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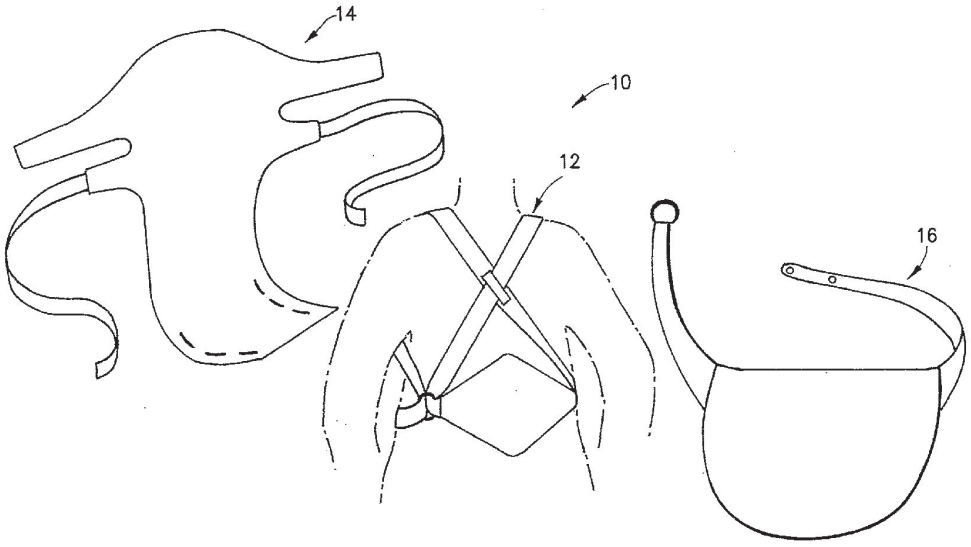
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(54) **Title:** A HARNESS



(57) **Abstract:** A baby carrier unit is configured with a harness made from a single piece of material, a baby carrier releasably attachable to the harness at the front of the wearer and configured with top, intermediate and bottom regions, each of which is controllably adjustable relative to the harness, and a diaper bag releasably coupled to the harness.

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A HARNESS

CROSS-REFERENCE TO RELATED APPLICATION

This application is based on and claims priority to U.S. Provisional Patent Application 60/674,214 filed with the U.S. Patent and Trademark Office on April 22, 2005 and fully incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to a modular garment item configured with a baby carrier, diaper bag and harness detachably coupled to one another to provide an ergonomically constructed, easily assembleable and aesthetically appealing harness-type baby carrier.

Related Art

Child carriers, in one form or another, have been used by parents since ancient times and in all corners of the support strap. Generations of child rearing have proven the usefulness of carriers for transportation, security, and hands-free convenience while keeping baby close. From primitive baby slings to today's advanced carrier frames and designs, the use of child and baby carriers have helped parents stay on the go for as long as there have been children to carry.

Carriers fall within three basic styles: front, sling and backpack. Generally, front and sling carriers are designed for newborns, infants and babies who can not yet sit up by themselves (usually up to about 6 months). Backpack carriers are for older babies and

small children who can support themselves in a sitting position and are still light enough to be transported comfortably (usually up to 40 - 45 lbs. depending on the manufacturer).

The advantage of front style and sling carriers is the ability to keep a child close to the parent and within easy view while the parent's hands are free to shop, work around the house or simply take a walk. In both cases, these infant carriers are comfortable, safe and as many parents will attest, the best solution to multi-tasking with a baby in tow. Front style carriers have the added benefit of providing greater support for heavier loads and longer wear while safely securing the baby during the use of such a carrier.

Despite a great number of designs of baby carrier, the requirements for optimal design remain unchanged: improved ergonomics conducive to the desired development of the infant and maximum comfort for both the wearer and infant, structural soundness and simplicity associated with easy adjustment of the carrier's components, safety of the infant, and aesthetics.

A need, therefore, exists for a harness-type baby carrier that has a modular structure including easily assembleable components and allowing for securely holding and supporting an infant.

Another need exists for a harness-type baby carrier that has a structure provided with multiple position-adjusting means which are easily operated by a wearer so as to adjust the carrier in the desired position on the parent/wearer carrying an infant and safely support the infant while the wearer is adjusting the baby carrier.

Still another need exists for a baby carrier that has a simple yet cost-effective, easily maintainable and aesthetically appealing structure.

A further need exists for a baby carrier that has multiple easily coupleable components at least some of which preserve their functionality and aesthetic appeal while being used separately from the rest of the components.

SUMMARY OF THE INVENTION

These needs are met by the inventive harness-type baby carrier proposed herein.

In accordance with one aspect of the invention, the inventive baby carrier init is configured with multiple individual components which include a harness, infant support and bag. The inventive unit has a modular structure in which all of its components are operative to releasably couple to one another.

The harness is configured from a single strap erectable to form two shoulder straps which intersect one another at the back of the wearer's upper torso and extend around respective shoulders of the wearer so as to have the free ends of the shoulder straps coupled to one another to form a continuous waistband. The infant support has upper and bottom end regions attachable to the harness so as extend along the front of the wearer's upper torso. The upper end region is coupled to the shoulder straps, while the bottom end region is folded over a front segment of the waistband of the harness and coupled thereto so as to form a U-shaped infant seat for which is flanked by two openings on the opposite sides of the seat for receiving respective legs of the infant.

In accordance with another aspect of the invention, the inventive baby carrier unit also has a first fastening assembly located between the inner surface of the bottom region of the infant support and the front segment of the waistband of the harness. The first fastening assembly is configured with a column of receiving formations configured to be selectively traversed by the free end of one of the shoulder straps. Accordingly, depending on the receiving formation traversed by the free end, the position of the infant seat is controllably varied relative to the waist of the wearer. Concomitantly, engagement between the traversed formation and the free end of the shoulder strap secures the lower portion of the infant's torso to the seat.

In accordance with still another aspect of the invention, the baby carrier unit has a second fastening assembly adjustably securing the shoulder straps of the harness to the upper region of the infant carrier so as to support the upper portion of the infant's body.

The upper region of the infant support includes upper and lower pairs of flaps operative to adjustably secure the top end region of the infant support to the harness.

In accordance with a further aspect of the invention, the bag of the inventive unit is configured to be worn as part of the inventive structure or as a separate garment item. Configured with multiple engagement assemblies, the belt of the bag may be coupled to the harness at alternative locations of the latter and, thus, the position of the bag can be easily adjusted by the wearer in accordance with the wearer's needs.

In accordance with still a further aspect, the components of the inventive baby carrier unit have respective adjusting assemblies including a plurality of D-rings, O-rings, buckles, snap-type connections and other fastening configurations. The adjusting assemblies are strategically located on the inventive unit to allow the wearer to adjustably couple the unit's components together and securely place the infant in the unit.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other features of the present invention will become more readily apparent from the following detailed description provided in conjunction with the following drawings, in which:

FIG. 1 is an exploded rear-side view of the inventive baby carrier unit configured with a harness, infant support and bag;

FIG. 2 is an elevated view of the harness having a single-piece strap which is provided with a central lumbar support shown facing the upper rear torso of the wearer;

FIG. 3 is an elevated view of the harness similar to FIG. 2 shown with the central lumbar support facing away from the upper rear torso of the wearer;

FIG. 4 is a front elevated view of the harness shown in an erected state and having its waistband coupled to an inner surface of the bottom region of the infant support;

FIGS. 5 and 6 are respective front and rear elevated views of the infant support;

FIG. 7 is an elevated view of the bag illustrated with its halves unfolded;

FIG. 8 is a view illustrating an intermediate stage of assembling the inventive unit; and

FIG. 9 is a view illustrating the assembled inventive unit provided with detachably coupled harness, infant support and bag components.

DETAILED DESCRIPTION

Reference will now be made in detail to several views of the invention that are illustrated in the accompanying drawings. Wherever possible, same or similar reference numerals are used in the drawings and the descriptions to refer to the same or like parts or steps. The drawings are in simplified form and are not to precise scale. For purposes of convenience and clarity only, directional terms, such as top, bottom, rear and front may be used with respect to the drawings. These and similar directional terms should not be construed to limit the scope of the invention in any manner. The words "connect," "couple," or "affix" and similar terms with their inflectional morphemes do not necessarily denote direct and immediate connections, but also include connections through mediate elements or devices.

FIG. 1 illustrates the inventive baby carrier unit 10 configured with three main components: a harness 12, an infant support 14 and a bag 16. The components are functionally and structurally associated with one another. At the same time, each component has its own structural inventive features and, as will be explained below, may be used individually. The baby carrier unit 10 is constructed around harness 12 which provides the structural basis for integrating infant support 14 and bag 16 to the overall configuration of unit 10 characterized by its ergonomic functionality and aesthetics, as will be discussed hereinbelow.

Referring to FIGS. 1-4, the harness 12 is preferably constructed from a single strap 18 (FIGS. 2 and 3) that, as a result of certain structural manipulations discussed

hereinbelow, can be assembled to assume the form better illustrated in FIGS. 1 and 4. As seen in FIGS. 2 and 3, strap 18 is structured with a central support 20 and two shoulder straps 22 and 24. Advantageously, support 20 has a larger cross-sectional area than shoulder straps 22 and 24 and may have a variety of shapes. For example, support 20 is configured with a diamond cross-section seen in all of the referred to figures. However, as can be easily understood by those skilled in the art, the shape of support 20 can vary and have other polygonal cross-sections, circular, oval and other regular and irregular cross-sections. A relatively large cross-sectional area of central support 20 is particularly advantageous for providing a strong yet flexible support for the lumbar region of the wearer's spine which is typically exposed to substantial loads generated by the infant.

In an alternative embodiment, instead of a one-piece strap, harness 12 may be configured from separate subcomponents including two individual shoulder straps and a support, or the support formed integrally with one of the shoulder straps which is provided with means for adjusting its length. The subcomponents may be coupled to one another by a variety of means, such as a snapping fastening unit, buckle unit, stitching and the like, to eventually form harness 12, as illustrated in FIGS. 1-4.

Each of shoulder straps 22 and 24 comprises an elongated band of material which runs from a lateral portion 26 (FIG. 2) of support 20. The shoulder straps 22 and 24 are not uniformly configured. One of the straps, for example strap 22, has a first strip of material 30 (FIG. 3) formed on one of the shoulder strap's sides and being narrower than the width of the shoulder strap. The strip 30 has its opposite ends attached to strap 22 so as to form a loop dimensioned to allow shoulder strap 24 to run through this loop 30 for centering shoulder straps 22 and 24 between the shoulder blades of the wearer. A tether 28 (FIG. 2), which is preferably located on the same outer side of shoulder strap 22 in the erected state of harness 12 or may be provided on the opposite inner side of shoulder strap 22 between an end region 40 of strap 22 and loop 30, has one end fixed to the strap 22 and the other end removably coupled to the strap 22 so as to form a further belt strap loop that, as will be discussed hereinbelow, is dimensioned to receive and engage the belt strap of bag 16 or the buckle affixed to the straps' end, as will be disclosed hereinbelow.

The end region 40 of shoulder strap 22 is provided with one or more male fasteners 32, which are located closer to the outer edge of this strap, and female fasteners 44. The fasteners 32 and 44 in combination with flexibility of material of shoulder strap 22 allow end region 40 to be bent over so that male fastener 32 is operative to selectively engage female fasteners 44 for adjusting the overall length of strap 22 in the erected state of harness 12, in which strap 22 preferably runs around the left shoulder of the wearer and further around the wearer's waist. Finally, end region 40 of shoulder strip 22 has one or more D- or O-rings 34 surrounding the shoulder strap and freely displaceable relative to one another along end region 40 within a loop which is formed when male fastener 32 engages one of female fasteners 44. Upon erecting and adjusting harness 12 on the wearer, D-rings 34 define one of the ends of waistband 42 (FIG. 4) of harness 12 and serve as a coupling and decorative element.

The shoulder strap 24 has an end region 46 provided with a tether 47 which is configured to engage infant carrier 14, as will be discussed hereinbelow, and then to be slipped through D-rings 34 so as complete formation of waistband 42. In addition, an intermediate region of shoulder strap 24 has a second position adjusting assembly configured with one or more fasteners 49 (FIG. 2) which are typically located proximate to the hip of the wearer on the outer side of waistband 42. The fasteners 49 are configured to releasably engage a complementary fastener which is provided on one of the ends of the bag's belt, as also will be discussed hereinbelow.

The lateral portions 26 of central support 20 are provided with respective assemblies 36, 38 each configured to guide and shape shoulder straps 22 and 24 as the wearer converts harness 12 into its erected state, as shown in FIGS. 1 and 4. In accordance with a preferred embodiment, each assembly 36, 38 includes a single D-ring coupled to lateral portion 26. One of the structural possibilities of coupling the D-rings includes, for example, stitching or adhering inner regions of shoulder straps 22, 24 proximal to support 20 to respective lateral portions 26 of support 20 so as to form respective loops limiting displacement of assemblies 36 and 38 along respective shoulder straps 22 and 24.

Referring to FIG. 4 in addition to FIGS. 2 and 3, the erection of harness 12 is initiated by crossing shoulder straps 22 and 24, respectively, so that strap 24 is threaded through a

loop defined by tether 30 on shoulder strap 22. Further, end regions 40 and 46 of respective shoulder straps 22 and 24 are guided over the wearer's shoulders and under the armpits back towards respective assemblies 38 and 36 through which free ends 40 and 46 are slipped and further brought around the waist to define waistband 42. As mentioned above, the overall length of shoulder strap 22 and, thus, waistband 42 may be adjusted by selectively engaging male and female members 32 and 34 (FIG. 2), respectively, formed on free end 40 of shoulder strap 22. In the erected state, harness 12 is ready to receive and support infant support 14 and bag 16.

Preferably, entire single strap 18 is decorated with a band of material 45 which is coupled to the opposite sides of strap 18 and, thus, surrounds the continuous peripheral edge of this strap. Consequently, the perimeter of harness 12 is padded providing maximum comfort to the wearer.

The erected harness 12 may have, thus, a shape resembling a butterfly and defined by two interconnected shoulder straps 22 and 24 which extend over respective left and right shoulders of the wearer at locations proximate to the wearer's chest and further run under the respective armpits back to support 20. As free ends 46 and 40 of respective shoulder straps 22 and 24 are being brought back and slipped through the respective D-rings, the wearer then guides the free ends around the waist and can engage them proximate to the left hip so as to form waistband 42. Of course, the configuration of the strap 18 may be slightly modified to have shoulder strap 24 formed with loops 30, 28 and a series of fasteners 32 and 44, as easily understood by one of ordinary skills in the art.

Instead of the D-rings, assemblies 36 and 36 may have other fastening configurations. For example, lateral portions 26 of these assemblies each may have a pair of elongated slits which, although not shown, are readily understood by one of ordinary skills in the art. Each of the slits is shaped and dimensioned to function similarly to the D-rings by guiding free ends 40 and 46 of respective shoulder straps 22 and 24 in a manner disclosed above.

Adjustment of waistband 42 can be realized by a variety of methods and structures. First, the overall length of shoulder strap 22 can be reduced or increased by selecting an appropriate combination of engaging male 32 and female 44 fasteners (FIG. 2). Further,

free end 46 of shoulder strap 24 may be tensioned by applying a greater or smaller force to it when the wearer slips the free end of shoulder strap 24 through D-rings 34 of shoulder strap 22. Alternatively, one of free ends 46 and 40 of respective shoulder straps 24 and 22 can feature a buckle with a pin, whereas the other free end can have a succession of holes each configured to retain the pin (not shown). Still another embodiment may be realized by providing opposing surfaces of free ends 40 and 46 with respective strips of Velcro®. Regardless of the particular implementation, it is desirable that free ends 40 and 46 engage one another at a location proximate to the hip region of the wearer since a central front region 48 (FIG. 4) of waistband 42 is configured to engage the bottom end region of infant support 14, as will be disclosed in detail hereinbelow.

Turning now to FIGS. 5 and 6, infant support 14 is configured to provide a baby carrier worn by the wearer at the wearer's front in a secured and comfortable manner. The infant support 14, like harness 12, is preferably made from a single piece of material and configured with a shell or body 50. The overall length of shell 50 is preferably, but not necessarily, uniform so as to facilitate a manufacturing process. However, shell 50 has numerous fastening and adjusting assemblies operative to controllably vary the length between a top region 52 and a bottom region 54 of shell 50 in accordance with the requirements of the wearer and, of course, the physical attributes of the infant, as will be discussed in detail hereinbelow.

The shell 50, having a top region 52 and a bottom region 54, can be configured in accordance with numerous designs. The bottom region 54 is provided with a first position adjusting assembly including an interface 56 (FIG. 6) which is located proximate to a bottom edge 58 on the inner surface of infant support 14. The interface 56 is configured to provide coupling between harness 12 and infant support 14 and to controllably adjust a distance between top and bottom regions 52 and 54, respectively, of the infant support in the assembled state of the baby carrier unit. Adjusting the distance between regions 52 and 54 allows the wearer to set the desired position of the infant, as will be disclosed hereinbelow.

According to one embodiment, interface 56 includes a column of individual pockets 66 formed along bottom region 54 of infant support 14. Each pocket 66 extends between the opposite sides of shell 50 and is configured to receive tether 47 of shoulder strap 24, as clearly illustrated in FIG. 4. The pockets 66 may be formed from a single piece of material having its spaced apart regions stitched to the inner surface of shell 50 so that each pair of the adjacent stitched regions defines a respective pocket therebetween. Alternatively, the adjacent pockets may be spaced apart and each, thus, formed from an individual piece of material.

In accordance with a further embodiment, interface 56 has a plurality of slits 60 formed in the inner surface of shell 50 and extending parallel to one another along bottom region 54 between the opposite lateral sides of bottom region 54 of infant support 14. The slits 60 each are dimensioned to allow tether 47 of shoulder strap 24 to slip through it.

Regardless of the particular configuration of interface 56, multiple receiving pockets 66 or slits 60 allow the wearer to select any particular channel and slip tether 47 of the shoulder strap 24 therethrough. As the wearer guides tether 47 through the selected channel, bottom region 54 of shell 50 is being folded rearwards toward the wearer and upwards in a direction of an arrow A (FIG. 5) to assume a generally U-shaped of J-shaped cross-section. Consequently, the engaged portion of tether 47 is flanked between regions 70 and 72 (FIG. 5) of shell's bottom end region 54. The area between folded regions 70 and 72 of bottom region 52 defines an infant seat 74 and two openings 76 (FIG. 8) formed to receive the infant's legs. Selection of pocket 66 or slit 60 located, for example, next to bottom edge 58 (FIG. 5) of infant support 14 determines the largest possible distance between bottom and top edges 58, 78 (FIG. 6), respectively, of shell 50 and, therefore, the least elevated position of seat 74 relative to the wearer's waist. Accordingly, adjusting the position of seat 74 allows the wearer to select the desired position of the infant while carrying him or her in inventive baby carrier unit 10. A relatively large contact area between tether 47 of shoulder strap 24 and bottom region 54 of infant support 14 reliably secures the lower portion of the infant's body to the baby carrier unit.

The bottom region 54 (FIG. 6) of infant support 14 may be provided with male or female fasteners, such as knobs 82, located at the opposite corners of bottom region 54 proximate to bottom edge 58 and configured to selectively engage respective rows of engaging elements 80 provided on opposite lateral sides of the intermediary region of infant support 14. This configuration ensures safety of the infant. The outer continuous edge of infant support 14 is padded by a band of material 53 to provide comfort for the infant.

The top region 52 of infant carrier 14 extends along top edge 78 (FIG. 5), which is preferably arcuate, and has two cutouts 86 and 88 extending from the opposite sides of infant carrier 14 towards one another and defining, thus, an upper pair of flaps 82 and 84 and a lower pair of flaps 90 and 92. The cutouts 86 and 88 are dimensioned to receive the arms of the infant upon attaching top end region 52 to harness 12. The upper and lower pairs of flaps each have a dual function. First, each of the four flaps engages closest shoulder strap 22, 24 of harness 12 and, thus, secures top region 52 of infant support 14 to harness 12. Second, each pair of upper and lower flaps has respective engaging or fastening assemblies that provide for length adjustment of the flaps, which, in turn, leads to securement of the infant's rear upper torso and, depending on the design, the cervical region of the infant's spine and the back of the infant's head.

The engaging system associated with upper flaps 82 and 84 includes a third position adjusting assembly having at least one or more male elements 94 (FIG. 5), such as a knob or buckle, and at least one or more female elements 96, such as a socket or receiving buckle. The engaging assembly associated with lower flaps 90 and 92 includes two tethers 98 one of which has a pair of D- or O-rings 100 suspended on the looped end region of this tether which is formed after male and female engaging elements 94 and 92, respectively, selectively engage one another.

Coupling between top region 52 of infant support 14 and harness 12 is realized by looping the free ends of each of upper flaps 82, 84 around respective shoulder straps 22 and 24 at the front of the wearer and engaging a respective pair of male and female fastening elements 94 and 96 to secure the wrapped flap to the shoulder strap. The free ends of respective lower flaps 90 and 92 are similarly wrapped around respective

shoulder straps 22 and 24 below the regions of attachment of the shoulder straps with respective upper flaps 82, 82. The tether 98 of lower flap 92 then engages rings 100 associated with the other lower flap in front of the wearer's chest to support the midsection of the infant's rear torso, as shown, for example, in FIG. 9. Selecting different combinations of male and female engaging elements 94 and 96 of the respective upper flaps and the degree of tightening between the lower flaps allows the wearer to adjust a position of the infant and safely secure him/her in the attached infant support.

To prevent the slippage of upper and lower flaps 82, 84 and 90, 94, respectively, along the respective shoulder straps, the latter may be provided with stoppers 102 (FIGS. 8 and 9). The stoppers 102 each may be configured as a loop defined by a tether which has either both its opposite ends fixed to the shoulder strap or one end fixed and the opposite end detachably coupled to the strap, as shown in FIG. 8.

In a further embodiment, infant support 14 may be provided with a receiving means configured to store a variety of items. Strategically positioned, for example, at the outer side of infant carrier 14, as shown in FIG. 9, the receiving means may be configured with a reservoir 150 for storing incompressible liquid, and a pneumatic pump (not shown) which is actuated by the wearer and allows liquid to exit reservoir 150 and be delivered to the infant. The pneumatic pump is a well known configuration including a hand-held body of flexible material, such as rubber or plastic, and operated by the wearer to increase pressure inside reservoir 150 to the level sufficient for a steady and metered delivery rate of the incompressible liquid to the infant. The reservoir 150 is removably coupled to infant support 14 and has a plastic tube dimensioned to allow the wearer to conveniently place the distal end of the tube in the vicinity of the infant's mouth.

Referring to FIGS. 7 and 9, bag 16 has preferably two halves 104 and 106 (FIG. 7) foldable about a common top edge 108 and juxtaposed with one another in the folded state, as shown in FIG. 1, so as to cover a plurality of compartments 110 (only one is shown). The compartments 110 may be used for storing various transportable items associated with the infant, such as diapers, as well with other items associated with the wearer. Accordingly, bag 16 can simultaneously function as a diaper bag and as a purse.

Each of the compartments may be zipped and tensioned to prevent undesirable displacement of the stored items from the respective compartments.

Two belt straps 112 and 114 are attached to opposite lateral regions of bag 16 and dimensioned so that the wearer preferably can suspend bag 16 at his back next to the outer surface of harness 12 facing away from the wearer. One of the belt straps, for example belt strap 114, runs over one of the wearer's shoulders proximate to the wearer's collarbone region, as illustrated in FIG. 9. As explained above, tether 28 is configured with at least one detachable end that allows the wearer to unfasten this end, slip tether 28 through one or more D- or O-rings or hook-like fasteners 116 (FIG. 7) of belt strap 114 and reattach the end of tether 28 to shoulder strap 22. As a result, shoulder strap 22 is prevented from disengagement with harness 12. The other belt strap 112 is guided around the hip or waist region of the wearer and has a plurality of engaging elements 118 configured to selectively engage fastening elements 49 (FIG. 8), which are formed on waistband 42 of harness 12, to adjust folded halves 104 and 106 of bag 16 at the back of the wearer in the desired position. The ends of respective belt straps 112 and 114 may, of course, have other engaging configurations. One alternative configuration, for example, allows for the use of two buckles – one on the end region of belt strap 114 and the other on shoulder strap 24 - having respective teeth meshing with one another (not shown). As can be understood, bag 16 may be used separately from the rest of the structure by simply tying up the ends of belt straps 114 and 112.

Alternatively, instead of fastening bag strap 112 to harness 12, the wearer may engage one or more fasteners 119, which are located on the side of belt strap 112 opposite the one with engaging element 118, to a receiving engaging elements 105, which is located on either of halves 104 and 106 and proximate to line 108, by displacing strap 112 in a direction of an arrow B. The configuration is particularly advantageous when bag 16 is used in combination with harness 12, since attachment between other belt strap 114 and harness 12 is sufficient to securely hold bag 16 on the wearer. Additionally, the outer surface of belt strap 112 or the border region between bag half 104 and this belt strap my be provided with a loop 107 improving the overall balance of bag 16 and serving as a support for relatively light objects attachable to loop 107. As

mentioned above, bag 16 may be used by the wearer separately from inventive unit 10. In this case, the wearer slips the free end of belt strap 112 through D-rings or other fastening configurations 116 of belt strap 114 and tightens the belt straps in accordance with his or her requirements.

FIGS. 8 and 9 illustrate one of possible methods related to the use of inventive baby carrier 10. The wearer initially adjusts harness 12 on his/her back, then slips tether 47 of shoulder strap 24 through bottom region 54 of infant carrier 14 and attaches the end of tether 47 to D-ring 34 of waistband 42, as shown in FIG. 8. Thereafter, the wearer may wrap the free ends of respective upper flaps 82 and 84 of infant support 14 around respective shoulder straps 22 and 24, as disclosed above, and secure upper region 52 of the infant support to the harness. The attachment between harness 12 and infant support 14 may be made before the wearer places the infant inside the attached infant support. Alternatively, as illustrated in FIG. 8, the infant may be placed atop the inner surface of infant support 14 and lifted towards the wearer along with infant support 14. In either case, after harness 12 and infant support 14 are coupled to one another with the infant securely supported by infant support 14, the wearer attaches lower flaps 90 and 92 of infant support 14 to one another, as shown in FIG. 9. If the wearer needs adjust any of the contact points or regions between harness 12 and infant support 14, he or she may fine tune any of the coupling assemblies discussed above utilizing both of his or her hands.

The inventive carrier baby unit 10 provides mobility, comfort for both the parent and infant, an incomparable feeling of closeness between the parent and infant and security. The materials used for manufacturing inventive baby carrier unit 10 are not limited to any particular type and include, for example, leather, cotton, corduroy and heavy-gauge nylon.

The baby carrier unit 10 is configured with multiple engaging/fastening assemblies allowing the wearer to adjust the assembled baby carrier unit relative to the wearer's body as well as to adjust the unit's components relative to another so as to secure upper, mid and lower portions of the infant's body. The provision of multiple fastening

assemblies allows a single adult to easily navigate through the assembling process of the unit. Modularity of inventive baby carrier unit allows it to be easily cleaned. Overall, the inventive baby carrier unit solves three huge problems for parents: first, it allows the wearer to have both hands free, second, it soothes the baby, and third, it provides a dynamic adjustment system that makes the baby carrier unit uniformly comfortable and safe for variously sized wearers and infants.

The specific features described herein may be used in some embodiments, but not in others, without departure from the spirit and scope of the invention as set forth. Many additional modifications are intended in the foregoing disclosure, and it will be appreciated by those of ordinary skill in the art that in some instances some features of the invention will be employed in the absence of a corresponding use of other features. The illustrative examples therefore do not define the metes and bounds of the invention and the legal protection is afforded the appended claims.

WHAT IS CLAIMED IS:

1. A baby carrier unit comprising:

a harness having two shoulder straps crossing one another at a back of the wearer upper torso and extending around respective shoulders of a wearer in an erected state of the harness, the shoulder straps having respective free ends coupleable to one another to form a continuous waistband in the erected state of the harness;

an infant support coupleable to the harness and configured to receive and support an infant in a desired position of the infant; and

a bag coupleable to the harness and adapted to be suspended at the back of the wearer upper torso.

2. The unit of claim 1, wherein the harness comprises a single strap operable to form the two shoulder straps and the waistband in the erected position of the harness, the shoulder straps and waist band being selectively coupleable to the infant support and the bag.

3. The unit of claim 1, wherein the infant support comprises a shell having top and bottom regions and configured to extend along a front of the wearer's upper torso, the top region being detachably coupled to the shoulder straps proximate to the chest of the wearer, the bottom region being foldable over a front segment of the waistband of the harness and coupleable thereto so as to form a seat for an infant and spaced openings flanking the seat and configured to receive respective legs of the infant.

4. The unit of claim 3, further comprising a first position adjusting assembly between an inner surface of the bottom region of the infant support and the front segment of the waistband of the harness for adjustably coupling the harness to the infant support so as to controllably vary a length of the infant support between the seat and the upper region, whereby the infant support is securely adaptable to an infant size.

5. The unit of claim 1, wherein the bag has two halves coupled to one another and foldable over a common joint and two belt straps attached to respective opposite lateral sides of one of the halves, one of the bag straps being detachably coupled to a respective one of the shoulder straps of the harness proximate to the wearer's collarbone.

6. The unit of claim 5, wherein the one shoulder strap of the harness comprises a strip of material having two opposite ends coupled to a surface of the one shoulder strap and forming a belt strap loop, at least one of the opposite ends of the belt strap loop being detachably coupled to the one shoulder strap of the harness so as allow the wearer to couple a distal end region of the one belt strap of the bag through the belt strap loop and prevent slipping of the distal end region from the belt strap loop upon coupling the opposite ends of the belt strap loop to the surface of the one shoulder strap.

7. The unit of claim 6, wherein the distal end region of the one belt strap of the bag has one or more rigid members coupleable to the one shoulder strap of the harness proximate to the chest and collarbone of the wearer, the rigid members being selected from the group consisting of O-rings, D-rings, snap-type coupling units, closable hooks and buckles.

8. The unit of claim 5, wherein at least the one half of the bag comprises a plurality of closable compartments configured to selectively receive and store miscellaneous transportable items, at least one of the compartments being configured to receive a plurality of diapers and having a locking unit operative to close the one or more compartments.

9. The unit of claim 5, wherein the other belt strap of the bag is selectively coupled to one of the waistband of the harness, a fastener located on the one half of the bag, and a distal end region of the one belt strap in response to a selection made by the wearer.

10. The unit of claim 9, wherein the waistband of the harness has a second adjusting position assembly provided with a series of coupling elements selectively engageable to a plurality of receiving elements on an distal end region of the other belt strap of the bag to controllably vary the position of the bag on the wearer.

11. The unit of claim 1, wherein a rear region of the waistband of the harness has a cross-section larger than each of the shoulder straps of the harness and configured to support the spinal lumbar region of the wearer upon adjusting the harness thereon.

12. The unit of claim 11, wherein the rear region of the waistband has a polygonal or circular cross section having opposite lateral portions running into the respective shoulder straps.

13. The unit of claim 1, wherein one of the shoulder straps of the harness has a tether coupled to a free end of the one shoulder strap, the other shoulder straps having a respective free end provided with at least one rigid engaging element, the rigid engaging element being configured to receive a free end of the tether proximate to the hip of the wearer so as to form the waistband upon coupling the harness to the infant support.

14. The unit of claim 1, further comprising a shoulder strap loop formed on one of the shoulder straps and configured to be threaded by the other shoulder strap at the back of the wearer to center the harness between the shoulder blades of the wearer.

15. The unit of claim 12, wherein the shoulder straps each have a region proximal to the rear region of the waistband and attached to the lateral portion of the rear region so as to define a waistband loop, the waistband loops each configured to receive one or more rigid components, each of the rigid components being traversed by the free end of the shoulder strap running from the lateral portion of the rear region spaced from the rigid component.

16. The unit of claim 3, wherein the top region of the infant support has two upper flaps extending from opposite sides of the infant support and two lower flaps located between the top and bottom regions and extending from the opposite sides of the infant support, the upper and lower flaps being coupleable to the shoulder straps of the harness at the front of the wearer to define opposite openings between each pair of adjacent upper and lower flaps.

17. The unit of claim 16, wherein the upper flaps are operative to wrap around the respective shoulder straps and each have a third position adjusting assembly operative to controllably tension the top region of the infant support for securely supporting an upper body of the infant.

18. The unit of claim 17, wherein the third position adjusting assembly has at least one male component and a plurality of female components provided in series on a free end of each of the upper flaps and operative to selectively engage one another so as to form a respective upper flap loop and controllably tension each of the shoulder straps to secure the top region of the infant support to the harness.

19. The unit of claim 18, wherein the shoulder straps each have a flap stopper provided on a frontal portion of the shoulder strap proximate to the chest of the wearer and configured to form a loop threaded by a respective one of the upper flaps.

20. The unit of claim 16, wherein the lower flaps are operable to wrap around the respective shoulder straps so as to have respective free ends of the lower flaps coupled to one another in front of the infant support to adjustably support a midsection of the infant's body.

21. The unit of claim 20, wherein one of the free ends of the lower flaps has a buckle configured to securely receive the free end of the other lower flap so as to couple the lower flaps together.

22. The unit of claim 4, wherein the first position adjusting assembly is located on the inner surface of the bottom region of the infant support and comprises a plurality of parallel guide channels extending between the openings of the infant support one under another and selectively traversed by the waistband of the harness so that the length of the infant support between the seat for the infant and top region of the infant support varies depending on which one of the plurality of channels is traversed by the waistband, the seat for the infant having a J-shape or U-shape configuration upon engaging the waistband to the bottom region of the infant support.

23. A portable modular transportation unit comprising:

a harness having a single strap operable to form two shoulder straps extending over respective shoulders of a wearer and then crossing one another at a back of the wearer upper torso, the shoulder straps having respective free ends coupleable to one another to form a continuous waistband at a front of the wearer in an erected state of the harness;

a carrier coupleable to the harness and extending along an upper front torso of the wearer, the carrier having top and bottom regions; and

a first position adjusting assembly operative to couple an inner surface of the bottom region of the carrier and a front segment of the waistband of the harness so that the bottom region is folded backward towards the wearer and upward to define a seat adapted to receive the infant, the first position adjusting assembly being operable in a plurality of modes corresponding to respective different positions of the seat relative to the top region of the carrier.

24. The unit of claim 23, wherein the first position adjusting assembly comprises a user interface configured with a plurality of parallel channels extending between opposite sides of the bottom region of the carrier and formed one under another, the free end of one of the shoulder straps selectively traversing the plurality of the parallel channels so as to controllably vary a respective one of the different positions of the seat.

25. The unit of claim 24, wherein the bottom region of the carrier has a generally J-shape or U-shape upon engaging the free end of the one shoulder strap to the user interface, the J- or U-shaped bottom region defining two spaced openings adapted to receive respective legs of the infant and flanking the seat.

26. The unit of claims 24, wherein the first position adjusting assembly further comprises fastening elements located at opposite bottom corners of the lower region of the carrier and a plurality of receiving elements arranged in two columns along an intermediate region of the carrier, the receiving elements of each of the columns being aligned with and selectively engageable by a respective one of the fastening elements to secure a respective one of the multiple positions of the seat.

27. The unit of claim 24, wherein the user interface comprises a plurality of slits located in an inner surface of bottom region of the carrier and each opening next to the opposite sides of the bottom regions, the slits each being configured to define a respective one of the parallel channels.

28. The unit of claim 24, wherein the user interface has a plurality of pockets provided on the inner surface of the bottom region of the infant support and defining respective channels.

29. The unit of claim 23, wherein the carrier further has two upper flaps extending from the upper region and located at opposite sides of the carrier and two lower flaps located between the upper and lowers regions at the opposite sides of the infant support, each pair of adjacent upper and lower flaps defining an opening adapted to receive the hand of the infant.

30. The unit of claim 29, further comprising a third position adjusting assembly operative to engage the upper flaps to respective shoulder straps of the harness so as to selectively position the top region of the carrier relative to the chest of the wearer.

31. The unit of claim 30, wherein the third position adjusting assembly comprises a first and second array of one or more male member and a plurality of female members, the male and female members of each of the arrays being mounted in series to an end portion of the upper flap and selectively engaging one another upon wrapping the end portion of the upper flap around a respective one of the shoulder straps proximate to the chest of the wearer so to apply a variable tension force to the top region, thereby selectively positioning the top region of carrier with the infant relative to the chest of the wearer.

32. The unit of claim 31, wherein the shoulder straps of the harness each have a strip of material forming a flap loop, the flap loops each being configured to limit displaced of the wrapped upper flap relative to the shoulder strap.

33. The unit of claim 29, wherein the lower flaps have respective end portions configured to wrap around respective shoulder straps and then couple to one another in front of the harness so as to support a midsection of the body of the infant.

34. The unit of claim 33, further comprising one or more rigid fastening elements formed on an end portion of one of the lower flaps and configured to receive an end portion of the other lower flap so as to tension an intermediate region of the carrier and a midsection of the infant's body relative to the chest of the wearer.

35. The unit of claim 23, wherein a rear region is configured to support the lumbar region of the wearer upon adjusting the harness thereon and opposite lateral portions running into the respective shoulder straps, each lateral portion being provided with one or more rigid fastening elements traversed by the free end of the shoulder strap which extends from the other lateral portion of the rear region.

36. The unit of claim 23, wherein the free end of one of the shoulder straps has a plurality of male and female engaging elements selectively coupleable to one another to form a ring loop and adjust a length of the waistband, the ring loop being configured to receive one or more rigid coupling elements located next to the hip of the wearer upon being engaged by the free end of other shoulder strap.

37. The unit of claim 23, further comprising a bag configured to receive and store a plurality of transportable items, the bag comprising:

two bag halves foldable about a common edge and adapted to be suspended at the back of the wearer, and

two spaced belt straps coupled to opposite lateral sides of one of the bag halves, one of the belt strap being configured to selectively engage one of the belt straps at the front of the wearer proximate to the hip thereof, or the one bag half at the back of the wearer or a free section of the other belt strap.

38. The unit of claim 37, further comprising: a belt strap loop proximate to the one bag half attaching the one belt strap.

39. A method for dynamically adjusting a baby carrier unit on a wearer comprising:

selectively engaging a plurality of seat position elements located on an inner surface of a bottom region of an infant support to a waist band of a harness proximate to a front section of a waist of the wearer so that the bottom region is folded so as define a seat for the infant, wherein the infant on the seat is selectively positioned relative to an upper edge of the infant support depending on the engaged seat position element;

selectively coupling a plurality of flap female and male position elements of an upper region of the infant support to one another, thereby coupling the upper region of the infant support to spaced shoulder straps of the harness while simultaneously therewith controllably tensioning the upper region of the infant support, wherein the upper torso of the infant is selectively positioned relative to the chest of the wearer depending on the applied tensile force; and

suspending a bag at the back of the wearer by detachably coupling

one of two spaced belt straps of the bag to one of the shoulder straps of the harness, and

the other belt strap to one of the other shoulder strap of the harness at the front of the wearer proximate to the hip thereof, the one belt strap, and one of two halves of the bag.

40. The method of claim 39, further comprising wrapping two lower flaps of the infant supports, which are located between the upper flaps and bottom region of the infant support, around the respective shoulder straps and coupling free ends of the lower flaps to one another around an intermediate region of the infant support, thereby securing a midsection of the upper torso of the infant.

41. The method of claim 39, further comprising coupling an end area of the folded bottom region of the infant carrier to an intermediate region of the infant support.

42. A portable modular transportation unit comprising:

a harness component erectable from a single strap to have two shoulder straps extending over respective shoulders of a wearer and crossing one another at a back of the wearer upper torso to have respective free ends coupled together at the front of the wearer; and

a bag component coupleable to the harness so as to be suspended at a back of the wearer and configured with a body and a first and a second belt strap attached to respective spaced portions of the body, the first belt strap being detachably coupleable to one of the shoulder straps at a location proximate to a collarbone of the wearer, the second belt strap being selectively and detachably coupleable to at least one of the other shoulder strap at a location proximate to a hip of the wearer, the first belt strap, and the body, wherein the body is configured to receive and store a plurality of transportable items.

43. The unit of claim 42, wherein the first belt strap of the bag component has an end region provided with a rigid engaging element, the one shoulder strap of the harness component having a formation member located proximate to the collarbone of the wearer and operable to engage and retain the rigid engaging element of the first belt.

44. The unit of claim 42, wherein the second belt strap of the bag component has a fastening assembly located along an end region of the first belt strap and selectively engaging one or more receiving elements on the other shoulder strap of the harness so as to adjust a position of the bag components on the wearer.

45. The unit of claim 43, wherein the rigid engaging element of the first belt strap of the bag is selected from the group consisting of one or more D-rings, O-rings, and variously configured hooks.

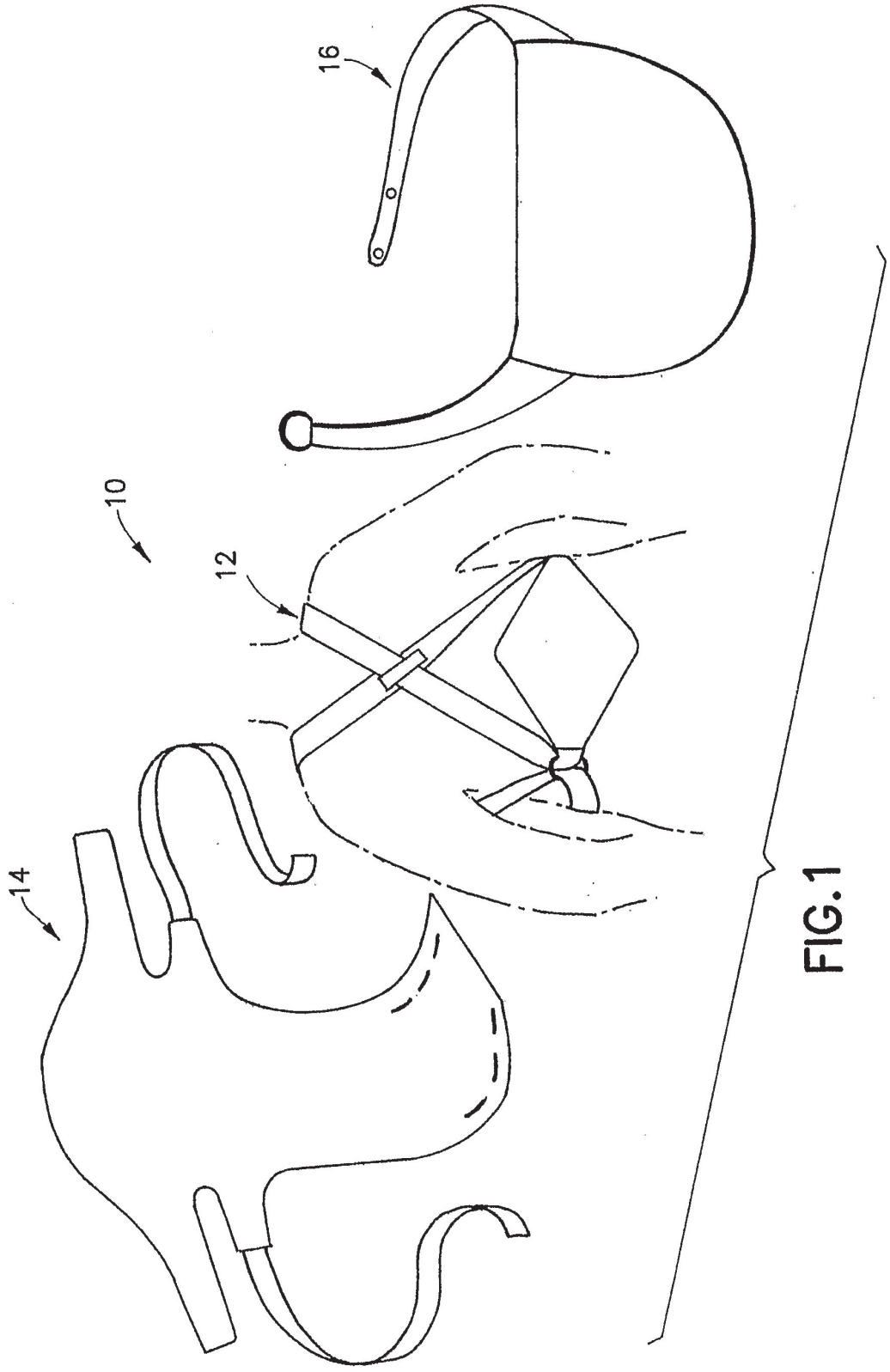


FIG. 1

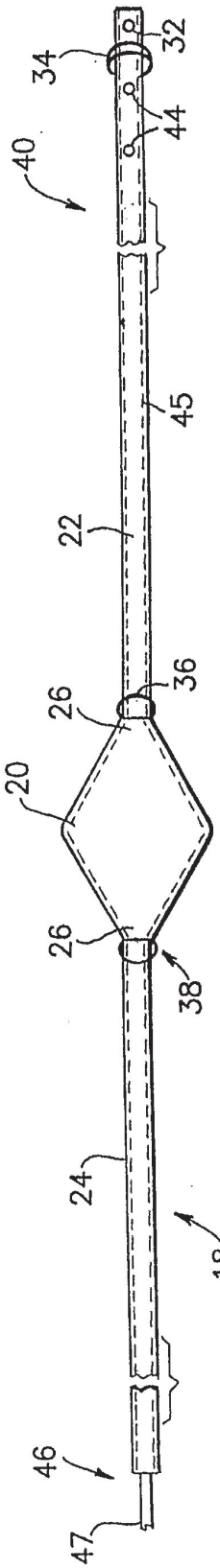

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FIG.2

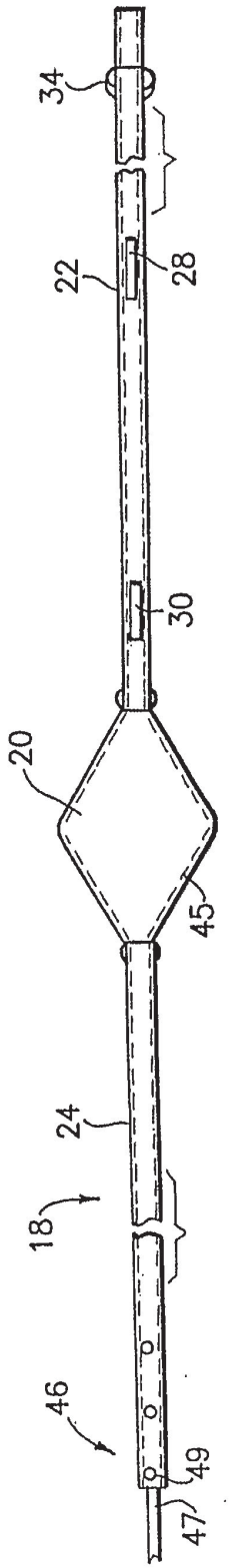

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FIG.3

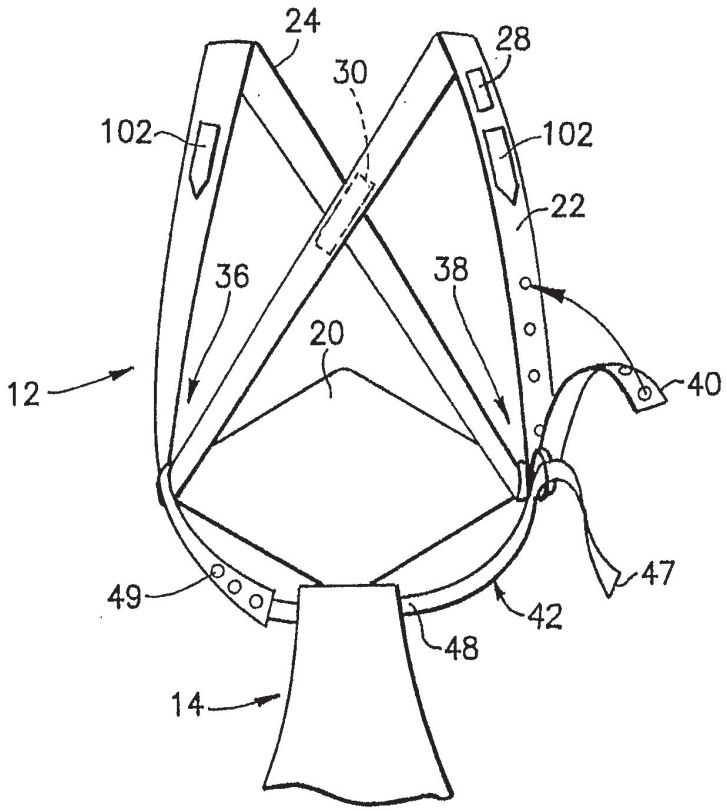


FIG.4

FIG.5

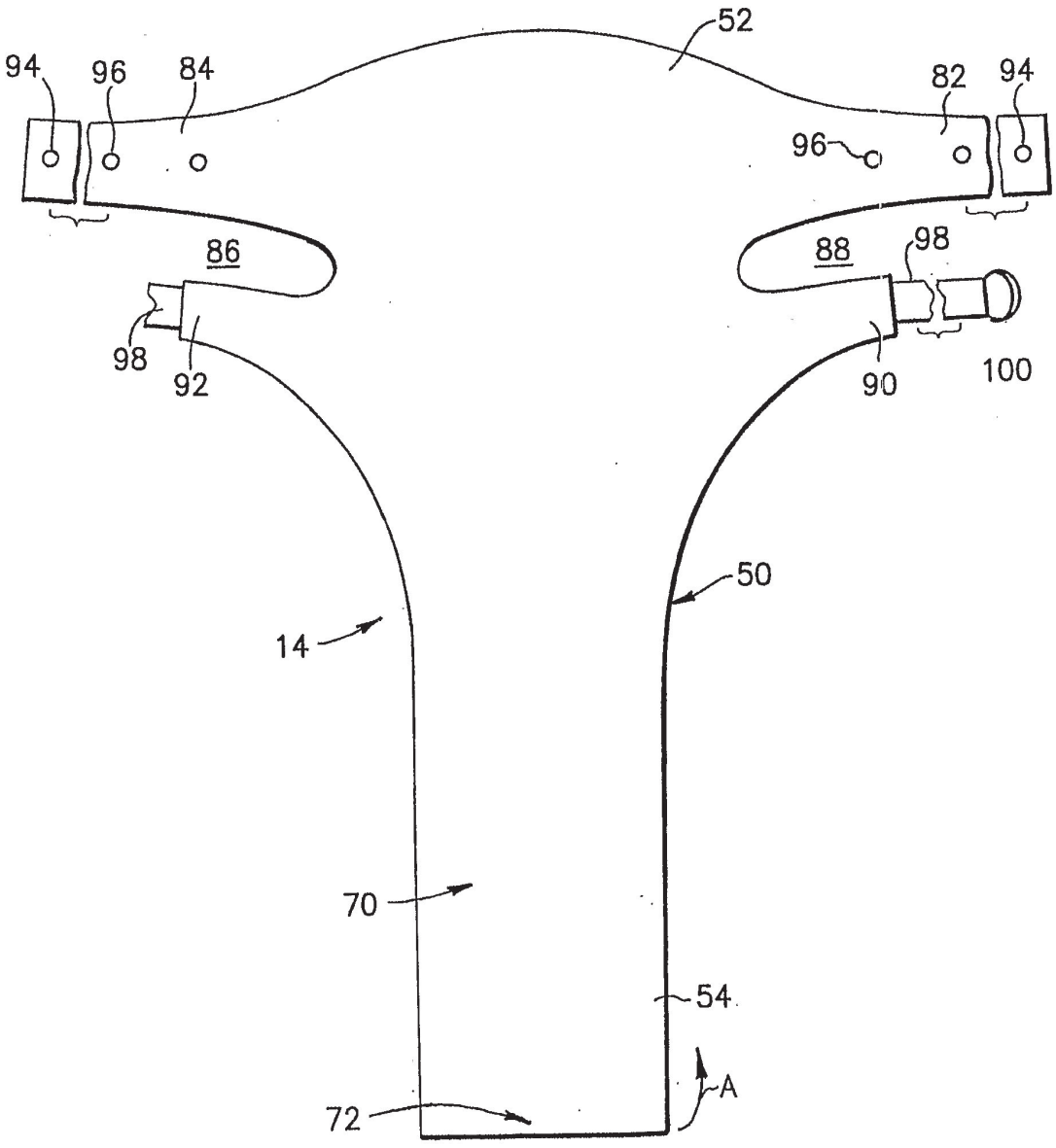


FIG.6

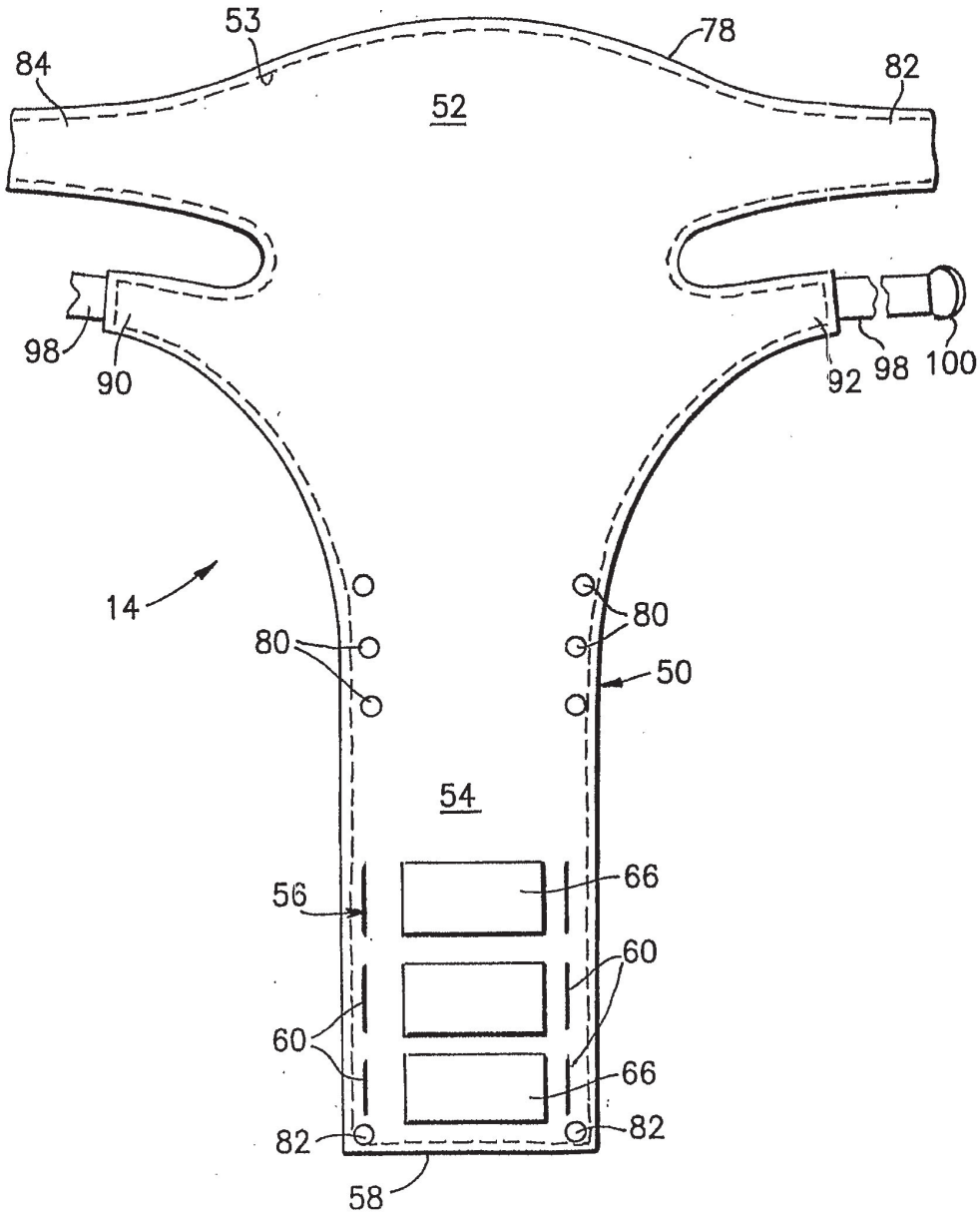


FIG.7

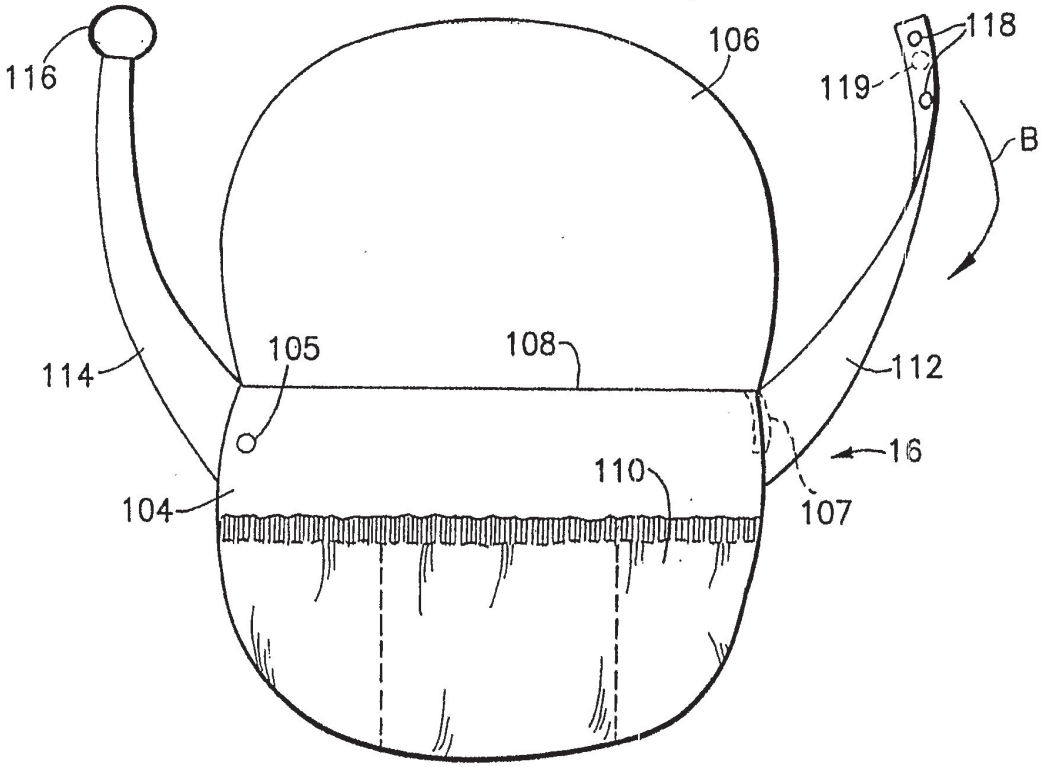


FIG.8

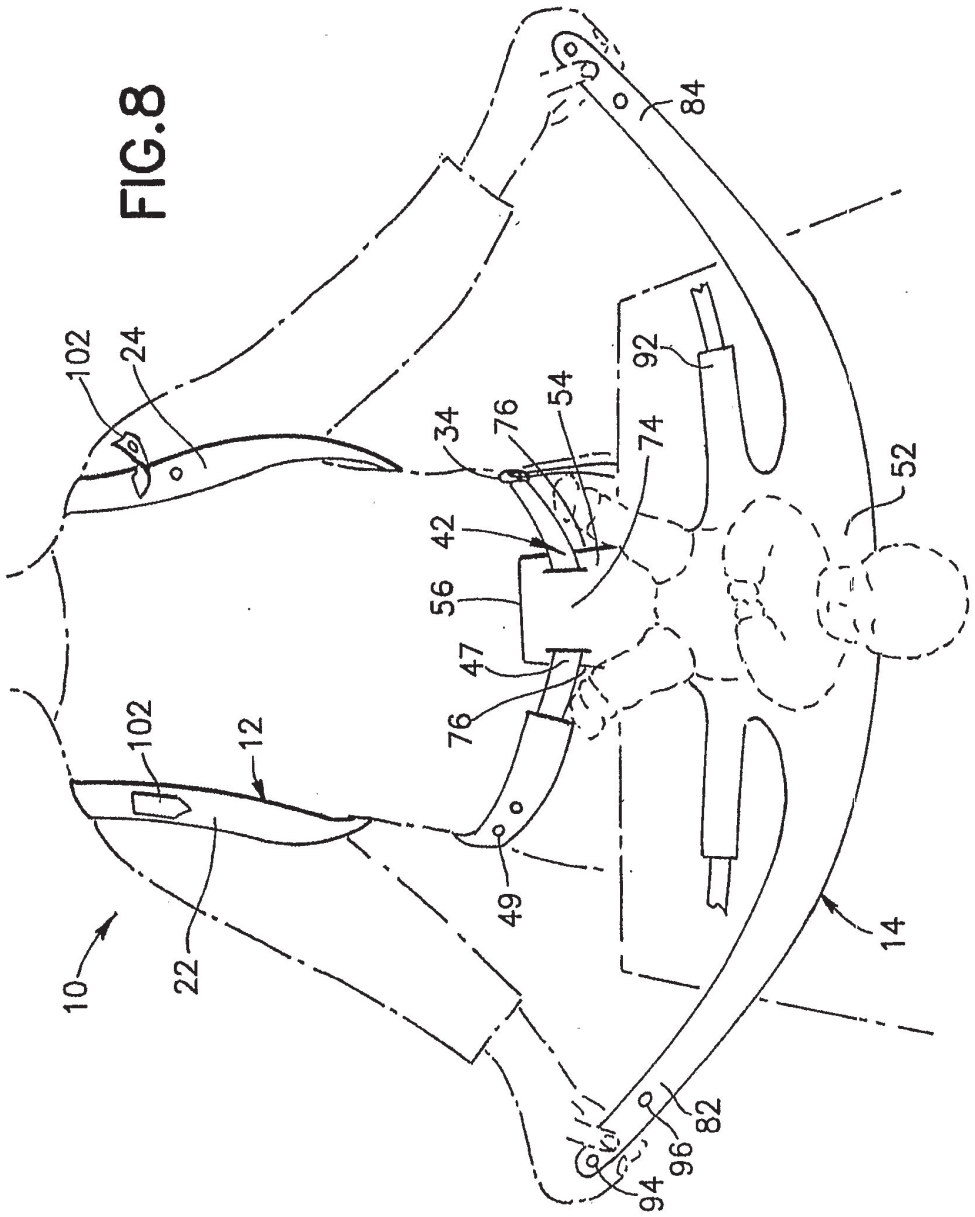


FIG.9

