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(54) **INFANT SLING**

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(57) **ABSTRACT**

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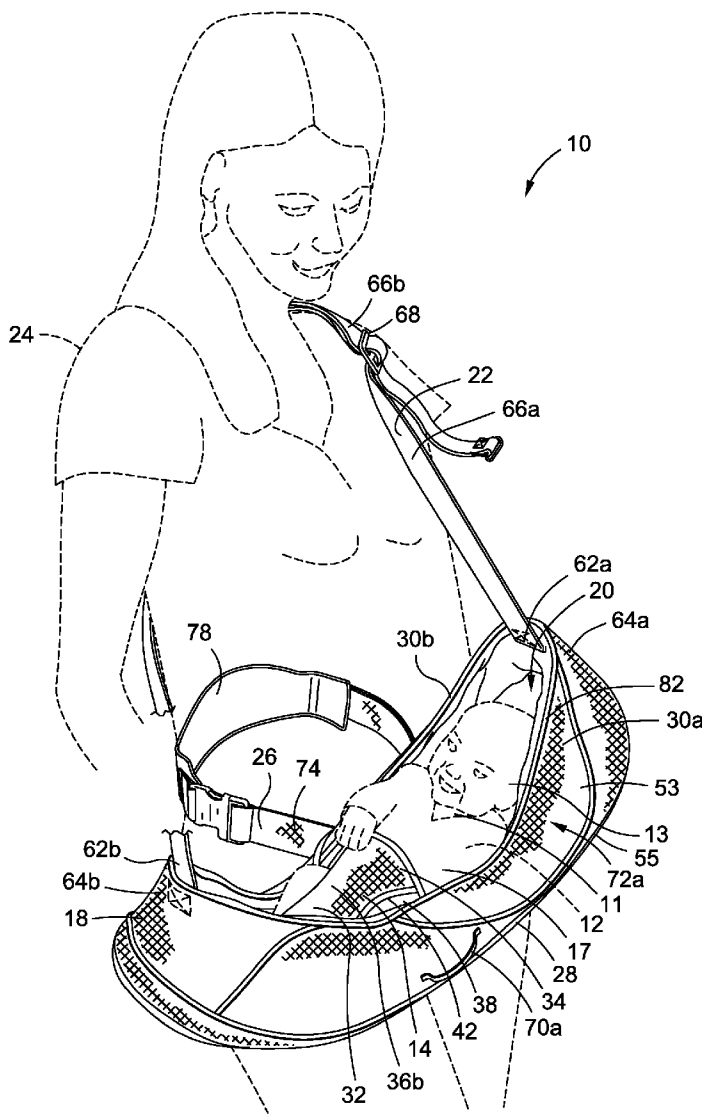
The present invention is directed to an adjustable sling for the carrying and transport of an infant, with features that impart improved safety, comfort and support for the infant. The adjustable sling has a sling body with an interior compartment for carrying the infant, and also has an adjustable shoulder strap that is extensible about a wearer's shoulder, with first and second opposing ends that are attached to the sling body. An adjustable lumbar belt is attached to the sling body and extensible about the wearer. In one embodiment, the sling has a retention flap that is attached to the sling body and retains the infant being carried by the sling to enhance the safety and security of the sling. In another embodiment, the sling has at least one support insert to support at least one of the infant's head and neck while the infant is carried in the interior compartment.

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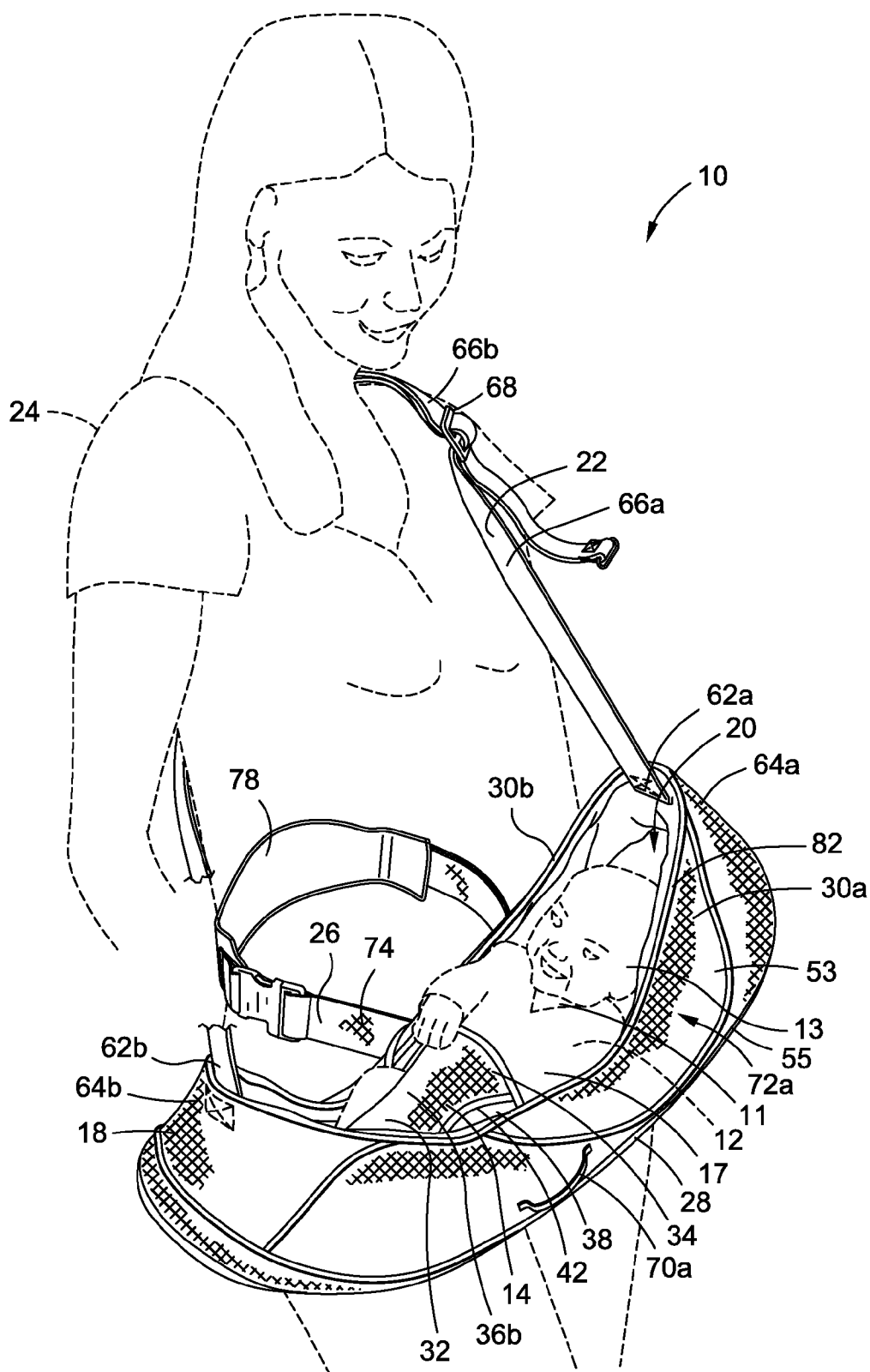


Fig. 1

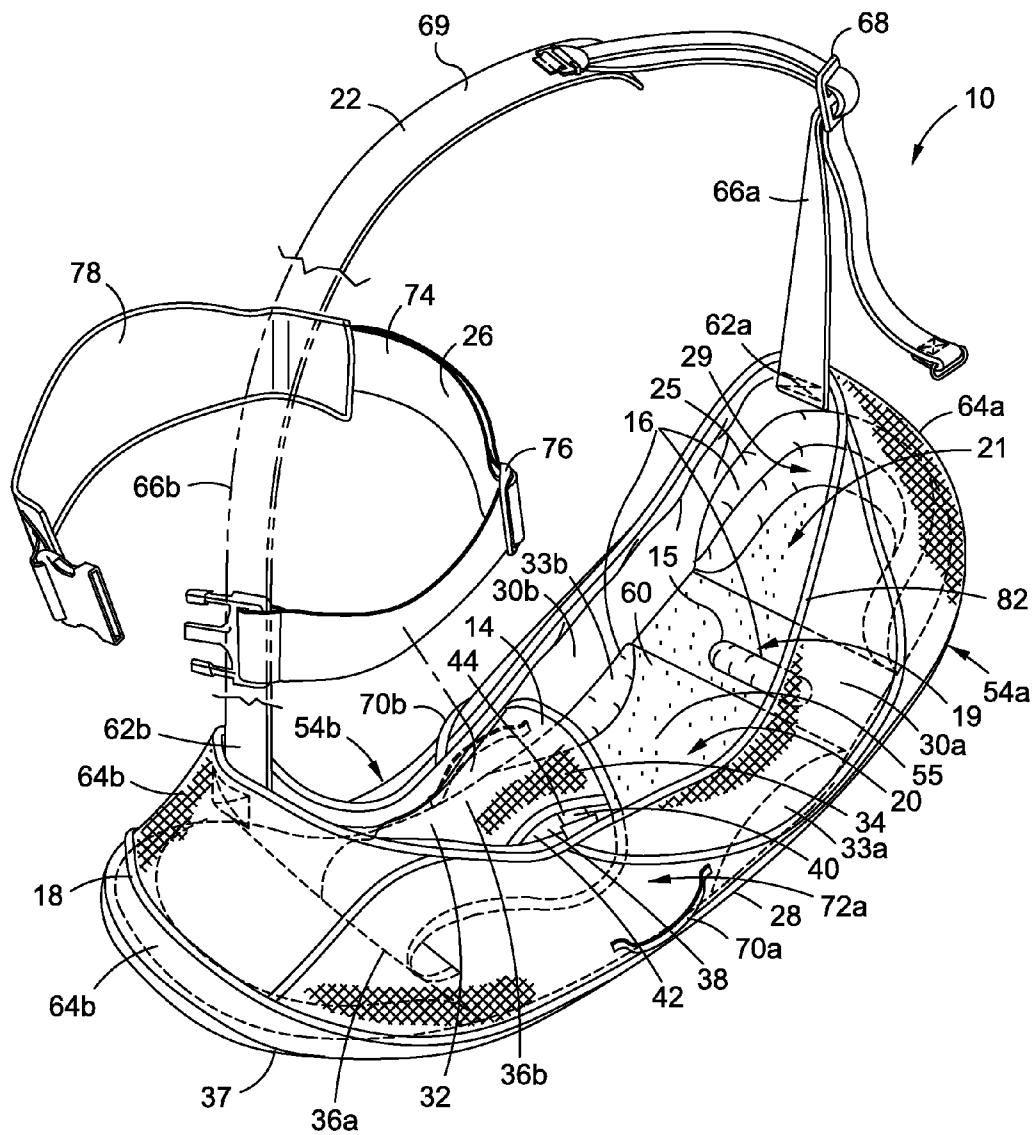


Fig. 2

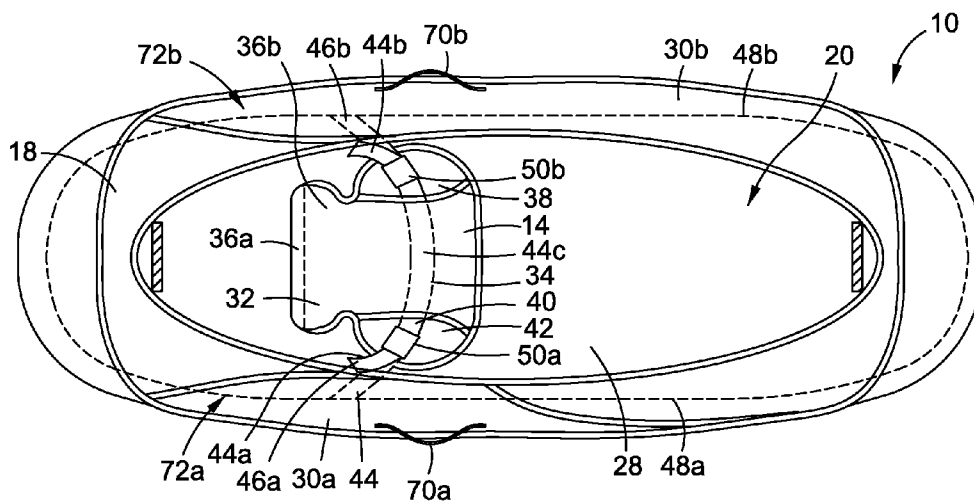


Fig. 3

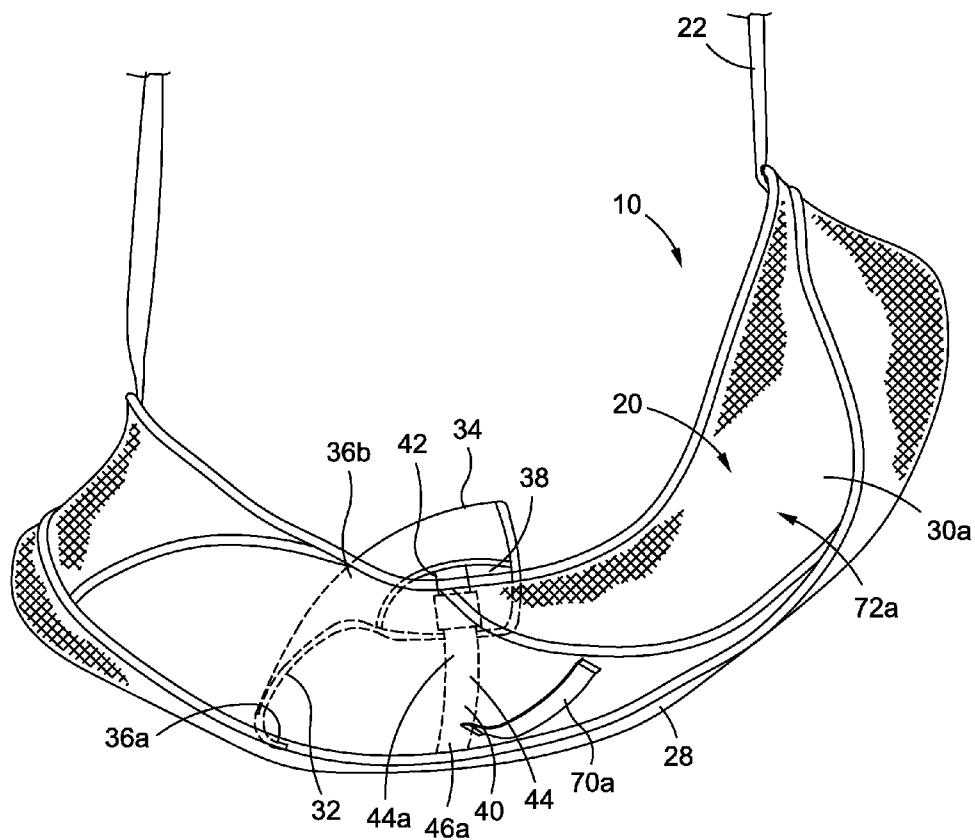


Fig. 4

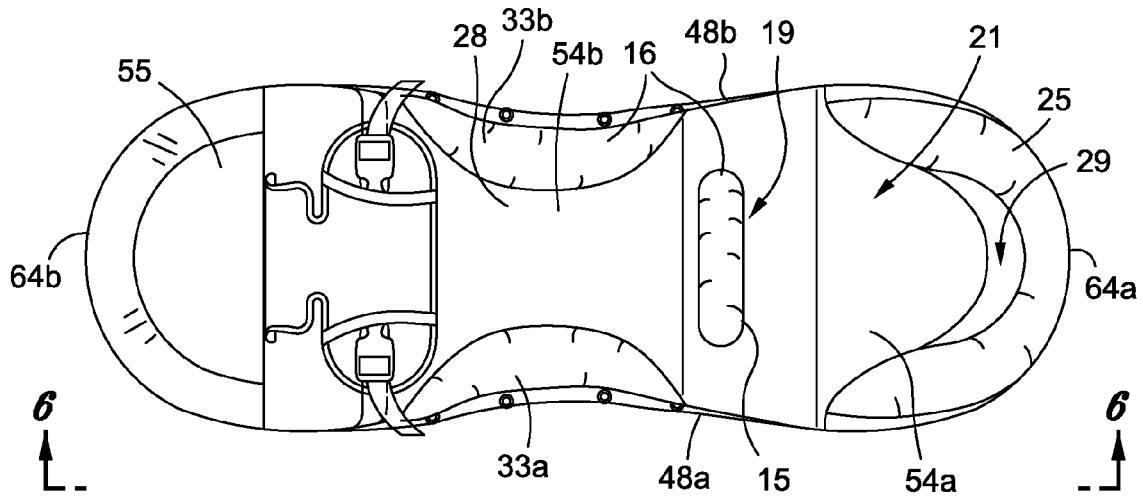


Fig. 5

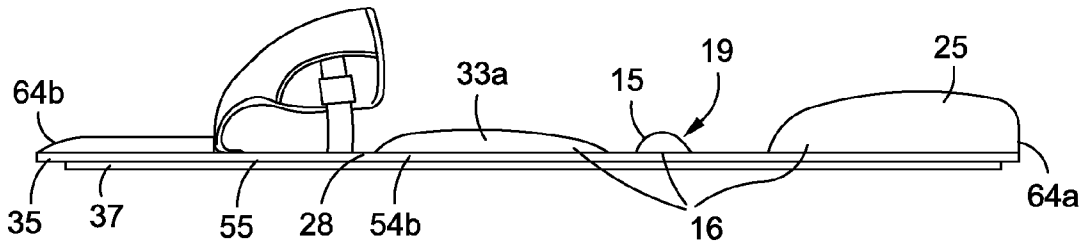


Fig. 6

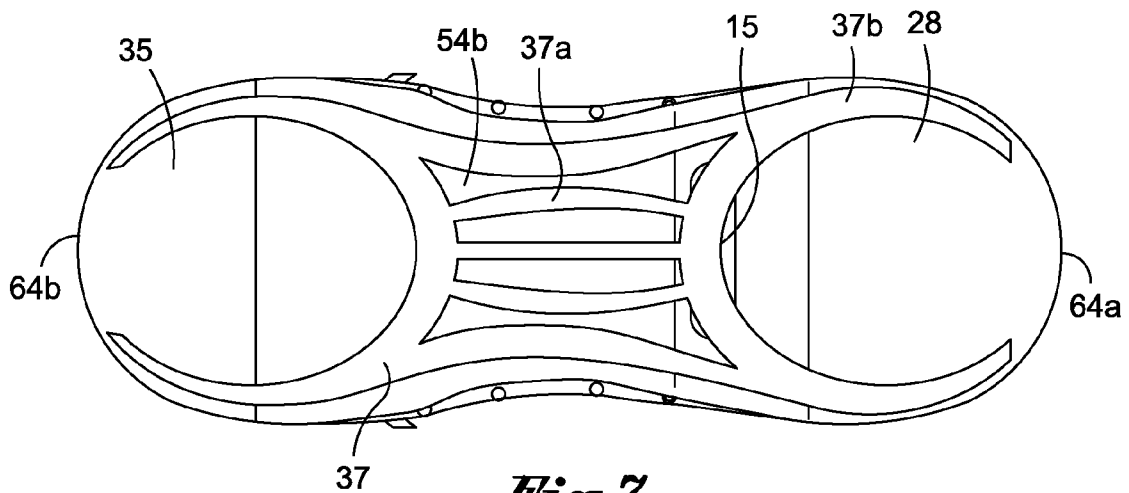


Fig. 7

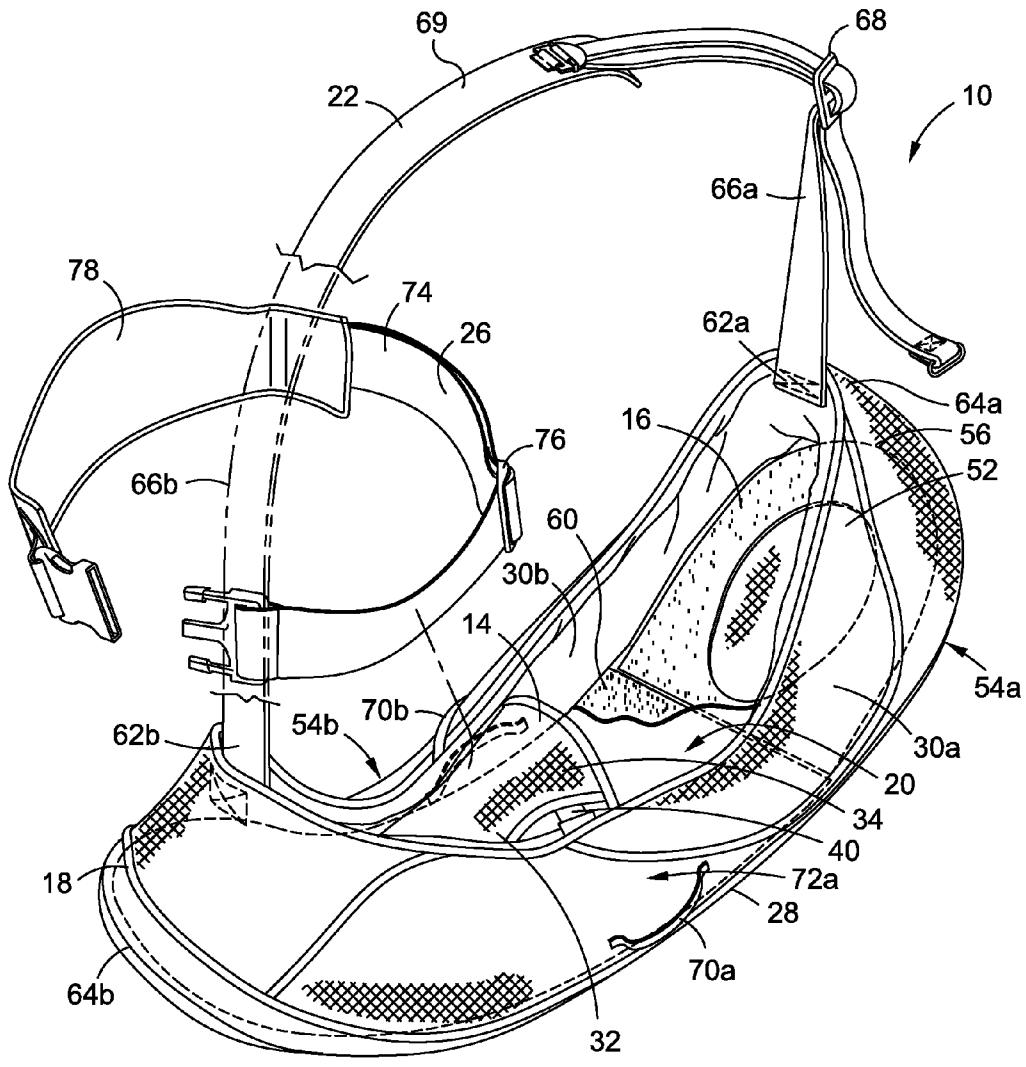


Fig. 8

INFANT SLING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable.

STATEMENT RE: FEDERALLY SPONSORED RESEARCH/DEVELOPMENT

[0002] Not Applicable

BACKGROUND OF THE INVENTION

[0003] 1. Technical Field

[0004] The present invention relates generally to sling carriers adapted to be worn by an adult to support and carry an infant or other young child. More particularly, the present invention is directed to a sling with improved features that allow the sling wearer to more securely hold the infant in the sling, and that improve the support of the infant's head and neck as well as the infant's body while being carried in the sling.

[0005] 2. Related Art

[0006] Baby slings are well known by parents and other persons involved in child care as being suitable carriers for the transport of children. Indeed, various different types of baby slings are currently available from manufacturers of infant products, such as for example the Jelly Bean™ Cargo Sling from Munchkin. Baby slings offer many advantages over other types of child carriers due to their typical simplicity of use, as well as other features. For example, baby slings typically hold the infant in a nestled position near the body of the adult sling wearer, which is often comforting to the child and allows easy monitoring and observation of the infant on the part of the adult wearer. Baby slings also typically allow for easy interaction between the adult wearing the sling and the infant being carried therein, such as for example to feed, soothe or entertain the infant. However, though currently known and available baby slings achieve their primary objective of carrying an infant, they nonetheless possess certain deficiencies that detract from their overall utility.

[0007] One of the deficiencies of prior art baby slings is the lack of any restraint or device to keep the infant securely held within the sling. In particular, slings fabricated from one or more layers of pliable fabric often rely on the infant's own weight to keep the fabric pulled snugly about the infant and restrain the infant therein. Such slings typically do not have any other means to restrain the infant, and thus leave the infant vulnerable to accidental falls, especially if the adult wearer bends or stoops while wearing the sling. Many conventional slings are even sold with accompanying warnings urging the wearer to avoid bending over or stooping while the infant is held in the sling. Even for those slings designed to minimize the likelihood of accident, the lack of any means of restraint may nonetheless be a source of unnecessary worry and anxiety to the sling wearer.

[0008] Yet another one of the deficiencies of the prior art baby slings is the insufficiency or lack of support for the body and head of the infant being carried therein. The prior art baby slings are typically fabricated from one or more layers of pliable fabric that individually or collectively define a pocket or compartment adapted to accommodate the infant. However, the pliability of the fabric used to fabricate the sling provides virtually no support for the body and head of the infant. This lack of support, coupled with the typical attach-

ment of the support strap of the sling to opposing longitudinal ends thereof, thus often results in the infant assuming an uncomfortable contour or curved position within the sling. In particular, as the head of an infant is typically relatively large and heavy compared to the infant's body, the infant may have difficulty in keeping their chin comfortably raised up off of their chest when laid in a supine or semi-supine position in the sling. Not only is this lack of support uncomfortable for the infant, but it also raises concerns with regard to possibly serious obstruction of the infant's breathing passageways. For example, as described in the article entitled "Cardiorespiratory Stability of Premature and Term Infants Carried in Infant Slings" to Stening et al, in Pediatrics Vol. 110, No. 5, November 2002, which is herein incorporated by reference in its entirety, a significant decrease of oxygen saturation was observed in infants carried in a conventional sling as compared to those placed in a pram. While the decrease was not deemed to be of clinical concern, the study nonetheless shows a trend that correlates sling carrying of infants with increased obstruction of breathing.

[0009] Accordingly, there remains a need in the art for slings that are capable of securely restraining an infant therein to reduce the likelihood of accidental falls and/or injury to an infant held in the slings. There is also a need for slings adapted for carrying an infant that provide improved support to the infant's head and/or neck region.

BRIEF SUMMARY OF THE INVENTION

[0010] The present invention specifically addresses and alleviates the above-identified deficiencies in the art. In this regard, the present invention is directed to an adjustable sling for carrying an infant. In one embodiment, the adjustable sling has a sling body that defines an interior compartment for carrying the infant, and an adjustable shoulder strap extensible about a wearer's shoulder, with first and second opposing ends of the strap being attached to the sling body. The sling also has an adjustable lumbar belt that attaches to the sling body and is extensible about the wearer. To enhance the security and safety of an infant being held in the interior compartment, the sling has a retention flap that is attached to the sling body and that is capable of securing and retaining the infant being carried in the compartment.

[0011] In yet another embodiment, the adjustable sling has a sling body that defines an interior compartment for carrying the infant and has at least one support insert therein. The support insert is configured to support at least one of the infant's head and neck while the infant is being carried in the interior compartment of the sling. The adjustable sling may also include an adjustable shoulder strap extensible about a wearer's shoulder, with first and second opposing ends of the strap being attached to the sling body. Further, the adjustable sling may include an adjustable lumbar belt that attaches to the sling body and is extensible about the wearer.

[0012] The present invention is best understood by reference to the following detailed description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] These as well as other features of the present invention will become more apparent upon reference to the drawings wherein:

[0014] FIG. 1 is a front perspective view of an embodiment of an adjustable infant sling according to the invention, depicting the sling as worn by an adult wearer holding an infant therein;

[0015] FIG. 2 is a front perspective view of an embodiment of an adjustable infant sling according to the invention, depicting a portion of the interior compartment of the sling;

[0016] FIG. 3 is a top plan view of an embodiment of an adjustable infant sling according to the invention;

[0017] FIG. 4 is a side plan view of an embodiment of an adjustable infant sling according to the invention; and

[0018] FIG. 5 is a sectional top view of an embodiment of a bottom panel for an adjustable infant sling according to the invention, depicting head and neck support inserts;

[0019] FIG. 6 is a sectional side view of the bottom panel of FIG. 5;

[0020] FIG. 7 is a sectional bottom view of the bottom panel of FIG. 5; and

[0021] FIG. 8 is a front perspective view of another embodiment of an adjustable infant sling according to the invention, depicting a portion of the interior compartment of the sling.

[0022] Common reference numerals are used throughout the drawings and detailed description to indicate like elements.

DETAILED DESCRIPTION OF THE INVENTION

[0023] The detailed description set forth below is intended as a description of the presently preferred embodiment of the invention, and is not intended to represent the only form in which the present invention may be constructed or utilized. The description sets forth the functions and sequences of steps for constructing and operating the invention. It is to be understood, however, that the same or equivalent functions and sequences may be accomplished by different embodiments and that they are also intended to be encompassed within the scope of the invention.

[0024] An adjustable sling 10 for carrying an infant 12 has been developed that provides substantial improvements over prior slings by providing secure restraint of the infant 12 being held therein, as well as improved support of the infant's head and neck regions. In one embodiment, the adjustable sling 10 comprises a specially devised retention flap 14 that comfortably and securely retains the infant 12 within the sling 10. In another embodiment, the adjustable sling 10 comprises a unique head and/or neck support insert 16 that provides improved comfort to the infant 12 being held in the sling 10. An improved adjustable sling 10 according to the invention may have either of these improved features individually, and may also comprise a combination of the features to improve the safety and comfort of the sling 10 in the transport and carrying of an infant 12.

[0025] It should be understood that the term "infant" as referred to herein is intended to be inclusive of all children and babies that may be suitably carried by the sling, and thus includes very young infants as well as older babies and children. In particular, the sling may be suitable for carrying very young infants and children that are 35 lbs or less, and especially those that are 20 lbs or less. Also, while it is envisioned that a likely wearer of the adjustable sling would be the child's parent, the wearer may also be another adult or teenager of a suitable age involved in the care of the child, such as a day care provider, sibling, grandparent and the like.

[0026] FIG. 1 shows an embodiment of an improved sling 10 according to the invention. The adjustable sling 10 generally comprises a sling body 18 that defines an interior compartment 20 for carrying the infant 12. An adjustable shoulder strap 22 is attachable to the sling body 18 and is extensible about the shoulder and/or back of a wearer 24 to support the sling body 18 on the wearer 24. The adjustable sling 10 can further comprise an adjustable lumbar belt 26 that is attachable to the sling body 18 to provide further support of the sling 10 on the body of the wearer 24. The sling 10 may thus be used to carry and transport an infant 12 by placing the shoulder strap 22 about the wearer's shoulders such that the strap 22 passes in a generally diagonal manner from the wearer's front and across the wearer's back, attaching the lumbar belt 26 to the sling 10 and extending the belt 26 about the wearer's waist, hips and/or torso region, and carefully placing the infant 12 within the interior compartment 20 of the sling body 18.

[0027] The sling body 18 can comprise a variety of different sizes, shapes and configurations adapted to provide an interior compartment 20 suitable for holding an infant 12 therein. In the version depicted in FIG. 1, the sling body 18 comprises an elongate bottom panel 28 and surrounding side panels 30a, 30b that together cooperate to define the interior compartment 20 therebetween. The elongate bottom panel 28 and surrounding side panels 30a, 30b can comprise separate segments of material or segments of material layers, such as for example one or more first segments 55 of material or material layers forming the bottom panel 28, and one or more second segments 53 of material or material layers disposed circumferentially about the bottom panel to form the side panels 30a, 30b. Alternatively the bottom and side panels 28, 30a, 30b can be formed from a single segment of material or layered material segments. The segments of material and/or material layers can be sewn or otherwise attached to each other to form the sling body 18. The segments of material that make up the sling body 18 are preferably fabricated from a soft, pliable fabric material, which can comprise one or more of a synthetic or natural material. The sling body 18 can also comprise a mesh material to provide breathability and air circulation within the interior compartment 20 to keep the infant 12 cool and comfortable. It should be understood that sling body 18 can furthermore comprise other suitable shapes, sizes and configurations other than those specifically shown and described herein.

[0028] Referring again to FIG. 1 as well as FIGS. 2-4, it can be seen that the sling 10 comprises the retention flap 14 that is configured to securely hold and retain the infant 12 within the sling body 18. In the version shown, the retention flap 14 is generally T-shaped, with an elongate lower segment 32 that attaches to the sling body 18 and passes between the infant's legs, and a transverse band segment 34 that extends transversely across the infant's body to support and restrain the infant 12. In this manner the retention flap 14 forms a sort of swaddling seat, similar to an onesie bottom or baby diaper, to support and retain the infant within the compartment 20. The elongate lower segment 32 of the retention flap 14 comprises a proximal end 36a configured to attach to the sling body 18, such as to the elongate bottom panel 28, and a free distal end 36b. The proximal end 36a of the retention flap 14 can be configured to attach to the elongate bottom panel 28 by sewing or otherwise attaching thereto, such as with snaps, hook and loop-type fasteners, buttons or other fasteners. The transverse band segment 34 is disposed at the distal end 36b of the

elongate lower segment 32 and is configured to cross over the infant's body, such as across the infant's stomach and/or torso, and attach to the sling body 18. The retention flap 14 is preferably fabricated from one or more soft, pliable fabric materials, which can comprise one or more of a synthetic or natural material. In one version, one or more portions of the retention flap 14 comprise padded materials, to increase the infant's comfort while being retained therein.

[0029] In the embodiment shown in FIGS. 1-4, the retention flap 14 comprises a retention belt sleeve 38 that is sized and configured to pass a retention belt 40 therethrough for restraining the infant 12 within the interior compartment 20. In this version, the retention belt sleeve 38 is located at the distal end 36b of the elongate lower segment 32, and forms a portion of the transverse band segment 34. The retention belt sleeve 38 defines a passage 42 therein that passes laterally across the transverse band segment 34 and is shaped and sized to accommodate the passage of the belt 40 therethrough. The retention belt 40 configured to pass through the retention belt sleeve 38 comprises at least one adjustable strap 44, with the belt 40 having first and second opposing ends 46a, 46b that are configured to attach to the sling body 18, such as at opposing edges 48a, 48b of the elongate bottom panel 28, as shown for example in FIG. 3. The retention belt 40 further comprises at least one releasable mating connector 50 configured to connect segments of the belt strap 44 together, or alternatively to connect a single segment of strap 44 directly to the sling body 18. The retention belt sleeve 38 that forms a part of the transverse band segment 34 thus promotes the infant's comfort by providing a layer of material, preferably padded, between the infant and retention belt 40 to gently and securely retain the infant.

[0030] In one version, at least a portion of the retention belt 40 is attached to the retention flap 14 itself to position and stabilize the belt 40, for example by sewing or otherwise attaching a portion of the retention belt 40 thereto. For example, the retention belt 40 can comprise first and second belt strap segments 44a, 44b, with a first belt strap segment 44a extending from a first opposing edge 48a of the elongate bottom panel 28 towards the retention flap 14, and the second belt strap segment 44b extending from a second opposing edge 48a of the elongate bottom panel 28 towards the retention flap 14, as shown for example in FIG. 3. A third belt strap segment 44c is attached to and passes through the retention belt sleeve 38 in the retention flap 14. First and second adjustable mating connectors 50a, 50b connect the attached third belt strap segment 44c to the first and second belt strap segments 44a, 44b, respectively. By attaching the strap segment 44c to the interior of the sleeve 38, the relative position of the belt 40 within the sleeve 38 can be maintained, while also allowing for adjustment of the belt 40 about the infant 12 via the adjustable mating connectors 50a, 50b, for example to tighten or loosen the belt 40 about the infant 12.

[0031] While specific embodiments of the retention belt 40 and retention flap 14 are being described herein for the purposes of illustrating aspects of the invention, it should be understood that the retention flap 14 and belt 14 are not limited to these specific embodiment, and other configurations may also be devised. For example, the retention flap 14 may itself form a central section of the belt 40, with first and second belt strap segments 44a, 44b being attached at opposing sides thereof and extending to connect to the sling body 18. Also, the retention belt segments 44a, 44b and/or retention flap 14 may be connected to each other via connectors

other than those specifically shown, such as for example via snaps, zippers, hook and loop closures such as Velcro™, and/or buttons. Embodiments in which the retention flap 14 is directly attached to the sling body 18 without the use of a retention belt 40, are also considered to be encompassed by the present invention. For example, in one embodiment, the retention flap 14 can comprise attachment mechanisms disposed at opposing lateral ends of the transverse band segment 34 that are capable of attaching the ends of the retention flap 14 to the sling body 18.

[0032] Accordingly, in one version, a method of employing the sling 10 for use in carrying and/or transporting an infant 12 involves laying the infant 12 on his/her back within the interior compartment 20 of the sling 10. The infant is placed in a supine or semi-supine position on the elongate bottom panel 28, with the infant's bottom positioned above the point of attachment of the retention flap 14 at the proximal end 36a of the elongate lower segment 32. The retention flap 14 is folded back over the infant's body, with the elongate lower segment 32 passing between the infant's legs and the transverse band segment 34 of the retention flap 14 crossing over the body of the infant 12, such as across the infant's stomach and/or torso. At least a portion of the retention belt 40 is extended through the sleeve 38 of the transverse band segment 34, and the belt 40 is secured via at least one releasable mating connector 50. The retention flap 14 can thus be used to gently and securely retain the infant in the interior compartment 20 of the sling body 18, thereby reducing the likelihood of accident or injury to the infant 12 while using the sling 10.

[0033] FIGS. 2 and 5-7 show yet another embodiment of the adjustable sling 10, wherein the sling 10 is configured to provide improved support to at least one of the infant's head 13 and neck 11 while the infant 12 is carried therein, as well as optionally to other portions of the infant's body. In this embodiment, the sling body 18 comprises at least one, and even a plurality of support inserts 16 that are shaped, sized and configured to improve the support of the infant. The improved support imparted by the support inserts 16 enhances the infant's comfort while being carried in the sling, and may also advantageously improve the positioning and alignment of the infant's breathing passages to ensure adequate oxygen saturation and breathing ability of the infant 12.

[0034] In one version, the support insert 16 comprises a neck support bolster 15 that is configured to maintain a position of the infant's neck 11 in relation to the head 13 of the infant 12, as shown for example in FIGS. 2 and 5-6. Specifically, the neck support bolster 15 is configured to maintain the infant's head 13 in a substantially neutral and/or mid-line position relative to the infant's spine when the infant 12 is in one or more of a supine or semi-supine position. By "neutral" or "mid-line" position it is meant that the infant's head 13 is positioned relative to the spine such that the head 13 is not bending excessively towards or away the spine, such as excessively forward, backward, or even sideways with respect to the spine, in a position that could otherwise be unacceptably uncomfortable to the infant 12 or restrict the infant's breathing. By maintaining the head and/or neck in such a neutral position, the infant's breathing passageways are kept unobstructed such that the infant 12 is able to breathe easier and maintain higher oxygen levels. In particular, the neck support bolster 15 is configured to lift a portion of the infant's neck 11 and/or body 17 with respect to the infant's head 13 such that the infant's chin is kept from excessively bending towards and

even into the infant's chest, thereby maintaining proper air passageway alignment. The neck support bolster 15 may preferably be formed of a cushioning foam material, although other padding or cushioning materials can also be used.

[0035] In the version shown in FIGS. 2 and 5-6, the neck support bolster 15 is anatomically shaped and positioned within the sling body 18 to allow the infant's scapulae, or shoulder blades, to rest thereon, thereby lifting the infant's upper back and neck regions to maintain the infant's head 13 and neck 11 in proper alignment. In this version, the elongate bottom panel 28 can be understood to comprise a head support region 54a configured to support the infant's head 13, and a body support region 54b to support the infant's body 17, with the neck support bolster 15 being disposed adjacent the head support region 54a at a location along the longitudinal axis of the elongate bottom panel 28 that allows for the lifting and support of the infant's upper back/shoulders and/or neck, such as between the head support region 54a and body support region 54b. The neck support bolster 15 further comprises a top surface 19 that is elevated above a surface 21 upon which the infant's head 13 rests in the head support region 54a of the elongate bottom panel 27, thereby lifting the infant's upper back and/or neck with respect to the infant's head 13. For example, the top surface 19 of the neck support bolster 15 can be at least about 0.5 inches higher than the head rest surface 21, such as from about 0.5 to about 1.0 inches higher, and even about 0.75 inches higher than the head rest surface 21. In the embodiment as shown in FIGS. 5-6, the neck support bolster 15 comprises a raised cushion having an at least semi-cylindrical shape that extends laterally across at least a portion of the elongate bottom panel 28 between first and second opposing sides 48a, 48b thereof.

[0036] The adjustable sling 10 can further comprise additional support inserts 16 disposed within the interior compartment 20 of the sling body 18 that are configured to support and cushion the infant's head 13 and/or neck 11 as well as to support and properly position the rest of the infant's body 17. In one embodiment, an additional support insert 16 comprises a head support insert 25 disposed towards an upper end 64a of the sling body 18 that at least partially conforms to a periphery of the infant's head 13 to maintain a position thereof. The head support insert 25 thus serves to promote proper alignment of the infant's head 13 with the rest of the infant's body 17, such as a substantially neutral alignment of the infant's head and spine, by inhibiting excessive lateral bending or twisting of the infant's neck 11. In the version shown in FIGS. 2 and 5-6, the head support insert 25 comprises a generally U-shaped body of cushioning material positioned at the upper end 64a of the elongate bottom panel 28, such as for example lining at least a portion of the side panels 30a, 30b at the upper end 64a of the sling body 18. The head support insert 25 thus forms supporting walls about the infant's head 13, with the interior surface 29 of the head support insert 25 being contoured to at least partially conform to the infant's head 13 while also allowing the infant a comfortable amount of head movement within the sling body 18. The head support insert 25 may preferably be formed of a cushioning foam material, although other padding or cushioning materials can also be used.

[0037] In yet another version, the additional support inserts 16 provided in the infant sling 10 comprise one or more body support bolsters 33a, 33b that are configured to support and position opposing sides of the infant's body 17. In the embodiment shown in FIGS. 2 and 5-6, the body support

bolsters 33a, 33b comprise arcuate bodies of cushioning material disposed on opposing sides of the elongate bottom panel 28 in the body support region 54b. The body support bolsters 33a, 33b thus inhibit excessive lateral slipping of the infant 12 within the interior compartment 20 of the sling body 18, and also promote a proper and comfortable alignment of the infant's body 17 therein. The body support bolsters 33a, 33b also cooperate with the retention flap 14 to properly position the infant 12 within the sling body 18 for optimum comfort and support. Similarly to the head support insert 25, the body support bolsters 33a, 33b may be formed of a cushioning foam material, or alternatively of another padding or cushioning material.

[0038] In yet another embodiment of a support insert 16 as shown in FIG. 8, the infant sling 10 comprises at least one support insert 16 that defines a central cutout 52 therein to provides support for the infant's head 13 while being carried in the interior compartment 20. The support insert 16 is disposed within the interior compartment 20 of the sling body 18, such as within, on top of, or otherwise about the elongate bottom panel 28. For example, the support insert 16 can be disposed about the head support region 54a of the elongate bottom panel 28, such as within or overlying the bottom panel 28 in the head support region 54a. The support insert 16 provides improved comfort and support to the infant 12 being carried within the sling 10 by stabilizing the infant's head 13 in a comfortable resting position, thereby also reducing pressure on the infant's neck 11. As shown in FIG. 8, the support insert 16 according to this embodiment comprises a central cutout 52 that is sized and shaped to accommodate at least a portion of the infant's head. For example, the central cutout 52 of the support insert 16 can comprise at least one of an ovate, circulate and elliptical shape sized to accommodate the infant's head therein. The support insert 16 preferably comprises a layer of cushioning material having the central cutout 52 therein, such as for example at least one of foam material, gel cushioning material, down and other padded material. The support insert 16 may also be shaped to be complementary to the sling body 18, for example by comprising a rounded periphery 56.

[0039] To further increase the comfort and support of an infant 12 being carried and/or transported in the adjustable sling 10, the sling 10 may further comprise at least one cushioning insert 60 extending along at least a portion of the sling body 18, as shown for example in FIGS. 2 and 8. For example, the cushioning insert 60 may extend along at least a portion of the body support region 54b of the elongate bottom panel 28, and may at least partially conform to the shape of the elongate bottom panel 28. The cushioning insert 60 can comprise at least one of foam, gel, down and other padded material. While the cushioning insert 60 can comprise the same cushioning material as the support insert 16, it may also be preferable in some versions to provide a relatively more rigid and/or stiff material for the support insert 16, such as a higher density foam material, and a relatively softer and/or more yielding material for the cushioning insert 60, such as at least one of a lower density foam material, memory foam, and gel material. In yet another version, the support insert 16 may itself be configured to extend along at least a portion of the sling body 18 to act as a cushioning insert for the infant's body, i.e., a single unitary insert may be provided that acts as both support and cushioning inserts.

[0040] In one version, the support and/or cushioning inserts 16, 60 are inserted into the sling body 18 by sewing or oth-

erwise permanently attaching to the sling body 18. However, it should be understood that the inserts 16, 60 can also be provided in a detachable form such that the inserts 16, 60 can be placed in the sling body 18 and then removed as desired. For example, one or more of the support and cushioning inserts 16, 60 can comprise snaps, buttons, zippers, hook and loop-type closures, or other types of closures that releasably attach the inserts 16, 60 to the support body 18. In a preferred embodiment, at least one and even both of the head support insert 25 and body support bolsters 33a, 33b are configured to be readily detachable from the sling body 18, for example to accommodate a larger or older infant 12. The neck support bolster 15 may also optionally be provided in detachable form.

[0041] The construction of the sling body 18 is devised to provide support and comfort to the infant 12, as well as the sling wearer 24. In the version shown in FIGS. 6-7, the elongate bottom panel 28 comprises multiple layers of materials designed to provide comfort and support as well as air circulation to the interior compartment 20 of the sling body 18 and the infant 12 being carried therein. In this version, the elongate bottom panel 28 comprises a base layer 35 formed of perforated foam that is covered by an overlying layer (not shown) formed of a breathable material, such as a mesh layer. A support structure 37 is disposed beneath the base layer 35, and finally a bottom breathable mesh layer (not shown) is provided to cover the support structure 37 and the bottom of the base layer 35. The breathable mesh layers and perforated foam layer provide 35 increased air circulation to improve the infant's breathing and oxygen saturation, while also cooling and supporting the infant 12 in the interior compartment 20. The support structure 37 is configured to provide support to the infant's body and torso. In the cut-away version as shown in FIG. 7, the support structure 37 comprises a plurality of support beams 37a extending beneath the base layer 35 of perforated foam. The support beams 37a connect upper and lower U-shaped regions 37b of the support structure 37, and provide increased support to a mid section of the sling body 18 to reduce sagging or deformation thereof, and to thereby facilitate the maintaining of the infant's body 17 in a more proper and comfortable alignment. The support structure 37 may be formed of a material having a degree of rigidity, such as for example a plastic material, to provide support to the base layer 35, with the support structure 37 preferably also having a degree of resiliency and "give" such that the elongate bottom panel 28 remains comfortable to the infant 12. With regards to the comfort and support of the infant 12, it should be furthermore understood that the length of the elongate bottom panel 28 is selected to provide comfortable leg extension for the infant 12, as well as a comfortable degree of flexion for the infant's developing muscles. The construction of the elongate bottom panel 28, including the support provided by the support structure 37, thus provides a supported elongated surface on which the infant 12 can comfortably stretch out, substantially without excessive cramping or bending of the infant's legs.

[0042] The sling body 18 is supported on the wearer 44 via at least one adjustable shoulder strap 22 that is extensible about the wearer's shoulder and/or back, as described above. As shown in FIGS. 1 and 2, the adjustable shoulder strap 22 comprises first and second opposing ends 62a, 62b that are configured to attach to the sling body 18, such as at prescribed locations on opposing front and rear sections at opposing ends 64a, 64b of the longitudinal axis of the sling body. The

adjustable shoulder strap 22 can further comprise first and second shoulder strap segments 66a, 66b and a strap adjustment connector 68 configured to attach the first and second segments 66a, 66b to one another and to allow adjustment of the overall length of the shoulder strap 22. Alternatively, the shoulder strap 22 can comprise a single strap segment that is attached to the sling body 18 at its opposing ends via the strap adjustment connector 68, or can comprise alternative configurations of strap segments and connectors. The shoulder strap 22 can further comprise one or more releasable fastening buckles to allow quick-release fastening of first and second strap segments 66a, 66b to each other, or releasable fastening of the shoulder strap 22 to the sling body 18 (not shown). The shoulder strap 22 also comprises a padded section 69 configured to be positioned over at least a portion of the wearer's neck and or shoulders to increase comfort in carrying the sling 10.

[0043] Further support for the sling body 18 during use in transporting and/or carrying an infant 12 can be provided by the adjustable lumbar belt 26 as described above, which is configured to attach to the sling body 18 as well as extend about the body of the wearer 24. For example, as shown in FIGS. 1 and 2, the sling body 18 can comprise at least one, and preferably a pair of belt loops 70a, 70b on opposing exterior surfaces 72a, 72b of the sling body side panels 30a, 30b. The belt loops 70a, 70b are configured to accommodate the passage of the lumbar belt 26 therethrough to connect the lumbar belt 26 to the sling body 18. The lumbar belt 26 comprises at least one adjustable belt segment 74, a strap cincher 76, and a lumbar belt pad 78 located on a region of the belt 26 configured to be positioned about the lumbar region of the back of the wearer 24. The lumbar belt 26 also typically comprises a releasable strap buckle 80. In the version as shown, the lumbar belt 26 comprises a first belt segment 74a configured to pass through the belt loops 70a, 70b, and a second segment 74b comprising the lumbar belt pad 78, as well as a strap cincher 76 and releasable strap buckle 80 that attach the first and second segments 74a, 74b of the belt 26 to one another.

[0044] The belt loops 70a, 70b located on opposing sides of the sling body 18 allow for the wearer 24 to selectively position the sling body 18. For example, in the version as shown in FIG. 1, the lumbar belt 26 is extended through belt loop 70b on opposing side panel 30b, resulting in the sling body 18 being positioned such that the head of the infant 12 is carried towards the left side of the body of the wearer 24. To reverse this position such that the infant's head is carried towards the right side of the wearer's body, the lumbar belt 26 is extended through belt loop 70a on the opposite side panel 30a. The lumbar belt 26 can thus be selectively extended through the belt loops 70a, 70b to provide a desired position of the sling body 18 with respect to the wearer 24.

[0045] The adjustable sling 10 can further comprise other attachments and/or modifications that are generally suitable for child carriers, and/or that otherwise enhance the performance of the sling 10. For example, the sling 10 can comprise one or more interior or exterior pockets or pouches configured to hold infant care items, such as bottles, toys, blankets, pacifiers, diaper changing supplies, and the like, and optionally other accessories such as cell phones, wallets, keys, and other similar items. The sling 10 may also comprise further straps and attachment members and devices to adjust the shape and configuration of the sling body 18. For example, in one version, the periphery 82 of the side panels 30a, 30b can be elasticized to at least partially enclose the sling body 18

about the infant **12**. Additionally or alternatively, the periphery **82** of the side panels **30a**, **30b** can comprise a cinching strap or similar mechanism (not shown) to adjust the size thereof, and thus adjust the size of the opening to the interior compartment **20**.

[0046] The improved sling **10** according to the present invention can thus be understood to provide improved comfort and security to an infant **12** being carried and/or transported therein. The retention flap **14** allows for an infant **12** to be more securely retained and held within the interior compartment **20** of the sling **10**, thus reducing the likelihood of accident or injury to the infant **12**. The support insert **16** increase the infant's comfort by stabilizing the head and/or neck of the infant **12**. The improved sling **10** thus provides for more secure, comfortable and stable transport of an infant **12**, substantially without sacrificing desirable aspects of conventional infant slings.

[0047] Additional modifications and improvements of the present invention may also be apparent to those of ordinary skill in the art. Thus, the particular combination of components and steps described and illustrated herein is intended to represent only certain embodiments of the present invention, and is not intended to serve as limitations of alternative devices and methods within the spirit and scope of the invention. Along these lines, it should be understood that the retention flap **14** and support insert **16** may take any of a variety of forms that are known or later developed in the art, and further contemplates that existing or newly formed retention flaps **14** and support inserts **16** should fall within the scope of the present invention. Also, it should be understood that the shoulder strap **22**, lumbar belt **26** and carrier body can comprise other configurations that are other than those specifically described.

What is claimed is:

1. An adjustable sling for carrying an infant, the sling comprising:

- (a) a sling body defining an interior compartment for carrying the infant;
- (b) a retention flap attached to the sling body to retain the infant being carried in the compartment;
- (c) an adjustable shoulder strap extensible about a wearer's shoulder and comprising first and second opposing ends attached to the sling body; and
- (d) an adjustable lumbar belt attached to the sling body and extensible about the wearer.

2. The adjustable sling of claim **1**, wherein the sling body comprises an elongate bottom panel and surrounding side panels that define the interior compartment therebetween, and wherein the retention flap is attached to the bottom panel.

3. The adjustable sling of claim **1**, wherein the retention flap comprises a generally T-shaped flap having:

an elongate lower segment configured to pass between the legs of an infant being carried in the sling, the elongate lower segment comprising a proximal end attached to the sling body and a distal end; and

a transverse band segment at the distal end of the elongate lower segment that is configured to extend transversely across at least a portion of the infant's body, the transverse band segment being attachable to the sling body to retain the infant in the compartment.

4. The adjustable sling of claim **3**, wherein the transverse band segment comprises a retention belt sleeve, and wherein the sling further comprises:

an adjustable retention belt configured to extend through the retention belt sleeve, the adjustable retention belt having first and second opposing ends configured to be attachable to the sling body.

5. The adjustable sling of claim **1** wherein the sling body comprises at least one support insert configured to provide support to at least one of the infant's head and neck while being carried in the interior compartment.

6. The adjustable sling of claim **5** wherein the sling body comprises a plurality of support inserts including:

a neck support bolster configured to maintain a position of the infant's neck in relation to the head of the infant;

a head support insert configured to at least partially conform to a periphery of the infant's head to maintain a position thereof; and

body support bolsters configured to support opposing sides of the infant's body.

7. The adjustable sling of claim **1** wherein the sling body comprises a pair of belt loops on opposing exterior surfaces thereof, the belt loops each being configured to pass the lumbar belt therethrough to connect the lumbar belt to the sling body.

8. An adjustable sling for carrying an infant, the sling comprising:

(a) a sling body defining an interior compartment for carrying the infant, the sling body comprising at least one support insert configured to support at least one of the infant's head and neck while the infant is carried in the interior compartment;

(b) an adjustable shoulder strap extensible about a wearer's shoulder and comprising first and second opposing ends attached to the sling body; and

(c) an adjustable lumbar belt attached to the sling body and extensible about the wearer.

9. The adjustable sling of claim **8** wherein the support insert comprises a neck support bolster configured to maintain a position of the infant's neck in relation to the head of the infant.

10. The adjustable sling of claim **9** wherein the neck support bolster is configured to maintain the infant's head in a substantially neutral position relative to the infant's spine.

11. The adjustable sling of claim **9** wherein the neck support bolster is anatomically shaped and positioned to allow the infant's shoulder blades rest thereon while being carried in the interior compartment.

12. The adjustable sling of claim **9** wherein sling body comprises an elongate bottom panel having a head support region configured to support the infant's head and a body support region to support the infant's body, wherein the neck support bolster is positioned adjacent the head support region on the elongate bottom panel.

13. The adjustable sling of claim **12** wherein a top surface of the neck support bolster is elevated above a surface upon which the infant's head rests in the head support region of the elongate bottom panel.

14. The adjustable sling of claim **12** wherein the neck support bolster comprises an at least semi-cylindrically shaped cushion that extends laterally across the elongate bottom panel between first and second opposing sides thereof.

15. The adjustable sling of claim **9**, further comprising a head support insert that at least partially conforms to a periphery of the infant's head to maintain a position thereof.

16. The adjustable sling of claim **15** wherein the head support insert comprises a U-shaped body of cushioning material positioned at an upper end of the elongate bottom panel.

17. The adjustable sling of claim **15**, further comprising body support bolsters disposed on opposing sides of the elongate bottom panel in the body support region.

18. The adjustable sling of claim **17**, wherein at least one of the head support insert and body support bolster are detachable from the sling body.

19. The adjustable sling according to claim **8** wherein the support insert comprises a layer of cushioning material having a rounded periphery, the support insert defining a central cutout therein that comprises at least one of an ovate, circular, and elliptical shape.

20. The adjustable sling according to claim **8** further comprising a retention flap attached to the sling body to retain the infant being carried in said compartment.

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