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(54) **Lever fastening device for sports footwear**

(57) A lever fastening device in particular for sports footwear, comprising a U-shaped lever arm (12) hinged to one side of the vamp and a puller (34) secured to the lever arm and having its end selectively engagable in one of the teeth (38) of a rack (49) secured to the other side of the vamp, characterised by comprising:

- a plate (18), one end of which is hinged to the puller (18) and has two sidepieces provided with facing slotted holes (16), the lower surface of the other end comprising a toothed portion (20) with teeth inclined towards the end hinged to the puller,

- a transverse pin (14), positioned between the prongs of the lever arm (12) and slidable within said slotted holes (16),
- a toothed pawl (22) provided with an operating arm (26) and hinged about said pin (14) to cooperate with said toothed portion (20),
- first elastic means maintaining said toothed pawl (22) engaged with said toothed portion (20),
- second elastic means maintaining said plate (18), said pawl (22) and said lever (12) substantially in contact with the side of the vamp.

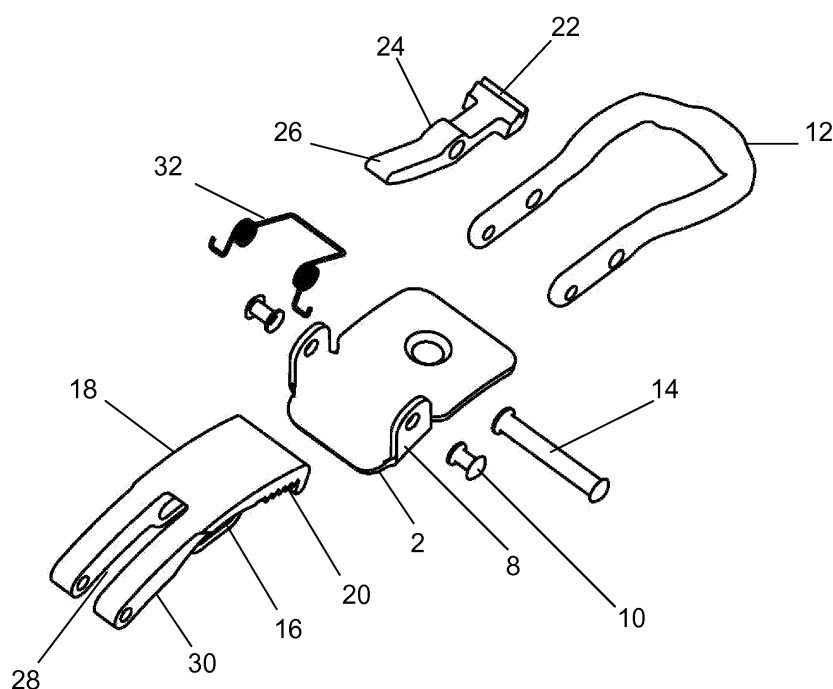


FIG. 1

## Description

**[0001]** The present invention relates to a lever fastening device for sports footwear.

**[0002]** Lever fastening devices for sports footwear are known: they generally comprise a fork fixed to a side of the vamp, for hinging a lever arm to which a threaded sleeve is fixed. At a threaded end a puller is engaged in the threaded sleeve, its other end being provided with a U-piece engagable selectively with one of the teeth of a rack secured to the other side of the vamp.

**[0003]** The device is used by engaging the U-piece with a tooth of the rack while the lever arm is in its non-operated state, and then rotating the lever arm to pull the two sides of the vamp together.

**[0004]** If the degree of tightening is not that required, the lever arm is slackened and the end of the U-piece is engaged with an adjacent tooth to obtain a greater or lesser degree of tightening.

**[0005]** These known devices present however the drawback of a lengthy and laborious operation if the positioning of the puller does not provide the required degree of tightening with either of the two teeth: In this case, to achieve microadjustment the U-piece is disengaged from the rack and the puller has to be rotated within the sleeve to increase or decrease the puller length relative to the sleeve.

**[0006]** The object of the invention is to eliminate these drawbacks by providing a lever fastening device which enables the microadjustment to be made easily and comfortably, without disengaging the U-piece from the rack.

**[0007]** This object is attained according to the invention by a lever fastening device, in particular for sports footwear, as described in claim 1.

**[0008]** The present invention is further clarified hereinafter with reference to the accompanying drawings, in which:

- |                 |                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------|
| Figure 1        | is an exploded perspective view of the lever arm of the device according to the invention, |
| Figure 2        | is a perspective view of the fastening device,                                             |
| Figure 3        | is a side view thereof,                                                                    |
| Figures 4, 5, 6 | show it in longitudinal section during operation,                                          |
| Figures 7 and 8 | are longitudinal sections through a variant.                                               |

**[0009]** As can be seen from the figures, the lever fastening device of the invention comprises substantially a fork 2 fixed by a rivet 4 to one 6 of the sides of the vamp of an article of footwear (not shown in the drawings).

**[0010]** A U-shaped lever arm 12 is hinged to the fork flanges 8 and is also hinged to a fork 18 about a transverse pin 14 slidable within two slotted holes 16 provided in the sides thereof. The fork presents, in that lower surface facing the vamp, a toothed portion 20 with its teeth

inclined towards the pin 14.

**[0011]** In the toothed portion 20 there engages a toothed pawl 22 provided at the end of a rocker arm 24 which is interposed between the sides of the fork 18 and is hinged about the pin 14.

**[0012]** The other end 26 of the rocker arm 24 emerges through the aperture 28 defined by the prongs 30 of the fork 18.

**[0013]** An elastic spring 32 secured to the pin 14 always maintains the pawl 22 engaged with one of the teeth of the toothed portion 20. The spring also interacts elastically with the arms of the lever 12.

**[0014]** A U-piece 34 hinged to the free end of the prongs 30 can engage with its horizontal end portion 36 between adjacent teeth 38 of a rack 40 fixed to the other side 6' of the vamp.

**[0015]** The lever fastening device of the invention operates in the following manner:

With the U-piece not engaged between the teeth of the rack, the user raises the end 26 of the rocker arm 24 against the elastic reaction of the spring 32, such as to bring the pawl 22 into the most outer position of the toothed portion (see Figure 4).

**[0016]** Then after engaging the transverse portion 36 of the U-piece between the teeth of the rack, the user rotates the lever 12 with respect to the fork to pull the two vamp sides together by means of the U-piece.

**[0017]** If the required degree of tightness is not satisfactorily achieved even if an adjacent tooth is engaged, the user with one hand holds the U-piece engaged in the tooth while with the other hand oscillates the lever 12 about the pin 14.

**[0018]** As a result of this operation the pin 14 slides along the slotted holes 16 to rearwardly drag with it the rocker arm 24, which with the toothed pawl slides along the teeth of the toothed portion 20 to distance itself from the free end of this portion and engage a subsequent tooth as appropriate (see Figures 5 and 6).

**[0019]** In this manner, during lever closure the length of the "puller" consisting of the U-piece 34 and the toothed portion 20 decreases to hence provide greater approach of the two vamp sides.

**[0020]** In the embodiment shown in Figures 6 and 7 the rocker arm has the fulcrum 14 positioned at its end and the operating portion 26 positioned between the prongs of the lever arm 12.

**[0021]** In this configuration, the use of which is similar to the preceding, the positioning of the pawl at the end of the toothed portion is achieved by pressing the end 26.

## Claims

1. A lever fastening device in particular for sports footwear, comprising a U-shaped lever arm (12) hinged to one side of the vamp and a puller (34) secured to

the lever arm and having its end selectively engagable in one of the teeth (38) of a rack (49) secured to the other side of the vamp, **characterised by** comprising:

- a plate (18), one end of which is hinged to the puller (18) and has two sidepieces provided with facing slotted holes (16), the lower surface of the other end comprising a toothed portion (20) with teeth inclined towards the end hinged to the puller, 5 10
  - a transverse pin (14), positioned between the prongs of the lever arm (12) and slidable within said slotted holes (16),
  - a toothed pawl (22) provided with an operating arm (26) and hinged about said pin (14) to cooperate with said toothed portion (20), 15
  - first elastic means maintaining said toothed pawl (22) engaged with said toothed portion (20), 20
  - second elastic means maintaining said plate (18), said pawl (22) and said lever (12) substantially in contact with the side of the vamp.
2. A device as claimed in claim 1, **characterised in that** said first and said second elastic means consist of a single spring (32). 25
3. A device as claimed in claim 1, **characterised in that** the pawl (22) is provided at the end of a rocker arm (24) interposed between the sidepieces of the plate (18). 30
4. A device as claimed in claim 1, **characterised in that** the plate (18) is U-shaped, the operating arm (26) for the rocker arm (24) being interposed between the prongs of the plate. 35
5. A device as claimed in claim 1, **characterised in that** the rocker arm (24) has its fulcrum positioned at one of its ends and hinged about the hinge pin (14) of the lever (12), its other end being interposed between the arms of the lever. 40

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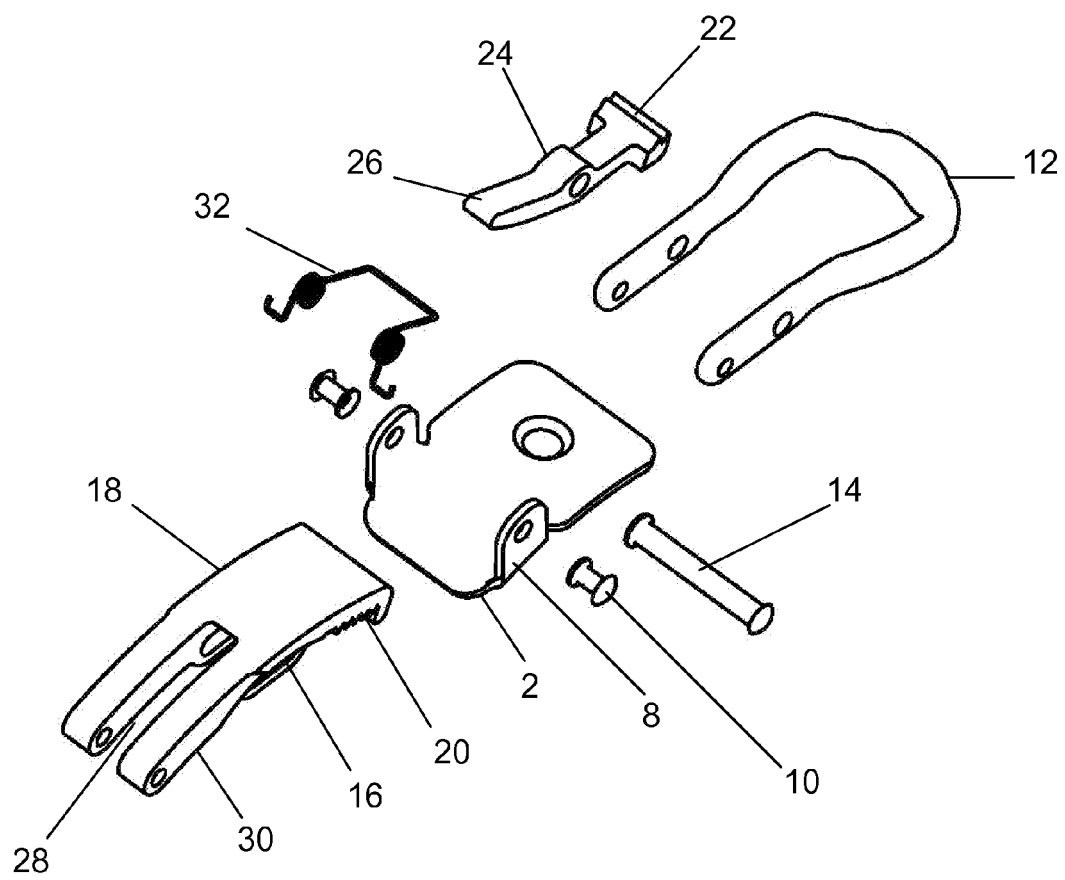


FIG. 1

FIG. 2

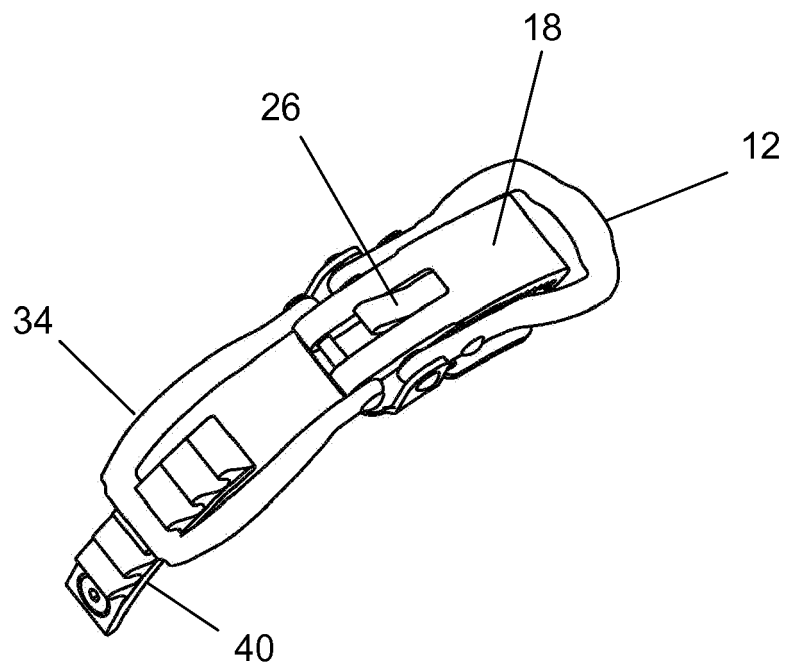


FIG. 3

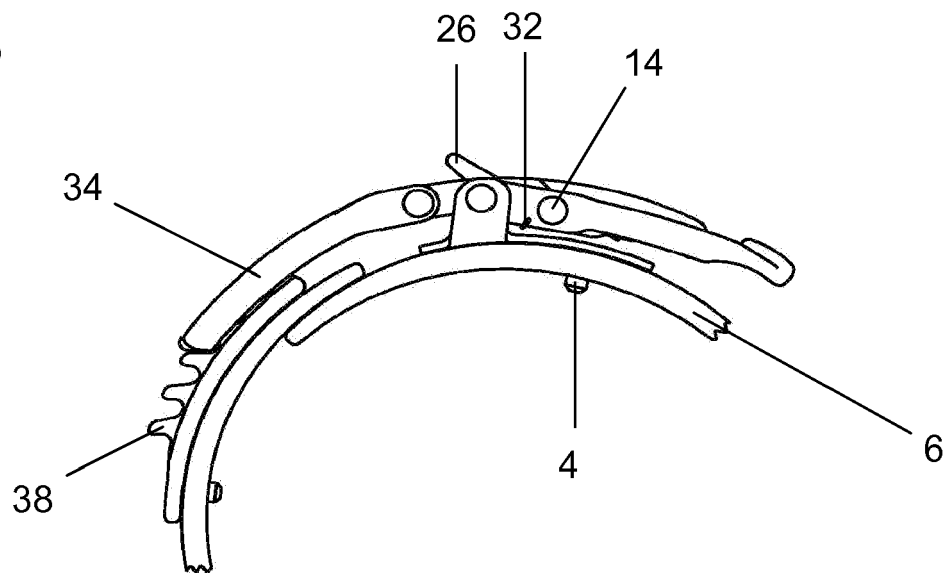


FIG. 4

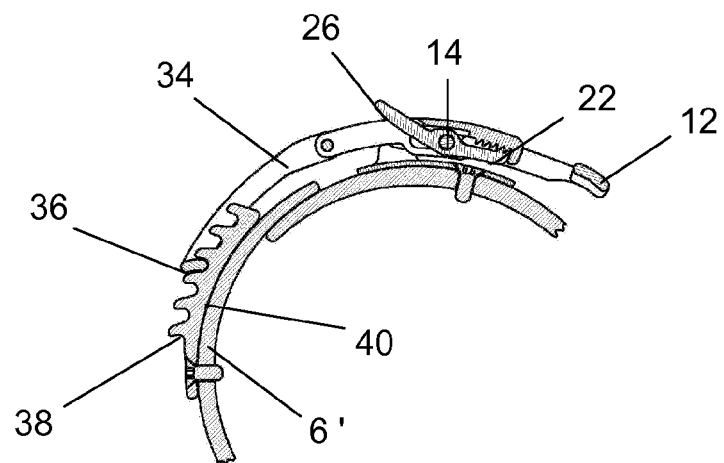


FIG. 5

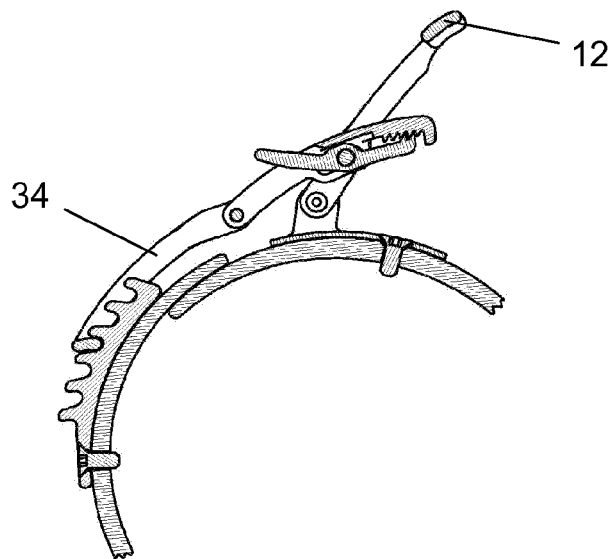


FIG. 6

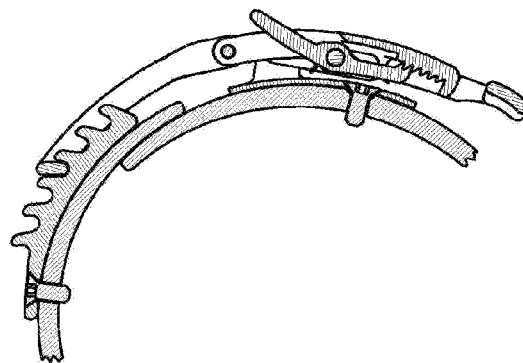


FIG. 7

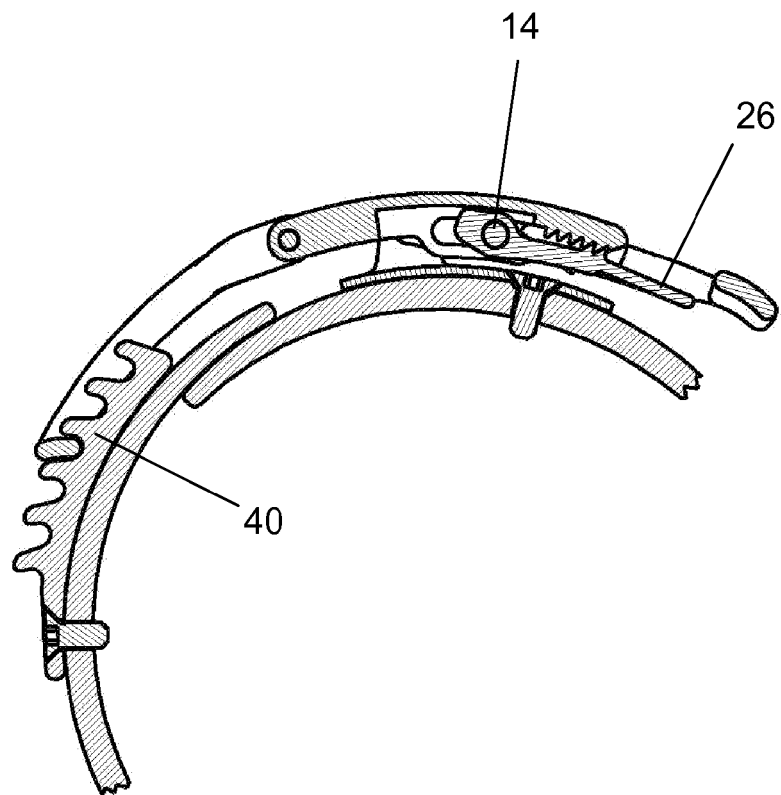
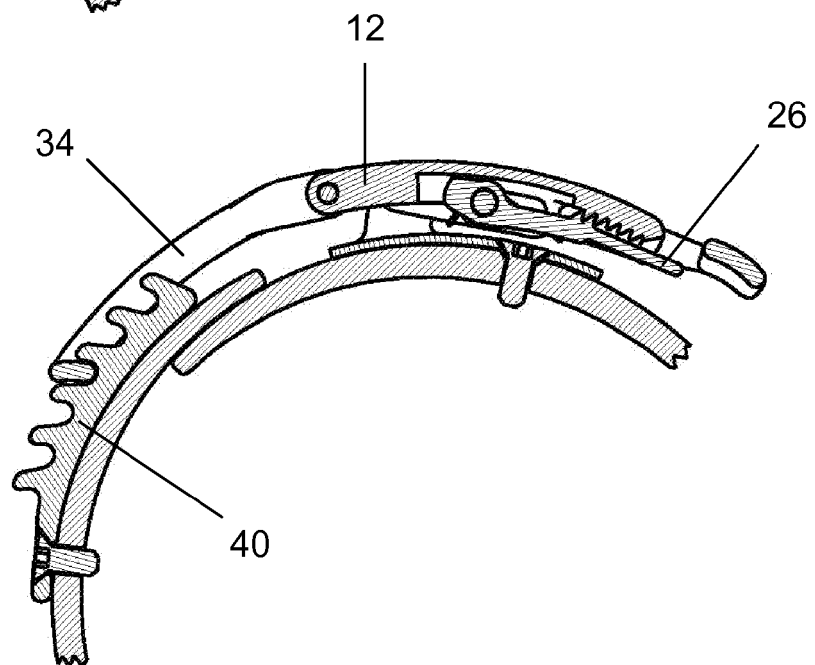


FIG. 8





## EUROPEAN SEARCH REPORT

Application Number  
EP 10 15 1008

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                    |                                                   |                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Citation of document with indication, where appropriate, of relevant passages                      | Relevant to claim                                 | CLASSIFICATION OF THE APPLICATION (IPC) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | DE 297 04 500 U1 (LANGE INT SA [CH])<br>24 April 1997 (1997-04-24)<br>* figures *                  | 1-5                                               | INV.<br>A43C11/14                       |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EP 0 134 618 A1 (LANGE INT SA [CH])<br>20 March 1985 (1985-03-20)<br>* figures 2-4 *               | 1-5                                               |                                         |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FR 2 760 329 A1 (LANGE INT SA [CH])<br>11 September 1998 (1998-09-11)<br>* figures *               | 1-5                                               |                                         |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EP 0 401 202 A2 (KOEFLACH SPORTGERAETE GMBH [AT]) 5 December 1990 (1990-12-05)<br>* figures 9-11 * | 1-5                                               |                                         |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                    |                                                   | TECHNICAL FIELDS SEARCHED (IPC)         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                    |                                                   | A43C                                    |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Place of search<br>Munich                                                                          | Date of completion of the search<br>29 April 2010 | Examiner<br>Vesin, Stéphane             |
| <p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>.....<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                    |                                                   |                                         |

EPO FORM 1503 03/02 (P04C01)



**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 15 1008

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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29-04-2010

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s)                      | Publication<br>date                    |
|-------------------------------------------|----|---------------------|-------------------------------------------------|----------------------------------------|
| DE 29704500                               | U1 | 24-04-1997          | CH 690980 A5<br>FR 2746607 A1<br>IT MI970151 U1 | 30-03-2001<br>03-10-1997<br>28-08-1998 |
| EP 0134618                                | A1 | 20-03-1985          | DE 3467688 D1                                   | 07-01-1988                             |
| FR 2760329                                | A1 | 11-09-1998          | DE 29802825 U1<br>IT MI970155 U1                | 16-04-1998<br>04-09-1998               |
| EP 0401202                                | A2 | 05-12-1990          | AT 397603 B<br>DE 59006404 D1                   | 25-05-1994<br>18-08-1994               |