



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.10.2013 Bulletin 2013/43

(51) Int Cl.:
A47L 15/50 (2006.01)

(21) Application number: **12164423.1**

(22) Date of filing: **17.04.2012**

(84) Designated Contracting States:
AL 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 RS SE SI SK SM TR
Designated Extension States:
BA ME

• **Forst, Klaus-Martin**
89423 Peterswörth (DE)
• **Haider, Gerhard**
105 45 Stockholm (SE)

(71) Applicant: **Electrolux Home Products Corporation N.V.**
1130 Brussel (BE)

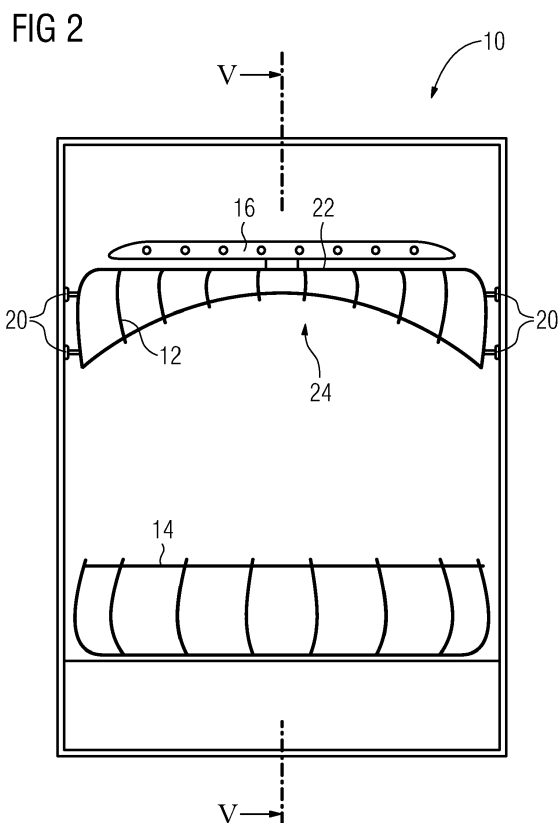
(74) Representative: **Samzelius, Roger Mikael**
AB Electrolux
Group IP
St Göransgatan 143
105 45 Stockholm (SE)

(72) Inventors:
• **Bächer, Peter**
91301 Forchheim (DE)

(54) **Dishwasher having at least one basket**

(57) The present invention relates to a dishwasher (10) having at least one basket (12), wherein the basket includes a bottom grid (22) and an open top side (24), and wherein the basket (12) is arrangeable in a standard orientation, in which the bottom grid (22) is located below the open top side (24) of the basket (12).

According to the invention the dishwasher is characterized in, that the basket (12) is arrangeable in an upside down orientation, in which the open top side (24) of the basket (12) is located below the bottom grid (22).



Description

[0001] The present invention relates to a dishwasher according to the preamble of claim 1.

[0002] In a conventional dishwasher two or more baskets are arranged one above the other. One spray arm is often arranged at an upper basket and another spray arm is often arranged below a lower basket. Usually, the arrangement of the baskets is predetermined and provides enough space for small, medium-sized and large dishes. However, extraordinarily large dishes, like platters or baking plates, cannot be inserted into the dishwasher.

[0003] FIG 8 illustrates a schematic front view of an open dishwasher 10 with an upper basket 12 and a lower basket 14 according to the prior art. The upper basket 12 is arranged in the upper portion, and the lower basket 14 is arranged in the lower portion inside the dishwasher 10.

[0004] The upper basket 12 and the lower basket 14 include a horizontal bottom grid, a front grid, a rear grid and two side grids in each case. The upper sides of the upper basket 12 and the lower basket 14 are open. The front grid, the rear grid and the side grids of the upper basket 12 and the lower basket 14 have substantially the same heights.

[0005] The spray arm 16 is installed below the bottom grid of the upper basket 12. The spray arm 16 extends in a horizontal direction and is rotatably mounted at the centre of the bottom grid of the upper basket 12. The side grids of the upper basket 12 are connected to the side walls of the dishwasher 10. Another spray arm, which cannot be seen in FIG 6, is arranged below the lower basket 14.

[0006] FIG 6 shows that the space between the lower basket 14 and the spray arm 16 is limited. Therefore, extraordinarily large dishes cannot be inserted into this dishwasher.

[0007] It is an object of the present invention to provide a dishwasher which allows an enlarged space inside the dishwasher to enable the insertion of extraordinarily large dishes into the dishwasher.

[0008] The object of the present invention is achieved by the dishwasher according to claim 1. Further embodiments of the invention are mentioned in the claims depending from claim 1.

[0009] According to the present invention the dishwasher has at least one basket. The basket (the only basket or at least one of a plurality of baskets) includes a bottom grid and an open top side. Said basket is arrangeable in a standard orientation, in which the bottom grid is located below the open top side of the basket. Furthermore, said basket is arrangeable in an upside down orientation, in which the open top side of said basket is located below the bottom grid.

[0010] One main idea of the present invention is that the basket can be arranged in to different orientations, besides the standard orientation known from prior art the

basket can additionally be arranged and used in the upside down orientation. Therefore, the problems mentioned above concerning the prior art are solved by the invention, since in said upside down orientation of the basket the space below the basket is enlarged compared to the standard orientation and to prior art. Thus, also huge dishes like platters or baking plates may be inserted into the dishwasher.

[0011] Preferably, in its upside down orientation the basket is turned substantially 180° compared to its standard orientation.

[0012] According to a preferred embodiment of the present invention, the basket corresponds with a rotatable spray arm that is arranged or arrangeable below the bottom grid of the basket in the standard orientation of the basket.

[0013] Preferably, the spray arm is arranged or arrangeable above the bottom grid of the basket in the upside down orientation of the basket.

[0014] In particular, the spray arm is attached or attachable to the bottom grid of the basket.

[0015] Particularly, the spray arm includes nozzles, wherein at least some of these nozzles are directed towards the basket. In particular, at least some of these nozzles are directed towards the basket in the standard orientation as well as in the upside down orientation of the basket.

[0016] Thus, in the upside down orientation the spray arm is facing down and creates an intensive washing zone. This is advantageous for heavily soiled objects. Therefore, the options for loading the dishwasher are increased compared to dishwashers according to the prior art.

[0017] Preferably, the spray arm is connectable or connected via a pipe and/or a flexible tube to a water supply of the dishwasher in the standard orientation as well as in the upside down orientation of the basket. In particular, the pipe and/or flexible tube is attached to an inner side wall of the dishwasher.

[0018] Particularly, the pipe and/or flexible tube includes an S- shaped or Z- shaped pipe section that is pivotable around a pipe axis, especially a horizontal pipe axis, in order to adapt the connection between the spray arm and the water supply to the standard orientation as well as to the upside down orientation of the basket.

[0019] Particularly, the basket is not only arrangeable in different orientations, is it also arrangeable at different heights inside the dishwasher. This further increases the options for loading the dishwasher.

[0020] According to a preferred embodiment, the basket is an upper basket which is located above at least one lower basket of the dishwasher.

[0021] Preferably, the spray arm is an upper spray arm which is located above at least one lower spray arm of the dishwasher.

[0022] In particular, the lower spray arm is located below the lower basket of the dishwasher, whereby the lower spray arm includes nozzles, wherein at least some of

these nozzles are directed towards the lower basket.

[0023] Thus, in the upside down orientation the upper spray arm is facing down and- together with the lower spray arm- creates an intensive washing zone, especially for extraordinarily large dishes.

[0024] According to a preferred embodiment, the basket comprises a plurality of fastening elements provided for connecting the basket to corresponding inner side walls of the dishwasher in the standard orientation as well as in the upside down orientation of the basket. In particular, at least some of the fastening elements comprise at least one mushroom-shaped end portion connectable or connected to a complementary guide rail or guide opening provided at or in the inner side walls of the dishwasher. In this case, for example, the guide rail or guide opening might include a big portion and a small portion, wherein the big portion is marginally bigger than the mushroom-shaped end portion of the fastening elements and the small portion is marginally bigger than a shaft of said mushroom-shaped end portion.

[0025] In particular, the fastening elements can be arranged or attachable symmetrically at the basket, especially the fastening elements can be arranged or attachable symmetrically at opposite side grids of the basket.

[0026] Preferably, the bottom grid of the basket comprises a structure with first fixing means adapted for medium- sized dishes and second fixing means adapted for flat and/or elongated dishes, wherein the first fixing means are provided on the side of the bottom grid that is orientated towards the open top side of the basket and the second fixing means are provided on the other side of the bottom grid that is orientated away from the open top side of the basket, so that medium- sized dishes can be applied to the basket in the standard orientation of the basket and flat and/or elongated dishes, for example cutlery, can be applied to the basket in the upside down orientation of the basket.

[0027] Preferably, a front grid and/or a rear grid of the basket comprise a lower central portion. This allows an enlarged access to the space below the basket in the upside down orientation of the basket.

[0028] The invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates a schematic front view of an open dishwasher according to a first embodiment of the present invention, with an upper basket arranged in a standard orientation,

FIG 2 illustrates a schematic front view of the open dishwasher according to the first embodiment shown in FIG 1, wherein the upper basket is arranged in an upside down orientation,

FIG 3 illustrates a schematic front view of the open dishwasher according to the first embodiment shown in FIG 1, wherein - as shown in FIG 2 - the upper basket is arranged in an upside down

orientation,

FIG 4 illustrates the upper part of a cross-sectional view along the line IV-IV in FIG 1,

FIG 5 illustrates the upper part of a cross-sectional view along the line V-V in FIG 2,

FIG 6 illustrates a schematic front view of a basket of a dishwasher according to a second embodiment of the present invention, wherein the basket is arranged in a standard orientation,

FIG 7 illustrates a schematic front view of the basket of the dishwasher according to the second embodiment shown in FIG 4, wherein the basket is arranged in an upside down orientation, and

FIG 8 illustrates a schematic front view of the open dishwasher with the upper basket and the lower basket according to the prior art.

[0029] FIG 1 illustrates a schematic front view of an open dishwasher 10 with an upper basket 12 and a lower basket 14 according to a first embodiment of the present invention. The upper basket 12 is arranged in an upper portion inside the dishwasher 10, in a standard orientation. In a similar way, the lower basket 14 is arranged in a lower portion inside the dishwasher 10.

[0030] The upper basket 12 includes a horizontal bottom grid 22, a front grid, a rear grid and two side grids. An upper side of the upper basket 12 is open and therefore defines an open top side 24 of the basket 12. In this example, the central portions of the front grid and/or the rear grid of the upper basket 12 are lower than the lateral portions of said front grid and the rear grid, respectively.

[0031] The lower basket 14 includes also a horizontal bottom grid, a front grid, a rear grid and two side grids. The upper side of the lower basket 14 is open. In this example, the front grid, the rear grid and the side grids of the lower basket 14 have substantially the same heights.

[0032] A spray arm 16 is installed below the bottom grid 22 of the upper basket 12. The spray arm 16 extends in a horizontal direction and is rotatably mounted at the centre of the bottom grid 22 of the upper basket 12. A further spray arm might be arranged below the lower basket 14, but this is not shown in FIG 1.

[0033] The upper basket 12 comprises a number of fastening elements 20. The fastening elements 20 connect the side grids of the upper basket 12 to side walls of the dishwasher 10. The upper basket 12 is removably fastened between the side walls of the dishwasher 10 by the fastening elements 20.

[0034] FIG 2 illustrates a schematic front view of the open dishwasher 10 according to the first embodiment shown in FIG 1, wherein the upper basket 12 is arranged in an upside down orientation. Preferably, the upper bas-

ket 12 is removably arranged upside down at the side walls of the dishwasher 10 by the same fastening elements 20 which are used for the arrangement of the upper basket 12 at the side walls in the standard orientation of the basket 12, as shown in FIG 1.

[0035] Since the upper basket 12 is arranged upside down, the spray arm 16 is now arranged above said upper basket 12. This arrangement of the upper basket 12 allows a very large space between the bottom grid of the lower basket 14 and the bottom grid 22 of the upper basket 12. Furthermore, the lower central portions of the front grid and/or the rear grid of the upper basket 12 allow an enlarged access to said space between the bottom grids of the lower basket 14 and the upper basket 12.

[0036] FIG 3 shows the same constellation of the upper basket 12 as FIG 2. Additionally, a shaded area 18 indicates the space between the bottom grids of the lower basket 14 and the upper basket 12. The upside down orientation of the upper basket 12 allows that the dishwasher 10 may receive very large dishes.

[0037] The fastening elements 20 are arranged or attachable at the side grids of the upper basket 12, so that the upper basket 12 may be arranged in the standard orientation according to FIG 1 as well as in the upside down orientation according to FIG 2 by the same fastening elements 20. For example, the fastening elements 20 are arranged or attachable symmetrically at the opposite side grids of the upper basket 12.

[0038] FIG 4 illustrates the upper part of a cross-sectional view along the line IV-IV in FIG 1. The upper basket 12 is arranged in the standard orientation, wherein the spray arm 16 is arranged below the bottom grid 22 of the upper basket 12. The spray arm 16 is connected to a water supply 30 of the dishwasher 10 via a pipe 32 which has a Z-shaped pipe section 34. The water supply 30 is arranged at an inner side wall 36 of the dishwasher 10, thus the pipe 32 is attached to this inner side wall 36.

[0039] FIG 5 illustrates the upper part of a cross-sectional view along the line V-V in FIG 2. The upper basket 12 is arranged in the upside down orientation, wherein the spray arm 16 is arranged above the bottom grid 22 of the upper basket 12. Again, the spray arm 16 is connected to the water supply 30 of the dishwasher 10, via the same pipe 32 shown in FIG 4. This pipe 32 is mounted to the bottom grid 22 of the upper basket 12 and thus, together with the spray arm 16, is arranged below the bottom grid 22 in the standard orientation and is arranged above the bottom grid 22 in the upside down orientation. Because of the Z-shaped pipe section 34 in both orientations the pipe 32 can be connected to the same water supply 30 at the inner side wall 36 of the dishwasher. This can be seen in FIG 5 and FIG 6. Thus, the spray arm 16 is connectable or connected via the pipe 32 to the water supply 30 of the dishwasher 10 in the standard orientation as well as in the upside down orientation of the upper basket 12. To adapt the connection between the spray arm 16 and the water supply 30 to the standard orientation as well as to the upside down orientation, an

end 38 of the pipe 32 that is provided for the connection with the water supply 30 is connectable to the water supply 32 in at least two orientations that are rotated to each other by 180°, and/or the end 38 is pivotable around the water supply 30 and/or around a horizontal pipe axis.

[0040] FIG 6 illustrates a schematic front view of a basket of a dishwasher according to a second embodiment of the present invention. The basket 12 is arranged in a standard orientation. The bottom grid 22 of the basket 12 according to the second embodiment comprises a structure with first fixing means 26 adapted for medium-sized dishes. The first fixing means 26 are provided on the side of the bottom grid 22 that is orientated towards the open top side 24 of the basket 12. Thus, medium-sized dishes can be applied to the basket 12, especially received from the open top side 24, in the standard orientation of the basket 12.

[0041] FIG 7 illustrates a schematic front view of the basket 12 of the dishwasher according to the second embodiment of the present invention. The basket 12 is arranged in an upside down orientation. The bottom grid 22 of the basket 12 according to the second embodiment comprises a structure with second fixing means 28 adapted for flat and/or elongated dishes. The second fixing means 28 are provided on the other side of the bottom grid that is orientated away from the open top side 24 of the basket 12. Thus, flat and/or elongated dishes, for example cutlery, can be applied to the basket 12 in the upside down orientation of the basket 12.

[0042] Furthermore, if the basket 12 shown in FIG 7 is an upper basket 12, the upside down orientation of said basket 12 according to FIG 5 allows a larger space between the bottom grid 22 of the upper basket 12 and a bottom grid of a lower basket in a dishwasher compared to the space in the standard orientation of the said basket 12, as shown in FIG 4.

[0043] In all embodiments the upper basket 12 according to the present invention may be inserted into the dishwasher 10 either in the standard orientation or in the upside down orientation, wherein both orientations are possible in principle. The upside down orientation of the upper basket 12 allows an enlarged space between the bottom grids of the upper basket 12 and the lower basket 14, so that also huge dishes like platters or baking plates may be inserted into the dishwasher 10. In the upside down orientation the spray arm 16 is facing down and creates an intensive washing zone. This is advantageous for heavily soiled objects.

[0044] The dishwasher 10 according to the present invention increases the options for loading the dishwasher 10. In a further embodiment, at least one further basket may be arranged between the upper basket 12 and the lower basket 14, which provides additional options for loading the dishwasher 12.

[0045] FIG 8 illustrates a schematic front view of the open dishwasher 10 with the upper basket 12 and the lower basket 14 according to the prior art, as already described above.

[0046] Although illustrative embodiments of the present invention have been described herein with reference to the accompanying drawings, it is to be understood that the present invention is not limited to that precise embodiment, and that various other changes and modifications may be affected therein by one skilled in the art without departing from the scope or spirit of the invention. All such changes and modifications are intended to be included within the scope of the invention as defined by the appended claims.

List of reference numerals

[0047]

10 dishwasher
12 upper basket
14 lower basket
16 spray arm
18 shaded area
20 fastening element
22 bottom grid
24 open top side
26 first fixing means
28 second fixing means
30 water supply
32 pipe
34 Z-shaped pipe section
36 inner side wall
38 end of pipe 32

Claims

1. A dishwasher (10) having at least one basket (12), wherein the basket includes a bottom grid (22) and an open top side (24), wherein the basket (12) is arrangeable in a standard orientation, in which the bottom grid (22) is located below the open top side (24) of the basket (12), **characterized in, that** the basket (12) is arrangeable in an upside down orientation, in which the open top side (24) of the basket (12) is located below the bottom grid (22) .
2. The dishwasher according to claim 1, **characterized in, that** in its upside down orientation the basket (12) is turned substantially 180° compared to its standard orientation.
3. The dishwasher according to claim 1 or 2, **characterized in, that** the basket (12) corresponds with a rotatable spray arm (16) arranged or arrangeable below the bottom grid (22) of the basket (12) in the standard orientation of the basket (12).

4. The dishwasher according to claim 3, **characterized in, that** the spray arm (16) is arranged or arrangeable above the bottom grid (22) of the basket (12) in the upside down orientation of the basket (12).
5. The dishwasher according to claim 3 or 4, **characterized in, that** the spray arm (16) is attached or attachable to the bottom grid (22) of the basket (12).
6. The dishwasher according to any one of claims 3 to 5, **characterized in, that** the spray arm (16) includes nozzles, wherein at least some of these nozzles are directed towards the basket (12).
7. The dishwasher according to claim 6, **characterized in, that** at least some of these nozzles are directed towards the basket (12) in the standard orientation as well as in the upside down orientation of the basket (12).
8. The dishwasher according to any one of claims 3 to 7, **characterized in, that** the spray arm (16) is connectable or connected via a pipe (32) and/or a flexible tube to a water supply (30) of the dishwasher (10) in the standard orientation as well as in the upside down orientation of the basket (12).
9. The dishwasher according to claim 8, **characterized in, that** the pipe (32) and/or flexible tube is attached to an inner side wall (36) of the dishwasher (10), and/or that the pipe (32) and/or flexible tube includes an S-shaped or Z-shaped pipe section (34) that is pivotable around a pipe axis in order to adapt the connection between the spray arm (16) and the water supply (30) to the standard orientation as well as to the upside down orientation of the basket (12).
10. The dishwasher according to any one of the preceding claims, **characterized in, that** the basket (12) is an upper basket which is located above at least one lower basket (14) of the dishwasher (10).
11. The dishwasher according to any one of the preceding claims and to claim 3, **characterized in, that** the spray arm (16) is an upper spray arm which is located above at least one lower spray arm of the dishwasher (10).
12. The dishwasher according to claim 11 and to claim 10,

characterized in, that

the lower spray arm is located below the lower basket (14) of the dishwasher (10), whereby the lower spray arm includes nozzles, wherein at least some of these nozzles are directed towards the lower basket (14). 5

13. The dishwasher according to any one of the preceding claims,

characterized in, that

the basket (12) comprises a plurality of fastening elements (20) provided for connecting the basket (12) to corresponding inner side walls of the dishwasher (10) in the standard orientation as well as in the upside down orientation of the basket (12). 10

15

14. The dishwasher according to claim 13,

characterized in, that

at least some of the fastening elements (20) comprise at least one mushroom-shaped end portion connectable or connected to a complementary guide rail or guide opening provided at or in the inner side walls of the dishwasher (10). 20

15. The dishwasher according to any one of the preceding claims, 25

characterized in, that

the bottom grid (22) of the basket (12) comprises a structure with first fixing means (26) adapted for medium-sized dishes and second fixing means (28) adapted for flat and/or elongated dishes, wherein the first fixing means (26) are provided on the side of the bottom grid (22) that is orientated towards the open top side (24) of the basket (12) and the second fixing means (28) are provided on the other side of the bottom grid (22) that is orientated away from the open top side (24) of the basket (12), so that medium-sized dishes can be applied to the basket (12) in the standard orientation of the basket (12) and flat and/or elongated dishes can be applied to the basket (12) in the upside down orientation of the basket (12). 30

35

40

45

50

55

FIG 1

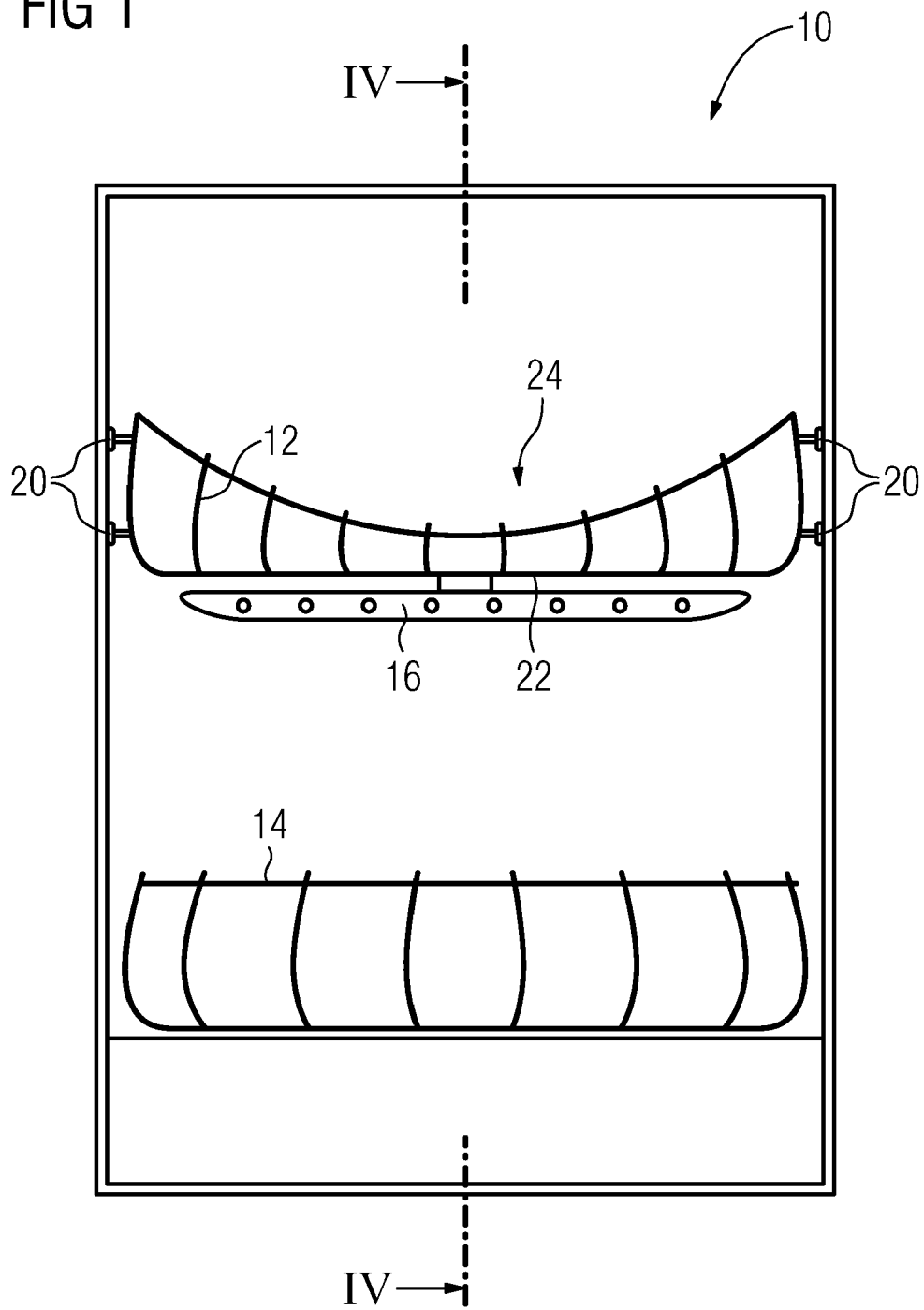


FIG 2

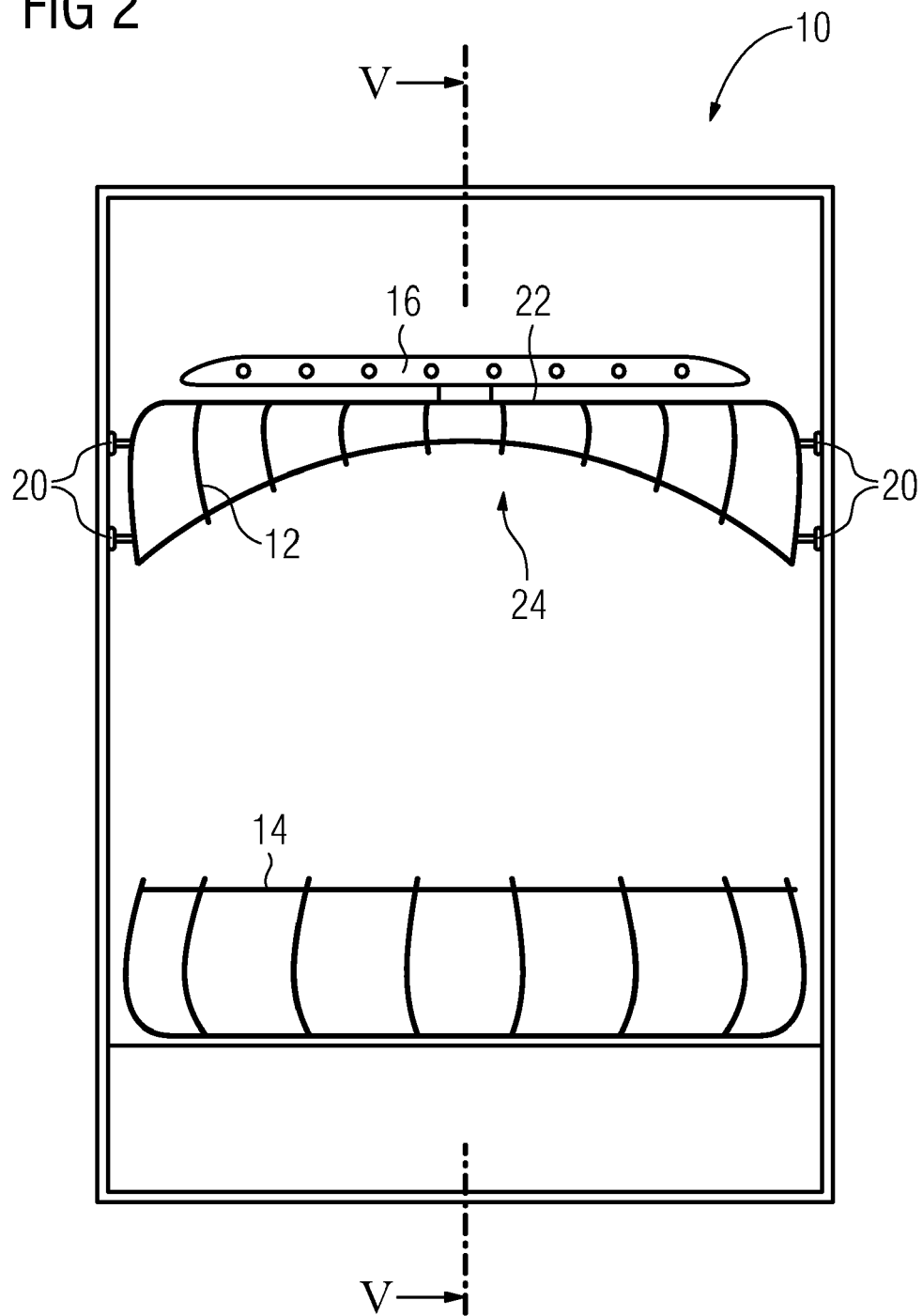


FIG 3

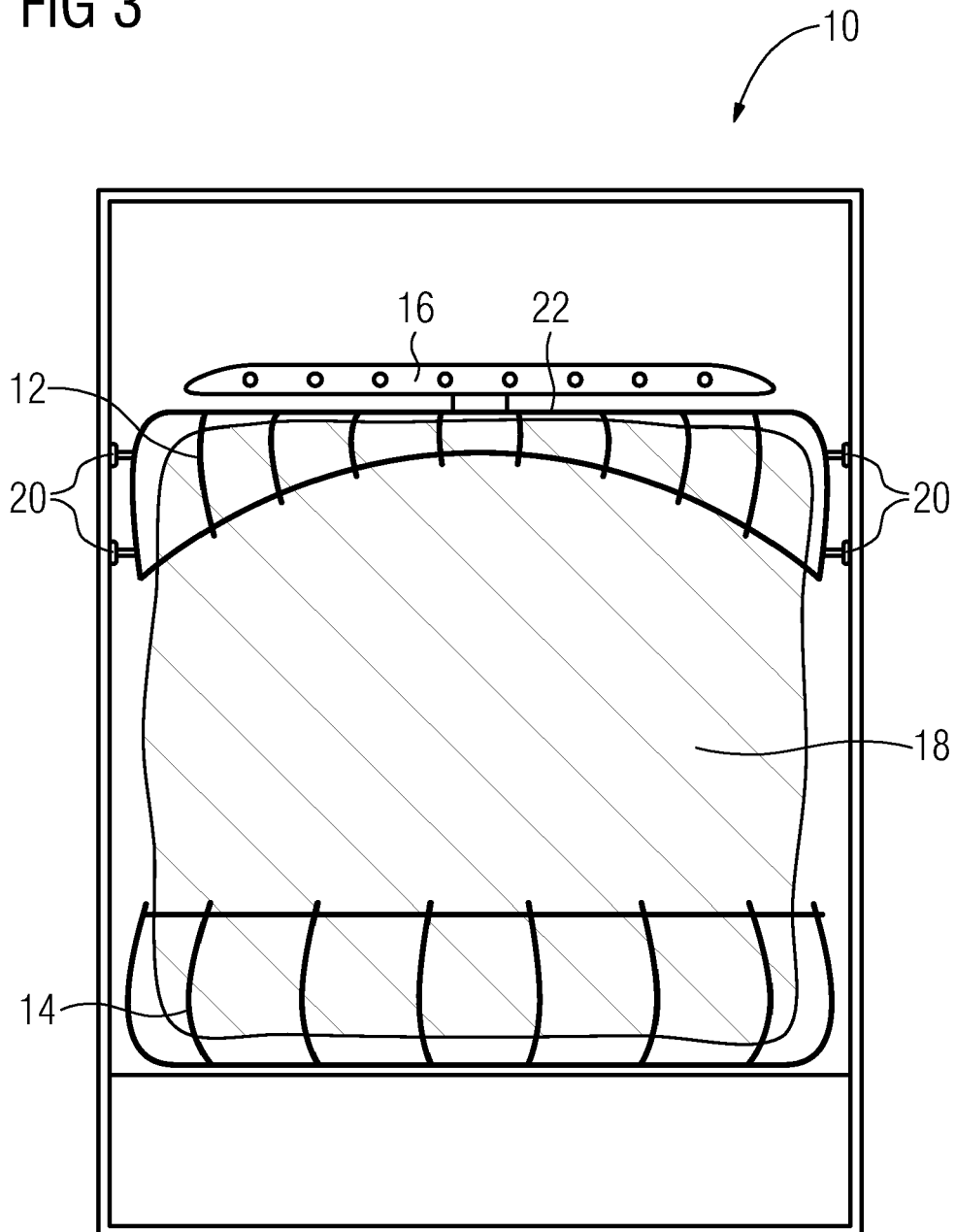


FIG 4

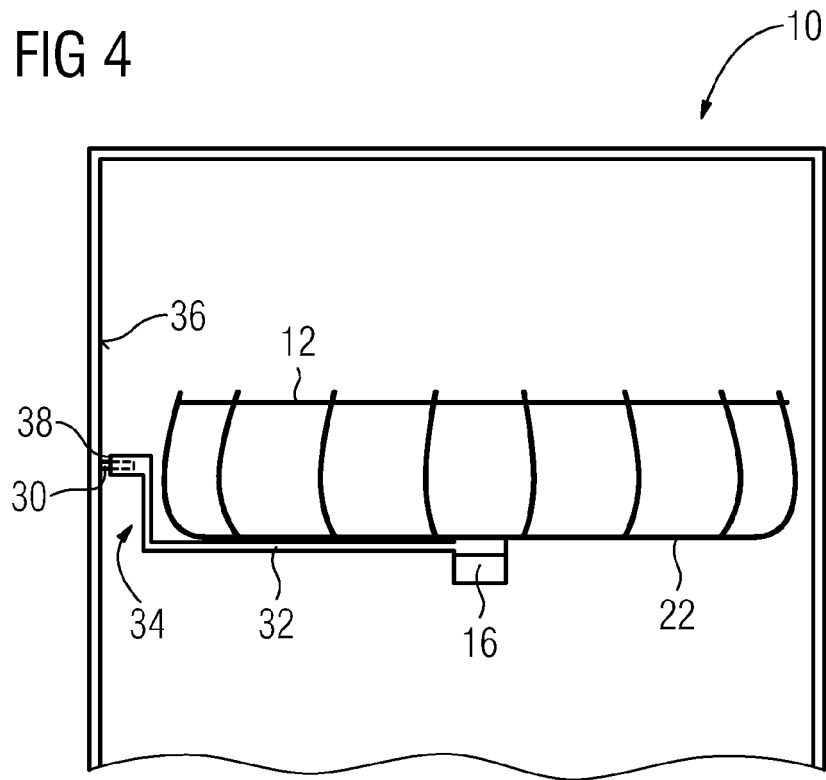


FIG 5

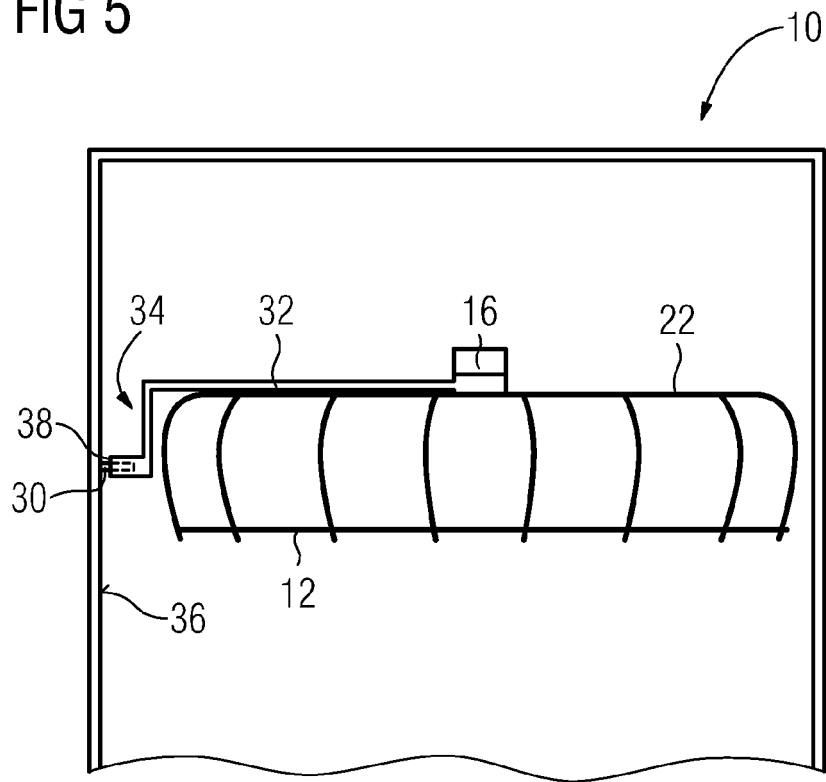


FIG 6

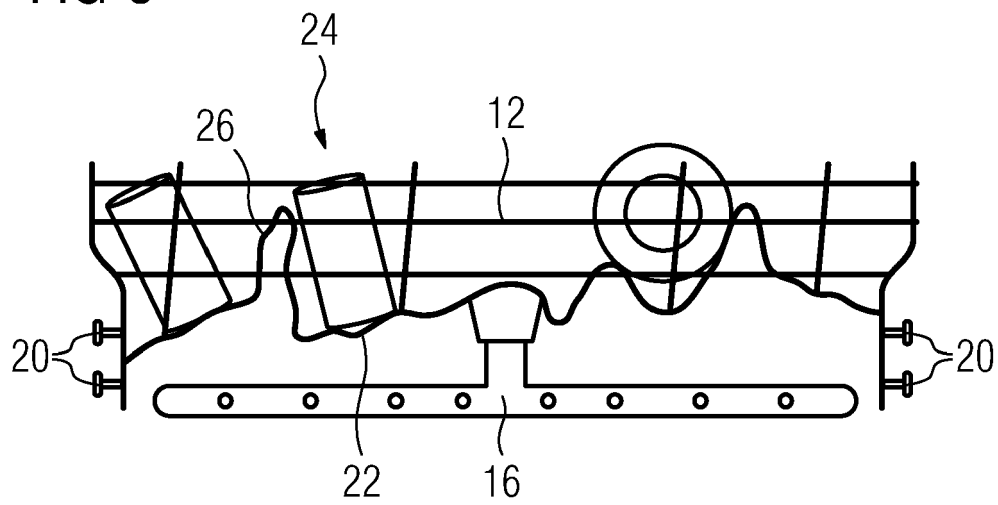


FIG 7

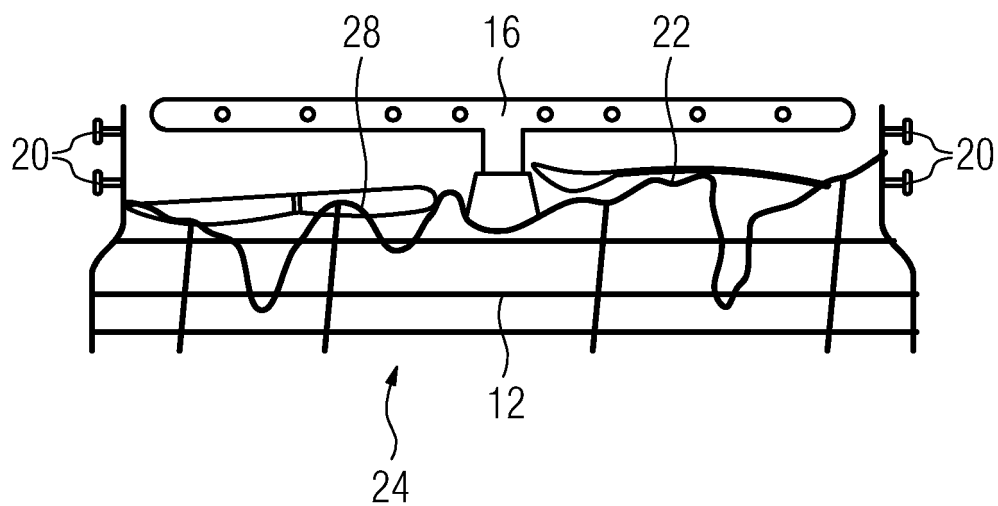
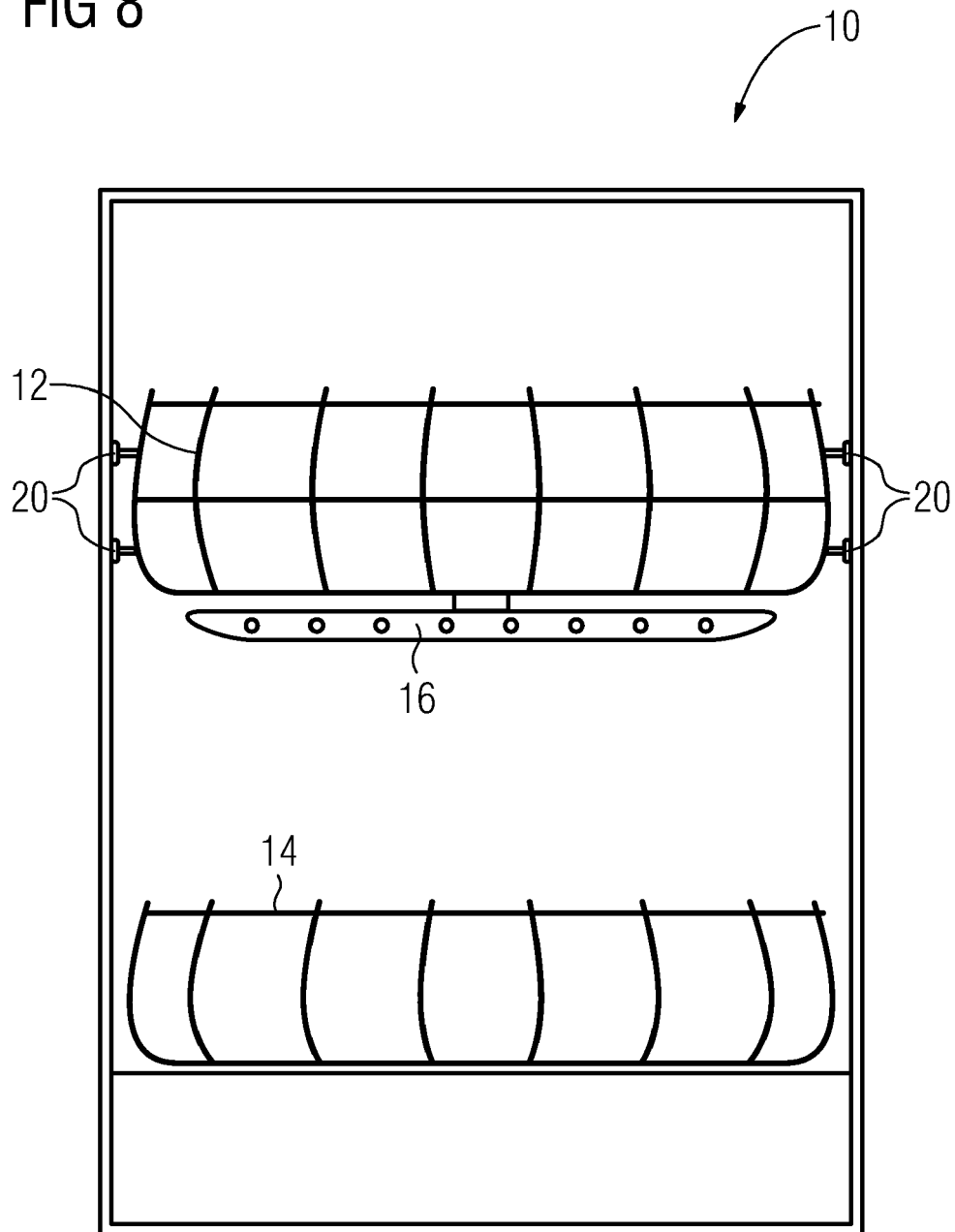


FIG 8





EUROPEAN SEARCH REPORT

Application Number
EP 12 16 4423

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 2004/051428 A1 (BARTLOFF WILLIAM F [US] ET AL) 18 March 2004 (2004-03-18)	1-3, 10-15	INV. A47L15/50
Y	* paragraphs [0011] - [0028] *	4-7	
X	US 2006/250058 A1 (STEVENS DAVID A [US] ET AL) 9 November 2006 (2006-11-09)	1-3, 10-15	
Y	* paragraphs [0048] - [0072]; figures 13-22 *	4-7	
Y	WO 2006/063900 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]; CLASSEN EGBERT [DE]) 22 June 2006 (2006-06-22) * page 7, lines 26-33 *	4-7	
A	US 2008/156362 A1 (SHIN GAP SU [KR] ET AL) 3 July 2008 (2008-07-03) * paragraphs [0021] - [0062] *	1-15	TECHNICAL FIELDS SEARCHED (IPC)
			A47L
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 1 October 2012	Examiner Martin Gonzalez, G
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			

 1
EPO FORM 1503 03.82 (P04C01)

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

EP 12 16 4423

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.

01-10-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004051428 A1	18-03-2004	NONE	
US 2006250058 A1	09-11-2006	CA 2587999 A1	09-11-2007
		EP 1854395 A1	14-11-2007
		US 2006250058 A1	09-11-2006
WO 2006063900 A1	22-06-2006	CN 200984167 Y	05-12-2007
		DE 102004060951 A1	29-06-2006
		EP 1827200 A1	05-09-2007
		US 2008093314 A1	24-04-2008
		WO 2006063900 A1	22-06-2006
US 2008156362 A1	03-07-2008	CN 101573066 A	04-11-2009
		EP 2124701 A1	02-12-2009
		KR 20080062619 A	03-07-2008
		US 2008156362 A1	03-07-2008
		WO 2008082231 A1	10-07-2008