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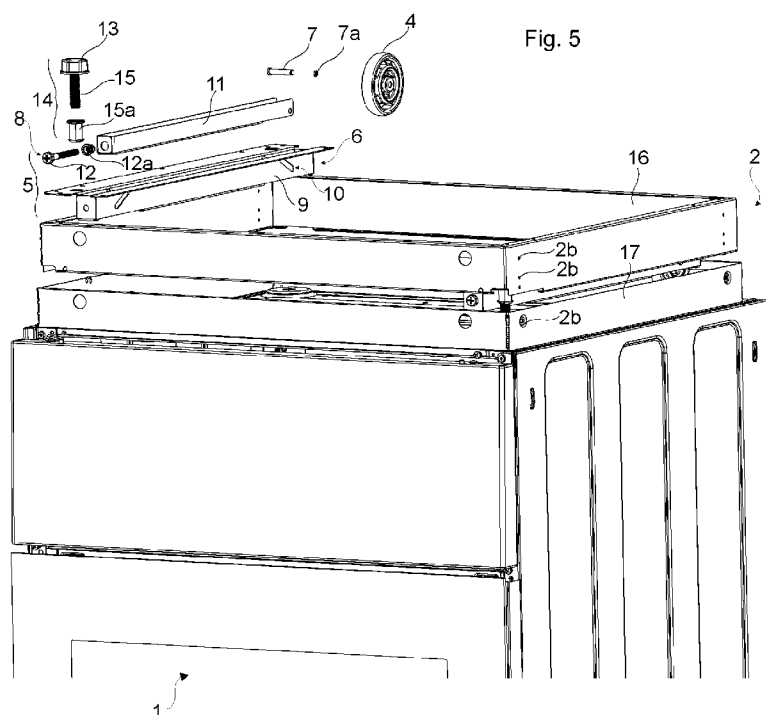
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(54) Title: HOUSEHOLD APPLIANCE WITH IMPROVED HEIGHT-ADJUSTMENT AND INSTALLATION



(57) Abstract: The present invention relates to a household appliance (1) comprising: a base and a height-adjustment means (3) for adjusting the height of the base (2).



Description**HOUSEHOLD APPLIANCE WITH IMPROVED HEIGHT-ADJUSTMENT AND INSTALLATION**

- [0001] The present invention relates to a household appliance, in particular to a free-standing type oven. The present invention more particularly relates to the height-adjustment means of the household appliance.
- [0002] Household appliances such as ovens are commonly known in the art. An oven is commonly provided as free-standing type oven or a built-in type oven. In either cases, the oven generally comprises: a base; four height-adjustable feet which are disposed into the base and adapted to support the base over the ground; and a height adjustment means for separately adjusting the height of the height-adjustable feet respectively. The kitchen floor and the kitchen counter are often irregular. During the installation of the free-standing type oven, the service person must adjust the height of each height-adjustable feet in order to compensate for the irregularities in the floor and the kitchen counter. Thereby, the cooking top of the freestanding type oven can be correctly aligned with surface of the kitchen counter. Thereby also the free-standing type oven gains a secure stand. The same also applies to a built-in type oven.
- [0003] US 2011/0148259A1 discloses a household appliance which has a height-adjustment means.
- [0004] A problem with the prior art oven is that installation of the oven is generally a time consuming task and also a complicated task for the service person.
- [0005] An objective of the present invention is to provide a household appliance which overcomes the aforementioned problems of the prior art in a cost-effective way and which enables an improved height-adjustment and an improved installation.
- [0006] This objective has been achieved by the household appliance as defined in claim 1. Further achievements have been attained by the subject-matters respectively defined in the dependent claims.
- [0007] The household appliance of the present invention further comprising: one or more height-adjustable wheels which are disposed into the rear part of the base, and adapted to move the base at least along its front-rear

direction over the ground, wherein the height-adjustment means comprises one or more rear height-adjustment mechanisms which are adapted to separately adjust the height of the height-adjustable wheels in the rear part of the base respectively.

- [0008] A major advantageous effect of the present invention is that the household appliance can be easily and precisely installed into its place by virtue of the height-adjustable wheels even when the kitchen floor and the kitchen counter have irregularities. Another major advantageous effect of the present invention is that the service person can save time, and thus the installation and maintenance costs can be reduced. Thereby, the user satisfaction can be further increased.
- [0009] In an embodiment, the rear height-adjustment mechanisms are accessible from the front part of the base. This embodiment is particularly advantageous as the service person can adjust the height of the height-adjustable wheels from the front part of the base after the household appliance has been rolled into its place in the kitchen counter. Thereby, the installation and the height adjustment can be easily and quickly performed by the service person.
- [0010] In another embodiment, one or more height-adjustable feet are disposed into the front part of the base so as to support the base over the ground. When installing the household appliance, the service person slightly lifts the front part of the base, and rolls the household appliance into its place in the kitchen counter. This embodiment is particularly advantageous as the height-adjustable-feet give a secure stand to the household appliance.
- [0011] In another embodiment, the base has a lower base member and an upper base member which can be detachably attached to each other at one or more different relative positions separated in the height direction. This embodiment is particularly advantageous as the height-adjustment can be more flexibly performed.
- [0012] In other alternative embodiments, the household appliance is provided as a free-standing type or built-in type household appliance.
- [0013] In other alternative embodiments, the household appliance is provided as an oven, a refrigerator, a dishwasher, a laundry washer, a laundry dryer or

the like.

[0014] Additional features and additional advantageous effects of the household appliance of the present invention will become more apparent with the detailed description of the embodiments with reference to the accompanying drawings in which:

[0015] Figure 1 – is a schematic perspective view of a household appliance, in particular a free-standing type oven according to an embodiment of the present invention;

[0016] Figure 2 – is a schematic perspective bottom view of the free-standing type oven of Fig.1;

[0017] Figure 3 – is a schematic partial perspective enlarged bottom view of the free-standing type oven of Fig.1;

[0018] Figure 4 – is another schematic partial perspective enlarged bottom view of the free-standing type oven of Fig.1;

[0019] Figure 5 – is a schematic partial perspective exploded bottom view of the free-standing type oven of Fig.1;

[0020] Figure 6 – is a schematic partial perspective view of the height-adjustable wheel of the free-standing type oven of Fig.1.

[0021] The reference signs appearing on the drawings relate to the following technical features.

1. Household appliance

2. Base

[0022] 2a. Screw

[0023] 2b. Screw hole

3. Height-adjustment means

4. Height-adjustable wheel

5. Rear height-adjustment mechanism

6. Guide

7. Shaft

[0024] 7a. Retainer

8. Driving device

9. First bracket

10. Slanted slot

- 11. Second bracket
- 12. Adjustment screw
- [0025] 12a. First threaded rivet
- 13. Height-adjustable feet
- 14. Front height-adjustment mechanism
- 15. Threaded shank
- [0026] 15a Second threaded rivet
- 16. Lower base member
- 17. Upper base member
- [0027] The household appliance (1) comprises: a base (2); and a height-adjustment means (3) for adjusting the height of the base (2) (Fig. 1).
- [0028] The household appliance (1) of the present invention further comprises: one or more height-adjustable wheels (4) which are disposed into the rear part of the base (2), and adapted to move the base (2) at least along its front-rear direction (x) over the ground (Fig. 2 and Fig. 4). Herein, the height-adjustment means (3) comprises one or more rear height-adjustment mechanisms (5) which are adapted to separately adjust the height of the height-adjustable wheels (4) in the rear part of the base (2) respectively (Fig. 5 and Fig. 6).
- [0029] In an embodiment, the rear height-adjustment mechanisms (5) are arranged to be accessible for the height-adjustment from the front part of the base (2) respectively (Fig. 4 to Fig. 6).
- [0030] In another embodiment, the rear height-adjustment mechanism (5) comprises: a guide (6) for slidably supporting the shaft (7) of the height-adjustable wheel (4) between two different height levels (L1 and L2); and a driving device (8) for driving the shaft (7) of the height-adjustable wheel (4) along the guide (6) (Fig. 4 to Fig. 6).
- [0031] In another embodiment, the shaft (7) is secured to the height-adjustable wheel (4) through a retainer (7a) (Fig. 5).
- [0032] In another embodiment, the height levels (L1 and L2) are separated through at least 10 millimeters in the vertical direction (Fig. 4).
- [0033] In another embodiment, the guide (6) comprises a first bracket (9) which

comprises a slanted slot (10) for slidably supporting the shaft (7) of the height-adjustable wheel (4) (Fig. 5).

- [0034] In another embodiment, the driving device (8) comprises: a second bracket (11) for holding the shaft (7) of the height-adjustable wheel (4); and an adjustment screw (12) which threadably connects the second bracket (11) to the guide (6), in particular to the first bracket (9) (Fig. 5 and Fig. 6).
- [0035] In another embodiment, the adjustment screw (12) is threadably connected to the second bracket (11) through a first threaded rivet (12a) (Fig. 5).
- [0036] In another embodiment, the household appliance (1) further comprises: one or more height-adjustable feet (13) which are disposed into the front part of the base (2), and adapted to support the base (2) over the ground (Fig. 1 and Fig. 2). In this embodiment, the height adjustment means (3) comprises one or more front height-adjustment mechanisms (14) which are adapted to separately adjust the height of the height-adjustable feet (13) in the front part of the base (2) respectively (Fig. 5).
- [0037] In another embodiment, the front height-adjustment mechanism (14) comprises a threaded shank (15) which is threadably connected to the base (2) and adapted to support the height adjustable foot (13) (Fig. 5).
- [0038] In another embodiment, the threaded shank (15) is threadably connected to the base (2) through a second threaded rivet (15a) (Fig. 5).
- [0039] In another embodiment, the base (2) comprises a lower base member (16) and an upper base member (17) which can be detachably attached to each other at one or more different relative positions separated in the height direction (Fig. 5).
- [0040] In another embodiment, the lower base member (16) and the upper base member (17) are connected through one or more screws (2a) and one or more screw holes (2b) (Fig. 3).
- [0041] In another embodiment, the household appliance (1) is provided as a free-standing type household appliance (1) (Fig. 1).
- [0042] In another embodiment, the household appliance (1) is provided as a free-standing type oven (1) (Fig. 1).

[0043] A major advantageous effect of the present invention is that the household appliance (1) can be easily and precisely installed into its place through the height-adjustable wheels (4) even when the kitchen floor and the kitchen counter have irregularities. Another major advantageous effect of the present invention is that the service person can save time, and thus the installation and maintenance costs can be reduced. Thereby, the user satisfaction can be further increased.

Claims

1. A household appliance (1) comprising: a base (2); and a height-adjustment means (3) for adjusting the height of the base (2), characterized by further comprising: one or more height-adjustable wheels (4) which are disposed into the rear part of the base (2), and adapted to move the base (2) at least along its front-rear direction (x) over the ground, wherein the height-adjustment means (3) comprises one or more rear height-adjustment mechanisms (5) which are adapted to separately adjust the height of the height-adjustable wheels (4) in the rear part of the base (2) respectively.
2. The household appliance (1) according to claim 1, characterized in that the rear height-adjustment mechanisms (5) are arranged to be accessible for the height-adjustment from the front part of the base (2) respectively.
3. The household appliance (1) according to claim 1 or 2, characterized in that the rear height-adjustment mechanism (5) comprises: a guide (6) for slidably supporting the shaft (7) of the height-adjustable wheel (4) between two different height levels (L1 and L2); and a driving device (8) for driving the shaft (7) of the height-adjustable wheel (4) along the guide (6).
4. The household appliance (1) according to claim 3, characterized in that the guide (6) comprises a first bracket (9) which comprises a slanted slot (10) for slidably supporting the shaft (7) of the height-adjustable wheel (4).
5. The household appliance (1) according to claim 3 or 4, characterized in that the driving device (8) comprises: a second bracket (11) for holding the shaft (7) of the height-adjustable wheel (4); and an adjustment screw (12) which threadably connects the second bracket (11) and the guide (6).
6. The household appliance (1) according to any one of claims 1 to 5, characterized by further comprising: one or more height-adjustable feet (13) which are disposed into the front part of the base (2), and adapted to support the base (2) over the ground, wherein the height-adjustment means (3) comprises one or more front height-adjustment mechanisms (14) which are adapted to separately adjust the height of the height-adjustable feet (13) in the front part of the base (2) respectively.
7. The household appliance (1) according to claim 6, characterized in that the front height-adjustment mechanism (14) comprises a threaded shank (15)

which is threadably connected to the base (2) and adapted to support the height adjustable foot (13).

8. The household appliance (1) according to any one of claims 1 to 7, characterized in that the base (2) comprises a lower base member (16) and an upper base member (17) which can be detachably attached to each other at one or more different relative positions separated in the height direction.
9. The household appliance (1) according to any one of claims 1 to 8, characterized in that the household appliance (1) is provided as a free-standing type household appliance (1).
10. The household appliance (1) according to any one of claims 1 to 8, characterized in that the household appliance (1) is provided as built-in type household appliance (1).
11. The household appliance (1) according to any one of claims 1 to 9, characterized in that the household appliance (1) is provided as an oven (1).

Fig. 1

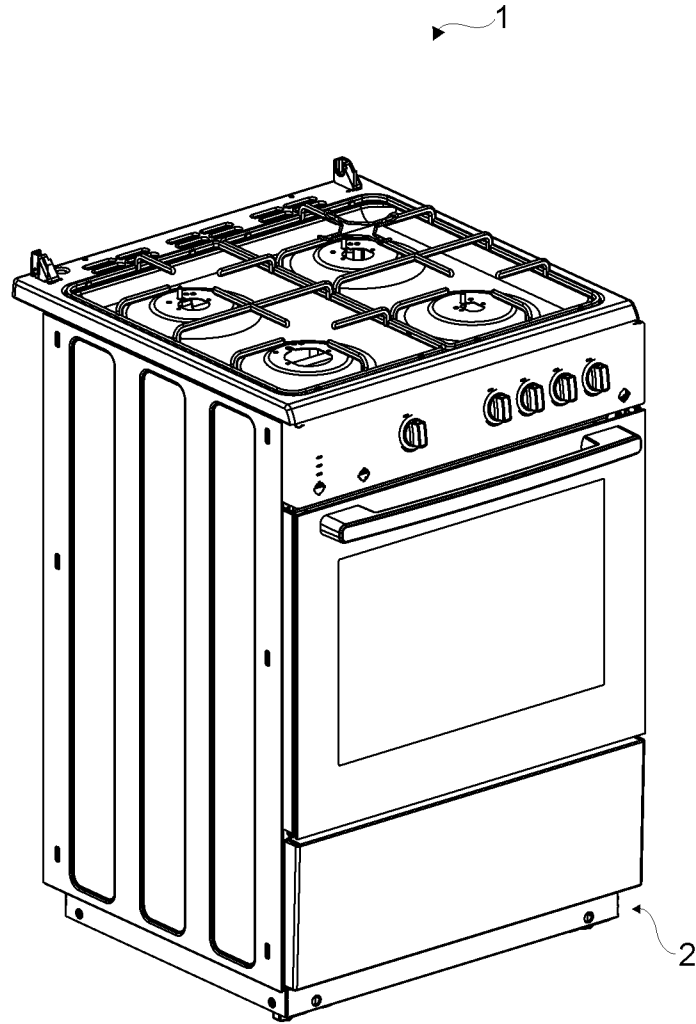


Fig. 2

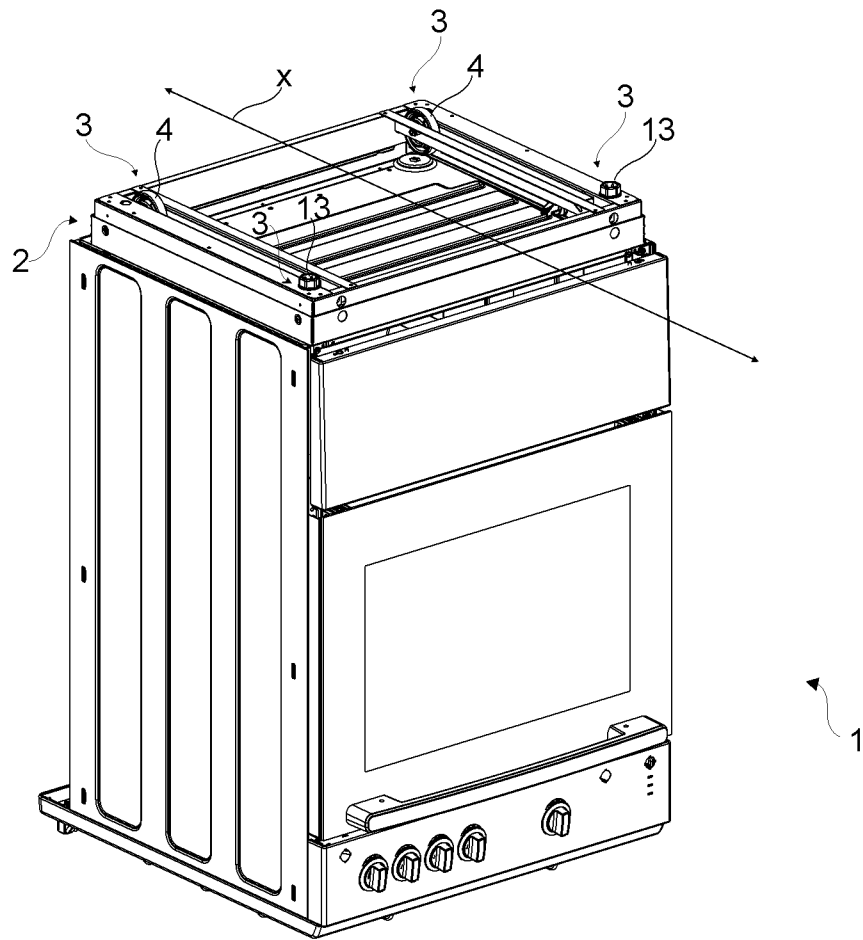


Fig. 3

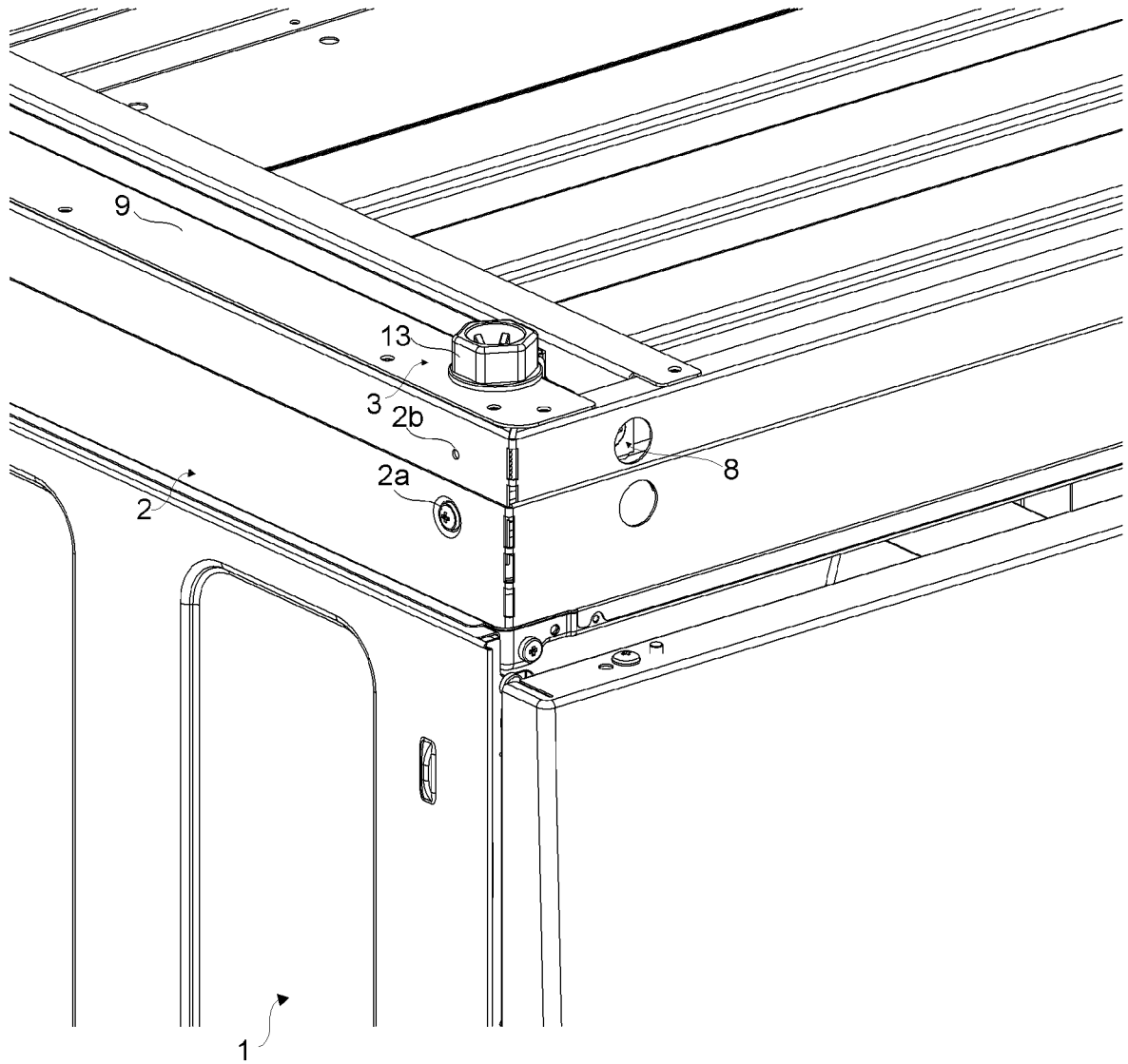


Fig. 4

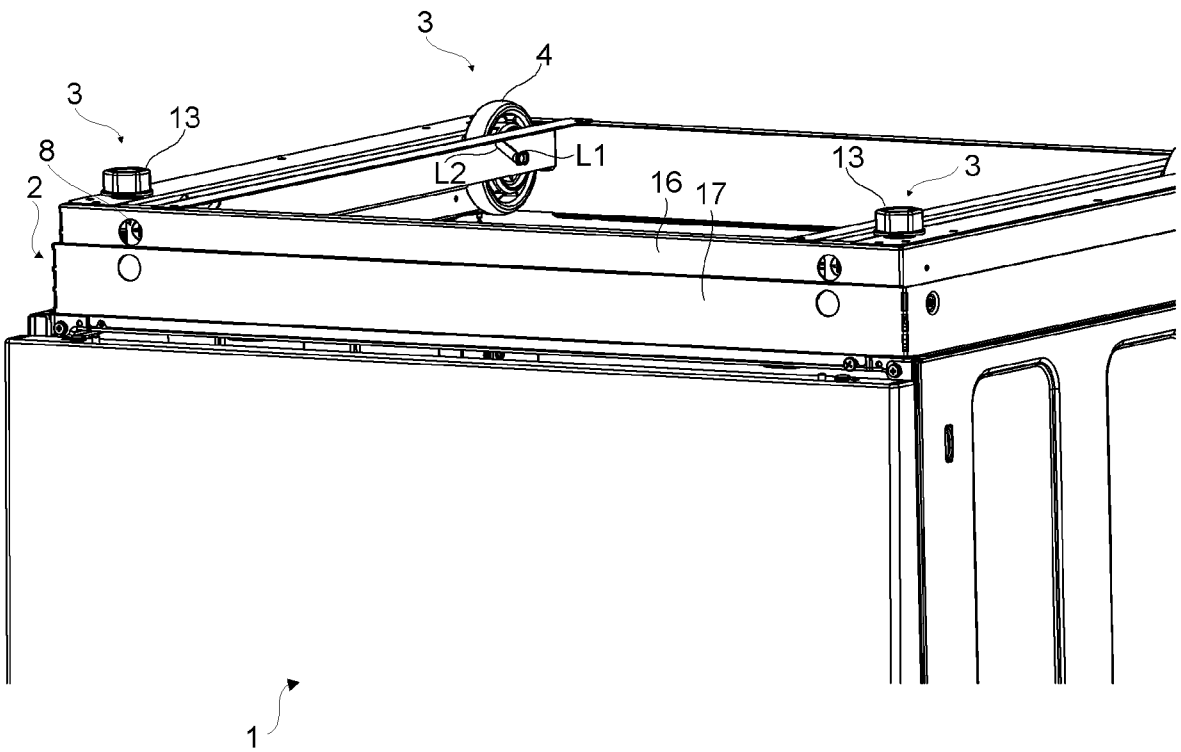


Fig. 5

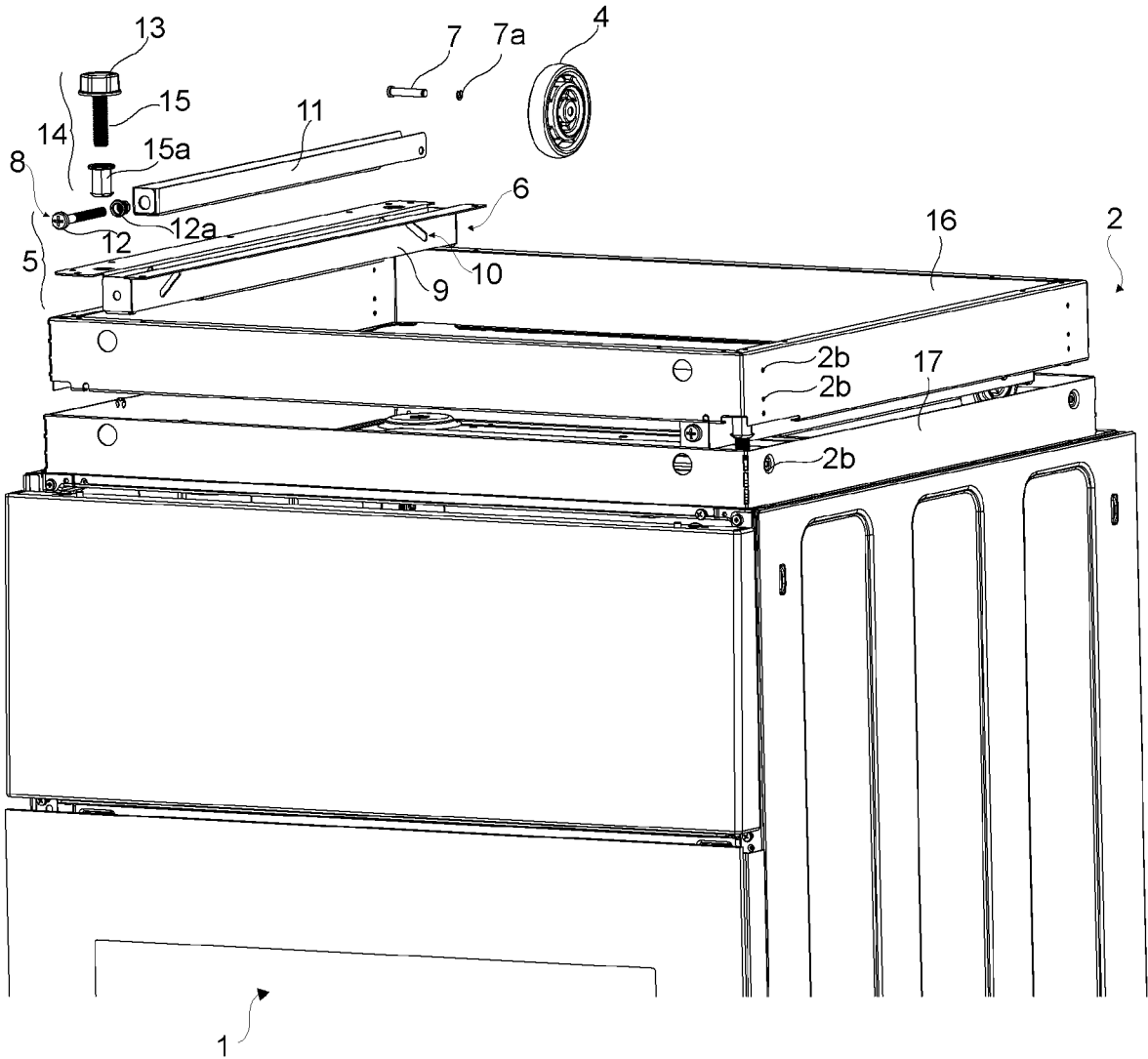
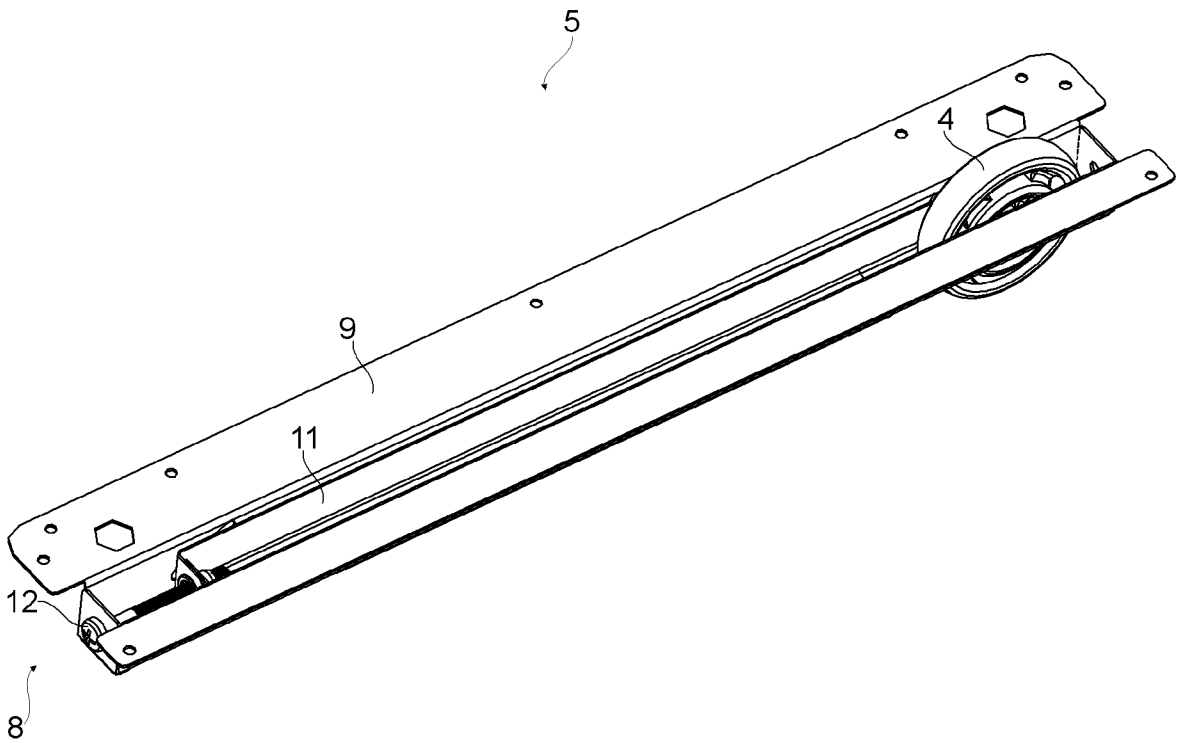


Fig. 6



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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ADD. F25D23/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F24C F25D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

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Further documents are listed in the continuation of Box C.

See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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