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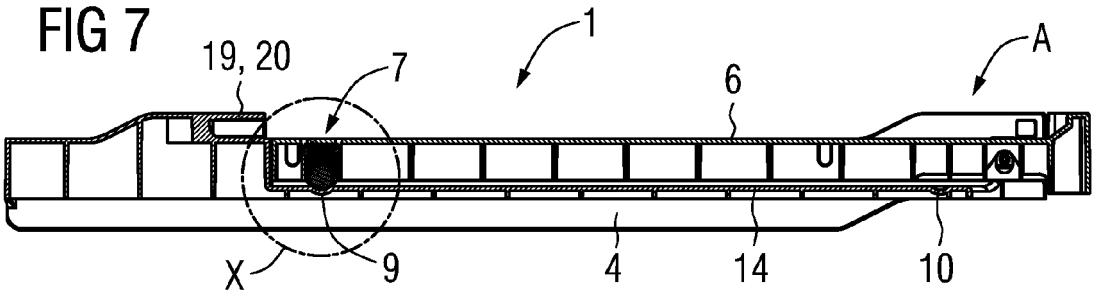
(54) Device for connecting a first appliance with a second appliance

(57) The invention relates to a device (1) for connecting a first appliance (2) with a second appliance (3), wherein the second appliance (3) is arranged on top of the first appliance (2), wherein the device (1) comprises a frame element (4) which is designed to be fixed on top of the first appliance (2). To provide an easy to use shelf in a stable manner the invention is characterized in that the frame element (4) has a reception (5) for receiving a shelf (6), so that the shelf (6) can be moved in a horizontal direction (H) forth and back from a first position (A) into a second position (B) relatively to the frame element (4), wherein means (7) are arranged for stopping the shelf (6) in at least one of the positions (A, B).

FIG 7



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Description

[0001] The invention relates to a device for connecting a first appliance with a second appliance, wherein the second appliance is arranged on top of the first appliance, wherein the device comprises a frame element which is designed to be fixed on top of the first appliance.

[0002] A connection device for connecting a first appliance, being for example a domestic washing machine, with a second appliance, being for example a domestic dryer, of the kind mentioned above is known e.g. from DE 10 2005 026 134 A1. Here, the connection device comprises receptions for the feet of the upper appliance, wherein the feet are arranged at respective stems. The reception has a recess for the passage of the stem. The foot itself is securely fixed in the reception when the foot is pushed into the reception. Each reception is arranged at the correct position for the respective upper appliance which has to be arranged onto the lower appliance.

[0003] Often, it is desired to have a shelf arranged in the device for connecting the appliances which can be used for example for holding a container of laundry before loading it into the upper household appliance. This shelf should of course be stowed in the device when it is not used to guarantee a convenient appearance of the device. Thus, the shelf should be movable forth and back from a closed position into an opened position. It is detrimental when the movement of the shelf between the two positions is difficult. Also it is a drawback when the shelf has no hold in the mentioned positions.

[0004] Thus, it is an object of the invention to propose a solution for a connection device of the kind mentioned above which allows an easy and comfortable movement of a shelf which is part of the device from a closed to an opened position and back. Here, it is desired that the shelf has a high degree of stability not only in the two mentioned positions but also during the movement between the two positions.

[0005] The solution of this object is characterized in that the frame element has a reception for receiving a shelf, so that the shelf can be moved in a horizontal direction forth and back from a first position into a second position relatively to the frame element, wherein means are arranged for stopping the shelf in at least one of the positions.

[0006] Preferably, the means are arranged for stopping the shelf in both the first and second position.

[0007] The means can be arranged for allowing the shelf a sliding movement between the first and second position.

[0008] The means can comprise a biased engaging element arranged in the shelf (or in the frame element), which engaging element is arranged for at least partially entering into at least one congruent reception which is arranged in the frame element (or in the shelf).

[0009] The engaging element is preferably a ball. The engaging element can be biased by means of a resilient element. The resilient element is preferably a helical spring and/or a piece of elastically compressible plastic material.

[0010] The biased engaging element can be arranged in a retainer which in turn is arranged in a seat in the shelf. The retainer can be fixed in a seat in the shelf by means of a snap connection.

[0011] The frame element has preferably a U-shaped form seen in a top view, wherein a base plate can be arranged between two arms of the U-shaped frame element.

[0012] The base plate can form a raceway for the biased engaging element of the means when the shelf travels between the mentioned positions.

[0013] Fixing means can be arranged for fixing the shelf relatively to the frame element in one of the positions. The fixing means can comprise at least one pin element fixed at the shelf (or at the frame element) and at least one elastic clamping seat fixed at the frame element (or at the shelf).

[0014] The frame element can comprise at least two receptions for a foot arranged at a stem of the second appliance.

[0015] Finally, the device can comprise a fixation device for the fixation of the device on the top side of the first appliance, wherein the fixation device preferably comprises a holding element having at least one hook element, wherein the hook element is designed to be engaged with a top plate of the first appliance.

[0016] The device can be designed to connect a first domestic appliance with a second domestic appliance, especially a washing machine and a dryer.

[0017] The shelf which can be used as a supporting panel can be easily moved from the closed position into the opened (extracted) position and back. Due to the design according to the invention it is made sure that definite latching positions are given in both the opened and the closed position. Also during movement of the shelf between the two positions a stable arrangement is obtained. Thus, the device is characterized by a high degree of safety and comfort during use.

[0018] In the drawings an embodiment of the invention is depicted.

FIG 1 shows a front view of a first appliance being a washing machine to be connected with a second appliance being a dryer by means of a device according to the invention, before connection,

FIG 2 shows a perspective view of the arrangement of FIG 1,

FIG 3 shows a front view of the first appliance and of the second appliance after connection,

FIG 4 shows the corresponding side view of FIG 3,

FIG 5 shows a perspective view of a device according

to the invention for connecting the first with the second appliance, wherein a shelf of the device is arranged in a first (closed) position,

FIG 6 shows a perspective view of the device according to FIG 5, wherein the shelf of the device is arranged in a second (opened) position,

FIG 7 shows a side sectioned view of the device according to the invention, wherein the shelf of the device is arranged in the first position,

FIG 8 shows a side sectioned view of the device according to the invention, wherein the shelf of the device is in an intermediate position between the first and the second position,

FIG 9 shows a side sectioned view of the device according to the invention, wherein the shelf of the device is arranged in the second position,

FIG 10 shows the detail "X" according to FIG 7,

FIG 11 shows an explosion view of the device according to the invention,

FIG 12 shows the shelf, seen from the bottom side, with means for stopping the shelf, wherein the means are shown in an explosion view,

FIG 13 shows the shelf, seen from the bottom side, with the assembled means for stopping the shelf and

FIG 14 shows a perspective view of a part of the first and the second appliance being connected by the device, seen from the rear.

[0019] In FIG 1 and FIG 2 a first appliance 2, preferably being a washing machine, and a second appliance 3, preferably being a dryer, are shown which has to be arranged one above the other in a stable manner. For doing so, a device 1 for connecting is employed. The upper appliance, i. e. the second appliance 3, has four feet 23 which are arranged at stems which preferably are designed as a threaded rod.

[0020] The device 1 comprises a frame element 4 forming a reception for a shelf 6, which can be arranged in a closed and in an opened (extracted) position. FIG 2 shows the shelf 6 being located in the opened position B. The two positions (closed and opened) are taken by a movement of the shelf 6 in a horizontal direction H.

[0021] While FIG 1 and FIG 2 show the two appliances 2, 3 before connection above each other, FIG 3 and FIG 4 show the appliances 2, 3 after connection by the device 1.

[0022] Advantageously, the shelf 6 of the device 1 can be extracted from the device 1 from the closed position into the opened position to define a supporting plane adapted, for example, for holding a container of laundry before loading it into the household appliance 2 positioned over the device 1. Advantageously, as illustrated in FIG 5, the shelf 6 can be pushed into the closed position A into the frame element 4, so as to reduce the encumbrance of the device 1 when the shelf 6 is not used and to guarantee a convenient appearance of the device 1.

[0023] In FIG 5 and FIG 6 the device 1 is shown as single part. The frame element 4 may advantageously have a substantially U-shaped form. Two arms 15, 16 preferably delimit the reception 5 for the shelf 6. So, a receiving space is formed for the shelf 6 as mentioned above. Preferably, but not necessarily, the reception 5 is closed at its bottom by a base plate 14 which connects the two arms 15, 16 of the U-shaped frame element 4.

[0024] Advantageously the device 1 has four receptions 19, 20, 21, 22 for the rear feet and the front feet of the upper appliance. Thus, the feet 23 (see FIG 1) which are arranged at the axial end of stems can be pushed into the receptions 19, 20, 21, 22 for surely secure the upper appliance 3 on the lower appliance 2.

[0025] Means 7 are provided - best to be seen in FIG 7 to FIG 10 - for stopping the shelf 6 in the first (closed) position A and/or in the second (opened) position B.

[0026] An advantageous design of those means 7 can be seen in detail in FIG 7 to FIG 10. In FIG 7 the shelf 6 is shown being in the closed position A, i. e. completely or almost completely in the reception 5 of the frame element 4. FIG 8 shows the movement of the shelf 6 from the closed position A into the opened position B. In FIG 9 the shelf 6 has reached the opened position B.

[0027] The means 7 for stopping the shelf 6 in the positions A and/or B and for supporting it during its travel between those positions preferably comprise a retainer 12 which is fixed in the shelf 6, preferably by means of a snap connection 13, preferably in a respective seat in the shelf 6. The shelf 6 as well as the retainer 12 is made of plastic material in the present embodiment, but it may be made of other materials, for example metal, wood, etc.

[0028] In the embodiment represented din the enclosed figures, for mounting the retainer 12 in the shelf 6 (see FIG 10), the retainer 12 is pushed upwards until lateral projections snap in respective openings in the shelf 6.

[0029] Before mounting the retainer 12, an engaging element 8, for example a ball made from steel, and a resilient element 11, for example a helical spring or a piece of elastically compressible plastic material, are arranged in the retainer 12. After mounting of the retainer 12 in the shelf 6 the ball 8 is biased by the resilient element 11 (for example by the helical spring) elastically towards the external of the respective opening in the shelf 6.

[0030] The assembly and arrangement of the retainer 12 in the shelf 6 is also depicted in FIG 12 and FIG 13. Here the bottom side of the shelf 6 can be seen where the retainers 12 are located.

[0031] Advantageously, for the removal of the retain-

ers 12 from the shelf 6, holes 29 are arranged (see FIG 6). The holes 29 obtained in the shelf 6 are adapted for allowing the removal of the retainers 12 by the insertion of a body, e. g. a screwdriver, in the holes 29, so as to disengage the retainers 12 from their seats in the shelf 6.

[0032] The frame element 4, and more specifically its base plate 14, has receptions 9 and 10 (see FIG 7 to FIG 9) with a shape corresponding to the engaging element 8 (e. g. the ball 8) in which the engaging element 8 can be pressed by the resilient element 11 when the shelf 6 is in the respective positions A or B, what becomes apparent by FIG 7, FIG 8 and FIG 9 which show the travel of the shelf 6 from the position A to the position B.

[0033] In the embodiment illustrated in the enclosed figures, two receptions 9 are advantageously arranged in the rear region of the base plate 14, and two receptions 10 are arranged in the front region of it. Thus, when the engaging element 8 has reached the receptions 9 or 10, a definite location of the shelf 6 is given. During the travel of the shelf 6 between the positions A and B the resilient element 11 is compressed by the engaging element 8. In this sliding condition the engaging element 8 slides or rolls on the base plate 14. So, the base plate 14 forms a raceway for the engaging element 8.

[0034] As can be seen in FIG 6 and FIG 11, the device 1 may advantageously comprise further means 17, 18 for fixing the shelf 6 in the closed position A. For example, these further means may comprise two pin elements 17 arranged at the rear side of the shelf 6; in this case the further means may comprise elastic clamping seats 18 which are arranged at the frame element 4 and are adapted to be engaged by the pin elements 17 when the shelf 6 approaches the closed position A. If the user applies a certain extracting force on the shelf 6 the pin elements 17 exit from the elastic clamping seats 18.

[0035] In FIG 14 it can be seen an advantageous way in which the device 1 may be fixed at a top plate 27 of the lower appliance 2. In this case the device 1 advantageously comprises a fixation device 24 for firmly arrange the device 1 on the top plate 27. The fixation device comprises a holding element 25 which has one or more hook elements 26. The hook elements 26 grab the bottom side of the top plate 27 and are also fixed at the frame element 4. The fixation takes place preferably by means of a screw connection 28.

[0036] So, the device 1 is firmly arranged on top of the top plate 27 of the bottom appliance 2.

[0037] Consequently, a secure connection between the two appliances 2, 3 is established.

[0038] Thus, the proposed means 7 allow a definite stopping (in the positions A and/or B) of the shelf 6 and also a sliding of the shelf 6 during its travel between the positions A and B. By the proposed device a good guiding of the shelf 6 is guaranteed during its movement between the two positions. The stability of the shelf 6 is improved both in the closed and the opened (extracted) position and also during the sliding of the shelf 6. An auto fixation of the shelf 6 relatively to the frame element 4 in the mentioned positions A and B is thus established.

[0039] The engagement element 8 needs not to be a ball; it can also be another element which rotates or slides during the travel of the shelf 6 between the positions A and B on the base plate 14. An example for a rolling element is a cylinder which is arranged in an analogue way in a retainer 12. An example for a sliding element is a pin which is elastically pressed by the resilient element 11 towards the base plate 14 of the frame element 4 and which slides (i. e. which does not rotate) on the base plate 14.

[0040] Preferably two different positions A and B are arranged; of course there could also be more than two positions in which the shelf 6 can rest.

[0041] Even if the fixation device 24 has been described with reference to the device 1, it is clear that such a fixation device 24 can be used also for other kinds of connection devices, even not provided with means 7 for stopping the shelf 6 in at least one of the positions A, B, provided that such connection devices are provided with a frame adapted to be fixed to the top plate 27 of a lower appliance 2.

Reference Numerals

[0042]

1	Device for connecting
2	First appliance (washing machine)
3	Second appliance (dryer)
4	Frame element
5	Reception
6	Shelf
7	Means for stopping the shelf
8	Engaging element (ball)
9	Reception
10	Reception
11	resilient element
12	Retainer
13	Snap connection
14	Base plate
15	Arm
16	Arm

17, 18	Fixing means
17	Pin element
18	Clamping seat
19	Reception
20	Reception
21	Reception
22	Reception
23	Foot
24	Fixation device
25	Holding element
26	Hook element
27	Top plate
28	Screw connection
29	Hole
H	Horizontal direction
A	First position (closed position)
B	Second position (opened / extracted position)

Claims

1. Device (1) for connecting a first appliance (2) with a second appliance (3), wherein the second appliance (3) is arranged on top of the first appliance (2), wherein the device (1) comprises a frame element (4) which is designed to be fixed on top of the first appliance (2), **characterized in that**
the frame element (4) has a reception (5) for receiving a shelf (6), so that the shelf (6) can be moved in a horizontal direction (H) forth and back from a first position (A) into a second position (B) relatively to the frame element (4), wherein means (7) are arranged for stopping the shelf (6) in at least one of the positions (A, B).

2. Device according to claim 1, **characterized in that** the means (7) are arranged for stopping the shelf (6) in both the first (A) and second position (B).

3. Device according to claim 1 or 2, **characterized in that** the means (7) are arranged for allowing the shelf (6) a sliding movement between the first (A) and second (B) position.

4. Device according to one of claims 1 to 3, **characterized in that** the means (7) comprise a biased engaging element (8) arranged in the shelf (6) or in the frame element (4), which engaging element (8) is arranged for at least partially entering into at least one congruent reception (9, 10) which is arranged respectively in the frame element (4) or in the shelf (6).

5. Device according to claim 4, **characterized in that** the engaging element (8) is a ball.

6. Device according to claim 4 or 5, **characterized in that** the engaging element (8) is biased by means of a resilient element (11).

7. Device according to claim 6, **characterized in that** the resilient element (11) comprises a helical spring and/or a piece of elastically compressible plastic material.

8. Device according to one of claims 4 to 7, **characterized in that** the biased engaging element (8) is arranged in a retainer (12) which in turn is arranged in the shelf (6).

9. Device according to claim 8, **characterized in that** the retainer (12) is fixed in the shelf (6) by means of a snap connection (13).

10. Device according to one of claims 1 to 9, **characterized in that** the frame element (4) has a U-shaped form seen in a top view, wherein a base plate (14) is arranged between two arms (15, 16) of the U-shaped frame element (4).

11. Device according to claim 10, **characterized in that** the base plate (14) forms a raceway for the biased engaging element (8) of the means (7).

12. Device according to one of claims 1 to 11, **characterized in that** fixing means (17, 18) are arranged for fixing the shelf (6) relatively to the frame element (4) in one of the positions (A).

13. Device according to claim 12, **characterized in that** the fixing means (17, 18) comprise at least one pin element (17) fixed at the shelf (6) or at the frame element (4) and at least one elastic clamping seat (18) fixed at the frame element (4) or at the shelf (6).

14. Device according to one of claims 1 to 13, **characterized in that** the frame element (4) comprises at least two receptions (19, 20, 21, 22) for a foot (23) arranged at a stem of the second appliance (3).

15. Device according to one of claims 1 to 14, **characterized in that** it a comprises fixation device (24) for the fixation of the device (1) on the top side of the first appliance (2), wherein the fixation device (24) preferably comprises a holding element (25) having at least one hook element (26), wherein the hook element (26) is designed to be engaged with a top plate (27) of the first appliance (2).

FIG 2

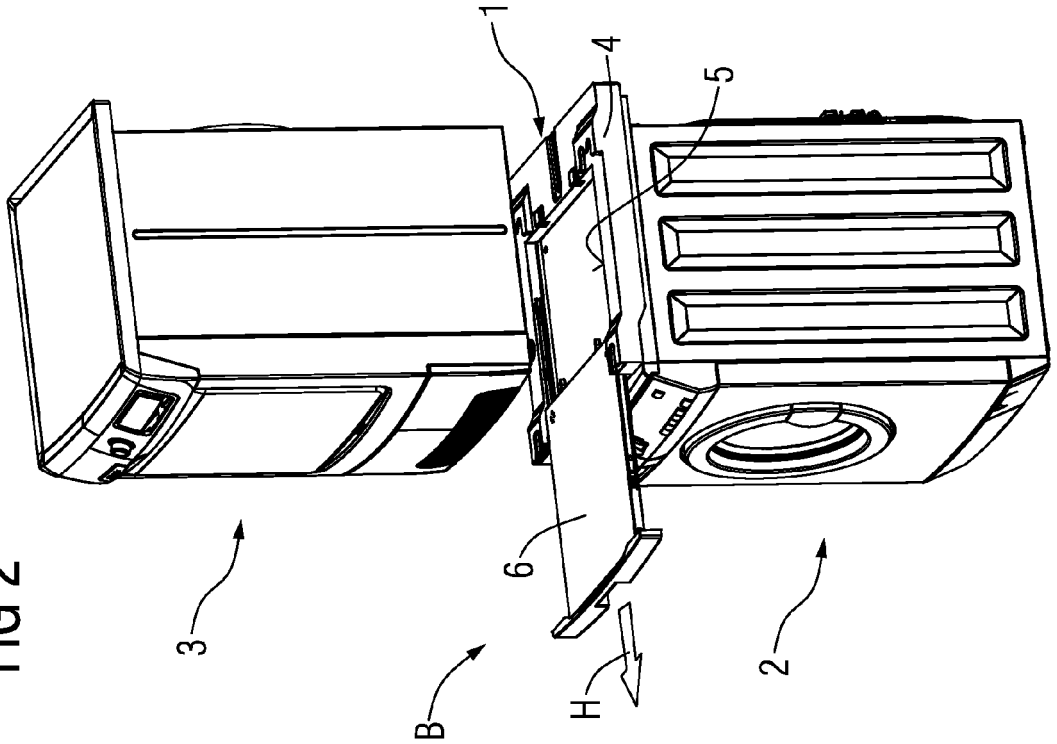


FIG 1

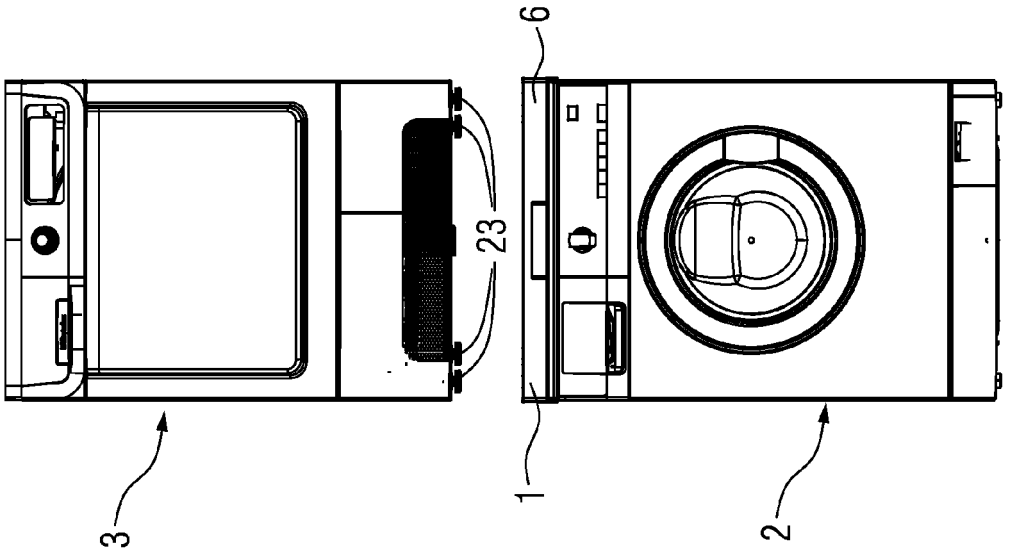


FIG 4

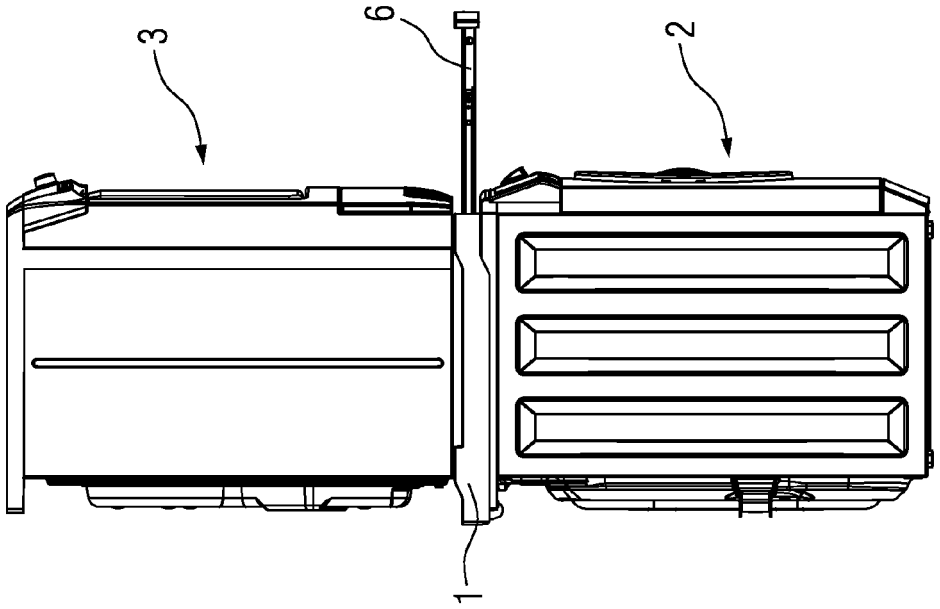
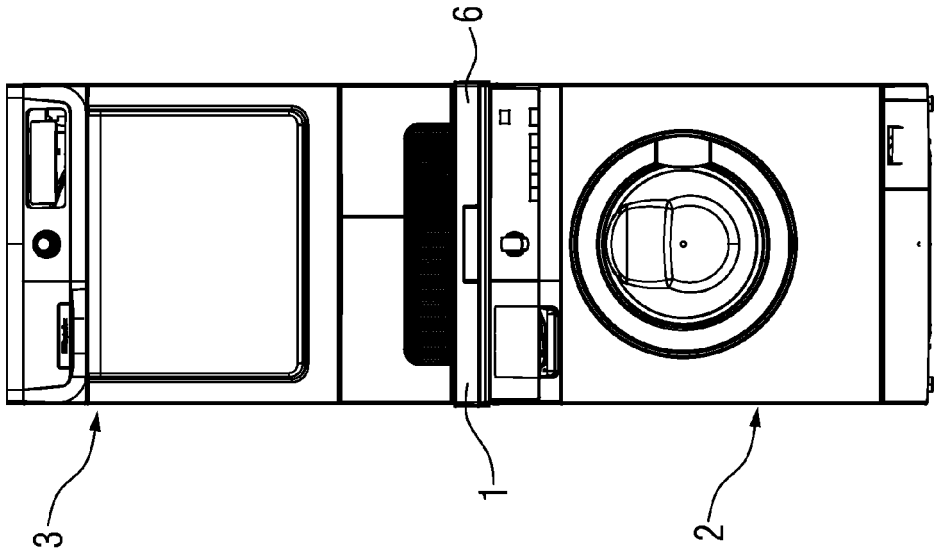


FIG 3



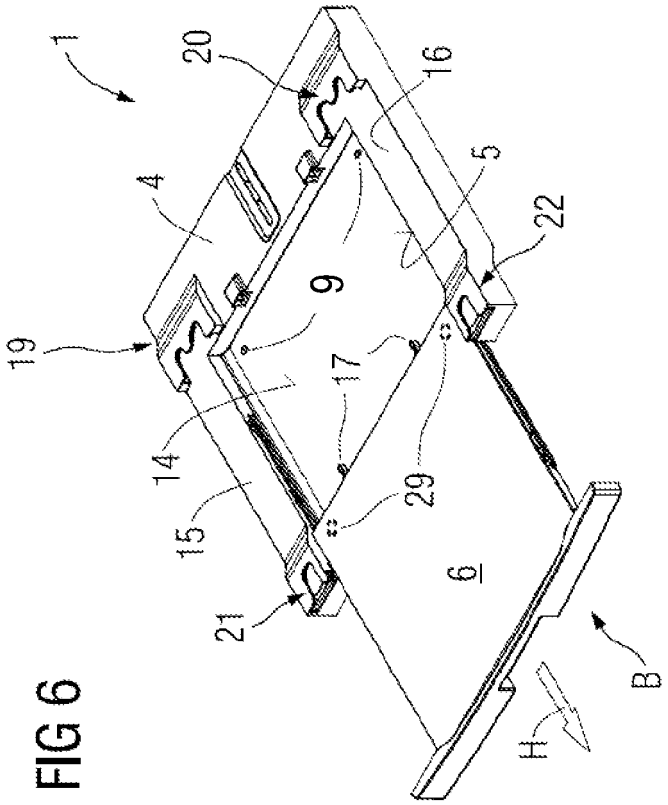


FIG 6

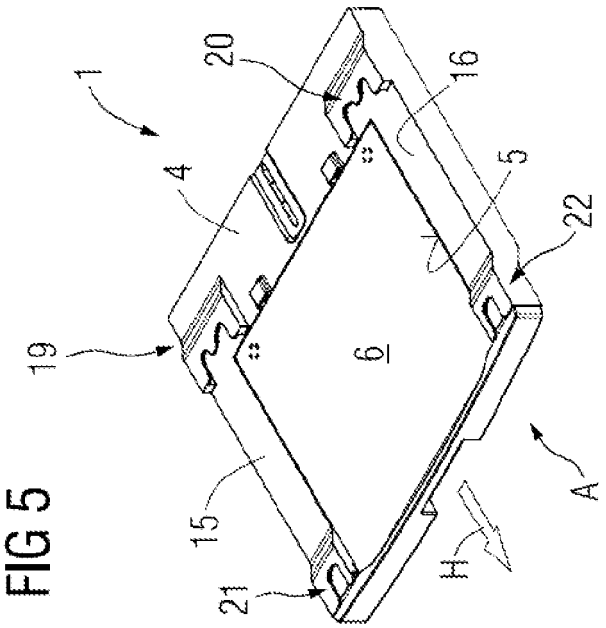


FIG 5

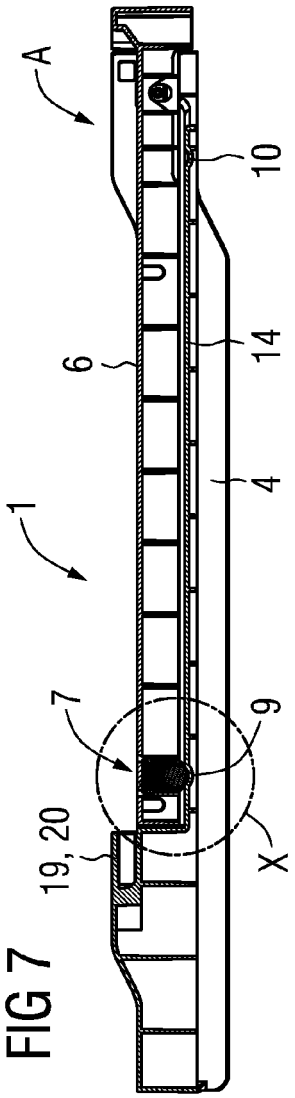


FIG 7

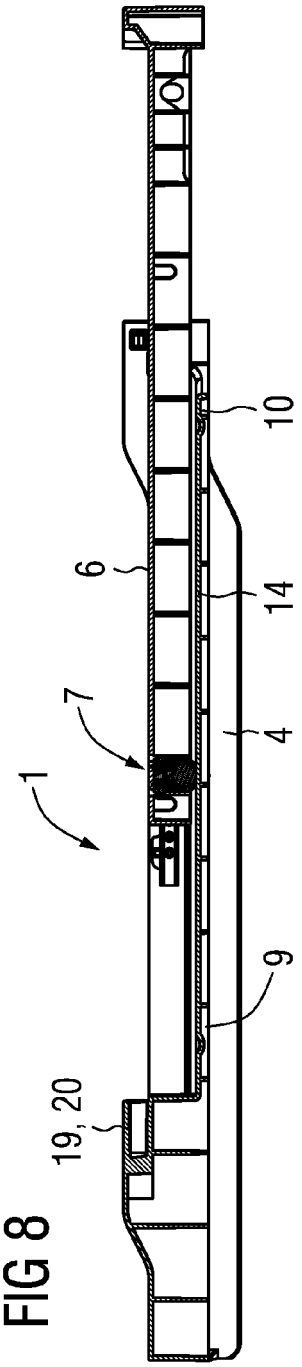


FIG 8

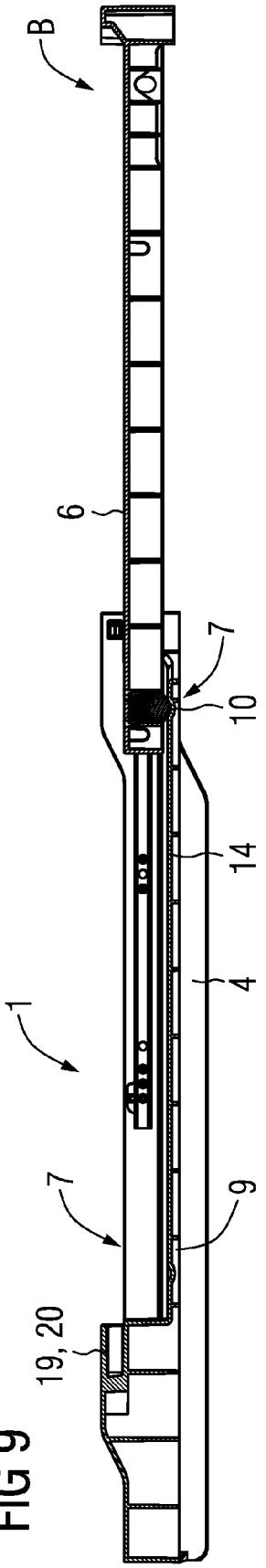
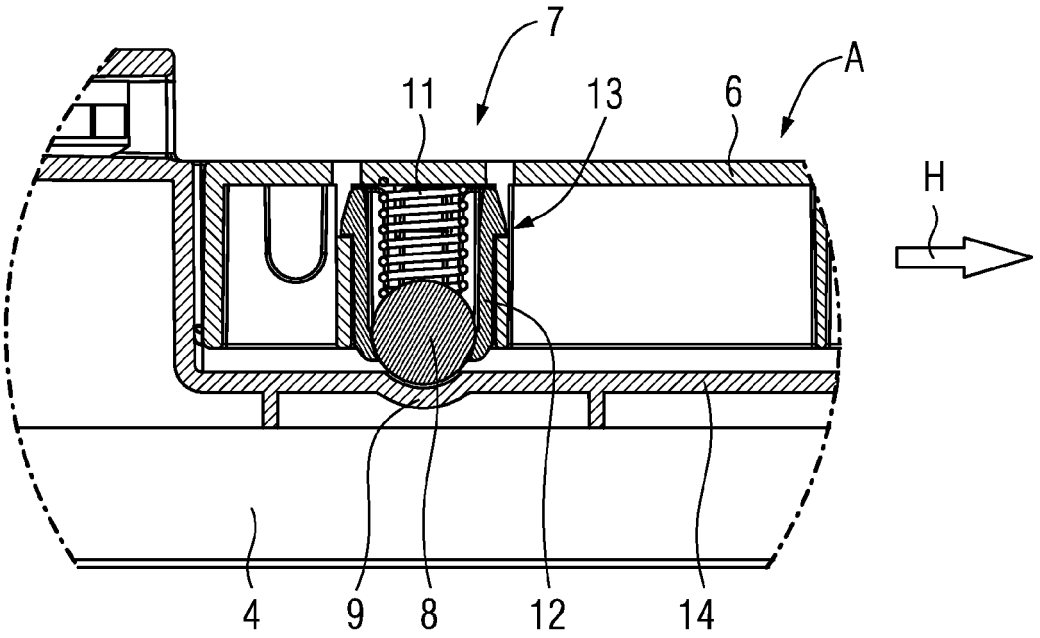


FIG 9

FIG 10



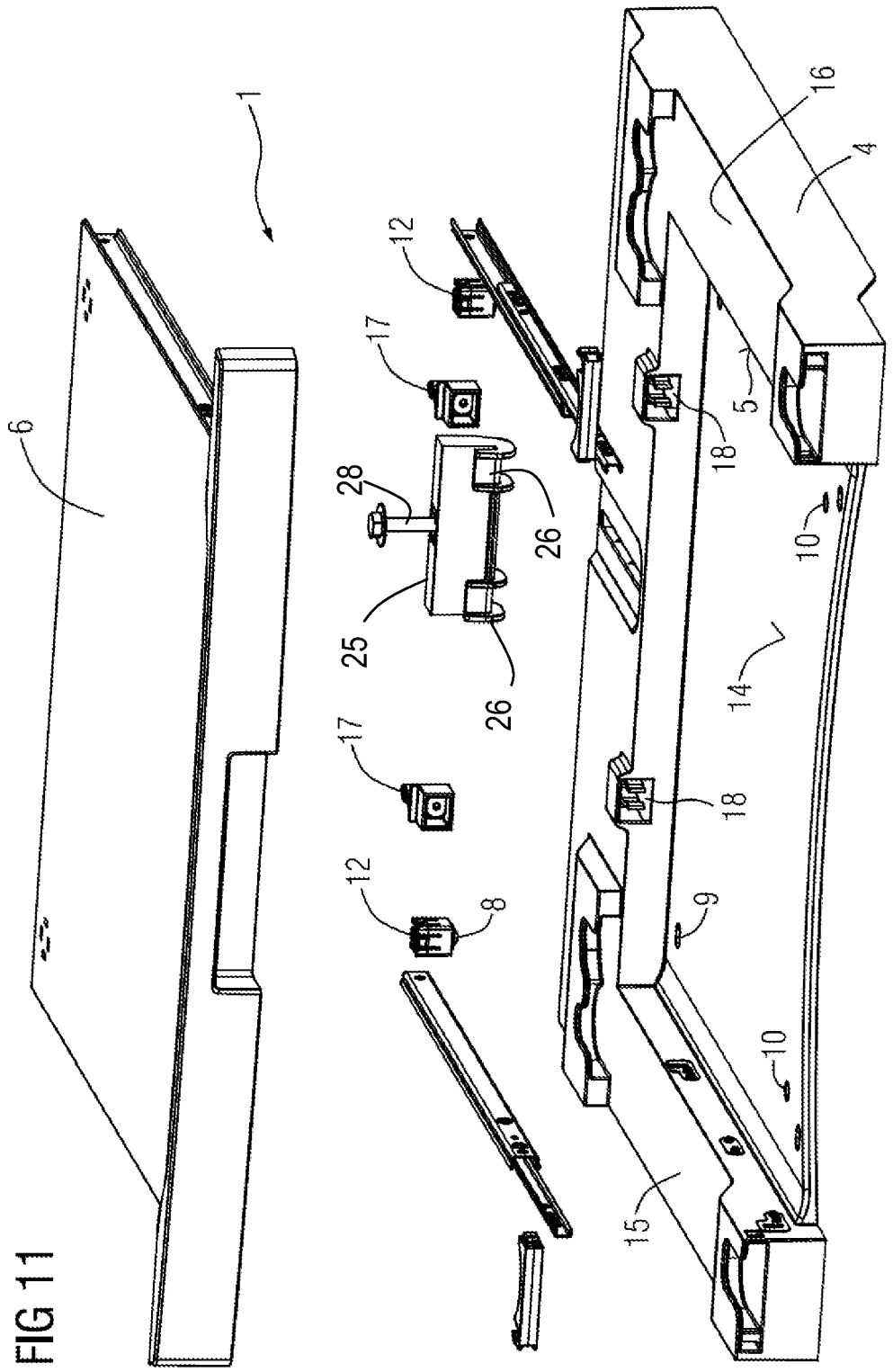


FIG 11

FIG 13

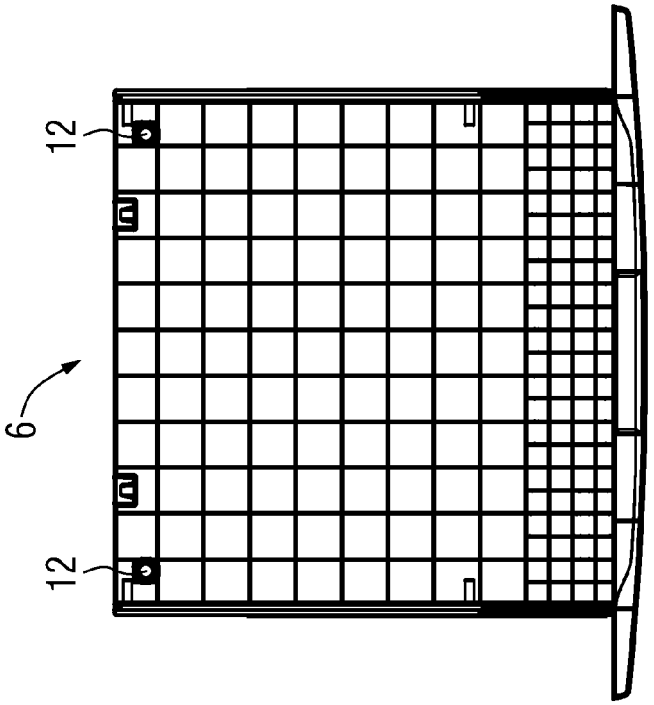
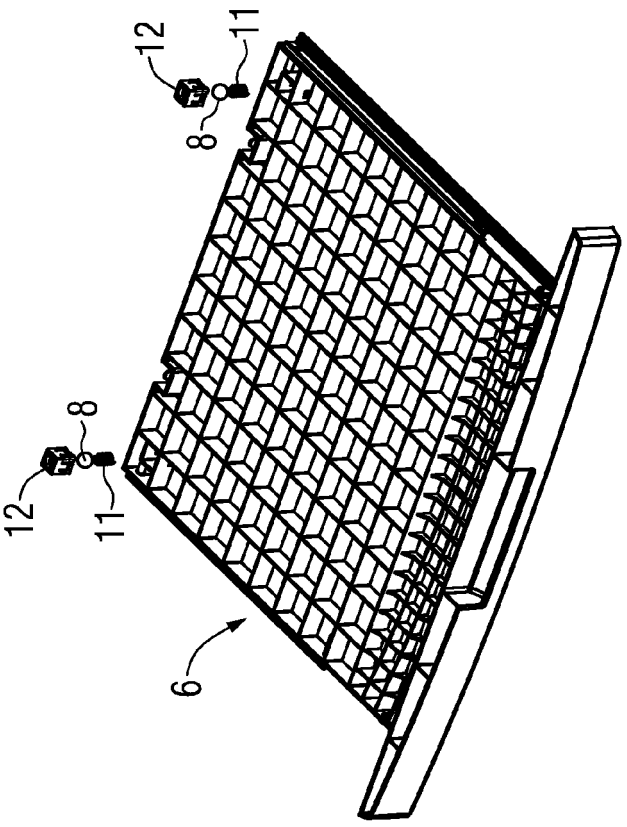


FIG 12



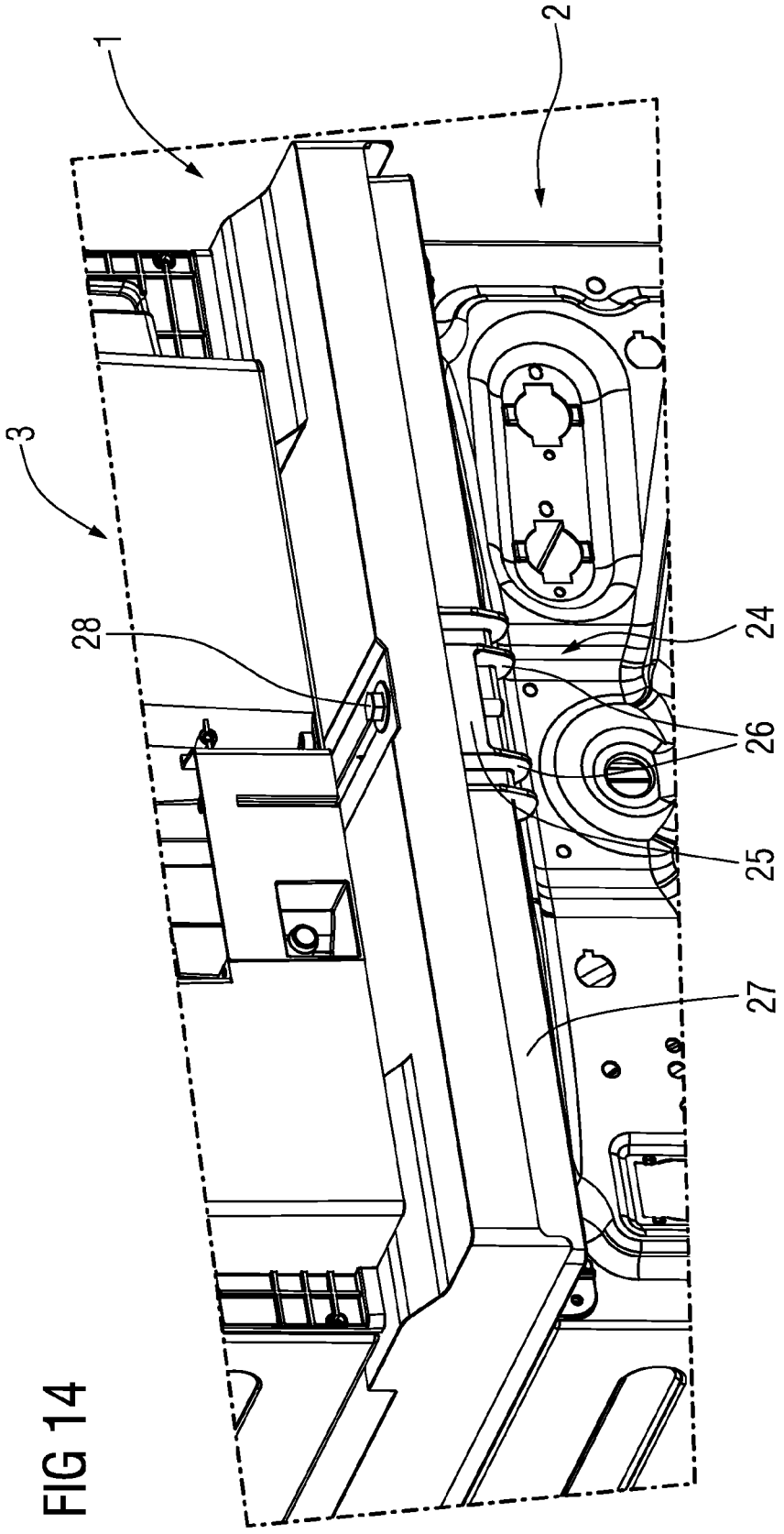


FIG 14

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EUROPEAN SEARCH REPORT

Application Number
EP 10 18 6422

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 2 841 719 Y (HAIER GROUP CO [CN]) 29 November 2006 (2006-11-29) * Computer translation from SIPOfigures 1-6 *	1-15	INV. D06F29/00 D06F39/12 D06F95/00
X	SI 20 301 A2 (MIHIC JANEZ [SI]) 31 December 2000 (2000-12-31) * Translation of abstractfigures 1-5 *	1-5	
X	FR 2 171 084 A1 (SIEMENS ELEKTROGERAETE GMBH [DE]) 21 September 1973 (1973-09-21) * page 3, line 22 - line 27; figure 2 *	1-4,12, 14,15	
X	DE 198 32 675 A1 (AEG HAUSGERAETE GMBH [DE]) 27 January 2000 (2000-01-27) * column 1 - column 2; figure 1 *	1-4,12	
A	DE 197 16 825 A1 (WOLKE BERNHARD [DE]) 9 April 1998 (1998-04-09) * the whole document *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC) D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 March 2011	Richmond, Sarah

CATEGORY OF CITED DOCUMENTS

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D : document cited in the application
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& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 18 6422

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22-03-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 2841719 Y	29-11-2006	NONE	
SI 20301 A2	31-12-2000	NONE	
FR 2171084 A1	21-09-1973	DE 2206039 A1 IT 972624 B	16-08-1973 31-05-1974
DE 19832675 A1	27-01-2000	NONE	
DE 19716825 A1	09-04-1998	NONE	

EPO FORM P0459

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

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Patent documents cited in the description

- DE 102005026134 A1 **[0002]**