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(72) Inventor; and

(71) Applicant: STOBAR, Ahyoung [US/US]; 405 W. Foothill Blvd, Monrovia, CA 91016 (US).

(74) Agent: DEMING, Benjamin, C.; Rutan & Tucker LLP, 611 Anton Boulevard, Suite 1400, Costa Mesa, CA 92626 (US).

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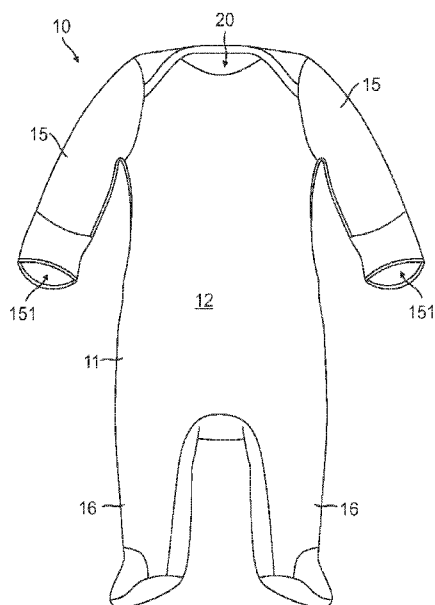


FIG. 1A

(57) Abstract: A bodysuit that may be easily donned and removed includes an unitary body which includes a front panel and a back panel that form a head opening at a seam position between top ends of the front panel and the back panel, wherein the back panel, which is adapted to put on and take off the bodysuit, includes a top piece and a bottom piece that overlap and define a receiving opening. A top opening end of the bottom piece may be configured to stay in a waist region of a back of the user while the wears the bodysuit. While the user takes off the bodysuit, the top opening end of the bottom piece of the back panel may be pulled towards feet of the user, be pulled off the feet, and pass back up over the user's crotch so as to take off the bodysuit.



BODYSUIT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Patent Application No. 15/224,415, filed July 29, 2016, and titled “Bodysuit,” which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] Most people change their clothes often, and most parents change their babies’ diapers and clothes often. Most parents change a baby’s diaper multiple times in a day; some even change diapers as much as ten times per day. Many parents change the diaper for their baby every two to three hours. Clothes that are difficult to put on and take off can make changing diapers or outfits complicated and time consuming. Wearing and/or having a baby wear clothes that can quickly be taken off and put on can make changing easier and facilitate the processes for changing a baby’s diaper. Clothes that allow for quick, easy access to the diaper area would be beneficial. Clothing that is easy and quick to put on and take off is highly desirable and may save time and money. For older wearers, a bodysuit that allows the wearer to use the bathroom more easily without requiring full removal of the bodysuit would be desirable as well.

[0003] Securing a bodysuit opening or flap using many snaps or buttons may cause difficulties. For example, the snaps or buttons may be easy to misalign and may be time-consuming to match with respective snaps, buttons, and/or button holes. If the snaps or buttons are arranged on the bottom portion of the child bodysuit, the opening or a flap might come apart when the child crawls, rolls, or walks around, so the parent may need to check the bodysuit again and again over time to make sure that the bodysuit continues to remain buttoned up. It is also possible that the buttoned or snapped area could become caught on something as the baby crawls or moves around. Snaps or buttons that need to be engaged or disengaged every time might be easily broken after frequent use. In other words, the snaps may lose their adhesive function, and the buttons may break off from the bodysuit. In addition, snaps/buttons might rip off and tear the garment around the snaps/buttons. If any snaps or buttons did come off, they could be a choking hazard for a child. A less complicated construction that does not require buttons or snaps may allow a manufacturer to reduce costs.

[0004] Disclosed herein are new garments, devices, components, systems, and methods for improving ease of use, access, removal, and changing of clothing, which avoid certain disadvantages. These may provide easier access and use for one-piece clothing or bodysuits. For example, these may help make changing clothes easier or changing diapers of a baby, and may provide other benefits as described herein. The concepts described herein may be applied to a wide variety of clothing, etc.

SUMMARY OF THE INVENTION

[0005] Embodiments of, and enhancements for, clothing, components, assemblies, systems, methods, etc. for easier access and use, are described herein. A variety of embodiments are encompassed, but a few non-limiting examples are described in more detail.

[0006] In one embodiment, a bodysuit is provided, wherein the bodysuit comprises a back panel having a top piece and a bottom piece thereof to define a receiving opening for allowing the user to easily put on or take off the bodysuit. A bodysuit can be a one-piece article of clothing.

[0007] In one embodiment a bodysuit is provided, wherein there are no snaps or buttons arranged on the front panel of the bodysuit so the user doesn't need to spend lots of time to engage or disengage snaps or buttons one by one so as to save more time to put on or take off the bodysuit. In one embodiment, the bodysuit does not include snaps or buttons on the back panel. In one embodiment, the bodysuit does not include any snaps or buttons at all.

[0008] In one embodiment, the bottom piece of a back panel of the bodysuit overlaps over the top piece of the back panel of the bodysuit to define an overlapping area, which may help protect against cold wind and/or unwanted materials falling into the receiving opening. In one embodiment, the top piece of a back panel of the bodysuit overlaps over the bottom piece of the back panel of the bodysuit to define an overlapping area, which may protect against cold wind and/or unwanted materials falling into the receiving opening.

[0009] In one embodiment, the bodysuit may comprise a front panel having a top piece and a bottom piece that combine to define a receiving opening for allowing the user to easily put on or take off the bodysuit. The bottom piece of the front panel of the bodysuit may overlap over the top piece of the front panel of the bodysuit to define an overlapping area for protecting cold wind or unwanted materials falling into the receiving opening, or the top piece of the front

panel of the bodysuit may overlap over the bottom piece of the front panel of the bodysuit to define an overlapping area for protecting cold wind or unwanted materials falling into the receiving opening.

[0010] In one embodiment, a receiving opening of a bodysuit may be longitudinally formed from one side of a seam between the front panel and the back panel of the bodysuit to the other side of a seam therebetween, wherein the width of receiving opening may be smaller than the width of the back panel so as to aid the top opening end of the bottom piece to stay in position.

[0011] In one embodiment, a method for the user to quickly put on or take off the bodysuit is provided according to the preferred embodiment of the present invention so as to facilitate and simplify the steps for putting on or taking off the bodysuit.

[0012] The bodysuits described herein may be constructed inexpensively (including less expensively than a bodysuit with many buttons and/or snaps) and do not have a complicated structure, which may help to decrease the manufacturing cost and related manufacturing processes of the present invention.

[0013] The bodysuits described herein and designed so as to minimize the manufacturing cost. The bodysuits are easy to operate and time-saving so as to be more convenient for the user to put on or take off the bodysuit. Therefore, the bodysuits provide an economic and efficient solution not only for providing a bodysuit to allow the user to quickly put on and take off the bodysuit, but also for reducing the manufacturing cost for the manufacturer.

[0014] The foregoing and other objects and advantages may be attained by a bodysuit, comprising a unitary body which includes a front panel and a back panel that form a head opening at a seam position between top ends of the front panel and the back panel; wherein the back panel may be adapted for putting on and taking off the bodysuit and may include a top piece and a bottom piece. The bottom piece may have a top opening end overlapped with the top piece to define a receiving opening, or the top piece may have a bottom opening end overlapped with the bottom piece to define a receiving opening. The top opening end of the bottom piece may stay in a waist position of a back of the user while the user puts on the bodysuit or, when the user takes off the bodysuit, the top opening end of the bottom piece of

the back panel may be pulled down towards to the user's leg and pass over the user's crotch and legs to take off the bodysuit.

[0015] The foregoing and other additional advantages and features will become apparent from the description which follows and the associated figures, and may be realized by means of the instrumentalities and combinations and methods described, including those in the appended claims.

[0016] In one embodiment, clothing, devices, apparatuses, components, systems, etc. may include any features described herein, depicted in the figures, or known in the art. And these may be used in various methods including any combination of the various steps described herein and any steps known in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The disclosed devices, apparatuses, components, assemblies, systems, methods, etc. can be better understood with reference to the description taken in conjunction with the following drawings, in which like reference numerals identify like elements. The components in the drawings are not necessarily to scale.

[0018] Fig. 1A is a front perspective view of an exemplary bodysuit.

[0019] Fig. 1B is a back perspective view of the bodysuit of Fig. 1A.

[0020] Fig. 2 is a unitary body of an exemplary bodysuit.

[0021] Fig. 3A to Fig. 3B illustrates a method for putting on and taking off an exemplary bodysuit.

[0022] Fig. 4 is a back perspective view of an exemplary bodysuit similar to that of Fig. 1A, but with different overlapping arrangement than Fig. 1B.

[0023] Fig. 5A is a side perspective view of an exemplary bodysuit with an overlapping area similar to that of Fig. 4, but for an older child.

[0024] Fig. 5B is a back perspective view of the bodysuit of Fig. 5A with the lower end of the top piece of the back pulled up to show the underlying top end of the bottom piece of the back.

[0025] While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the drawings and are herein described in detail. It should be understood, however, that the description herein of specific embodiments is not intended to limit the invention to the particular forms disclosed, but on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS

[0026] Described herein are clothes, devices, components, assemblies, systems, methods, etc. associated with covering a person's body in an easy and efficient way. The description and accompanying figures, which describe and show certain embodiments, are made to demonstrate, in a non-limiting manner, several possible configurations of clothing, devices, components, assemblies, systems, etc. and various methods of using them according to various aspects and features of the present disclosure. Accordingly, the disclosure is not limited to the specific embodiments described. Rather, the inventive principles associated with the embodiments described herein, including with respect to the clothing, apparatuses, devices, components, assemblies, systems, methods, etc. described herein, may be applied in a variety of ways, including to other types of clothing, apparatuses, devices, components, assemblies, systems, methods, etc. General and specific clothing, apparatuses, devices, components, assemblies, systems, methods, etc. are described herein sufficiently to enable one to develop a variety of implementations/applications without undue experimentation. In the development of particular applications, numerous implementation-specific decisions will be made to achieve the design-specific goals, which will vary from one implementation/application to another. It will be appreciated that, having access to this disclosure and reading this disclosure, such a development effort would be a routine undertaking for persons of ordinary skill in the art.

[0027] This document does not intend to distinguish between components that differ in name but not function. In the following discussion and in the claims, the terms "including," "includes," "comprising," "have," and "has" are used in an open-ended fashion, and thus should be interpreted to mean "including, but not limited to." The word "or" is used in the inclusive sense (i.e., "and/or") unless a specific use to the contrary is explicitly stated.

[0028] The following description is disclosed to enable any person skilled in the art to make and use the present invention. Preferred embodiments are provided in the following description only as examples and modifications will be apparent to those skilled in the art. The

general principles defined in the following description can be applied to other embodiments, alternatives, modifications, equivalents, and applications without departing from the spirit and scope of the present invention.

[0029] As shown in Fig. 1A and Fig. 1B of the drawings, an exemplary bodysuit 10 is provided, wherein the bodysuit 10 comprises a unitary body 11 having a front panel 12 and a back panel 13 that form a head opening 20, wherein the back panel 13 comprises a top piece 131 and a bottom piece 132 that has a top opening end 1321 to define a receiving opening 30. The front panel 12 is a front facing side (relative to a wearer's body) of the bodysuit 10, and the back panel 13 is the back facing side of the bodysuit 10. (However, in one embodiment, the panel 12 may be a back panel and the panel 13 may be a front panel, i.e., with the opening 30 on a front side of a wearer.) The front panel 12 may be made of a unitary piece of material or of multiple pieces (e.g., pieces sewn together). The front panel 12 could be constructed to appear as a one piece bodysuit or may include additional features to make it look like a two-piece article of clothing. For example, the front panel 12 may include a flap sewn in the middle to overlap and make the front panel appear as two pieces, e.g., as a shirt and pants/shorts. The front panel may include one or more pockets as well, e.g., similar to pants pockets and/or a shirt pocket. The front panel, the back panel, the top piece of the back panel, the bottom piece of the back panel, may each be combination pieces formed of multiple other pieces, panels, components, etc.

[0030] The bodysuit 10 may be made of any kinds of material that are suitable for clothing, including materials suitable for clothing a child or baby. In one embodiment, the bodysuit 10 is preferably made of cotton, but polyester, cashmere, silk, wool, rayon, stretchy materials, or blends or combinations of these or others maybe be used. In one embodiment, multiple materials are used to form bodysuit 10. In one embodiment, an inner material and an outer material of all or portions of bodysuit 10 may be different and have different physical properties. For example, an inner material of bodysuit 10 may be lower friction (e.g., silk) to facilitate ease of putting on and taking off of bodysuit 10. Optionally, an inner material could be warmer material or lined with a warmer material for keeping the wearer/user warm (e.g., similar to thermal underwear material, fleece, or other warm materials).

[0031] In Figs. 1A and 1B, the bodysuit 10 is illustrated as a child or baby bodysuit; however, the bodysuit can also be designed and/or configured as other kinds of garments, such as swimsuits, pajamas, doll/toy clothing, undergarments (e.g., thermal undergarments), adult

bodysuits, senior garments (e.g., for easy changing of adult diapers), youth or teenage bodysuits, and onesies for babies and older people, including toddlers, children, youths, teenagers, adults, and seniors. For example, Figs. 5A and 5B show pictures of an embodiment of a bodysuit for an older child. Bodysuits made for babies and toddlers (or children still in diapers), may provide easy access to the diaper for changing. However, the configurations and features described herein, when used on bodysuits for larger children, youths, teenagers, adults, seniors, etc., may provide easier access for using the toilet. For example, a wearer wishing to use the toilet, may pull down the top end and elastic band of the bottom piece 132 without having to remove the bodysuit entirely from the wearer's legs. The top end and elastic band of the bottom piece 132 may be easily pulled down over the buttocks sufficiently to allow the person to use the toilet, then pulled back up over the buttocks (e.g., to rest in the waist or lower back region), all without having to entirely remove the bodysuit from the legs.

[0032] As shown in Fig. 1B, the top piece 131 of the back panel 13, in one embodiment, may extend from a seam between the front panel 12 and the back panel 13 to the position which passes through the receiving opening 30, and the bottom piece 132 of the back panel 13 may extend from the bottom end of the back panel to the waist portion of the bodysuit 10. In such a manner, the top piece 131 of the back panel 13 and the bottom piece 132 of the back panel 13 may define an overlapping area 40 that a bottom end (e.g., a bottom end formed as flap) of the top piece 131 of the back panel 13 may be downwardly extended below the waist portion of the bodysuit 10, and the top opening end 1321 of the bottom piece 132 of the back panel 13 may be upwardly extended over the butt portion of the bodysuit 10 to reach the waist portion thereof. The bottom end of the top piece 131 of the back panel 13 may be tucked into the top of the bottom piece 132 of the back panel 13. In one embodiment, the bottom end of the top piece 131 may be sewn in such a way that the bottom end is predisposed to be tucked in, e.g., the seam may extend inside and below the top opening end 1321. This can help ensure that the bottom edge of the top piece 131 is tucked inside the top opening end 1321 and can help ensure that the bodysuit looks more like a one-piece outfit in the back. The bottom end and bottom edge of the top piece 131 may extend down to various positions/lengths, e.g., the bottom edge of the top piece 131 may extend below the waist, below the middle of the buttocks, below the buttocks of the wearer/user, and/or any point in between. The lower the bottom edge extends the more effective it may be at protecting against drafts or, cold air, etc. reaching the wearer/user or his/her legs through the receiving opening 30. The bodysuit may look like a one-piece bodysuit from the front.

[0033] As shown in Fig. 4, the top piece 131 of the back panel 13, in one embodiment, may extend from a seam between the front panel 12 and the back panel 13 to a position which passes over the receiving opening 30, and the bottom piece 132 of the back panel 13 may extend from the bottom end of the back panel to the waist portion of the bodysuit 10. The top piece 131 of the back panel 13 and the bottom piece 132 of the back panel 13 may define an overlapping area 40 that a bottom end (e.g., a bottom end formed as flap) of the top piece 131 of the back panel 13 may be downwardly extended below the waist portion of the bodysuit 10, and the top opening end 1321 of the bottom piece 132 of the back panel 13 may be upwardly extended over the butt portion of the bodysuit 10 to reach the waist portion thereof. The bottom of the top piece 131 of the back panel 13 may extend over and cover the top of the bottom piece 132 of the back panel 13. Fig. 4 includes a cut out region for the purpose of showing the top opening end 1321 and elastic band underneath the top piece 131 in the overlapping area 40. In one embodiment, the bottom end of the top piece 131 may be sewn in such a way that the bottom end of the top piece 131 is predisposed to overlap and cover the top portion of the bottom piece 132, e.g., the seam may extend below the top opening end 1321 along the outside of the bottom piece 132 (for example, along the outer edges or sides). This can help ensure that the bottom edge of the top piece 131 covers the top opening end 1321 and can help ensure that the bodysuit looks similar to a two-piece outfit from the back having a top and bottom, e.g., a shirt and pants/shorts. The bottom end and bottom edge of the top piece 131 may extend down to various positions/lengths, e.g., the bottom edge of the top piece 131 may extend below the waist, below the middle of the buttocks, below the buttocks of the wearer/user, and/or any point in between. The lower the bottom edge extends the more effective it may be at protecting against drafts or, cold air, etc. reaching the wearer/user or his/her legs through the receiving opening 30. The bodysuit may still look like a one-piece bodysuit from the front, e.g., the front of the bodysuit of Fig. 4 may look similar to Fig. 1A.

[0034] It is worth mentioning that the overlapping area 40 between the top piece 131 and the bottom piece 132 of the back panel 13 can prevent cool air from passing through the receiving opening 30 of the bodysuit 10, so even if a receiving opening 30 is located at a back side of the bodysuit 10, the user may not feel cold.

[0035] As shown in Fig. 1B, the receiving opening 30 may be longitudinally formed from one side seam between the front panel 12 and the back panel 13 to another side seam therebetween, and, the width of the receiving opening 30 may be smaller than the width of the

back panel 13, such that the top opening end 1321 of the bottom piece 132 of the back panel 13 is able to stay more easily in a position. Since the width of the receiving opening 30 is smaller than the width of the back panel 13, the top opening end 1321 of the bottom piece 132 of the back panel 13 can generate an inward-pressed force while the user wears the bodysuit 10, so the top opening end 1321 of the bottom piece 132 of the back panel 13 may not easily fall down from the waist portion of the user.

[0036] It is worth mentioning that the top opening end 1321 of the bottom piece 132 of the back panel 13 may be a curved, straight, or other shape opening end. For the ergonomics, while the user wears the bodysuit 10, a curved shape opening end can attach on the waist portion of the user, such that the curved shape opening end can match with the waist shape of the user's body, so the top opening end 1321 of the bottom piece 132 of the back panel 13 may stay in the waist portion of the user's body.

[0037] Accordingly, the bodysuit 10 may further comprise an elastic band 14 arranged along the top opening end 1321 of the bottom piece 132 of the back panel 13, wherein the elastic band 14 can be stretched to a predetermined length or a range of lengths so as to expand the size of the receiving opening 30. Therefore, the elastic band 14 can be pulled to expand the size of the receiving opening 30 for allowing the user to put on or take off the bodysuit 10 through the receiving opening 30. After the user puts on the bodysuit 10, the pulled force on the elastic band 14 is released, so the elastic band 14 will return to its original length so as to secure on the waist portion of the user. In one embodiment, the elastic band may expand in length anywhere between 10–100% longer than the original length, though other percentages and lengths are possible.

[0038] The bodysuit 10 may further comprise a pair of sleeves 15 extended (e.g., integrally extended) from the front panel 12 of the unitary body 11 defining two arm openings 151 for allowing the user to put the user's arms along the two sleeves 15 through the two arm openings 151, and a pair of trouser legs 16 downwardly extended (e.g., integrally extended) from the garment body 11, wherein the user is able to insert the user's legs into the two trouser legs 16 through the receiving opening 30, such that the pair of the trouser legs 16 can protect the user's legs (e.g., from exposure in cold weather) so as to support the user wearing the bodysuit 10 according to the preferred embodiment. The trouser legs 16 may optionally include foot portions on the end of each leg that cover the feet.

[0039] The bodysuit may include or omit sleeves, trouser legs, or various combinations of these, e.g., trouser legs but no sleeves, sleeves but no trouser legs. As shown for example in Fig. 2, the bodysuit 10 can be a vest style bodysuit or onesie, so in this manner, the two arm openings 151A may be formed at the seam between the front panel 12 and the back panel 13. In other words, sleeves 15 may be omitted in the bodysuit 10 and, if omitted, the vest style bodysuit may be cooler for the user (e.g., for use in hot weather). In addition, the pair of the trouser legs 16 can be omitted and the bodysuit 10 provided with two leg openings 161 spacedly arranged on the bottom portion of the unitary body 11, which can be the bottom seam between the front panel 12 and the back panel 13, so the legs of the user may be inserted through the two leg openings 161 respectively. In one embodiment, trouser legs 16 and/or sleeves 15 may be removably attachable (e.g., using zippers, hook and loop fasteners, snaps/buttons, other fasteners, etc.) to the vest style bodysuit to form a bodysuit more similar to that shown in Figs. 1A, 1B, and 4.

[0040] The elastic band 14 provides benefits in terms of ease of use, manufacturing, and other things, but can optionally be replaced or supplemented by other components. For example, the bodysuit may include one or more drawstrings, separated elastic bands, pleats, accordion folds, zippers, magnets, snaps, buttons, and/or combinations of some or all of these. In one embodiment, snaps, buttons, and/or magnets arranged on the top opening end 1321 of the bottom piece 132 of the back panel 13 may be attached on the top piece 131 of the back panel 13 by matching with the respective snaps, buttons, and/or magnets on the top piece 131 of the back panel 13 so as to hold the top opening end 1321 of the bottom piece 132 of the back panel 13 in position. In other words, this kind of design (and others described below) can support the elastic band 14 on the top opening end 1321 to stay in position even if the elastic band 14 were to lose its extendable/retractable function after frequent use.

[0041] In one embodiment, one or more drawstrings may be used instead of or in addition to an elastic band. The drawstring(s) may be used to loosen or tighten the receiving opening 30 in any of the embodiments discussed herein. The drawstring(s) may be pulled to tighten the opening 30 and help hold the bodysuit 10 and bottom piece 132 tightly on the wearer/user. The drawstring(s) may be tied, clamped, fastened, and/or otherwise held in position to help hold the bodysuit 10 and bottom piece 132 tightly on the wearer/user. The drawstring(s) may be untied, unclamped, unfastened, and/or otherwise loosened to help open the receiving opening 30 of the bodysuit 10 for removal or partial removal from the

wearer/user. In one embodiment, the drawstring(s) may loop around the waist of the wearer/user in a way that does not significantly alter the appearance of the bodysuit 10, e.g., so the bodysuit 10 may still resemble a one piece bodysuit as in Fig. 1A or 2. For example, a passage way through the fabric or under the outer layer of fabric may be provided for the drawstring(s) to pass through. In one embodiment, loops or slits may be provided around the waist on the inside or outside of the bodysuit through which the drawstring(s) (and/or a belt) may pass. In one embodiment, the drawstring(s) may alternate directions inward and outward passing through slits. In one embodiment, the drawstring(s) may cause bunching, folds, pleats, and/or an accordion-like arrangement of fabric as the drawstring(s) are tightened. This can allow more fabric to be available in the loosened configuration to allow for easier dressing and removal of the bodysuit 10. In embodiments similar to Fig. 4, the bottom portion of the top piece 131 may help to hide any bunching, folds, pleats, and/or accordion-like arrangement of fabric where the bottom portion of the top piece 131 overlaps and covers the top portion of the bottom piece 132.

[0042] In one embodiment, multiple elastic bands may be used and may be separated from each other. This may allow different portions of the receiving opening 30 to open or expand in different ways. For example, the opening 30 may be designed to open more in areas where the feet of a wearer are more likely to pass to make putting on and taking off the bodysuit 10 easier. In one embodiment, the top end of the bottom piece 132 may be formed as a flap and elastic bands may attach between edges or corners of the flap to another portion of the bodysuit 10 (e.g., to a side seam or to the front panel 12). The elastic bands may act as an expandable tether between portions of the bodysuit 10. In one embodiment, the flap may form an opening between the flap, an elastic band(s), and another portion of the bodysuit 10 and the opening may increase in size when the flap is pulled outwardly and the elastic band(s) expands.

[0043] In one embodiment, pleats and/or accordion folds (or other bunching or folding of material) may be used around opening 30, which may provide additional fabric/material to allow the receiving opening 30 to open wider and make it easier to put on and take off. In one embodiment, pleats and/or folds may be formed with snaps, hook and loop fasteners (Velcro), buttons, magnets, etc. arranged in a manner to make opening and closing of the receiving opening 30 as easy and convenient as possible.

[0044] In one embodiment, one or more zippers may be used in addition to or instead of the elastic band. For example, zippers may extend from the receiving opening 30 in one or

more directions on the top piece 131 and/or the bottom piece 132. The zippers may allow for expanding or narrowing the receiving opening 30. In one embodiment, a zipper may extend down the middle of the bottom piece 132 starting from the top edge of the bottom piece 132. In one embodiment, two zippers may extend down the sides of the bottom piece 132 starting from the top edge of the bottom piece 132. In one embodiment, one or more zippers may extend up the top piece 131 starting from the bottom edge of the top piece 131. One or more zippers could also run along the side seams of the top piece 131 or the bottom piece 132. In embodiments similar to Fig. 4, the bottom portion of the top piece 131 may help to hide any zippers where the bottom portion of the top piece 131 overlaps and covers the top portion of the bottom piece 132. In one embodiment, zippers may be formed along edges of the flap portion of the top piece 131 that is tucked under or covers over the top edge and elastic band of the bottom piece 132 to restrict movement or allow greater movement of the flap portion.

[0045] Fig. 5A is a side perspective view of an exemplary bodysuit with an overlapping area similar to that of Fig. 4, but configured/designed for an older child. Fig. 5B is a back perspective view of the bodysuit of Fig. 5A with the lower end of the top piece of the back pulled up to show the underlying top end of the bottom piece of the back. The top piece 131 of the back panel is shown with a seam running down the side to the bottom edge of the top piece 131. The bottom piece 132 may also include a seam along the side running up to the top edge of the bottom piece 132.

[0046] The clothing, bodysuits, components thereof, etc. described herein may be used in a variety of methods. Methods of using the clothing and bodysuits or any of their components/features may include any of the steps discussed anywhere in this description or the summary. For example, referring to Fig. 3A to 3B of the drawings, a method for using or putting on a bodysuit 10 may comprise one or multiple of the following steps and/or other steps: (1) inserting a wearer/user's head through the receiving opening 30 and the head opening 20 respectively; (2) pulling down the unitary body 11 of the bodysuit 10 in a direction towards the leg/legs of the wearer/user (e.g., this may be similar to pulling down a t-shirt after putting it over a wearer's head); (3) inserting the wearer/user's arm/arms into the receiving opening 30; (4) inserting the wearer/user's arm(s) through one or both of the two arm openings 151 of the two sleeves 15 along the two sleeves 15 respectively (or through openings 151A, if not sleeves); (5) pulling down the unitary body 11 of the bodysuit 10 towards the leg/legs of the wearer/user; (6) inserting the wearer/user's two legs into the receiving opening 30; (7) inserting

one and/or both of the wearer/user's two legs into the trouser legs 16 (or into openings 161, if not leg portions); and (8) pulling the top opening end 1321 of the bottom piece 132 of the bodysuit 10 over the user's crotch and butt so as to reach the waist portion or lower back of the back of the user. Other steps may involve using additional features described herein. These and other steps described herein may be performed in the order disclosed or in a different sequence, and some steps may be omitted or added.

[0047] A portion of the bottom piece 132 of the bodysuit 10 may overlap with a portion of the top piece 131 of the back panel 13 of the bodysuit 10 to define an overlapping area. In one embodiment, a portion of the bottom piece 132 of the back panel 13 of the bodysuit 10 may cover a portion of the top piece 131 of the back panel 13 of the bodysuit 10 to define the overlapping area, such that the overlapping area therebetween is able to support the bodysuit 10 in position. In one embodiment, a portion of the top piece 131 of the back panel 13 of the bodysuit 10 may cover a portion of the bottom piece 132 of the back panel 13 of the bodysuit 10 to define the overlapping area, such that the back of the bodysuit 10 resembles two articles of clothing, e.g., a shirt over shorts. Methods may include tucking or otherwise arranging the top piece 131 relative to the bottom piece 132 to form the overlapping area.

[0048] A method for taking off the bodysuit 10 may comprise one or multiple of the following steps and/or other steps: (1) pulling down the top opening end of the bottom piece of the back panel over the wearer/user's butt and crotch respectively; (2) releasing the wearer/user's legs from the trouser legs 16 (or openings 161); (3) further releasing the wearer/user's legs to outside of the bodysuit 10 through the receiving opening 30; (4) pulling the top opening end 1321 of the bottom piece 132 of the back panel 13 towards the wearer/user's head; (5) removing or releasing the wearer/user's arms from the sleeves 15 (or openings 151A); (6) removing or releasing the wearer/user's two arms through the receiving opening 30 to outside; (7) pulling the top opening end of the bottom piece of the back panel in a direction towards the wearer/user's head; (8) removing or releasing the wearer/user's head through the head opening 20 and then the receiving opening 30. Other steps may involve using additional features described herein. These and other steps described herein may be performed in the order disclosed or in a different sequence, and some steps may be omitted or added.

[0049] A method for changing a diaper of a wearer of the bodysuit may include steps described above and may also include (1) pulling down the top opening end of the bottom piece of the back panel over the wearer/user's butt/crotch; (2) releasing the wearer/user's legs from

the trouser legs 16 (or openings 161); (3) further releasing the wearer/user's legs to outside of the bodysuit 10 through the receiving opening 30; (4) changing the diaper or replacing the old diaper with a new diaper; (5) inserting one and/or both of the wearer/user's two legs into the trouser legs 16 (or into openings 161, if not leg portions); and (6) pulling the top opening end 1321 of the bottom piece 132 of the bodysuit 10 over the user's crotch and butt so as to reach the waist portion or lower back of the back of the user.

[0050] A method for using the bodysuit may include steps described above and may also include (1) pulling down the top opening end of the bottom piece of the back panel over the wearer/user's butt/crotch; (2) using a toilet to relieve oneself; and (3) pulling the top opening end 1321 of the bottom piece 132 of the bodysuit 10 over the user's butt/crotch so as to reach the waist portion or lower back of the back of the user.

[0051] Accordingly, the method for putting on and taking off the bodysuit 10 in the present invention may be operated in opposite directions or using steps in reverse of each other. The direction for putting on the bodysuit 10 in the present invention may be towards the wearer/user's leg, and passing through the wearer/user's crotch and butt portion to reach the waist portion of the back of the user. And, for taking off the bodysuit 10 in the present invention, the direction for taking off the bodysuit 10 may be towards the wearer/user's legs from the back of the user, and along the wearer/user's crotch to the front side of the wearer/user, and continuously towards the wearer/user's head to take off the bodysuit 10.

[0052] When worn by a baby or child, the elastic band of the receiving opening 30 in the back portion of the bottom piece 132 of the back panel 13 of the bodysuit 10 may allow a parent to simply pull the bottom piece 132 of the back panel 13 on or off the wearer/user's bottom so as to easily put on or take off the bodysuit or to access and change a diaper. The parent can spend less than one or two minutes to put on or take off the bodysuit for their children or to access a diaper for changing, and the parent does not need to spend lots of time opening or closing snaps or buttons.

[0053] One skilled in the art will understand that the embodiment of the present invention as shown in the drawings and described above is exemplary only and not intended to be limiting. The embodiments have been shown and described for the purposes of illustrating the functional and structural principles of the present invention and is subject to change without

departure from such principles. Therefore, this invention includes all modifications encompassed within the spirit and scope of the following claims.

[0054] The above clothing, apparatuses, devices, components, systems, assemblies, methods, etc. have generally been described and shown in figures; however, the principles described may be applied to a variety of other clothing, apparatuses, devices, components, systems, assemblies, methods, etc. Further, the features described in one embodiment herein may generally be combined with features described in other embodiments herein.

[0055] While the clothing, apparatuses, devices, components, systems, assemblies, methods, etc. of this invention may have been described in terms of particular variations and illustrative figures, it will be apparent to those skilled in the art that the invention is not so limited and that variations may be applied to other clothing, apparatuses, devices, components, systems, assemblies, methods, etc. For example, with respect to the methods, uses, and/or steps described herein variations may occur in the steps, uses, the sequence/order of steps, etc. described herein without departing from the concept, spirit, and scope of the invention, as defined by the claims. Additionally, certain of the steps may be performed concurrently in a parallel process when possible, as well as performed sequentially as described above. Therefore, to the extent there are variations of the invention, which are within the spirit of the disclosure or equivalent to the inventions found in the claims, it is the intent that this patent will cover those variations as well.

CLAIMS

What is claimed is:

1. A bodysuit that can be worn by a user, comprising:
a unitary body which comprises a front panel and a back panel that form a head opening at a seam position between top ends of the front panel and the back panel; wherein the back panel, which is adapted for putting on and taking off the bodysuit, comprises a top piece and a bottom piece, wherein the top piece includes a bottom end and the bottom piece includes a top opening end that together form a receiving opening, wherein the bottom end of the top piece overlaps and covers the top opening end of the bottom piece to form an overlapping area, wherein the top opening end is configured to stay in a waist portion of a back of the user while worn by the user, and wherein the top opening end of the bottom piece of the back panel can be pulled towards to the user's leg and then pass over the user's crotch so as to take off the bodysuit.
2. The bodysuit, as recited in claim 1, wherein the unitary body is made of cotton.
3. The bodysuit, as recited in claim 1, wherein the bottom end of the top piece of the back panel downwardly extends from a seam between the front panel and the back panel to a position below a waist of the user when worn by the user.
4. The bodysuit, as recited in claim 1, wherein the bottom end of the top piece of the back panel downwardly extends from a seam between the front panel and the back panel to reach a butt portion of the bodysuit.
5. The bodysuit, as recited in claim 1, wherein the receiving opening is longitudinally formed from one side seam between the front panel and the back panel to another side seam therebetween, wherein a width of the receiving opening is smaller than a width of the back panel.
6. The bodysuit, as recited in claim 5, wherein the top opening end of the bottom piece of the back panel is a curved shape opening end, so while the user wears the bodysuit, the curved shape opening end matches with a waist shape of the user's body.

7. The bodysuit, as recited in claim 1, further comprising an elastic band arranged along the top opening end of the bottom piece of the back panel, wherein the elastic band can be stretched to a predetermined length so as to expand a size of the receiving opening.

8. The bodysuit, as recited in claim 7, wherein the size of the receiving opening when expanded is sufficiently large to enable the user to put on or take off the bodysuit therethrough, and after the user puts on the bodysuit, the elastic band returns to its original length so as to be secure on the waist portion of the user.

9. The bodysuit, as recited in claim 1, further comprising a pair of sleeves integrally extended from the unitary body defining two arm openings for allowing the user to putting the user's arms along the two sleeves through the two arm openings.

10. The bodysuit, as recited in claim 1, further comprising a pair of trouser legs integrally extended from the unitary body, wherein the user is able to insert the user's legs into the two trouser legs through the receiving opening so as to protect the user's leg in the cold weather.

11. The bodysuit, as recited in claim 1, further comprising two arm openings formed at a seam between the front panel and the back panel for supporting the user wearing the bodysuit thereon in the hot weather.

12. The bodysuit, as recited in claim 1, further comprising two leg openings spacedly arranged at a bottom seam between the front panel and the back panel for allowing the user to put the user's legs therethrough.

13. A method for putting on a bodysuit, comprising steps of:

- inserting a head of a user through a receiving opening of the bodysuit;
- inserting the head of the user through a head opening of the bodysuit;
- pulling down a unitary body of the bodysuit in a direction towards legs of the user;
- inserting arms of the user into the receiving opening;
- inserting hands of the user through arm openings of the bodysuit;
- pulling down the unitary body of the bodysuit towards feet of the user;
- inserting the legs of the user into the receiving opening;
- inserting the legs of the user into trouser legs of the body suit; and

pulling a top opening end of a bottom piece of the bodysuit over buttocks of the user so as to position the top opening end at a waist region of a back of the user;

positioning a bottom end of a top piece of the bodysuit such that the bottom end overlaps and covers the top opening end of the bottom piece.

14. The method for putting on the bodysuit as recited in claim 13, wherein the unitary body further comprises two sleeves integrally extending to the arm openings, and wherein the hands of the user pass through the sleeves before passing through the arm openings of the bodysuit.

15. The method for putting on the bodysuit as recited in claim 13, wherein the unitary body further comprises leg openings spacedly formed between a seam between a bottom end of the front panel and the back panel, and wherein the feet of the user are inserted through the leg openings.

16. A method for taking off a bodysuit, comprising steps of:

reaching under a bottom end of a top piece of a back panel of a bodysuit, wherein the bottom end of the top piece overlaps and covers a top opening edge of a bottom piece of the back panel when worn;

pulling down the top opening end of the bottom piece of the back panel of the bodysuit over buttocks of a user;

releasing legs of the user from trouser legs of the bodysuit;

releasing the legs of the user to outside of the bodysuit through a receiving opening of the back panel of the bodysuit;

pulling the top opening end of the bottom piece of the back panel towards a head of the user;

releasing arms of the user from arm openings of the bodysuit;

releasing arms of the user to outside of the bodysuit through the receiving opening; and

pulling the bodysuit over the head of the user such that the head of the user passes through a head opening and the receiving opening of the bodysuit to separate the bodysuit from being worn on the body of the user.

17. The method for taking off the bodysuit, as recited in claim 16, wherein the bodysuit comprises leg openings spacedly formed at a seam between a bottom end of the front panel and the back panel, and wherein releasing the legs of the user from the trouser legs of the bodysuit includes passing feet of the user through the leg openings.

18. The method for putting on the bodysuit, as recited in claim 16, wherein bodysuit comprises integral sleeves that define the arm openings, such that releasing the arms of the user from the arm openings of the bodysuit includes passing the arms through the sleeves.

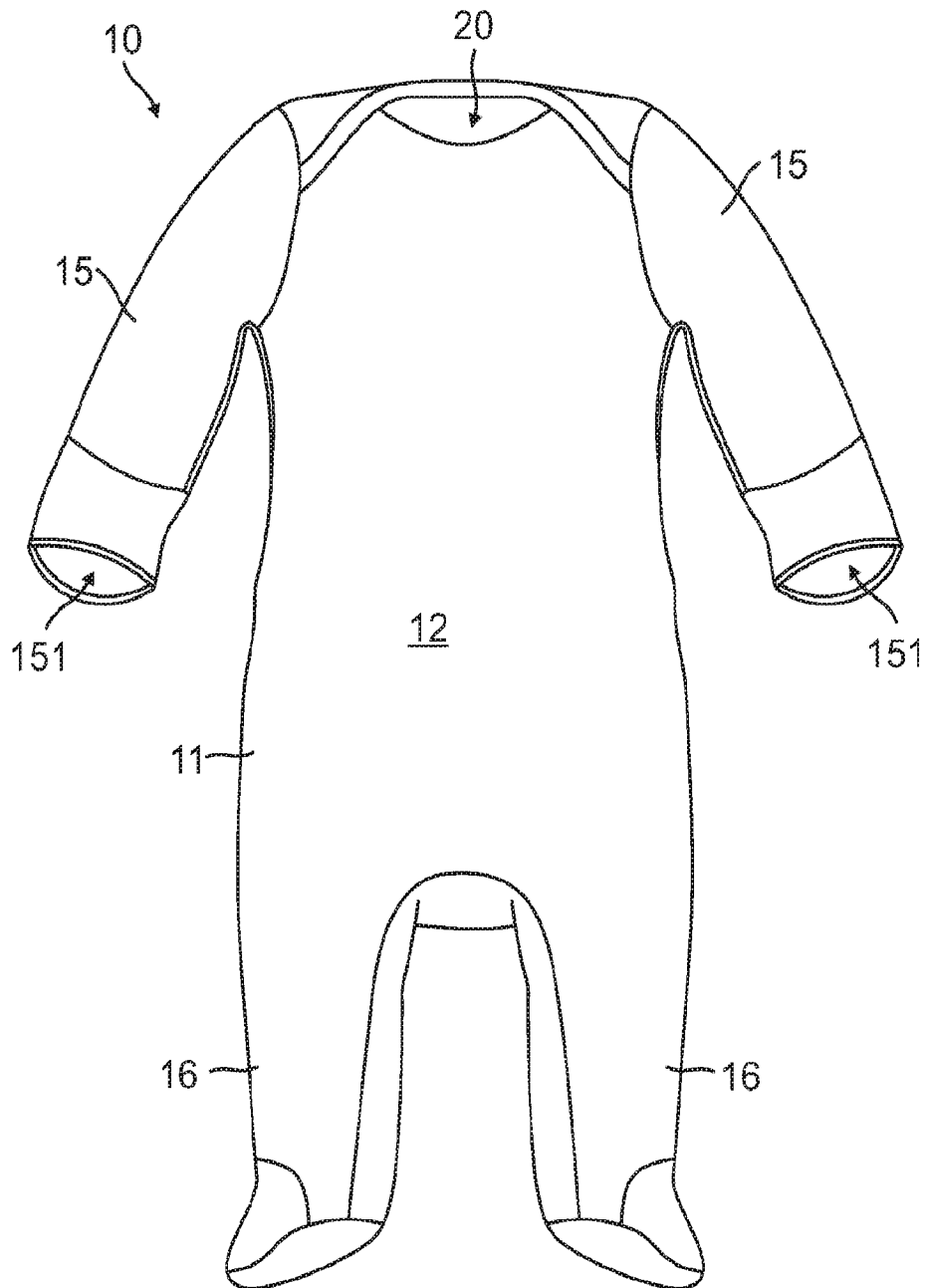


FIG. 1A

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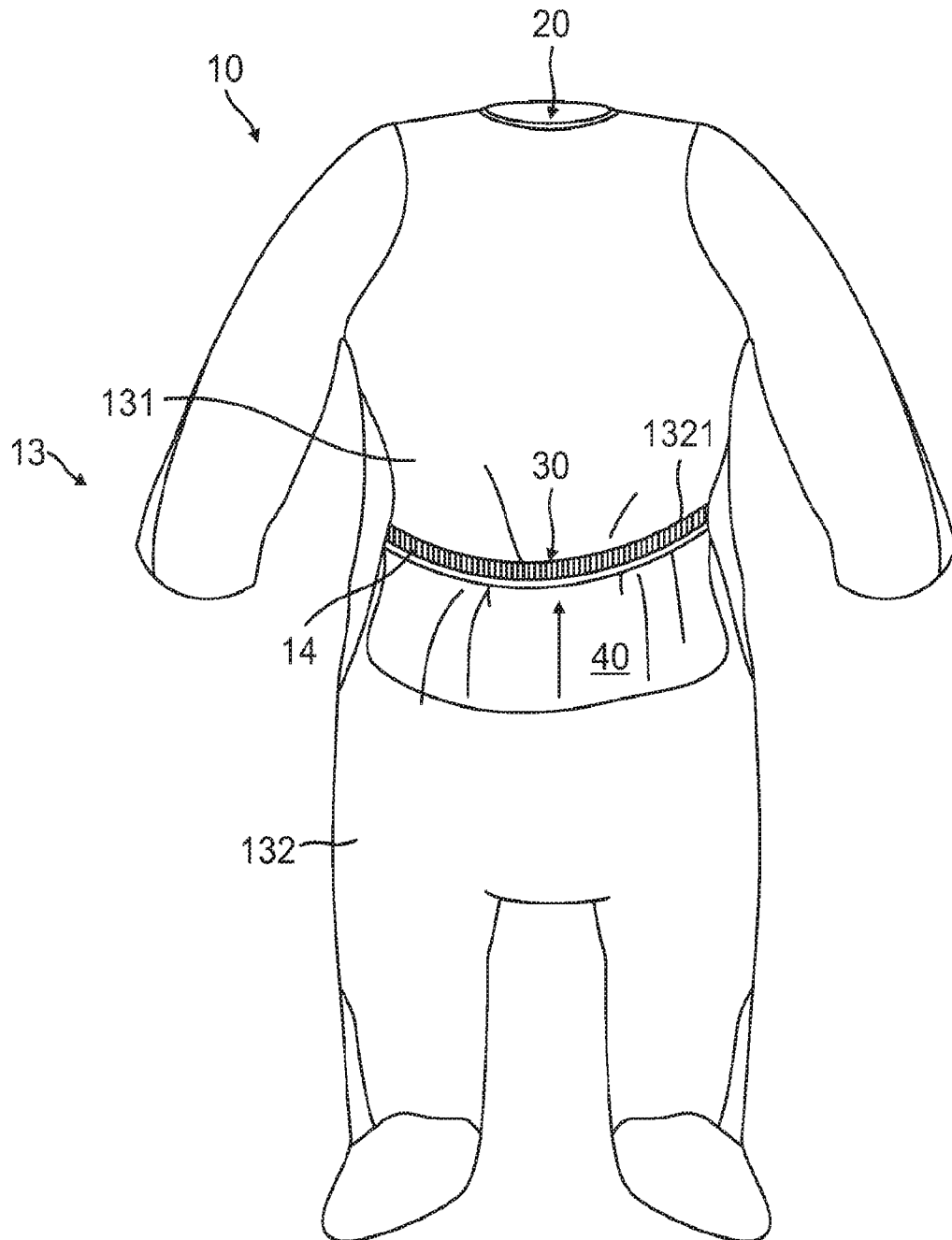


FIG. 1B

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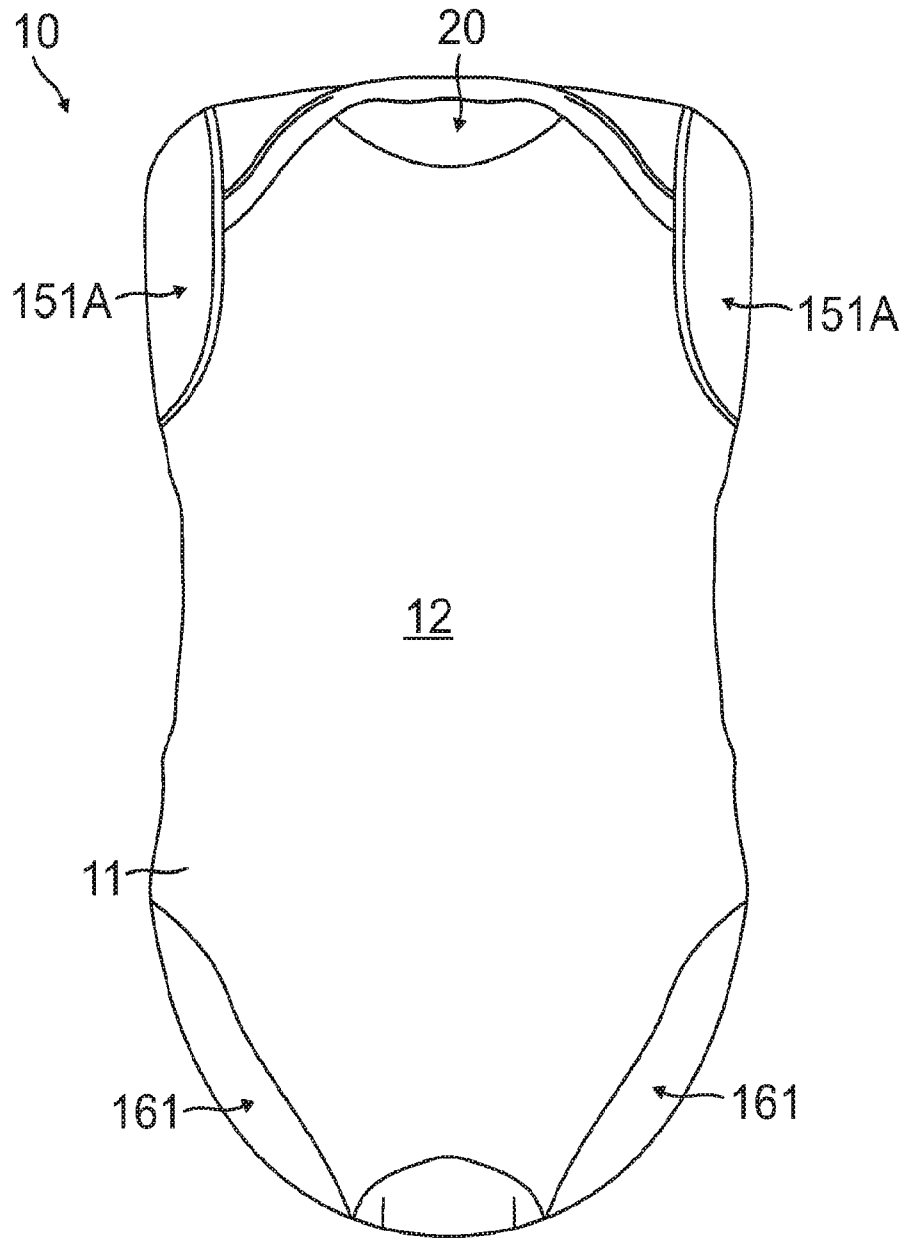


FIG. 2

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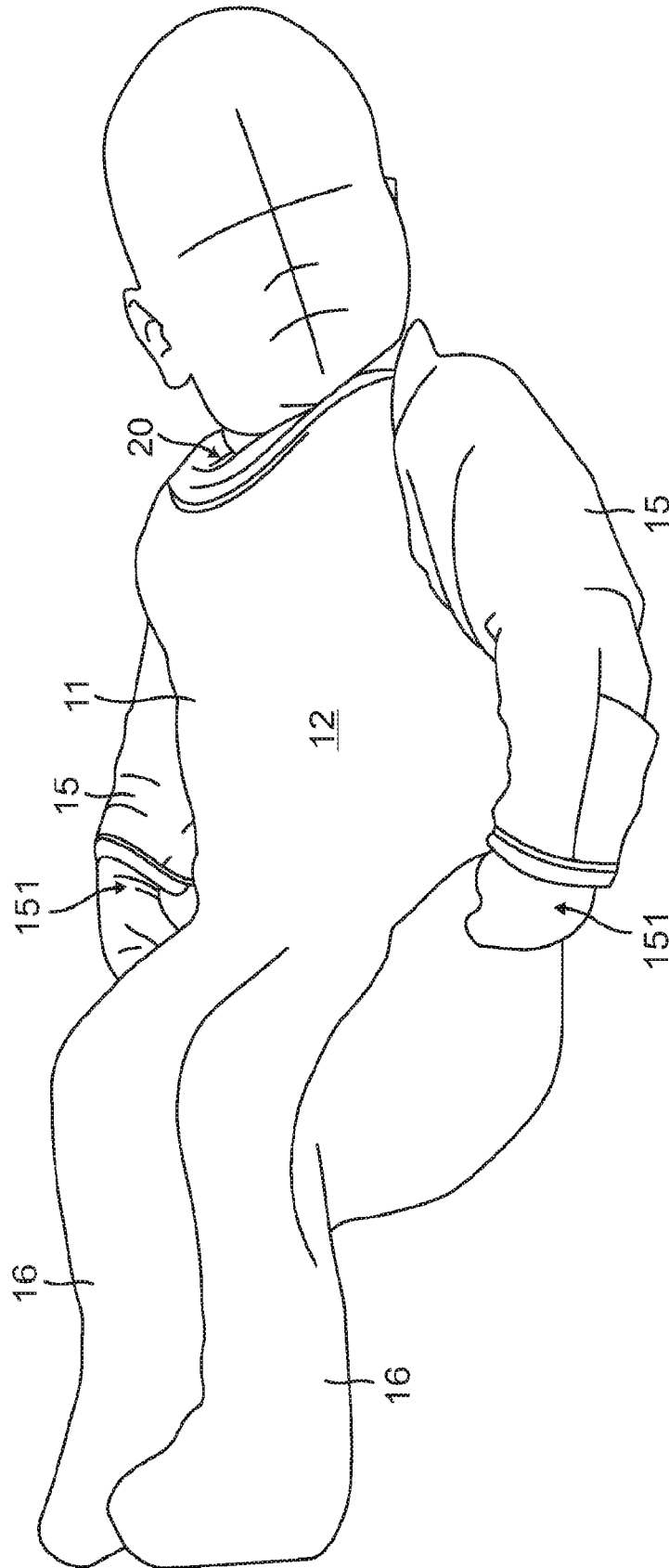


FIG. 3A

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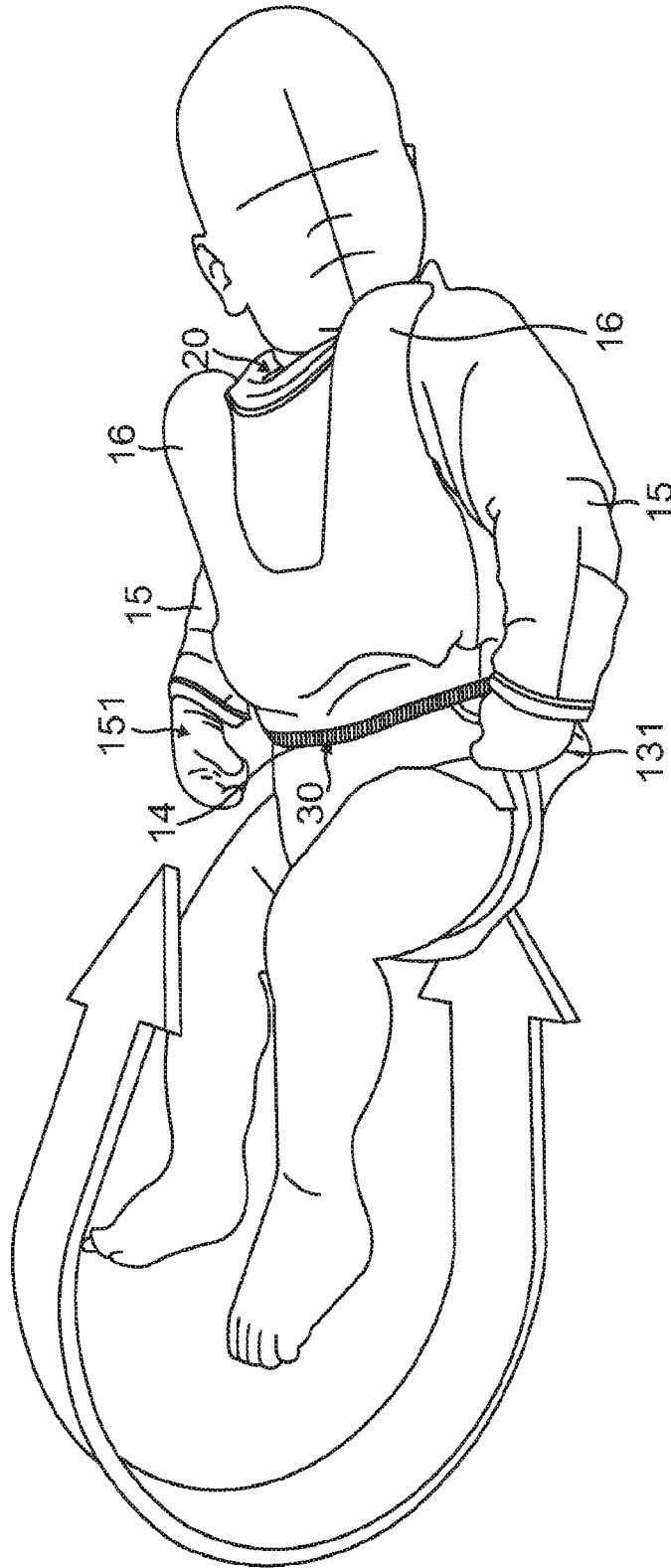


FIG. 3B

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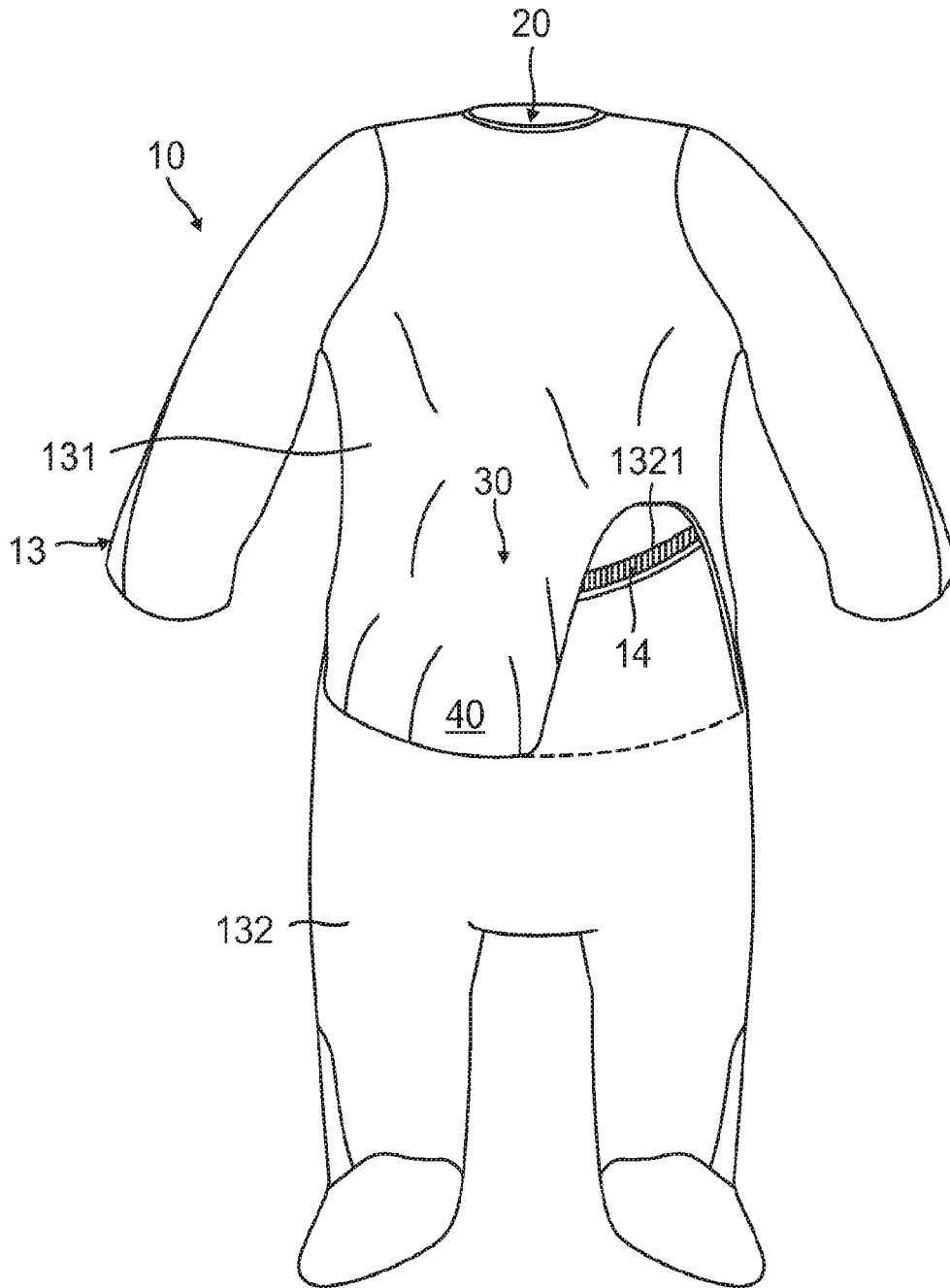


FIG. 4

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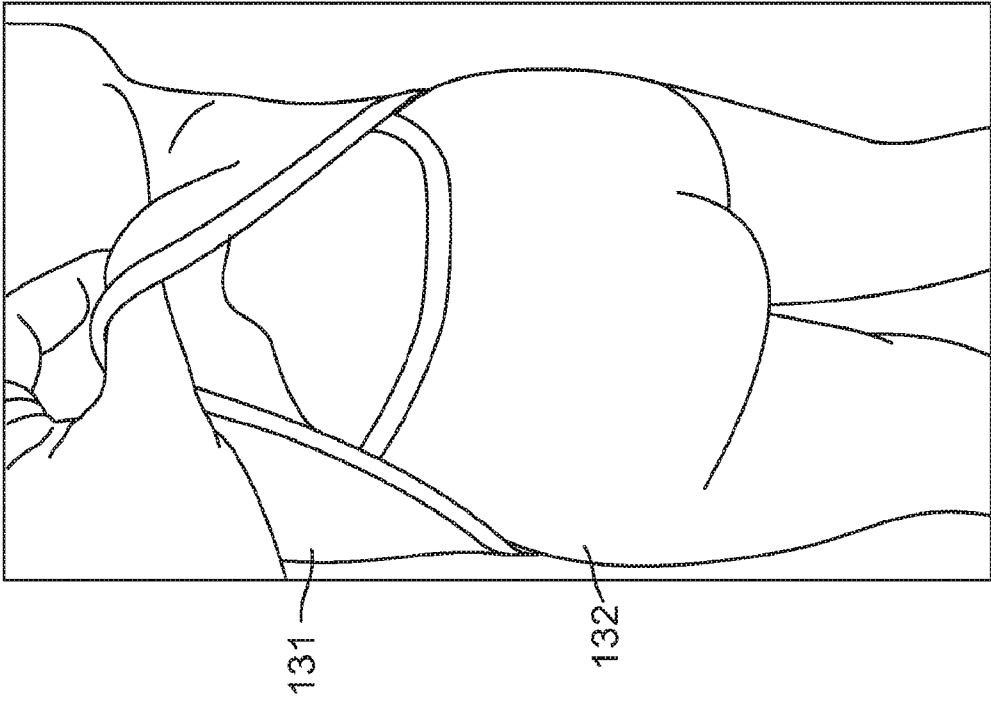


FIG. 5B

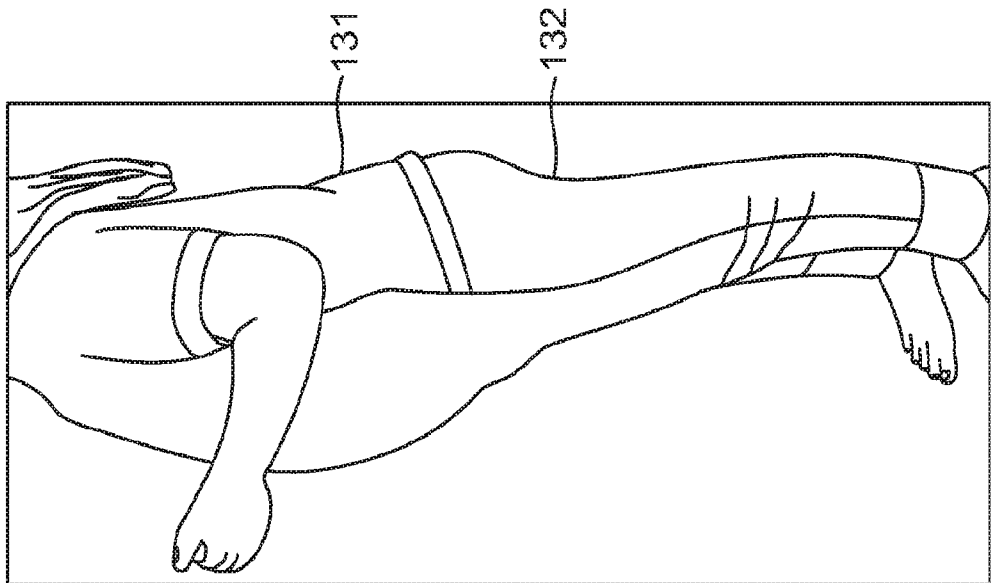


FIG. 5A

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 17/44493

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(8) - A41D 11/00; A41B 13/00; A41B 13/08 (2017.01)
 CPC - A41D 11/00; A41B 13/00; A41B 13/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History Document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2014/0259274 A1 (SAVAGE et al.) 18 September 2014 (18.09.2014); entire document, especially para [0017]-[0018], [0020]-[0021], [0024]-[0025], [0027]-[0028], and Figs. 1-3.	1, 3-18 -- 2
Y	US 2007/0250985 A1 (HARRIS et al.) 1 November 2007 (01.11.2007); especially para [0024] and Fig. 1A.	2
A	"EZ1Z Baby onesies" (EZ1Z) 24 August 2015 (24.08.2015); retrieved from the internet 12.09.2017; <URL=https://www.youtube.com/watch?v=IEsXI_YWjyM>; entire document.	1-18
A	US 2008/0196137 A1 (FORNEY) 21 August 2008 (21.08.2008); entire document.	1-18
A	US 2014/0053314 A1 (BLOMBERG) 27 February 2014 (27.02.2014); entire document.	1-18
A	US 2014/0317828 A1 (HOLSINGER) 30 October 2014 (30.10.2014); entire document.	1-18

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

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"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

12 September 2017

Date of mailing of the international search report

13 OCT 2017

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 Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
 P.O. Box 1450, Alexandria, Virginia 22313-1450
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Authorized officer:
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