(19) Europäisches Patentamt
European Patent Office
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(11) **EP 2 108 284 A1**

# (12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
**14.10.2009 Bulletin 2009/42**

(51) Int Cl.:
***A47C 1/027*** *(2006.01)* ***A47C 4/46*** *(2006.01)*

(21) Application number: **09425113.9**

(22) Date of filing: **20.03.2009**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR**
Designated Extension States:
**AL BA RS**

(30) Priority: **01.04.2008 IT BS20080012 U**

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## (54) Device for adjusting the sitting positions of a deckchair

(57) This invention concerns a device for adjusting the positions of a deckchair seat of the type with two armrests, each connected to a pair of legs by means of a top joint and each having a tubular element sliding in a guide sleeve integral with said joint. The guide sleeve (120) of each top joint (13) is provided with a stop tang (125) designed to interact with a respective tubular element (121), and a locking lever is attached to the top joint (122) facing towards and cooperating with said stop tang (125) which also turns between a released position, in which the stop tang is disengaged from the tubular element, enabling the latter to slide, and a locked position, in which the stop tang is thrust and locked against the tubular element to block it and prevent it from moving longitudinally.

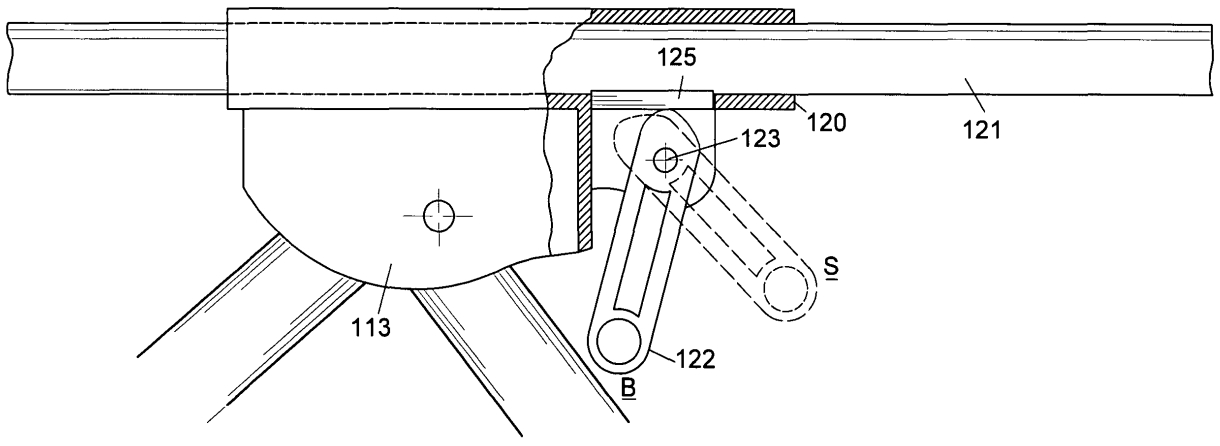


FIG. 3

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## Description

**[0001]** This invention concerns deckchairs with variable adjustments of the seat and backrest, and refers in particular to a device for continuous adjustments of the positions of said seat.

**[0002]** Deckchairs of the type taken into consideration herein which have a structure that permits varying adjustments of the seat and backrest and which can be folded to reduce the overall size for packing and transport and for storing after being used are already known. Moreover, from a previous utility model patent of the same applicant, a continuous adjustment device of the positions for the type of above-mentioned deckchair is also known and comprises: two pairs of legs converging and connected at the top by top joints; a seat linked to the legs and connected to a backrest; two armrests connecting the backrest to the top joints of the legs, and also a leg rest connected to the armrests and sides of the front part of the seat. Each top joint of said legs defines a guide sleeve and each armrest comprises a tubular element that extends and slides in said sleeve to allow the recline of the seat. Then, to carry out the positioning of the seat, each top joint is provided with a lever, which is oriented radially towards the tubular element that extends in the guide sleeve and that turns between a released and a locked position, said lever having a cam end facing towards and tightly engaging with said tubular element when it is in the locked position so as to stabilize the position of the seat.

**[0003]** Such an embodiment, however, is resulted capable of improvements in order to fix and stabilize better the good order of the seat, that is the backrest and the seat, in every position and to remove in this way any risk of the locking system becoming loose and causing accidental or unintentional changes in the positions of the seat from time to time required.

**[0004]** The task of this invention is to achieve this objective by means of a more secure, efficient and reliable continuous adjustment device of the positions of a deckchair, a device which furthermore is easy to reach and use and the locking action of which can only be changed intentionally.

**[0005]** The objective is reached with a position adjustment device for a deckchair according to the preamble of claim 1 which basically comprises, on the edge of each top joint of the legs, a stop tang designed to interact with a respective tubular element and a locking lever facing towards and cooperating with said stop tang, as well as turning between a released position, in which the stop tang is disengaged from the tubular element allowing the latter to slide, and a locked position, in which the stop tang is thrust and closed against the tubular element to block it and avert any longitudinal movement.

**[0006]** More details of the invention will however become evident in the following description made in reference to the enclosed indicative and not limiting drawings, in which:

Fig. 1 is an example of a deckchair with an adjustment device;

Fig. 2 is an external view of the adjustment device in the locked position applied to an arm rest;

Fig. 3 is a similar view as the one in Fig. 2, but with a partial cross-section and with an adjustment device in the locked position; and

Fig. 4 is a view according to arrows A-A on Fig. 3.

**[0007]** The chair, to which the device of this invention is applicable and also shown in the example in Fig.1, , comprises: a pair of front legs 111 and a pair of rear legs 112 connected on the upper part by top joints 113; a seat 114 linked to the legs and connected to a backrest 115; two armrests 116 connected at the rear to the sides of the backrest and united with the top joints 113 of said legs, and a leg rest 117 connected to the armrests and to the sides of the front part of the seat. The front and rear legs are also connected by a crosspiece 118, one end of which is pivoted to a respective front leg, whereas its opposite end is fixed to the rear leg by a C supporting element 119.

**[0008]** The top joint 113 of each two collateral legs defines a guide sleeve 120, and each armrest 116 comprises a tubular element 121 that extends and slides in said guide sleeve 120, allowing the change in seat recline.

**[0009]** The structure of the deckchair is such that, when it is ready for use, the pairs of front and rear legs 111, 112 are positioned and kept wide apart towards the bottom starting from the joints113, whereas the backrest and seat can be differently reclined by means of the armrests 116 and with the help of the leg rest 117.

**[0010]** The tubular elements 121 of the armrests that slide in the guide sleeves 120 of the joints 113, enable the continuous change in recline of the backrest and seat even while sitting and, once chosen, the recline is stabilised by a locking device associated with each of said top joints 113.

**[0011]** This device basically consists in a stop tang 125 interacting with a respective tubular element 121 and in a locking lever 122. The stop tang 125 is provided in the guide sleeve 120, preferably attached and integral with the latter, and is relatively flexible and extends in parallel to said tubular element. It has a saddle shaped internal surface defining a concavity 125' radius equivalent to that of said tubular element and an external surface facing towards the locking lever 122. The latter is mounted on a forked part 113' of the respective joint 113 by means of a pin 123 oriented crossways as regards to the tubular element 121 -Fig. 4. The lever 122 turns on the pin 123 between a released position S and a locked position B and has a cam portion 124 facing towards and interacting with the stop tang 125.

**[0012]** When the locking levers 122 associated with the top joints 113 of the legs are turned into the released position S, they do not engage the respective stop tangs 125 with their cam portions 124, allowing in this way free movement of the armrests so as to be able to vary the

recline of the seat Fig. 2. When on the other hand the locking levers 122 are turned into the lock position B -Fig. 3, 4-, their cam portions 124 engage with the respective stop tangs 125 pushing and tightening them against the respective tubular elements 121, preventing every possibility of them sliding and establishing in this way the effective recline position chosen which cannot be changed unless the said levers are intentionally moved into the release position.

## Claims

1. A device for the continuous adjustment of the positions of a deckchair seat which comprises: two pairs of legs converging at the top and connected to the top joints, a seat associated with the legs and connected to a backrest, two armrests connecting the backrest to the top joints of the legs, a leg rest connected to the armrests and sides of the front part of the seat, and where each top joint (113) defines a guide sleeve (120), and each armrest comprises a tubular element (121) that extends and slides in the guide sleeve enabling the recline of the seat, **characterized in that** in the guide sleeve (120) of each top joint (13) is envisaged a stop tang (125) designed to interact with a respective tubular element (121), and **in that** to said top joint is attached a locking lever (122) facing towards and cooperating with said stop tang (125) also turning between a released position, in which the stop tang is disengaged from the tubular element, enabling the latter to slide, and a lock position, in which the stop tang is thrust and locked against the tubular element to block it and prevent it from moving longitudinally

2. An adjusting device according to claim 1, wherein said stop tang (125) is relatively flexible, is integral with the respective guide sleeve and extends in the direction of the respective tubular element.

3. An adjusting device according to claim 1 or 2, wherein said stop tang (125) has an internal saddle shaped surface with a concavity 125' radius corresponding to that of the respective tubular element and an external surface facing towards the locking lever.

4. An adjusting device according to the previous claims, wherein each top joint (113) of the legs has a forked portion (113'), in which the locking lever (122) is associated with said forked position with a pin (123) oriented crossways to the tubular element (121) that extends in said guide sleeve, and in which said locking lever (122) has a cam end (124) facing towards and interacting with said stop tang (125) to move away from and to approach the latter with regards to the relative tubular element (121) in answer to the rotation of the lever from the released to the locking position, respectively.

5. A deckchair comprising a continuous adjusting system of its positions according to the previous claims.

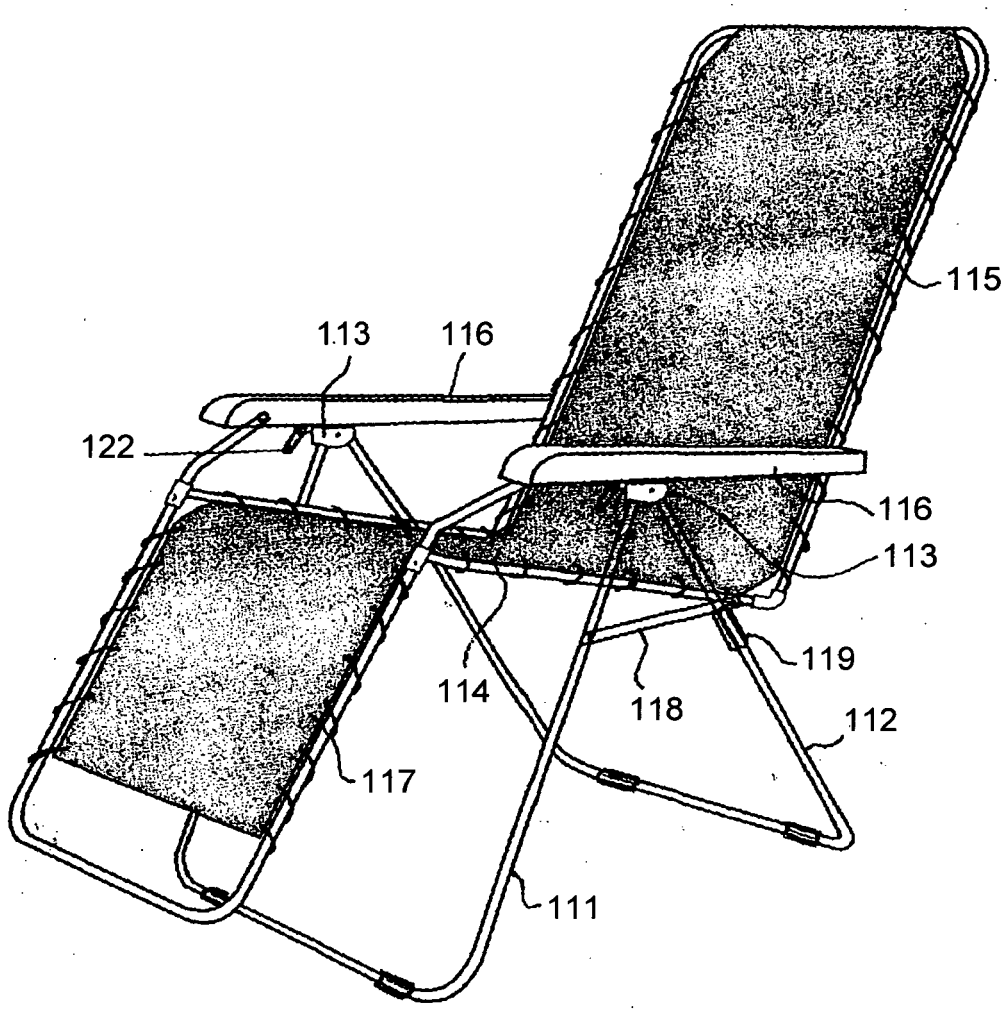


FIG. 1

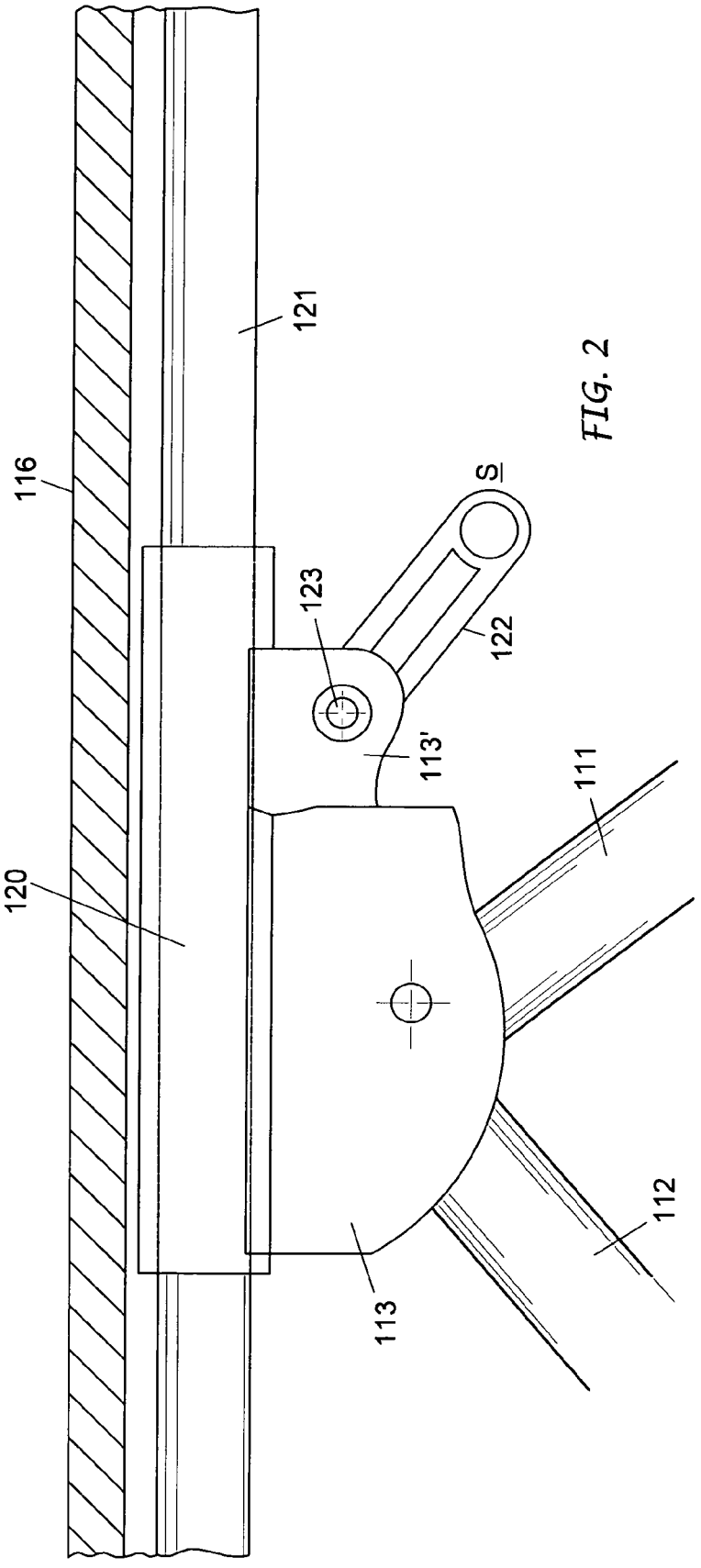


FIG. 2

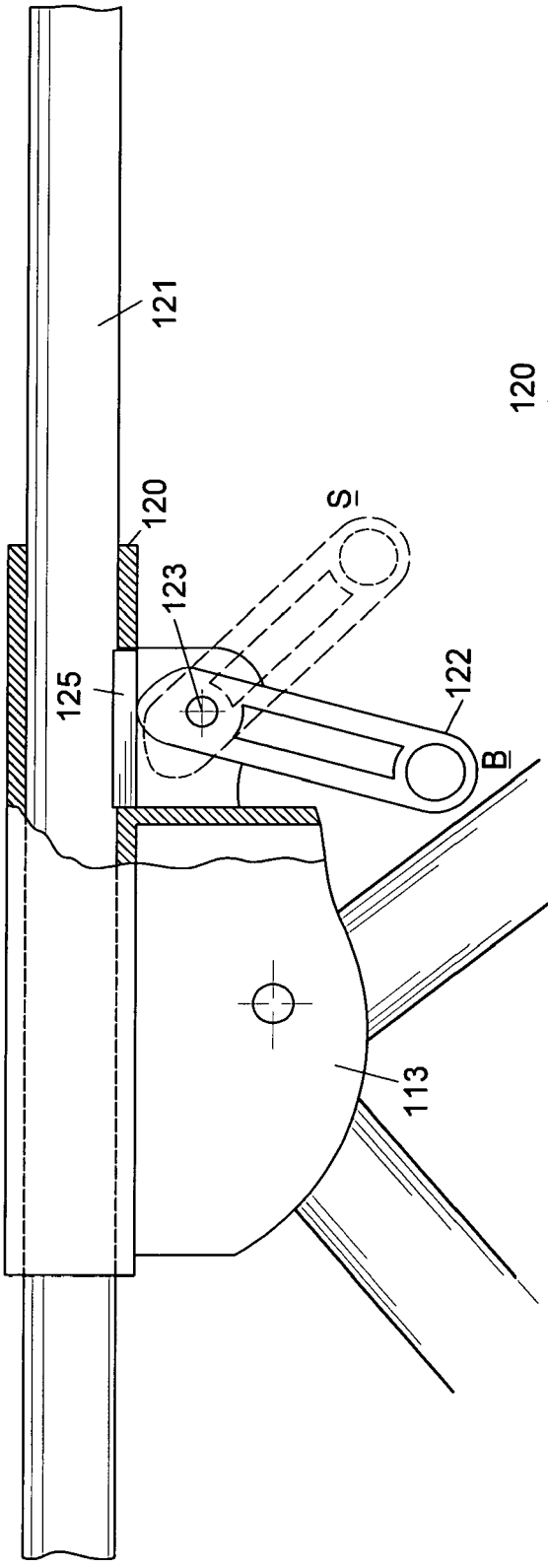


FIG. 3

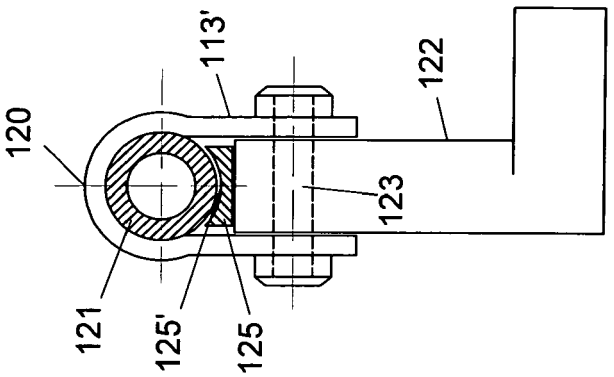


FIG. 4

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# EUROPEAN SEARCH REPORT

Application Number
EP 09 42 5113

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X | CN 101 125 051 A (CHANGZHOU QIAOYU TOURIST GOODS [CN]) 20 February 2008 (2008-02-20) * abstract; figures 1-8 * | 1-5 | INV. A47C1/027 A47C4/46 |
| X | EP 1 627 582 A1 (LIU LAUSAN CHUNG-HSIN [TW]) 22 February 2006 (2006-02-22) * paragraph [0012] - paragraph [0017]; figures 2-5 * | 1-3,5 | |
| X | US 2002/125745 A1 (LEE MENG-FENG [TW]) 12 September 2002 (2002-09-12) * figures 1,2,6,5 * | 1-3,5 | |
| X | US 2003/164626 A1 (LARDIERI GAETANO [US]; ARRE MARY ALICE [US]) 4 September 2003 (2003-09-04) * paragraph [0059] - paragraph [0060]; figures 1A,4,5 * | 1,3,5 | |
| X | CN 101 019 723 A (NINGBO AOLIDA GARDEN ARTICLE C [CN]) 22 August 2007 (2007-08-22) * abstract; figures 1,4-7 * | 1-3,5 | TECHNICAL FIELDS SEARCHED (IPC) A47C |
| X | CN 200 947 941 Y (NORTHPOLE CHINA LTD [CN]) 19 September 2007 (2007-09-19) * abstract; figures 1-5 * | 1-3,5 | |
| Y | DE 20 2005 003244 U1 (FIAM SPA [IT]) 12 May 2005 (2005-05-12) * the whole document * | 1-5 | |
| Y | US 4 596 484 A (NAKATANI KOMA [JP]) 24 June 1986 (1986-06-24) * column 2, line 38 - column 4, line 26; figures 1-4 * | 1-5 | |

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The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 3 September 2009 | Kus, Slawomir |

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Application Number
EP 09 42 5113

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X,P | CN 201 073 127 Y (CHANGZHOU QIAOYU TOURISM ARTIC [CN]) 18 June 2008 (2008-06-18)<br>* abstract; figures 1-8 *<br>----- | 1-5 | |
| X,P | US 7 500 715 B1 (CHEN LIBIN [CN])<br>10 March 2009 (2009-03-10)<br>* column 2, line 4 - line 58; figures 1-8 *<br>----- | 1-5 | |

TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 3 September 2009 | Kus, Slawomir |

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03-09-2009

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| CN 101125051 A | 20-02-2008 | NONE | |
| EP 1627582 A1 | 22-02-2006 | AT 397875 T | 15-07-2008 |
| | | ES 2307115 T3 | 16-11-2008 |
| US 2002125745 A1 | 12-09-2002 | NONE | |
| US 2003164626 A1 | 04-09-2003 | NONE | |
| CN 101019723 A | 22-08-2007 | NONE | |
| CN 200947941 Y | 19-09-2007 | NONE | |
| DE 202005003244 U1 | 12-05-2005 | FR 2866218 A3 | 19-08-2005 |
| | | IT BS20040011 U1 | 18-05-2004 |
| US 4596484 A | 24-06-1986 | NONE | |
| CN 201073127 Y | 18-06-2008 | NONE | |
| US 7500715 B1 | 10-03-2009 | NONE | |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82