

(19)



(11)

EP 2 110 900 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

21.10.2009 Bulletin 2009/43

(51) Int Cl.:

H01R 33/95 (2006.01)

H01R 33/945 (2006.01)

F25D 27/00 (2006.01)

H01R 103/00 (2006.01)

H01R 43/18 (2006.01)

(21) Application number: **09151799.5**

(22) Date of filing: **30.01.2009**

(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

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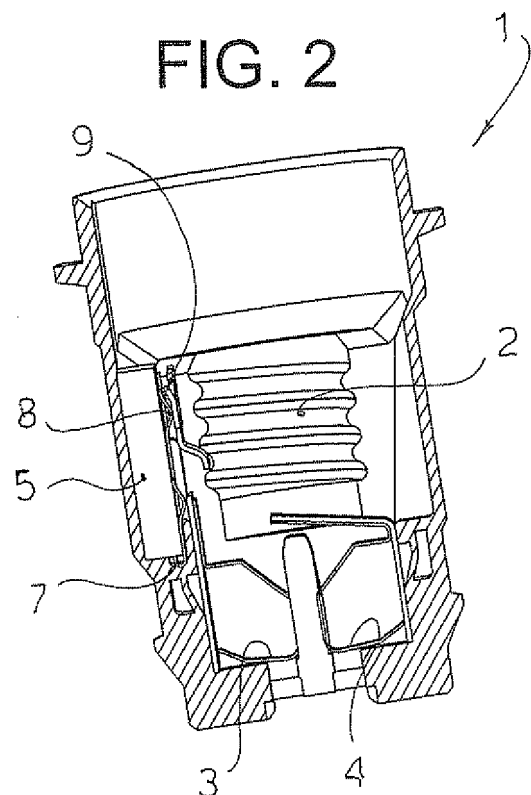
(30) Priority: **17.04.2008 IT MI20080709**

(54) **Lampholder for an electrical appliance, in particular for a refrigerator, comprising thermal protection means**

(57) A lampholder (1) for an electrical appliance, in particular for a refrigerator, is disclosed, comprising a thermal switch (5), situated inside the lampholder (1), which cuts off the electrical supply circuit of the lamp if the temperature inside the electrical appliance exceeds a pre-set value.

The thermal switch (5) is mounted, preferably removably, in a seat (6) formed in the inner wall of the lampholder cavity (2) designed to receive the lamp socket and has on its surface facing said cavity (2) a first push-on contact (7) connected to one of the electrical contacts (3, 4) on which the supply conductors of the lamp abut and a second push-on contact (8) connected to a terminal of the lamp socket by means of a side contact member (9) or directly.

FIG. 2



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Description

[0001] The present invention refers to a lampholder comprising a thermal switch adapted to protect the appliance in which it is installed from excessive temperature increases.

[0002] A lampholder produced according to the invention has been designed particularly for electrical appliances, and in particular for refrigerators where a prolonged lighting of the lamp inside the refrigerator, due to a malfunction of the switch normally controlled by the refrigerator door or to a prolonged opening of said door causes (or could cause) an unwanted increase in the temperature inside the refrigerator.

[0003] Recent changes to the standards require a test to be carried out with the light on and the refrigerator door closed: during said test the temperature inside the refrigerator exceeds the values that can be measured during the normal operation and could exceed the values permitted by the plastic materials employed inside said refrigerator, which risk being damaged.

[0004] For this reason, it has become necessary to insert in the supply circuit of the lamp a thermal switch which cuts off the power supply to the lamp when the temperature inside the refrigerator exceeds a pre-set value and which restores the power supply to the lamp as soon as said temperature returns to normal.

[0005] There exist on the market different types of thermal switches of various sizes and action types, which are normally connected to the lampholder contacts by soldering, by crimping, by abutment on terminals or on rapid connectors, and so on.

[0006] The aforementioned connection methods make it practically impossible to reduce the manufacturing costs of the lampholder by automating the assembly thereof and, in particular, by automating the assembly of the thermal switch inside the lampholder.

[0007] The large number of types of lampholder used by each electrical appliance manufacturer (in particular by the refrigerator manufacturers), the high cost and the long times necessary to modify them in order to adapt them to meet with the new standards and the difficulties in managing two or more similar versions have given rise to the need for a lampholder which, besides incorporating the thermal switch, maintains the overall dimensions more or less unchanged if compared with the models already in use.

[0008] Object of the present invention is to produce a lampholder for an electrical appliance, in particular for a refrigerator, that includes a thermal switch (or other functionally equivalent thermal protection means) incorporated in the lampholder and which is free from the limits and the drawbacks previously mentioned; this object is achieved by means of a lampholder which has the characterising features indicated in the independent claim 1.

[0009] Further characteristics of the invention will be apparent from the dependent claims.

[0010] The invention will now be described with refer-

ence to a purely exemplifying and therefore non-limiting embodiment thereof, illustrated in the appended figures, wherein:

- 5 - Figure 1 shows diagrammatically a side view of a lampholder;
- Figure 2 shows diagrammatically a front view of a lampholder made according to the invention, sectioned along the plane A-A of Figure 1;
- 10 - Figure 3 shows diagrammatically a perspective view of the lampholder sectioned as in Figure 2;
- Figure 4 shows diagrammatically a perspective view of the lampholder sectioned as in Figure 2 and without the thermal switch and the metal contact members;
- 15 - Figure 5 shows diagrammatically a perspective view of a thermal switch;
- Figure 6 shows diagrammatically a front view of the lampholder, sectioned as in Figure 2, during the insertion of the thermal switch and of the side contact member;
- 20 - Figure 7 shows diagrammatically a perspective view of the lampholder, sectioned as in Figure 2, with the thermal switch in place;
- 25 - Figure 8 shows diagrammatically a perspective view of the lampholder, sectioned as in Figure 2, with the thermal switch and the side contact member in place.

[0011] In the appended figures, corresponding elements will be identified by the same reference numerals.

[0012] The present invention refers to a lampholder consisting of a casing, preferably made in a single piece, which comprises at least an inner cavity adapted to accommodate a lamp socket, electrical contacts on which the terminals of the electrical supply cables abut and thermal protection means (preferably a thermal switch) inserted in the connection between one of said electrical contacts and one of the terminals of the lamp socket.

[0013] The thermal switch is preferably mounted removably in a seat made in the side wall of the inner cavity of the lampholder and has on its surface facing said inner cavity a first push-on contact against which the aforementioned electrical contact rests and a second push-on contact connected to a terminal of the lamp socket, preferably by means of a side contact member.

[0014] Figure 1 shows diagrammatically a side view of a lampholder 1 made according to the invention, consisting of a casing, preferably made in a single piece, inside which are situated, as will be described with reference to the subsequent figures, the thermal switch and the metal contact members.

[0015] Figure 2 shows diagrammatically a front view of the lampholder 1, sectioned along the plane A-A of Figure 1, which consists of a casing which comprises at least an inner cavity 2 bearing a thread to receive a lamp socket (omitted in the appended figures to simplify the graphic representation), the electrical contacts (3, 4) on which the terminals of the electrical supply cables of the

lamp (omitted in the appended figures to simplify the graphic representation) abut and a thermal switch 5 inserted in the connection between one of the electrical contacts (3, 4) and one of the terminals of the lamp socket.

[0016] The inner cavity 2 adapted to receive the lamp socket, the circuit which makes up the thermal switch 5 and the electrical contacts 3 and 4 on which the terminals of the electrical supply cables of the lamp abut will not be described in detail herein because they are per se known.

[0017] The thermal switch 5 is mounted, preferably removably, in a seat 6, made in the side wall of the inner cavity 2 and not visible in Figure 2 because it is occupied by the thermal switch 5.

[0018] This removable assembly allows the thermal switch 5 to be replaced (for example because it is broken or to meet specific requirements) without having to replace the entire lampholder.

[0019] As can be seen better in the perspective view of Figure 5, the thermal switch 5 has on its surface facing the inner cavity 2 of the lampholder 1 a first push-on contact 7, against which rests the electrical contact 3 on which one of the supply conductors of the lamp abuts, and a second push-on contact 8 against which rests a side contact member 9, seen better in Figures 3 and 8, which protrudes into the inner cavity 2 of the lampholder 1 to connect the thermal switch 5 to a terminal of the lamp socket.

[0020] In the embodiment illustrated in Figures 2, 3 and 8, the side contact member 9 is adapted to connect the second surface push-on contact 8 of the thermal switch 5 with the threaded side area of the lamp socket but, without departing from the scope of the invention, the side contact member 9 can connect the second surface push-on contact 8 of the thermal switch 5 with the flat area situated at the end of the lamp socket.

[0021] Again without departing from the scope of the invention, the side contact member 9 can be omitted and the second surface push-on contact 8 protrudes into the inner cavity 2 of the lampholder 1 to connect the thermal switch 5 to the threaded side area of the lamp socket or to the flat area situated at the end of the lamp socket.

[0022] Again without departing from the scope of the invention, the thermal switch 5 can be replaced by another functionally equivalent thermal protection means, not described because it is per se known, adapted to be mounted in the seat 6 formed in the side wall of the inner cavity 2 of the lampholder 1 and having the surface push-on contacts 7 and 8.

[0023] Figure 3 shows diagrammatically a perspective view of the lampholder 1 sectioned as in Figure 2; visible in Figure 3 is the casing inside which are housed the inner cavity 2, the electrical contacts 3 and 4, the thermal switch 5, the surface push-on contact 7 of the thermal switch 5 and the side contact member 9.

[0024] Figure 4 shows diagrammatically a perspective view of the lampholder 1 sectioned as in Figure 2 and

without the thermal switch 5 and the metal contact members (3, 4, 9); visible in Figure 4 is the casing inside which are housed the inner cavity 2, the seats designed to accommodate the contacts 3 and 4 and the seat 6, formed in the side wall of the inner cavity 2, designed to accommodate the thermal switch 5.

[0025] Figure 5 shows diagrammatically a perspective view of a thermal switch 5; attention is drawn in Figure 5 to the push-on contacts 7 and 8 present on the surface of the thermal switch 5.

[0026] Figure 6 shows diagrammatically a front view of a lampholder 1, sectioned as in Figure 2, during the insertion of the thermal switch 5 into the seat 6 and of the side contact member 9 into the inner cavity 2.

[0027] In Figure 6 the contact 3 is also visible, whereas the contact 4 has been omitted.

[0028] Figure 7 shows diagrammatically a perspective view of the lampholder 1 sectioned as in Figure 2; visible in Figure 7 are the thermal switch 5 positioned in the seat 6 and the surface push-on contacts 7 and 8 of the thermal switch 5, whilst the contacts 3 and 4 and the side contact member 9 have been omitted.

[0029] Figure 8 shows diagrammatically a perspective view of the lampholder 1 sectioned as in Figure 2; visible in Figure 8 are the thermal switch 5 placed in the seat 6, the side contact member 9 which rests against the surface push-on contact 8 of the thermal switch 5 (not visible in the figure because it is covered by the side contact member 9) and the surface push-on contact 7 of the thermal switch 5.

[0030] A lampholder 1 produced according to the invention holds numerous advantages over the lampholders of the prior art, amongst which the following are cited by way of non-limiting example:

- the push-on contacts (7, 8) present on the surface of the thermal switch 5 allow it to be easily inserted into the supply circuit of the lamp and considerably simplify the assembly of the lampholder 1, which can be carried out with an automatic process since it is sufficient to insert the thermal switch 5 into the seat 6 of the lampholder 1, without particular manual operations being required;
- the lampholder 1 has more or less the same outer dimensions as those of the lampholders currently in use, which it can replace without requiring mechanical and/or electrical modifications to the appliance on which it is installed;
- the thermal switch 5 integrated into the lampholder 1 avoids having to run connection cables between the lampholder 1 and the thermal switch, as would be necessary if the thermal switch were positioned in another area of the refrigerator.

[0031] Without departing from the scope of the invention, a person skilled in the art can make to the thermal switch previously described all those changes and improvements suggested by normal experience and/or by

the natural evolution of the art.

Claims

1. A lampholder (1) consisting of a casing comprising at least an inner cavity (2) adapted to accommodate the socket of a lamp and electrical contacts (3, 4) on which the terminals of the electrical supply cables of the lamp abut, **characterised in that** it further comprises a thermal protection means (5) inserted in the connection between one of said electrical contacts (3, 4) and one of the terminals of the lamp socket. 5
2. A lampholder (1) as in claim 1, **characterised in that** the thermal protection means (5) is mounted in a seat (6) formed in the side wall of the inner cavity (2) of the lampholder (1). 10
3. A lampholder (1) as in claim 1, **characterised in that** the thermal protection means (5) is removably mounted in the seat (6) formed in the side wall of the inner cavity (2) of the lampholder (1). 15
4. A lampholder (1) as in claim 2, **characterised in that** the thermal protection means (5) has, on its surface facing the inner cavity (2) of the lampholder (1), a first push-on contact (7), against which rests the electrical contact (3) on which one of the supply conductors of the lamp abuts, and a second push-on contact (8) against which rests a side contact member (9) which protrudes into the inner cavity (2) of the lampholder (1) to connect the thermal protection means (5) to a terminal of the lamp socket. 20
5. A lampholder (1) as in claim 4, **characterised in that** the side contact member (9) connects the second surface push-on contact (8) of the thermal protection means (5) to the threaded area of the lamp socket. 25
6. A lampholder (1) as in claim 2, **characterised in that** the thermal protection means (5) has, on its surface facing the inner cavity (2) of the lampholder (1), a first push-on contact (7), against which rests the electrical contact (3) on which one of the supply conductors of the lamp abuts, and a second push-on contact (8) which protrudes into the inner cavity (2) of the lampholder (1) to connect the thermal protection means (5) to a terminal of the lamp socket. 30
7. A lampholder (1) as in claim 6, **characterised in that** the second surface push-on contact (8) connects the thermal protection means (5) to the threaded area of the lamp socket. 35
8. A lampholder (1) as in at least one of the preceding claims, **characterised in that** the thermal protection 40

means (5) consists of a thermal switch.

9. A lampholder (1) as in at least one of the preceding claims, **characterised in that** it has the same overall dimensions as a lampholder currently in use. 45
10. A lampholder (1) as in at least one of the preceding claims, **characterised in that** it can be assembled with a completely automatic process. 50

FIG. 1

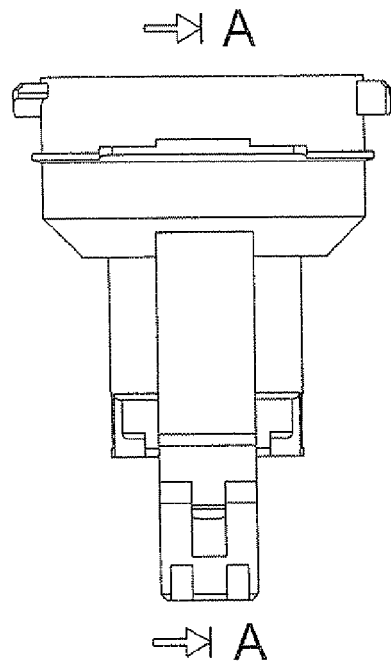


FIG. 2

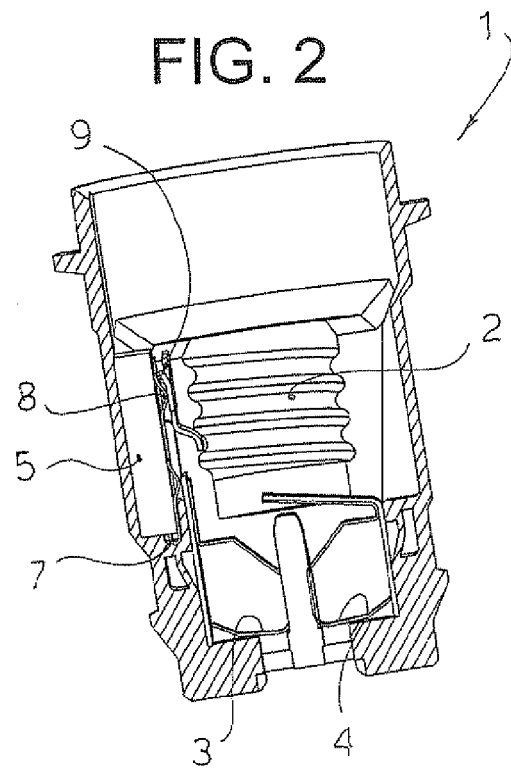


FIG. 3

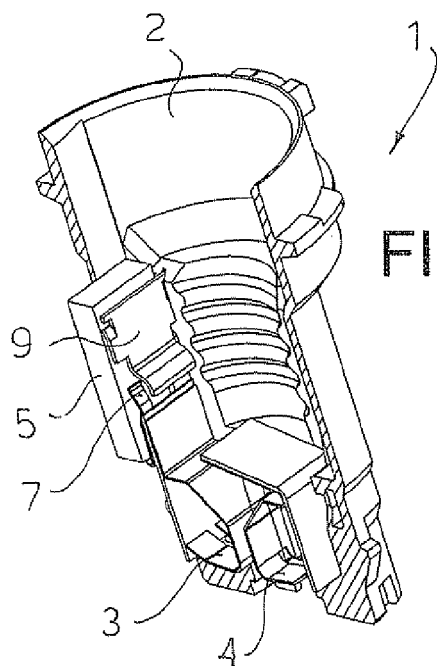
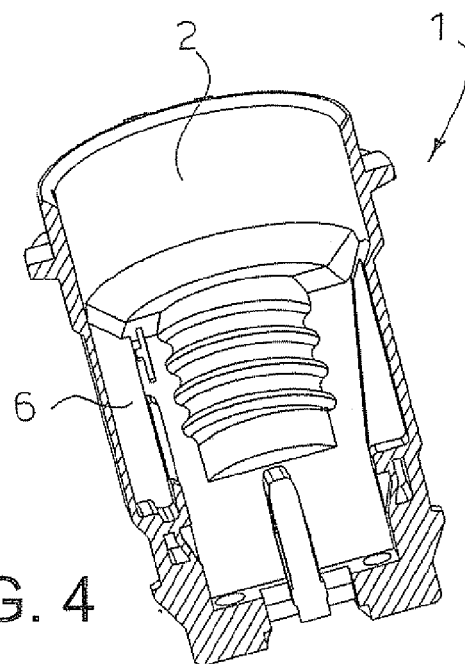


FIG. 4



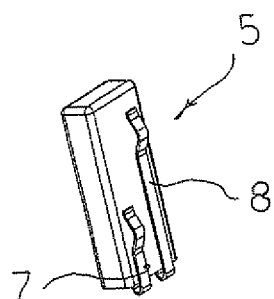


FIG. 5

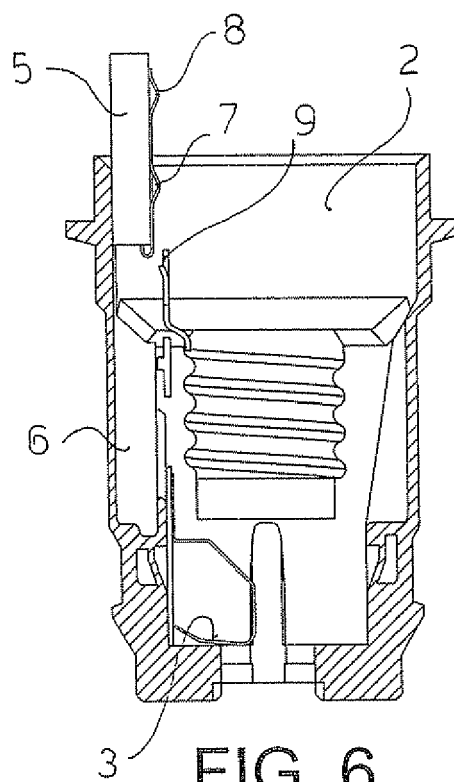


FIG. 6

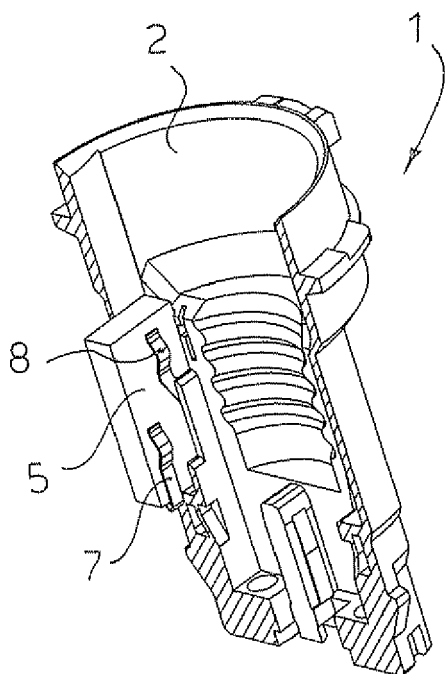


FIG. 7

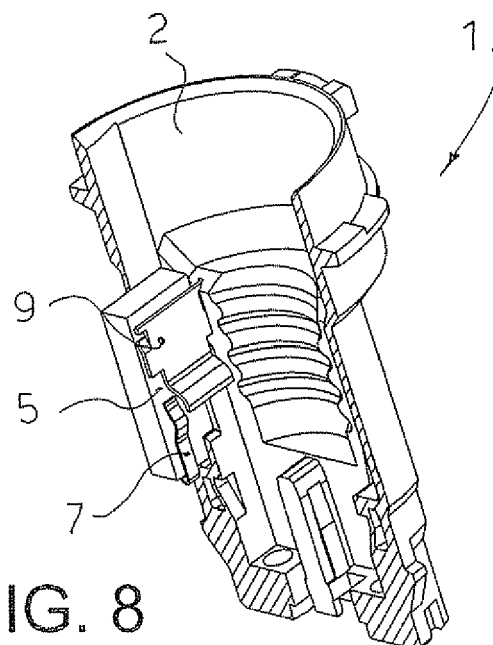


FIG. 8



EUROPEAN SEARCH REPORT

Application Number
EP 09 15 1799

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	US 4 298 923 A (LIN SHONG D) 3 November 1981 (1981-11-03)	1,9	INV. H01R33/95
Y	* abstract * * figure 3 * * figures 1a,b,d,e *	8,10	ADD. H01R33/945 F25D27/00 H01R103/00 H01R43/18
X	US 4 903 162 A (KOPELMAN ROBERT L [US]) 20 February 1990 (1990-02-20) * figure 6 * * column 4, lines 34-39 *	1	
X	GB 519 993 A (HORACE WOOLDRIDGE) 11 April 1940 (1940-04-11) * figure 2 *	1	
A		3	
Y	WO 2005/018285 A (CRAFT LAB [GB]; LUSCOMBE NICHOLAS CHARLES [GB]) 24 February 2005 (2005-02-24) * page 4, line 7 *	8	
A		3	
Y	US 5 456 615 A (TANG FUH-CHYUN [TW] ET AL) 10 October 1995 (1995-10-10) * column 1, paragraph 1 *	10	TECHNICAL FIELDS SEARCHED (IPC)
A	GB 689 021 A (BRITISH THOMSON HOUSTON CO LTD) 18 March 1953 (1953-03-18) * page 1, column 1, paragraph 2 *	1	H01R F25D G08B F21V
A	US 4 314 223 A (KRISTOFEK PAUL J) 2 February 1982 (1982-02-02) * abstract * * figure 1 * * figure 3 * * figure 7 *	1,8	
A	GB 2 068 524 A (OILFIELD INSPECTION SERVICES) 12 August 1981 (1981-08-12) * abstract *	1,2,8	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 July 2009	Examiner Hugueny, Bertrand
CATEGORY OF CITED DOCUMENTS 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 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 & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 09 15 1799

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 41 05 426 A1 (POELLET WILFRIED [DE]) 27 August 1992 (1992-08-27) * abstract * * figure 2 * * column 6, lines 14-23 * * column 5, lines 62-65 * -----	1,2,8	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 July 2009	Examiner Hugueny, Bertrand
CATEGORY OF CITED DOCUMENTS 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 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 & : member of the same patent family, corresponding document			

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

EP 09 15 1799

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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08-07-2009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4298923	A	03-11-1981	NONE	
US 4903162	A	20-02-1990	NONE	
GB 519993	A	11-04-1940	NONE	
WO 2005018285	A	24-02-2005	AU 2003251064 A1 GB 2420921 A	07-03-2005 07-06-2006
US 5456615	A	10-10-1995	NONE	
GB 689021	A	18-03-1953	NONE	
US 4314223	A	02-02-1982	NONE	
GB 2068524	A	12-08-1981	NONE	
DE 4105426	A1	27-08-1992	DE 9116387 U1 DE 9200222 U1	20-08-1992 03-09-1992