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(54) **Mobile chair**

(57) The present invention concerns the field of mobile chairs and relates particularly to an versatile shower chair for use by disabled persons in conducting their ablutions and toileting. According to the present invention there is provided a mobile chair comprising: a back rest portion comprising a two generally upstanding struts which are held spaced apart by one or more spacer members, a seat portion and first and second side portions for supporting the seat and backrest portions, the side portions being provided at a lower region thereof with wheel means for supporting the chair for movement over a surface upon which the chair may be placed, the side portions being held spaced apart one from the other by engagement of a rear end region of each side portion with the backrest portion and by a side portion spacer member extending between a front end region of each side portion, wherein the side portion spacer member releasably engages with the side portions and the back rest portion releasably engages with the side portions thereby to permit a variation in chair width by substitution of the side portion spacer member and the backrest portion for replacement respective side portion spacer member and backrest portion. Hence only two members need be substituted in order to alter the width of the chair.

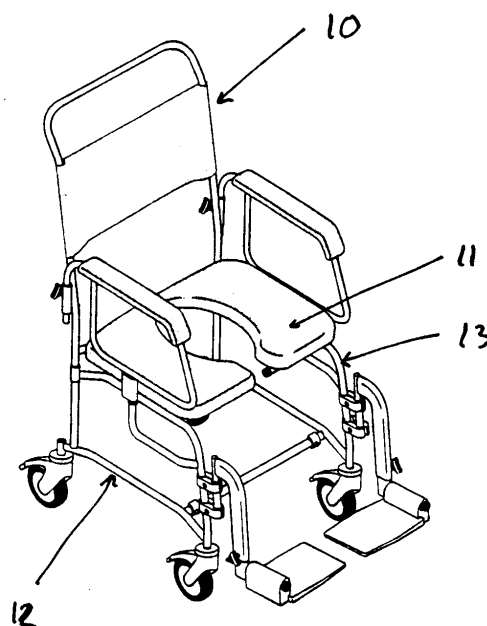


Fig 1

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## Description

**[0001]** The present invention concerns the field of mobile chairs and relates particularly to a versatile chair suitable for use by disabled persons in conducting their ablutions and toileting.

**[0002]** Wheelchairs are well known mobile chairs which are used by persons permanently or temporarily unable to use their legs for walking. A more specialised form of wheelchair is the shower chair. This chair is designed to be used in a bathroom environment, typically to permit washing of a user when located under a shower head.

**[0003]** Current shower chairs are formed from a welded framework of steel tubes. The tubes are arranged to form a seat support and a back support. The framework carries wheels which permit movement of the chairs over a floor surface. Currently shower chairs, and wheel chairs in general, are made in a wide range of sizes. It is important to match the size of the wheelchair to the user so that the chair is comfortable to use, as well as safe to use. A wheel chair that is too large may not support the user adequately and lead to falling or slumping.

**[0004]** It is however very expensive to manufacture chairs in a range of sizes. It is also expensive for a disabled user to purchase a new chair if he or she grows out of the old one.

**[0005]** There is therefore a need for a mobile chair, such as a wheel chair or shower chair, which is readily capable of adjustment for tailoring to the size of a user.

**[0006]** This and further objects are met by a mobile chair in accordance with the present invention.

**[0007]** According to the present invention there is provided a mobile chair comprising: a back rest portion comprising two generally upstanding struts which are held spaced apart by one or more spacer members, a seat portion and first and second side portions for supporting the seat and backrest portions, the side portions being provided at a lower region thereof with wheel means for supporting the chair for movement over a surface upon which the chair may be placed, the side portions being held spaced apart one from the other by engagement of a rear end region of each side portion with the backrest portion and by a side portion spacer member extending between a front end region of each side portion, wherein the side portion spacer member releasably engages with the side portions and the back rest portion releasably engages with the side portions thereby to permit a variation in chair width by substitution of the side portion spacer member and the backrest portion for replacement respective side portion spacer member and backrest portion. Hence only two members need be substituted in order to alter the width of the chair, and the same core components may be used in a wide range of wheelchair widths.

**[0008]** The seat portion may comprise a seat member which releasably engages with the side portions and backrest portion.

**[0009]** The seat member may releasably engage at a front end region thereof with one inwardly directed cantilever strut provided on one side portion and another corresponding inwardly directed cantilever strut provided on the other side portion.

**[0010]** The seat member may releasably engage at a rear end region thereof with a lower spacer member of the back rest portion.

**[0011]** The backrest lower spacer member and the inwardly directed struts preferably extend substantially orthogonally from the side portion.

**[0012]** Preferably, the seat member releasably engages with the back rest portion and side portions by means of a plurality of spring clamps provided on a lower surface of the seat member. The springs may be arranged laterally spaced apart in two rows, one at a front end region of the seat member and one at a rear end region of the seat member.

**[0013]** Each side portion may be provided with an arm rest portion which releasably engages with a top end region of the side portion and releasably engages with a mid-region of the backrest portion.

**[0014]** The releasable engagement of each arm rest at the mid region of the backrest may comprise a pivoting engagement, which engagement permits swinging outward of each arm rest away from the seat portion, thereby to facilitate sideways transfer of a user of the chair.

**[0015]** Preferably the backrest portion releasably engages with the side portions by means of respective male/female sockets at a rear end region of the side portions.

**[0016]** The side portion spacer member may engage with the respective side portions at a lower front end region of each side portion.

**[0017]** The side portion spacer member preferably engages with the respective side portions by means of respective male/female sockets at each end of the spacer member.

**[0018]** Each male/female socket engagement is locked by means of a locking pin inwardly extending from an inside surface of a C-clamp.

**[0019]** The wheel means may comprise four castors. Alternatively, the wheel means may comprise two large wheels disposed at a rear end region of the side portions, the large wheels being of a size suitable to permit self-propulsion of the chair by action of the arms of the user.

**[0020]** The backrest portion may be provided with a web back support which is slung between the two upstanding backrest struts and tensioned by means of adjustable ties.

**[0021]** Following is a description by way of example only and with reference to the figures of the drawings of one method of putting the present invention into effect.

**[0022]** In the drawings:-

**[0023]** Figure 1 is a perspective line drawing of a shower chair according to the present invention.

**[0024]** Figure 2 is an exploded view of certain components of the chair of figure 1.

**[0025]** Figure 3 is a view of the lower components of the chair.

**[0026]** Figure 4 is a view of the components of figure 3 to which has been added a backrest portion.

**[0027]** Figure 5 is a view of the components of figure 4 provided with arm rests.

**[0028]** Figure 6 is a view of a seat member for use with the chair. Figure 6A shows the assembly process for attaching the seat member.

**[0029]** Figure 7 shows a substantially complete chair provided with footplates.

**[0030]** Figure 8 shows detail of backrest webbing.

**[0031]** Figure 9 shows detail of the footplates.

**[0032]** Figure 10 shows a leg extension element.

**[0033]** Figure 11 shows an arm rest adjustment mechanism.

**[0034]** Figure 12 shows the completed shower chair ready for use.

**[0035]** Figure 1 shows a shower chair according to the present invention. The shower chair comprises a back rest portion 10, a seat portion 11, and first and second side portions 12 and 13. Particular structural details will become apparent in the following description of an assembly sequence for the chair.

**[0036]** In Figure 2 the second side portion 13 is shown. The side portion is formed from tubular metal struts. There is a vertical rear strut 14 which is attached at a lower end thereof to a rear end region of a generally horizontal lower strut 15. The lower strut 15 is attached at a front end thereof to vertical front strut 16. The front strut is formed with a bend 17 at a top end thereof. The bend directs a continuation of the front strut to extend horizontally to form an upper horizontal strut 18. A rear end of the strut 18 is attached to a top end region of the rear strut 14. A front end region of the upper strut 18 is formed with an inwardly directed cantilever strut 19. The strut extends orthogonally from the plane occupied by the struts 15, 16, 17 and 18. A front end region of the lower strut is formed with a similarly inwardly directed stub plug 20. The stub plug 20 engages with an open end 21 of a spacer strut 22. An opposite end 23 of the spacer strut engages with a stub tube formed on the second side portion 12, as shown in figure 3.

**[0037]** The first and second side portions are mirror versions of each other. Hence corresponding parts on each are given corresponding numbers in the drawings. The respective ends of the spacer strut 22 are locked in engagement with the stub tubes by means of C-clamps 25. The clamps each have a locking pin 26 formed along a radius of the C-clamp. The pin is accommodated in corresponding holes in the stub plug and spacer strut, as shown in the detail view figure 3A.

**[0038]** A lower end of the front strut 16 of each side portion carries a front castor 27. A rear end of each lower horizontal strut 15 carries a rear castor 28. Each rear castor is lockable by means of foot pressure applied to

an upper brake plate 29 of the castor, as shown in the detailed view figure 3b.

**[0039]** The backrest portion 10 comprises a tubular metal frame 30, as shown in figure 4. the frame comprises an upper horizontal strut 31. The upper strut is formed with bends 32 at each end thereof. The bends direct extensions of the horizontal struts downwards to form respective vertical struts 33 and 34. A lower end region of each vertical strut is attached to a respective end of a spacer strut 35.

**[0040]** A plastics material web 36 is slung between the two vertical struts 33,34 to form a back support.

**[0041]** A lower end of each vertical strut is attached to a top end of each side portion rear vertical strut 14. The top end of each side portion vertical strut 14. the top end of each side portion vertical strut is formed as a collar 37. The collar receives the lower end of the respective back portion vertical strut 33 or 34. The back portion is locked in engagement by means of C-clamp 38/locking pin/hold combinations of the same type to those described with respect to the side portion spacer strut engagement hereabove.

**[0042]** The side portions are provided with respective arm rests 40 and 41, as shown in figure 5. the arm rests each comprises a generally rectilinear loop 42 of tubular metal. An upper region of the loop is provided with comfort padding 43. A lower region of the loop is formed with a depending collar 44. A rearward extension 45 of the loop is bent to give a generally downward orientation. A free end 46 of the extension is slidably entered into a collar 47 attached to a mid region of each of the vertical back portion struts 33 and 34. The collar is provided with a screw threaded hole into which is threaded a gnarled locking knob 49. The locking knob may be loosened to permit pivoting of the armrest with respect to the rest of the chair. The collars 44 engage with upstanding stubs 48. The stubs are carried by frame extensions 59.

**[0043]** The seat portion 11 comprises a generally horseshoe configuration rigid plate 50. An upper surface of the plate is provided with plastics material cushioning 53. A central hole 56 in the seat portion permits toileting of a user in situ in the chair. A lower surface 54 of the plate is provided at a front end region 51 thereof with two pairs of laterally spaced part and axially aligned C-clamps 52. The front end C-clamps engage with the inward cantilever struts 19 carried by the side portions 12 and 13. A rear end region of the lower surface 54 is provided with three axially aligned C-clamps 55. The clamps 55 engage with the backrest lower horizontal strut 35. The clamps permit snap-engagement of the seat portion (as shown in Figure 6a), and removal of the seat portion for cleaning or widening of the chair.

**[0044]** The front vertical strut 16 of each side portion carries a mid region thereof a twin bore clamping device 60. One bore accommodates the strut. A second bore 61 is aligned parallel to the strut. The bore receives a depending spigot member 62 of a foot plate assembly 63. Each foot plate assembly includes a foldable foot

plate 64. Rotation of the spigot in the second bore allows the footplates to be swung outwardly in order to permit fine alignment with the foot of a user. Figure 9 shows possible footplate arrangements.

**[0045]** Figure 8 shows the arrangement whereby the backrest web 36 may be tightened. The tightening relies upon a lace threaded through a series of eyelets in the web. This arrangement permits a single type of web member to be used with backrests of differing width. Figure 8 shows the lacing detail.

**[0046]** Figure 9 shows a castor assembly 70 by means of which castors attached to the chair may be adjusted to provide greater height to the chair. The assembly comprises a castor wheel 71 carried between a yoke member 72. A top end 73 of the yoke is formed as a circular face with a central bore 74. A cylindrical spacer 75 is provided at one end with a screw threaded bore (not visible) and at another, top end, with a threaded bolt extension 76. The bolt engages with a lower end of the side portion 12 or 13. The bore receives a free end of a bolt 77. The spacer serves to separate the yoke and side portion, thereby increasing the overall height of the chair above the ground.

**[0047]** Figure 11 shows an arm rest variation. In this armrest the padding 43 is carried by an elongate depending strut 80. The strut is formed along its length with several spaced apart holes. The strut 80 is entered into a rigid sheath member attached to a side portion 12 or 13. The height of the padding arm rest may be altered by locking of the strut by means of a locking pin (not shown) carried by the sheath and entered into one of the holes.

**[0048]** Figure 12 shows an assembled shower chair. One arm rest 85 has been swung out by lifting up to disengage the spigot 48 from the collar 44, and then swivelling about the pivot provided by the collar 47.

**[0049]** The use of a detachable back rest frame 30 and detachable side portion spacer strut 23 permits easy variation of the chair width by substitution of a spacer of different length, and a back rest frame of different span. The side portions remain the same. the same seat member may be used for a range of chair width because of the alignment of the spring claims 52 and 55.

## Claims

### 1. A mobile chair comprising:

a back rest portion comprising a two generally upstanding struts which are held spaced apart by one or more spacer members,  
a seat portion and  
first and second side portions for supporting the seat and backrest portions, the side portions being provided at a lower region thereof with wheel means for supporting the chair for move-

ment over a surface upon which the chair may be placed, the side portions being held spaced apart one from the other by engagement of a rear end region of each side portion with the backrest portion and by a side portion spacer member extending between a front end region of each side portion, wherein the side portion spacer member releasably engages with the side portions and the back rest portion releasably engages with the side portions thereby to permit a variation in chair width by substitution of the side portion spacer member and the backrest portion for replacement respective side portion spacer member and backrest portion.

2. A mobile chair as claimed in claim 1 wherein the seat portion comprises a seat member which releasably engages with the side portions and backrest portion
3. A mobile chair as claimed in claim 2 wherein the seat member releasably engages at a front end region thereof with one inwardly directed cantilever strut provided on one side portion and another corresponding inwardly directed cantilever strut provided on the other side portion.
4. A mobile chair as claimed in claim 2 or claim 3 wherein the seat member releasably engages at a rear end region thereof with a lower spacer member of the back rest portion.
5. A mobile chair as claimed in claim 4 wherein the backrest lower spacer member and the inwardly directed struts extend substantially orthogonally.
6. A mobile chair as claimed in any or claims 2 to 5 wherein the seat member releasably engages with the back rest portion and side portions by means of a plurality of spring clamps provided on a lower surface of the seat member.
7. A mobile chair as claimed in claim 6 wherein the spring are arranged laterally spaced apart in two rows, one at a front end region of the seat member and one at a rear end region of the seat member.
8. A mobile chair as claimed in any preceding claim wherein each side portion is provided with an arm rest portion which releasably engages with a top end region of the side portion and releasably engages with a mid-region of the backrest portion.
9. A mobile chair as claimed in claim 8 wherein the releasable engagement of each arm rest at the mid region of the backrest comprises a pivoting engagement, which engagement permits swinging outward

of each arm rest away from the seat portion, thereby to facilitate sideways transfer of a user of the chair.

10. A mobile chair as claimed in any preceding claim wherein the backrest portion releasably engages with the side portions by means of respective male/female sockets at a rear end region of the side portions. 5
11. A mobile chair as claimed in any preceding claim wherein the side portion spacer member engages with the respective side portions at a lower front end region of each side portion. 10
12. A mobile chair as claimed in any preceding claim wherein the side portion spacer member engages with the respective side portions by means of respective male/female sockets at each end of the spacer member. 15
13. A mobile chair as claimed in claim 12 or claim 10 wherein each male/female socket engagement is locked by means of a locking pin inwardly extending from an inside surface of a C-clamp. 20
14. A mobile chair as claimed in any preceding claim wherein the wheel means comprise four castors. 25
15. A mobile chair as claimed in any preceding claim wherein the wheel means comprise two castors disposed at a front end region of the side portions and two large wheels disposed at a rear end region of the side portions, the large wheels being of a size suitable to permit self-propulsion of the chair by action of the arms of the user. 30  
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16. A mobile chair as claimed in any preceding claim wherein the backrest portion is provided with a web back support which is slung between the two up-standing struts and tensioned by means of adjustable ties. 40

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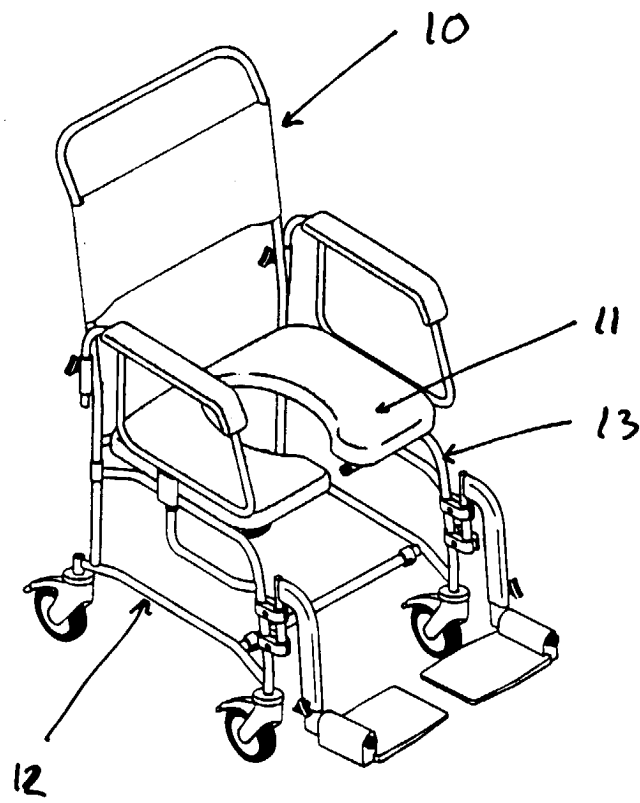
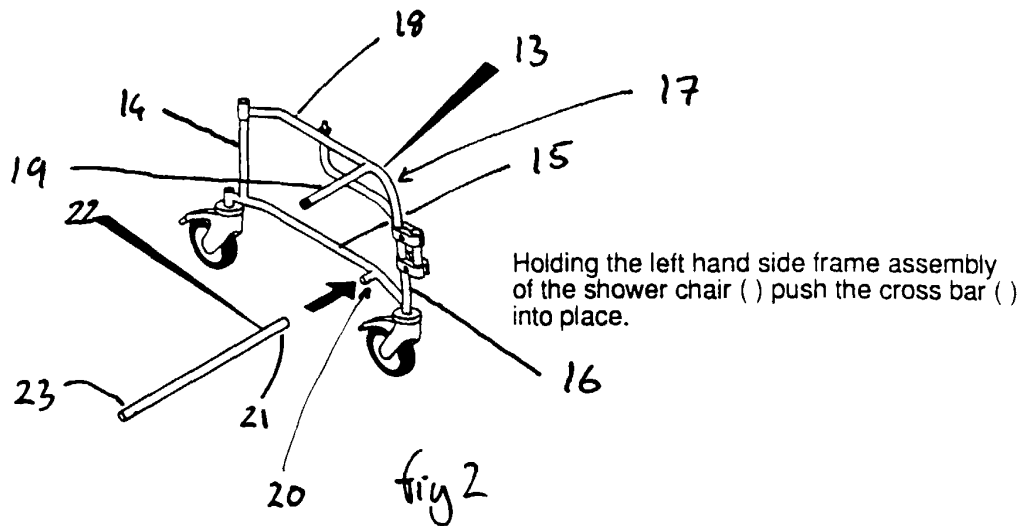


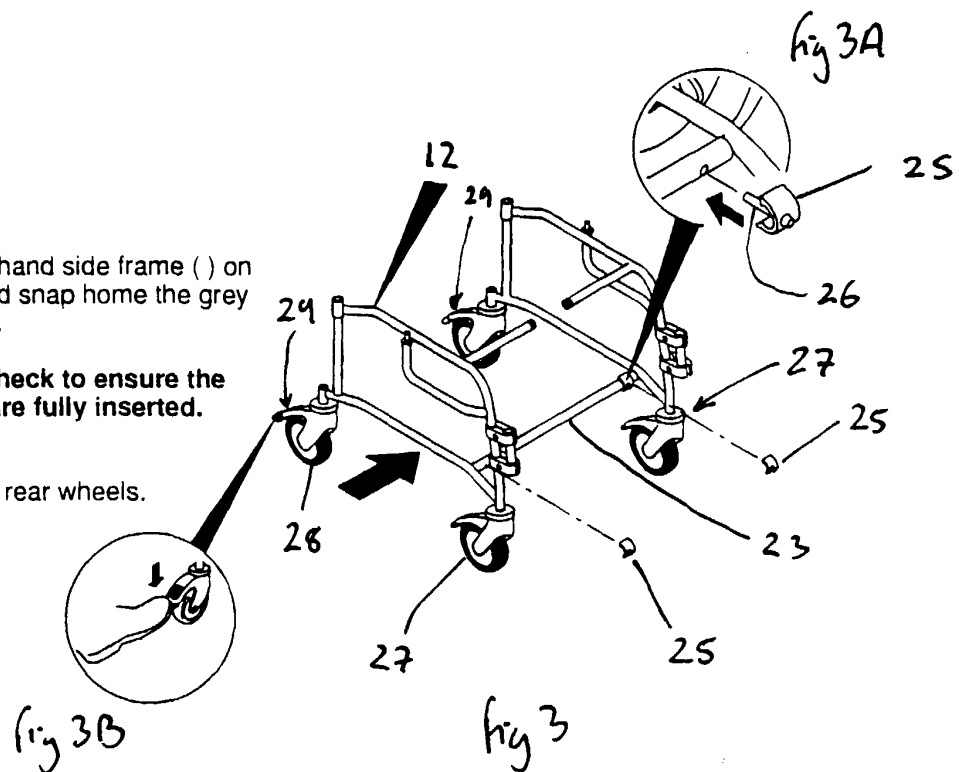
fig 1

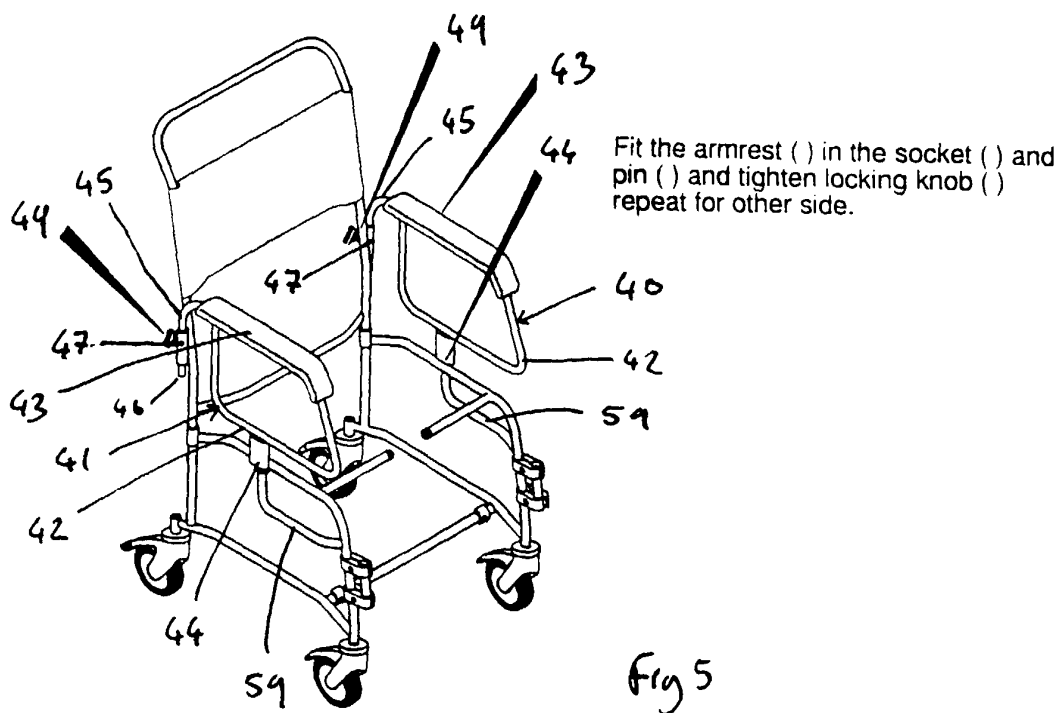
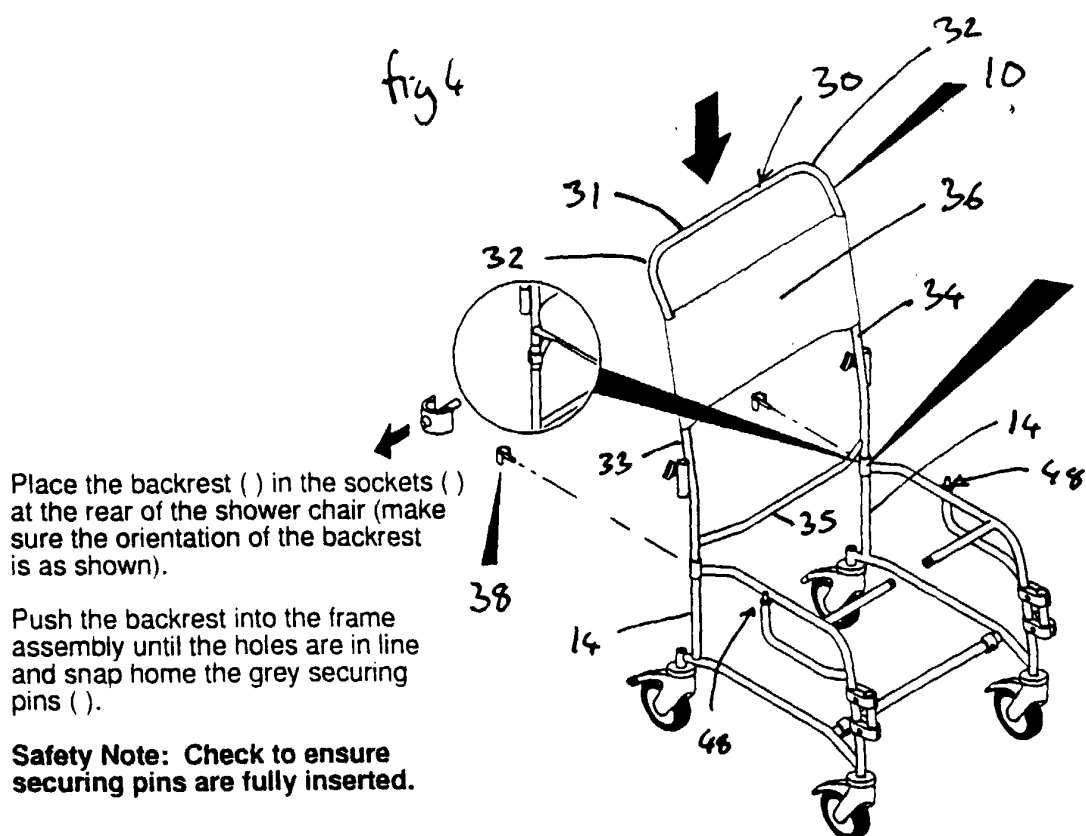


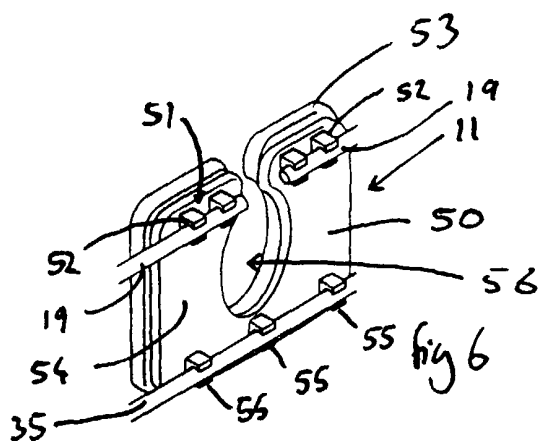
Locate the right hand side frame ( ) on the cross bar and snap home the grey securing pins ( ).

**Safety Note:** Check to ensure the securing pins are fully inserted.

Apply brakes on rear wheels.







Tip the chair backward to visually check all clamps are secured.

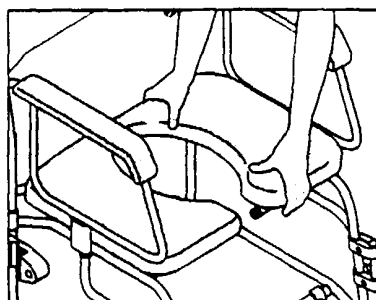


fig 6A

Snap on the seat ( ), ensuring correct orientation. (On the underside of the seat there are 4 snap-on fixings at the front and 3 at the rear.)

**Safety Note:** Put one hand at front of seat and one at rear to avoid trapping fingers under armrest

Fit footrests ( ) into sockets and tighten screws ( ) with allen key provided.

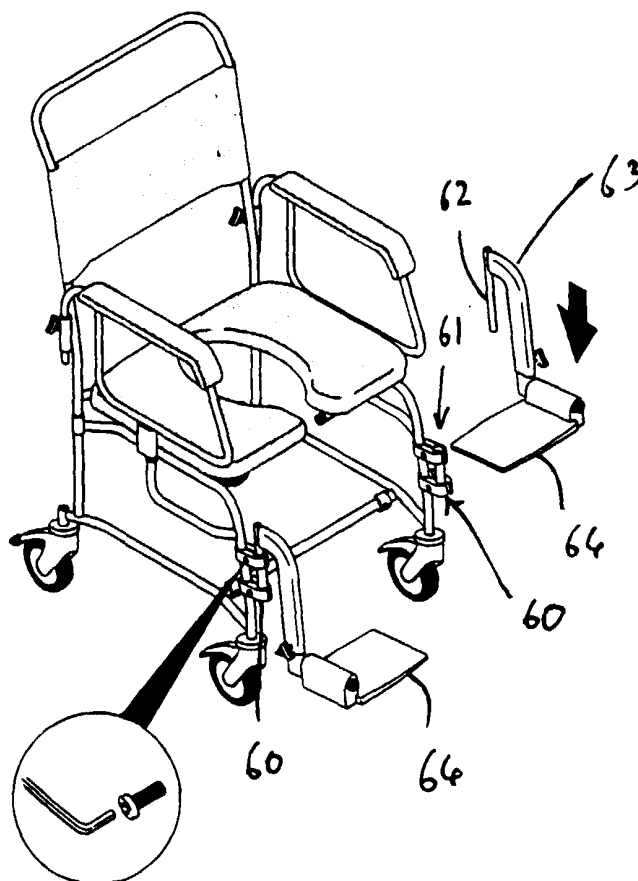
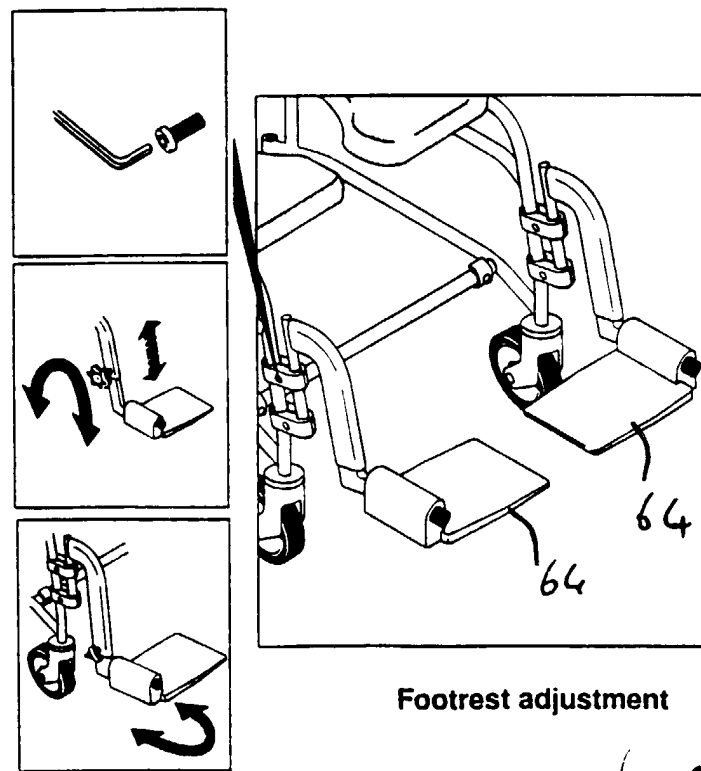
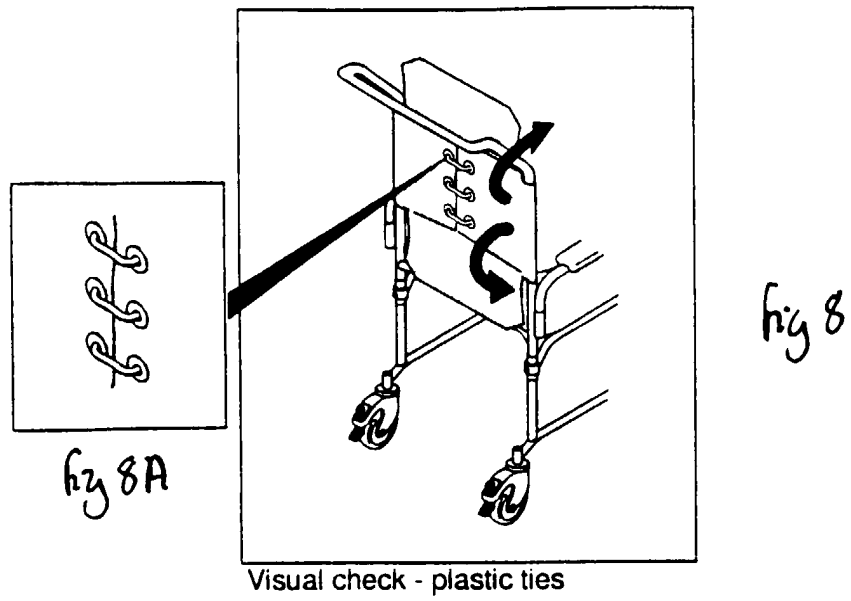


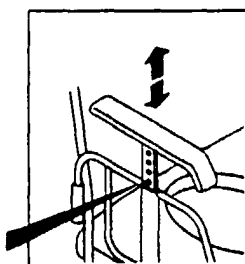
fig 7





leg extension

fig 10



Adjustable armrest  
adjustment

fig 11

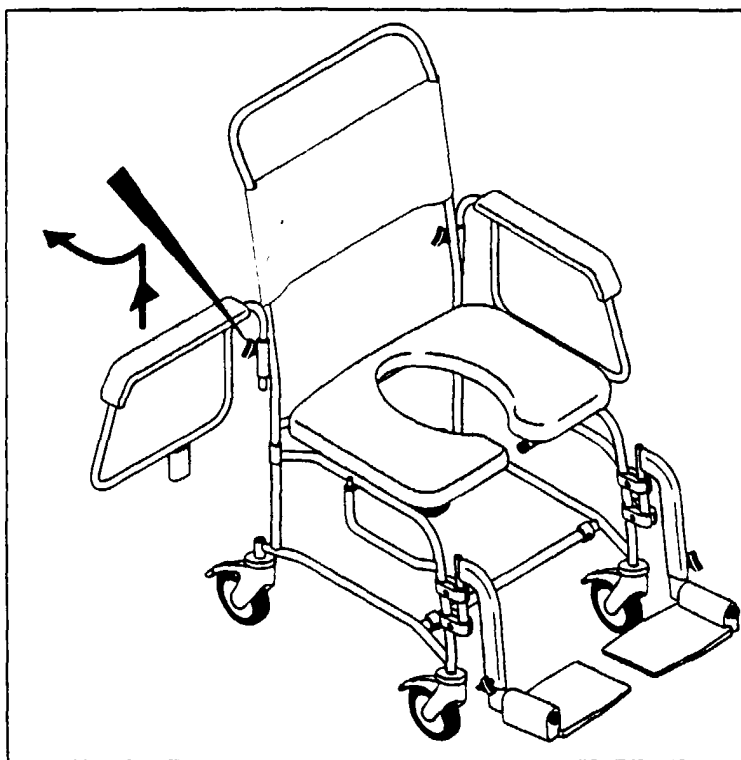


fig 12

Armrest adjustment for transfer



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# EUROPEAN SEARCH REPORT

Application Number  
EP 99 30 7270

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>16 February 2000</b>	Examiner <b>Cametz, C</b>
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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