein a depression is reduced to about 50% of the nominal thickness.

50. The blank of claim 49, wherein a depression is plastically deformed.

51. The blank of claim 49, wherein a depression has been deformed to take a permanent set.

52. A blank used to form a body of a cup, the blank comprising a generally planar sheet of insulative cellular non-aromatic polymeric material having a first side and a second side, the sheet being defined by a first arcuate edge, a second arcuate edge, a first linear edge, and a second linear edge, an arcuately shaped area of reduced thickness being positioned between the first and second arcuate edges and parallel to at least one of the first and second arcuate edges, and a plurality of areas of reduced thickness being positioned between the arcuately shaped area of reduced thickness and at least one of the first arcuate edge and the second arcuate edge,

wherein the plurality of areas of reduced thickness positioned between the arcuately shaped area of reduced thickness and at least one of the first arcuate edge and the second arcuate edge comprises a plurality of depressions and each depression is aligned along an independent linear axis

wherein the plurality of linear depressions positioned between the arcuately shaped area of reduced thickness and at least one of the first arcuate edge and the second arcuate edge include at least two depressions aligned along an independent linear axis, the independent axes of the depressions being parallel and aligned in first direction, and at least two depressions aligned along an independent linear axis, the independent axes of the depressions being parallel and aligned in the second direction, at least one of the two depressions aligned in the first direction intersecting at least one of the two depressions aligned in the second direction.

53. The blank of claim 52, wherein the arcuately shaped area of reduced thickness extends from the first linear edge to the second linear edge.

54. The blank of claim 53, wherein the arcuately shaped area of reduced thickness comprises a depression.

55. The blank of claim 54, wherein the sheet has a generally uniform nominal thickness and the depression is reduced to about 50% of the nominal thickness.

56. The blank of claim 55, wherein the depression is plastically deformed.

57. The blank of claim 55, wherein the depression has been deformed to take a permanent set.

58. The blank of claim 54, wherein the depression comprises a localized area of higher density.

59. The blank of claim 58, wherein cells of the insulative cellular non-aromatic polymeric material remain unbroken in the localized area of higher density.

60. The blank of claim 52, wherein the axes of least two depressions aligned along an independent linear axis are parallel.

61. The blank of claim 52, comprising at least three depressions aligned along an independent linear axis, the independent axes of the three depressions being parallel and evenly spaced such that congruent areas of nominal thickness are formed between the depressions.

62. The blank of claim 52, wherein at least one of the first or second directions is not parallel to at least one of the first or second linear edges.

63. The blank of claim 62, wherein angle between the first and second directions is between zero and ninety degrees.

64. The blank of claim 62, wherein the angle between the first and second directions is about forty- five degrees.

65. The blank of claim 52, wherein the at least two depressions aligned in the second direction comprise a plurality of additional arcuate depressions parallel to the first and second arcuate edges, the additional arcuate depressions intersecting at least one of the plurality of depressions aligned along an independent linear axis.

66. The blank of claim 65, wherein the first and second linear edges each lie along a ray emanating from the common radial axis of the first and second arcuate edges.

67. The blank of claim 65, wherein the sheet is defined by a circular ring sector.

68. The blank of claim 65, wherein the sheet has a generally uniform nominal thickness and an area adjacent one or more of the depressions has a non-uniform thickness that varies between the thickness of the respective depression and the nominal thickness.