

CLAIMS

1. A fitment bistable pull-snap hold open mechanism, comprising:

a flexible first flat, strip like member comprised of a polyolefin material having:

a first end;

a second end opposite the first end;

an inner mating surface;

an outer bonding surface opposite the inner mating surface;

a flexible second flat, strip like member positioned relative to the first flat strip like member, the second flat, stripe like member comprised of a polyolefin having:

a first end;

a second end opposite the first end;

an inner mating surface;

an outer bonding surface opposite the inner mating surface;

one or more pivot members integrated into the second flat, strip like member separating the second flat, strip like member into a side seal portion and an operable portion, the side seal portion coupled to the operable portion,

wherein the first flat, strip like member is coupled to the second flat, strip like member at both the first ends and

the second ends with two or more bonding points at each of the first and second ends,

wherein the one or pivot members comprise a vertical living hinge and a flexure allowing the fitment bistable pull-snap hold open mechanism to be biased between an open configuration and a closed configuration,

wherein the vertical living hinge does not extend to the top edge or the bottom edge of the second flat, strip like member, and

wherein the first flat, strip like member and the second flat, strip like member are applied proximate the opening of a flexible package on the inside walls of the package.

2. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the vertical living hinge comprises a thin portion of material coupling outer end corners of the side seal portion and the operable portion of the second flat, strip like member.

3. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the vertical living hinge is created by indenting, engraving, or slitting the inside surface of the polyolefin material of the second flat, strip like member to a specified blind depth.

4. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the vertical living hinge has a material thickness that is 80 percent or less of adjacent portions of the second flat, strip like member.

5. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the vertical living hinge has a material thickness that is 25 percent or less of adjacent portions of the second flat, strip like member.

6. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the gap between the top edge of the second flat, strip like member and top of the vertical living hinge is less than or equal to 2 mm.

7. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the gap between the bottom edge of the second flat, strip like member and bottom of the vertical living hinge is less than or equal to 2 mm.

8. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the gap between the top edge of the second flat, strip like member and top of the vertical living hinge is less than 50% of the length of the vertical living hinge.

9. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the gap between the bottom edge of the second flat, strip like member and bottom of the vertical living hinge is less than 50% of the length of the vertical living hinge.

10. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the vertical living hinge does not extend to the top edge or the bottom edge of the flexure.

11. The fitment bistable pull-snap hold open mechanism of claim 10 wherein the gap between the top edge and bottom edge of the flexure and the vertical living hinge is less than or equal to 2 mm.

12. The fitment bistable pull-snap hold open mechanism of claim 10 wherein the gap between the top edge and bottom edge of the flexure and the vertical living hinge is less than 50% of the length of the vertical living hinge.

13. The fitment bistable pull-snap hold open mechanism of claim 1, wherein for the two or more bonding points at each of the first and second ends there is one bonding point positioned above the top edge of the flexure and one bonding point positioned below the bottom edge of the flexure.

14. The fitment bistable pull-snap hold open mechanism of claim 1, wherein for the two or more bonding points at each of the first and second ends there are from 2 to 12 bonding points positioned above the top edge of the flexure and from 2 to 12 bonding points positioned below the bottom edge of the flexure.

15. The fitment bistable pull-snap hold open mechanism of claim 13 further including an additional one or more bonding points positioned between the top edge and bottom edge of the flexure.

16. The fitment bistable pull-snap hold open mechanism of claim 14 further including an additional one or more bonding points positioned between the top edge and bottom edge of the flexure.

17. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the two or more bonding points at each of the first and second ends are circular, square, rectangular, triangular, diamond, star, oval or a combination thereof in shape.

18. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the flexure is cut into a shape selected from the group consisting of a half-square, a half-elliptical, a half-octagonal, and a half-rectangular.

19. The fitment bistable pull-snap hold open mechanism of claim 18 wherein the half-square and half-rectangular shapes include rounded corners.

20. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the flexure includes a flexing point parallel with that of the vertical living hinge allowing the flexure to move from a first flat configuration to a second bent, flexed, or engaged configuration.

21. The fitment bistable pull-snap hold open mechanism of claim 20 wherein the flexure includes a sliding edge generally parallel with that of the vertical living hinge which engages the surface of the first member, a second configuration of the flexure holding the operable portion of the second member in a separated orientation relative to that of the first member where the mating surfaces are generally between about 90 degrees and 180 degrees of separation relative to one another, the body of the flexure intersecting the vertical living hinge.

22. The fitment bistable pull-snap hold open mechanism of claim 1 further including a pair of grab tabs, wherein the first grab tab extends from the top edge of the first flat, strip like member and the second grab tab extends from top edge of the second flat, strip like member, and wherein the pair of grab tabs are located about midway between the first ends and second ends of the first and second flat, strip like members.

23. The fitment bistable pull-snap hold open mechanism of claim 22 wherein the shape of the pair of grab tabs are selected from the group consisting of semi-circular, square, rectangular, trapezoidal, triangular, elliptical and parallelogram.

24. The fitment bistable pull-snap hold open mechanism of claim 22 wherein the pair of grab tabs completely overlap with each other when the mechanism is in the closed position.

25. The fitment bistable pull-snap hold open mechanism of claim 22 wherein the pair of grab tabs are offset from each other when the mechanism is in the closed position.

26. The fitment bistable pull-snap hold open mechanism of claim 25 wherein the offset is less than 30 mm.

27. The fitment bistable pull-snap hold open mechanism of claim 25 wherein the offset is less than 10 mm.

28. The fitment bistable pull-snap hold open mechanism of claim 25 wherein the offset is at least 20% of the width a grab tab.

29. The fitment bistable pull-snap hold open mechanism of claim 1 further including a carrying handle extending from the top edge of the first flat, strip like member and the top edge of the second flat, strip like member.

30. The fitment bistable pull-snap hold open mechanism of claim 29 wherein the carrying handle is located about midway between the first ends and seconds ends of the first and second flat, strip like members.

31. The fitment bistable pull-snap hold open mechanism of claim 29 wherein the carrying handle is in the shape selected

from the group consisting of rectangular, square, circular, semi-circular, trapezoidal, triangular, elliptical, and parallelogram.

32. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the mechanism makes a sudden audible snapping sound when actuated from the open position to the closed position and from the closed position to the open position.

33. The fitment bistable pull-snap hold open mechanism of claim 32 wherein the sudden audible snapping sound is at least 30 decibels over a time period of less than or equal to 1 second.

34. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the flexible package includes a male-female closure mechanism.

35. The fitment bistable pull-snap hold open mechanism of claim 34 wherein the male-female closure mechanism includes a handle to facilitate the opening and closing of the male-female closure mechanism.

36. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the flexible package includes a hook and loop or a hook and hook fastening system closure mechanism.

37. The fitment bistable pull-snap hold open mechanism of claim 1 wherein the coupled first and second flat, strip like members of the mechanism are made from a single piece of the polyolefin material formed in an extrusion or injection molding process followed by a die cutting or punching process and then followed by a welding process.

38. The fitment bistable pull-snap hold open mechanism of claim 37 wherein the polyolefin material is selected from the group consisting of polypropylene, polyethylene, polybutylene, ethylene-propylene-butylene terpolymer and ethylene-propylene copolymer.

39. The fitment bistable pull-snap hold open mechanism of claim 37 wherein the single piece of the polyolefin material is rectangular in shape.

40. The fitment bistable pull-snap hold open mechanism of claim 39 wherein the die cutting or punching process removes an elliptical shaped center region from the rectangular piece and forms a horizontal cut at each end of the piece to allow for the first flat, strip like member and the second flat, strip like member to be formed.

41. The fitment bistable pull-snap hold open mechanism of claim 40 wherein the die cutting or punching process forms the vertical living hinge and flexure of the one or more pivot members of the second flat, strip like member.

42. The fitment bistable pull-snap hold open mechanism of claim 41 wherein the first flat, strip like member is folded onto the second flat, strip like member at each horizontal cut at each end of the piece.

43. The fitment bistable pull-snap hold open mechanism of claim 37 wherein the die cutting or punching process is selected from the group consisting of a rotary flat-bed die cutting operation, a laser die cutting operation and a digital die cutting operation.

44. The fitment bistable pull-snap hold open mechanism of claim 42 wherein the welding process couples the first flat, strip like member to the second flat strip like member at both the first ends and at the second ends by forming the two or more bonding points at each end of the mechanism.

45. The fitment bistable pull-snap hold open mechanism of claim 44 wherein the two or more bonding points have a diameter ranging from 0.2 mm to 20 mm.

46. The fitment bistable pull-snap hold open mechanism of claim 37 wherein the welding process is a hot tool welding process, spot sealing process, adhesive bonding process or an ultrasonic welding process.

47. A method of using the fitment bistable pull-snap hold open mechanism of claim 1 comprising:

- applying a separating pressure between the first flat, strip like member and second flat, strip like member;

- sliding the flexure from a first flat configuration to a second bent configuration, holding the first member separate from the second member allowing easy access to the contents of the package;

- applying a compressive pressure between the first and second member; and

- sliding the flexure from a second bent configuration to a first flat configuration thus closing and mating the first member relative to the second member to close the package.

48. A fitment bistable pull-snap hold open mechanism, comprising:

a flexible first flat, strip like member comprised of a polyolefin material having:

an inner mating surface;

an outer bonding surface opposite the inner mating surface;

a flexible second flat, strip like member positioned relative to the first flat strip like member, the second flat, stripe like member comprised of a polyolefin having:

an inner mating surface;

an outer bonding surface opposite the inner mating surface;

one or more pivot members pivotally coupling the first flat, strip like member to the second, flat strip like member.

wherein the first flat, strip like member is coupled to the second flat, strip like member at both the first ends and the second ends with two or more bonding points at each of the first and second ends,

wherein the one or pivot members comprise a vertical living hinge and one or more flexures allowing the fitment bistable pull-snap hold open mechanism to be biased between an open configuration and a closed configuration,

wherein the vertical living hinge does not extend to the top edge or the bottom edge of the second flat, strip like member and does not extend to the top edge or the bottom edge of the one or more flexures, and

wherein the first flat, strip like member and the second flat, strip like member are applied proximate the opening of a flexible package on the inside walls of the package.

49. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the vertical living hinge is defined by a thin portion of material coupling the inner end corners of the first member and the second member.

50. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the vertical living hinge is created by indenting, engraving, or slitting the inside surface of the polyolefin material of the second flat, strip like member to a specified blind depth.

51. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the vertical living hinge has a material thickness that is 80 percent or less of adjacent portions of the second flat, strip like member.

52. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the gap between the top edge of the second flat, strip like member and top of the vertical living hinge is less than or equal to 2 mm.

53. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the gap between the bottom edge of the second flat, strip like member and bottom of the vertical living hinge is less than or equal to 2 mm.

54. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the gap between the top edge and bottom edge of

the one or more flexures and the vertical living hinge is less than or equal to 2 mm.

55. The fitment bistable pull-snap hold open mechanism of claim 48, wherein for the two or more bonding points at each of the first and second ends there is one bonding point positioned above the top edge of the one or more flexures and one bonding point positioned below the bottom edge of the one or more flexures.

56. The fitment bistable pull-snap hold open mechanism of claim 48, wherein for the two or more bonding points at each of the first and second ends there are from 2 to 12 bonding points positioned above the top edge of the one or more flexures and from 2 to 12 bonding points positioned below the bottom edge of the one or more flexures.

57. The fitment bistable pull-snap hold open mechanism of claim 55 further including an additional one or more bonding points positioned between the top edge and bottom edge of the one or more flexures.

58. The fitment bistable pull-snap hold open mechanism of claim 56 further including an additional one or more bonding points positioned between the top edge and bottom edge of the one or more flexures.

59. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the two or more bonding points at each of the first and second ends are circular, square, rectangular, triangular, diamond, star, oval or a combination thereof in shape.

60. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the one or more flexures are cut into a shape selected from the group consisting of a half-square, a half-elliptical, a half-octagonal, and a half-rectangular.

61. The fitment bistable pull-snap hold open mechanism of claim 60 wherein the half-square and half-rectangular shapes include rounded corners.

62. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the one or more flexures include a flexing point parallel with that of the vertical living hinge allowing the flexure to move from a first flat configuration to a second bent, flexed, or engaged configuration.

63. The fitment bistable pull-snap hold open mechanism of claim 62 wherein the one or more flexures include a sliding edge generally parallel with that of the vertical living hinge which engages the surface of the first member, a second configuration of the one or more flexures holding the operable portion of the second member in a separated orientation relative to that of the first member where the mating surfaces are generally between about 90 degrees and 180 degrees of separation relative to one another.

64. The fitment bistable pull-snap hold open mechanism of claim 48 further including a pair of grab tabs, wherein the first grab tab extends from the top edge of the first flat, strip like member and the second grab tab extends from top edge of the second flat, strip like member, and wherein the pair of grab tabs are located about midway between the first ends and seconds ends of the first and second flat, strip like members.

65. The fitment bistable pull-snap hold open mechanism of claim 64 wherein the shape of the pair of grab tabs are selected from the group consisting of semi-circular, square, rectangular, trapezoidal, triangular, elliptical and parallelogram.

66. The fitment bistable pull-snap hold open mechanism of claim 64 wherein the pair of grab tabs completely overlap with each other when the mechanism is in the closed position.

67. The fitment bistable pull-snap hold open mechanism of claim 64 wherein the pair of grab tabs are offset from each other when the mechanism is in the closed position.

68. The fitment bistable pull-snap hold open mechanism of claim 67 wherein the offset is less than 30 mm.

69. The fitment bistable pull-snap hold open mechanism of claim 67 wherein the offset is at least 20% of the width a grab tab.

70. The fitment bistable pull-snap hold open mechanism of claim 48 further including a carrying handle extending from the top edge of the first flat, strip like member and the top edge of the second flat, strip like member.

71. The fitment bistable pull-snap hold open mechanism of claim 70 wherein the carrying handle is located about midway between the first ends and seconds ends of the first and second flat, strip like members.

72. The fitment bistable pull-snap hold open mechanism of claim 70 wherein the carrying handle is in the shape selected from the group consisting of rectangular, square, circular,

semi-circular, trapezoidal, triangular, elliptical, and parallelogram.

73. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the mechanism makes a sudden audible snapping sound when actuated from the open position to the closed position and from the closed position to the open position.

74. The fitment bistable pull-snap hold open mechanism of claim 73 wherein the sudden audible snapping sound is at least 30 decibels over a time period of less than or equal to 1 second.

75. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the flexible package includes a male-female closure mechanism.

76. The fitment bistable pull-snap hold open mechanism of claim 75 wherein the male-female closure mechanism includes a handle to facilitate the opening and closing of the male-female closure mechanism.

77. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the flexible package includes a hook and loop or hook and hook fastening system closure mechanism.

78. The fitment bistable pull-snap hold open mechanism of claim 48 wherein the coupled first and second flat, strip like members of the mechanism are made from a single piece of the polyolefin material formed in an extrusion or injection molding process followed by a die cutting or punching process and then followed by a welding process.

79. The fitment bistable pull-snap hold open mechanism of claim 78 wherein the polyolefin material is selected from the group consisting of polypropylene, polyethylene, polybutylene, ethylene-propylene-butylene terpolymer and ethylene-propylene copolymer.

80. The fitment bistable pull-snap hold open mechanism of claim 78 wherein the single piece of the polyolefin material is rectangular in shape.

81. The fitment bistable pull-snap hold open mechanism of claim 80 wherein the die cutting or punching process removes an elliptical shaped center region from the rectangular piece and forms a horizontal cut at each end of the piece to allow for the first flat, strip like member and the second flat, strip like member to be formed.

82. The fitment bistable pull-snap hold open mechanism of claim 81 wherein the die cutting or punching process forms the vertical living hinge and one or more flexures of the one or more pivot members of the second flat, strip like member.

83. The fitment bistable pull-snap hold open mechanism of claim 82 wherein the first flat, strip like member is folded onto the second flat, strip like member at each horizontal cut at each end of the piece.

84. The fitment bistable pull-snap hold open mechanism of claim 78 wherein the die cutting or punching process is selected from the group consisting of a rotary flat-bed die cutting operation, a laser die cutting operation and a digital die cutting operation.

85. The fitment bistable pull-snap hold open mechanism of claim 83 wherein the welding process couples the first flat, strip like member to the second flat strip like member at both the first ends and at the second ends by forming the two or more bonding points at each end of the mechanism.

86. The fitment bistable pull-snap hold open mechanism of claim 85 wherein the two or more bonding points have a diameter ranging from 0.2 mm to 20 mm.

87. The fitment bistable pull-snap hold open mechanism of claim 78 wherein the welding process is a hot tool welding process, spot sealing process, adhesive bonding process or an ultrasonic welding process.

88. A method of using the fitment bistable pull-snap hold open mechanism of claim 48 comprising:

- applying a separating pressure between the first flat, strip like member and second flat, strip like member;

- sliding the one or more flexures from a first flat configuration to a second bent configuration, holding the first member separate from the second member allowing easy access to the contents of the package;

- applying a compressive pressure between the first and second member; and

- sliding the one or more flexures from a second bent configuration to a first flat configuration thus closing and mating the first member relative to the second member to close the package.

89. A fitment bistable pull-snap hold open mechanism, comprising:

a flexible first flat, strip like member comprised of a polyolefin material having:

an inner mating surface;

an outer bonding surface opposite the inner mating surface;

a flexible second flat, strip like member positioned relative to the first flat strip like member, the second flat, stripe like member comprised of a polyolefin having:

an inner mating surface;

an outer bonding surface opposite the inner mating surface;

one or more pivot members pivotally coupling the first flat, strip like member to the second, flat strip like member.

wherein the first flat, strip like member is coupled to the second flat, strip like member at both the first ends and the second ends with a bonding area adjacent to each of the first and second ends,

wherein the one or pivot members comprise a vertical living hinge and one or more flexures allowing the fitment bistable pull-snap hold open mechanism to be biased between an open configuration and a closed configuration,

wherein the vertical living hinge does not extend to the top edge or the bottom edge of the second flat, strip like member and does not extend to the top edge or the bottom edge of the one or more flexures, and

wherein the first flat, strip like member and the second flat, strip like member are applied proximate the opening of a flexible package on the inside walls of the package.

90. The fitment bistable pull-snap hold open mechanism of claim 89 wherein the bonding area is the area between the side edges of the first and second flat strip like members and the vertical living hinge and one or more flexures of the second flat, strip like member.

91. The fitment bistable pull-snap hold open mechanism of claim 89 wherein the bonding area is formed in a welding process selected from the group consisting of a hot tool welding process, an adhesive bonding process and an ultrasonic welding process.

92. A method of using the fitment bistable pull-snap hold open mechanism of claim 89 comprising:

applying a separating pressure between the first flat, strip like member and second flat, strip like member;

sliding the one or more flexures from a first flat configuration to a second bent configuration, holding the first member separate from the second member allowing easy access to the contents of the package;

applying a compressive pressure between the first and second member; and

sliding the one or more flexures from a second bent configuration to a first flat configuration thus closing and mating the first member relative to the second member to close the package.