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B. F. SMITH
BODY CONFORMING DIAPER WITH BUILT-IN
UNTENSIONED METALLIC SPRINGS

3,116,733

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2 Sheets-Sheet 1

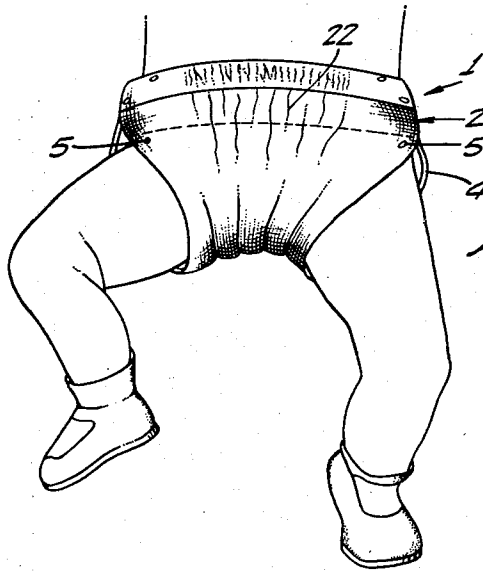


FIG. 1.

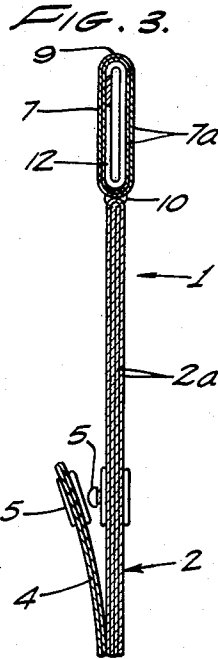


FIG. 3.

FIG. 6.

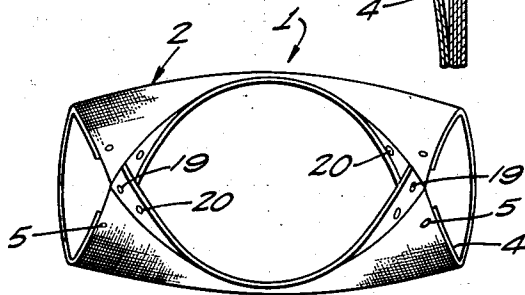
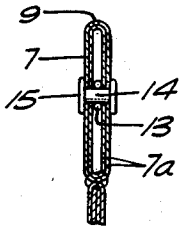


FIG. 2.

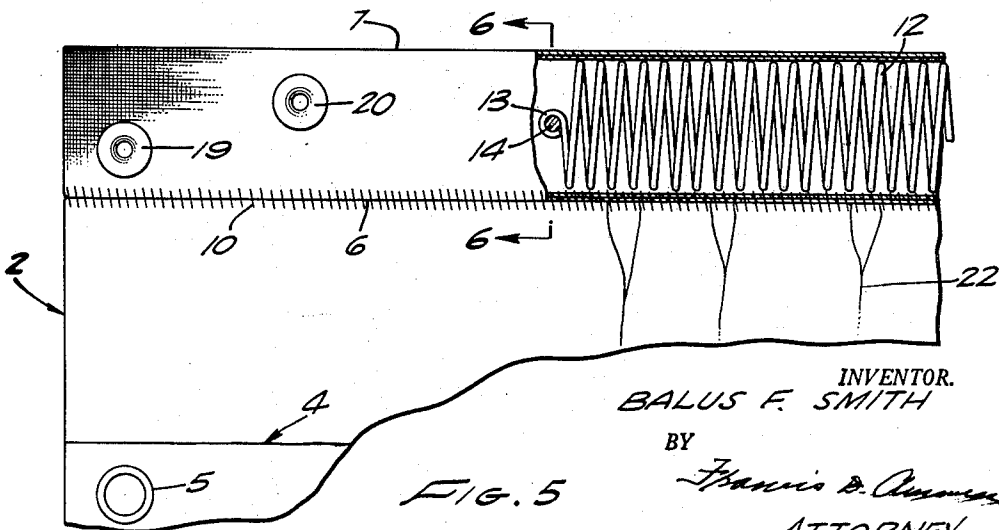


FIG. 5

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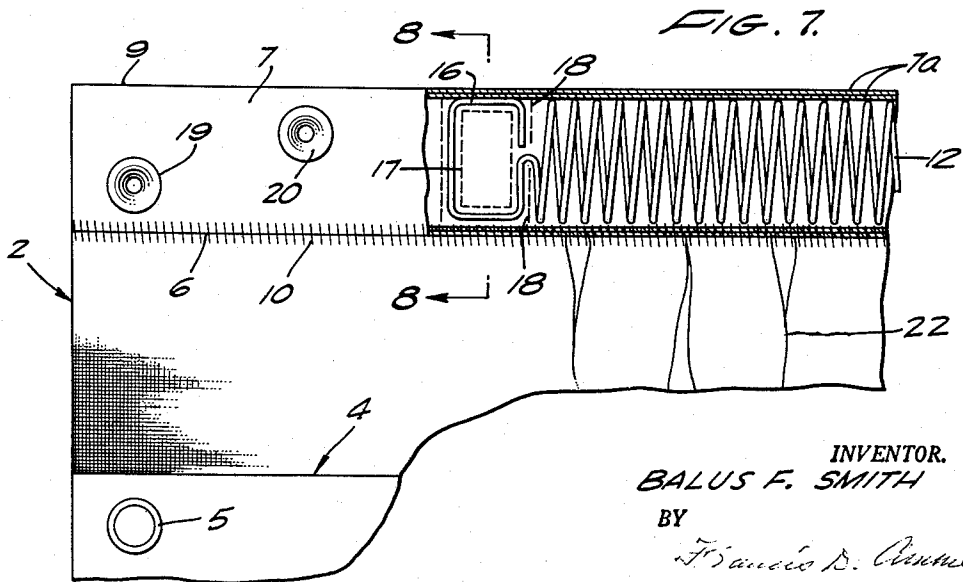
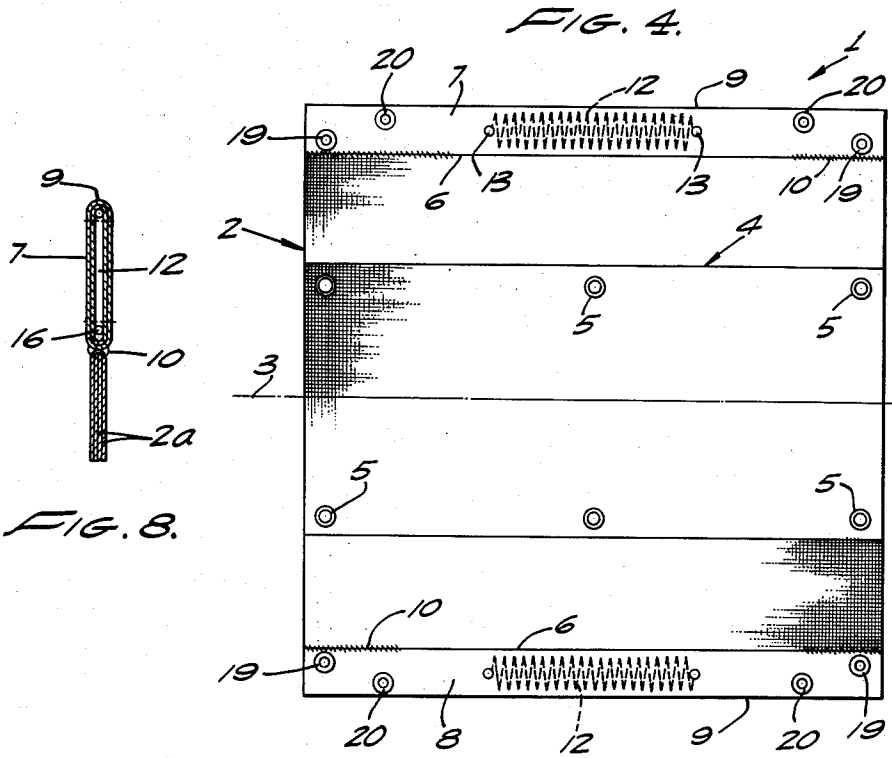
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2 Sheets-Sheet 2



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**BODY CONFORMING DIAPER WITH BUILT-IN
UNTENSIONED METALLIC SPRINGS**Balus F. Smith, 978 S. Ardmore Ave.,
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3 Claims. (Cl. 128—284)

This invention relates to infant's diapers. In applying a diaper to an infant it is the custom to use ordinary pins at a number of points to connect different parts of the diaper to keep the diaper in place on the infant's body.

Most infants do considerable movement of their legs as well as their arms, and in this way they may dislodge such pins sufficiently to make it possible for the infant's legs or his body to be stuck by a dislodged pin.

The most common diaper is a piece of soft cloth that is laid in a front-and-rear direction between the child's legs while he is lying upon his back. Some corners of the cloth are then manipulated to encircle the baby's thighs, while other corners are used to encircle the child's waist tightly enough to enable the diaper to maintain itself in position.

However, generally there is no "give" to the material of a diaper, if it is too tight it is uncomfortable; and if it is too loose it may become looser, so much so, in fact, that it will not stay in place.

One of the objects of this invention is to provide a "diaper sheet" of material having features of construction operating when the diaper sheet is being applied to the infant's crotch and his waist, to be transferred automatically into a complete diaper, presenting a waistband encircling the infant's waist to which it will fit snugly but yieldingly, so that it will not be uncomfortable, and at the same time will present material encircling his thighs, but not too tightly.

Another object of the invention is to provide a metallic spring of a form that particularly adapts it for being encased in a hem of the waistband where it can, when pressed against the body, conform to the curves of the exterior surface of the infant's body; and can be left in the casing hem when the diaper is being washed.

Further objects of the invention will be evident from reading the present specification, and study of the accompanying drawing.

The invention consists in the novel parts and combinations of parts to be described hereinafter, all of which contribute to produce an efficient conforming pinless diaper.

A preferred embodiment of the invention is described in the following specification, while the scope of the invention is pointed out in the appended claims.

In the drawings:

FIGURE 1 is a perspective of the lower part of an infant's body and legs, and illustrating a complete diaper applied to the same.

FIGURE 2 is of a diagrammatic nature showing in plan the relation of the parts of the diaper attached together, but without any distortions such as occur when the diaper is in place on an infant's body.

FIGURE 3 is a vertical section taken down through the upper portion of a diaper sheet, illustrating a waistband portion in section. This waistband portion is illustrated as formed into a hem that encases elastic extensible means that maintains slight but comfortable tension in the waistband. This view also illustrates the upper portion of an absorbent liner or pad for the diaper that is detachable for disposal or being consigned to a laundry.

FIGURE 4 is a plan of the inner face of the complete diaper sheet showing the absorbent pad referred to above; and in dotted lines showing the preferred type of elastic

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tension device for the waistbands. This mounting should confine the spring means to the middle portion of the hem as shown here.

FIGURE 5 is a fragmentary view showing the left end of one of the waistband portions, partially in section to display a metallic "flat" spring that may be used as the elastic extensible means for developing slight tension in the upper edge of the diaper when worn.

FIGURE 6 is a vertical section on the line 6—6 of FIGURE 5 further illustrating a means for mounting one end of the metallic spring in the hem of the waistband that encases it. This view also illustrates an arrangement of snap buttons enabling the size of the waistband to be enlarged as the baby grows.

FIGURE 7 is a view similar to FIGURE 6 but showing an alternate means for effecting the anchoring of an end of the spring such as shown in FIGURES 6 and 7.

FIGURE 8 is a section on the line 8—8 of FIGURE 7 further illustrating the anchor means for the end of the spring shown in FIGURE 7.

Referring more particularly to the parts the completed diaper 1 shown in FIGURE 1 is a transformation of the diaper-sheet 2 shown in FIGURE 4.

Along the central transverse axis 3 of the diaper sheet 2, a liner or pad 4 of absorbent material is removably secured by means other than pins, and preferably by snapfasteners 5.

This pad 4 should be applied to the face of the diaper-sheet that will be adjacent to the infant's body in the completed diaper.

It will be noted that the diaper-sheet as shown in FIGURE 4 is a four-sided figure. The two sides or edges 6 that are parallel to the axis 3, have stitched to them respectively two waistband portions 7 and 8 that are each in the form of a hem preferably made of two plies of cloth as shown with a folded outer edge 9, and their inner free edges come together to form an inner edge by being connected to each other and to the edge 6 by stitching 10 that extends continuously throughout the entire length of the diaper sheet 2.

In at least one of the hems 7 or 8 I place elastic extensible means respectively, that are preferably confined to the middle or intermediate part of each hem, as indicated in FIGURE 4.

The elastic extensible means in the hems preferably consist of a metallic resilient steel or spring-brass wire. And these springs are readily formed from wire coils. When making them of steel regular circular coils of untempered steel may be flattened between the jaws of a press so that the coil is flattened to a thickness slightly less than the inside narrow width of the hem; after which the flattened coil should be tempered to give it the degree of tensile force desired.

If brass stock is used to make the coil the coil will have to be compressed between the jaws of the press to give it a positive differential of less than the narrow width of the hems; and of course, there will be a slight decrease of the transverse narrow "thickness" of the coil, if we are permitted to coin a new word in this connection. But brass has some advantages over steel unless stainless steel is used as the stock. It would be more expensive, but the stainless steel springs could be transferred to newly constructed diaper sheets as the first used ones became passé from the repeated laundering.

Using either steel or brass, FIGURE 3 shows an effect of flattening the coil so that it is transformed by the press into extensions flattened more or less at their ends so that at the junction of the oppositely inclined straight extensions they form two series of extensions that are brought virtually into one plane.

As indicated in FIGURE 3, the waistband portions 7

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and 8 are preferably composed of two juxtaposed plies 7a and the waistband 8 has this same detail of construction, though not illustrated.

A diaper is constructed so that the spring means can be removed in one way or another to enable it to be removed from the body of the diaper when the body of the diaper is to be laundered. This can be accomplished by mounting the spring means removably within the hem or hems, or by removing the stitching 10 which attaches the hems to the diaper body.

In the practical use of this diaper when the diaper sheet 2 must be renewed, the stitching 10 can be ripped out by a housewife or nurse, to enable it to be stitched to a new diaper sheet.

In practicing this invention it is obvious that if desired, a kind of snap-fasteners can be used instead of the stitching 10 to removably secure these parts together. It seems unnecessary however, to use an illustration of the use of that expedient.

Of course, any number of plies 2a can be employed to form the diaper-sheet 2. This, of course, would depend upon the quality of the fabric of which it is composed.

As indicated in FIGURES 4 and 5 the ends of the springs 12 already described, may be bent into eyes 13 that receive short-bolts 14 (see FIGURE 6) with integral heads on one end and snap heads 15 on the other. Or if desired, an alternate way of anchoring the ends of the springs may be used, which is illustrated in FIGURE 7. This means includes the forming of the end of the spring into a tip 16 in the form of a frame 16 preferably of rectangular form (see FIGURE 7). In the present instance the frame is rectangular, but it could be triangular to function as well, because its tip 16 is anchored down to the hems by rows of stitching 17 and 18, as shown in FIGURE 7.

In applying the diaper sheet 2, completed by the spring-carrying waistband portions 7 and 8, to the infant, of course, the diaper sheet is laid in the crib with the axis line 3 of FIGURE 4, extending parallel with the longitudinal axis of the crib. The baby's buttocks should be then resting on the geometric center of the pad 4, and the lower part of the diaper should then be lifted and swung up, and then down so that the ends of the hem 8 can be overlapped on the ends of the waistband portion 7 as indicated in FIGURE 2, and then the snap-fasteners 19 should be snapped shut. This is assuming that the very young man or young lady, has grown too large at the hips to enable the snap fasteners 20 to be still in use.

In connection with the elastic extensible members shown as springs 12 in the accompanying drawing, it should be understood that when the diaper-sheet is lying at rest, that is, before it has been applied to the infant, the springs will be contracted. In other words, their extension will be zero. This will occasion the appearance of a shirring effect in the hems that encase the springs.

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This shirring must be present; otherwise, when the springs are extended a considerable strain might be developed in the hems and in the adjacent medial areas of the diaper-sheet body 2. This shirring effect in it is shown at 22 in FIGURES 5 and 7.

Many other embodiments of this invention may be resorted to without departing from the spirit of the invention.

I claim as my invention and desire to secure by Letters Patent:

1. In a sheet form diaper capable of being applied on, and secured to, an infant's body without the employment of pins to hold the same in place, the combination of a four sided body of flexible fabric material having a forward waistband portion adapted to extend across the front of an infant's body, and a rear waistband portion adapted to extend across the rear of the infant's body, at least one of said waistbands comprising a flat sleeve-form hem, fasteners carried by the ends of said waistband portions for securing the ends of the waistband portions together so that they encircle the infant's body, whereby the connecting together of the ends of the waistbands transforms the four sided flexible body into a diaper with an opening at each side of the infant's body, the edges whereof encircle the thighs of the infant's legs; metallic spring means composed of zigzag members having eyes at their ends and received within said flat hems, and removable through-bolts passing through the said eyes and mounted between the two-ply of material that form the hems, thereby enabling the spring means to be laundered with the diaper, or removed at will.

2. In a sheet form diaper capable of being applied on, and secured to, an infant's body without the employment of pins to hold the same in place, according to claim 1, in which the metallic spring means are applied and mounted confined to the middle portions of the length of the hems, and are relatively short.

3. In a sheet form diaper capable of being applied on, and secured to, an infant's body without the employment of pins to hold the same in place, in which the metallic spring means are applied and mounted confined to the middle portions of the length of the hems, according to claim 2, and in which each spring means is formed of wire with each end of the wire terminating in an eye formed of an extension of the said wire; and means for securing said eyes to said hems.

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