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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), wherein the frame element (4) comprises two receptions (5, 6) for a foot (7) arranged at a stem (8) of the second appliance (3), wherein those receptions (5, 6) are arranged in a front region (9) of the frame element (4), wherein the frame element (4) comprises two receptions (10, 11) for a foot (7) arranged at a stem (8) of the second appliance (3), wherein those receptions (10, 11) are arranged in a rear region (12) of the frame element (4), wherein each reception (5, 6, 10, 11) has a carrier surface (13) for the foot (7) which is limited by side walls (14) and an upper wall (15) having at least one recess (16) for the passage of the stem (8) of the foot (7). To allow a secure connection between two appliances with different depth, the invention is characterized in that the device comprises two adapter elements (17), wherein each adapter element (17) comprises a reception (18) for the foot (7) arranged at the stem (8), wherein the reception (18) has an upper wall (19) having at least one recess (20) for the passage of the stem (8) of the foot (7), wherein the recess (20) is arranged at a front end (21) of the adapter element (17), wherein the adapter element (17) is designed to fit into a reception (10, 11) in the rear region (12) of the frame element (4) with a rear end (22).

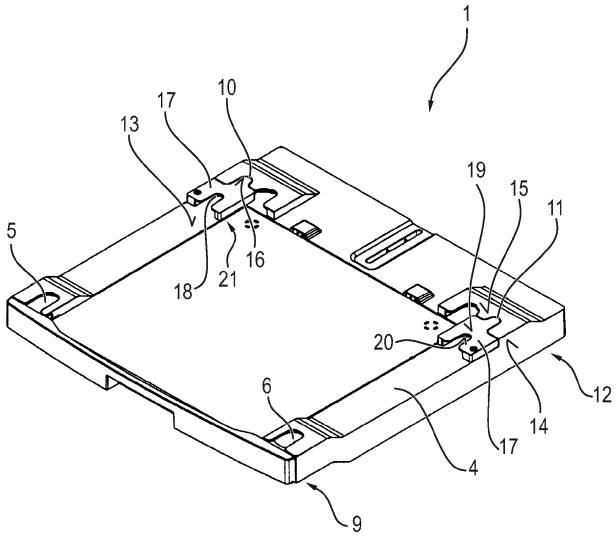

FIG. 6

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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, wherein the frame element comprises two receptions for a foot arranged at a stem of the second appliance, wherein those receptions are arranged in a front region of the frame element, wherein the frame element comprises two receptions for a foot arranged at a stem of the second appliance, wherein those receptions are arranged in a rear region of the frame element, wherein each reception has a carrier surface for the foot which is limited by side walls and an upper wall having at least one recess for the passage of the stem of the foot.

[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 EP 2 436 819 A1. Here, the connection device comprises receptions for the feet of the upper appliance, wherein the feet are arranged at respective stems. The receptions have 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 necessary position for the respective upper appliance which has to be arranged onto the lower appliance.

[0003] A similar solution is described in DE 10 2005 026 134 A1. Also here, a frame element is used which has four receptions at defined locations to take the four feet of the upper appliance which are arranged at their stems.

[0004] In DE 38 27 790 A1 a design is shown where separate receptions are fixed by screws on the top plate of the lower appliance, so that the upper appliance can be securely fixed on the first appliance.

[0005] Problems occur if an appliance, e. g. a dryer, has to be arranged and fixed on another appliance, e. g. a washing machine, and when the depth of the two appliances are not identical. In this case the upper appliance is too short to fit into the rear receptions with its rear feet.

[0006] In DE 38 27 790 A1 it would be possible to relocate the fixed receptions to that location where all four feet can securely be taken. But in this case an unpleasant appearance remains due to the worktop with the unused drilling holes.

[0007] Thus, it is an object of the invention to propose a solution for a connection device of the kind mentioned above which allows a secure and easy arrangement of a second appliance onto a first appliance even when the upper appliance has a smaller depth than the lower appliance.

[0008] The solution of this object is characterized in that the device comprises two adapter elements, wherein each adapter element comprises a reception for the foot arranged at the stem, wherein the reception has an upper wall having at least one recess for the passage of the stem of the foot, wherein the recess is arranged at a front end of the adapter element, wherein the adapter element is designed to fit into a reception in the rear region of the frame element with its rear end.

[0009] The adapter element is preferably formed in its rear end to form-fit into the reception in the rear region of the frame element.

[0010] The recess in the upper wall of the reception of the adapter element can have a circular shape in a top plan view.

[0011] At least one of the recesses of the receptions in the rear region of the frame element has - according to a special embodiment of the invention - two adjacent sections, each forming a housing or a dead stop for the stem of the second appliance. In this case the adapter element can be shaped to fit into both of the adjacent sections of the recess.

[0012] Furthermore, connection means can be arranged to connect the adapter element with the frame element in its mounted state. The connection means are preferably screws.

[0013] The adapter element can be made from plastic material. Preferably, the adapter element is an injection moulded part.

[0014] The frame element can have two side regions, wherein the receptions are arranged in the side regions of the frame element.

[0015] The frame element can also have a receiving space for a panel element.

[0016] The device can comprise fixation means for the fixation of the device on the top side of the first appliance. Those fixation means can comprise 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. The holding element is connected with the frame element by means of a screw connection. In this connection reference is made to EP 2 436 819 A1 of the applicant where details of this embodiment are shown.

[0017] According to a further aspect of the invention the device comprises at least two sets of two adapter elements, wherein the longitudinal extension of the adapter elements in the direction of the depth of the appliances is different for each set of adapter elements. In this case a second appliance with different depths can be securely arranged on the first appliance.

[0018] Thus, the proposed concept is basing on the idea that two adapters are inserted into a connection device as pre-known e. g. from EP 2 436 819 A1 from the applicant in order to allow a user to stack a second appliance, specifically a dryer, having a smaller depth dimension onto a first appliance, specifically a washing machine, which has ordinary (standard) dimensions (standard depth: normally about 60 cm).

[0019] Due to the provision of the two adapters according to the invention the same connection device for stacking a second appliance can be used, without adapters,

when the two appliances have the same depth (ordinary depth dimensions) and with adapters, in case the second appliance has a lower depth than the first appliance. This allows to provide a single connection device for being used for stacking a very wide range of appliances models.

[0020] The adapters are simply inserted into the recesses provided in the connection device (stacking kit) for receiving a resting foot of the second appliance having the same depth of the first appliance. The adapters itself are provided with a recess to receive the foot of the upper appliance with the smaller depth.

[0021] A screw may further fix each adapter onto the connection device (stacking kit) after the adapter has been inserted into the stacking kit recess.

[0022] Beneficially, as a basis equipment a connection device can be employed as known from EP 2 436 819 A1 from the applicant. Only the two adapter elements are required in addition to be able to connect a smaller second appliance on the first appliance in a secure manner and with a pleasant appearance.

[0023] In the drawings an embodiment of the invention is depicted.

Fig. 1 shows a perspective view of a first appliance being a washing machine and a second appliance being a dryer having the same depth, which are connected by a device,

Fig. 2 shows a perspective view of the first appliance and the second appliance having different depths, which are connected by a device,

Fig. 3 shows the arrangement according to Fig. 1 in an exploded view, wherein a connection device according the state of the art is employed for connecting the two appliances,

Fig. 4 shows the arrangement according to Fig. 2 in an exploded view, wherein a connection device according to the invention is employed for connecting the two appliances,

Fig. 5 shows a perspective view of the connection device in a pre-mounted state, and

Fig. 6 shows a perspective view of the connection device in the assembled state.

[0024] In Fig. 1 a first appliance 2, which is a washing machine in the present embodiment, and a second appliance 3, which is a dryer in the present case, are shown. The second appliance 3, i. e. the dryer, has to be arranged onto the first appliance 2 in a stable manner. For doing so, a device 1 for connecting is employed.

[0025] The upper appliance, i. e. the second appliance 3, has four feet (schematically shown in Fig. 5 with reference numeral 7) which are arranged at stems (see reference numeral 8 in Fig. 5) which often are designed as a threaded rod.

[0026] In Fig. 1 is can be seen that both appliances 2 and 3 have the same depth Do. This is normally a depth of about 60 cm. As can be seen in Fig. 2 in some cases a second appliance 3 has to be arranged on the first appliance 2, which has a smaller depth D_1.

[0027] When the depth of both appliances 2, 3 are identical (D_0) a device 1 for connection can be employed as it is well known in the art. Reference is made to EP 2 436 819 A1 of the applicant where such a device is shown in detail. The mentioned document is incorporated by reference into this application.

[0028] Such a pre-known solution is shown in Fig. 3.

[0029] The device 1 has a frame element 4. The frame element 4 has a substantial U-shaped form. So, a receiving space is formed for a panel element 25. The device 1 has four receptions 5, 6, 10, 11, i. e. two receptions 5, 6 for the front feet 7 of the second appliance 3 and two receptions 10, 11 for the rear feet 7 of the second appliance 3. Thus, the front receptions 5, 6 are arranged in a front region 9 of the device 1, the receptions 10, 11 are arranged in a rear region 12 of the device 1. All receptions 5, 6, 10, 11 are arranged in side regions 23 and 24 of the frame element 4 and the device 1 respectively.

[0030] When to upper appliance 3 is smaller in its depth than the lower appliance 2, the pre-known connection device 1 is not suitable as the rear feet 7 of the upper appliance 3 are not at the right position in relation to the connection device 1 to be received by the rear receptions.

[0031] Thus, in this case the same device 1 is employed as shown in Fig. 3 but with adapter elements 17 as shown in Fig. 4.

[0032] As can be seen from the detailed depiction according to Fig. 5 and Fig. 6 each reception 5, 6, 10, 11 has a carrier surface 13 which is basically formed by the upper surface of the frame element 4. The reception 5, 6, 10, 11 is formed by side walls 14 and upper walls 15 to form a reception chamber. To allow a foot 7 with its stem 8 to be pushed into the reception, the upper wall 15 has a recess 16.

[0033] The adaptor element 17 has a front end 21 and a rear end 22. The rear end 22 is formed in such a manner that it form-fits into the respective reception 10 and 11 as can be seen in the synopsis of Fig. 5 and Fig. 6. In Fig. 5 the adapter element 17 is shown before it is pushed into the reception 10, 11. In Fig. 6 it can be seen that the adapter element 17 is fully pushed into the reception 10, 11.

[0034] For receiving the foot 7 of the upper appliance 3 the adapter element 17 has a design in its front end 21 similar to the reception 10, 11. Thus, the reception 18 of the adapter element 17 is formed by an upper wall 19 in which a recess 20 is provided. Side walls delimit the containing chamber of the reception 18.

[0035] Consequently, a secure connection between the two appliances 2, 3 is established even in the case that the two appliances have different depths D_1 and D_2.

[0036] When a connection device 1 is provided with

more than one pair of adapter elements 17 it becomes possible to use adapter elements 17 of different length for arranging a second appliance 3 onto the first appliance 2, wherein the adapter elements 17 are chosen according to the actual depth of the upper appliance.

Reference Numerals

[0037]

1	Device for connecting
2	First appliance (washing machine)
3	Second appliance (dryer)
4	Frame element
5	Reception
6	Reception
7	Foot
8	Stem
9	Front region
10	Reception
11	Reception
12	Rear region
13	Carrier surface
14	Side wall
15	Upper wall
16	Recess
17	Adapter element
18	Reception
19	Upper wall
20	Recess
21	Front end
22	Rear end
23	Side region
24	Side region
25	Panel element
D_0	Depth (regular depth)
D_1	Depth (reduced depth)

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),
wherein the frame element (4) comprises two receptions (5, 6) for a foot (7) arranged at a stem (8) of the second appliance (3), wherein those receptions (5, 6) are arranged in a front region (9) of the frame element (4),
wherein the frame element (4) comprises two receptions (10, 11) for a foot (7) arranged at a stem (8) of the second appliance (3), wherein those receptions (10, 11) are arranged in a rear region (12) of the frame element (4),
wherein each reception (5, 6, 10, 11) has a carrier surface (13) for the foot (7) which is limited by side walls (14) and an upper wall (15) having at least one recess (16) for the passage of the stem (8) of the foot (7),
characterized in that
the device comprises at least two adapter elements (17), wherein each adapter element (17) comprises a reception (18) for the foot (7) arranged at the stem (8), wherein the reception (18) has an upper wall (19) having at least one recess (20) for the passage of the stem (8) of the foot (7), wherein the recess (20) is arranged at a front end (21) of the adapter element (17), wherein the adapter element (17) is designed to fit into a reception (10, 11) in the rear region (12) of the frame element (4) with a rear end (22).

2. Device according to claim 1, **characterized in that** the adapter element (17) is formed in its rear end (22) to form-fit into the reception (10, 11) in the rear region (12) of the frame element (4).

3. Device according to claim 1 or 2, **characterized in that** the recess (20) in the upper wall (19) of the reception (18) of the adapter element (17) has a circular shape in a top plan view.

4. Device according to one of claims 1 to 3, **characterized in that** at least one of the recesses (16) of the receptions (10, 11) in the rear region (12) of the frame element (4) has two adjacent sections, each forming a housing or a dead stop for the stem (8) of the second appliance (3).

5. Device according to claim 4, **characterized in that** the adapter element (17) is shaped to fit into both of the adjacent sections of the recess (16).

6. Device according to one of claims 1 to 5, **characterized in that** connection means are arranged to connect the adapter element (17) with the frame element (4).

7. Device according to claim 6, **characterized in that** the connection means are screws.

8. Device according to one of claims 1 to 7, **characterized in that** the adapter element (17) is made from plastic material.

9. Device according to claim 8, **characterized in that** the adapter element (17) is an injection moulded part.

10. Device according to one of claims 1 to 9, **characterized in that** the frame element (4) has two side regions (23, 24), wherein the receptions (5, 6, 10, 11) are arranged in the side regions (23, 24) of the frame

element (4).

11. Device according to one of claims 1 to 10, **characterized in that** the frame element (4) has a receiving space for a panel element (25).

12. Device according to one of claims 1 to 11, **characterized in that** is comprises fixation means for the fixation of the device (1) on the top side of the first appliance (2).

13. Device according to claim 12, **characterized in that** the fixation means comprise 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 (2).

14. Device according to claim 12 or 13, **characterized in that** the holding element is connected with the frame element (4) by means of a screw connection.

15. Device according to one of claims 1 to 14, **characterized in that** is comprises at least two sets of two adaptor elements (17), wherein the longitudinal extension of the adapter elements (17) in the direction of the depth of the appliances (2, 3) is different for each set of adapter elements (17).

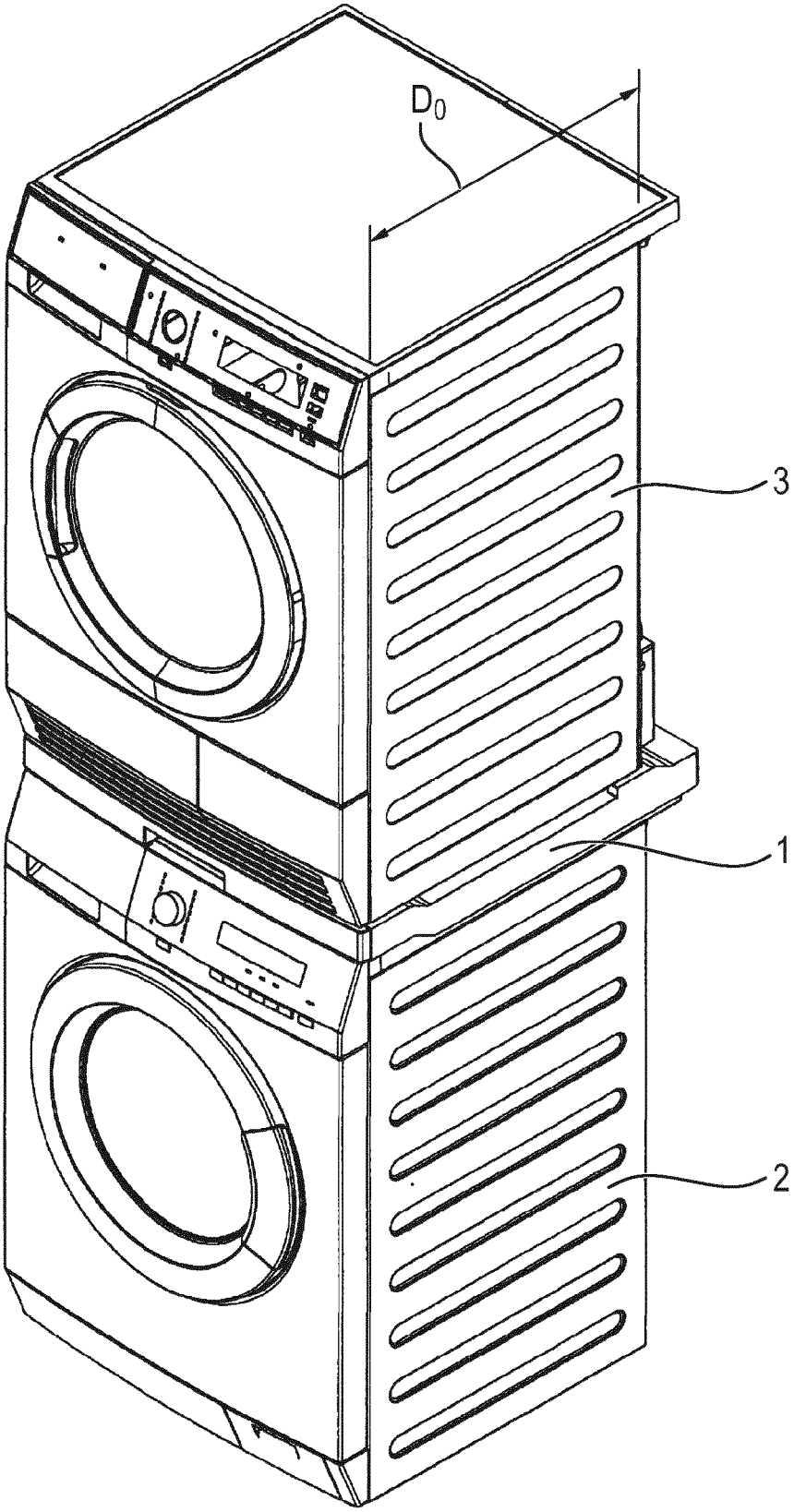

FIG. 1

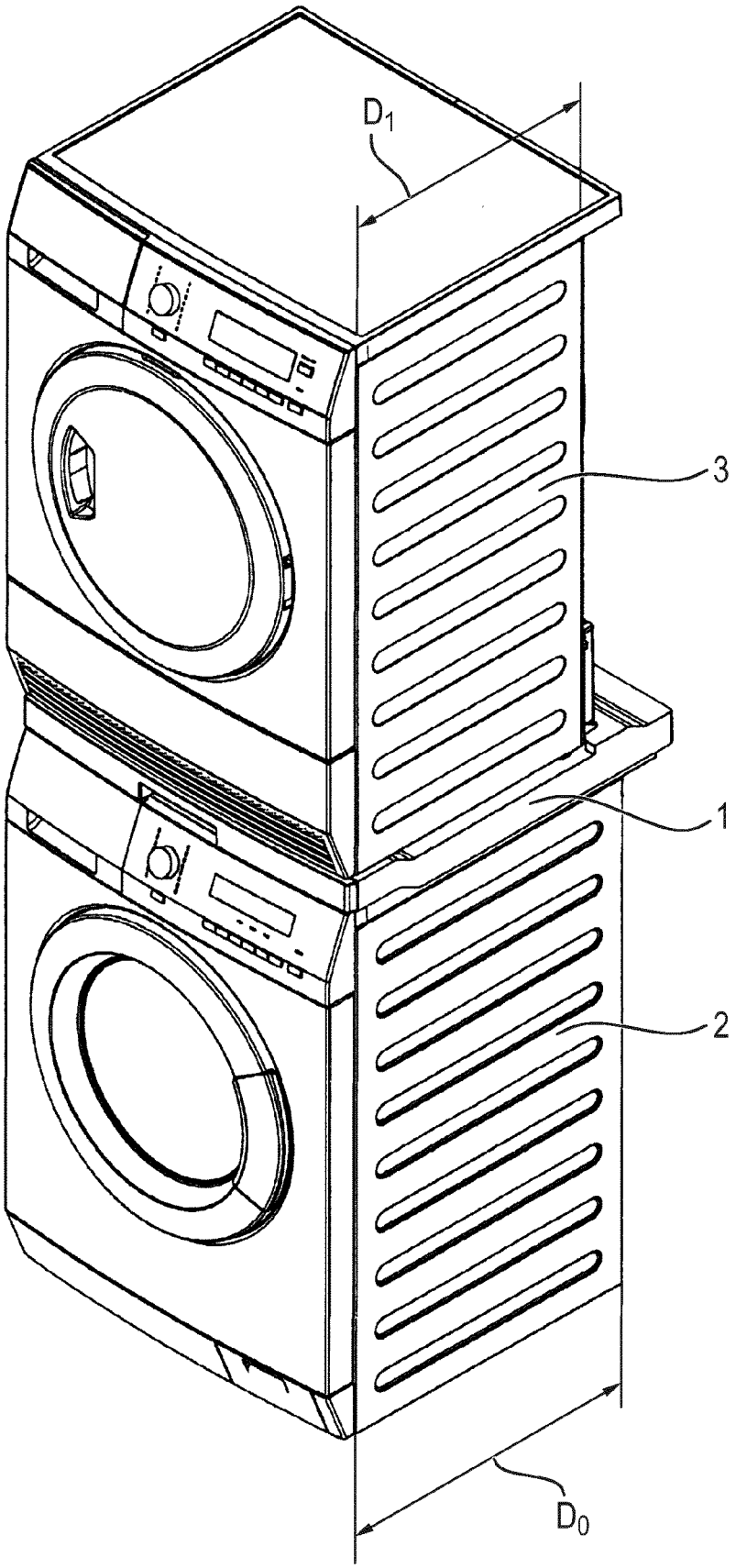

FIG. 2

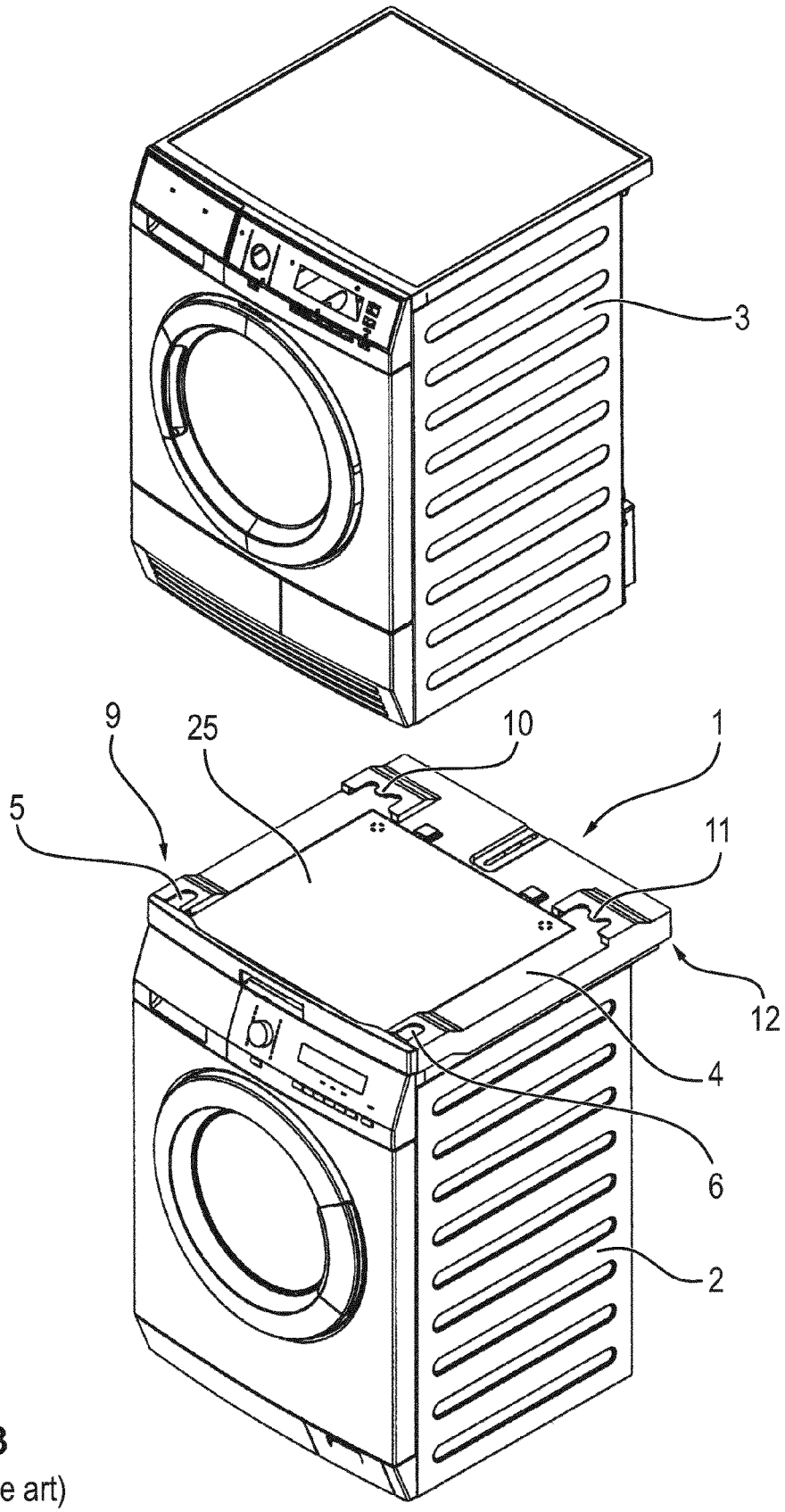

FIG. 3
(State of the art)

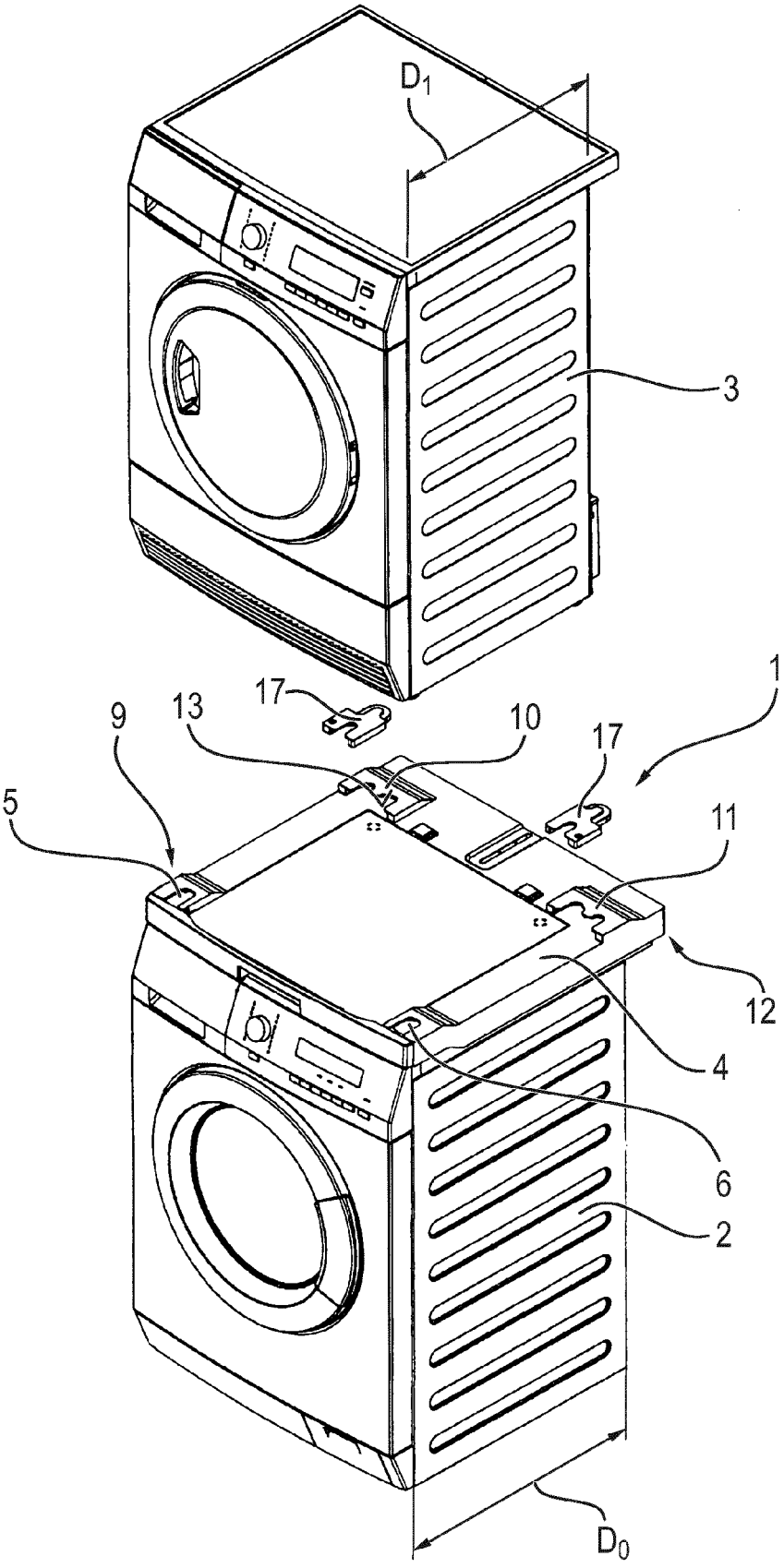

FIG. 4

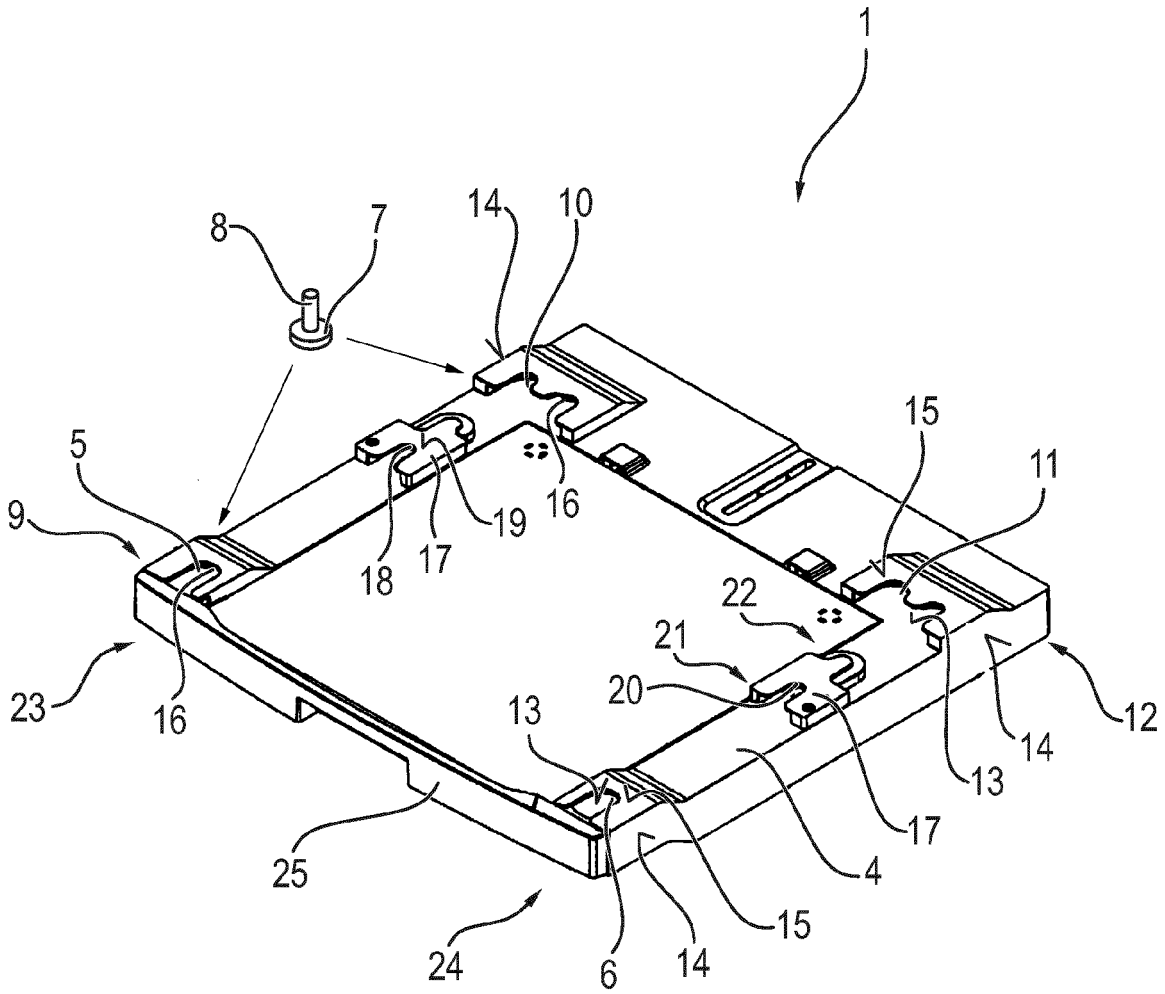
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FIG. 5

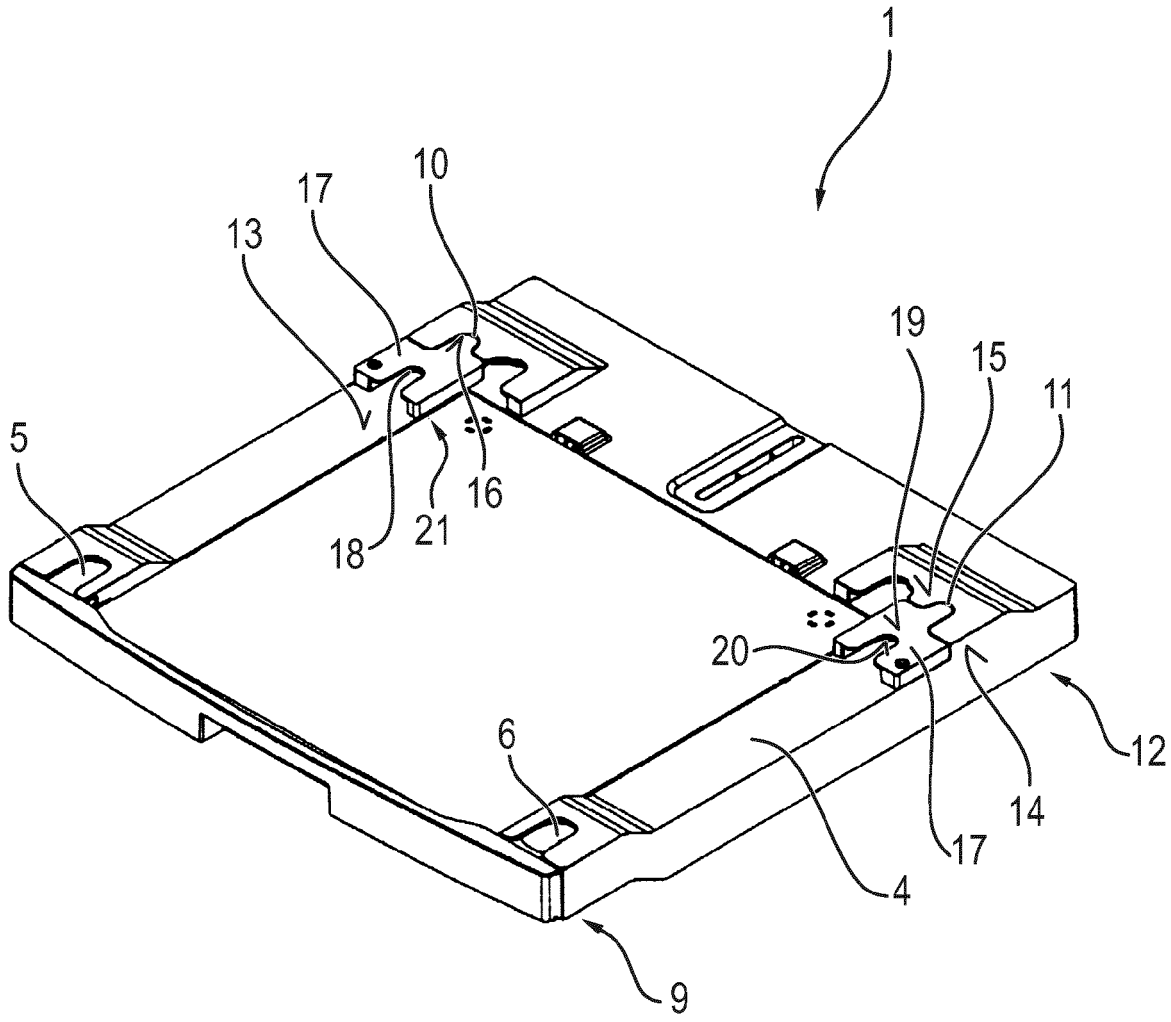

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 12 18 2518

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,D	EP 2 436 819 A1 (ELECTROLUX HOME PROD CORP [BE]) 4 April 2012 (2012-04-04) * the whole document *	1-15	INV. D06F29/00 D06F39/12
A,D	DE 38 27 790 A1 (BOSCH SIEMENS HAUSGERAETE [DE]) 22 February 1990 (1990-02-22) * the whole document *	1-15	
A,D	DE 10 2005 026134 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 7 December 2006 (2006-12-07) * the whole document *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

D06F
H05K
H02B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 January 2013	Prosig, Christina

CATEGORY OF CITED DOCUMENTS

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29-01-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2436819 A1	04-04-2012	NONE	
DE 3827790 A1	22-02-1990	DE 3827790 A1	22-02-1990
		ES 2014377 A6	01-07-1990
		GB 2221970 A	21-02-1990
		IT 1230803 B	29-10-1991
DE 102005026134 A1	07-12-2006	NONE	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 2436819 A1 **[0002] [0016] [0018] [0022] [0027]**
- DE 102005026134 A1 **[0003]**
- DE 3827790 A1 **[0004] [0006]**