CLAIMS

1. A frame (100e) for a foldable playard (1000a), the frame having a compact folded configuration for storage of the frame and a deployed unfolded configuration to support the foldable playard on a ground surface (90) to contain a child (50) in an interior space (102) of the foldable playard, the frame comprising:

a plurality of X-frame assemblies positioned at respective side faces (106) of the interior space, each X-frame assembly of the plurality of X-frame assemblies comprising a plurality of X-frame tubes (142a, 142b), each X-frame tube of the plurality of X-frame tubes being a straight tube; and

a plurality of leg support assemblies (110e) coupled to the plurality of X-frame assemblies, each leg support assembly of the plurality of leg support assemblies comprising:

a leg tube (112) having a centerline axis (111a) positioned along a side edge (104) of the interior space;

a corner (130), coupled to a top end (113a) of the leg tube, having a first corner arm (134) and a second corner arm (136); and

a slider (120), slidably coupled to the leg tube, having a first slider arm (124) and a second slider arm (126),

wherein:

the first corner arm of a first leg support assembly of the plurality of leg support assemblies and the second corner arm of a second leg support assembly of the plurality of leg support assemblies are each horizontally offset from a side face (106) of the interior space intersecting the first centerline axis of the first leg support assembly and the second centerline axis of the second leg support assembly such that at least a portion of the first corner arm of the first leg support assembly overlaps at least a portion of the second corner arm of the second leg support assembly along the side face when the frame is in the compact folded configuration;

the first slider arm of the first leg support assembly and the second slider arm of the second leg support assembly are each horizontally offset from the side face such that at least a portion of the first slider arm of the first leg support assembly overlaps at least a portion of the second slider arm of the second leg support assembly along the side face when the frame is in the compact folded configuration;

respective sliders of the plurality of leg support assemblies are identical; and

respective corners of the plurality of leg support assemblies are identical.

2. The frame of claim 1, wherein each X-frame tube of the plurality of X-frame tubes is rotatably coupled to at least one leg tube of the plurality of leg support assemblies such that no portion of each X-frame tube is separated from the at least one leg tube by a gap less than 1.5 inches in each of the compact folded configuration, the deployed unfolded configuration, and a configuration between the compact folded configuration and the deployed unfolded configuration.

3. The frame of claim 2, wherein respective first and second slider arms of the plurality of leg support assemblies each have a length (l_{sr}) equal to or greater than 1.5 inches.

4. The frame as in claims 2 or 3, wherein respective first and second corner arms of the plurality of leg support assemblies each have a length (l_{cr}) equal to or greater than 1.5 inches.

5. The frame of claim 1, wherein:

the first slider arm of the first leg support assembly is offset away from the interior space; and

the second slider arm of the first leg support assembly is offset towards the interior space.

6. The frame of claim 1, wherein the first and second slider arms of the first leg support assembly are together one of offset towards the interior space or offset away from the interior space.

7. The frame as in claims 1, 5, or 6, wherein:

the first corner arm of the first leg support assembly is offset away from the interior space; and

the second corner arm of the first leg support assembly is offset towards the interior space.

8. The frame as in claims 1, 5, or 6, wherein the first and second corner arms of the first leg support assembly are together one of offset towards the interior space or offset away from the interior space.

9. The frame of claim 1, wherein each X-frame tube of the plurality of X-frame tubes has a constant cross section.

10. The frame of claim 1, wherein the plurality of X-frame tubes of each X-frame assembly comprises:

a first X-frame tube (142a); and

a second X-frame tube (142b) rotatably coupled to the first X-frame tube, the second X-frame tube being horizontally offset from the first X-frame tube by a distance (w_x) ranging between 0.625 inches and 1.5 inches.

11. The frame of claim 1, further comprising:

only one latch (200a), coupled to one X-frame assembly of the plurality of X-frame assemblies and/or one leg support assembly of the plurality of leg support assemblies, to maintain the frame in the deployed unfolded configuration.

12. The frame of claim 1, further comprising:

a storage latch (600a-600c), coupled to one leg support assembly of the plurality of leg support assemblies, to maintain the frame in the compact folded configuration.

13. The frame of claim 12, wherein the frame only comprises the storage latch to maintain the frame in the compact folded configuration.

14. The frame of claim 12, wherein:

the slider of the one leg support assembly is disposed proximate to the top end of the leg tube of the one leg support assembly when the frame is in the deployed unfolded configuration; and

the storage latch prevents the slider of the one leg support assembly from moving towards the top end of the leg tube by physically contacting a top surface (129) of the slider thereby maintaining the frame in the compact folded configuration.

15. The frame of claim 14, wherein the storage latch comprises:

a push button (610) partially protruding through an opening (113d) located near a bottom end (113b) of the leg tube, the push button having a restraining surface (612) to physically contact the top surface of the slider of the one leg support assembly so as to prevent the slider from moving towards the top end of the leg tube, the push button, when pressed, being inserted through the opening and disposed within a cavity (113c) of the leg tube such that the slider is able to move towards the top end of the leg tube; and

a spring element (620), disposed within the cavity of the leg tube and directly coupled to the push button, to apply a spring bias force to the push button causing the push button to protrude through the opening such that the restraining surface of the push button is able to contact the top surface of the slider when the push button is not pressed.

16. The frame of claim 15, wherein:

the push button includes a ramped surface (616); and

when the frame transitions from the deployed unfolded configuration to the compact folded configuration, a bottom surface (127) of the slider physically contacts the ramped surface of the push button causing the push button to be inserted into the cavity of the leg tube thereby allowing the slider to move below the push button such that the top surface of the slider is positioned below the restraining surface of the push button.

17. The frame of claim 14, wherein:

the storage latch comprises:

a base (640) coupled to the leg tube of the one leg support assembly and disposed below the slider of the one leg support assembly;

a latch member (642) coupled to the base and extending along the leg tube such that an end (643) of the latch member is disposed above the slider when the frame is in the compact folded configuration; and

a hook (644), disposed at the end of the tab, to physically contact the top surface of the slider of the one leg support assembly so as to prevent the slider from moving towards the top end of the leg tube; and

the latch member, when pulled, bends such that the hook is physically separated from the slider thereby allowing the slider to move towards the top end of the leg tube.

18. The frame of claim 17, wherein the base of the storage latch is integrally formed together with a foot (114) disposed at a bottom end (113b) of the leg tube.

19. The frame of claim 17, wherein:

the hook includes a ramped surface (646); and

when the frame transitions from the deployed unfolded configuration to the compact folded configuration, a bottom surface (127) of the slider physically contacts the ramped surface of the hook causing the latch member to bend thereby allowing the slider to move below the hook such that the top surface of the slider is disposed below the hook of the latch member.

~~20. A frame (100e) for a foldable playard (1000a), the frame having a compact folded configuration for storage of the frame and a deployed unfolded configuration to support the foldable playard on a ground surface (90) to contain a child (50), the frame comprising:~~

~~a plurality of leg support assemblies (110e), each leg support assembly of the plurality of leg support assemblies comprising a leg tube (112); and~~

~~a plurality of X-frame assemblies (140c) coupled to the plurality of leg support assemblies, each X-frame assembly of the plurality of X-frame assemblies comprising at least one X-frame tube (142a, 142b) rotatably coupled to the leg tube of at least one leg support assembly of the plurality of leg support assemblies such that no portion of the at least one X-frame tube is separated from the leg tube by a gap less than 1.5 inches in each of the compact folded configuration, the deployed unfolded configuration, and a configuration between the compact folded configuration and the deployed unfolded configuration.~~

~~21. The frame of claim 20, wherein:~~

~~each leg support assembly of the plurality of leg support assemblies further comprises:~~

a slider (120), slidably coupled to the leg tube, having a first slider arm (124) and a second slider arm (126);

the first slider arm of a first leg support assembly of the plurality of leg support assemblies and the second slider arm of a second leg support assembly of the plurality of leg support assemblies are each horizontally offset from a first plane (103) intersecting a first centerline axis (111a) of the first leg support assembly and a second centerline axis (111a) of the second leg support assembly such that at least a portion of the first slider arm of the first leg support assembly overlaps at least a portion of the second slider arm of the second leg support assembly along the first plane when the frame is in the compact folded configuration; and

the second slider arm of the first leg support assembly and the first slider arm of a third leg support assembly of the plurality of leg support assemblies are each horizontally offset from a second plane (103) intersecting the respective centerline axes of the first and third leg support assemblies such that at least a portion of the second slider arm of the first leg support assembly overlaps at least a portion of the first slider arm of the third leg support assembly along the second plane when the frame is in the compact folded configuration.

22. The frame as in claims 20 or 21, wherein:

each leg support assembly of the plurality of leg support assemblies further comprises:

a corner (130), rigidly coupled to the leg tube, having a first corner arm (134) and a second corner arm (136);

the first corner arm of the first leg support assembly and the second corner arm of the second leg support assembly are each horizontally offset from the first plane such that at least a portion of the first corner arm of the first leg support assembly overlaps at least a portion of the second corner arm of the second leg support assembly along the first plane when the frame is in the compact folded configuration; and

the second corner arm of the first leg support assembly and the first corner arm of the third leg support assembly are each horizontally offset from the second plane such that at least a portion of the second corner arm of the first leg support assembly overlaps at least a portion of the first corner arm of the third leg support assembly along the second plane when the frame is in the compact folded configuration.

23. The frame of claim 20, wherein:

each leg support assembly of the plurality of leg support assemblies further comprises:

a slider (120) slidably coupled to the leg tube; and

a corner (130) rigidly coupled to the leg tube;

respective sliders of the plurality of leg support assemblies are identical; and

respective corners of the plurality of leg support assemblies are identical.

24. The frame of claim 20, wherein the at least one X-frame tube of each X-frame assembly of the plurality of X-frame assemblies is a straight tube.

25. A frame (100e) for a foldable playard (1000a), the frame having a compact folded configuration for storage of the frame and a deployed unfolded configuration to support the foldable playard on a ground surface (90) to contain a child (50), the frame comprising:

a plurality of X-frame assemblies (140e); and

a plurality of leg support assemblies (110e) coupled to the plurality of X-frame assemblies, the plurality of leg support assemblies comprising:

a first leg support assembly, comprising:

a first leg tube (112) having a first centerline axis (111a); and

a first slider (120), slidably coupled to the first leg tube, having a first slider arm (124) rotatably coupled to a first X-frame assembly of the plurality of X-frame assemblies; and

a second leg support assembly, comprising:

a second leg tube (112) having a second centerline axis (111a); and

a second slider (120), slidably coupled to the second leg tube, having a second slider arm (126) rotatably coupled to the first X-frame assembly,

wherein the first and second slider arms are horizontally offset from a first plane (103) intersecting the first and second centerline axes such that at least a portion of the first slider arm of the first leg support assembly overlaps at least a portion of the second slider arm of the second leg support assembly along the first plane when the frame is in the compact folded configuration.

26. The frame of claim 25, wherein:

the first leg support assembly further comprises:

a first corner (130), rigidly coupled to the first leg tube, having a first corner arm (134) rotatably coupled to the first X-frame assembly;

the second leg support assembly further comprises:

a second corner (130), rigidly coupled to the second leg tube, having a second corner arm (136) rotatably coupled to the first X-frame assembly; and

the first and second corner arms are horizontally offset from the first plane such that at least a portion of the first corner arm of the first leg support assembly overlaps at least a portion of the second corner arm of the second leg support assembly along the first plane when the frame is in the compact folded configuration.

27. The frame of claim 25, wherein the first and second slider arms each have a length (l_{sr}) equal to or greater than 1.5 inches.

28. The frame of claim 25, wherein:

the first leg support assembly further comprises:

a third slider arm (126) rotatably coupled to a second X-frame assembly of the plurality of X-frame assemblies;

the first slider arm is offset away from an interior space (102) of the foldable playard; and

the third slider arm is offset towards the interior space.

29. The frame of claim 25, wherein:

the first leg support assembly further comprises:

a third slider arm (126), rotatably coupled to a second X-frame assembly of the plurality of X-frame assemblies; and

the first and third slider arms are together one of offset towards an interior space (102) or offset away from the interior space.

30. The frame of claim 25, wherein each X-frame assembly of the plurality of X-frame assemblies comprises a plurality of X-frame tubes (142a, 142b), each X-frame tube of the plurality of X-frame tubes is a straight tube.

31. The frame of claim 25, further comprising:

only one latch (200a), coupled to one X-frame assembly of the plurality of X-frame assemblies and/or one leg support assembly of the plurality of leg support assemblies, to maintain the frame in the deployed unfolded configuration.

32. The frame of claim 25, further comprising:

a storage latch (600a-600c), coupled to the first leg support assembly, to maintain the frame in the compact folded configuration.

33. The frame of claim 32, wherein:

the first leg tube has a top end (113a);

the first slider is disposed proximate to the top end of the first leg tube when the frame is in the deployed unfolded configuration; and

the storage latch prevents the slider of the one leg support assembly from moving towards the top end of the leg tube by physically contacting a top surface (129) of the slider thereby maintaining the frame in the compact folded configuration.

34. A frame (100e) for a foldable playard (1000a), the frame having a compact folded configuration for storage of the frame and a deployed unfolded configuration to support the foldable playard on a ground surface (90) to contain a child (50), the frame comprising:

a plurality of X-frame assemblies (140c);

a plurality of leg support assemblies (110e) coupled to the plurality of X-frame assemblies, each leg support assembly of the plurality of leg support assemblies comprising:

a leg tube (112) having a top end (113a); and

a slider (120) slidably coupled to the leg tube and rotatably coupled to at least one X-frame assembly of the plurality of X-frame assemblies, the slider being disposed proximate to the top end of the leg tube when the frame is in the deployed unfolded configuration; and

a storage latch (600a), coupled to the leg tube of one leg support assembly of the plurality of leg support assemblies, to maintain the frame in the compact folded configuration, the storage

latch preventing the slider of the one leg support assembly from moving towards the top end of the leg tube by physically contacting a top surface (129) of the slider.

35. The frame of claim 34, wherein the frame only comprises the storage latch to maintain the frame in the compact folded configuration.

36. The frame of claim 34, wherein the storage latch comprises:

a push button (610) partially protruding through an opening (113d) located near a bottom end (113b) of the leg tube, the push button having a restraining surface (612) to physically contact the top surface of the slider of the one leg support assembly so as to prevent the slider from moving towards the top end of the leg tube, the push button, when pressed, being inserted through the opening and disposed within a cavity (113c) of the leg tube such that the slider is able to move towards the top end of the leg tube; and

a spring element (620), disposed within the cavity of the leg tube and directly coupled to the push button, to apply a spring bias force to the push button causing the push button to protrude through the opening such that the restraining surface of the push button is able to contact the top surface of the slider when the push button is not pressed.

37. The frame of claim 36, wherein:

the push button includes a ramped surface (616); and

when the frame transitions from the deployed unfolded configuration to the compact folded configuration, a bottom surface (127) of the slider physically contacts the ramped surface of the push button causing the push button to be inserted into the cavity of the leg tube thereby allowing the slider to move below the push button such that the top surface of the slider is positioned below the restraining surface of the push button.

38. The frame of claim 34, wherein:

the storage latch comprises:

a base (640) coupled to the leg tube of the one leg support assembly and disposed below the slider of the one leg support assembly;

a latch member (642) coupled to the base and extending along the leg tube such that an end (643) of the latch member is disposed above the slider in the compact folded configuration; and

a hook (644), disposed at the end of the tab, to physically contact the top surface of the slider of the one leg support assembly so as to prevent the slider from moving towards the top end of the leg tube; and

the latch member, when pulled, bends such that the hook is physically separated from the slider thereby allowing the slider to move towards the top end of the leg tube.

39. The frame of claim 38, wherein the base of the storage latch is integrally formed together with a foot (114) disposed at a bottom end (113b) of the leg tube.

40. The frame of claim 38, wherein:

the hook includes a ramped surface (646); and

when the frame transitions from the deployed unfolded configuration to the compact folded configuration, a bottom surface (127) of the slider physically contacts the ramped surface of the hook causing the latch member to bend thereby allowing the slider to move below the hook such that the top surface of the slider is disposed below the hook of the latch member.

41. The frame of claim 34, wherein each X-frame assembly of the plurality of X-frame assemblies comprises:

at least one X-frame tube (142a, 142b) rotatably coupled to the leg tube of at least one leg support assembly of the plurality of leg support assemblies such that no portion of the at least one X-frame tube is separated from the leg tube by a gap less than 1.5 inches in each of the compact folded configuration, the deployed unfolded configuration, and a configuration between the compact folded configuration and the deployed unfolded configuration.

42. The frame of claim 34, wherein:

respective leg tubes of the plurality of leg support assemblies each have a centerline axis (111a);

respective sliders of the plurality of leg support assemblies each have a first slider arm (124) and a second slider arm (126); and

the first slider arm of a first leg support assembly of the plurality of leg support assemblies and the second slider arm of a second leg support assembly of the plurality of leg support assemblies are each horizontally offset from a first plane (103) intersecting a first centerline axis (111a) of the first leg support assembly and a second centerline axis (111a) of the second leg support assembly such that at least a portion of the first slider arm of the first leg support assembly overlaps at least a portion of the second slider arm of the second leg support assembly along the first plane when the frame is in the compact folded configuration.

43. The frame as in claims 34 or 42, wherein:

each leg support assembly of the plurality of leg support assemblies further comprises:

a corner (130), coupled to the top end (113a) of the leg tube, having a first corner arm (134) and a second corner arm (136); and

the first corner arm of the first leg support assembly and the second corner arm of the second leg support assembly are each horizontally offset from the first plane such that at least a portion of the first corner arm of the first leg support assembly overlaps at least a portion of the second corner arm of the second leg support assembly along the first plane when the frame is in the compact folded configuration.