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(54) **DIAPER CHANGING APPARATUS**

(52) **U.S. Cl. .... 5/655**

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(57) **ABSTRACT**

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Disclosed is a diaper changing apparatus which is adaptable for use on a variety of surfaces. Non limiting examples of suitable surfaces include a mat, bed, changing table, etc. The diaper changing apparatus comfortably elevates and restricts a baby's arm motions. In addition a lateral restraining member is provided to restrain the baby's waist area. In one embodiment the diaper changing apparatus includes a width adaptable mechanism to accommodate babies of varying sizes. The width adaptable mechanism comprises of a pair of base members with a removable means for fastening. The lateral width between the two base members can be modified to accommodate babies of varying sizes. In an alternative embodiment the diaper changing apparatus has a fixed lateral width and is constructed from one piece. In a further embodiment the diaper changing apparatus comprises at least two base members and one lateral restraining member.

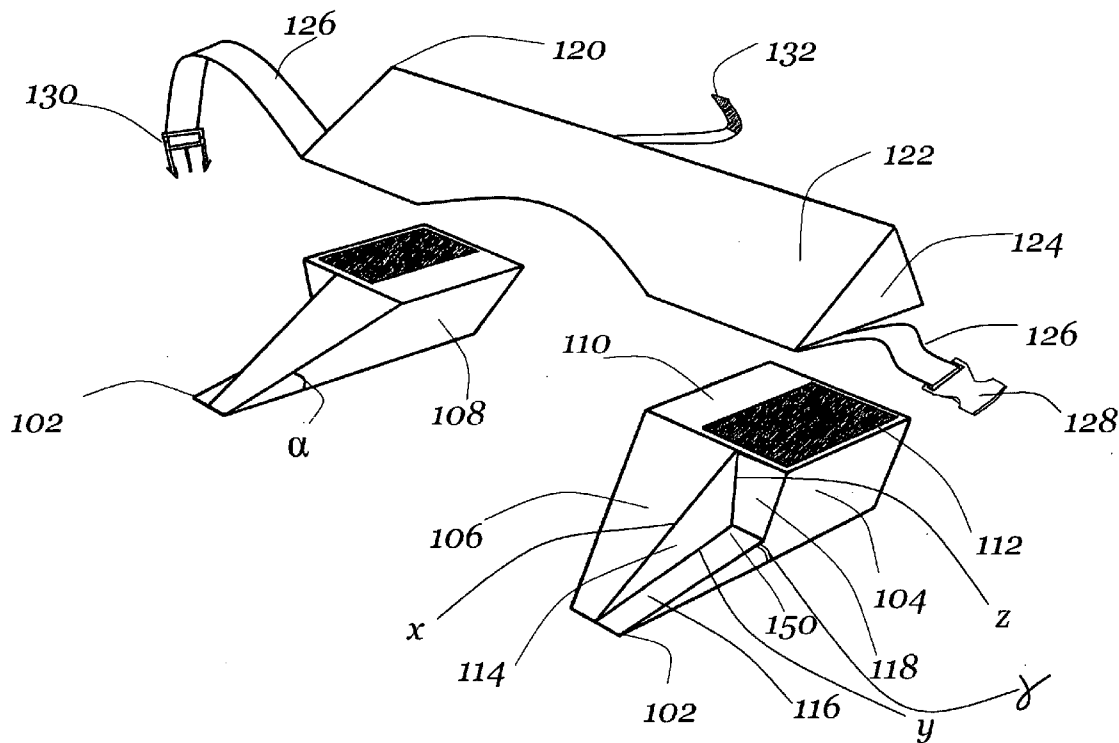
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**100**



100

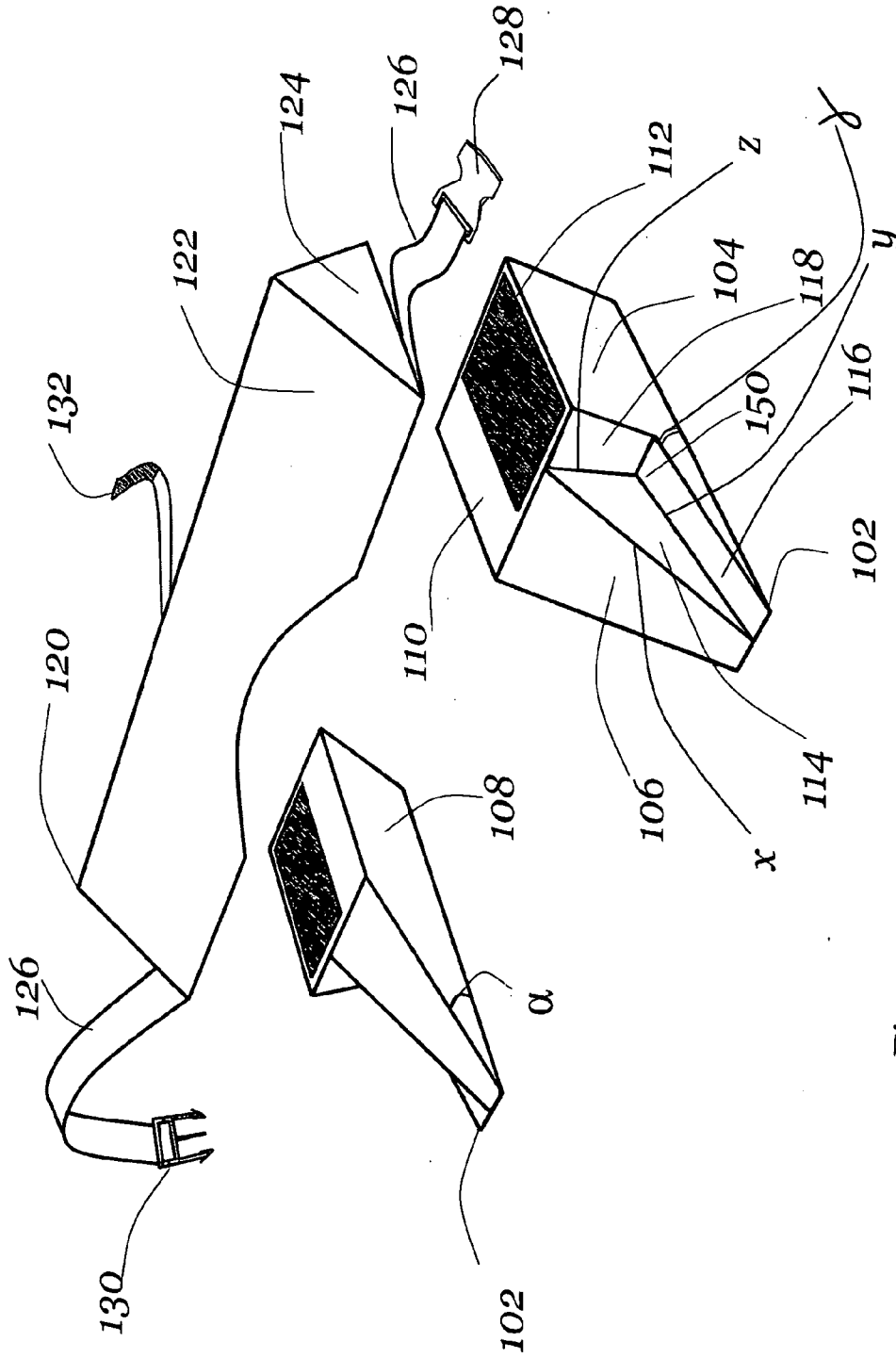


Fig. 1a

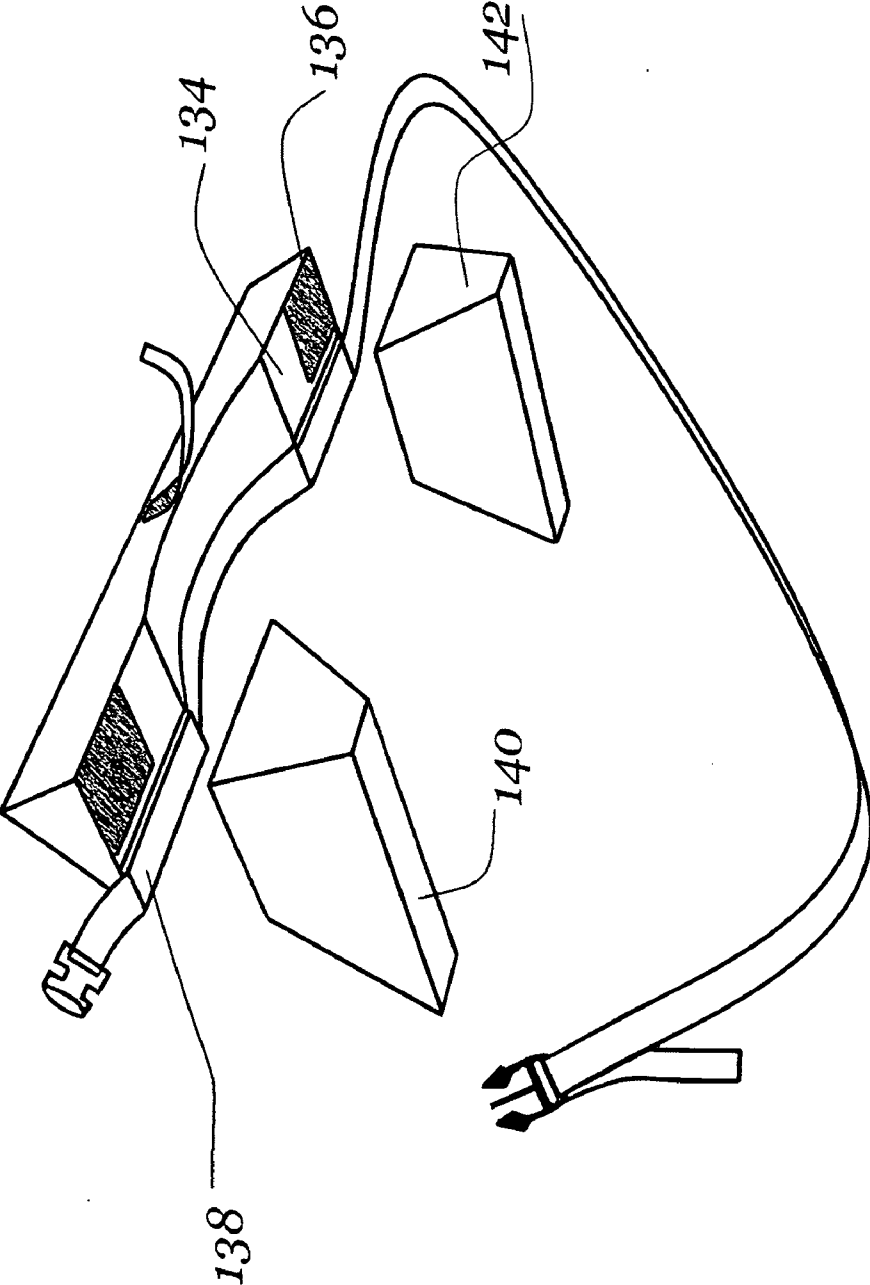


Fig. 1b

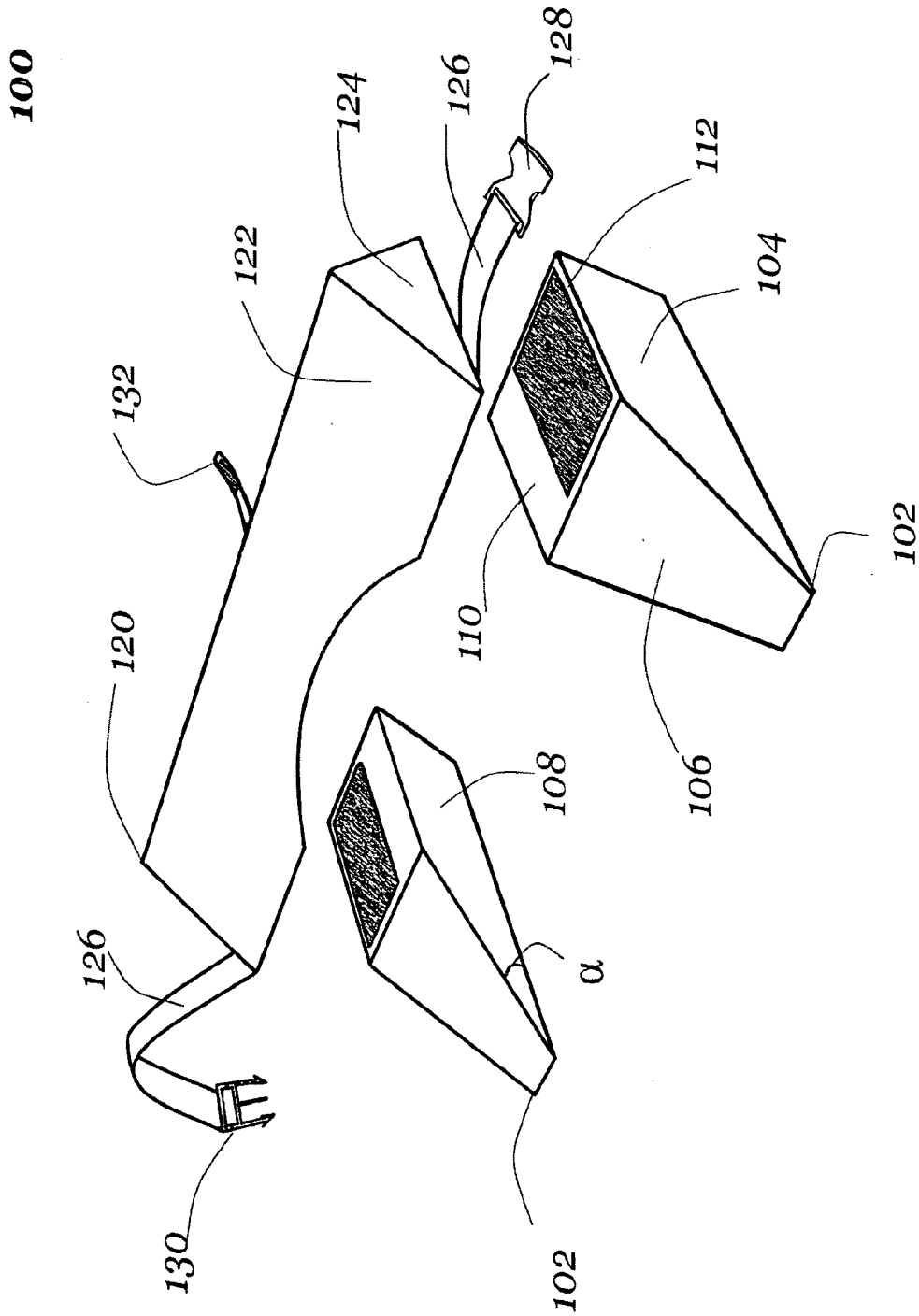


Fig. 1 c

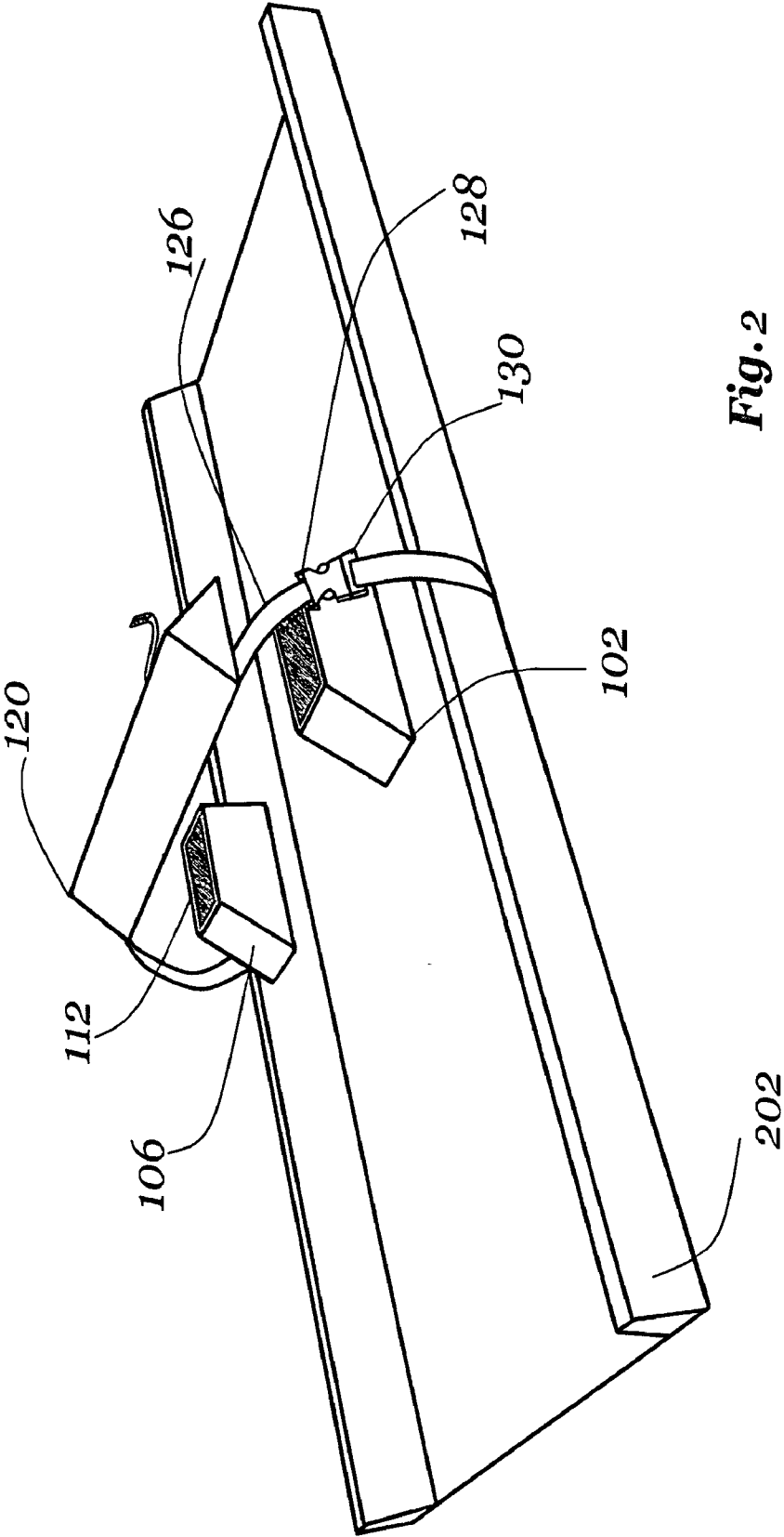


Fig. 2

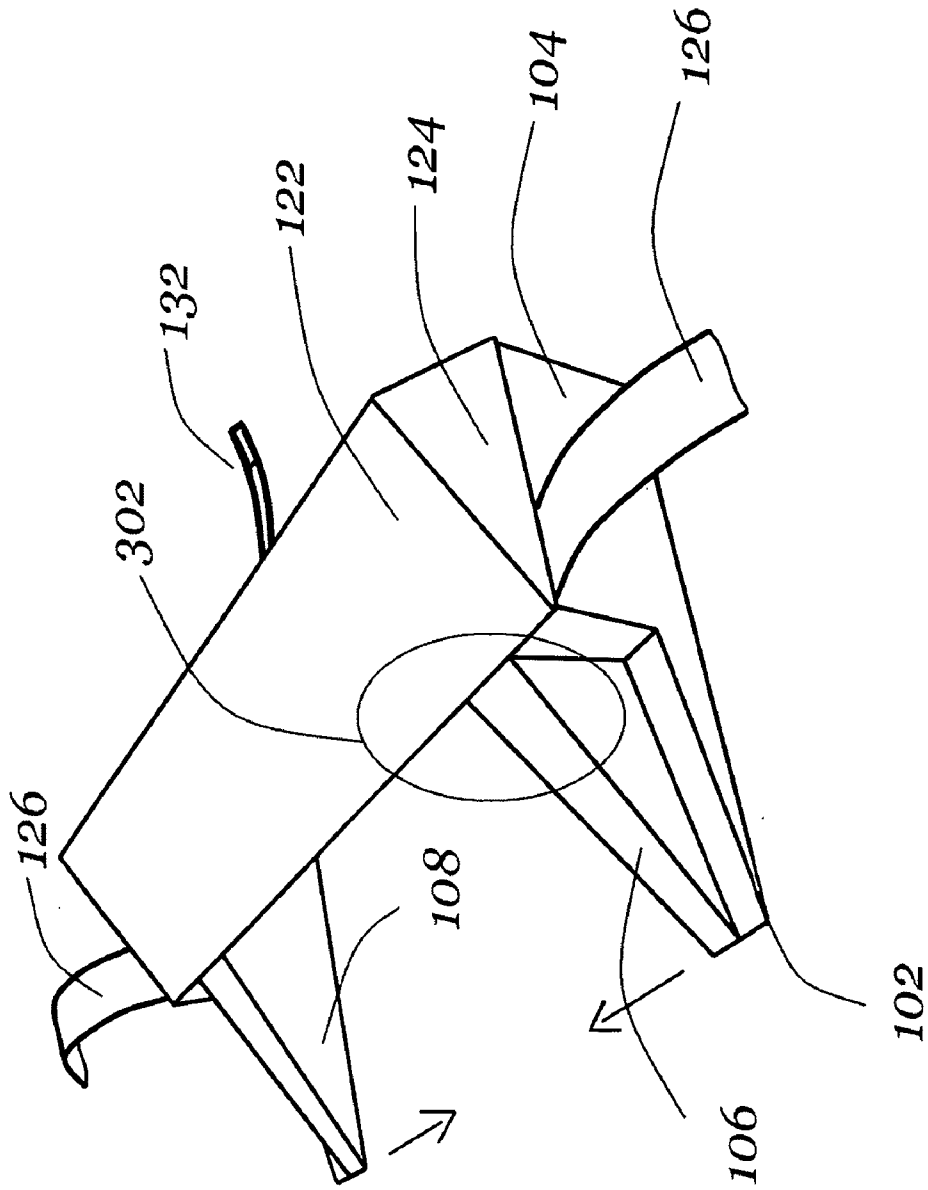


Fig. 3

400

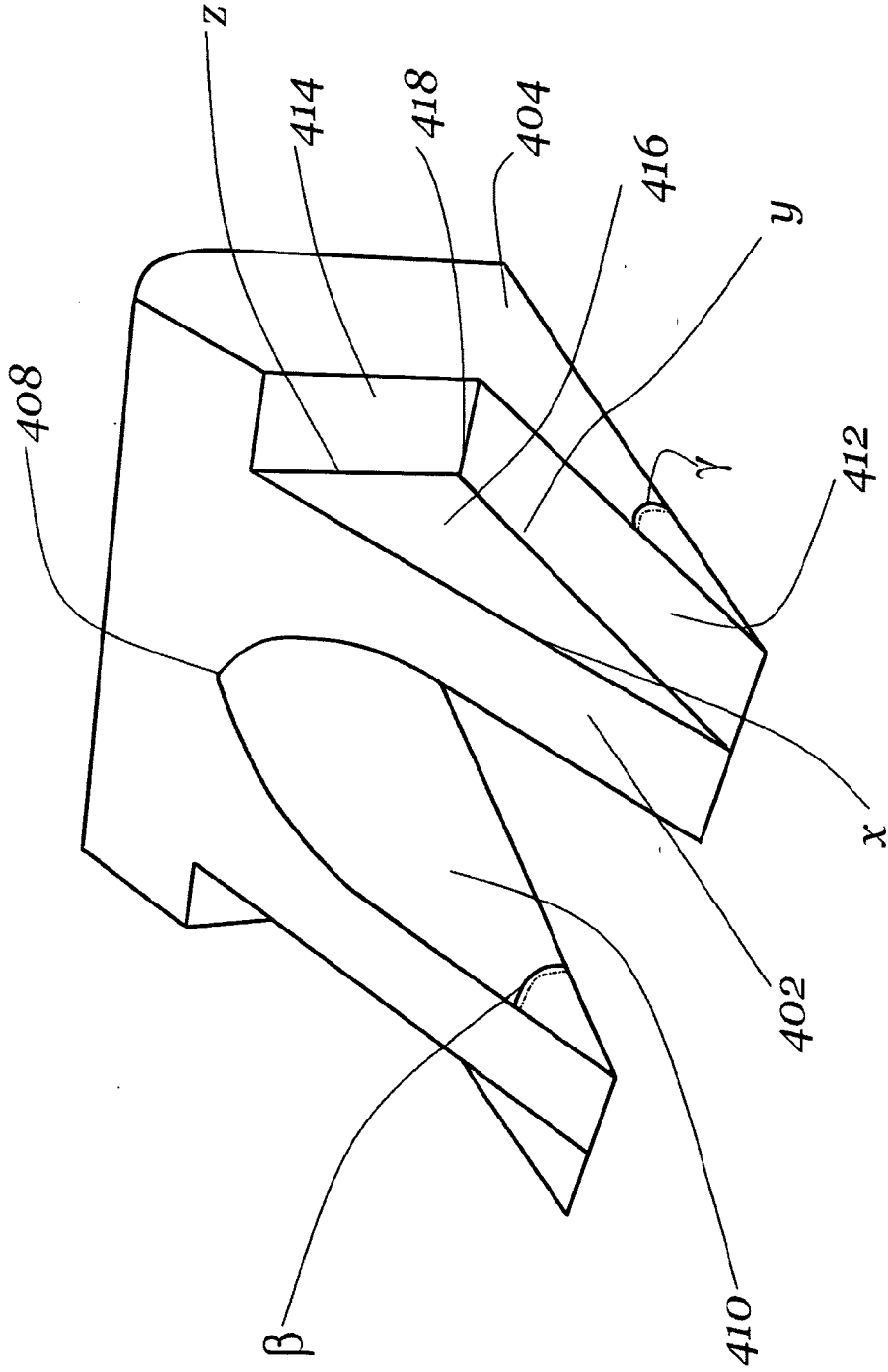


Fig. 4a

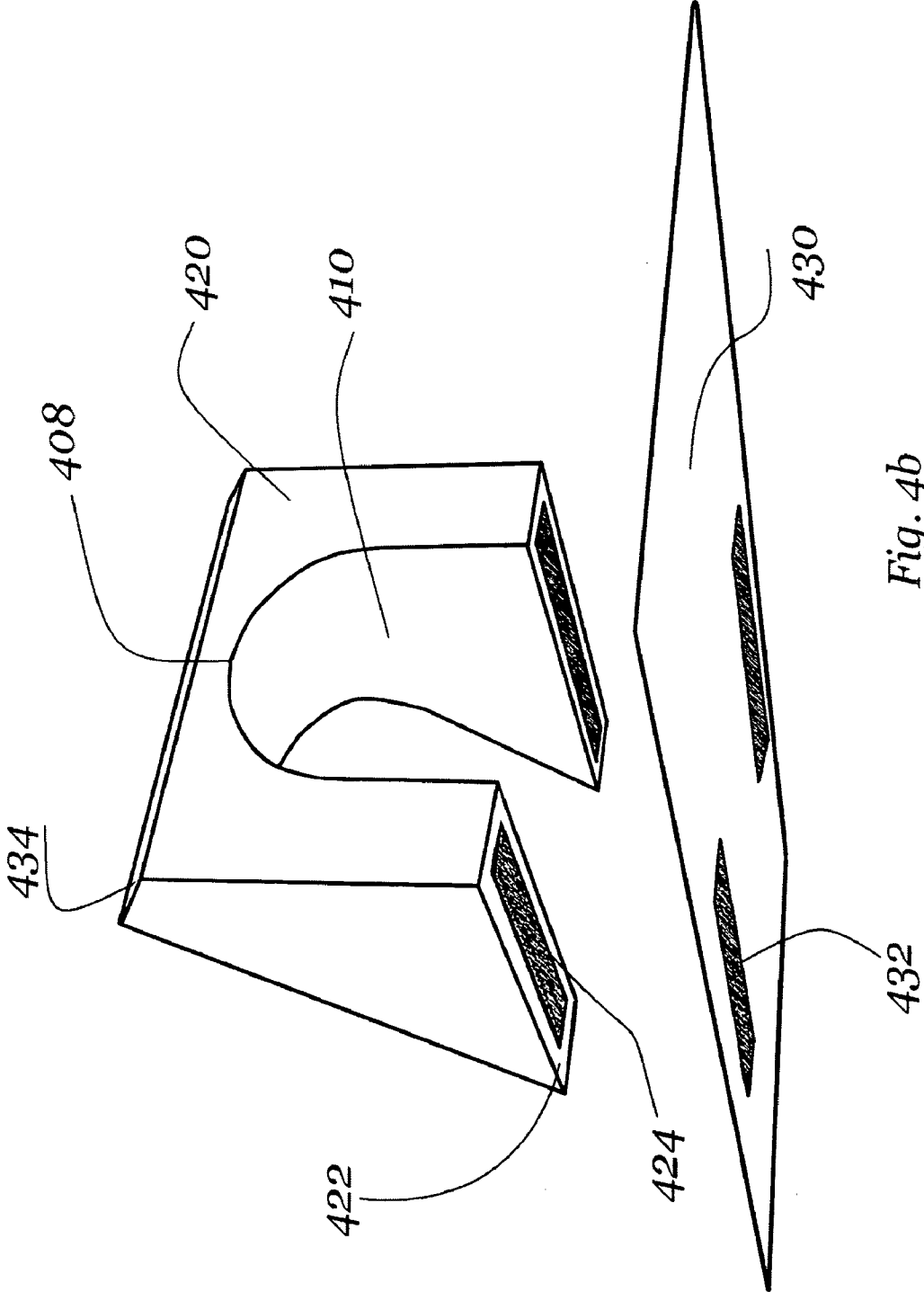


Fig. 4b



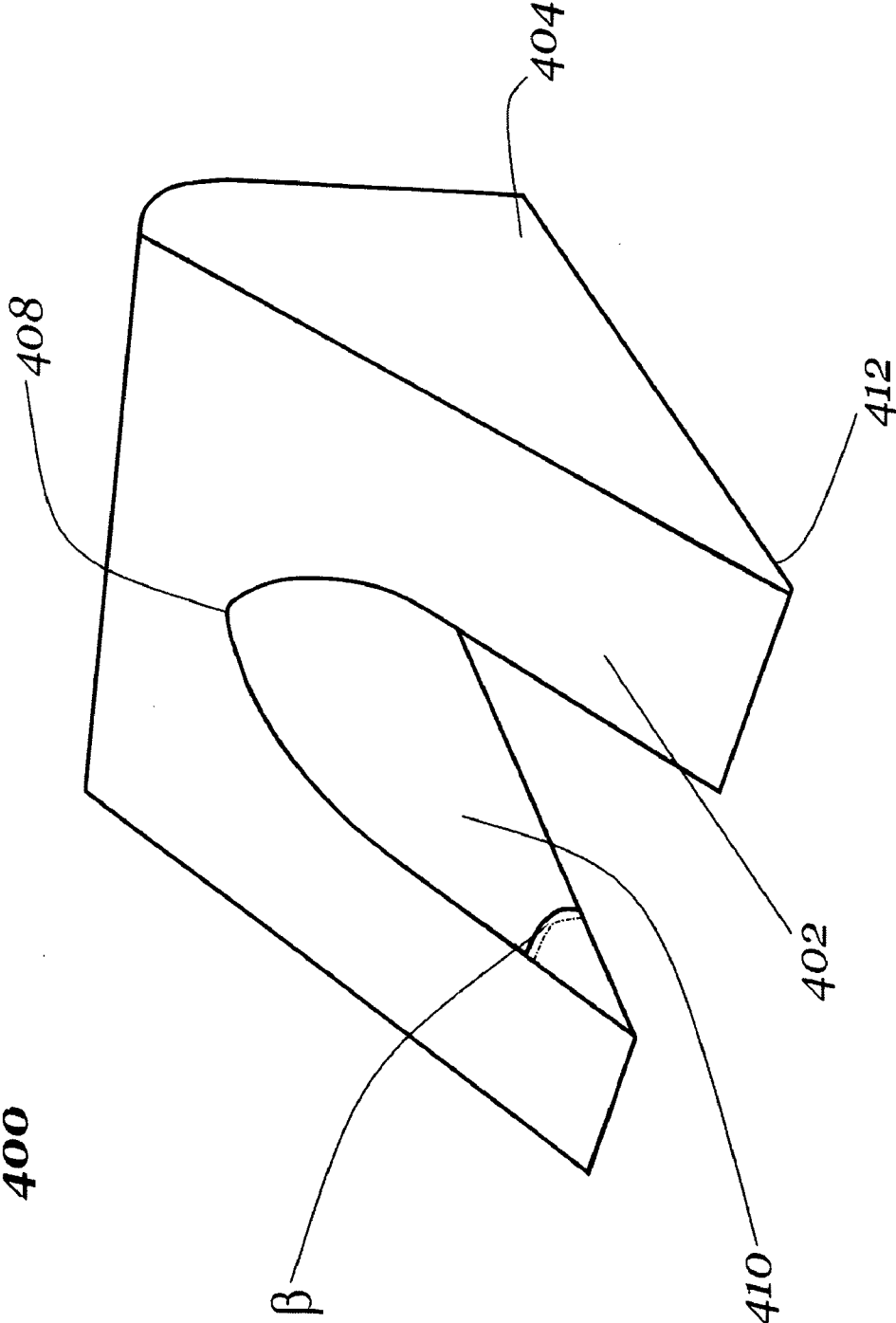


Fig. 4 c

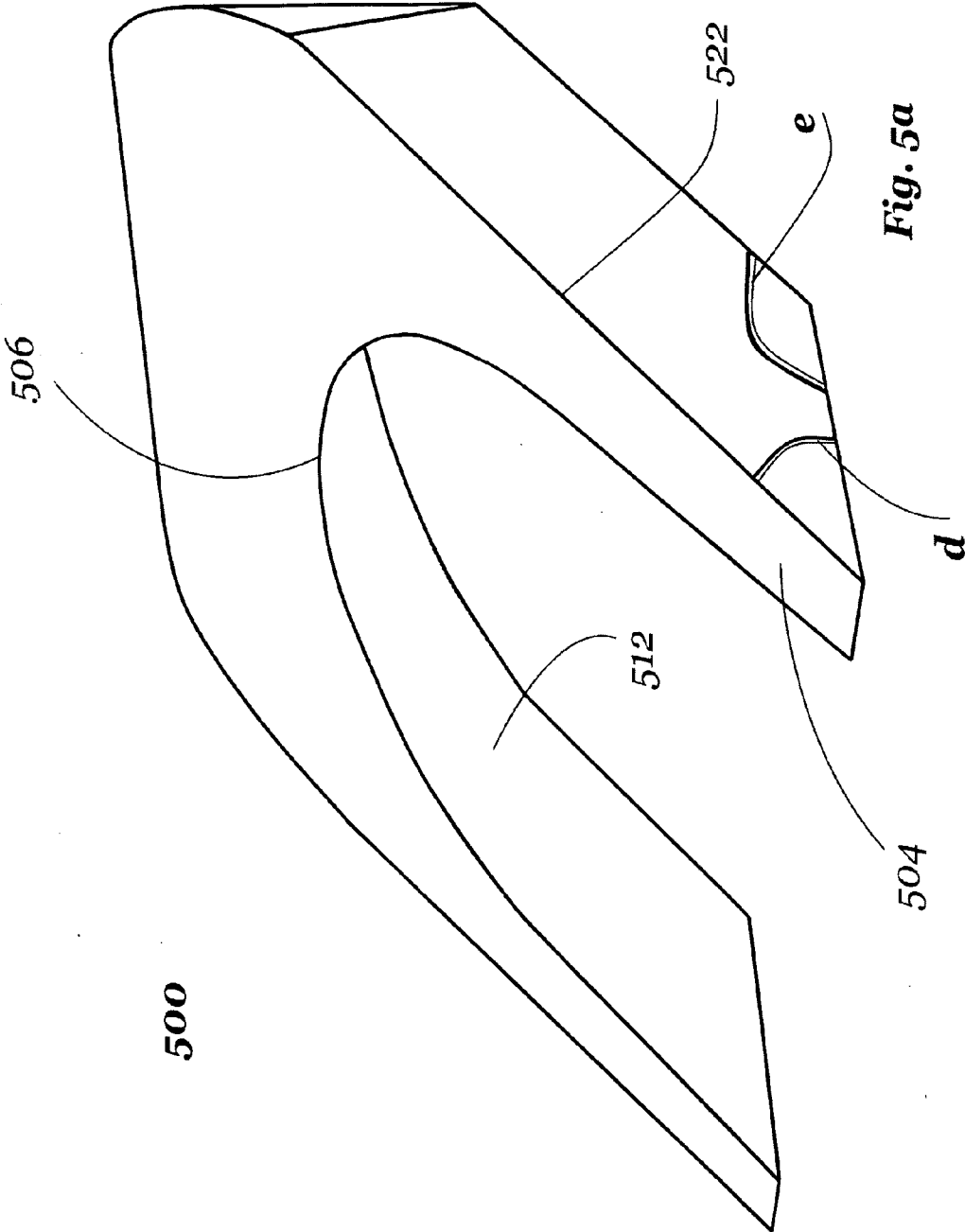


Fig. 5a

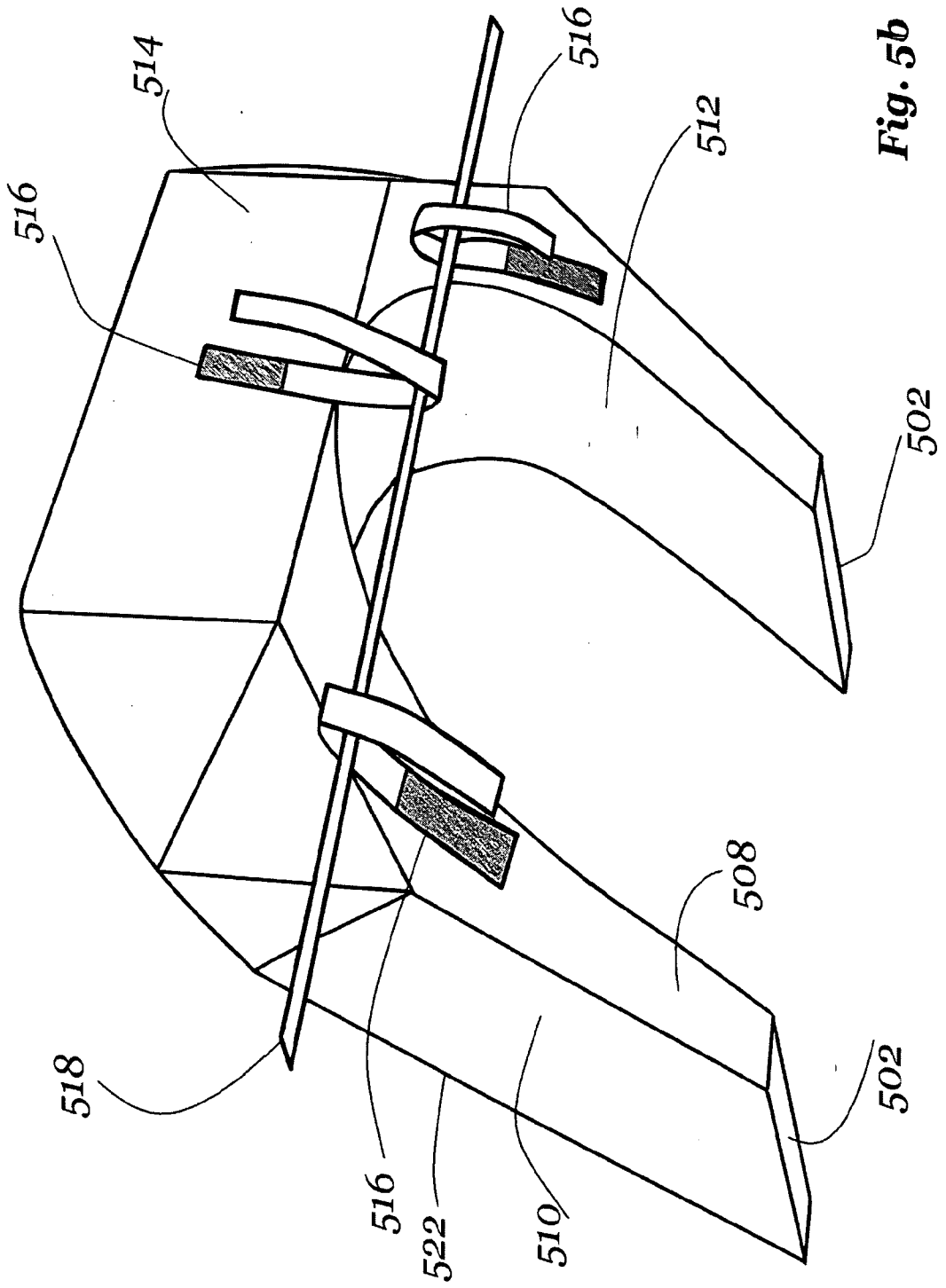


Fig. 5b

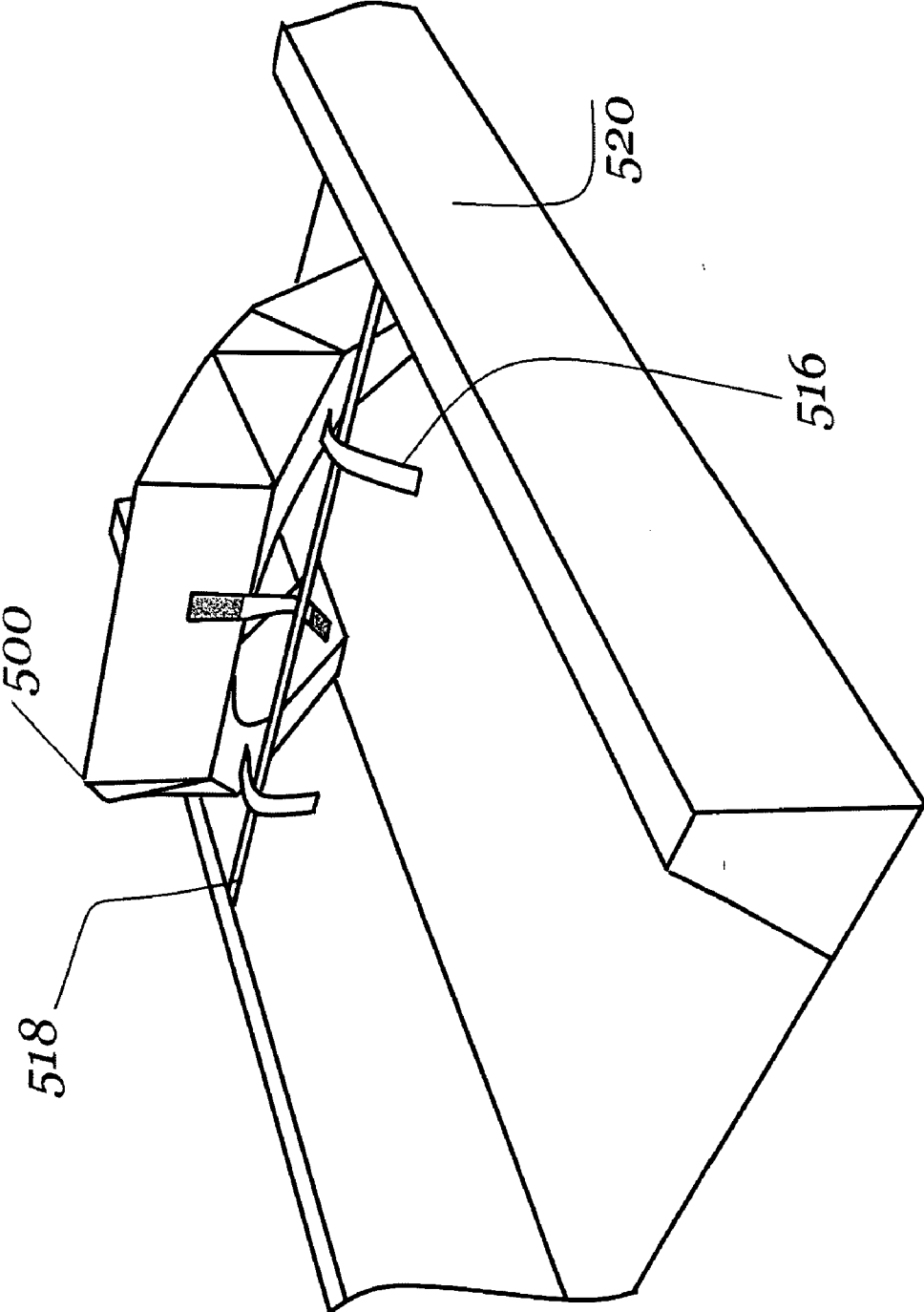


Fig. 5c

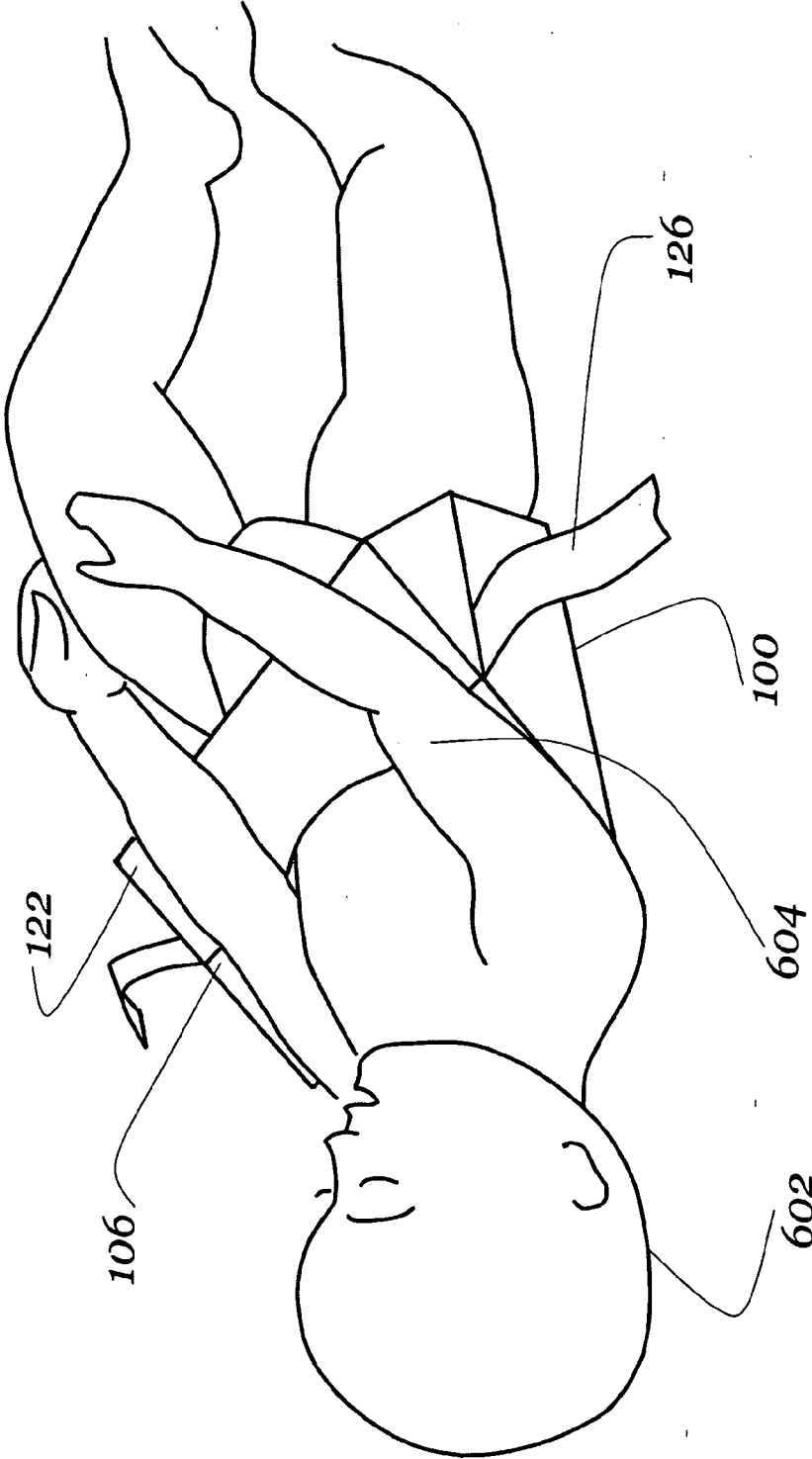


Fig. 6

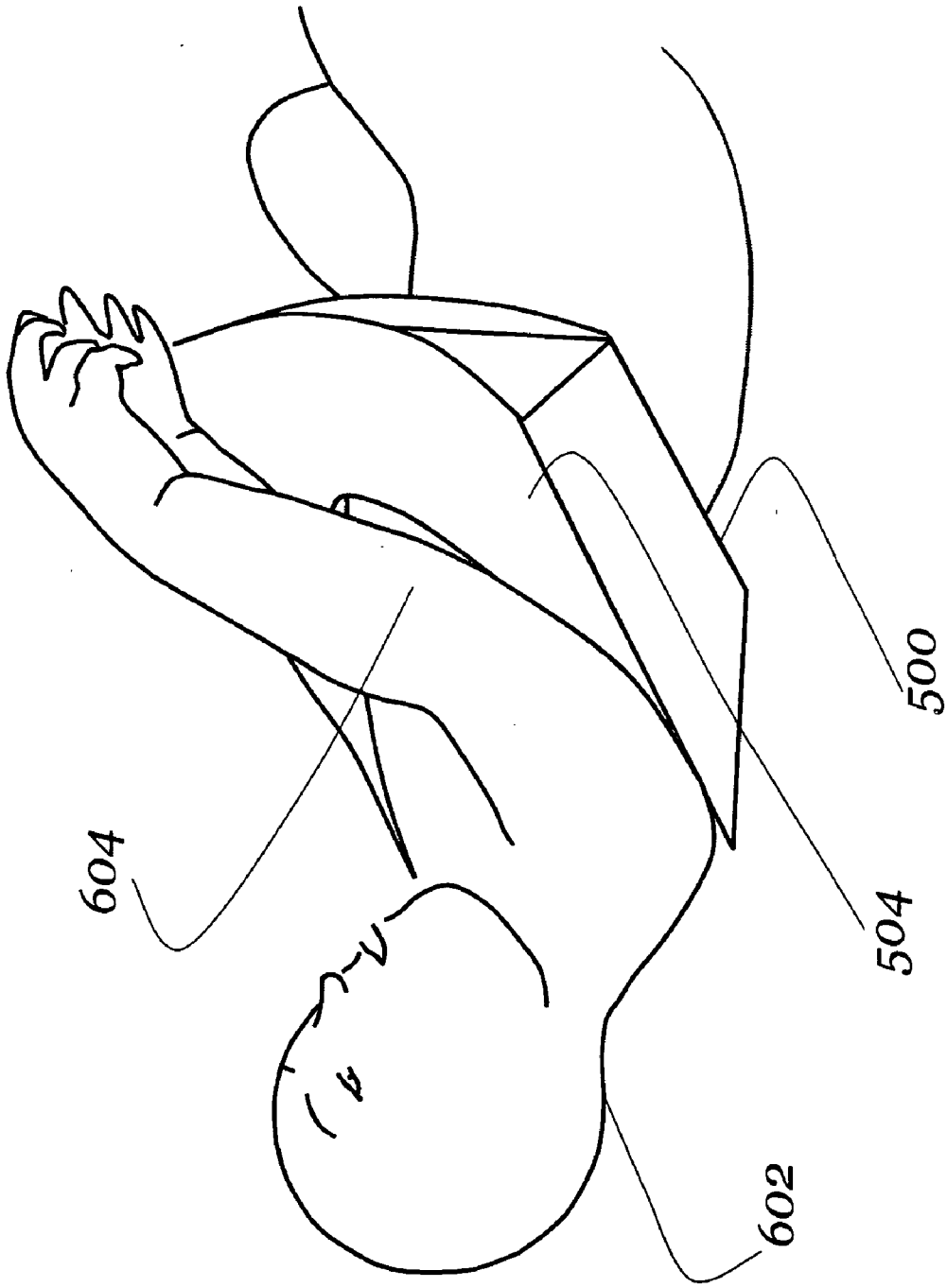
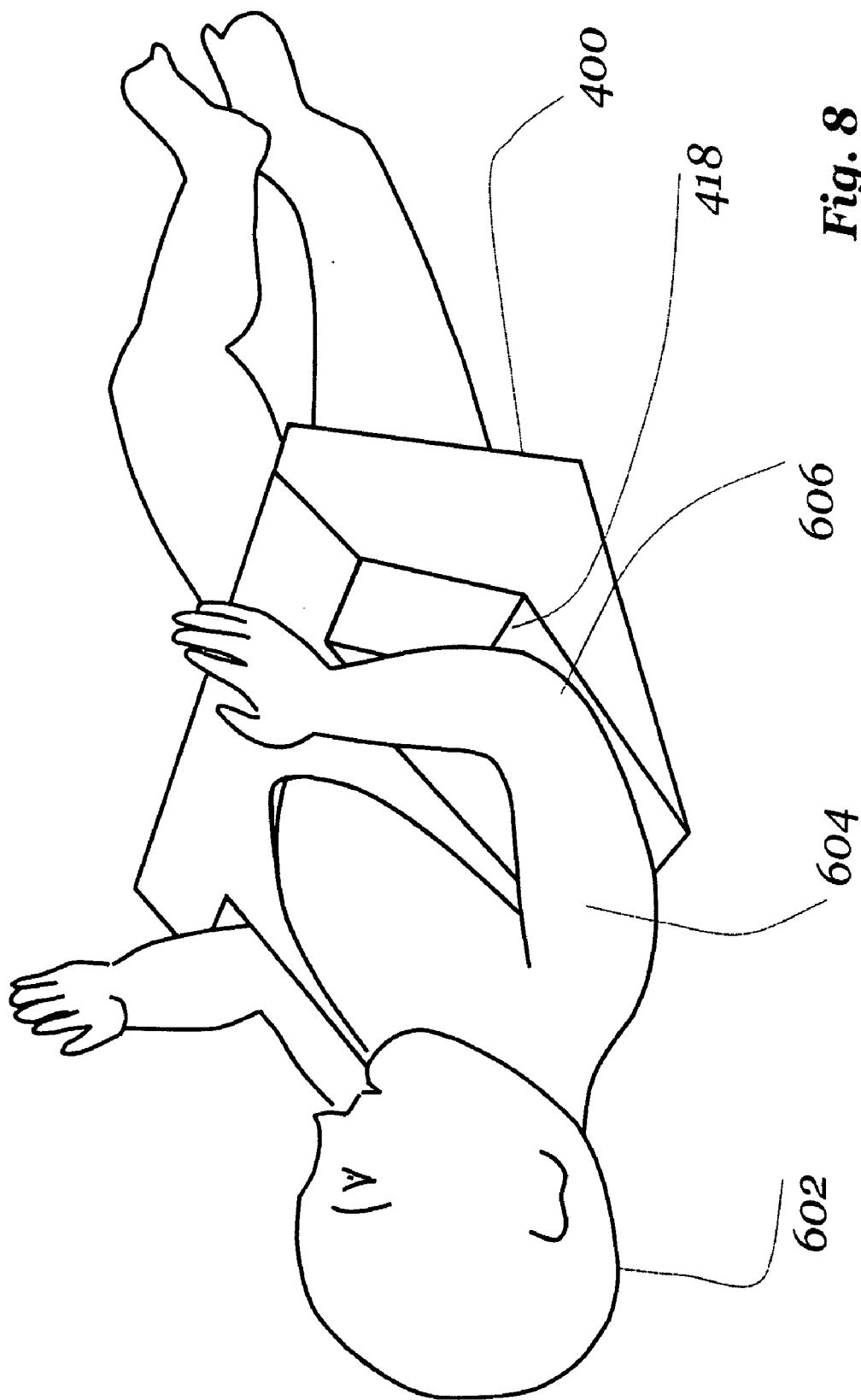


Fig. 7



**Fig. 8**

## DIAPER CHANGING APPARATUS

### BACKGROUND

**[0001]** Changing diapers of a baby or “changing a baby” and other small children not yet toilet trained can be an incredibly frustrating task. Infants typically do not remain still during a diaper change presenting the parent, sibling, or other person the challenge of removing the diaper while simultaneously restraining the infant. Another challenge is that babies have a tendency to reach for the pelvic region upon diaper removal, creating an unpleasant and unsanitary environment. In addition, while changing the diaper, the individual may also want to apply medication, such as diaper rash lotion or medication. Thus it is desirable to limit the baby’s arm motions. Most individuals do not have the dexterity to restrain the body and control the arm motions of a baby while simultaneously changing the diapers.

**[0002]** Accordingly there is a need for an apparatus which is adapted to elevate and position a baby’s arms above the body and away from the pelvic area. Such an apparatus would also ideally help restrain the baby’s body as well. An apparatus which restrains the baby’s unwanted motions while keeping the baby comfortable, occupied and amused is highly desirable.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0003]** The present invention is described with reference to the accompanying drawings. In the drawings, like reference numbers indicate identical or functionally similar elements. Additionally, the left-most digit(s) of a reference number identifies the drawings in which the reference number first appears.

**[0004]** FIG. 1a is a perspective view of a diaper changing apparatus in an unassembled form.

**[0005]** FIG. 1b is a perspective view from the bottom of a diaper changing apparatus in an unassembled form.

**[0006]** FIG. 1c is a perspective view of an alternative embodiment of a diaper changing apparatus in an unassembled form.

**[0007]** FIG. 2 is a perspective view of a diaper changing apparatus in use with a diaper changing table.

**[0008]** FIG. 3 is a perspective view of a diaper changing apparatus assembled.

**[0009]** FIG. 4a is a perspective view of an alternative embodiment of a diaper changing apparatus.

**[0010]** FIG. 4b is a perspective view from the bottom of an alternative embodiment of a diaper changing apparatus.

**[0011]** FIG. 4c is a perspective view of an alternative embodiment of a diaper changing apparatus.

**[0012]** FIG. 5a is a front perspective view of an alternative embodiment of a diaper changing apparatus.

**[0013]** FIG. 5b is a rear perspective view of an alternative embodiment of a diaper changing apparatus.

**[0014]** FIG. 5c is a rear perspective view of an alternative embodiment of a diaper changing apparatus used in conjunction with a changing table.

**[0015]** FIG. 6 is a top view of a diaper changing apparatus in use with a baby.

**[0016]** FIG. 7 is a top view of an alternative embodiment of a diaper changing apparatus in use with a baby.

**[0017]** FIG. 8 is a top view of an alternative embodiment of a diaper changing apparatus showing the use of an elbow shelf.

### BRIEF SUMMARY OF THE INVENTION

**[0018]** Disclosed is a diaper changing apparatus which is adaptable for use on a variety of surfaces. Non limiting examples of suitable surfaces include a mat, bed, changing table, etc. The diaper changing apparatus comfortably elevates and restricts a baby’s arm motions helping keep the diaper changing process sanitary and efficient. In one embodiment the diaper changing apparatus includes a width adaptable mechanism to accommodate babies of varying sizes. The width adaptable mechanism comprises of a pair of base members with a removable means for fastening. The lateral width between the two base members can be modified to accommodate babies of varying sizes. In an alternative embodiment the diaper changing apparatus has a fixed lateral width.

**[0019]** In a further embodiment the diaper changing apparatus comprises at least two base members and one lateral restraining member. The base members are adapted to provide a support base for the restraining member and also to elevate and direct an infant’s arms away from the baby’s pelvic region. The base members also provide structural support for the restraining member in the vertical direction, with the restraining member resting horizontally across the base members in the lateral direction. The restraining member is adapted to fit snugly over the baby’s abdomen area. Thus, the diaper changing apparatus limits the baby’s movements in at least two ways by restraining the baby’s abdomen area and the baby’s arms. In one aspect the restraining member is attached to the base members with a removable fastening means such as Velcro or other suitable method. In operation, the restraining member is adapted to fit snugly, with moderate tension, over the baby’s abdomen/waist area. The baby restraining system is adapted to fit snugly around the infant while providing a high level of comfort not found in the prior art. The diaper changing apparatus is generally constructed of a foam material and can be sheathed in a variety of materials including, but not limited to, cotton, polyester, leather, vinyl or other suitable material. Preferably the material is machine washable.

### DETAILED DESCRIPTION OF THE INVENTION

**[0020]** To aid in the description of the invention references are made herein to “front portion,” “back portion,” and “side portion.” Front portion refers to the portion that faces the baby and is adjacent to the baby’s arms. The baby’s arms will generally rest on the front portion. The back portion generally refers to the portion that is directionally posterior or opposite of the front portion. The side portion generally refers to the area that is lateral to the sides of the front portion. However, it is to be understood that these portions are not sharply delineated.

**[0021]** In one embodiment, as depicted in FIG. 1c, the diaper changing apparatus 100 generally comprises a pair of base member 102 and a lateral restraining member 120. Preferably the base member 102 is about 5-9 inches long, 3-6 inches wide and 3-7 inches high. Base member 102 is generally comprised of two sections. The first section is a wedge shaped portion which comprises the front portion of base member 102 and includes the arm rest portion 106. This first



section generally has a thinner portion which transitions to a thicker portion. The second portion of base member **102** comprises the support structure of base member **102** and is located in the back portion of base member **102**. This second section is generally blocked shaped.

[0022] Referring to FIGS. **1b** and **1c**, base member **102** further comprises of arm rest portion **106**, a top portion **110**, bottom portion **140**, exterior wall **104**, rear portion **142**, interior wall **108** and a fastening portion **112**. Rising from bottom portion **140** in the longitudinal direction, arm rest portion **106** shares a common edge with top portion **110**. Downwards in the longitudinal direction, arm rest portion **106** also has a common edge with bottom portion **140**. Going in the lateral direction, armrest portion **106** shares a common edge with exterior wall **104** on one side and interior wall **108** on the other side, respectively. Rear wall **142**, rising in the lateral direction, has a common edge with top portion **110** in the rear portion. Sinking in the lateral direction, rear wall **142** shares a common edge with bottom portion **140**. In the lateral direction, rear wall **142** shares a common edge with exterior wall **104** on one side and interior wall **108** on the other side, respectively. Arm rest portion **106** is located at the front portion of device **100** and has an oblique angle to comfortably accommodate a baby's arms. In one aspect, arm rest portion **106** has an angle of  $\alpha$ . The angle of  $\alpha$  is 45 degrees in one embodiment. In another embodiment  $\alpha$  is an angle selected between 35 degrees to 75 degrees.

[0023] Base member **102** further comprises of base fastener **112** which is affixed to top portion **110**. Base fastener **112** removably attaches to restraining member fasteners **136** via a fastening means, such as a Velcro fastener (hook and pile) or another suitable mechanism. Fasteners **112** and fasteners **136** are of a predetermined width and length. In one embodiment base fastener **112** can attach to restraining member fastener **136** at different lateral widths, which allows the lateral width between the pair of base member **102** to be adjusted as shown by the directional arrows in FIG. **2**. This adjustability allows the diaper changing apparatus **100** to accommodate babies of varying sizes and to ensure a snug comfortable fit.

[0024] Base member **102** can optionally include an elbow shelf **150** as depicted in FIG. **1a**. Elbow shelf **150** is carved out of the front portion of base member **102** through a series of lateral and longitudinal cuts. A person of ordinary skill in the art could readily determine the appropriate lateral and longitudinal cuts necessary to form the elbow shelf **150**. Elbow shelf **150** comprises of sidewall **114**, resting portion **116** and rear wall **118**. Sidewall portion **114** is triangle shaped with sides  $x$ ,  $y$ , and  $z$ . Side  $x$  has a common edge with arm rest portion **106**. Side  $y$  has a common edge with resting portion **116**. Side  $z$  has a common edge with rear wall **118**. Resting portion **116** is shaped like a rectangle with one side having a common edge with side  $y$  of sidewall portion **114**. The back portion of resting portion **116** shares a common edge with rear wall **104**. In the lateral direction going away from the arm rest portion **106**, resting portion **116** shares a common edge with exterior wall **104**. Rear wall **118** has a common edge with top portion **110** and exterior wall **104**. Elbow shelf **150** is wedge shaped with a thinner first portion which transitions into a thicker second portion. The transition occurs at an angle  $\gamma$ . In one embodiment angle  $\gamma$  is selected from 15 degrees to 45 degrees. In a further embodiment angle  $\gamma$  is 25 degrees.

[0025] In an exemplary embodiment, restraining member **120** is wedge shaped with a triangular cross section. Preferably restraining member **120** is about 13-17 inches wide in the

lateral direction, about 3-5 inches high and about 3-5 inches deep. Restraining member **120** comprises of two oblique portion **122** capped or terminated in the lateral ends by two triangle shaped end portions **124**. The two oblique portions **122** meet to form an apex edge at the top end. Bottom portion **126** has a common edge with the two triangle shaped end portions **124** and the two oblique portion **122**. One of the oblique portion **122** is located at the front portion of the device **100**. The length of restraining member **120** is selected based on the width of an average sized baby. In one embodiment, the length of restraining member **120** is about 14 inches across. Bottom portion **134** further comprises at least two restraining member fasteners **136**. Restraining member fasteners **136**, in one embodiment, are located at the ends of restraining member **102**. Fasteners **136** can removably attach to fasteners **112** at different lateral positions. Thus the pair of base member **102** can be adjusted laterally, thereby adjusting the width of apparatus **100**, to accommodate different size babies.

[0026] In still a further embodiment restraining member **120** further comprises of side straps **126**. Side straps **126** are located on the lateral ends of restraining member **102** and laterally attach restraining member **120** to, for example, a mat to add extra member. Side straps **126** terminate in a quick release buckle **128**, **130**. Side straps **126** can also include an adjustable loop so that the length can be adjusted to accommodate different size mats or surfaces. Such straps are available from a wide variety of manufactures and are commonly seen on luggage items. A person of ordinary skill in the art can readily substitute other suitable type of fasteners in place of the loop and buckle straps. In another aspect, restraining member **120** further comprises a rear fastener **108** which attaches to, for example, a changing table to add extra support. Fastener **108**, in one embodiment, is a hook and pile type fastener. A person of ordinary skill in the art can readily substitute other suitable type of fasteners in place of a hook and pile type fastener. FIG. **2** depicts how straps **126** and buckle **128**, **130** operate in conjunction with a changing table **202**. In an additional aspect, bottom portion **134** has a sleeve **138** which allows straps **126** to be secured to bottom portion **134**.

[0027] Referring to FIG. **3**, restraining member **120** is attached to base member **102** via a Velcro fastener between base fasteners **112** and restraining member fasteners **136** (not shown). In one aspect, the removable nature of the fasteners **112**, **136** allows a user to adjust base members **102** closer together in the lateral direction to accommodate a smaller baby as indicated by the directional arrows of FIG. **3**.

[0028] In operation, when restraining member **120** is attached to base members **102**, a flush member surface **302** is formed between oblique portion **122** of restraining member **120** and the arm rest portion **106** of base member **102**. In one embodiment a baby's arms rest in a comfortable position on flush member surface **302**. The angle of flush member surface **302** is determined by the angle of arm rest portion **106** and oblique portion **122**. When the arms of a baby are placed on flush member surface **302**, the baby's arms are elevated yet remain comfortable.

[0029] In still a further embodiment, diaper changing apparatus **400** is constructed from one piece as depicted in FIGS. **4b** and **4c**. Preferably diaper changing apparatus **400** is about 11-16 inches wide in the lateral direction, about 4-8 inches deep and about 4-8 inches high. The diaper changing apparatus **400** is generally wedge shaped with a thinner front

portion transitioning to a thicker back portion. An arch shaped opening 408 is centered on the lateral axis. The arch shaped opening is flanked by a pair of armrest 402. In further detail, diaper changing apparatus comprises of interior sidewall 410 which is formed when an arch shaped opening is carved out from the wedge. Rising from bottom portion 422, arm rest portion 402 rises at an angle  $\beta$  and terminates at an upper edge with top portion 434. Laterally armrest portion 402 has a common edge with a pair of exterior wall 404 on either side. Exterior wall 404, rear wall 420, and bottom portion 422 add structural rigidity to the diaper changing apparatus 400. In one embodiment, angle  $\beta$  is about 45 degrees. In another embodiment, angle  $\beta$  is selected between 25 degrees to 75 degrees. In another aspect, fastening strips 424 are affixed to bottom portion 422. Fastening strips 424 can be used to provide extra gripping power for use with a mat as depicted in FIG. 4b. Diaper changing apparatus 400 is used in conjunction with a mat 430. In operation a baby is placed on mat 430. A user secures apparatus 400 to mat 430 via fasteners 424 and 432. Fasteners 424 and 432, in one embodiment are made from Velcro. In an alternative embodiment apparatus 400 rests upon a mat, bed, carriage etc., without any fasteners.

[0030] Diaper changing apparatus 400, in a further embodiment, comprises of an elbow shelf carved out from armrest 402 as depicted in FIG. 4a. Elbow shelf 418 is similar to elbow shelf 150 of FIG. 1a. Elbow shelf 418 is carved out from the edges of armrest portion 402 through a series of lateral and longitudinal cuts. Based on FIG. 4a, a person of ordinary skill in the art could readily determine the appropriate lateral and longitudinal cuts necessary to form elbow shelf 418. Elbow shelf 418 comprises of sidewall portion 416, resting portion 412 and rear wall 414. Sidewall portion 416 is triangle shaped with sides x, y, and z. Side x has a common edge with arm rest portion 402. Side y has a common edge with resting portion 412. Side z has a common edge with rear wall 414. Resting portion 412 is shaped like a rectangle with one side having a common edge with side y of sidewall portion 416. The back portion of resting portion 412 shares a common edge with rear wall 414. In the lateral direction going away from the arm rest portion 402, resting portion 412 shares a common edge with exterior wall 404. The upper edge of rear wall 414 has a common edge with armrest portion 402. The side edge of rear wall 414 has a common edge with exterior wall 404. Elbow shelf 418 is wedge shaped with a thinner first portion which transitions into a thicker second portion. The transition occurs at an angle  $\gamma$ . In one embodiment angle  $\gamma$  is selected from 15 degrees to 45 degrees. In a further embodiment angle  $\gamma$  is 25 degrees.

[0031] FIGS. 5a, 5b, and 5c depicts a further embodiment. Diaper changing apparatus 500 is similar to diaper changing apparatus 400 except that the bottom portion, exterior wall and rear portion have been trimmed. Preferably diaper changing apparatus 500 is about 11-16 inches wide in the lateral direction, about 4-8 inches deep and about 4-8 inches high. This allows diaper changing apparatus 500 to work with the widely available diaper changing table 520 which contains a restraining strap 518 as depicted in FIG. 5c. Diaper changing apparatus, in one embodiment, has an arch opening 506 with two flanking arm rest portion 504. The two armrest portion 504 has an angle d which, in one embodiment, is selected from 25 degrees to 75 degrees. In one aspect, angle d is 45 degrees.

[0032] The pair of arm rest portion 504 are part of a pair of pillar structure 522 supporting the arch opening 506 on either

side of the arch. The pillar structure 522 comprise of a base member 502, exterior side wall 510, rear wall 508, and interior wall 512. Pillar 522 is supported below by base member 502. An interior sidewall 512 is formed when arch opening 506 is carved out from the wedge. Referring to FIG. 5b, exterior sidewall 510 rises from base member 502 and shares a common edge with arm rest portion 504 in the front portion and with rear wall 508 in the back portion. Rising from base member 502, rear wall 508 shares a common edge with interior sidewall 512. A pillar angle e occurs at the intersection of base member 502, exterior wall 510 and rear wall 508. In one embodiment pillar angle e is an oblique angle selected from 95 degrees to 135 degrees. In a further embodiment, pillar angle e is 115 degrees. In one aspect, a plurality of fastening means 516 are located on back portion 514 and rear wall 508, to secure diaper changing apparatus 500 to restraining strap 518 located on table 520 as depicted in FIG. 5c. Fastening means 516, in one embodiment, are of the Velcro variety.

Example 1

[0033] In operation an individual would assemble the diaper changing apparatus 100 as shown in FIG. 2. Referring to FIG. 6, with the baby 602 positioned horizontally, the individual places the diaper changing apparatus 100 snugly around the baby, appropriately adjusting the base members 102 laterally to ensure a snug fit. The restraining member 120 fits snugly with some tension atop the baby's abdomen or waist area. The pair of base member 102 fit snugly on either side of the baby as depicted in FIG. 6, with interior portion 108 resting adjacent to sides of baby 602. The baby's arms rest comfortably on flush support surface 302. In one aspect side fasteners 126 are attached to the diaper changing surface on the left and right sides, as depicted in FIG. 6. The individual proceeds to change the baby's diapers. Alternatively diaper changing apparatus 500 is used in a similar manner. In another embodiment, device 100 is used with a widely available diaper changing table 502 as depicted in FIG. 5. Side fasteners 106 are used to attach device 100 to table 502.

Example 2

[0034] As depicted in FIG. 8, diaper changing apparatus 400 is used in a similar manner as in Example 1 to assist a user in changing a diaper. In this embodiment, the elbow shelf 418 is used to elevate and limit the baby's arms 604 motion. In a similar manner, elbow shelf 150 of apparatus 100 can be used to elevate and limit the motion of a baby's arms.

CONCLUSION

[0035] While various embodiments of the present invention have been described above, it should be understood that they have been presented by the way of example only, and not limitation. It will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined. Thus, the breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments

What is claimed is:

1. A diaper changing apparatus for use with a baby comprises:
  - a. a lateral restraining member having a first front sloped portion facing the baby and a bottom portion;
  - b. a first means for fastening affixed to said bottom portion;

- c. a plurality of base members having a second front sloped portion facing the baby and a top portion;
  - d. a second means for fastening affixed to said top portion; and
  - e. wherein upon attachment of said lateral restraining member to said plurality of base members, said first front sloped portion and said second front sloped portion form a planar surface with an angle selected between 25 to 75 degrees.
2. The diaper changing apparatus of claim 1 wherein said angle is 45 degrees.
3. The diaper changing apparatus of claim 1 wherein said first means for fastening comprises of two hook and pile type fasteners located at the two lateral ends of said bottom portion.
4. The diaper changing apparatus of claim 1 wherein said first means for fastening comprises of two hook and pile type fasteners located at the two lateral ends of said bottom portion.
5. The diaper changing apparatus of claim 1 wherein said bottom portion includes a sleeve for accepting side straps.
6. The diaper changing apparatus of claim 1 wherein said second front slope portion comprises an arm rest.
7. The diaper changing apparatus of claim 6 wherein said arm rest comprises an elbow shelf adjacent to said arm rest.
8. The diaper changing apparatus of claim 7 wherein said elbow shelf comprises:
- a. a sidewall portion, a resting portion, and a rear wall; and
  - b. wherein said sidewall portion comprises a first side, a second side and a third side forming a triangle.
9. The diaper changing apparatus of claim 1 wherein said lateral restraining member and said plurality of base members are made from foam.
10. The diaper changing apparatus of claim 9 wherein said foam is sheathed in a material selected from cotton, vinyl, polyester, plastic or leather.
11. A diaper changing apparatus for a baby comprises:
- a. a wedge shaped foam having a thin front portion facing the baby transitioning into a thicker back portion and a bottom portion;
  - b. an arch portion located centrally along the lateral axis of said wedge shaped foam;
  - c. a first and second armrest portions flanking the arched portion; and
  - d. wherein said armrest portion has an angle selected between 25 to 75 degrees.
12. The diaper changing apparatus of claim 11, wherein said angle is 45 degrees.
13. The diaper changing apparatus of claim 11 wherein a means for fastening is affixed to said bottom portion.
14. The diaper changing apparatus of claim 13 wherein said means for fastening is a hook and pile type fastener.
15. A diaper changing apparatus for use with a baby comprising:
- a. a wedge shaped foam with an arch shaped opening flanked by a pair of pillar located on either side arch shaped opening and a back portion;
  - b. said pair of pillar each comprising a arm rest portion, a base member, a exterior wall, a rear wall and an interior wall;
  - c. wherein said arm rest portion has an angle selected from 25 to 75 degrees;
  - d. wherein a pillar angle is formed where said base member, said exterior wall and said rear wall intersect; and
  - e. said pillar angle is selected from 95 degrees to 135 degrees.
16. The diaper changing apparatus of claim 15 wherein said arm rest portion is 45 degrees.
17. The diaper changing apparatus of claim 15, wherein said pillar angle is 115 degrees.
18. The diaper changing apparatus of claim 15 comprising a plurality of means for fastening located on the rear wall and back portion.
19. The diaper changing apparatus of claim 18 wherein said means for fastening are hook and pile type fasteners.

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