

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
1 August 2002 (01.08.2002)

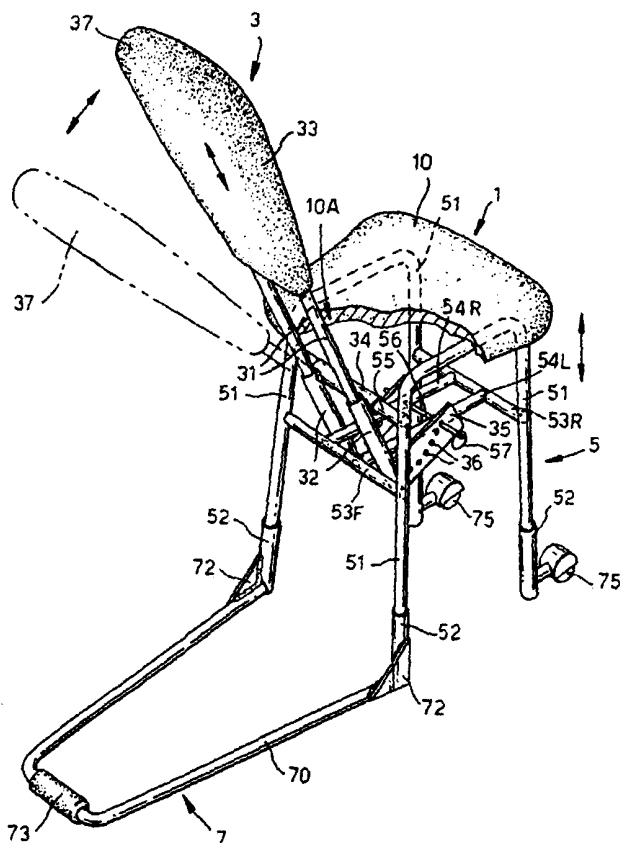
PCT

(10) International Publication Number  
WO 02/058601 A1

- (51) International Patent Classification<sup>7</sup>: A61F 5/04 [GB/GB]; A & E Department, John Radcliffe Hospital, Oxford (GB).
- (21) International Application Number: PCT/GB02/00027
- (22) International Filing Date: 2 January 2002 (02.01.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
0100087.6 3 January 2001 (03.01.2001) GB
- (71) Applicant (for all designated States except US): ISIS INNOVATION LIMITED [GB/GB]; Ewert House, Ewert Place, Summertown, Oxfordshire OX2 7SG (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): HORMBREY, Philip
- (74) Agents: NICHOLLS, Michael, John et al.; J.A. Kemp & Co., 14 South Square, Gray's Inn, London WC1R 5JJ (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent

[Continued on next page]

(54) Title: DEVICE FOR ASSISTING IN THE RELOCATION OF DISLOCATED SHOULDERS



(57) Abstract: A device for assisting a patient to adopt an efficient position to allow a dislocated shoulder to be reset with the minimum effort and pain reducing the need for sedative medication. The device comprises a seat with a chest supporting section extending at an adjustable angle in front of the seat so that the patient sits on the seat and leans forward against the chest supporting section. The height of the seat and the length of the chest supporting section are adjustable to suit the patient. The patient is positioned with the dislocated shoulder over the top of the chest supporting section with the arm hanging down the other side of the chest supporting section. The device is provided with a base extension extending from the front beyond the lateral position of the end of the chest supporting section to prevent the device toppling over as the patient leans forward and as traction is applied to the arm. The extension to the base conveniently can provide a handle for the device, which is movable on wheels provided on the side of the base opposite the base extension. The seat is narrow, to allow the patient easily to straddle the seat, and the seat, chest supporting section and top of the chest supporting section are padded and covered with a material which does not stick to human skin.

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(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*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.*

**Published:**

— with international search report

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DEVICE FOR ASSISTING IN THE RELOCATION  
OF DISLOCATED SHOULDERS

The invention relates to a device that facilitates the reduction of anterior  
5 dislocations of the shoulder, avoiding the use of drugs for sedation or pain relief and  
achieving reduction with minimal pain and effort.

There are a number of methods currently used to reduce anterior  
dislocations of the shoulder (eg Kochers, Hippocratic). These methods may require  
the use of significant force and can cause considerable discomfort to the patient. The  
10 use of force may also cause further damage to the structures that support the shoulder  
joint and to the surrounding nerves. Sedative medications are necessary for many of  
the techniques. The use of these sedative medications necessitates a high degree of  
training and the availability of resuscitation equipment. These techniques can  
therefore only be performed in medical facilities. The use of sedation also promotes  
- 15 delay in treatment as the resource, both time and personnel, may not be immediately  
available and the sedation technique itself takes time. The patient is likely to require  
pain relief if there is delay before reduction can take place and reduction may be  
made more difficult by the delay. Furthermore, following reduction of the  
dislocation, the sedated patient requires careful observation for a period of time using  
20 additional resource.

Most shoulder dislocations are anterior dislocations where the humeral head  
dislocates forwards from the shoulder joint. This usually occurs when the arm is in  
the throwing position, with the arm held upwards and forwards from the shoulder  
joint, as the structures that support the shoulder are at their weakest in this position.  
25 It would be advantageous to position the dislocated arm and torso in a similar  
position, recreating the weakest position of the supporting structures as reduction  
would be most easily achieved in this position. If this position of the arm relative to  
the shoulder can be achieved and the forces of gravity be applied to the arm,  
reduction of the dislocated shoulder would be further facilitated.

30 According to the present invention, there is provided a device for allowing  
the patient to sit with the torso supported on an adjustable angle and length chest

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supporting section and the arm extended forward from the shoulder, by pivoting over the end of the chest supporting section. By providing for the chest supporting section to be adjustably angled relative to the seat, and to have an adjustable length, the correct relative position of the arm and torso for a particular patient and a particular  
5 dislocation can be achieved, facilitating most simple reduction of the shoulder.

The invention also provides a method of reducing a shoulder dislocation by using the device.

The device is simple to use, requires minimal training, so could be used by a nurse rather than a doctor, does not necessitate the use of pain relief and avoids the  
10 use of sedation. It can also allow the technique of anterior shoulder reduction to be performed in the pre-hospital environment for instance at a sports facility. It considerably speeds up the treatment and, as it tends to minimise damage and the use of drugs, reduces the need for continued treatment or observation after relocation, improving turn-around time. The invention allows the positioning of the body with  
15 the optimal angle between the arm and torso. This angle is specific to each patient and depends on several factors such as height, build and the nature of the dislocation.

In more detail, the device comprises:

a seat;

a chest supporting section positioned forwards of the seat and having an  
20 adjustable length and an adjustable angle of greater than or equal to  $90^\circ$  relative to the seat, the top of the chest supporting section having a shoulder support surface for supporting from underneath the shoulder of a human patient sitting on the seat with the chest against the chest supporting section;

a base on which are mounted the seat and chest supporting section and  
25 which has a ground engaging base extension extending forwards from the device beyond the front edge of the seat.

In use, with the device, the mere positioning of the torso against the chest supporting section at the correct angle, with the arm over the top of the chest supporting section is, in some circumstances, enough to reset the joint immediately.  
30 In other cases, the addition of traction and external rotation, by the doctor pulling down and externally rotating the arm, resets the shoulder joint.

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To ensure that the device does not topple forwards, even under traction exerted by the doctor, the base extension preferably extends at least as far from the front of the seat as the top of the chest supporting section, when it is inclined to at least 50% of its maximum angle, or more preferably to at least 75% of its maximum  
5 angle. Thus, in one embodiment it may extend as far out as the top of the chest supporting section when the chest supporting section is inclined at 135° to the seat. The base extension may be at least 45 cm long, more preferably in the range of 50 cm to 1 m. In one embodiment it is about 70 cm long. The device should be suitable and stable for patients of height from 130 cm to 200 cm and weight from 40  
10 kg to 175 kg.

To allow for different patients and different dislocations, the angle of the chest supporting section is preferably adjustable from 90° to 170°, more preferably 90° to 150°.

In order that all patients can comfortably straddle the seat, the seat is  
15 preferably saddle-shaped with a narrow portion adjacent the chest supporting section and a wider portion remote from the chest supporting section. The narrow portion may be less than 30 cm wide, e.g. 20 cm, and the wider portion, for example, about 40 cm. The seat, chest supporting section and shoulder support surface may be padded, and may be covered with a material which does not stick to human skin, and  
20 which is washable and/or may also be removable allowing it to be washed or disposed of.

Preferably the height of the seat from the ground is also adjustable, for instance by providing for telescopic adjustment of the base.

It is also convenient if the base extension forms a handle for transporting the  
25 device, with wheels being provided on the side of the base opposite the base extension.

The device may also be made collapsible so as to be easily storable.

The invention will be further described by way of non-limitative example with reference to the accompanying drawings in which:

30 Figure 1(A) is a schematic perspective view of the device and 1(B) a view of the device in use; and

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Figure 2 illustrates the seat.

Figure 1 illustrates an embodiment of the invention which generally comprises a seat part 1 mounted on a base 5, the device having an adjustable length and angled chest supporting section 3. The base part 5 includes a base extension 7  
5 extending forward from the seat underneath the angled chest supporting section 3.

As illustrated, the base part 5 is constructed by a tubular frame having four legs 51, each with telescopic adjustment 52 for allowing the height of the seat to be adjusted. Extending between the front pair of legs 51 is a horizontal support brace 53F, and extending between the rear pair of legs is a horizontal support brace 53R.  
10 Extending from front to back between the two support braces are a pair of tubular struts 54L and 54R, which not only strengthen the base but also form part of the angle adjustment for the chest supporting section 3. Of course the frame need not be of tubular metal, but could be of plastic or a composite material such as carbon fibre.

The chest supporting section 3 comprises a padded section 33 mounted on a  
15 U-shaped tubular support 31. The limbs of the U-shaped tubular support 31 are supported inside tubular sections 32, to give the chest supporting section telescopic length adjustment. The tubular support sections 32 are rigidly connected to a tube 34 which forms a sleeve around a horizontal tubular section 55 extending between the two front legs of the base, so that the chest supporting section can pivot around the  
20 tubular support 55 altering the angle between the chest supporting section 3 and the seat 10. The tubular sections 32 extend beyond the pivot tube 34 to two rectangular plates 35 which form part of the angle adjusting mechanism. Each of the rectangular plates 35 is provided with an array of holes 36 positioned so that a pin 56 can pass through a corresponding hole in each of the rectangular plates 35, and through a hole  
25 in the tubular struts 54L and 54R, thus locking the angle of the chest supporting section. By withdrawing the pin 56, pivoting the chest supporting section so that another pair of holes in the rectangular plates lines up with the holes in the tubular struts 54L and 54R, and re-inserting the pin 56, the chest supporting section can be locked at a different angle. For safety the pin can be secured using a split ring 57  
30 through its end. The top of the chest supporting section is provided with a curved, padded shoulder support section 37, which provides a padded surface extending from

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the front of the chest supporting section around to the back.

The seat part 1 consists of a padded, slightly saddle-shaped seat 10 which, like the chest supporting section and shoulder support section, is covered with a material which does not stick to human skin and is washable. Optionally the covers  
5 for the padded sections may be removable for washing, or disposable. The seat is shaped so that a patient can comfortably straddle the seat with his or her chest resting on the chest supporting section. Therefore it is advantageous if the front part of the seat 10A is relatively narrow, for instance less than 30 cm wide, the seat widening to the rear. Figure 2 illustrates schematically a possible shape for the seat. In Fig 2 the  
10 side edges 200 of the seat consist of the straight sections 202 and 203 joined by a smoothly curved concave section 201. The width  $n$  of the narrow portion may be in the range 10 to 25 cm e.g. about 20 cm, and the width  $w$  of the wide portion 25 to 60 cm, eg. about 40 cm.

The base part 5 is attached to a horizontally extending, ground-engaging  
15 base extension 7 formed by a U-shaped tubular member 70. - This is important because the patient will be leaning against the chest supporting section, thus tending to topple the device forward. Further, the doctor may have to apply traction to the arm, increasing the toppling force. Preferably, therefore, the base extension 70 extends beyond the position of the shoulder support section 37 when the chest  
20 supporting section 3 is at its maximum angle compared to the plane of the seat. To provide for additional strength, triangular braces 72 may be provided at the connection between the base and the base extension.

While not illustrated, the telescopic adjustment 52 on the base, and the telescopic adjustment provided by the limbs of the chest supporting section 31  
25 passing inside the tubular supports 32 are lockable in the desired position by any known and suitable mechanism such as a pin extending through a hole, or a screw clamp.

To assist in manoeuvring the device, the base extension may form a handle, provided with a grip 73, and wheels or castors 75, may be positioned on the opposite  
30 edge of the base. This allows the device to be raised and wheeled around.

In use, as shown in Fig. 1(B), the patient sits on the seat, facing forwards,

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with his or her chest against the chest supporting section 3, the doctor adjusting the angle and length of the chest supporting section, and the height of the seat, to suit the patient and also to suit the particular direction of dislocation. The patient's dislocated arm hangs over the top of the chest supporting section with the dislocated  
5 shoulder being supported from the underneath by the shoulder support section 37 (which thus fits into and engages the armpit). If necessary, traction and rotation can be applied to the dislocated arm, thus assisting in resetting of the shoulder.

It should be appreciated that the device may be made collapsible, for instance the chest supporting section may be folded down to the base extension 70,  
10 and the seat may also be made collapsible.

Further, while telescopic adjustment of the length of the chest supporting section and of the height of the seat has been illustrated, other known length adjustments may be used. Similarly, while a simple form of angle adjustment for the chest supporting section has been described and illustrated, other known forms of  
15 angle adjustment may be used, for instance which provide for a continuous angular adjustment e.g. using an arcuate slot in plates 35 and a clamping mechanism, rather than adjustment in discrete steps as illustrated.



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CLAIMS

1. A device for facilitating the relocation of a dislocated human shoulder, the device comprising:
  - 5 a seat;
  - a chest supporting section positioned forwards of the seat and having an adjustable length and an adjustable angle of greater than or equal to  $90^\circ$  relative to the seat, the top of the chest supporting section having a shoulder support surface for supporting from underneath the shoulder of a human patient sitting on the seat with
  - 10 the chest against the chest supporting section;
  - a base supporting the seat and chest supporting section and having a ground engaging base extension extending forwards from the device beyond the front edge of the seat.
- 15 2. A device according to claim 1, wherein the base extension extends at least as far beyond the front edge of the seat as the position of the shoulder support surface when the chest supporting section is at its maximum angle to the seat.
3. A device according to claim 2, wherein the base extension extends
- 20 at least 60 cm beyond the front edge of the seat.
4. A device according to claim 1, 2, or 3, wherein the angle between the seat and the chest supporting section is between  $90^\circ$  and  $180^\circ$ .
- 25 5. A device according to any one of the preceding claims, wherein the seat is saddle-shaped.
6. A device according to any one of the preceding claims, wherein the seat has a narrow portion less than 25 cm wide adjacent the chest supporting section
- 30 and a wider portion greater than 25 cm wide remote from the chest supporting section.

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7. A device according to any one of the preceding claims wherein the width of the seat decreases towards the chest supporting section.

8. A device according to any one of the preceding claims, wherein the chest supporting section is padded.

9. A device according to any one of the preceding claims, wherein the shoulder support surface is a curved padded surface extending from the front of the chest supporting section to the back of the chest supporting section.

10

10. A device according to any one of the preceding claims, wherein the seat is padded.

11. A device according to claim 8, 9 or 10, wherein the padded parts are covered with a non-stick material.

12. A device according to any one of the preceding claims, wherein the seat and/or chest supporting section is provided with a removable cover.

13. A device according to any one of the preceding claims, wherein the height of the seat above the ground is adjustable.

14. A device according to any one of the preceding claims, wherein the length of the chest supporting section is adjustable.

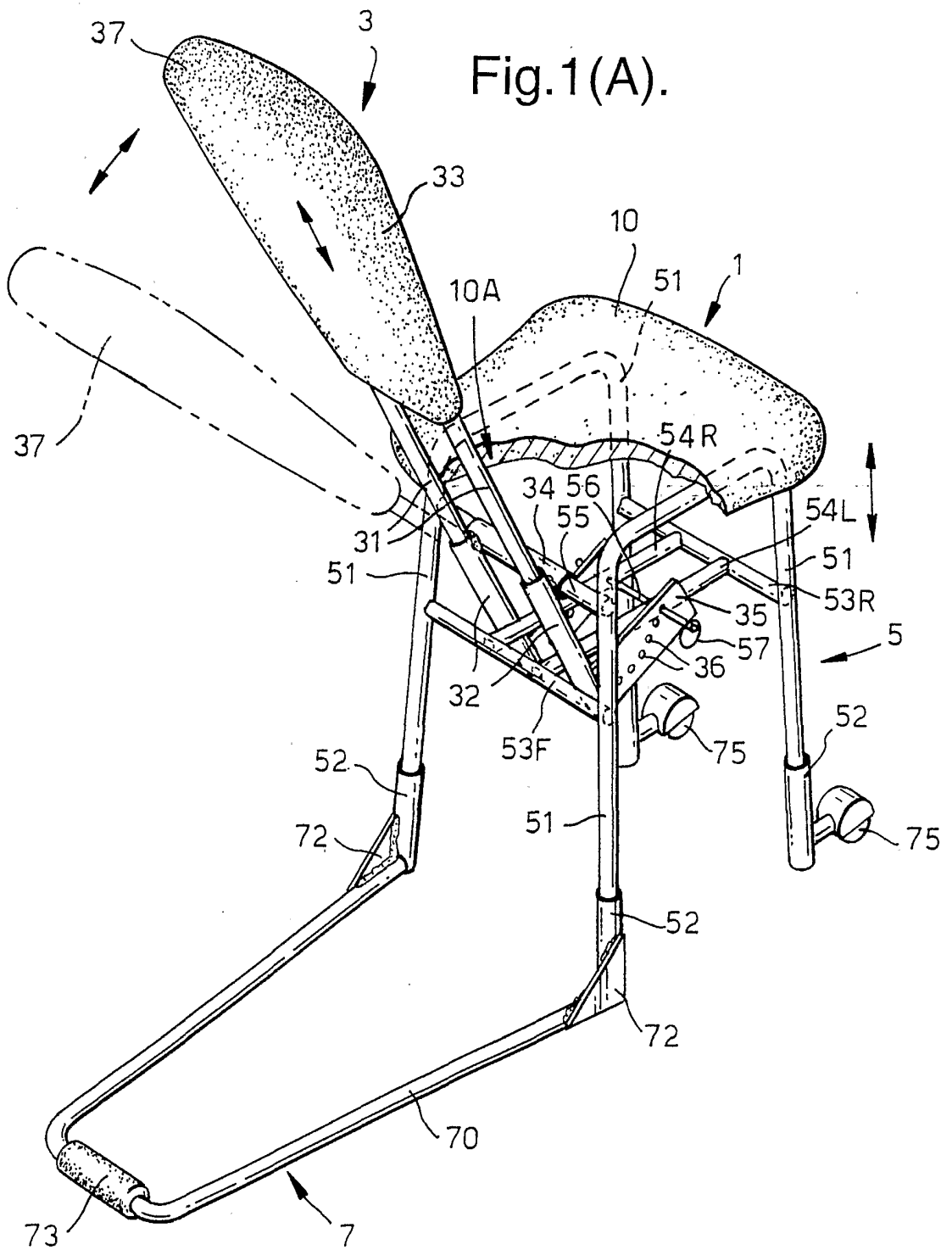
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15. A device according to any one of the preceding claims, wherein the base extension comprises a handle for facilitating transport of the device.

16. A device according to claim 15, wherein wheels are provided on the base on the side opposite the base extension.

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Fig.1 (A).



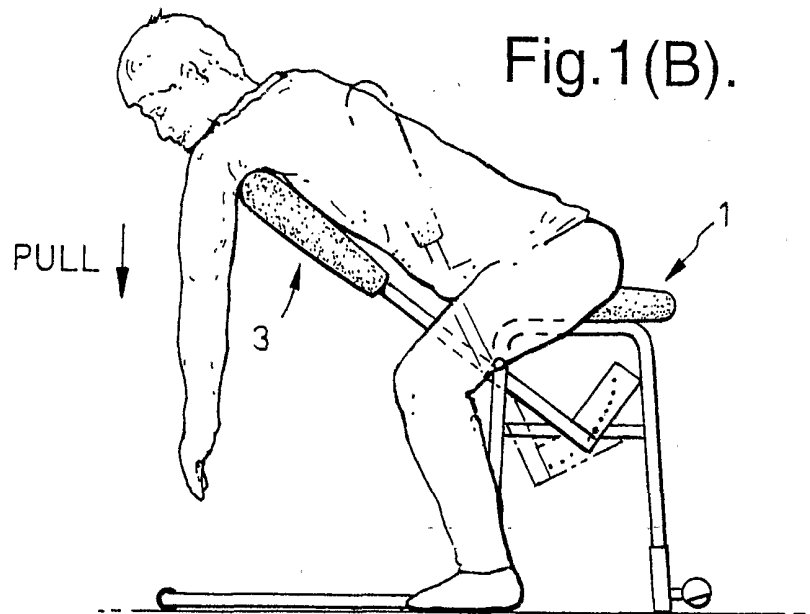
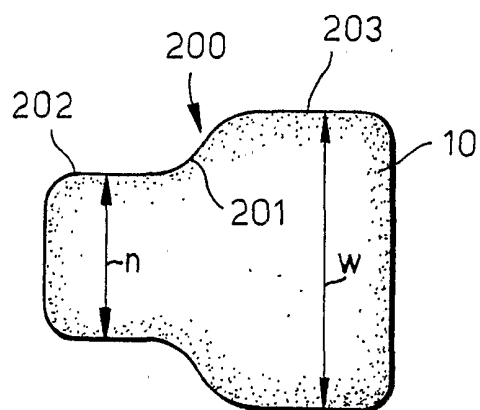


Fig.2.



**INTERNATIONAL SEARCH REPORT**

International Application No  
PCi/WB 02/00027

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61F5/04

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

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61F A61G

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 354 485 A (SAFADAGO GARY J) 19 October 1982 (1982-10-19) abstract	1
A	US 4 207 879 A (SAFADAGO GARY J ET AL) 17 June 1980 (1980-06-17) abstract	1
A	US 5 997 494 A (STEARNS RANDALL G ET AL) 7 December 1999 (1999-12-07) abstract; figure 3	1
A	US 4 844 056 A (PETERS ROBERT M) 4 July 1989 (1989-07-04) abstract	1
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

5 April 2002

Date of mailing of the international search report

11/04/2002

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Sánchez y Sánchez, J

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 02/00027

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 059 365 A (DIAMOND PENELOPE J) 9 May 2000 (2000-05-09) abstract; figures -----	1

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 02/00027

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