



EP 2 042 640 A1

(12)

## EUROPEAN PATENT APPLICATION

(43) Date of publication:  
01.04.2009 Bulletin 2009/14

(51) Int Cl.:  
D06F 39/02 (2006.01)

(21) Application number: 08016829.7

(22) Date of filing: 25.09.2008

(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 MT NL NO PL PT  
RO SE SI SK TR**  
Designated Extension States:  
**AL BA MK RS**

(30) Priority: 26.09.2007 SE 0702148

(71) Applicant: **Aktiebolaget Electrolux  
105 45 Stockholm (SE)**  
(72) Inventor: **Szabó, Levente  
9737 Budapest (HU)**  
(74) Representative: **Bodin, Henrik  
AB Electrolux  
Group Intellectual Property  
105 45 Stockholm (SE)**

### (54) Container comprising a soapnut chamber

(57) The present invention relates to a soapnut container, which is attachable to a laundry washing machine or the like. The container comprises a soapnut chamber for accommodating soapnuts, an inlet opening, and an outlet opening. The inlet opening and outlet opening are arranged on either side of the soapnut chamber such

that, when soapnuts are accommodated in the soapnut chamber and when a fluid flows through the inlet, the fluid passes and washes the soapnuts, whereby the soapnuts releases their soapnut detergent into the flow of fluid, and such that a flow of fluid containing the released soapnut detergent is discharged through the outlet.

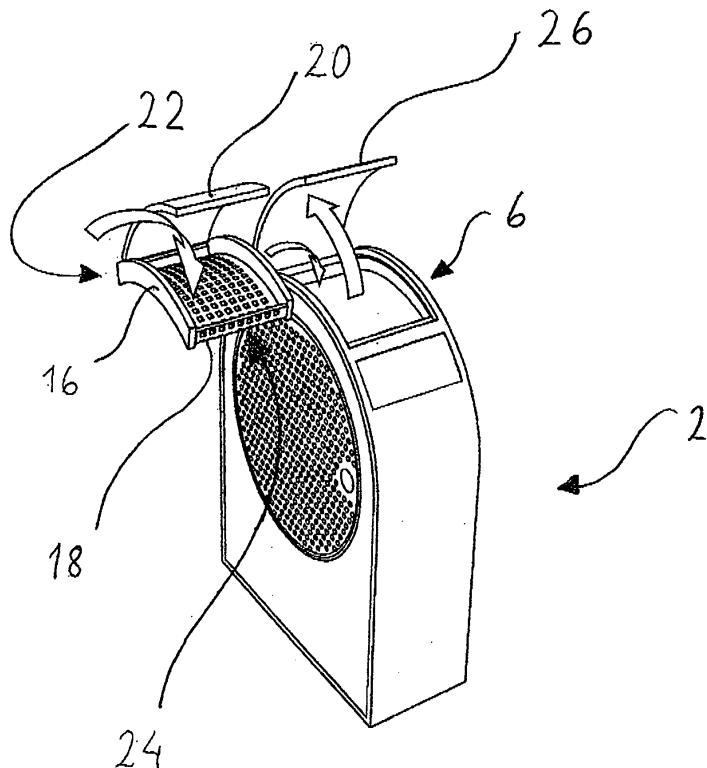


Fig. 3

**Description****Technical field of the invention**

**[0001]** The present invention relates to a soapnut container and to a laundry washing machine including such a soapnut container.

**Background art**

**[0002]** In most laundry washing machines, detergents are supplied to the machine to be mixed with the washing fluid for obtaining a desired cleansing laundry effect. For this purpose, it is known to place the detergent in a container of the machine, which container then is supplied with a fluid, such as water or the like. The detergent and fluid are mixed into a laundry washing fluid for the cleaning of the laundry. A problem associated with such detergents is that it has a polluting effect to the environment. Furthermore, such detergent, most often a liquid or powder, must be stored and delivered in a package. Thus, another problem of such detergent is that it generates waste, which causes an additional polluting effect.

**Summary of the invention**

**[0003]** It is therefore an object of the present invention to provide a container for laundry washing machines that alleviates the above mentioned problems.

**[0004]** This object is met by the invention as defined in the independent claims. Specific embodiments of the invention are defined in the dependent claims. In addition, the present invention has other advantages and features apparent from the description below.

**[0005]** According to a first aspect of the present invention, there is provided a soapnut container, which is attachable to a laundry washing machine or the like, the container comprising a soapnut chamber for accommodating soapnuts, an inlet opening, and an outlet opening, wherein the inlet opening and outlet opening are arranged on either side of the soapnut chamber such that, when soapnuts are accommodated in the soapnut chamber and when a fluid flows through the inlet, the fluid passes and washes the soapnuts in the soapnut chamber, whereby the soapnuts releases their soapnut detergent into the flow of fluid, and such that a flow of fluid containing the released soapnut detergent is discharged through the outlet.

**[0006]** An advantage of the container of the present invention is that when the container is filled with soapnuts and washed with a washing fluid, an environmentally sound or friendly soapy washing liquid is produced. The soapnut are washed in a way that soapnut detergent are discharged from the soapnuts, whereby washing means that a flowing fluid floods or overflows the container such that the soapnuts are covered to some extent with the flowing fluid. Thus, the soapnuts are situated within a soapnut accommodating chamber of a container, and

the container is preferably fixated in a flowing fluid, such that the soapnuts bounces back and forth between the walls of the container for an efficient detergent discharge or release. Moreover, the amount of discharged soapnut detergent also depends on the flow speed, that is, a more powerful flow will increase the speed of the soapnut detergent discharge or release. Furthermore, the soapnut filled container may be reused several times without being refilled, since the soapnut detergent is a long-lasting detergent and since only a suitable amount of soapnut detergent is released from the soapnuts each washing circle. Moreover, a soapnut detergent may also have a higher detergent concentration than normal detergent products. Hence, from a given volume of soapnut detergent and normal detergent, respectively, the soapnut has a larger laundry washing capacity. The advantage is thereby that the amount of package waste is reduced. Yet another advantage is that soapnuts may be stored in reusable bags, such as a cotton bag, thereby reducing the package waste even further.

**[0007]** The soapnut or fruit, is a small leathery-skinned drupe, which contains seeds. Soapnuts comes from the genus of *Sapindus*, a kind of shrubs and small trees. Another common name is soapberry. These names refer to the use of crushed seeds for the making of soapnut soap. Soapnuts contain Saponin, which is a natural detergent.

**[0008]** In an embodiment of the present invention, the container is a detachable unit. An advantage of a detachable container is that the refilling operation is simplified for the user. For example, such a container may be used for scooping up soapnuts in a bag, instead of pouring soapnuts into the container, which often causes some soapnuts to be poured outside. Thus, when a detachable unit is used the user is spared from picking up soapnuts. Another advantage is that the used nuts may simply be emptied in a waste bin or basket, or the like. The size and shape of the container may vary depending on the type and purpose of the laundry washing machine, for example, if the machine is for domestic or professional use, such as at a hotel or a laundry service or the like.

**[0009]** In a further embodiment of the present invention, the container has a curvature in a direction from the inlet to the outlet for close arrangement with a cylindrical, rotatable inner tub of a laundry washing machine or the like. Such curvature allows the washing liquid passing there through to maintain its flow speed, thereby enhancing the possibility of releasing the soapnut detergent from the soapnuts. Thus, a steady and continuous flow through the soapnut accommodating container ensure a proper amount of soapnut detergent containing washing liquid for a proper laundry washing. Another advantage of a container having a curvature is that it may be closely positioned to the inner tub, thereby enabling a short distance to the laundry being washed for a fast laundry response and a faster laundry washing cycle.

**[0010]** In another embodiment of the present invention, the inlet opening and/or outlet opening comprises

at least one opening, having a largest distance across the opening which is substantially less than the diameter of a soapnut for keeping the soapnut within the container. Such opening may be formed as slots or other narrow openings, or any suitable opening which provides an efficient inlet and/or outlet of the flow of fluid and which simultaneously keeps the soapnuts within the container.

**[0011]** In yet another embodiment of the preset invention, the inlet opening and/or outlet opening comprises a net allowing the flow of fluid to enter and leaving the container and simultaneously keeping the soapnuts within the container. Such a net enhance the soapnut detergent production since a the soapnuts are washed with a uniform flow of liquid. Moreover, the container becomes insensitive to the whereabouts of the soapnuts within the container, since the flow reaches the entire inside of the container. Another advantage of such a net-supplied container is that it ensures an easy cleaning during the container cleaning process. Such a net may be formed as a sheet-like plate with at least one inlet opening and one outlet opening. Furthermore, such a net may also be formed as sheet-like plate with a large number of holes of various shape. The net may even constitute a net-like bag. Another advantage related to the net is that it enables the flowing fluid to pass through the soapnut accommodating container without decreasing the flow speed.

**[0012]** In another embodiment of the present invention, the container has a rectangular plate-shape with a height, which substantially corresponds to the diameter of a soapnut. An advantage of this embodiment is that the soapnuts are forced to be positioned in a layer, thereby avoiding problems of stuck soapnuts, which could decrease the soapnut detergent production due to the decreased soapnut surface area to be exposed to the washing liquid. Preferably, in the inlet and outlet are arranged at opposite short sides of the container having the rectangular plate-shape. The outlet can also extend over a part of or the entire bottom portion of such a container.

**[0013]** According to a second aspect of the present invention, there is provided a laundry washing machine for washing with a soapnut detergent, wherein the machine comprising at least one container according to the present invention. Such a laundry washing machine may be provided an inner tub for receiving laundry and an outer tub for holding a washing fluid, wherein the inner tub is rotatable supported in the outer tub, wherein the container is arranged between the inner tub and the outer tub. Such a laundry washing machine provide an efficient washing process with soapnut detergents, thereby reducing the amount of package waste and providing an environmentally friendly or sound laundry washing process.

**[0014]** In an alternative embodiment of the present invention, the laundry washing machine comprises means for supplying a circumferential flow of fluid passing through the soapnuts accommodating container for releasing a soapnut detergent. Such circumferential flow provides an efficient washing of the soapnuts, thereby

providing an efficient discharge of soapnut detergent from the soapnut.

**[0015]** In yet another embodiment of the present invention, the means for supplying a circumferential flow of fluid has a flow redirector for bypassing the flow around the container for stopping the releasing of the soapnut detergent. This redirector forces the liquid around the soapnut accommodating container, whereby a the washing liquid maintains detergent-free. Such a fluid redirecting device may be used when a user only wants to use the machine for rinsing, that is when no detergent is to be added to the washing liquid. Another advantage of such a redirector is when a user wants to rinse the laundry with clear water, or detergent-free liquid, after a detergent containing washing.

### Brief description of the drawings

**[0016]** The invention may be performed in many different ways, and by way of example only, embodiments thereof will now be described in detail with reference being made to the accompanying drawings, in which:

Fig. 1 is a schematically perspective view of a laundry washing machine including a container according to the present invention;

Fig. 2 is a schematically sectional view of a laundry washing machine including a container according to the present invention.

Fig. 3 is a schematically perspective view of a container and a laundry washing machine according to the present invention.

### Detailed description of the example embodiments of the invention

**[0017]** With reference to Fig. 1, a schematically perspective view of a laundry washing machine including a container according to the present invention is shown. The laundry washing machine 2 includes an opening 4 for feeding the machine with laundry, such as textiles or clothes or the like. The opening is provided with a door or shutter or similar for the provision of an impermeable container therein. Moreover, the machine is provided with a detergent opening 6, where through detergent is supplied. A display panel 8 is provided for indicating of laundry washing parameters, such as liquid temperature, selected wash program and its estimated program time and so on.

**[0018]** With reference to Fig. 2, a schematically sectional view of a laundry washing machine including a container according to the present invention is shown. The machine 2 comprises an inner tub 10, which accommodates the laundry to be washed, and an outer tub 12, which provides an impermeable outer shell for the washing liquid. Furthermore, the machine comprises an elec-

tric engine 14, which not supplies the machine with power, but also supplies the machine with a flow of washing liquid (indicated with arrows). The washing liquid follows the circumferential wall of the outer tub 12 and at the top of the machine, the flow passes through a container 16 (indicated in Fig. 2 with circulating arrows), which is embedded between the inner tub 10 and the outer tub 12. The container are supplied with soapnut detergent, which, when washed with a fluid, generates a soapy soapnut detergent.

**[0019]** With reference to Fig. 3, a schematically perspective view of a container and a laundry washing machine according to the present invention is shown. In Fig. 3, the container 16 comprises a net 18, formed into a curved rectangular box. The flow of fluid is supplied through an inlet opening 22, which the passes the soapnut accommodating container space, and which the leaves the container through an outlet opening 24. Soapnuts are positioned in the container and then enclosed by a lid 26. This soapnut filled container is the positioned in the detergent opening 6 and enclosed by another lid 22. It is to be understood that the container 16 may have another shape and form than what is shown in Fig. 3. For example, the net 18 may be provided only at the inlet and outlet opening side. Another alternative is that the entire container is formed of net. The net may made of fluid resistant material, such a metal or plastic or other suitable materials.

## Claims

1. A soapnut container, which is attachable to a laundry washing machine or the like, the container comprising
  - a soapnut chamber for accommodating soapnuts, an inlet opening, and an outlet opening, wherein the inlet opening and outlet opening are arranged on either side of the soapnut chamber such that, when soapnuts are accommodated in the soapnut chamber and when a fluid flows through the inlet, the fluid passes and washes the soapnuts in the soapnut chamber, whereby the soapnuts releases their soapnut detergent into the flow of fluid, and such that a flow of fluid containing the released soapnut detergent is discharged through the outlet.
2. The soapnut container of claim 1, wherein the container is a detachable unit.
3. The soapnut container of any one of claim 1 or 2, wherein the container has a curvature in a direction from the inlet to the outlet for close arrangement with a cylindrical, rotatable inner tub of a laundry washing machine or the like.
4. The soapnut container of any one of claim 1 to 3,

5 wherein the inlet opening and/or outlet opening comprises at least one opening, having a largest distance across the opening which is substantially less then the diameter of a soapnut for keeping the soapnut within the container.

5. The soapnut container of any one of claim 1 to 4, wherein the inlet opening and/or outlet opening comprises a net allowing the flow of fluid to enter and leaving the container and simultaneously keeping the soapnuts within the container.
- 10 6. The soapnut container of any one of claim 1 to 5, 15 wherein the container has a rectangular plate-shape with a height, which substantially corresponds to the diameter of a soapnut.
- 15 7. A laundry washing machine for washing with a soapnut detergent, the machine comprising at least one 20 soapnut container according to any one of the claims 1 to 6.
- 20 8. The laundry washing machine according to claim 7, 25 further comprising an inner tub for receiving laundry and an outer tub for holding a washing fluid, wherein the inner tub is rotatable supported in the outer tub, wherein the container is arranged between the inner tub and the outer tub.
- 30 9. The laundry washing machine according to claim 8, 35 comprises means for supplying a circumferential flow of fluid passing through the soapnuts accommodating container for releasing a soapnut detergent.
- 35 10. The laundry washing machine according to claim 9, 40 wherein the means for supplying a circumferential flow of fluid has a flow redirector for bypassing the flow around the container for stopping the releasing of the soapnut detergent.

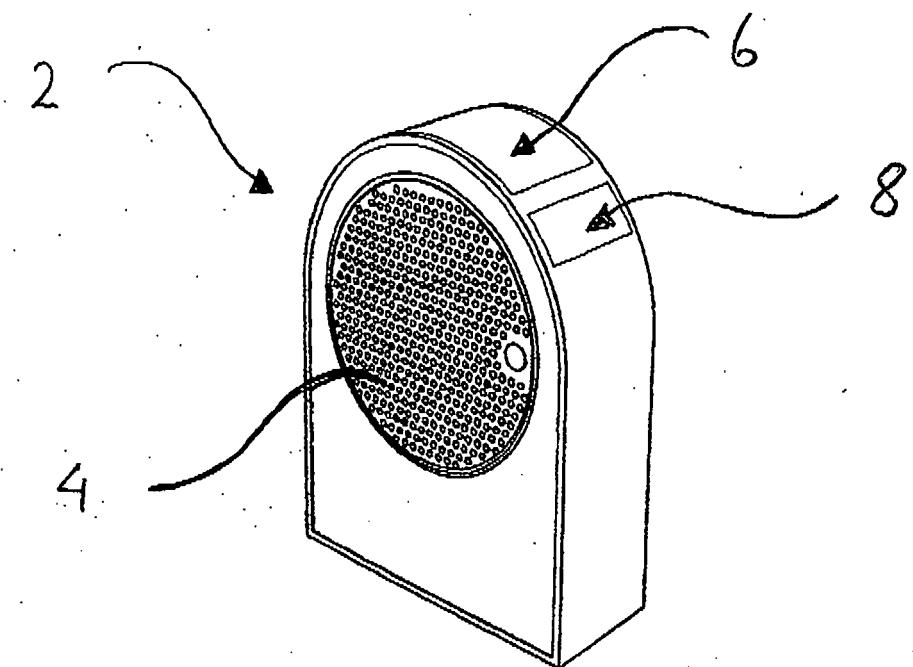


Fig. 1

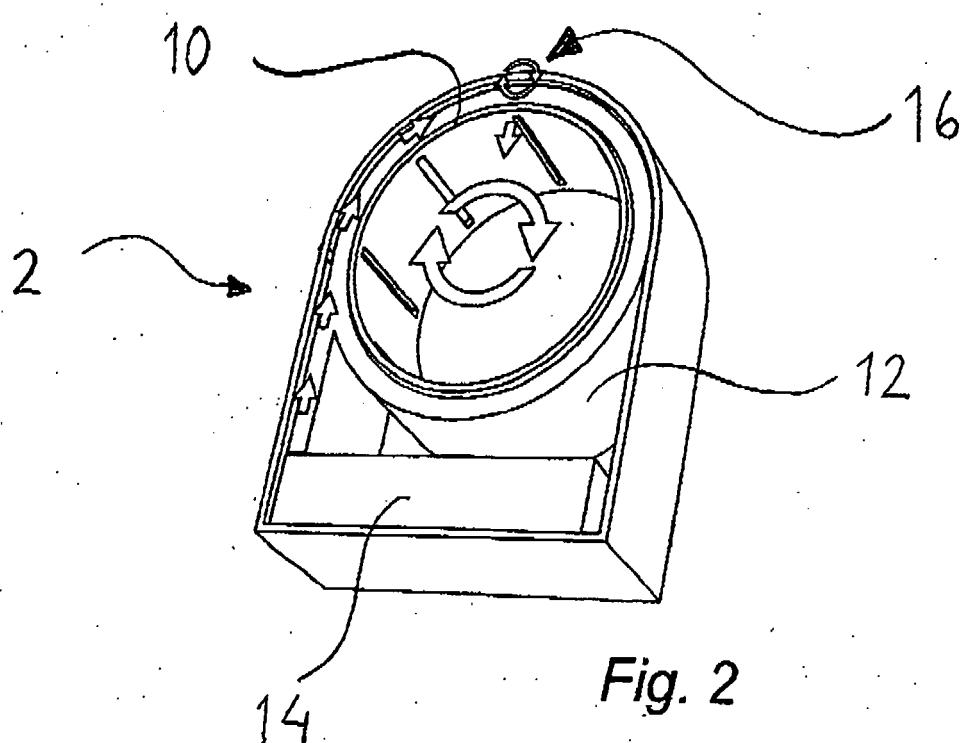
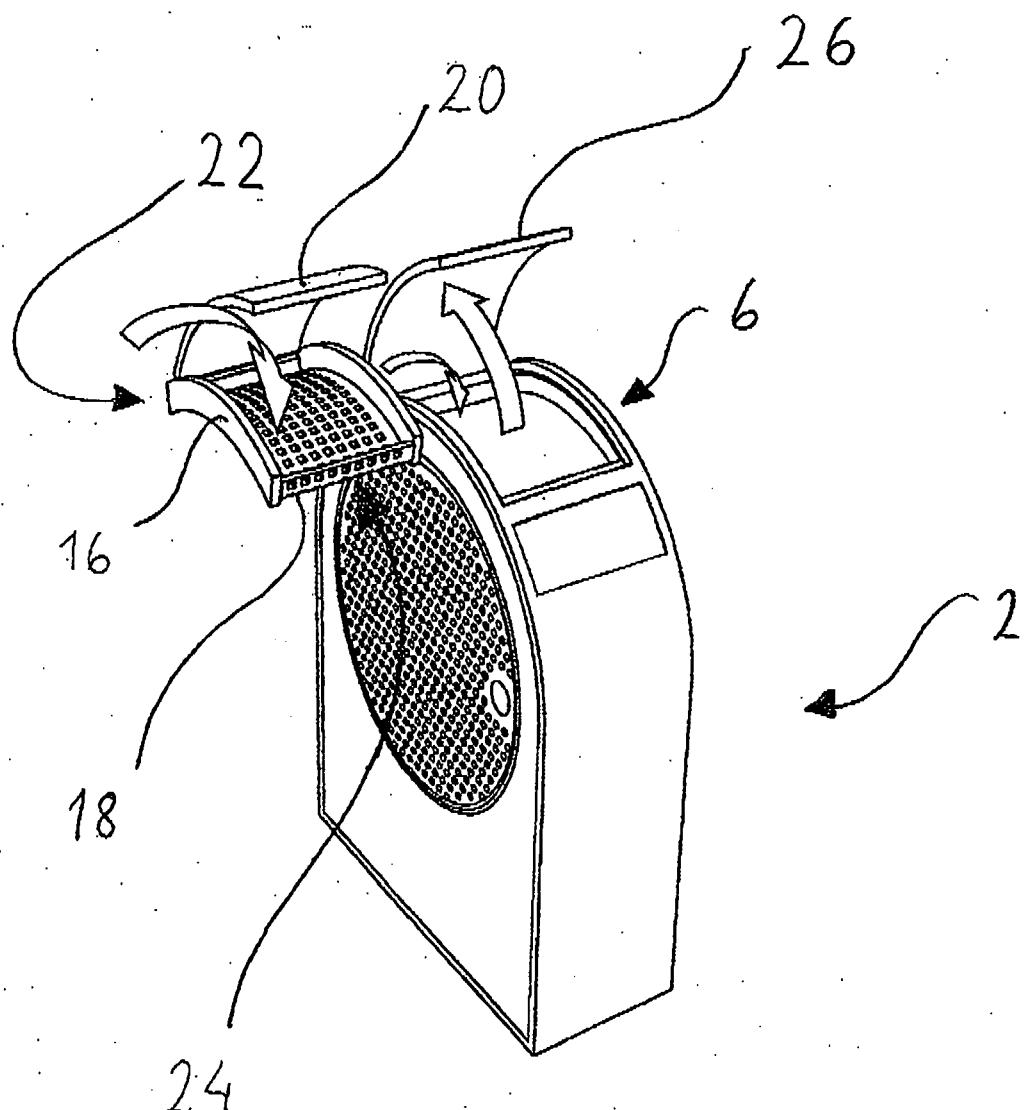


Fig. 2



*Fig. 3*



## EUROPEAN SEARCH REPORT

Application Number  
EP 08 01 6829

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	GB 2 074 613 A (THOMSON BRANDT) 4 November 1981 (1981-11-04) * page 1, line 89 - page 3, line 82; figures 1,2 *	1-4,6-9	INV. D06F39/02
X	GB 2 260 770 A (ZANUSSI ELETTRODOMESTICI [IT]) 28 April 1993 (1993-04-28) * abstract * * page 3, last paragraph - page 5, paragraph 1; figure *	1,2,4,5,7	
X	EP 1 479 813 A (AWECO APPLIANCE SYS GMBH & CO [DE]) 24 November 2004 (2004-11-24) * page 6, paragraph 36 - page 7, paragraph 39; figure 3 *	1,2,4,5,7	
X	DE 100 49 316 A1 (HENKEL KGAA [DE]) 17 January 2002 (2002-01-17) * abstract * * column 2, paragraph 6-8 * * column 4, paragraph 24 - column 6, paragraph 31; figures *	1,2,4,7	
X	US 2007/022788 A1 (CHOI DONG H [KR] ET AL) 1 February 2007 (2007-02-01) * page 2, paragraph 34 - page 3, paragraph 40; figures *	1,4,5,7	D06F A47L C11D
A	DE 20 2006 015106 U1 (CARSTENSEN DIRK [DE]) 4 January 2007 (2007-01-04) * the whole document *	1,7	
A	WO 2006/007741 A (THOENY ROLF [CH]) 26 January 2006 (2006-01-26) * abstract * * page 1, paragraph 1 - page 2, last paragraph *	1,2,4,5,7	
			-/-
The present search report has been drawn up for all claims			
3	Place of search	Date of completion of the search	Examiner
	Munich	15 January 2009	Prosig, Christina
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			



## EUROPEAN SEARCH REPORT

Application Number

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 20 2007 003185 U1 (LOEFFLER GUDRUN [DE]) 28 June 2007 (2007-06-28) * the whole document *	1,7			
P,A	DE 20 2007 006615 U1 (KAMMERER VOLKER [DE]) 18 October 2007 (2007-10-18) * the whole document *	1,2,4,5,7			
			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			
Munich	15 January 2009	Prosig, Christina			
CATEGORY OF CITED DOCUMENTS					
X : particularly relevant if taken alone	T : theory or principle underlying the invention				
Y : particularly relevant if combined with another document of the same category	E : earlier patent document, but published on, or after the filing date				
A : technological background	D : document cited in the application				
O : non-written disclosure	L : document cited for other reasons				
P : intermediate document	S : member of the same patent family, corresponding document				

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

EP 08 01 6829

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. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-01-2009

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
GB 2074613	A	04-11-1981		AU 6932881 A BR 8102289 A DE 3168858 D1 EP 0038247 A1 ES 8207604 A1 FR 2480319 A1 JP 56161097 A YU 93181 A1	22-10-1981 01-12-1981 28-03-1985 21-10-1981 16-12-1982 16-10-1981 11-12-1981 31-12-1983
GB 2260770	A	28-04-1993		DE 9214331 U1 ES 2065830 A2 FR 2682695 A1 IT 1256272 B	10-12-1992 16-02-1995 23-04-1993 29-11-1995
EP 1479813	A	24-11-2004	US	2004244434 A1	09-12-2004
DE 10049316	A1	17-01-2002		NONE	
US 2007022788	A1	01-02-2007	CN	1904189 A	31-01-2007
			JP	2007029708 A	08-02-2007
			KR	20070013811 A	31-01-2007
DE 202006015106	U1	04-01-2007		NONE	
WO 2006007741	A	26-01-2006		NONE	
DE 202007003185	U1	28-06-2007		NONE	
DE 202007006615	U1	18-10-2007		NONE	