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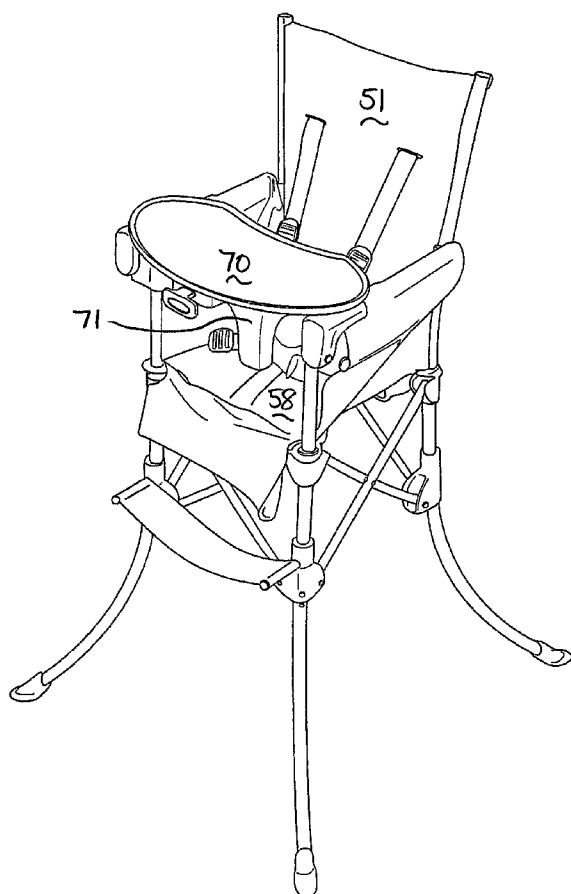
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(54) Title: CHILD'S HIGH CHAIR



(57) Abstract: A folding high chair comprising four legs (10-13), a seat (58), a back (51), and a pair of side arms (22, 23). The seat or back are made of flexible material. A small tray (70) is removably attachable to the arms (22, 23), and can be stowed in the seat or back when the chair is collapsed. The small tray has a removable crotch restraint (71) attached to its lower front edge. A large tray (80) is removably attachable to the small tray, and can be stowed adjacent to the chair in a stowage bag. The legs are preferably coupled together by cross members (17-24) forming Xs. Preferably the legs are curved outwardly at their bottom ends, and preferably the rear legs (12, 13) are also curved outwardly at their top ends. The seat and back are preferably of canvas or like material. The chair preferably also has a footrest (66).



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Child's High Chair

The present invention relates to high chairs for children.

5 High chairs for children are well known. A high chair typically comprises a chair with a relatively small and high seat; the small size of the seat makes it suitable for children, and its height brings the child up to the typical height of a seated adult. The chair typically has a back and side arms to keep the child in the seat.

10

Traditional high chairs are rigidly constructed of wood. However, such chairs are heavy, and are also bulky, making them difficult to store away or to transport when the child is taken on a trip. Folding chairs, typically of light metal, are therefore also well known. Many folding high chairs fold in a single
15 dimension, so that on folding, typically the side-to-side width of the chair remains unchanged but the chair is collapsed front-to-back. (The height also typically remains unchanged.) Some high chairs, however, fold in 2 dimensions, ie side-to-side as well as front-to-back (an arrangement sometimes termed "umbrella fold").

20

It is known to provide a high chair with a tray or table, supported on the arms of the chair. Such trays are often removable. However, removing the tray is often inconvenient, involving unscrewing nuts and bolts and resulting in loose parts (nuts and/or bolts) which are liable to become lost. Further, the tray
25 itself is then separate from the chair.

According to a first aspect of the invention there is provided A folding high chair comprising four legs, a seat, a back, the seat or back being of flexible material a pair of side arms, and a tray removably attachable to the side arms,
30 wherein when the chair is folded, the seat or back forms a pocket in which the

tray is stowable. (Obviously the tray is of a size which can be accommodated in the pocket.)

According to another aspect of the invention there is provided a folding
5 high chair comprising four legs, a seat of flexible material, a back of flexible material, a pair of side arms, and a tray removably attachable to the side arms, wherein the chair is foldable side-to-side and front-to-back.

According to a further aspect of the invention there is provided a folding
10 high chair comprising four legs, a seat, a back, a pair of side arms and a tray removably attachable to the high chair, wherein the legs are curved outwardly at their bottom ends.

There is preferably a stowage bag for receiving the folded chair with its
15 stowed tray. A second tray (a large tray) may also be provided, attachable over the first tray (the small tray), larger than the first tray. The large tray is preferably stowable in the bag behind the rear legs of the folded chair.

A crotch restraint is preferably attachable to the front underside of the
20 small tray.

A high chair embodying the invention will now be described by way of example and with reference to the drawings, in which:

- Fig. 1 shows the framework of the chair in perspective;
- 25 Fig. 2 shows the framework with the small tray attached;
- Fig. 3 shows the framework and small tray from above;
- Fig. 4 shows the two trays exploded and in perspective;
- Fig. 5 shows the framework and the two trays exploded and from the side;
- 30 Fig. 6 shows the Fig. 5 configuration from the front and side;

Fig. 7 shows the framework and large tray in perspective;

Fig. 8 shows the framework and large tray from the front;

Fig. 9 shows the framework and large tray from above;

Fig. 10 shows the chair including the seat panels;

5 Fig. 11 shows the chair including the seat cover; and

Fig. 12 shows some details of the seat cover;

Fig. 13 shows the chair including the seat panels, with the small tray attached.

10 Fig. 1 shows the mechanical framework of the high chair. The framework comprises four vertical legs 10-13, eight cross-members 14-21, a pair of side arms 22 and 23, and eight hinge members 24-31.

The two legs 10 and 11 form the front legs of the chair, and the two legs
15 12 and 13 form the rear legs of the chair; the rear legs are longer than the front legs, with their upper ends forming the back part of the chair (ie the part against which the back of the child rests). As shown, the legs 10-13 are generally vertical, but are curved outwardly to give greater stability, both against the chair tipping over and for the back support.

20

Each leg has a respective lower hinge member 24-27 and a respective upper hinge member 28-31 mounted on it. The lower hinge members are mounted rigidly on the legs; the upper hinge members are slidable on the legs. The hinge members are connected together by the cross members 14-21, which
25 form four crossed pairs. Thus cross member 17 is hinged to hinge members 24 and 30 and cross member 18 is hinged to hinge members 24 and 30; these two cross members are also hinged to each other at 32 where they cross. The remaining cross members are hinged in three further pairs between legs 10 and 11, 11 and 13, and 13 and 12.

30

If desired, the legs may be in two parts, meeting slightly below the hinge members 24-27, which engage with each other. This will allow the lower parts of the legs to be taken off when the chair is folded, so that it can be stowed in a smaller volume. The lower parts of the legs preferably engage with the upper parts by a click mechanism giving positive engagement in a defined orientation. The engagement mechanism may be provided in the hinge members 24-27. The lower parts of the legs may be left off if a low chair is desired.

Alternatively the legs may each comprise two parts, the lower part being pivotally connected to the upper part. This will allow the lower part of each leg to be folded about the pivot point, so that the chair can be stowed in a smaller volume when it is not in use.

As just noted, hinge members 24-27 are fixed to their respective legs, while hinge members 28-31 are slidable on their respective legs. The chair can therefore be collapsed by moving or pushing the legs together, with the hinge members 28-31 sliding upwardly, and opened by moving the legs apart, with the hinge members 28-31 sliding downwardly. The cross members 14-21 constrain the upper hinge members 28-31 to slide in unison and the legs 10-13 to remain in the same relative orientation (ie all vertical).

The cross members are preferably hinged together at their midpoints, but if desired they may be hinged together at points slightly below their midpoints. This will result in a slight rotation of the legs 10-13 as the chair is folded, drawing the bottom ends of the legs slightly inwards.

Preferably the arms 22 and 23 are rigid, and are rigidly attached to the top ends of the front legs 10 and 11 and to the corresponding points on the back legs 12 and 13 as shown. Preferably each arm is telescopic, so that when the chair is

folded, the side arms automatically telescope down to approximately half their extended length; they extend out to their full length when the chair is unfolded.

Figs. 10, 11, and 13 show the chair with the seat. The seat consists of two components, a set of seat panels which are a relatively permanent part of the structure and a seat cover which is readily removable. The seat panels provide the required structural strength; the seat cover can be readily washed or otherwise cleaned, and protects the seat panels.

The seat panels form a canvas structure 50 (the term "canvas" is of course used for any suitable form of cloth or other flexible material). This canvas 50 comprises four major portions, a back 51, two sides 54 and 55, and a seat 58 attached to each other as shown.

The back 51 may have its sides formed as a pair of tubes which fit over the upper ends of the rear vertical legs 12 and 13. These tubes may be closed at their upper ends to maintain the back 51 in position; alternatively, the upper corners of the back 51 may be attached to the legs 12 and 13 at or near their upper ends. Similar tubes may encase the adjacent lower portions of the legs 12 and 13. The side panel 55 may be formed with a tube 57 along its upper edge, in which the end element 41 and sliding element 42 of the chair fit. This tube will serve both to support the side panel and to protect the telescopic mechanism of the side arm. A tube down its front edge may encase the upper part of leg 10. The side panel 54 is similar, with tubes along its top and front edges.

Alternatively, the canvas structure may have at least some parts of its boundary formed as thickenings, eg by having its material bent back on itself and encasing flexible rods. The legs of the chair are then formed as hollow rods each with a longitudinal slot so that the relevant edge of the canvas structure can be inserted longitudinally in it and is then retained by it.

Other methods of fixing the canvas structure to the chair framework may also be used, such as press studs.

5 The seat 58 is attached along its back edge to the rear panel 51 and along its side edges to the side panels 54 and 55. The seat panel 58 may have attachment means at its corners by means of which it is attached to the upper sliding hinge members 28-31.

10 As shown in Figs. 10 and 11, the seat canvas structure has a restraint harness attached to it. This harness consists of two shoulder straps 96 and a crotch strap 97. Each shoulder strap is attached top and bottom to the back 51; the crotch strap is attached to the centre of the seat 58. Each of the shoulder straps carries a clip which engages with the crotch strap.

15 Fig. 11 shows the seat cover 90, which is simply placed in position over the seat panel canvas structure, covering and extending beyond that structure. The seat cover 90 is preferably made of canvas or other flexible material. The seat cover 90 has holes through which the straps of the harness may be passed.

20 As shown in Fig. 12, the crotch strap passes through a simple hole 91. Each of the shoulder straps passes through a pair of holes, an upper hole 92 and a lower hole 93. For each strap, the two holes 92 and 93 form parts of a single large hole which is formed by overlapping flaps 94 and 95. The cover 90 can therefore be removed and disengaged from the straps by separating the flaps 94

25 and 95 and pulling the shoulder straps through the resulting large hole and pulling the crotch strap 93 through its hole. The cover can be replaced by reversing the process.

 If desired, the flaps 94 and 95 can be provided with hook and eye

30 material so that they can be positively attached to each other.

When the chair is folded or collapsed, the material of the canvas automatically folds or deforms as the legs 10-14 come together. When the chair is opened up, the canvas automatically unfolds and expands. The attachments of the canvas structure ensure that the seat panel is pulled into position on unfolding so that it will have relatively little “give” when the child is placed in the chair.

The front legs 10 and 11 have a pair of projecting bars 65 attached to them at or close to the lower hinges 24 and 25. A canvas strip 66, with tubes 67 at its ends, fits onto these bars to form a footrest. The footrest, like the main canvas seat, automatically folds and unfolds as the chair is collapsed and expanded.

Fig. 2 shows the chair with the small tray 70 attached to its arms. The tray has a crotch restraint 71 attached to its forward under edge; the lower end of this crotch restraint is located between the legs of a child in the chair, and acts to prevent the child from sliding forward under the tray.

Fig. 3 shows the chair with the small tray 70 from above. Fig. 4 shows the large tray 80, the small tray 70, and crotch restraint 71 in exploded form. Up to this point, the term “tray” has been used for convenience, but in considering the details of the trays, it is preferable to regard each tray as a tray assembly including a tray element providing a flat upper surface and additional components attached beneath the tray element.

As shown in Fig. 4, the small tray (ie assembly) includes a pair of parallel poles 72. The arms 22 and 23 of the chair have respective tubular apertures 60 into which these arms may be slid, to mount the small tray on the chair. The poles engage in the arms with a positive or click engagement having 3 positions

so that the tray may be positioned at forward, middle, or rearward positions. Each arm also includes a release button 61, which can be pressed to release the tray.

5 The large tray has slightly resilient clip means 81 positioned at intervals around its under edge as shown. This large tray attaches to the small tray by being pressed down onto the small tray so that the clips 81 expand outwardly and engage over the edges of the small tray; it can be removed by pulling it upwards with sufficient force.

10

 The small tray also has a ridge 73 positioned as shown. The crotch restraint 71 has a slot 74 which matches the ridge 73, so that the crotch restraint can be engaged onto the tray and removed therefrom by appropriate force. The engagement and disengagement require vertical movement, such that a child in
15 the chair cannot achieve either adequate force or adequate movement for disengagement.

 Fig. 5 shows the small tray 70 with the large tray 80 attached to it, positioned for attachment to the chair. Figs. 6 to 9 are various views of the chair
20 with the combined small and large trays attached to it.

 As noted above, the complete assembly includes a stowage bag (not shown) for receiving the folded chair with its trays. When the chair is folded or collapsed, the material of the canvas 50 automatically folds or deforms as the
25 legs 10-13 come together, the folded seat 58 forming a pocket in which the small tray 70 is stowable. Alternatively the tray 70 can be stowed in the folded back portion 51 of the canvas 51, as this also forms a pocket when the chair is folded. The large tray is stowable in the bag behind the rear legs of the folded chair.

Claims

- 5 1. A folding high chair comprising four legs (10-13), a seat (58), a back (51), the seat or back being of flexible material, a pair of side arms (22, 23), and a tray (70) removably attachable to the side arms, wherein when the chair is folded, the seat or back forms a pocket in which the tray is stowable.
- 10 2. A folding high chair comprising four legs (10-13), a seat (58) of flexible material, a back (51) of flexible material, a pair of side arms (22, 23), and a tray (70) removably attachable to the side arms, wherein the chair is foldable side-to-side and front-to-back.
- 15 3. A folding high chair comprising four legs (10-13), a seat (58), a back (51), a pair of side arms (22, 23) and a tray (70) removably attachable to the high chair, wherein the legs are curved outwardly at their bottom ends.
- 20 4. A folding high chair according to any previous claim wherein the side arms (22, 23) are rigid.
- 25 5. A folding high chair according to any previous claim wherein the tray has a crotch restraint (71) removably attachable to its front under edge.
6. A high chair according to any previous claim including also a second tray (the large tray) removably attachable to the first tray (the small tray).

7. A high chair according to claim 6 further including a bag for receiving the chair and large tray when folded.
8. A high chair according to any previous claim wherein the legs are coupled together by cross members (14-21) forming Xs.
9. A high chair according to any of claims 1-2 or 4-8 wherein the legs (10-13) are curved outwardly at their bottom ends.
10. A high chair according to any previous claim wherein the rear legs (12,13) are curved outwardly at their top ends.
11. A high chair according to any previous claim, each leg (10-13) comprising an upper section and a lower section, wherein the lower section is detachable from the upper section.
12. A high chair according to any previous claim, each leg (10-13) comprising an upper section and a lower section, wherein the lower section is pivotally connected to the upper section.
13. A high chair according to any previous claim wherein the seat (58) and back (51) are of canvas or like material.
14. A high chair according to any previous claim including a removable seat cover (90).
15. A high chair according to claim 14 wherein the seat cover has holes (91-93) to accommodate restraint straps on the seat.

16. A high chair according to claim 15 wherein the holes include two pairs of back holes (92,93) which are linked in pairs by overlapping flaps (94,95).
- 5 17. A high chair according to any previous claim wherein the chair also has a footrest (66).
18. A high chair substantially as herein described with reference to the drawings.
- 10 19. Any novel and inventive feature or combination of features specifically disclosed herein within the meaning of Article 4H of the International Convention (Paris Convention).

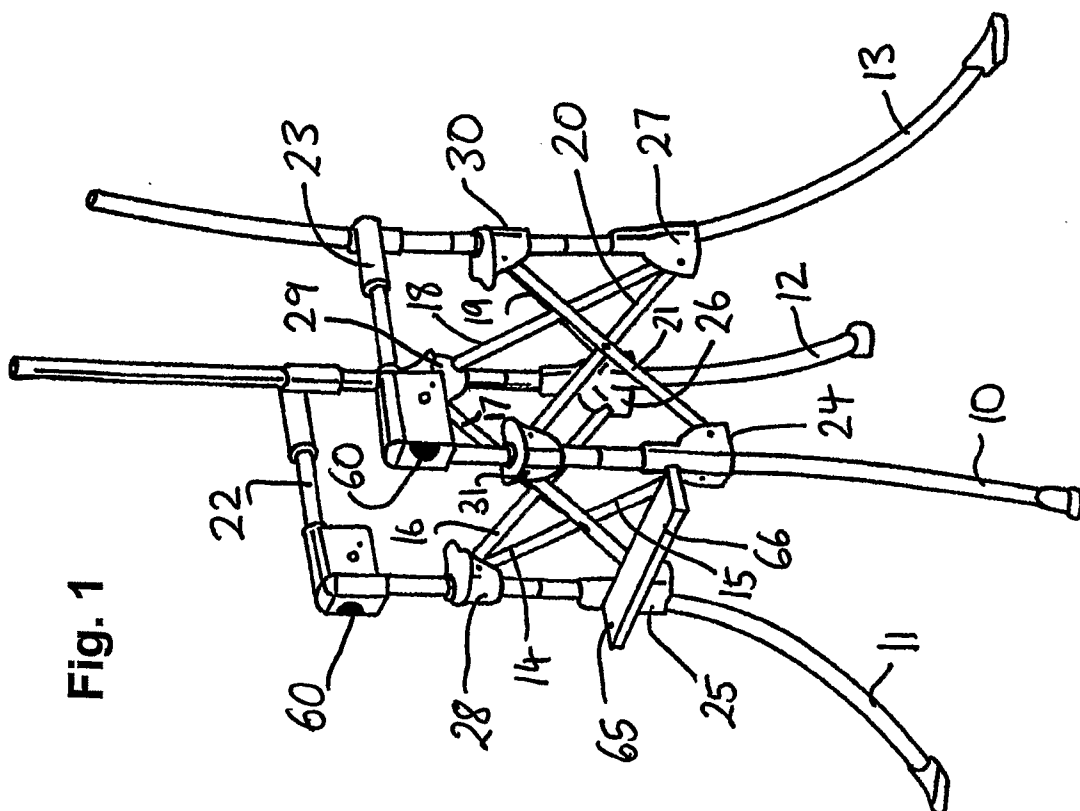
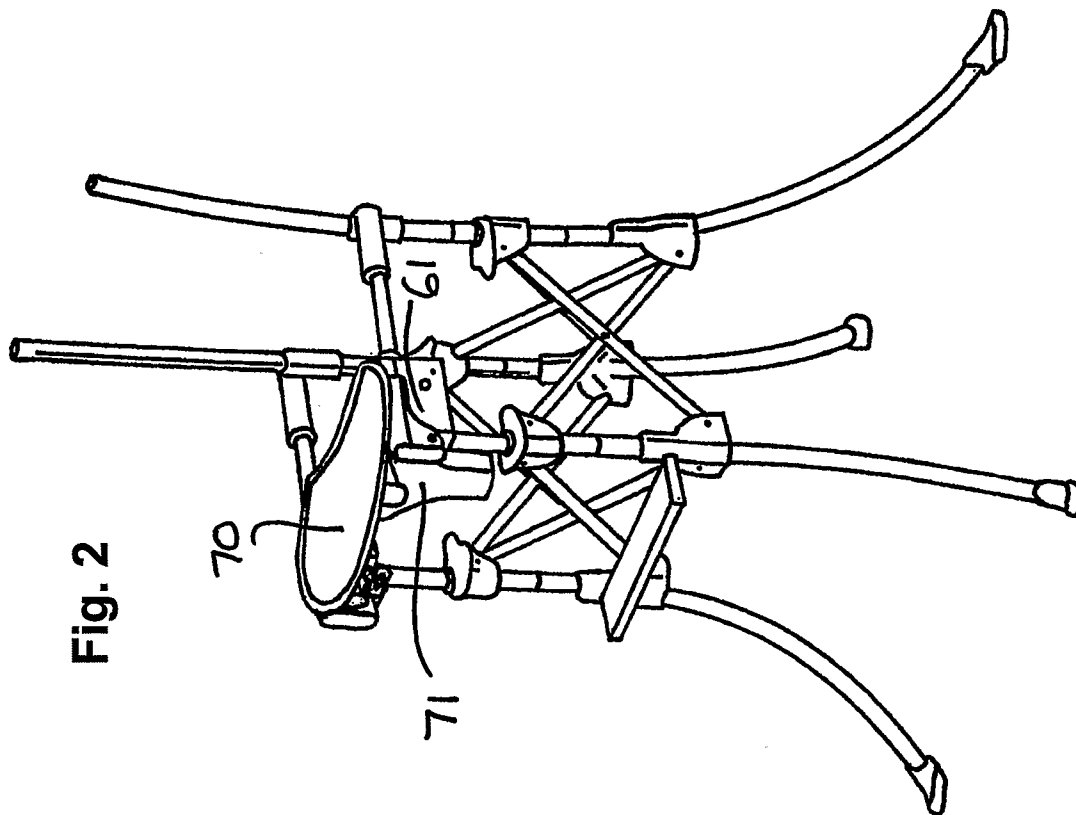


Fig. 4

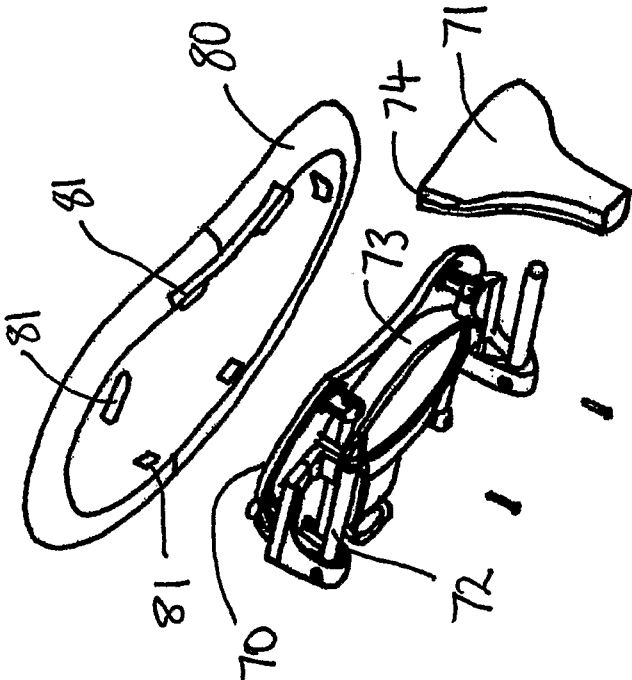


Fig. 3

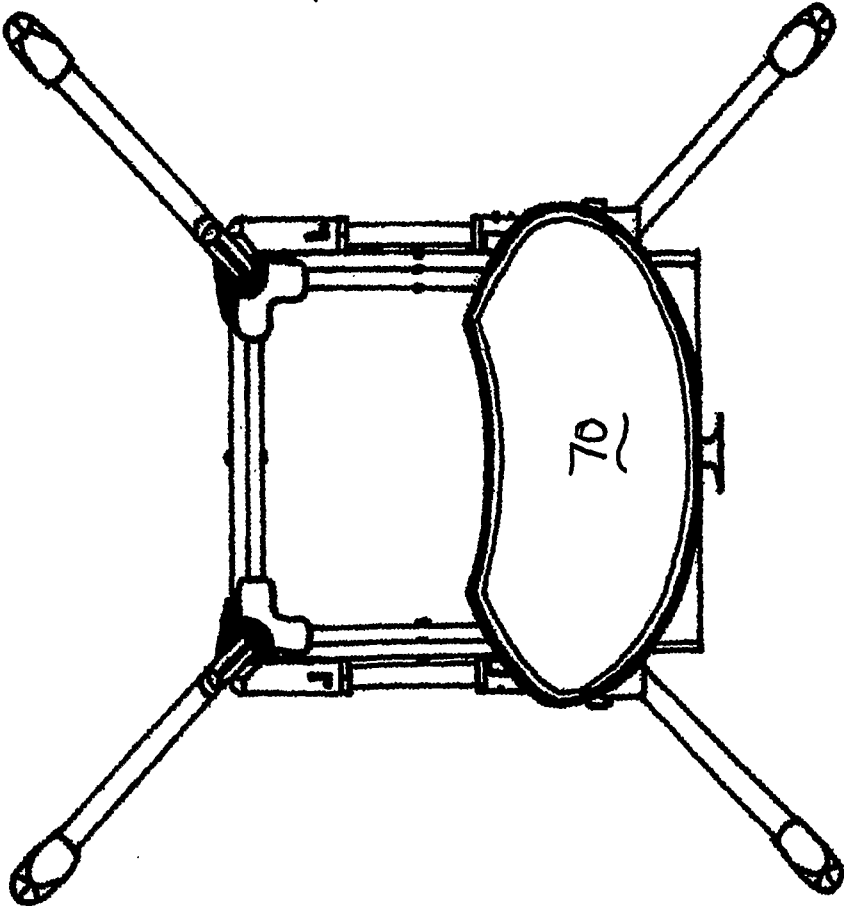


Fig. 6

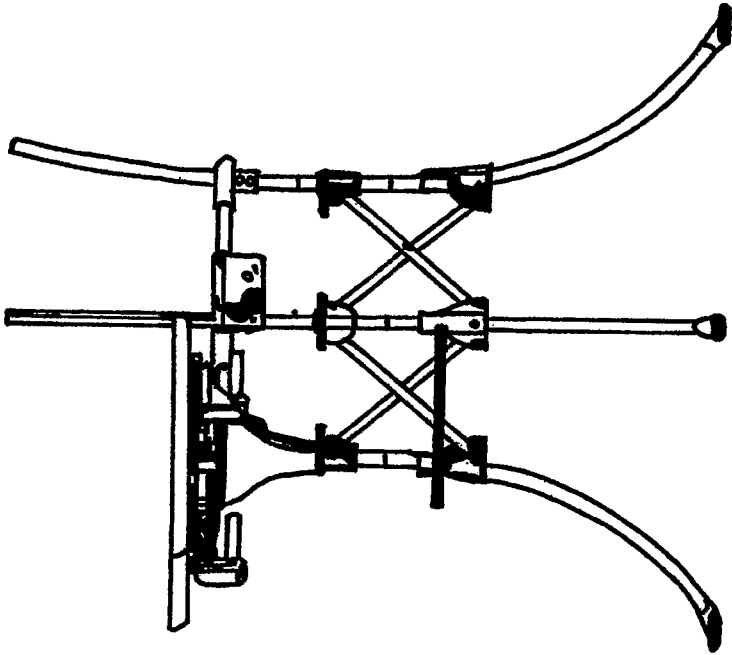


Fig. 5

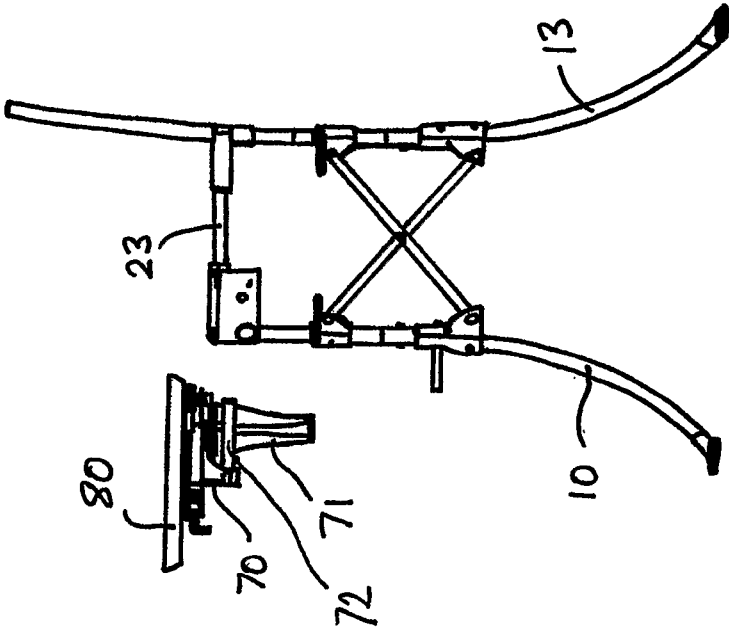


Fig. 8

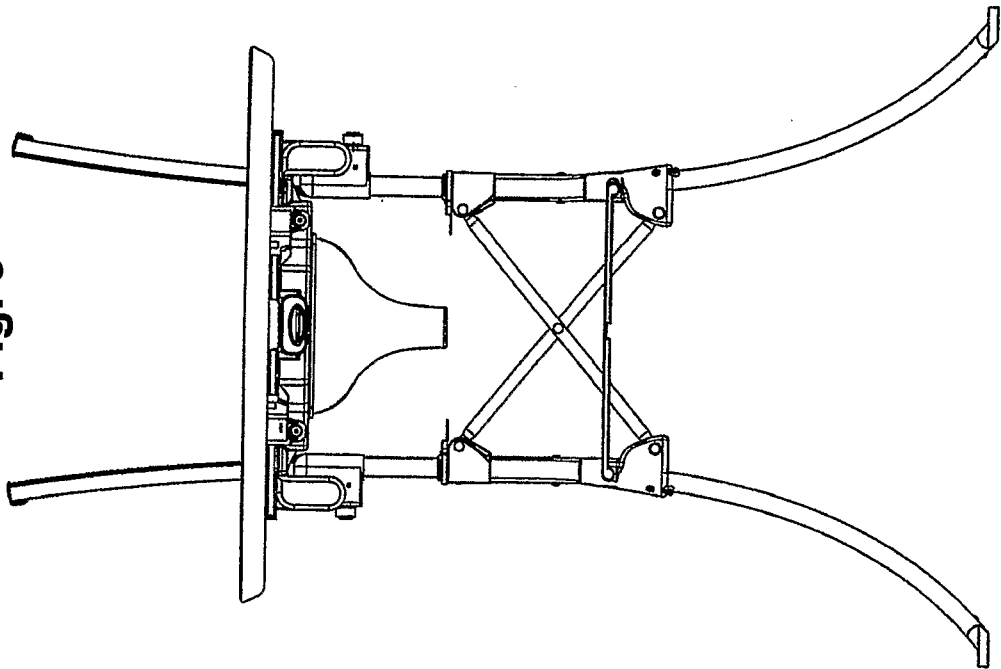
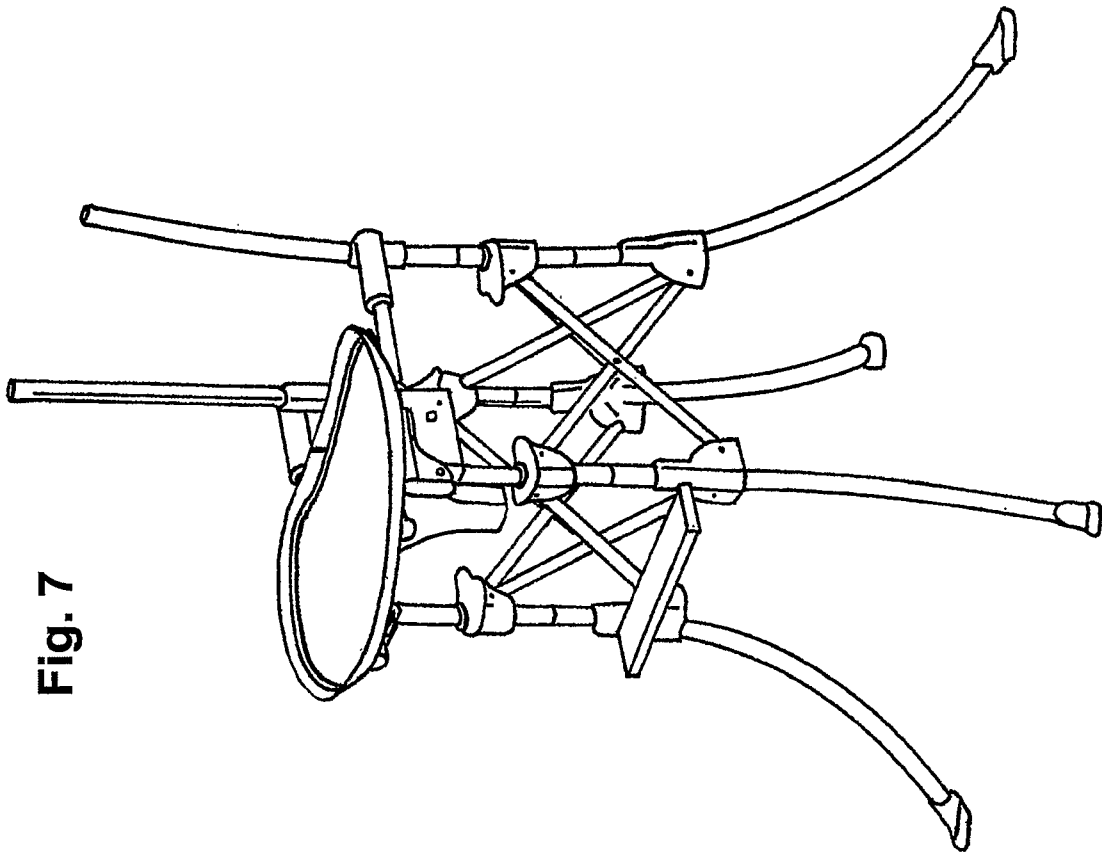


Fig. 7



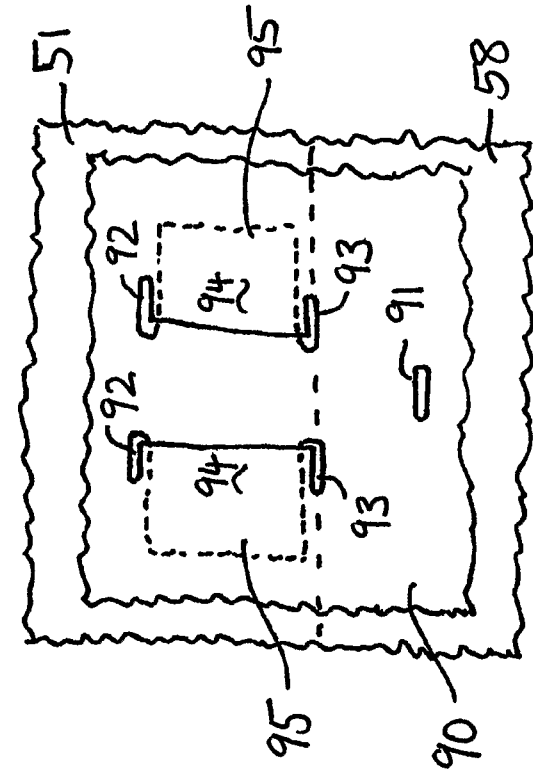


Fig. 12

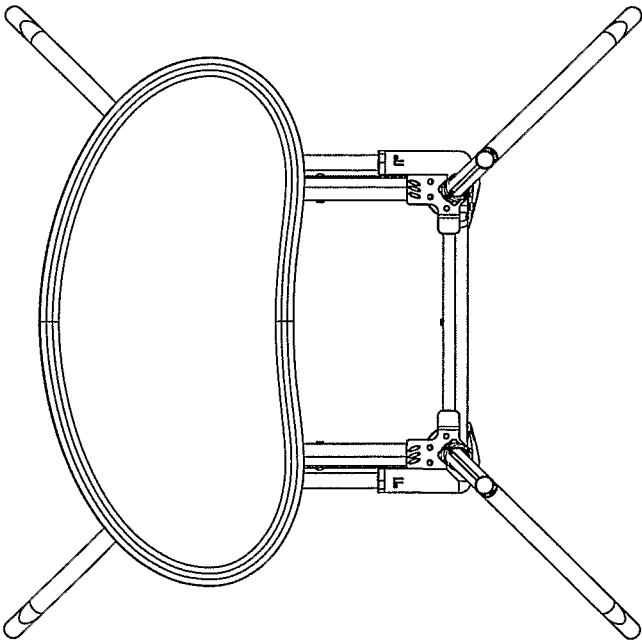


Fig. 9

Fig. 10

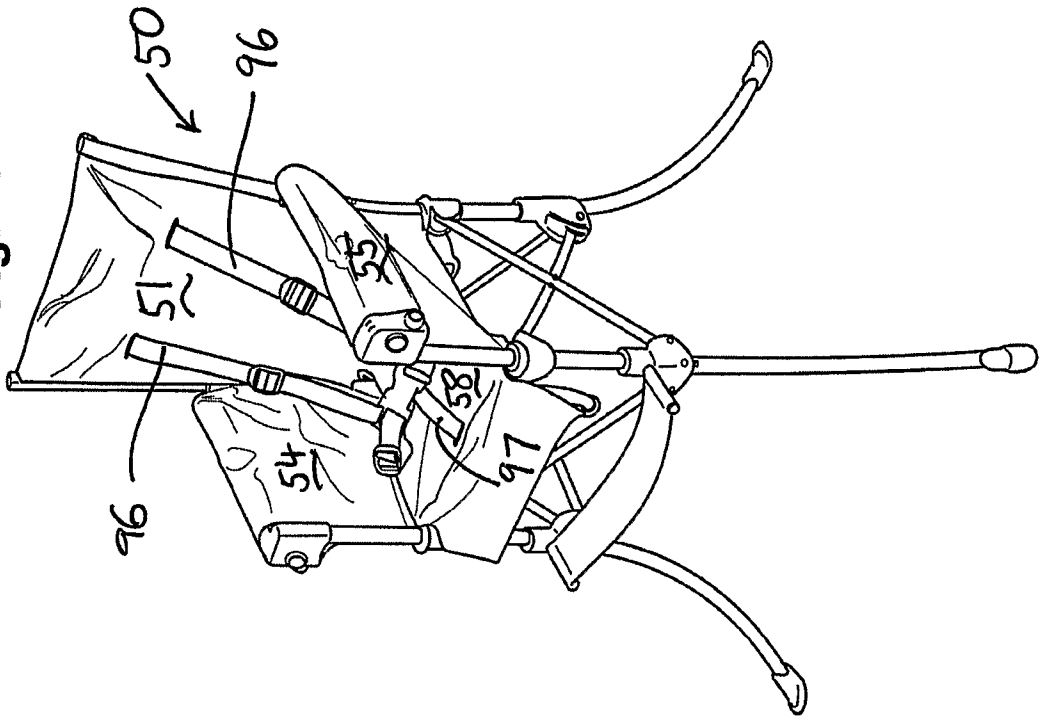
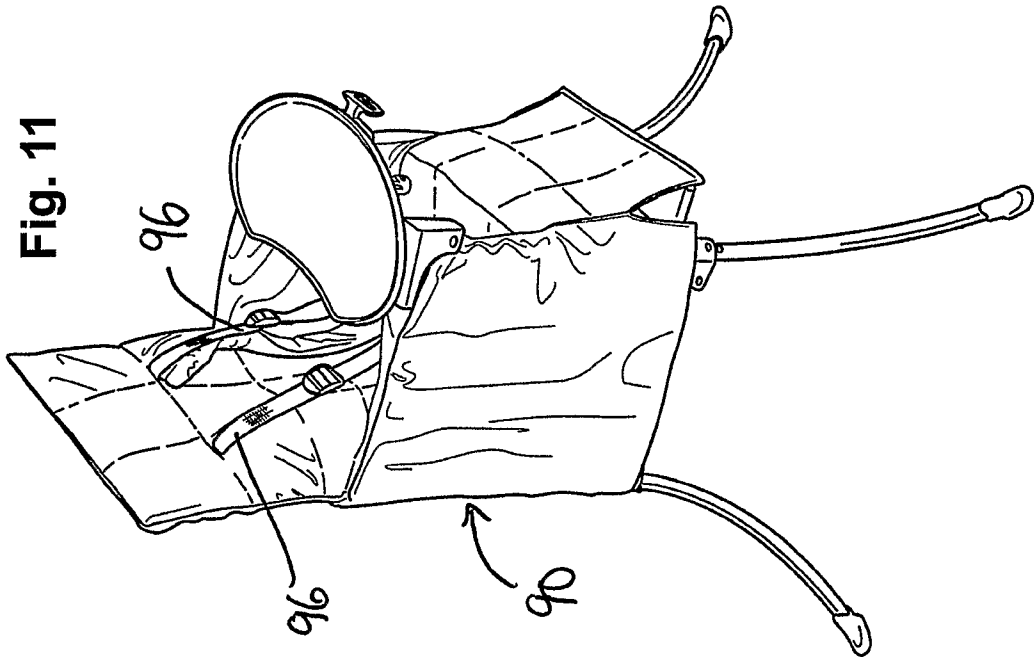


Fig. 11



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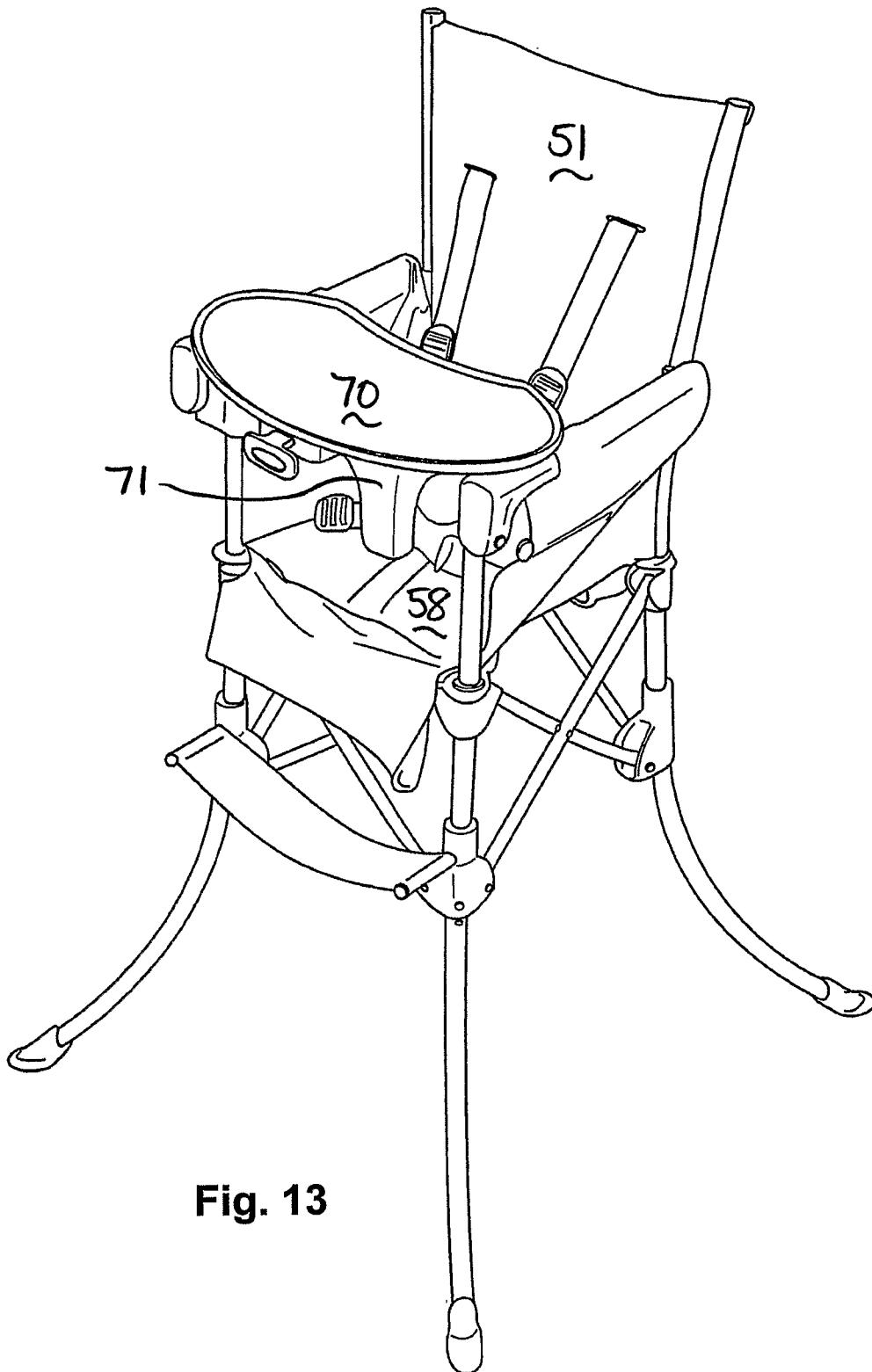


Fig. 13

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2007/050040

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47D1/02

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

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
A47D

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

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

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 340 032 A (EAST COAST NURSERY PROD LTD [GB] EAST COAST NURSERY PRODUCTS LT [GB]) 16 February 2000 (2000-02-16) page 6, line 8 - page 10, line 3; figures 1-7	1-17
X	GB 2 324 717 A (MOTHERCARE [GB]) 4 November 1998 (1998-11-04) page 5, line 27 - page 12, line 17; figures 1-5	1-17
X	GB 1 403 902 A (WILSON SON LTD LAWRENCE) 28 August 1975 (1975-08-28) page 1, line 71 - page 2, line 121; figures 1-5	1-17
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☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

7 May 2007

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18/05/2007

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Klintebäck, Daniel

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2007/050040

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 072 433 A (HELLER LEON A ET AL) 8 January 1963 (1963-01-08) column 2, line 17 - column 4, line 22; figures 1-3 -----	1-17
X	US 2 790 486 A (ERIC HARDIE DONALD) 30 April 1957 (1957-04-30) column 2, line 36 - column 5, line 62; figures 1-10 -----	1-17
X	GB 846 092 A (ARNOLD TICKNER) 24 August 1960 (1960-08-24) page 1, line 63 - page 2, line 101; figures 1-7 -----	1-17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2007/050040

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