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(54) **ARRANGEMENT FOR ADJUSTING THE HEIGHT OF A CARRIER MEANS**

(75) Inventor: **Bettina Lindbloom**, Helsinki (FI)

Correspondence Address:
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747 (US)

(73) Assignee: **BABYIDEA OY**, Vantaa (FI)

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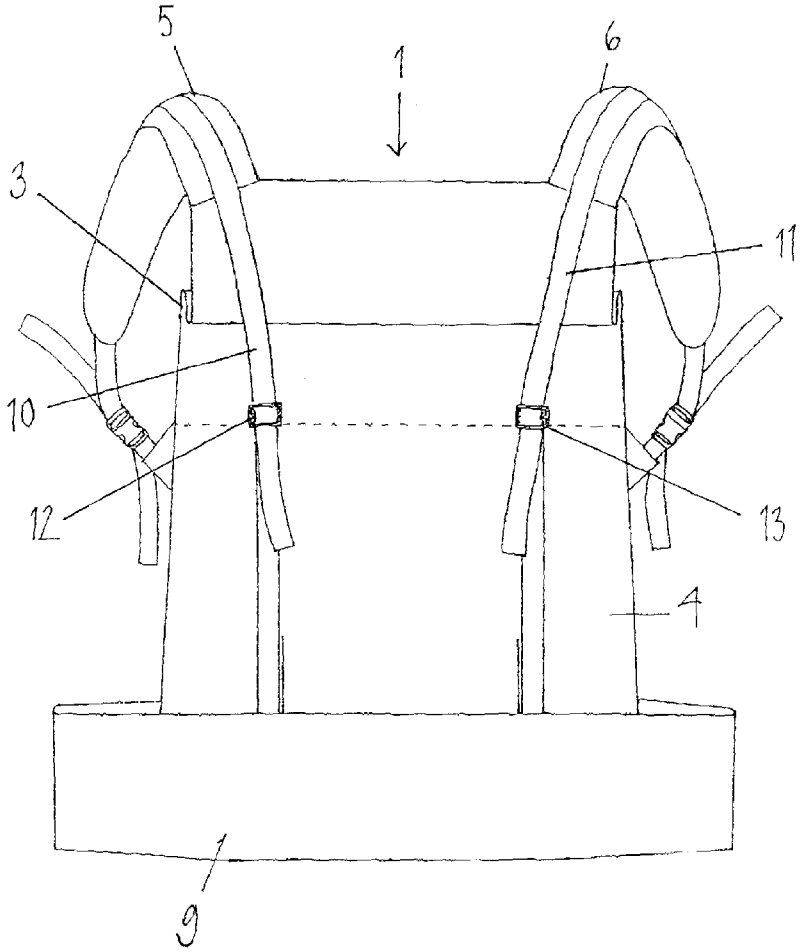
(57) **ABSTRACT**

This invention relates to an arrangement for adjusting the height of a carrier (**1**), which carrier (**1**) includes at least a carrying section (**2**) intended for carrying a child, upper support elements (**5**, **6**) attached to the carrying section and placed over the wearer's shoulders, and lower support elements (**7-9**) to be placed around the wearer's body. The carrying section (**2**) is equipped at least with essentially webbing like adjustment elements (**10**, **11**, **14**), with which the multi-stepped or stepless height adjustment is designed to be carried out.



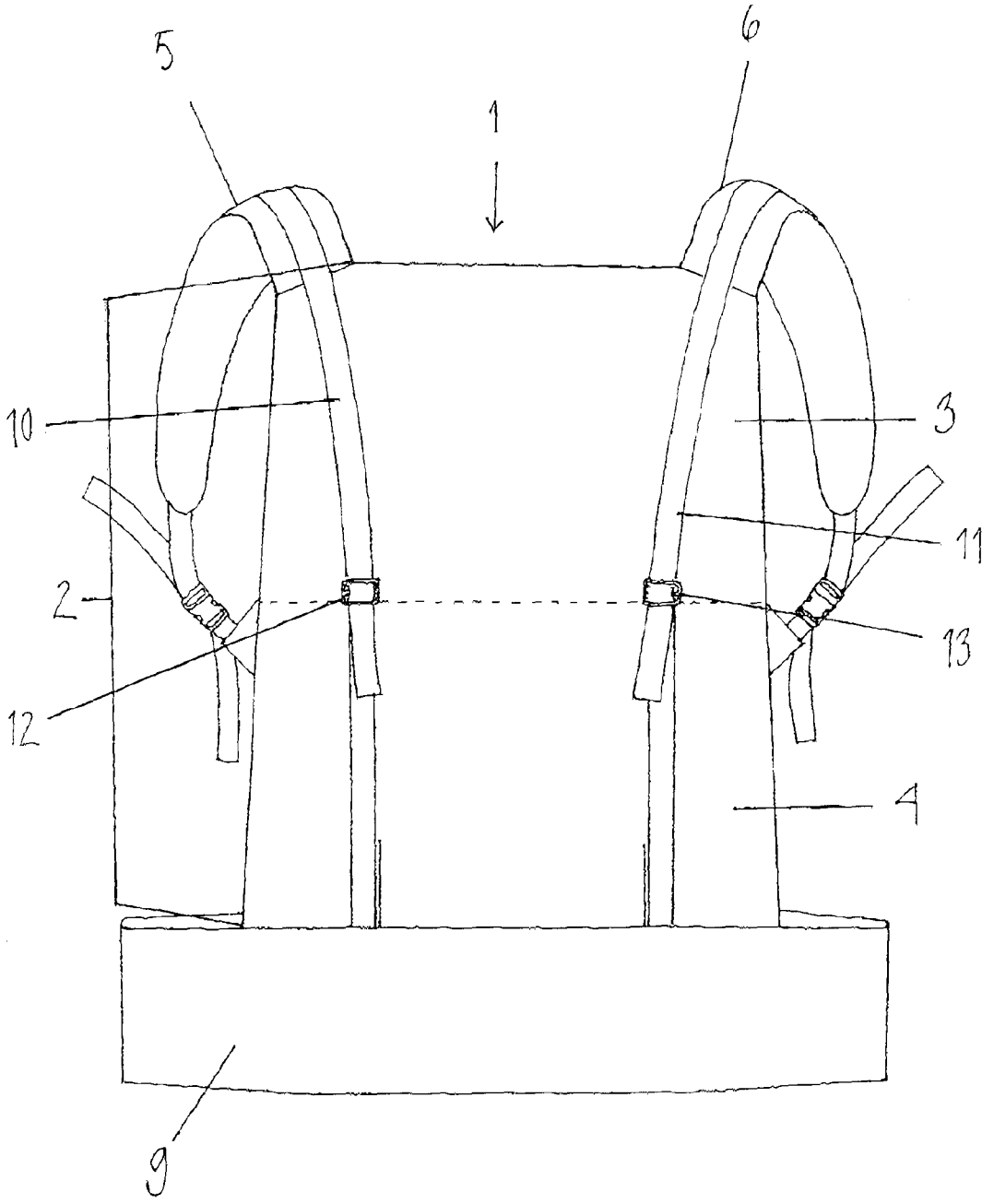


Fig. 1

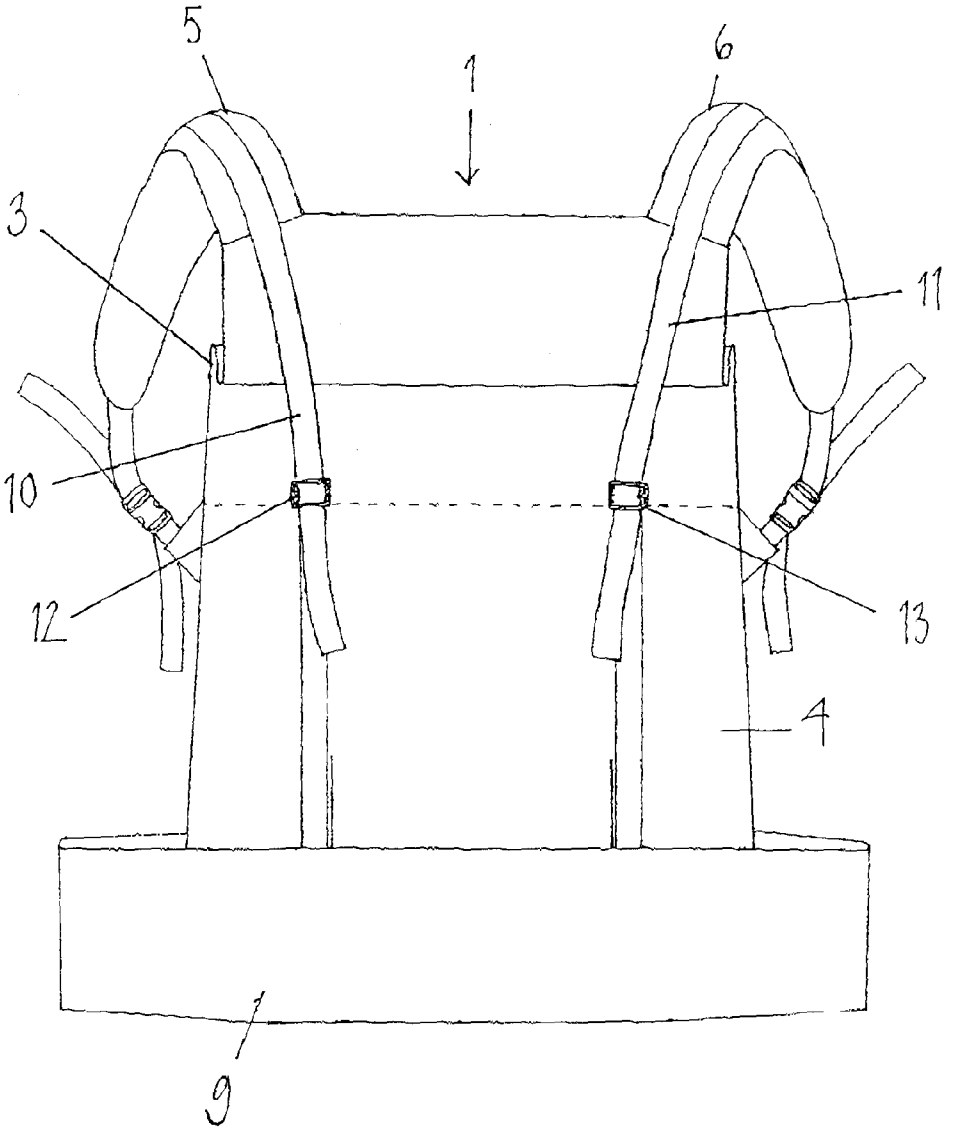


Fig. 2

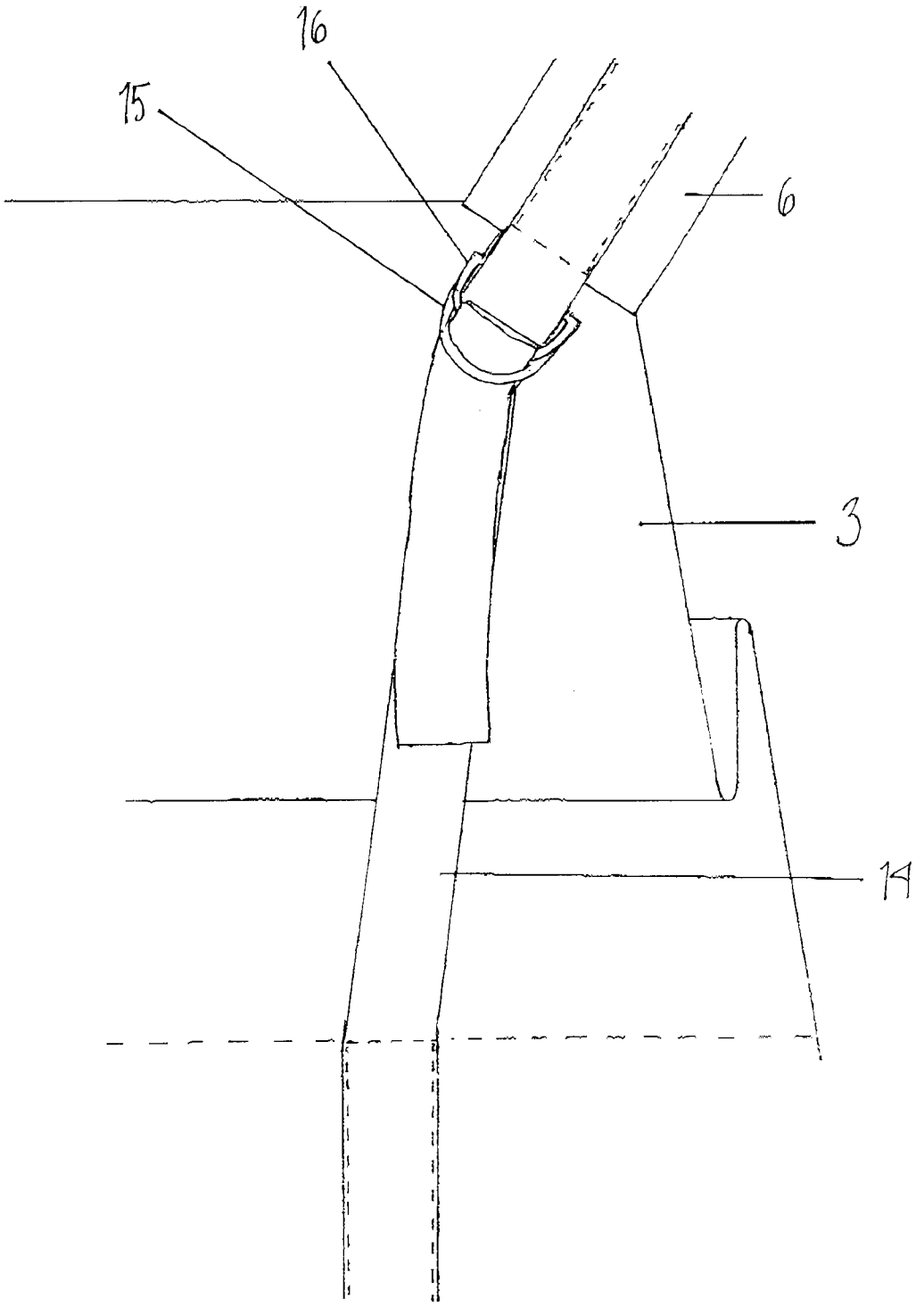


Fig. 3

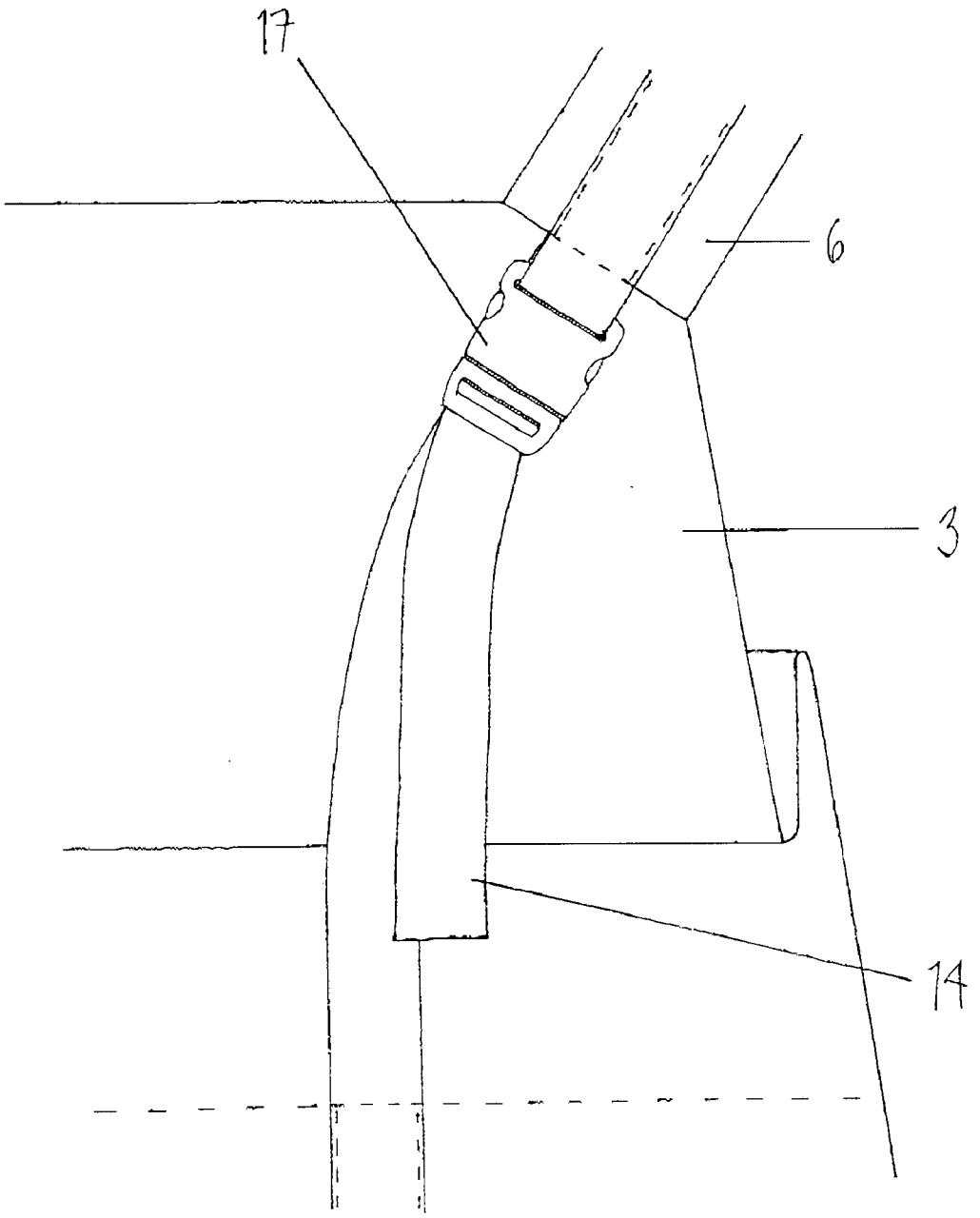


Fig. 4

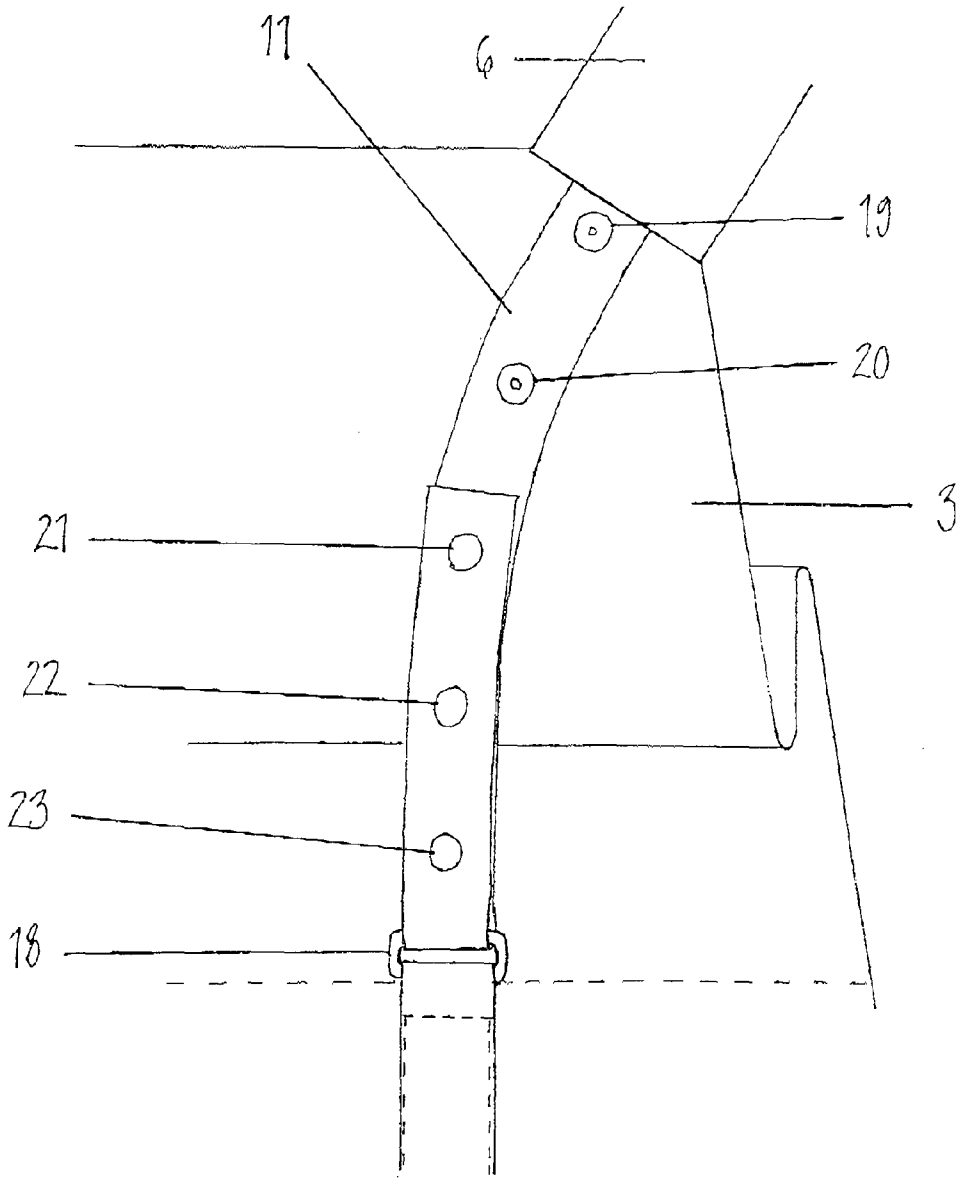


Fig. 5

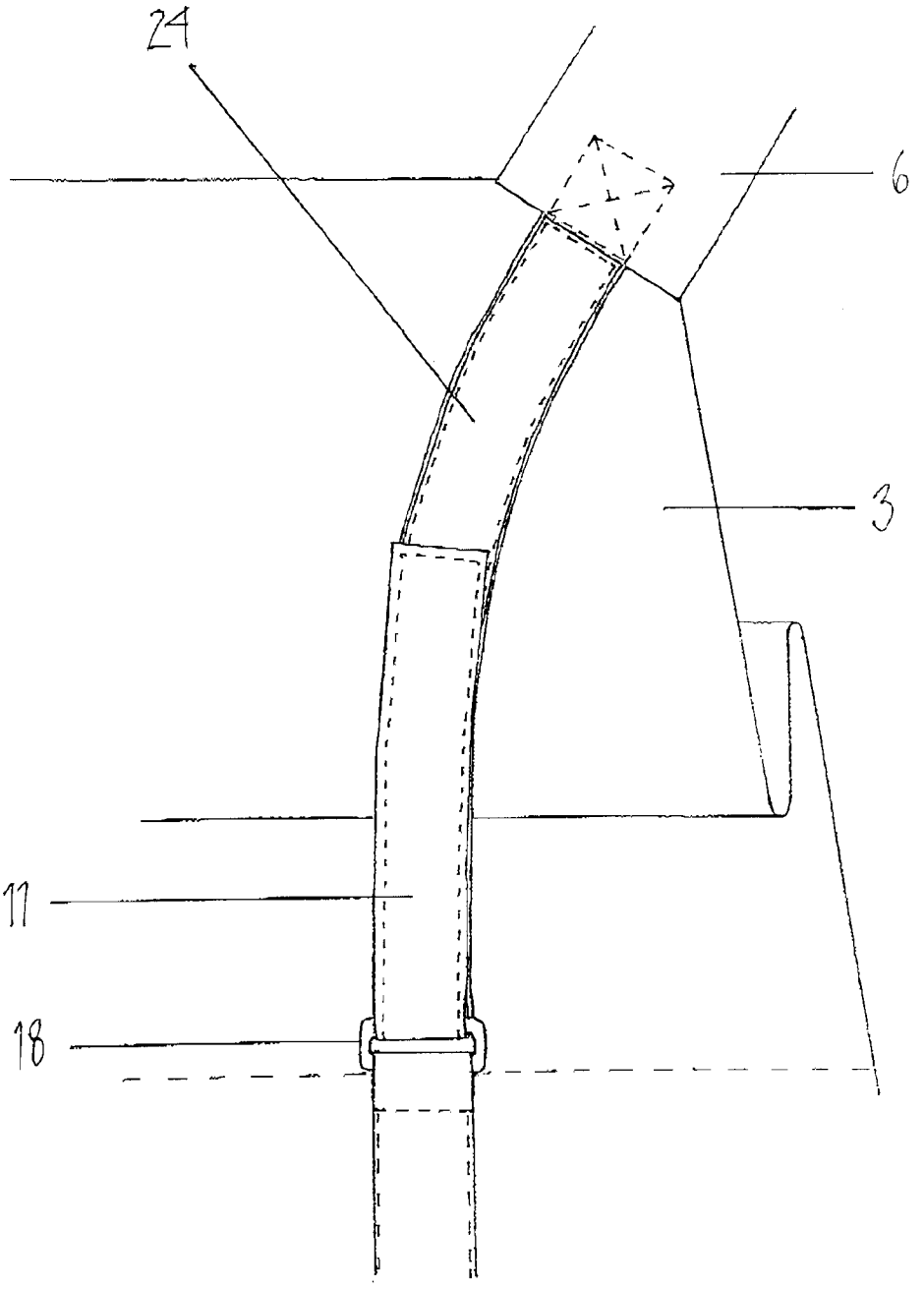


Fig. 6

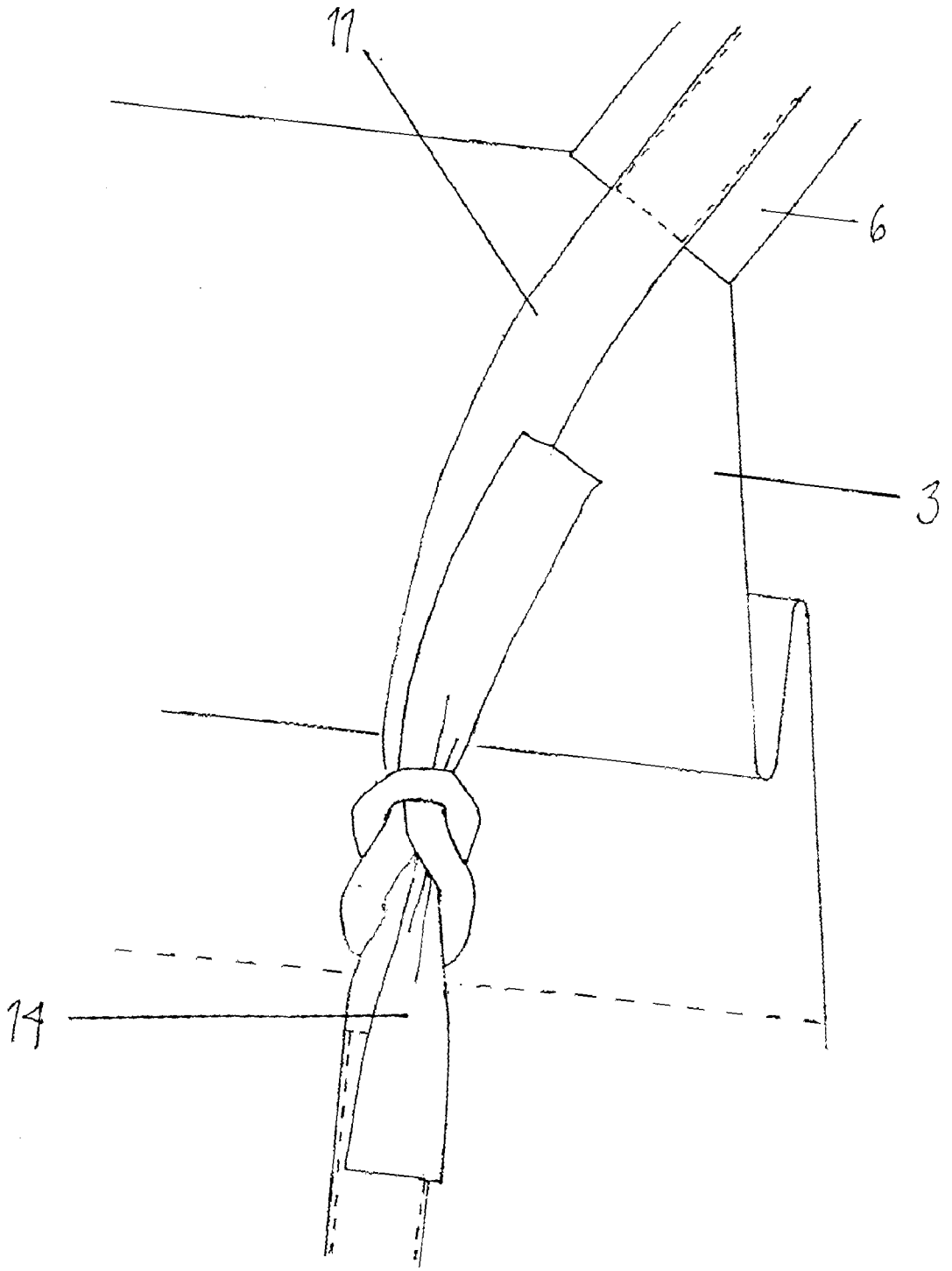


Fig. 7

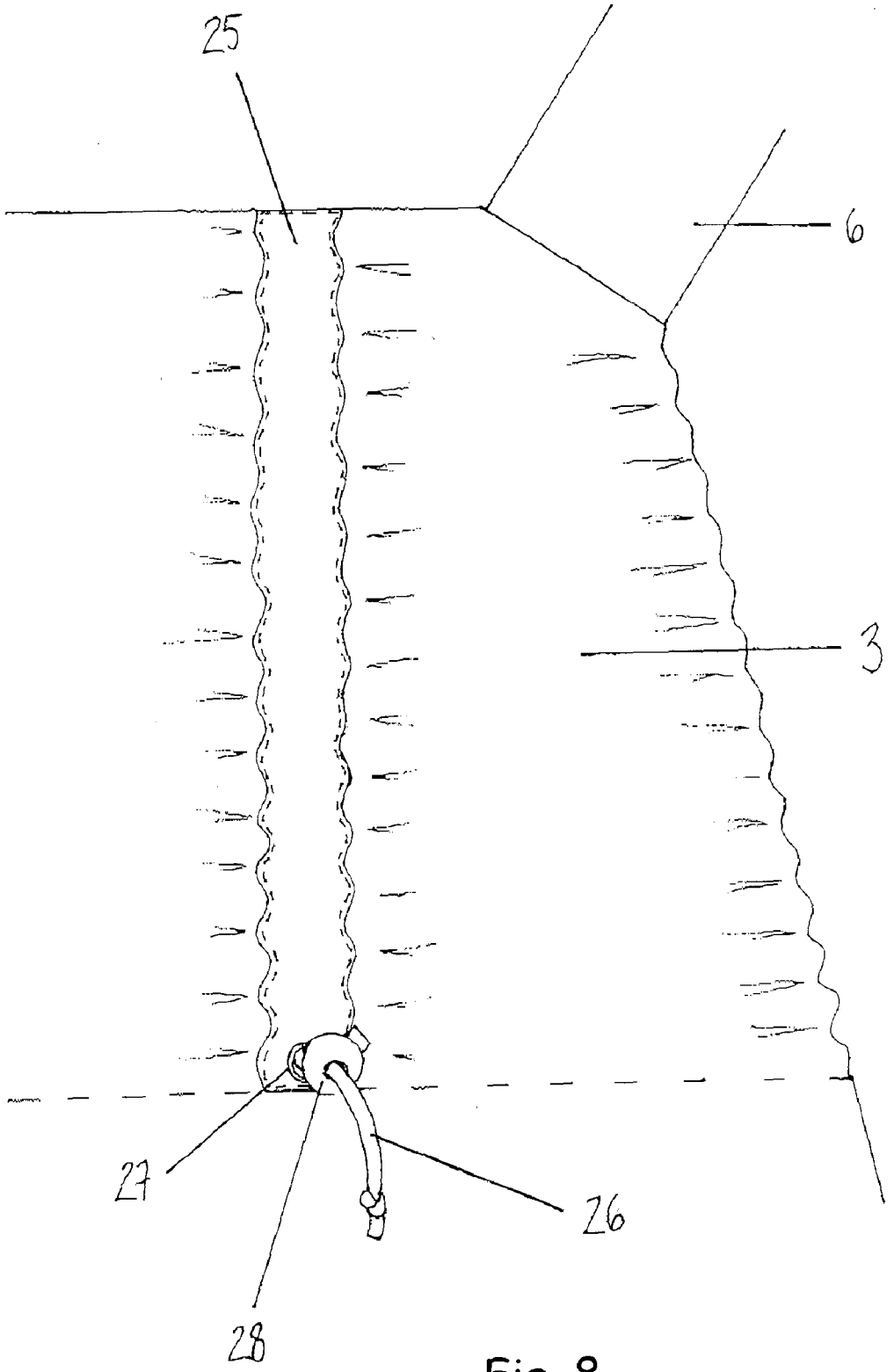


Fig. 8

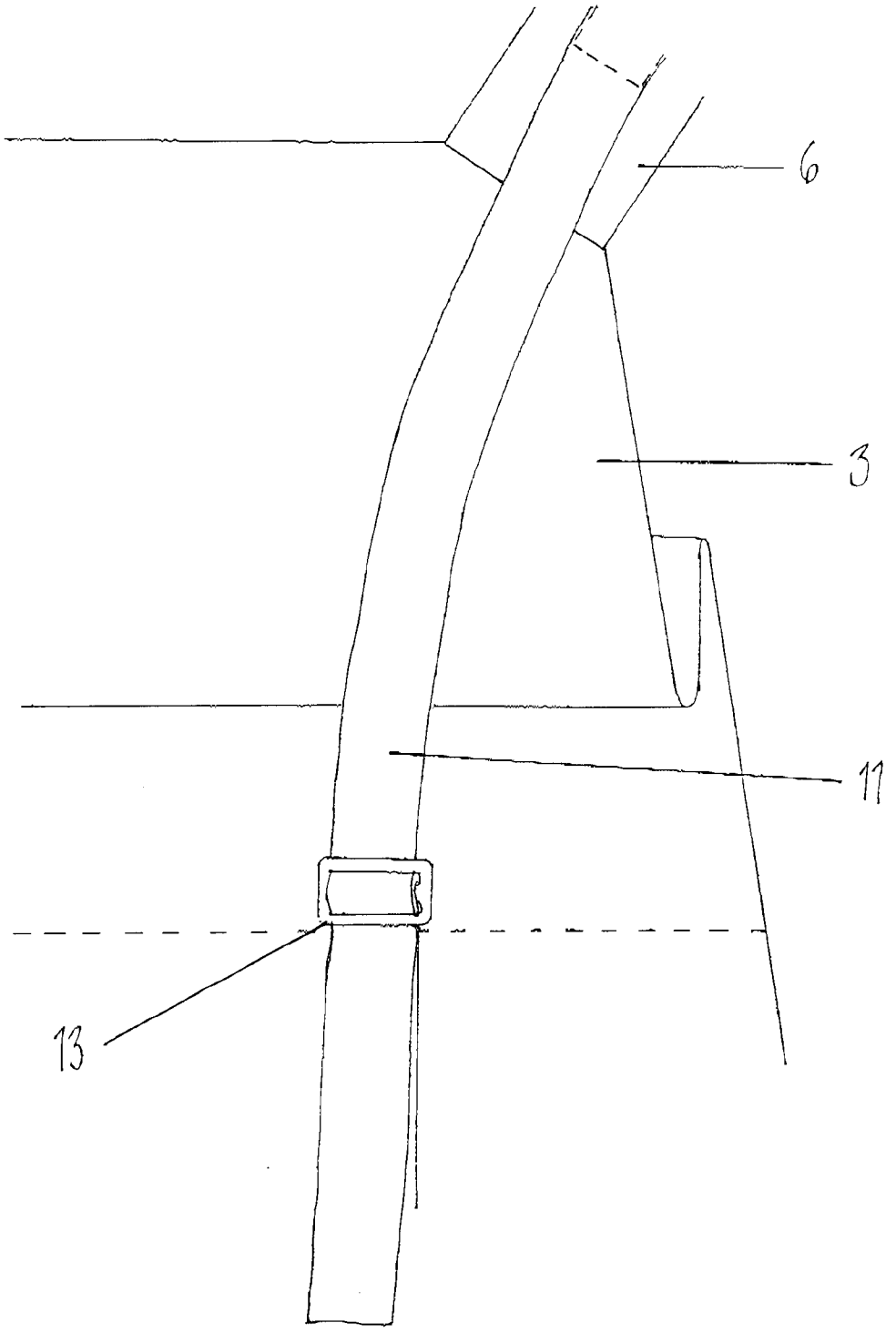


Fig. 9

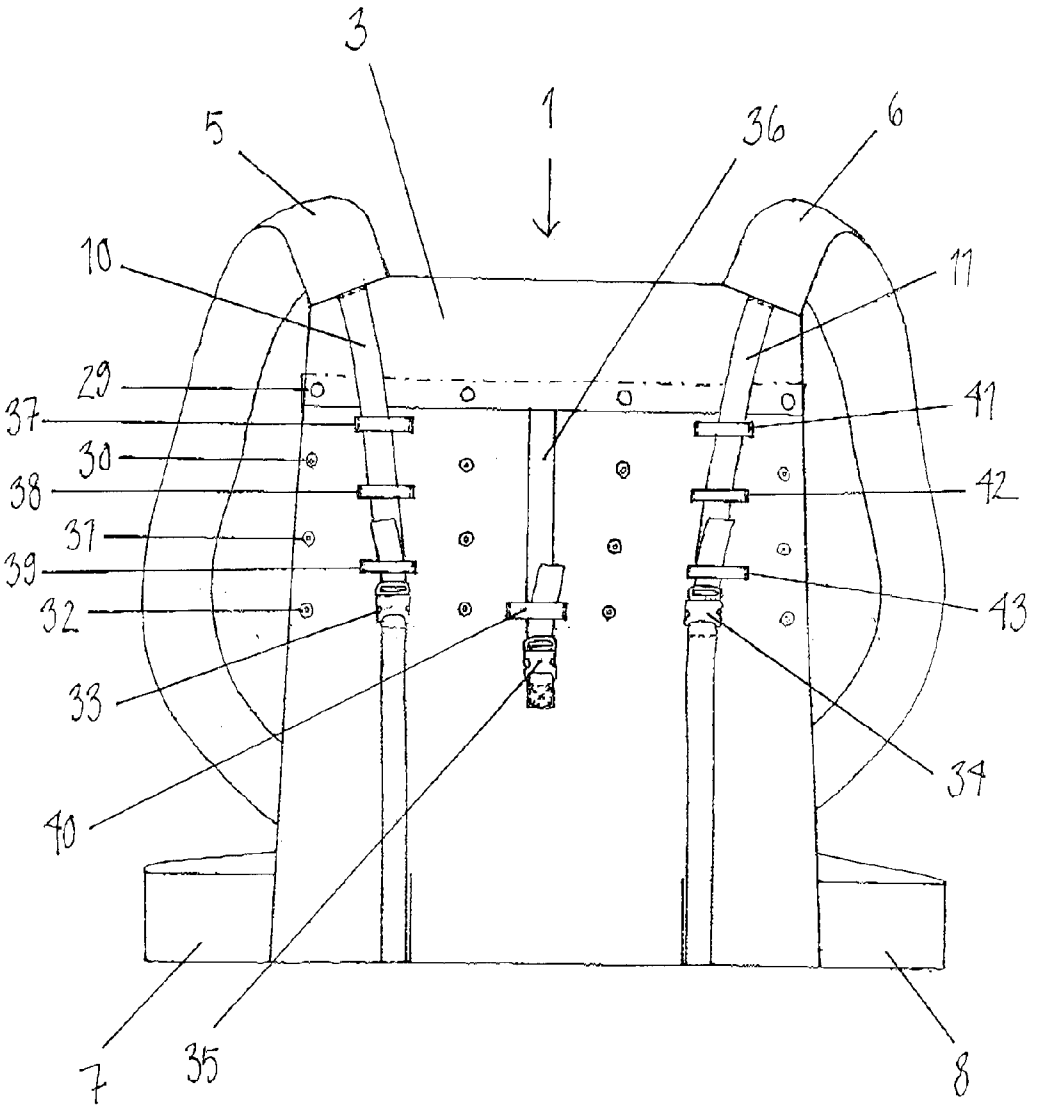


Fig. 10

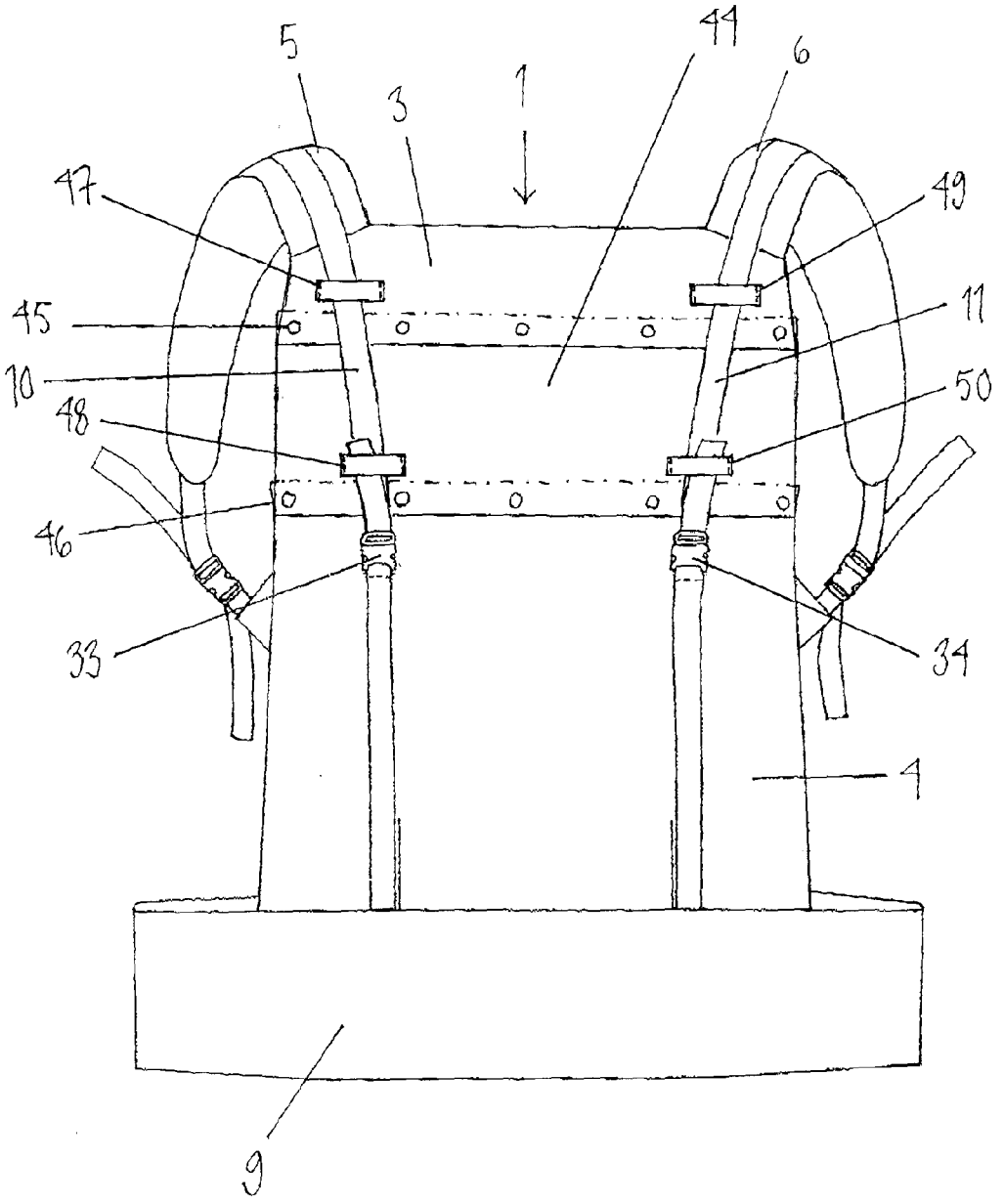


Fig. 11

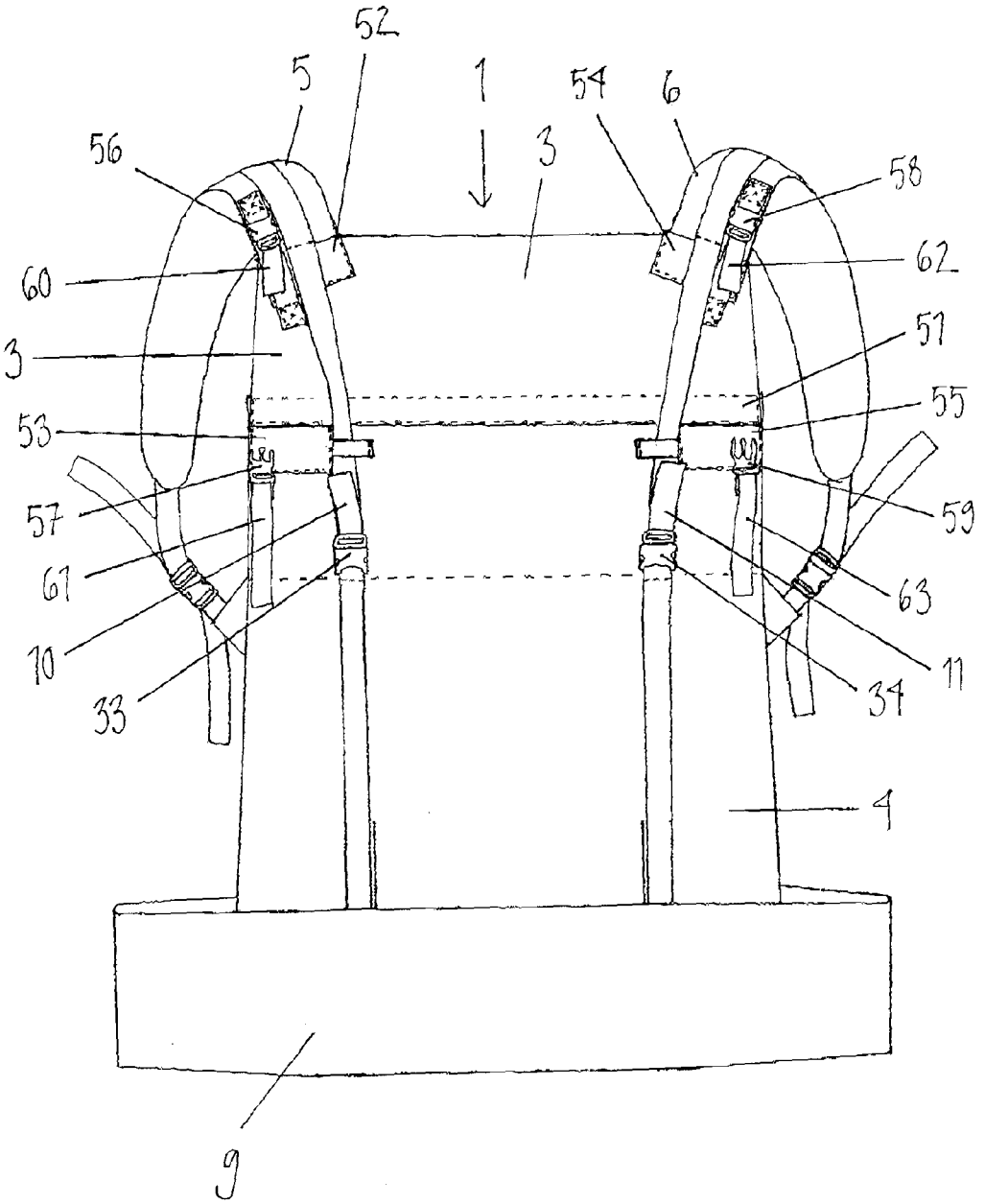


Fig. 12

ARRANGEMENT FOR ADJUSTING THE HEIGHT OF A CARRIER MEANS

[0001] The present invention relates to the arrangement described in the preamble of claim **1** for adjusting the height of a carrier, which carrier is intended particularly for carrying a child on an adult's front, back, or hip. The carrier has been supplied with a height adjustment of the carrying section, to make the same carrier ergonomically suitable for infant babies as well as for larger toddlers well until their pre-school years.

[0002] In prior art, various fabrics or their combinations are used for sewing carriers in a form of, for instance, a back carrier, a front carrier or a mei, with upper straps, which go over the wearer's shoulders, as well as lower straps or a hip belt, which are attached around the waist or hip, and occasionally also other straps such as a chest strap, which holds the upper straps in place. Between the straps there is a carrying section that can be realized in various ways, formed a little e.g. into a shape of a cup or into a rectangle or square. Ergonomically, the carrying section should support the child's back all the way up. This is particularly important for a small baby and for a baby who is sleeping or moving actively in the carrier, in order for the carrier to be safe for the baby and for the carrying to be pleasant for the wearer and to the baby. When the carrying section supports the child's back all the way up, or at least up to the level of the arms, the mass centre of the child stays close to the wearer. During the most active carrying period, from newborn to about two-year-old, the child will grow by dozens of centimetres. Furthermore, carriers are often used occasionally for carrying larger children, for instance on longer distances, at airports or while hiking, and for handicapped or other children with special needs. Most carriers according to prior art make compromises regarding the height of the carrying section to make it suitable for children aged approximately six to eighteen months. This makes it too high for small babies and too low for larger children. Thus a carrier that is suitable for a twelve-month-old is not suitable for ergonomic carrying of a small baby or a larger child. For some carriers, the problem has been solved by adding a separate inner part for smaller babies. This adds to the fabric layers of the carriers, which is undesirable in hot weather, warm climates or indoor use. Nor does the separate inner section solve the problem in terms of the ergonomics of carrying larger children. Other carriers are sold in various sizes, in which case a family has to buy several carriers for a same child or an own carrier for each child of a various age.

[0003] The object of this invention is to remove the disadvantages described above and to achieve an advantageous and easily modifiable, reliable and ergonomic arrangement for adjusting the height of a carrier intended particularly for carrying children, where the height can be increased as a child grows. The arrangement according to the invention is characterised by what is disclosed in the characterisation part of claim **1**. Other embodiments of the invention are characterised by what is disclosed in the other claims.

[0004] The advantages of the arrangement according to the invention include the fact that the height adjustment of the carrier's carrying section is multistepped or stepless, which allows the height to be increased easily as the child grows. Another benefit of the height adjustment of the arrangement according to the invention is that the same carrier is optimally suitable for children of different sizes, meaning that a family, or e.g. a children's private day care or a day-care centre, does not have to purchase several carriers, if the children are carried at different times. The height adjustment of the carrying section can be a fixed part of the carrier or an additional piece or a removably fastened upper part. The height adjustment according to the invention is suitable for different carrier models, including back carriers, front carriers and square cloths—i.e. any equipment with a carrying section that supports the back or the front part of the child to be carried. The height adjustment according to the invention also enables the same carrier to be realized so that the child can be carried facing forward, because in such a position the height of the carrying section must be lower than when the child is carried facing the wearer. In addition, the height adjustment of the carrying section is useful when the baby is carried not only in vertical position but also in L-shaped or reclining position in the same carrier.

[0005] In the following, the invention will be described in more detail by the aid of embodiment examples with reference to the attached drawings, wherein

[0006] FIG. **1** presents an arrangement according to the invention for stepless height adjustment of a carrier, adjusted to the maximum height and viewed from the backside of the carrier,

[0007] FIG. **2** presents a stepless height adjustment of a carrier according to the invention adjusted to a smaller height and viewed from the backside of the carrier,

[0008] FIG. **3** presents an alternative detail of FIG. **2**, where the adjustment means consist of webbings and D-rings,

[0009] FIG. **4** presents an alternative detail of FIG. **2**, where the adjustment means consist of webbings and buckles,

[0010] FIG. **5** presents an alternative detail of FIG. **2**, where the adjustment means consist of webbings, buckles and snap fasteners,

[0011] FIG. **6** presents an alternative detail of FIG. **2**, where the adjustment means consists of a buckle and a Velcro tape sewn on a webbing,

[0012] FIG. **7** presents an alternative detail of FIG. **2**, where the adjustment means consist of webbings that can be tied to each other,

[0013] FIG. **8** presents an alternative detail of FIG. **2**, where the adjustment means consist of a cord that runs inside a channel, a reinforcement ring and a cord lock,

[0014] FIG. **9** presents an alternative detail of FIG. **2**, where the webbings used as the adjustment means begin higher, near from the upper straps,

[0015] FIG. **10** presents a multistepped height adjustment of a carrier according to the invention, viewed from the back side of the carrier, where the upper part of the carrier is removably fastened and where the adjustment and attachment means consist of snap fastener rows, buckles and webbings, and also support loops,

[0016] FIG. **11** presents a stepless height adjustment of a carrier according to the invention, viewed from the back side of the carrier, where in the carrying section there is a removably fastenable additional piece with snap fastener rows as attachment elements, and where the adjustment means consist of buckles and webbings, and also support loops, and

[0017] FIG. **12** presents a stepless height adjustment of a carrier according to the invention, viewed from the back side of the carrier, where the adjustment means consist of buckles and webbings and where there is a removably fastened upper part with snap fastener tape as the attachment means.

[0018] A multistepped or stepless height adjustment has been developed for the carrier according to the invention. FIG. **1** presents a carrier **1** according to the invention, viewed from the backside of the carrier, i.e. from the outside, with the carrier hanging freely open. In this case the carrier would be positioned between the viewer and the wearer of the carrier. The carrier **1** comprises at least a carrying section **2**, upper

support elements **5** and **6**, such as upper straps placed on the wearer's shoulders, i.e. carrying straps. In addition, the carrier has at least lower support elements to be adjusted around the wearer's body, which elements consist for example of a hip belt **9** or for example of lower straps **7** and **8** presented in FIG. **10**, or for example of both a hip belt **9** and lower straps **7** and **8**. The carrying section **2** in between the upper support elements **5** and **6** can be realized in various ways, formed a little e.g. into a shape of a cup or into a rectangle or square.

[0019] FIG. **1** presents a stepless height adjustment of the carrier **1** according to the invention adjusted to the maximum height. The height of the carrying section **2** has been fitted to be adjusted with webbings **10**, **11** acting as adjustment elements and with buckles **12**, **13** acting as adjustment means, which webbings and buckles are placed in between the upper support elements **5** and **6**, which are attached to the top edge of the hip belt **9** and to the top edge of the upper part **3** of the carrying section **2**. Each adjustment element consists at least of an upper webbing part, which is essentially attached near to the top edge of the upper part **3** of the carrying section **2** by its top end, and of a lower webbing part, which is attachable to the upper webbing part with the adjustment means, and which is attached by its lower end to the lower support elements, such as the hip belt **9** or the lower straps **7**, **8**.

[0020] FIG. **2** presents the carrier according to FIG. **1**, where the stepless height adjustment is adjusted to a smaller height, in which case the upper part **3** of the carrying section **2** is slightly folded towards the hip belt **9**.

[0021] FIGS. **3-9** present alternative details of the embodiment presented in FIG. **2**. In the solution according to FIG. **3** the adjustment elements consists of webbings **14** and the adjustment means consist of D-rings **15**, **16** instead of buckles. Respectively, FIG. **4** presents a height adjustment solution, in which the adjustment elements consists of webbings **14** and the adjustment means consist of lockable buckles **17**. In the solution presented in FIG. **5** the adjustment elements consists of webbings **11** and the adjustment means consist of buckles **18** and snap fasteners **19-23**. Respectively, FIG. **6** presents a solution, in which a Velcro tape **24** and a buckle **18** acting as adjustment means has been sewn on to the webbing **11** acting as the adjustment element. In the solution according to FIG. **7** the adjustment elements consists of webbings **11**, **14** that can be tied to each other, and in the embodiment presented in FIG. **8** the adjustment element consists of a cord **26** that runs inside a channel **25** and the adjustment means consist of a reinforcement ring **27** and a cord lock **28**. FIG. **9** presents another solution, where the webbings **11** acting as the adjustment elements begin higher, near from the upper straps **5**, **6**.

[0022] FIG. **10** presents a multistepped height adjustment of the carrier **1** according to the invention, where the upper part **3** of the carrier **1** is removably fastened and where the adjustment and attachment means consist of snap fastener rows **29-32** and buckles **33-35** and the adjustment elements consist of webbings **10**, **11**, **36** and also support loops **37-43**. Respectively, FIG. **11** presents a stepless height adjustment of the carrier **1** according to the invention, where in the carrying section **2** there is a removably fastenable additional piece **44** with snap fastener rows **45**, **46** as attachment elements. In the solution according to FIG. **11** the adjustment means consist of buckles **33**, **34** and the adjustment elements consist of webbings **10**, **11** and also support loops **47-50**. FIG. **12** presents yet another stepless height adjustment solution of the carrier **1** according to the invention, where the adjustment means consist of buckles **33**, **34** and the adjustment elements consist of webbings **10**, **11**. In the carrier **1** there is a removably fastened upper part **3** with snap fastener tape **51** as the attachment means. In the carrier **1** there are also removably fastened upper straps **5**, **6** with pockets **52-55** and buckles **56-59** and webbings **60-63** as the attachment means.

[0023] The multistepped or stepless height adjustment of the carrier **1** according to the invention, which carrier **1** is intended for carrying a child, consists of webbings, thongs or straps acting as the adjustment elements **10**, **11** and **14**, which are placed on top of/under the carrying section **2** or in between its fabric layers, and of various adjustment means **12**, **13**, **15-24**, **26**, **29-34**. The adjustment means include various buckles **12**, **13**, **17**, **33-34**, snap fasteners **19-23**, **29-32**, snap fastener tape, Velcro tape **24**, buttons or rings **15**, **16**. For example, there can be one or several webbings acting as adjustment elements. Each adjustment element consists at least of an upper webbing part, which is essentially attached near to the top edge of the upper part **3** of the carrying section **2** by its top end, and of a lower webbing part, which is attachable to the upper webbing part with the adjustment means, and which is attached by its lower end to the lower support elements, such as the hip belt **9** or the lower straps **7**, **8**. When adjusting the height of the carrying section, the adjustment elements are locked to a desired position with the adjustment means. The adjustment elements **10**, **11** and **14** are, for example, various ready-made webbings and made of the same or a different fabric than the carrying section **2** is made of. What is essential is that the adjustment elements are sufficiently durable for adjustment use, particularly when the upper part **3** of the carrying section **2** is removably fastened as presented in FIGS. **10-12**. Webbings can begin from the point where the shoulder straps **5**, **6** are attached to (FIG. **10**), from below them (FIG. **6**) or they can be extended and sewn on top of the shoulder straps **5**, **6** (FIG. **7**). The buckle **12**, **13**, **17**, **33-35** or other adjustment means **15**, **16**, **18-24**, **28**, **29-32** can be attached either to the webbing attached to the lower edge of the adjustable part (FIG. **1**) or to the webbing attached near to the shoulder (FIGS. **3** and **4**).

[0024] The above description represents the most advantageous embodiments of the invention. Those skilled in the art will see, however, that the invention is not limited to the embodiment examples presented above, but can be varied within the scope of the patent claims presented below. The webbings can alternatively be placed into webbing channels **25**, which are either separate or sewn in between the fabrics of the carrying section **2**, and which have cord locks **28** as adjustment means in their one end or both ends or in the middle (FIG. **8**). The upper part **3** of the carrying section **2** can be removably fastened to the lower part **4** of the carrying section **2**, and in between these there may be one or several additional parts **44**. In the removably fastened model the support loops **37-43**, **47-50** are helpful in keeping the webbings in place.

[0025] The parts, shape and length of the multistepped or stepless adjustment of the carrier **1** according to the invention can be varied to optimally suit each carrier. For example, zippers, snap fasteners, snap fastener tape and Velcro tape are suitable to act as the attachment means **29-32**, **45**, **46**, **51** of the removably fastened upper part **3** and the additional part/parts **44** of the carrying section **2**. Other variation possibilities of the invention include adding various removable or non-removable linings and/or various removable or non-removable neck/head rests. In addition, the length and the width of the

webbings, straps and other adjustment parts can be varied. Knots and various fastening clips can be used instead of cord locks. The carrier can be made as a one-size solution or in several sizes.

1. An arrangement for adjusting the height of a carrier (**1**), which carrier (**1**) includes at least a carrying section (**2**) intended for carrying a child, upper support elements (**5**, **6**) attached to the carrying section and placed over the wearer's shoulders, and lower support elements (**7-9**) to be placed around the wearer's body, characterised in that the carrying section (**2**) is equipped at least with essentially webbing like adjustment elements (**10**, **11**, **14**), with which the multi-stepped or stepless height adjustment is designed to be carried out.

2. An arrangement according to claim **1**, characterised in that the height of the carrying section (**2**) is fitted to be adjusted with the adjustment elements placed in between the lower support elements, such as a hip belt (**9**) or lower straps (J, **8**), and the upper support elements (**5**, **6**) situated at the top edge of the upper part (**3**) of the carrying section (**2**), and with adjustment means connected to the adjustment elements.

3. An arrangement according to claim **1** or **2**, characterised in that the carrying section (**2**) is removably fastened and/or additionally the carrying section (**2**) includes one or several additional parts (**44**).

4. An arrangement according to claim **1**, characterised in that the various webbings (**10**, **11**, **14**) acting as the adjustment elements are fitted to begin from the shoulder straps (**5**, **6**), from the top surface of the shoulder straps, from between the fabric layers of the shoulder straps, from the top of the carrying section (**2**) or from between the fabric layers of the carrying section (**2**) or other similar spots.

5. An arrangement according to claim **1**, characterised in that the various buckles (**12**, **13**, **17**, **33-35**), rings (**15**, **16**), snap fasteners (**19-23**, **29-32**), snap fastener tapes and Velcro tapes (**24**) acting as the adjustment means are placed at any spot on the webbing (**10**, **11**, **14**) and the carrying section (**2**).

6. An arrangement according to claim **1**, characterised in that the carrier (**1**) has one or several support loops (**37-43**, **47-50**) helping to keep in place a removably fastened carrying section (**2**) and/or adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) such as webbings.

7. An arrangement according to claim **1**, characterised in that there are more adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) helping to keep in place a removably fastened carrying section (**2**) and additional parts (**44**) than in the carrier (**1**) equipped with a non-removable carrying section (**2**), which adjustment means are placed at the spots of the carrying section (**2**) that are on top of each other, or at other suitable spots.

8. An arrangement according to claim **2**, characterised in that the various webbings (**10**, **11**, **14**) acting as the adjustment elements are fitted to begin from the shoulder straps (**5**, **6**), from the top surface of the shoulder straps, from between the fabric layers of the shoulder straps, from the top of the carrying section (**2**) or from between the fabric layers of the carrying section (**2**) or other similar spots.

9. An arrangement according to claim **3**, characterised in that the various webbings (**10**, **11**, **14**) acting as the adjustment elements are fitted to begin from the shoulder straps (**5**, **6**), from the top surface of the shoulder straps, from between the fabric layers of the shoulder straps, from the top of the carrying section (**2**) or from between the fabric layers of the carrying section (**2**) or other similar spots.

10. An arrangement according to claim **2**, characterised in that the various buckles (**12**, **13**, **17**, **33-35**), rings (**15**, **16**), snap fasteners (**19-23**, **29-32**), snap fastener tapes and Velcro tapes (**24**) acting as the adjustment means are placed at any spot on the webbing (**10**, **11**, **14**) and the carrying section (**2**).

11. An arrangement according to claim **3**, characterised in that the various buckles (**12**, **13**, **17**, **33-35**), rings (**15**, **16**), snap fasteners (**19-23**, **29-32**), snap fastener tapes and Velcro tapes (**24**) acting as the adjustment means are placed at any spot on the webbing (**10**, **11**, **14**) and the carrying section (**2**).

12. An arrangement according to claim **4**, characterised in that the various buckles (**12**, **13**, **17**, **33-35**), rings (**15**, **16**), snap fasteners (**19-23**, **29-32**), snap fastener tapes and Velcro tapes (**24**) acting as the adjustment means are placed at any spot on the webbing (**10**, **11**, **14**) and the carrying section (**2**).

13. An arrangement according to claim **2**, characterised in that the carrier (**1**) has one or several support loops (**37-43**, **47-50**) helping to keep in place a removably fastened carrying section (**2**) and/or adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) such as webbings.

14. An arrangement according to claim **3**, characterised in that the carrier (**1**) has one or several support loops (**37-43**, **47-50**) helping to keep in place a removably fastened carrying section (**2**) and/or adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) such as webbings.

15. An arrangement according to claim **4**, characterised in that the carrier (**1**) has one or several support loops (**37-43**, **47-50**) helping to keep in place a removably fastened carrying section (**2**) and/or adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) such as webbings.

16. An arrangement according to claim **5**, characterised in that the carrier (**1**) has one or several support loops (**37-43**, **47-50**) helping to keep in place a removably fastened carrying section (**2**) and/or adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) such as webbings.

17. An arrangement according to claim **2**, characterised in that there are more adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) helping to keep in place a removably fastened carrying section (**2**) and additional parts (**44**) than in the carrier (**1**) equipped with a non-removable carrying section (**2**), which adjustment means are placed at the spots of the carrying section (**2**) that are on top of each other, or at other suitable spots.

18. An arrangement according to claim **3**, characterised in that there are more adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) helping to keep in place a removably fastened carrying section (**2**) and additional parts (**44**) than in the carrier (**1**) equipped with a non-removable carrying section (**2**), which adjustment means are placed at the spots of the carrying section (**2**) that are on top of each other, or at other suitable spots.

19. An arrangement according to claim **4**, characterised in that there are more adjustment means (**12**, **13**, **15-24**, **26**, **29-36**) helping to keep in place a removably fastened carrying section (**2**) and additional parts (**44**) than in the carrier (**1**) equipped with a non-removable carrying section (**2**), which adjustment means are placed at the spots of the carrying section (**2**) that are on top of each other, or at other suitable spots.

* * * * *