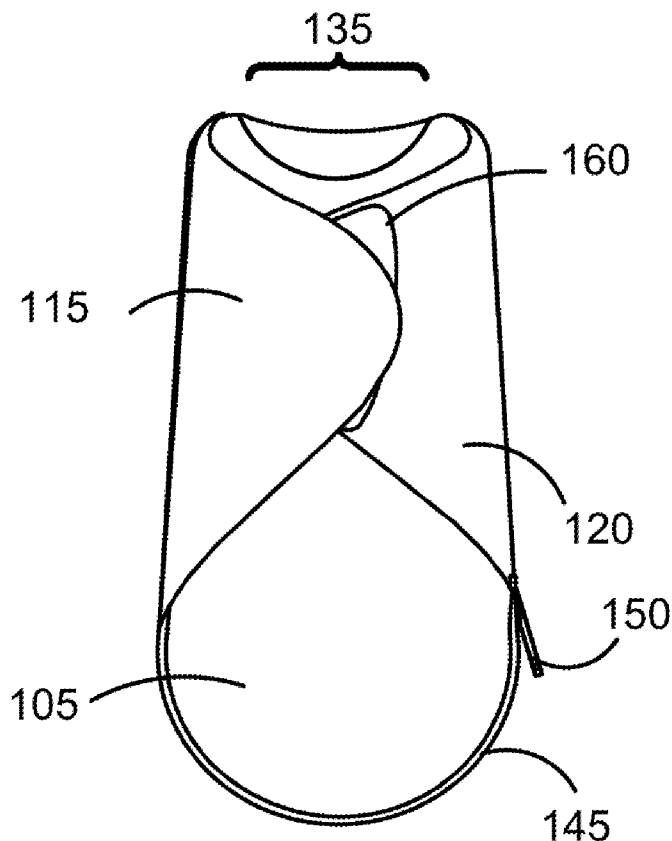




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(19) **United States**(12) **Patent Application Publication**
Bopanna et al.(10) **Pub. No.: US 2016/0295928 A1**(43) **Pub. Date: Oct. 13, 2016**(54) **TEMPERATURE MAINTENANCE
COVERING OR APPAREL FOR CHILDREN**(52) **U.S. Cl.**
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(US)(21) Appl. No.: **15/097,165**(22) Filed: **Apr. 12, 2016****Related U.S. Application Data**(60) Provisional application No. 62/146,942, filed on Apr.
13, 2015.**Publication Classification**(51) **Int. Cl.**
A41B 13/06 (2006.01)(57) **ABSTRACT**

A baby temperature maintenance device is designed to regulate the temperature of a baby while providing a care-taker access to a lower portion of the baby without disturbing the baby. The baby temperature maintenance device includes a first panel of fabric, a second panel of fabric, a lower securing mechanism, and a plurality of upper securing mechanisms. The lower portions of the panels are fastened together with a lower securing mechanism that can be zipped open or closed. The upper portions of the panels are fastened together with upper securing mechanisms that fasten over each of the baby's shoulders. In some embodiments, a first wing and a second wing are included as a swaddle to fold over different sides and across the center of the first panel. The first wing and the second wing have reciprocal mating portions that fasten to each other to restrict movement of the baby's arms.

100

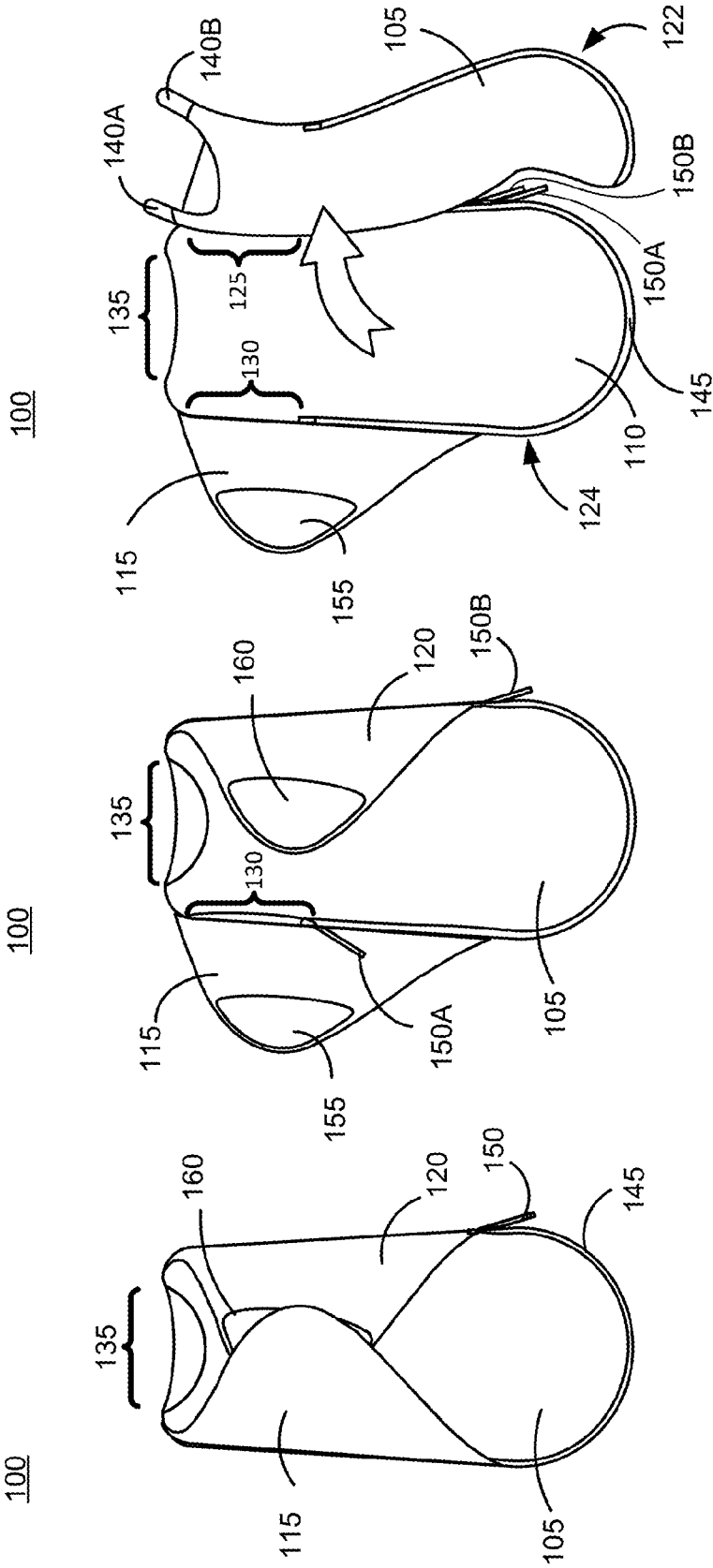


FIG. 1A

FIG. 1B

FIG. 1C

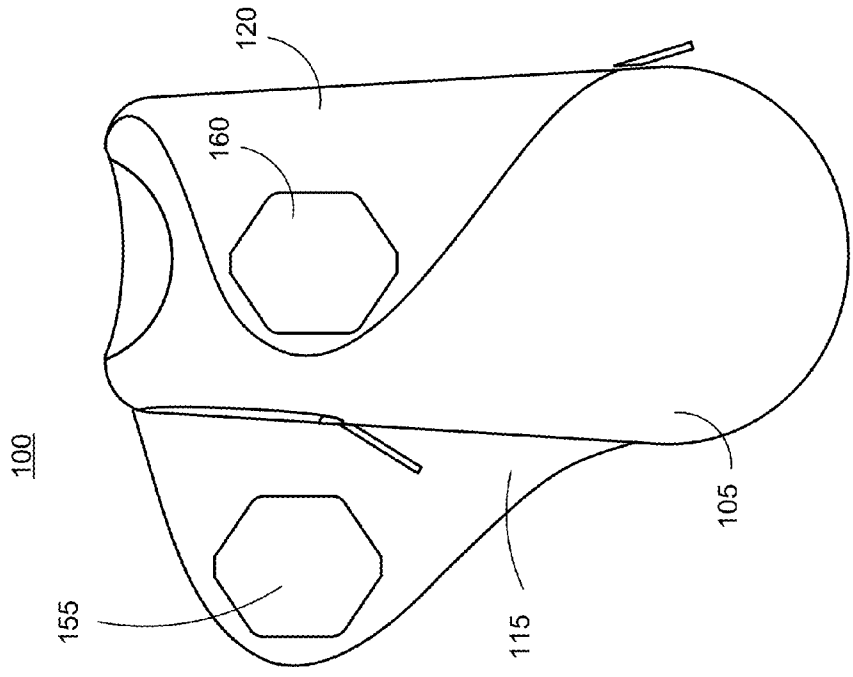


FIG. 1D

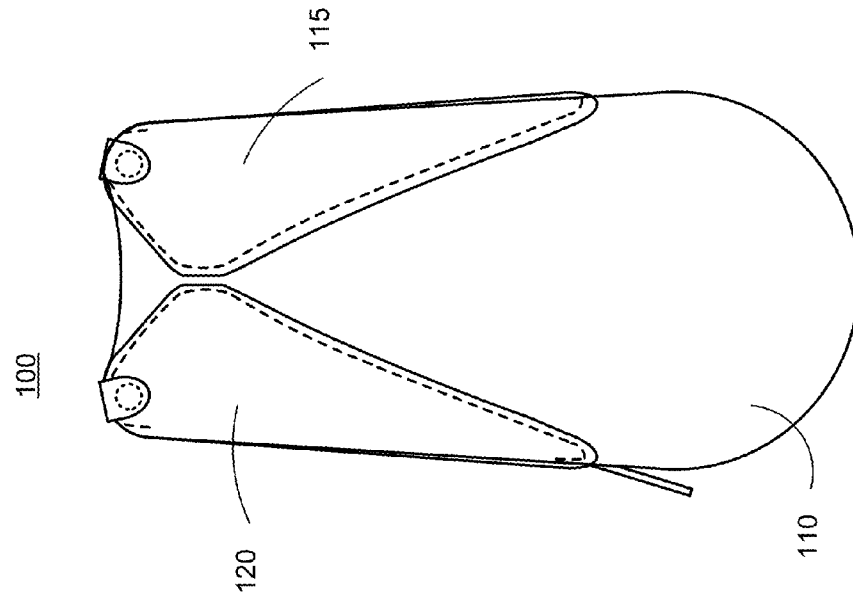


FIG. 1E

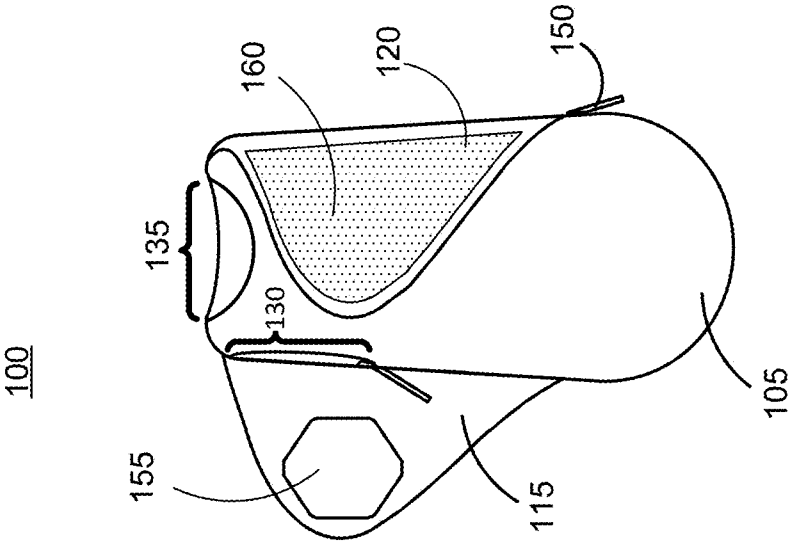


FIG. 1G

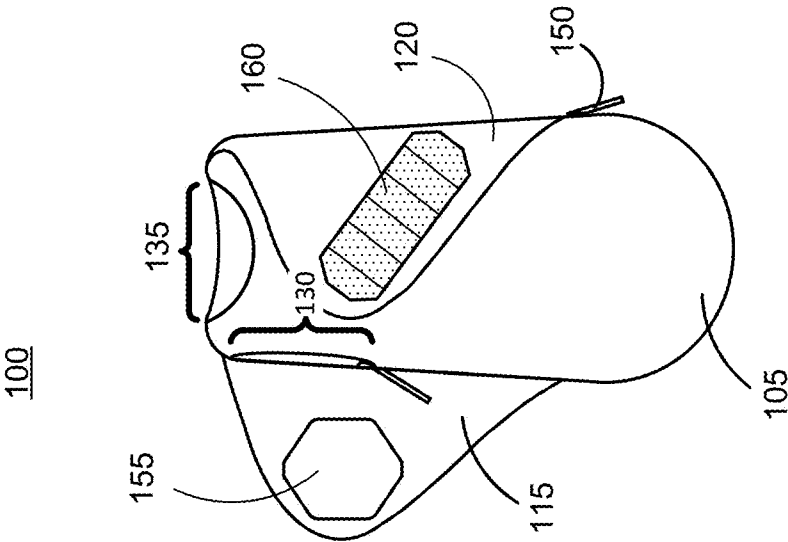


FIG. 1F

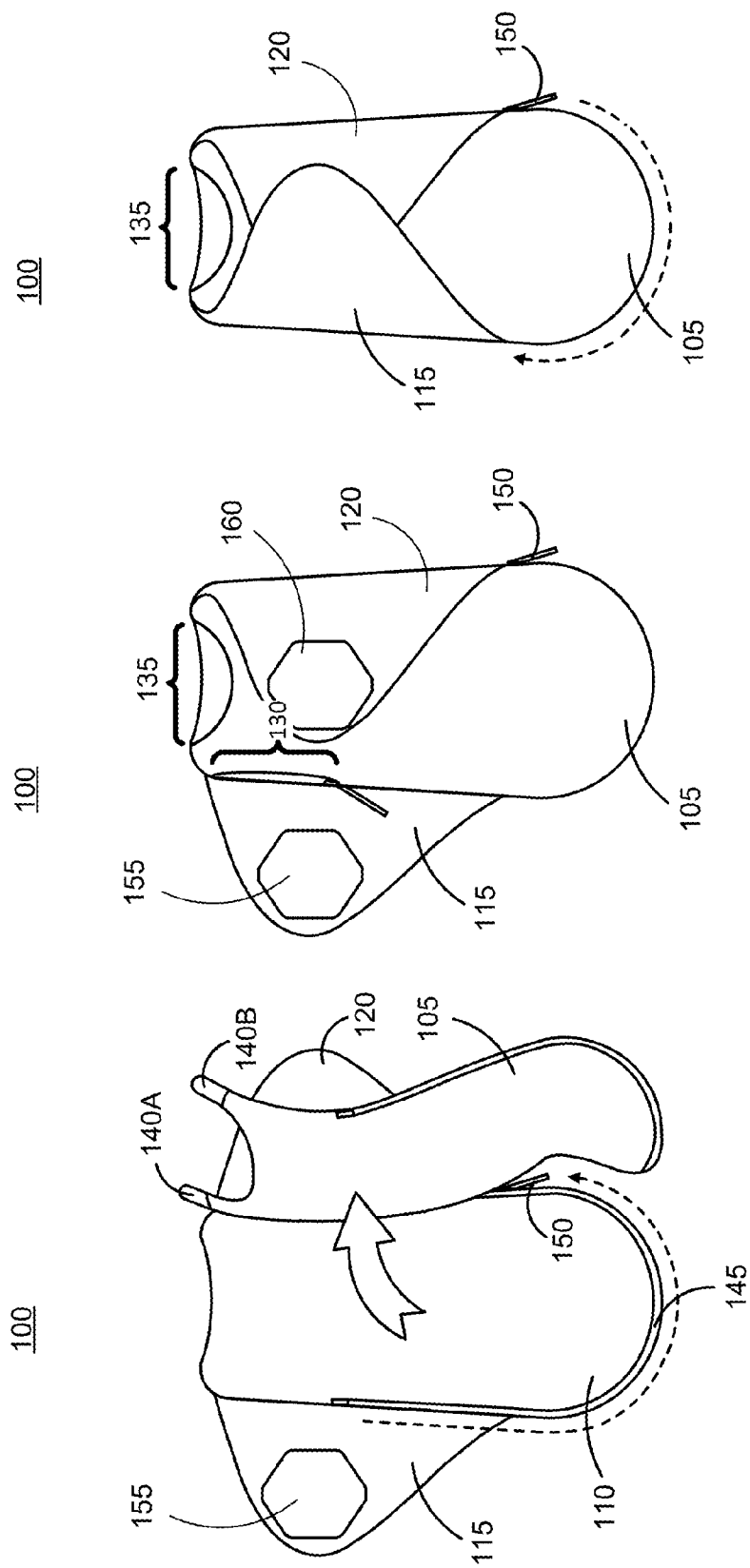


FIG. 1H

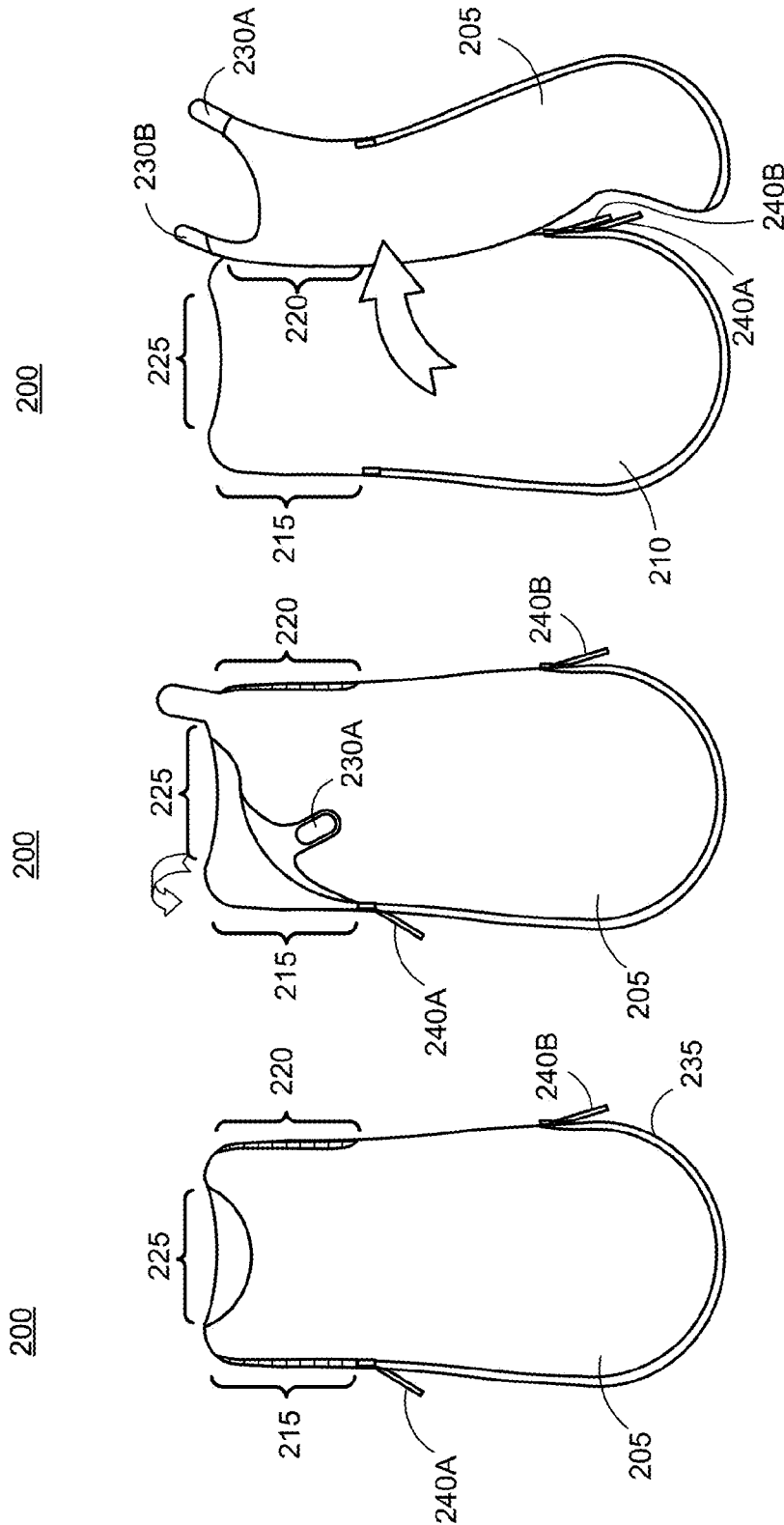


FIG. 2A

FIG. 2B

FIG. 2C

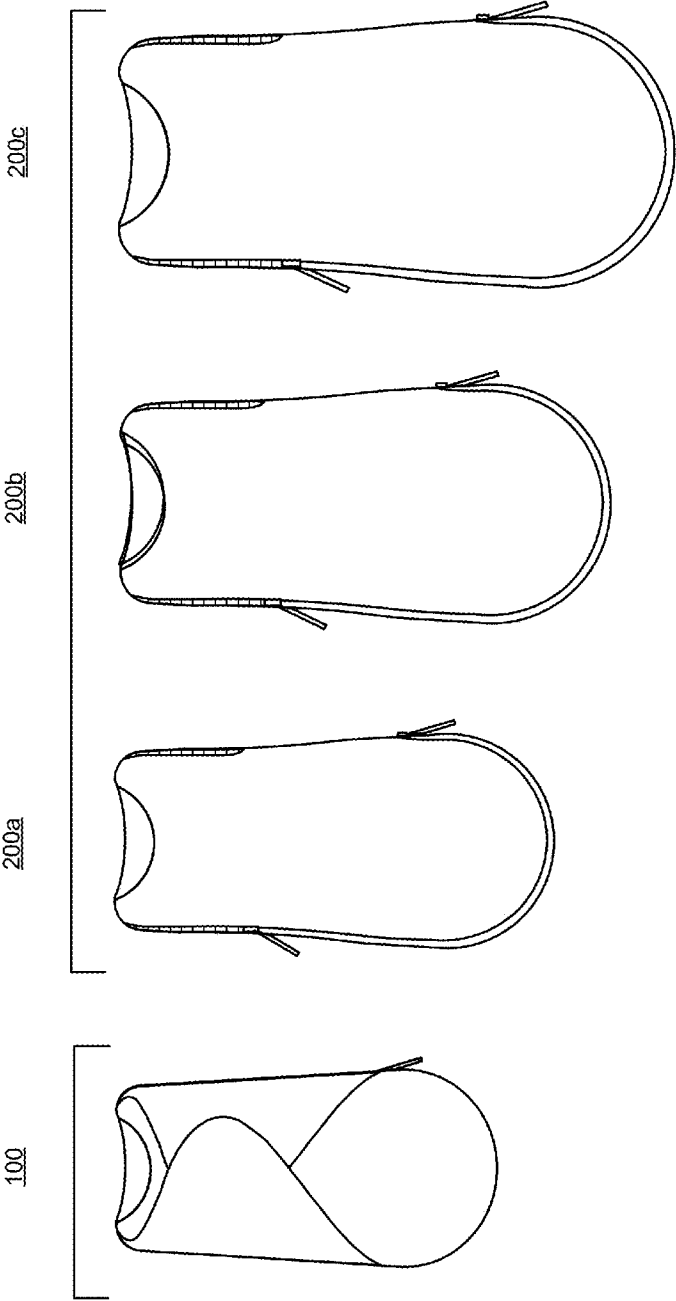


FIG. 2D

TEMPERATURE MAINTENANCE COVERING OR APPAREL FOR CHILDREN

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 62/146,942 filed Apr. 13, 2015, which is incorporated by reference in its entirety.

BACKGROUND

[0002] This invention relates generally to temperature maintenance coverings or apparel, and specifically to a baby swaddle or sleeping bag providing temperature maintenance of the baby.

[0003] Parents often worry about their babies being kept warm or being at the right temperature. Since babies cannot indicate whether they are too hot or too cold, the parent or caretaker is left to guess and make assumptions about the baby's temperature. Conventional methods to maintain a baby's body temperature include apparel or a wrap that can be worn by the baby, such as a baby swaddle or sleeping bag. However, conventional wraps require disturbance of the baby when placing the baby in the wrap or removing the wrap, possibly awaking the baby while the baby is sleeping. For example, a design that only allows the baby to be put into the swaddle or sleeping bag by putting it over the baby's head or by inserting the baby's arms into the arm openings can be disturbing to the baby and challenging for the parents. In addition, these conventional designs often provide limited or inconvenient access to the diaper for changing the baby while the baby is wearing the swaddle or sleeping bag. For example, much of the baby's body may have to be exposed to the cold air during the diaper change, or the baby's body may have to be inconveniently maneuvered and lifted out of the swaddle or sleeping bag to access the diaper. Additionally, some conventional designs include a zipper near the baby's face or neck, which can be uncomfortable for the baby.

SUMMARY

[0004] A baby temperature maintenance device is designed to maintain and regulate the temperature of a baby while providing easy access to a parent or caretaker of the baby to change the baby's diaper or adjust the baby without disturbing the baby. The baby temperature maintenance device, in one embodiment, includes a first panel of fabric, a second panel of fabric, a lower securing mechanism, and a plurality of upper securing mechanisms. For example, the device can be designed as a sleeping bag for a baby. In some embodiments, the device includes at least one wing or possibly multiple wings for wrapping a baby. For example, the device can include a first wing and a second wing, in which case the device can be designed as a swaddle for a baby.

[0005] An outer edge of the first panel and an outer edge of the second panel are fastened along various portions of the outer edges. In one embodiment, the outer edges of the lower portions of the first panel and the second panel are fastened together with a zipper that is configured to open or close in one or more directions, providing access to the lower portion of the baby and the baby's feet. The zipper can extend from beneath a first arm hole to beneath a second arm hole of the baby temperature maintenance device.

[0006] The upper portion of the first panel and the second panel includes two upper securing mechanisms, wherein each upper securing mechanism is designed to secure the baby temperature device over one of the baby's shoulders. Each upper securing mechanism includes a first mating portion and a second mating portion, such that the first mating portion and the second mating portion are configured to fasten over one of the baby's shoulders.

[0007] In embodiments including wings, the first wing and the second wing are panels of fabric that are secured to the first panel. The first wing is configured to fold across a first side and a center of the second panel, and the second wing is configured to fold across a second side and the center of the second panel. The first wing includes a first mating portion that is capable of being fastened to a second mating portion on the second wing, securing the wings to each other over the baby's arms to restrict movement of the baby's arms.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1A illustrates a closed position of a temperature maintenance swaddle with wings, in accordance with an embodiment.

[0009] FIG. 1B illustrates a partially open wing position of a temperature maintenance swaddle with wings, in accordance with an embodiment.

[0010] FIG. 1C illustrates a fully open position of a temperature maintenance swaddle with wings, in accordance with an embodiment.

[0011] FIG. 1D illustrates a back view of a closed position of a temperature maintenance swaddle with wings, in accordance with an embodiment.

[0012] FIG. 1E illustrates an alternate embodiment of a partially open wing position of a temperature maintenance swaddle with wings, in accordance with an embodiment.

[0013] FIG. 1F illustrates an additional alternate embodiment of a partially open wing position of a temperature maintenance swaddle with wings, in accordance with an embodiment.

[0014] FIG. 1G illustrates an additional alternate embodiment of a partially open wing position of a temperature maintenance swaddle with wings, in accordance with an embodiment.

[0015] FIG. 1H illustrates the configuration of the swaddle as described in FIGS. 1A-E in various positions, in accordance with an embodiment.

[0016] FIG. 2A illustrates a closed position of a temperature maintenance swaddle/sleeping bag without wings, in accordance with an embodiment.

[0017] FIG. 2B illustrates a partially open position of a temperature maintenance swaddle/sleeping bag without wings, in accordance with an embodiment.

[0018] FIG. 2C illustrates a fully open position of a temperature maintenance swaddle/sleeping bag without wings, in accordance with an embodiment.

[0019] FIG. 2D illustrates varying sizes of swaddles without wings and an example of a swaddle with wings, in accordance with an embodiment.

[0020] The figures depict various embodiments of the present invention for purposes of illustration only. One skilled in the art will readily recognize from the following discussion that alternative embodiments of the structures

and methods illustrated herein may be employed without departing from the principles of the invention described herein.

DETAILED DESCRIPTION

Overview

[0021] A temperature maintenance material acts as a covering or is used in apparel for children, herein referred to as a swaddle with wings (e.g., a swaddle) and a swaddle without wings (e.g., a sleeping bag). In one embodiment, the temperature maintenance material is composed of nanoparticles that release heat such that a child or infant wearing the clothing or covered with a blanket in the material is kept warm. Some embodiments do not include the temperature maintenance material, but instead use a soft, comfortable material, such as cotton or fleece. In one embodiment, the apparel is an infant or toddler swaddle or sleeping bag. The swaddle and sleeping bag are designed such that, when unzipped, the entire swaddle and sleeping bag can lay flat to allow a baby or child to be placed on the swaddle and sleeping bag such that the swaddle and sleeping bag can be wrapped and zipped around the baby. One embodiment includes a dual-slider zipper design along the outer edge at the lower portion of the swaddle and sleeping bag holding the baby or child's feet and allows the swaddle and sleeping bag to be unzipped for diaper changes with minimal disturbance to and exposure of the baby or child. In the swaddle design, wings are configured to wrap the baby's arms for swaddling the baby. Other embodiments include different types of apparel or coverings for children, such as a stroller blanket, a scarf, a jacket, pajamas, a shirt or pants, a dress, a jumpsuit, among other options.

Swaddle with Wings

[0022] FIGS. 1A, 1B, and 1C illustrate a closed position of a temperature maintenance swaddle with wings, a partially open wing position of a temperature maintenance swaddle with wings, and a fully open position of a temperature maintenance swaddle with wings, respectively. Herein, a swaddle with wings may also be referred to as a swaddle. The swaddle is designed to maintain and regulate the temperature of a baby while providing easy access to a parent or caretaker of the baby to change the baby's diaper without disturbing the baby. A swaddle with wings may be used in particular for newborn babies and younger babies where it is desirable to restrict the arm movement of the baby.

[0023] The shape of the swaddle is designed to provide comfort for the baby. In the embodiments of FIGS. 1A-C, the swaddle is shaped such that the lower portion of the swaddle that encloses the baby's feet is wider relative to the upper portion of the swaddle that wraps around the baby's shoulders. The bottom of the swaddle has rounded corners, such that the shape of the swaddle is substantially similar to a tear-drop. This configuration provides the baby with room for movement of their legs and feet while the movement of their arms is restricted. The shape of the swaddle may vary in other embodiments.

[0024] The dimensions of the swaddle can be designed to accommodate several different sizes and ages of babies. In some embodiments, the length of the swaddle may be between 18-28 inches, while the width of the swaddle may be 6-12 inches (measured without the wings), each measured between the outermost edges when the swaddle is laid

flat. In other embodiments, the length may be greater than 28 inches for larger and/or older babies or children or less than 18 inches for smaller babies or premature babies. Similarly, the width may vary to include widths greater than 12 inches or less than 6 inches. In some embodiments, the swaddle may be used for a range of sizes (e.g., 20-25 inches in length or 7-9 inches in width) and may include features that can be adjusted to accommodate for a specific size of a baby within the range of sizes.

[0025] In the embodiments of FIGS. 1A-C, the swaddle 100 includes a front panel 105, a back panel 110, a right wing 115, and a left wing 120. The front panel 105 is the portion of the swaddle 100 that is designed to rest against a front side of a baby, and the back panel 110 is the portion of the swaddle 100 that is designed to rest against a back side of a baby. The right wing 115 and the left wing 120 are designed to be wrapped around the baby when the baby is placed between the front panel 105 and back panel 110 of the swaddle 100.

[0026] The front panel 105 and the back panel 110 are made of pieces of fabric that are similarly shaped and are configured to reciprocally secure along outer edges 122 of the front panel 105 and outer edges 124 of the back panel 110. As previously described, the front panel 105 and the back panel 110 are substantially tear-drop shaped. The upper portions of the front panel 105 and the back panel 110 are designed to accommodate for the baby's head and neck to provide a comfortable fit. As illustrated in FIGS. 1A-C, the upper portions of the front panel 105 and the back panel 110 have a scoop-shaped neckline. In some embodiments, the upper portion of the front panel 105 may scoop lower than the upper portion of the back panel 110 for a comfortable fit around the baby's neck. In other embodiments, the front panel 105 may have a v-shaped neckline rather than a scoop-shaped neckline.

[0027] The front panel 105 and the back panel 110 are fastened together along different portions of the outer edges 122 and 124, such that the remaining portions that aren't fastened together create a right arm hole 125, a left arm hole 130, and a neck hole 135. The sizes of the holes can vary depending on the overall dimensions of the swaddle 100 and the intended size range for the swaddle 100. The portions of outer edges of the front panel 105 and the back panel 110 can be fastened together with a clasp, thread, zipper, buttons, snap buttons, any other suitable fastener, or some combination thereof. Each of the different portions of the outer edges of the front panel 105 and the back panel 110 may be fastened using the same method or using different methods.

[0028] In the embodiments of FIGS. 1A-C, the portions of outer edges of the front panel 105 and the back panel 110 under the right arm hole 125 and the left arm hole 130 can be sewn together with thread. The sewn portions may begin between 3-10 inches from the top of the swaddle to maintain the openings for the right arm hole 125 and the left arm hole 130. The sewn portions may end up to 15 inches from the top of the swaddle 100. The length of sewn portions may differ or be the same under the right arm hole 125 and the left arm hole 130. In some embodiments, only one of the portions under the right arm hole 125 and under the left arm hole 130 is sewn together rather than both portions under the holes 125, 130.

[0029] In the embodiments of FIGS. 1A-C, the upper portions of the front panel 105 and the back panel 110 surrounding the neck hole 135 may be fastened together

with securing mechanisms, such as a hook-and-loop fastener, that has a first mating portion and a second mating portion which can be attached and detached to each other as desired. When the mating portions are attached to each other, the upper portions of the arm holes **125**, **130** are formed. As shown in FIG. 1C, the front panel **105** has tabs **140A** and **140B** that are configured to fold over the baby's shoulders and overlap with upper portions of the back panel **110**. In some embodiments, the tabs **140A**, **140B** include a hook component, the first mating portion of the hook-and-loop fastener, while the back panel **110** includes a respective loop component, the second mating portion of the hook-and-loop fastener. This configuration ensures that the hook component is not exposed when the tabs **140A**, **140B** are fastened to the back panel **110** and will not be able to rub against or irritate the baby or the parent or caretaker. The hook-and-loop fastener provides a range of adjustability to accommodate for babies of different sizes and lengths and to loosen or tighten the fit of the swaddle **100**. In alternate embodiments, the back panel **110** may have the tabs configured to fold over and overlap with the front panel **105**, or the front panel **105** and the back panel **110** may each have tabs that meet across the shoulder. Other embodiments may use other types of suitable fasteners, such as one or more buckles, one or more buttons, one or more pins, one or more shoelaces or strings, one or more snap fasteners, a zipper, or any combination thereof.

[0030] In the embodiments of FIGS. 1A-C, the lower portions of outer edges **122**, **124** of the front panel **105** and the back panel **110** are fastened together by a zipper **145**. The outer edge **122** includes a first portion of the zipper **145**, while the outer edge **124** includes a second portion of the zipper **145**, such that the first portion and the second portion reciprocally mate to open and close the lower portion of the swaddle **100** around the baby's feet. The zipper **145** may include one or more pull tabs **150** to form a dual-slider zipper that can open and close from two directions. The zipper **145** begins at the end of a sewn portion under a first arm hole and ends at the end of a sewn portion under a second arm hole, as illustrated in FIGS. 1B-C. In some embodiments in which a portion under only one arm hole is sewn rather than under both arm holes, the zipper **145** may begin or end at an edge of an arm hole, forming the lower portion of the arm hole when the zipper **145** is zipped closed. The use of a zipper **145** with a plurality of pull tabs **150** allows for a parent or a caretaker to open the bottom of the swaddle **100** for diaper changes or access of the baby without opening and disturbing the upper part of the swaddle **100** where the wings **115**, **120** are closed around the baby. In other embodiments, the zipper **145** can be arranged differently than is shown. For example, the pull tabs **150** may be designed to meet at the bottom middle of the swaddle at the baby's feet and can be pulled apart to access the diaper or bottom of the swaddle **100**. In other embodiments, the zipper **145** used to fasten the bottom edges of the front panel **105** and the back panel **110** can be one or more hook-and-loop fasteners, one or more buckles, one or more buttons, one or more pins, one or more shoelaces or strings, one or more snap fasteners, a single slider zipper, one or more magnets, other suitable magnet fasteners, or any combination thereof.

[0031] In the embodiments of FIGS. 1A-C, the front panel **105** and the back panel **110** are formed from a plurality of layers of different fabrics. In one embodiment, the panels **105**, **110** include an outer layer and an inner layer, the inner

layer touching the baby and the outer layer not touching the baby. The outer layer can be any suitable body fabric such as cotton (e.g., Lycra), silk, wool, cashmere wool, camel hair, polyester, nylon, spandex, or any other suitable durable textile fiber. In some embodiments, the inner layer can be a type of insulating fabric that provides temperature maintenance for the baby. These insulating fabrics may include as OUTLAST® THERMOCULES™, any other suitable phase change materials (PCM), or any other suitable fiber that adjusts to body temperature and maintains the body at a set temperature. For example, the OUTLAST® THERMOCULES™ is a fabric embedded with a wax-like substance called a phase change material. The OUTLAST® THERMOCULES™ absorbs and releases heat and, if the temperature of the baby is above a first threshold temperature, the material absorbs the heat to cool off the baby. If the temperature of the baby is below a second threshold temperature, the material releases the heat it stored earlier, transferring the heat to the baby and bringing the baby back to a comfortable temperature. The inner layer can be a material that ensures that the baby within the swaddle **100** and touching the material of the inner layer maintains a temperature in the range of 97-100.3° F. Example of types of fabric that could be used as a temperature maintenance fabric are described in more detail within the following U.S. Patents: U.S. Pat. No. 6,855,422; U.S. Pat. No. 7,241,497; U.S. Pat. No. 7,160,612; U.S. Pat. No. 7,666,502; U.S. Pat. No. 7,666,500; U.S. Pat. No. 6,793,856; U.S. Pat. No. 7,563,398; U.S. Pat. No. 7,135,424; U.S. Pat. No. 7,244,497; U.S. Pat. No. 7,579,078; U.S. Pat. No. 7,790,283; U.S. Pat. No. 6,514,362; U.S. Pat. No. 6,660,667; U.S. Pat. No. 7,836,722; U.S. Pat. No. 5,677,048; U.S. Pat. No. 5,851,338; U.S. Pat. No. 5,955,188; U.S. Pat. No. 6,179,879; U.S. Pat. No. 6,077,597; U.S. Pat. No. 6,217,993; U.S. Pat. No. 7,135,424; U.S. Pat. No. 4,756,958; U.S. Pat. No. 6,689,466; U.S. Pat. No. 6,099,894; U.S. Pat. No. 6,171,647; U.S. Pat. No. 6,270,836; U.S. Pat. No. 6,197,415 U.S. Pat. No. 6,696,145; U.S. Pat. No. 5,532,039; U.S. Pat. No. 6,230,444; U.S. Pat. No. 6,892,478, each of which is hereby incorporated by reference herein in its entirety. This configuration allows a baby in the swaddle **100** to maintain a safe and comfortable temperature, which otherwise can be difficult for a parent or caretaker to determine or monitor.

[0032] The right wing **115** and the left wing **120** are made of pieces of fabric that are similarly shaped and are designed to overlap with each other to wrap a baby in the swaddle **100**. The wings **115**, **120** are substantially triangular-shaped with rounded corners, as illustrated in the embodiment of FIGS. 1A-C, and are positioned to be substantially mirror images of each other. To wrap the wings **115**, **120** around the baby, as shown in the closed position in FIG. 1A, a rounded corner of a first triangular-shaped wing is drawn towards the center of the front side of the swaddle and laid against the front side of the swaddle while a rounded corner of a second triangular-shaped wing is similarly drawn towards the center of the front side of the swaddle to overlap with and secure to the second triangular-shaped wing. The triangular shape of the wings **115**, **120** allows the portions closest to the baby's head to angle downwards away from the baby's face from the edges of the swaddle **100**, forming a "V" shape when the wings **115**, **120** are wrapped or closed around the baby, as illustrated in FIGS. 1A-C. Thus, this design prevents the closed wings **115**, **120** from covering the baby's face when the baby is in the swaddle **100** even if the baby

shifts position within the swaddle 100. In some embodiments, the top edge and the bottom edge of each wing 115, 120 are similarly shaped. The wings 115, 120 may have a variety of geometries that provide similar function and comfort as the triangle shape. For example, in other embodiments, the top edge of the wing near the baby's head can be scooped away from the baby's neck, the wings can be hexagonally-shaped or ovular-shaped, or other similar geometries, or some combination thereof.

[0033] The dimensions of the wings 115, 120 are designed to provide sufficient overlap of the right wing 115 and the left wing 120 such that the wings 115, 120 can be wrapped and secured around a baby in the swaddle 100. The wings 115, 120 have a unique shape relative to conventional swaddle designs in that the width of the wings 115, 120 across the body is not long and are only sufficient enough to cover just the baby's arms without wrapping all the way around the baby or wrapping near to the baby's back. The width of each wing 115, 120, measured from an attachment point on the back panel 110 to the outermost edge that is intended to lie across the front of the baby, can vary based on the intended size range of the swaddle 100. For example, the width can measure 12 inches or measure within the range of 10-14 inches, or other ranges for other sizes (e.g. 5-11 inches, 13-18 inches, etc.), given that the wings 115, 120 are long enough to wrap around the arms of a baby wearing the swaddle 100 so that the baby's arms cannot swing or move around. The overlapping portions of the wings 115, 120 allow the wings 115, 120 to secure to each other with suitable clasps or fasteners. The amount of overlap between the wings 115, 120 when in the closed position, as illustrated in FIG. 1A, may be 5 inches or less, or, in other embodiments, may be less than 4 or 3 inches. In the embodiment of FIGS. 1A-C, the length of the top edge closest to the baby's head is generally similar to the length of the bottom edge closest to the baby's feet. In some embodiments, the wings 115, 120 can have uniform dimensions or different dimensions, given that the overlap of the wings 115, 120 is sufficient for the intended size range. This configuration provides an ease of use for the parent or the caretaker such that the wings 115, 120 don't have to wrap all the way around and disturb the baby, and the shape and overlap of the wings 115, 120 allow for ease of tightening or loosening the swaddle 100 when the baby is enclosed.

[0034] FIG. 1D illustrates a back view of a closed position of a temperature maintenance swaddle with wings, in accordance with an embodiment. As illustrated in the embodiment of FIG. 1D, a portion of each of the wings 115, 120 extends past the edges of the back panel 110 and overlap with the back panel 110, potentially meeting or nearly meeting on the back panel 110. Thus, a greater surface area of the wings 115, 120 overlaps with the back panel 110, and, for example, allows the overlapping portions of the wings 115, 120 to be sewn onto the back panel 110. The overlap of the wings 115, 120 with the back panel 110 can be 3-7 inches in width. Other amounts of overlap are also possible (e.g., 1-8 inches, 0.5-4 inches, 6-10 inches, etc.), depending on the intended size range for the swaddle 110. In the embodiment of FIG. 1D, the wings 115, 120 are bound to the back panel 110 with thread, but other suitable fasteners may be used (e.g. zippers, clasps, mechanical fasteners, or the like, or any combination thereof). In other embodiments, the right wing 115 and the left wing 120 can be attached along the right and left edges of the front panel 105 or the back panel 110, respectively,

without overlapping the back panel 110. The length of the right wing 115 and the left wing 120 along the edges of the back panel 110 can be different or the same lengths in the range of 10-18 inches, depending on the dimensions of the wings 115, 120 and the intended size range for the swaddle 100. Other length ranges are also possible, such as ranges within this range (e.g., 12-15 inches) or ranges extending beyond one or both of the end points (e.g., 5-18 inches or 10-25 inches). In some embodiments, the wings 115, 120 may be made of the same piece of fabric, rather than two separate pieces of fabric, such that the single piece of fabric can be secured across the width of the back panel 110. In alternate embodiments, the wings 115, 120 may be made of the same piece of fabric as the back panel 110 or the front panel 105.

[0035] FIG. 1E illustrates an alternative partially open wing position of a temperature maintenance swaddle with wings, in accordance with an embodiment. As previously described, the wings 115, 120 are designed to overlap and secure to each other to snugly wrap the baby in the swaddle 100. Each of the wings 115, 120 can have a variety of securing mechanisms that are configured to reciprocally mate when the wings 115, 120 are in the closed position. For example, a male wing clasp and a female wing clasp, hook-and-loop fasteners, one or more buckles, one or more buttons, one or more pins, one or more shoelaces or strings, one or more snap fasteners, a zipper, or any combination thereof, may be used. In the embodiment of FIG. 1E, the right wing 115 includes a hook component 150 of a hook-and-loop fastener while the left wing 120 includes a loop component 160 secured to a back side or front side of each wing, each positioned on sides of the wings 115, 120 such that the hook component 155 will reciprocally fasten to the loop component 160 when the wings 115, 120 are in the closed position. The hook component 155 and the loop component 160 can be secured to either the right wing 115 or the left wing 120, such that either the right wing 115 or the left wing 120 is placed on top when in the closed position. In some embodiments, the loop component 160 may be secured to the back of a wing such that the loop component 160 faces outward when in the closed position. This configuration ensures that the hook component 155 is not exposed when the wings 115, 120 are in the closed position and will not be able to rub against or irritate the baby or the parent or caretaker. As illustrated in FIG. 1E, the hook component 155 and the loop component 160 may be hexagonally-shaped and may cover a large portion of the wings 115, 120, which provides a range of adjustability and allows the wings 115, 120 to be loosened or tightened around the baby as necessary. In other embodiments, the shape and dimensions of the hook component 155 and the loop component 160 may be similar or different. For example, the shape of the loop component may cover the entire width of a wing or may cover the entire wing to provide a larger range of adjustability.

[0036] FIGS. 1F and 1G illustrate additional alternate embodiments of a partially open wing position of a temperature maintenance swaddle with wings, in accordance with an embodiment. As described with regards to FIG. 1E, the wings 115, 120 are designed to overlap and secure to each other to snugly wrap the baby in the swaddle 100. Each of the wings 115, 120 include a hook component or a loop component of a hook-and-loop fastener that are configured to reciprocally fasten when the wings 115, 120 are in the

closed position. As illustrated in FIG. 1F, the loop component 160 may be shaped such that the loop component 160 covers a significant portion of the width of a wing to provide a large range of adjustability. As illustrated in FIG. 1G, the loop component 160 may cover substantially the entire wing to provide a larger range of adjustability.

[0037] FIG. 1H illustrates the configuration of the swaddle as described in FIGS. 1A-E in various positions, in accordance with an embodiment. The swaddle 100 is shown in a fully open position, in which the front panel 105 has been unzipped from the back panel 110 and can lay flat with the back panel 110. This fully open position allows for minimal disturbance to the baby when putting the swaddle 100 on or taking the swaddle 100 off. To put the swaddle 100 on the baby, the baby is laid onto the back panel 110 such that the baby's arms align with the arm holes 125, 130, and the front panel 105 is folded over the baby and fastened to the back panel 110 with the zipper 145 along the lower portion. The tabs 140A, 140B are folded over the baby's shoulders and secured to the back panel 110 with the appropriate tightness or looseness. In the embodiments of FIGS. 1F-H, the right wing 115 includes the loop component 160 and is pulled across the front of the baby and the swaddle 100. The left wing 120 includes the hook component 155 and is pulled across the front of the baby and the swaddle 100 to overlap with the right wing 115 such that the hook component 155 fastens to the loop component 160. The right wing 115 and the left wing 120 are wrapped around the baby with the appropriate tightness or looseness.

Swaddle/Sleeping bag without Wings

[0038] FIGS. 2A, 2B, and 2C illustrate a closed position of a temperature maintenance swaddle/sleeping bag without wings, a partially open position of a temperature maintenance swaddle/sleeping bag without wings, and a fully open position of a temperature maintenance swaddle/sleeping bag without wings, respectively. Herein, a swaddle without wings may also be referred to as a sleeping bag. The sleeping bag is designed to maintain and regulate the temperature of a baby while providing easy access to a parent or caretaker of the baby to change the baby's diaper without disturbing the baby. A sleeping bag may be used in particular for older babies where it is not necessary to restrict the arm movement of the baby.

[0039] The sleeping bag 200 differs from the swaddle described with regards to FIGS. 1A-1E because the sleeping bag 200 does not include wings. In the embodiments of FIGS. 2A-C, the sleeping bag 200 includes a front panel 205 and a back panel 210. The front panel 205 is the portion of the sleeping bag 200 that is designed to rest against a front side of a baby, and the back panel 210 is the portion of the sleeping bag that is designed to rest against a back side of a baby. The description of the front panel 205 and the back panel 210 of the swaddle 100 in conjunction with FIGS. 1A-C can be incorporated herein for the front panel 205 and the back panel 210 of the sleeping bag 200.

[0040] As similarly described with regards to FIGS. 1A-C, the front panel 205 and the back panel 210 of the sleeping bag are fastened together along different portions of the outer edges, such that the remaining portions that aren't fastened together create a right arm hole 215, a left arm hole 220, and a neck hole 225. The sizes of the holes can vary depending on the overall dimensions of the sleeping bag 200 and the intended size range for the sleeping bag 200. The portions of edges of the front panel 205 and the back panel

210 can be fastened together with a clasp, thread, zipper, buttons, snap buttons, any other suitable fastener, or some combination thereof. Each of the different portions of the edges of the front panel 205 and the back panel 210 may be fastened using the same method or using different methods.

[0041] In the embodiments of FIGS. 2A-C, the portions of outer edges of the front panel 205 and the back panel 210 under the right arm hole 215 and/or the left arm hole 220 can be sewn together with thread. The portions of the front panel 205 and the back panel 210 surrounding the neck hole 225 may be removeably fastened together with tabs 230A, 230B that include a hook-and-loop fastener, as described for the swaddle 100. The lower portions of outer edges of the front panel 205 and the back panel 210 are fastened together by a zipper 235 which includes one or more pull tabs 240 to form a dual-slider zipper 235. The zipper 235 begins at the end of a sewn portion under a first arm hole and ends at the end of a sewn portion under a second arm hole or at the edge of a second arm hole, as illustrated in FIGS. 2A-C. Similar to the swaddle 100, the use of a zipper 235 with a plurality of pull tabs 240 allows for a parent or a caretaker to open the bottom of the sleeping bag 200 for diaper changes or access of the baby without opening and disturbing the upper part of the sleeping bag 200.

[0042] In the embodiments of FIGS. 2A-C, the front panel 205 and the back panel 210 are formed from a plurality of layers of different fabrics. In one embodiment, the panels 205, 210 include an outer layer and an inner layer, the inner layer touching the baby and the outer layer not touching the baby. The outer layer can be any suitable body fabric such as cotton (e.g., Lycra), silk, wool, cashmere wool, camel hair, polyester, nylon, spandex, or any other suitable durable textile fiber. In some embodiments, the inner layer can be a type of insulating fabric that provides temperature maintenance for the baby. These insulating fabrics may include as OUTLAST® THERMOCULES™, any other suitable phase change materials (PCM), or any other suitable fiber that adjusts to body temperature and maintains the body at a set temperature. The inner layer can be a material that ensures that the baby within the sleeping bag and touching the material of the inner layer maintains a temperature in the range of 97-100.3° F. This configuration allows a baby in the sleeping bag to maintain a safe and comfortable temperature, which otherwise can be difficult for a parent or caretaker to determine and monitor.

[0043] Other designs for apparel can also be used and can include the same types of layers of fabric as described for the swaddle or the sleeping bag. For example, a stroller blanket or scarf can include the same plurality of layers for temperature maintenance. As one example, the invention includes any apparel or covering for children or infants with at least one outer layer of body fabric, as described above, and at least one inner layer of temperature maintenance fabric, as also described above.

[0044] FIG. 2D illustrates a representative example of a swaddle 100 and varying sizes of sleeping bags 200. The dimensions of the swaddle 100 and the sleeping bags 200 can be designed to accommodate for different size ranges and ages of babies. As described above, the swaddle 100 and the sleeping bag 200 have a variety of features that allow a parent or caretaker to appropriately tighten or loosen the swaddle 100 or sleeping bag 200 around the baby.

Summary

[0045] The foregoing description of the embodiments has been presented for the purpose of illustration; it is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Persons skilled in the relevant art can appreciate that many modifications and variations are possible in light of the above disclosure.

[0046] Further, the language used in the specification has been principally selected for readability and instructional purposes, and it may not have been selected to delineate or circumscribe the inventive subject matter. It is therefore intended that the scope of the patent rights be limited not by this detailed description, but rather by any claims that issue on an application based hereon. Accordingly, the disclosure of the embodiments is intended to be illustrative, but not limiting, of the scope of the patent rights, which is set forth in the following claims.

What is claimed:

1. A baby temperature maintenance device comprising:
 - a first panel of fabric having an outer edge and an upper portion;
 - a second panel of fabric having an outer edge an upper portion, the second panel attached at one side to the first panel;
 - a lower securing mechanism having a mating portion attached along the outer edge of the first panel and a mating portion attached along the outer edge of the second panel, the mating portions capable of fastening the first and second panels together along the outer edges for enclosing a baby between the first and second panels, the lower securing mechanism openable at a first location and a second location to provide access to a lower portion of a baby from two sides;
 - a first upper securing mechanism and a second upper securing mechanism at the upper portion of the first panel and the upper portion of the second panel, the first upper securing mechanism having two mating portions on a first side and the second upper securing mechanism having two mating portions on a second side, the mating portions on the first side capable of being fastened over one of the baby's shoulders and the mating portions on the second side capable of being fastened over another of the baby's shoulders;
 - a first wing that is a panel of fabric that is secured to the first panel, the first wing configured to fold across a first side and a center of the second panel, the first wing comprising a first mating portion of a wing securing mechanism; and
 - a second wing that is a panel of fabric that is secured to the first panel, the second wing configured to fold across a second side and the center of the second panel, the second wing comprising a second mating portion of the wing securing mechanism capable of being fastened to the first mating portion to secure the first and second wings over the baby's arms to restrict movement.
2. The baby temperature maintenance device of claim 1, wherein the first panel and the second panel are substantially tear-drop shaped, such that a lower portion of the baby temperature maintenance device is wider than the upper portion.
3. The baby temperature maintenance device of claim 1, wherein the first panel and the second panel each comprise a plurality of layers of fabric, at least one of the layers of fabric comprising nanoparticles that are configured to absorb

and release heat to maintain a temperature of a baby enclosed within the baby temperature maintenance device.

4. The baby temperature maintenance device of claim 1, wherein the second panel attached at one side to the first panel further comprises a portion of the outer edges of the first panel and the second panel underneath a hole configured for a baby's arm being sewn together.

5. The baby temperature maintenance device of claim 1, wherein the lower securing mechanism along the outer edges of the first panel and the second panel is a dual slider zipper, which is configured to zip open and closed in one or more directions and provide a parent or a caretaker of the baby access to a lower portion of the baby for diaper changes or adjustment of the baby without disturbing an upper portion of the baby or the first wing or the second wing.

6. The baby temperature maintenance device of claim 1, wherein the first location is directly beneath a first hole configured for a baby's arm and the second location is beneath a location at which the second panel is attached at one side to the first panel.

7. The baby temperature maintenance device of claim 6, wherein the second location at which the second panel is attached at one side to the first panel is directly underneath a hole configured for a baby's arm.

8. The baby temperature maintenance device of claim 1, wherein the lower securing mechanism along the outer edges of the first panel and the second panel is a dual slider zipper, and wherein the first location or the second location is positioned at the edge of a first hole or a second hole configured for a baby's arm, such that a dual slider zipper forms the lower portion of the first hole or the second hole when the zipper is zipped closed.

9. The baby temperature maintenance device of claim 1, wherein the mating portions of the plurality of upper securing mechanisms form the upper portion of a first hole or a second hole configured for a baby's arm when the mating portions are fastened.

10. The baby temperature maintenance device of claim 1, wherein the mating portions of the plurality of upper securing mechanisms are hook-and-loop fasteners.

11. The baby temperature maintenance device of claim 1, wherein the first panel and the second panel are configured to lay flat next to each other when the lower securing mechanism and the plurality of upper securing mechanisms are undone or open.

12. The baby temperature maintenance device of claim 1, wherein the mating portions of the first wing and the second wing are hook-and-loop fasteners that cover at least half of the surface area of each wing to provide a range of adjustability for increasing tightness or looseness of the first wing and the second wing when fastened together.

13. The baby temperature maintenance device of claim 1, wherein portions of the first wing and portions of the second wing overlap with the first panel, such that the first wing and the second wing touch to form a shape of a "v" on the first panel.

14. The baby temperature maintenance device of claim 1, wherein upper portions of the first wing and the second wing near a neckline are shaped such that the first wing and the second wing angle away from the neckline.

15. The baby temperature maintenance device of claim 1, wherein a width of the first wing and a width of the second wing are sufficient to allow the first wing and the second wing to overlap around a body of a baby enclosed by the first

and second panels without the first wing and the second wing wrapping around a back of the first panel.

16. A baby temperature maintenance device comprising:
a first panel of fabric having an outer edge and an upper portion;

a second panel of fabric having an outer edge an upper portion, the second panel attached at one side to the first panel, the first panel and the second panel each comprising a plurality of layers of fabric, at least one of the layers of fabric comprising nanoparticles that are configured to absorb and release heat to maintain a temperature of a baby enclosed within the baby temperature maintenance device;

a lower securing mechanism having a mating portion attached along the outer edge of the first panel and a mating portion attached along the outer edge of the second panel, the mating portions capable of fastening the first and second panels together along the outer edges for enclosing a baby between the first and second panels, the lower securing mechanism openable at a first location and a second location to provide access to a lower portion of a baby from two sides; and

a first upper securing mechanism and a second upper securing mechanism at the upper portion of the first panel and the upper portion of the second panel, the first upper securing mechanism having two mating portions on a first side and the second upper securing mechanism having two mating portions on a second side, the mating portions on the first side capable of being fastened over one of the baby's shoulders and the

mating portions on the second side capable of being fastened over another of the baby's shoulders.

17. The baby temperature maintenance device of claim **16**, wherein the first panel and the second panel are configured to lay flat next to each other when the lower securing mechanism and the plurality of upper securing mechanisms are undone or open.

18. The baby temperature maintenance device of claim **16**, wherein the lower securing mechanism along the outer edges of the first panel and the second panel is a dual slider zipper, and wherein the first location or the second location is positioned at the edge of a first hole or a second hole configured for a baby's arm, such that a dual slider zipper forms the lower portion of the first hole or the second hole when the zipper is zipped closed.

19. The baby temperature maintenance device of claim **16**, wherein the mating portions of the plurality of upper securing mechanisms form the upper portion of a first hole or a second hole configured for a baby's arm when the mating portions are fastened.

20. The baby temperature maintenance device of claim **16**, wherein the first location is directly beneath a first hole configured for a baby's arm and the second location is beneath a location at which the second panel is attached at one side to the first panel, wherein the location at which the second panel is attached at one side to the first panel is directly underneath a hole configured for a baby's arm, and wherein the zipper is configured to open and close the device along a left, right and bottom side of a baby wearing the device.

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