March 6, 1962 O. TAPIOVAARA 3,024,035

COLLAPSIBLE CHAIR OR WHEEL CHAIR FOR CHILDREN OR ADULTS

Filed April 25, 1960

Fig. 1.

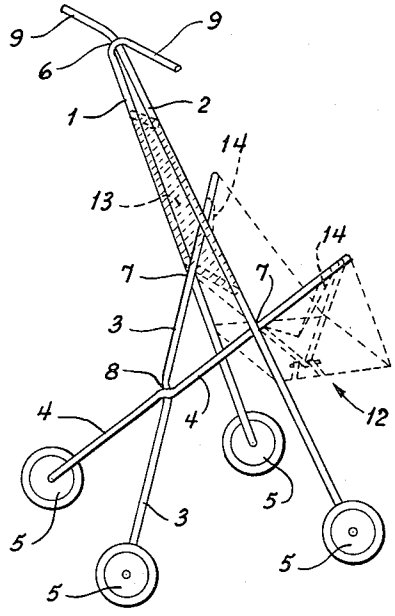


Fig. 2.

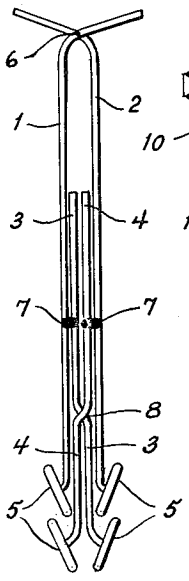


Fig. 3.

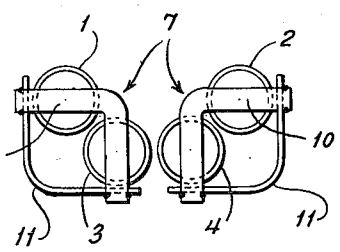


Fig. 4.

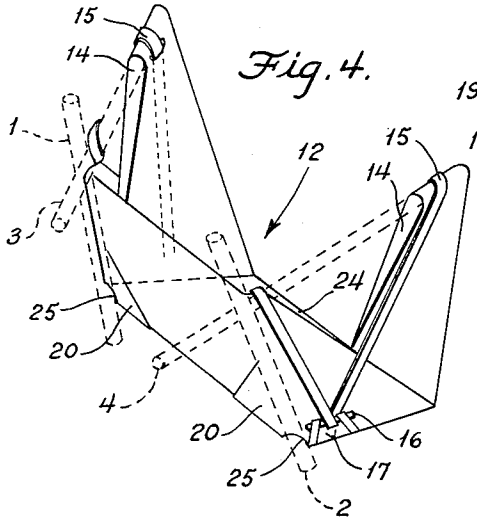
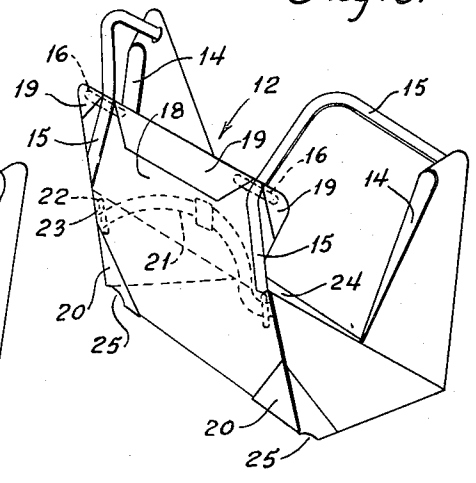


Fig. 5.



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COLLAPSIBLE CHAIR OR WHEEL CHAIR FOR CHILDREN OR ADULTS

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This invention consists of a collapsible chair which, when its feet are fitted with wheels, is eminently suitable as a collapsible wheel chair for children or adults, depending on its size. The invention is presented below in the form of a child's wheel chair, although it is not limited to this embodiment.

Many different kinds of collapsible children's wheel chairs have been known in the past. All of them, however, have had one feature in common: they can only be collapsed to occupy less space in one direction, so that the size of the wheel chair remains unchanged in at least two dimensions, i.e. in the space between the wheels and their axles.

The purpose of this invention is to produce a chair or wheel chair for adults or children that is simple to manufacture and can be collapsed at least in two dimensions.

Another aim is to produce a child's wheel chair from which the seat can easily be removed and used as a "handbag-seat" to carry the child in.

A further aim is to produce a child's wheel chair which can, to some extent at least, be collapsed in all three dimensions.

The invention and its advantages are made clear in the following, in which one advantageous embodiment of the invention is presented as an example. Reference is made to the attached drawing, in which:

FIG. 1 is a perspective view of the child's wheel chair according to the invention, when opened out,

FIG. 2 shows the frame of the chair in the collapsed position,

FIG. 3 shows certain details of a pair of hinges,

FIG. 4 shows the seat fitted to the frame, and

FIG. 5 shows the seat adapted for carrying by hand.

As seen in the drawing, the wheel chair according to the invention has four shafts **1**, **2**, **3** and **4**, which cross each other when opened out, and at the feet of which are wheels **5**. In winter said wheels can be exchanged for skis or runners, or else the latter can be fastened to the wheels in a suitable fashion. The shafts are joined to each other by hinges **6**, **7** and **8**. Shafts **1** and **2** are similar in design and are joined to each other by hinge **6** near their upper ends, which are bent outwards to form handles **9**. Shafts **3** and **4** are joined to each other approximately half way down by hinge **8**. Shaft **1** is joined to shaft **3** and shaft **2** to shaft **4** by universal hinges **7**. In this embodiment, each hinge **7** consists of an L-shaped axle **10** inserted through holes in the shafts, the ends of the axle being joined by an L-shaped flange **11**, which simultaneously connects the ends of the axle and acts as a locking device so that the shafts do not spread out further than they should for their extended position (FIG. 3). In other words, this flange **11** limits the angle that shafts **1** and **3**, and shafts **2** and **4** can form between one another.

A back-rest **13** is fitted over shafts **1** and **2** between the joints **6** and **7**. An elastic bag to hold things can be furnished together with said back-rest. The back-rest **13** can also be used to limit the angle between shafts **1** and **2** in their opened-out position. The flexibility of the said shopping bag can be achieved by means of rubber, rubber cloth or rubber netting. Alternatively a pocket can be provided for a collapsible hand-bag, e.g. a net bag.

The seat **12** is supported by the upper ends of shafts **3** and **4** above joints **7**. In the child's wheel chair according to the invention, the seat can also be made detachable, as seen in FIGURES 4 and 5, and the child can be carried in a "handbag-seat" of the type shown. In FIG. 4 the seat is shown fitted to the frame (indicated by dotted lines) of the child's wheel chair, shafts **3** and **4** being inserted into pockets **14** formed in the fabric of the seat. The seat itself is fitted with straps **15** for tightening to the frame and for carrying. Said straps can be passed below the seat. When the handbag-seat is fitted to the frame, the straps **15** are passed over the upper ends of shafts **3** and **4**, and pegs **16**, with which the straps are provided, are inserted into links or pockets **17** fitted to the outside of the seat, so that the straps support the whole seat. When the child is being carried in the handbag-seat (FIG. 5), the pegs **16** are inserted into links or pockets **19** on the extension **18** of the back-support of the seat (in this context, "back-support" is taken to mean the part of the seat itself which extends upwards at the back, while "back-rest" denotes the fabric or other material **13** between shafts **1** and **2**). When not in use, the back-support extension **18** can be folded against the back-support with its corners inserted into pockets **20**, as seen in FIG. 4. To hold the child in place there is a belt **21** (shown by dotted lines in FIG. 5) which is fitted to the inner side of the back-support and can be adjusted for length by means of a buckle of a known type, the other ends being held firm by pegs **22** in pockets or links **23** in exactly the same way as pegs **16** in pockets or links **19**. If required, the seat can be provided with a bag-type footrest or one attached to it by means of straps.

The actual seat is preferably of sheet material. It could be made to fold into two or more, and in it are made suitable slots **25** through which shafts **1** and **2** pass, thus holding the seat firmly in position.

The child's wheel chair according to the invention can, as mentioned previously, be fitted with skis or runners instead of or underneath the wheels. The skis can be made so that in winter they can be used in addition to the wheels, as needed; for this purpose they can be made to turn up over the wheels and be locked in such a position that they act as mudguards when the wheels are in use, it being equally easy to turn them down under the wheels to function as skis. The skis or runners can also be detachable, being fastened for use to the wheels by spring clips or in some other known way.

In the collapsed position the child's wheel chair of the invention can be made shorter if shafts **1** and **2**, for instance, are telescopic, i.e. if the upper lengths of the shafts are of thinner tubing fitting into the thicker lower ends. In this case, they must naturally be provided with some locking device, such as a ratchet or similar assembly, which will also enable the length of shafts **1** and **2** to be adjusted as desired. Another possibility, of course, is to fit the shafts with addition hinges by means of which they can be folded in two in the collapsed position; any known locking device can be used to lock the shafts straight in the extended position.

The material of the seat and back-rest of the child's wheel chair of the invention is optional: it can be either an elastic folding material or a rigid hinged one. Similarly, metal, wood, plastics, etc. can all be used for the frame parts. Furthermore, the shape and other details can be varied without departing from the essential features of the invention. As stated above, the present description refers to only one possible embodiment, to which the invention is in no way limited. The invention is ideally suited as a camp-chair or as any other corresponding type of chair or wheel chair with back-rest.

What I claim is:

1. A collapsible chair comprising two pairs of legs, one of said pairs forming the front legs and the other pair forming the back legs, first hinge means for said

front legs, said first hinge means joining said front legs together adjacent their upper ends for swinging movement toward and away from each other in substantially a single plane, said pair of back legs, when said chair is in open operable position, extending from a lower position in back of said front legs to an upper position forward of the same, second hinge means hinging said back legs together in crossed relationship at a position substantially at the midpoint of their length for swinging movement of said back legs toward and away from each other about said second hinge means and third and fourth hinge means, one connected with each of said front legs at substantially the midposition of the same, one of said third and fourth hinge means being connected with one of said back legs and the other thereof being connected with the other of said back legs for hinging said back legs to said front legs and said third and fourth hinge means including a stop member to limit the angle of said back legs with respect to said front legs, said third and fourth hinge means providing for the folding of said back legs inwardly with respect to said front legs, a back rest mounted on the upper portions of said front legs and a seat mounted on the portions of said back legs extending forwardly of said front legs, said back rest and said seat being formed of flexible foldable material.

2. A collapsible chair as in claim 1 and including wheels mounted on said legs at the bottom ends thereof.

3. A collapsible chair as in claim 2, said front legs above said first hinge means being bent laterally into outwardly extending handle portions for use in pushing said chair.

4. A collapsible chair as in claim 2, said third and fourth hinge means each consisting of L-shaped axle pins, one leg of each of said pins being mounted in holes in the other legs being hinged, the ends of said L-shaped pins projecting outwardly beyond said legs and L-shaped strap means joining said projecting ends, said strap means serving to limit the angle formed between said pairs of front and back legs in the open position thereof.

5. A collapsible chair as in claim 1 and including means for varying the length of the legs of one of said pairs of legs.

6. A collapsible chair as in claim 1 and including means for varying the length of both legs of both of said pairs of legs.

7. A collapsible chair as in claim 1, said seat being formed to be removable and consisting of a seat portion proper, flaps formed on either side of said seat portion proper to support the same, said flaps being formed with pockets into which the forwarding projecting portions of each of said back legs are inserted, back support means attached to said seat portion and to said side flaps, an extension flap for said back support attached along the upper edge thereof and strap means at either side of said chair, means at either end of said strap means fastening the same to the inner sides of said side flaps at the upper corners thereof, said straps, when said seat is attached to said legs to form part of said chair, extending over the outer ends of said projecting portions of said second pair of legs, extending downwardly to said seat portion proper and means for fastening said straps to the under part of said seat portion proper to help support said seat, said fastening means and said ends of said straps engaged therewith being removable from said seat portion proper and means for attaching said fastening means to the free upper corners of said back support extension flap so that when said seat is removed from said legs said straps can serve as carrying handles for said seat.

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