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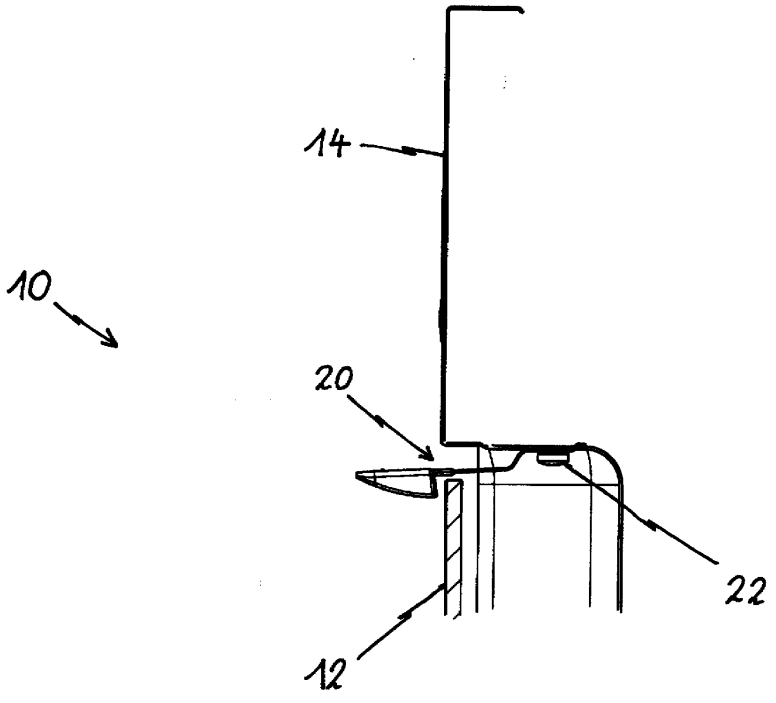
(54) LOCKING MECHANISM FOR A DOOR OF A DOMESTIC APPLIANCE

(57) The present invention relates to a locking mechanism (20) for a door (12) of a domestic appliance (10), in particular for an oven door (12) of a cooking oven (10). The locking mechanism (20) comprises a spring element (24) attachable or attached at the domestic appliance (10). The locking mechanism (20) comprises a lever element (26) attached at a distal end of said spring element (24). The lever element (26) is adapted for engaging with a section of an edge of the door (12), when said door (12) is in a closed state. The spring element (24) is bendable, so that the lever element (26) can be disengaged from the section of the edge of the door (12).

FIG 2



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Description

[0001] The present invention relates to a locking mechanism for a door of a domestic appliance, in particular of a cooking oven. Further, the present invention relates to a domestic appliance with a locking mechanism. In particular, the present invention relates to a cooking oven with a locking mechanism.

[0002] For a domestic appliance, in particular for a cooking oven, a locking mechanism is required in order to avoid that unauthorised persons can open a door of said domestic appliance by small forces. Usually, the locking mechanism is activated mechanically. When a user wants to open the door, the locking mechanism has to be deactivated by pulling or pushing with a certain force. When the user closes the door again, then the locking mechanism closes the door automatically in its closed position.

[0003] Further, there are locking mechanisms, wherein the user may decide, if said locking mechanism is used or not. If the locking mechanisms should not be used, then said locking mechanism is removed completely and the domestic appliance is without any locking mechanism. If the locking mechanism is installed and activated, then a force is defined, which has to be overcome in order to open the door.

[0004] It is an object of the present invention to provide an improved locking mechanism for a domestic appliance, which keeps the door closed by low complexity, when said door is pulled.

[0005] The object is achieved by the locking mechanism for a domestic appliance according to claim 1.

[0006] According to the present invention a locking mechanism for a door of a domestic appliance, in particular for an oven door of a cooking oven, is provided, wherein:

- the locking mechanism comprises a spring element attachable or attached at the domestic appliance,
- the locking mechanism comprises a lever element attached at a distal end of said spring element,
- the lever element is adapted for engaging with a section of an edge of the door, when said door is in a closed state, and
- the spring element is bendable, so that the lever element can be disengaged from the section of the edge of the door.

[0007] The core of the present invention is that the locking mechanism consists only of a few components. The spring element provides the spring force, while the lever element is in contact with the edge of the door on the one hand and acts as actuating element of the locking mechanism on the other hand. The spring element forms a joining element between the domestic appliance the lever element. Any further connection between the lever element and the domestic appliance is not required.

[0008] Preferably, at least one contact element is attached at the lever element, wherein said contact element is adapted for engaging with the section of the edge of the door, when said door is in the closed state.

[0009] In particular, the contact element is made of silicone. The contact element made of silicone increases the friction between the locking mechanism and the edge of the door.

[0010] Further, the spring element may be made of metal, preferably made of steel.

[0011] According to the preferred embodiment, the spring element is elongated, wherein one end is attachable or attached at the domestic appliance by a fixing element, and wherein preferably the spring element is bendable perpendicular to its longitudinal axis.

[0012] Particularly, the spring element is formed as a strip.

[0013] Moreover, the spring element may include at least one curvature.

[0014] For example, at least two curvatures form a Z-shape or S-shape structure of the spring element. The Z-shape or S-shape structure of the spring element allows an adaption to the profile of the door.

[0015] In particular, the lever element is made of plastics.

[0016] Furthermore, the lever element may be formed as a prism or as a wedge, so that the locking mechanism forms a snap-in mechanism, when the door is closed by the user.

[0017] Preferably, the locking mechanism is arrangeable or arranged beside the edge of the door in the closed state of said door.

[0018] In particular, the locking mechanism may be arrangeable or arranged opposite to a door hinge of said door.

[0019] Moreover, the longitudinal axis of the spring element extends perpendicular to the plane of the door in the closed state of said door.

[0020] Further, the present invention relates to a domestic appliance with a door, in particular a cooking oven with an oven door, wherein the domestic appliance comprises at least one locking mechanism mentioned above.

[0021] For example, the door comprises a front panel made of glass.

[0022] Novel and inventive features of the present invention are set forth in the appended claims.

[0023] The present invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates a schematic front view of a cooking oven with a locking mechanism according to a preferred embodiment of the present invention,

FIG 2 illustrates a schematic detailed sectional side view of the cooking oven with the locking mechanism according to the preferred embodiment of the present invention,

FIG 3 illustrates a schematic side view of the locking

mechanism according to the preferred embodiment of the present invention,

FIG 4 illustrates a schematic top view of the locking mechanism according to the preferred embodiment of the present invention,

FIG 5 illustrates a schematic rear view of the locking mechanism according to the preferred embodiment of the present invention,

FIG 6 illustrates a schematic front view of the locking mechanism according to the preferred embodiment of the present invention, and

FIG 7 illustrates a schematic perspective view of a lever element of the locking mechanism according to the preferred embodiment of the present invention.

[0024] FIG 1 illustrates a schematic front view of a cooking oven 10 with a locking mechanism 20 according to a preferred embodiment of the present invention.

[0025] The cooking oven 10 comprises an oven door 12 and a front panel 14, wherein said front panel 14 is arranged above the oven door 12. The oven door 12 includes a door handle 16 for opening and closing said oven door 12. Control elements 18 are arranged at the front panel 14.

[0026] The locking mechanism 20 is arranged between the oven door 12 and the front panel 14. In the state shown in FIG 1 the locking mechanism 20 avoids that the oven door 12 can be opened. If the locking mechanism 20 would be pushed or pulled upwards by the user, then the oven door 12 could be opened.

[0027] FIG 2 illustrates a schematic detailed sectional side view of the cooking oven 10 with the locking mechanism 20 according to the preferred embodiment of the present invention.

[0028] The front panel 14 is arranged above the oven door 12. The locking mechanism 20 is arranged between said oven door 12 and front panel 14. The locking mechanism 20 is fastened by a fixing element 22 at the cooking oven 10. When the locking mechanism 20 is pushed or pulled upwards, then the oven door 12 can be opened.

[0029] FIG 3 illustrates a schematic side view of the locking mechanism 20 according to the preferred embodiment of the present invention.

[0030] The locking mechanism 20 includes a spring element 24, a lever element 26 and a contact element 28. In this example, the spring element 24 is made of metal and formed as a strip. The lever element 26 is made of plastics and formed as a prism or as a wedge. The lever element 26 is attached at a distal end of the spring element 24. Said distal end forms the front end of the spring element 24. The contact element 28 is made of silicone and attached at the rear side of the lever element 26. The contact element 28 made of silicone increases the friction between the locking mechanism 20 and the edge of the door 12.

[0031] The front and rear sides of the locking mechanism 20 relate to the front and rear sides of the cooking oven 10, i.e. the front side of the locking mechanism 20 is facing the user.

[0032] The spring element 24 is bendable perpendicular to its longitudinal axis. When the spring element 24 is fixed with its rear side at the cooking oven 10 by the fixing element 22, then the lever element 26 is moveable upwards by the user.

[0033] In an unstressed state of the spring element 24, the locking mechanism 20 encloses an upper front edge of the oven door 12, if said over door 12 is closed. In this case, the contact element 28 is aligned at said upper front edge of the oven door 12. When the locking mechanism 20 is pushed or pulled upwards by the user, then the oven door 12 can be opened.

[0034] The contact element 28 made of silicone provides a high friction between the upper front edge of the oven door 12 and said contact element 28. The high friction between the edge of the oven door 12 and the contact element 28 requires less material for the spring element 24 and the lever element 26. No further spring element is required.

[0035] If the spring element 24 is in the unstressed state and the oven door 12 is open, then said oven door 12 is automatically locked, when the oven door 12 is closed by the user. The lever element 26 is pushed upwards during closing the oven door 12. Thus, the locking mechanism 20 acts as a snap-in mechanism for the oven door 12.

[0036] FIG 4 illustrates a schematic top view of the locking mechanism 20 according to the preferred embodiment of the present invention.

[0037] The spring element 24 is formed as a strip and made of metal. The lever element 26 is attached at the front portion of the spring element 24.

[0038] FIG 5 illustrates a schematic rear view of the locking mechanism 20 according to the preferred embodiment of the present invention.

[0039] The lever element 26 is attached at the front portion of the spring element 24. The contact element 28 is attached at the rear side of the lever element 26.

[0040] FIG 6 illustrates a schematic front view of the locking mechanism 20 according to the preferred embodiment of the present invention. The lever element 26 is attached at the front portion of the spring element 24.

[0041] FIG 7 illustrates a schematic perspective view of the lever element 26 of the locking mechanism 20 according to the preferred embodiment of the present invention.

[0042] The contact element 28 is attached at the lever element 26. FIG 7 clarifies that the lever element 26 has the shape of the prism or is wedge-shaped. The contact element 28 is attached at the rear side of the lever element 26. In this example, the contact element 28 is an L-shaped profile part.

[0043] The locking mechanism 20 according to the present invention is made of two, preferably three, components made of different materials. The spring element 24 is made of metal, while the lever element 26 is made of plastics. The contact element 28 is made of silicone. The combination of the components and materials allows high flexibility and safety of locking the door and improves the functionality.

[0044] The spring element 24 may be formed as thin metal strip, so that only little force for releasing the locking mechanism 20 is required. The deformation of the locking mechanism 20 and the door 12 is small, so that the lifetime of the involved components is relative long.

[0045] The locking mechanism 20 keeps the oven door 12 closed, when someone is pulling at the door handle 16. The locking mechanism 20 allows a good absorption or compensation of production tolerances.

[0046] The locking mechanism 20 according to the present invention has a simple structure and can be produced by low costs.

[0047] Although an illustrative embodiment of the present invention has 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

[0048]

10	cooking oven
12	oven door
14	front panel
16	door handle
18	control element
20	locking mechanism
22	fixing element
24	spring element
26	lever element
28	contact element

Claims

1. A locking mechanism (20) for a door (12) of a domestic appliance (10), in particular for an oven door (12) of a cooking oven (10), wherein:

- the locking mechanism (20) comprises a spring element (24) attachable or attached at the domestic appliance (10),
- the locking mechanism (20) comprises a lever element (26) attached at a distal end of said spring element (24),
- the lever element (26) is adapted for engaging with a section of an edge of the door (12), when said door (12) is in a closed state, and
- the spring element (24) is bendable, so that the lever element (26) can be disengaged from the section of the edge of the door (12).

2. The locking mechanism according to claim 1, **characterised in that** at least one contact element (28) is attached at the lever element (26), wherein said contact element (28) is adapted for engaging with the section of the edge of the door (12), when said door (12) is in the closed state.

3. The locking mechanism according to claim 2, **characterised in that** the contact element (28) is made of silicone.

4. The locking mechanism according to any one of the preceding claims, **characterised in that** the spring element (24) is made of metal, preferably made of steel.

5. The locking mechanism according to any one of the preceding claims, **characterised in that** the spring element (24) is elongated, wherein one end is attachable or attached at the domestic appliance (10) by a fixing element (22), and wherein preferably the spring element (24) is bendable perpendicular to its longitudinal axis.

6. The locking mechanism according to any one of the preceding claims, **characterised in that** the spring element (24) is formed as a strip.

7. The locking mechanism according to any one of the preceding claims, **characterised in that** the spring element (24) includes at least one curvature.

8. The locking mechanism according to claim 7, **characterised in that** at least two curvatures form a Z-shape or S-shape structure of the spring element (24).

9. The locking mechanism according to any one of the preceding claims, **characterised in that** the lever element (26) is made of plastics.

10. The locking mechanism according to any one of the preceding claims,

characterised in that
the lever element (26) is formed as a prism or as a wedge, so that the locking mechanism (20) forms a snap-in mechanism, when the door (12) is closed by the user.

11. The locking mechanism according to any one of the preceding claims,
characterised in that
the locking mechanism (10) is arrangeable or arranged beside the edge of the door (12) in the closed state of said door (12) .

12. The locking mechanism according to claim 11,
characterised in that
the locking mechanism (10) is arrangeable or arranged opposite to a door hinge of said door (12).

13. The locking mechanism according to any one of the preceding claims,
characterised in that
the longitudinal axis of the spring element (24) extends perpendicular to the plane of the door (12) in the closed state of said door (12).

14. A domestic appliance (10) with a door (12), in particular a cooking oven (10) with an oven door (12),
characterised in that
the domestic appliance (10) comprises at least one locking mechanism (20) according to any one of the preceding claims.

15. The domestic appliance (10) according to claim 14,
characterised in that
the door (12) comprises a front panel made of glass.

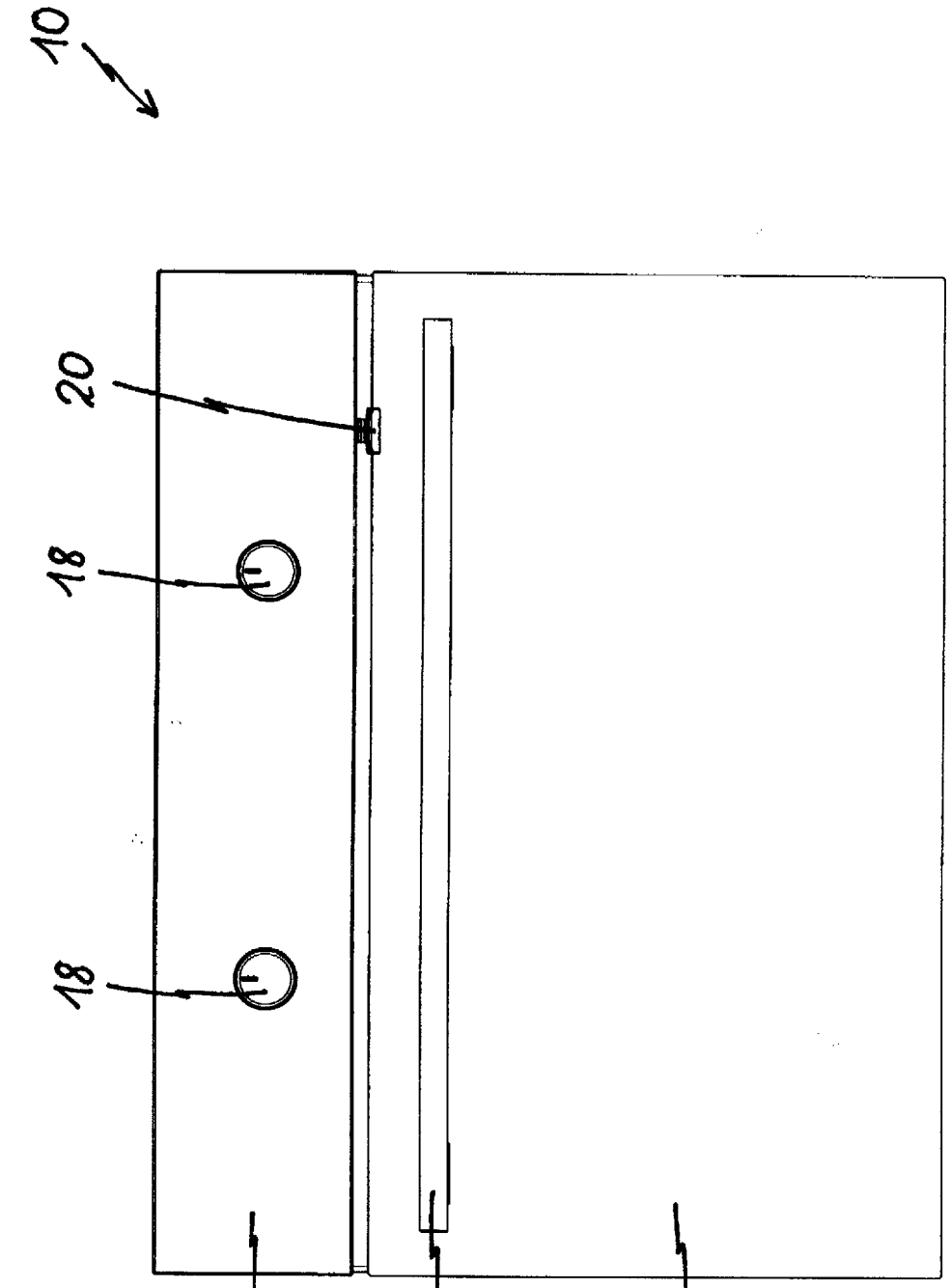

FIG 1

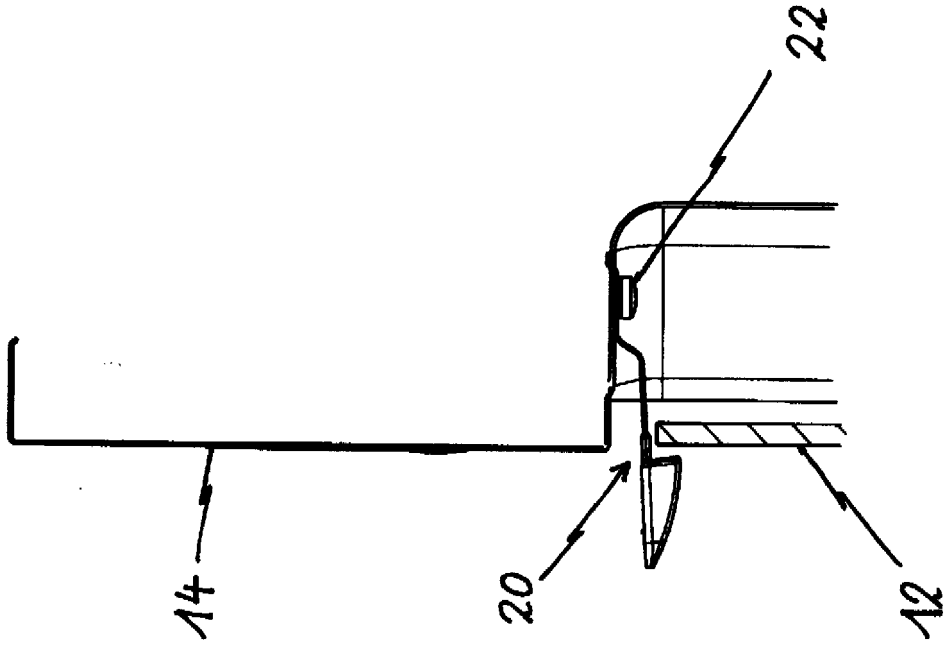

FIG 2

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FIG 6

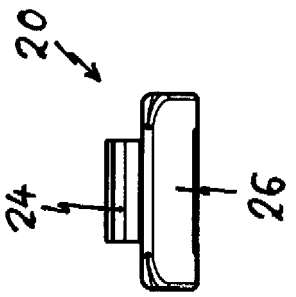


FIG 7

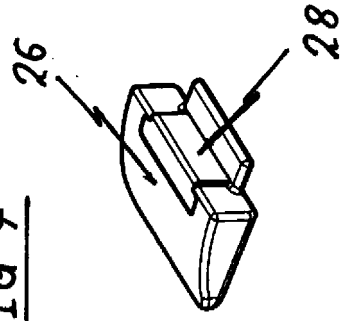


FIG 3

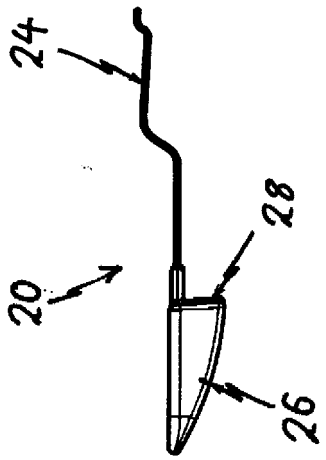


FIG 4

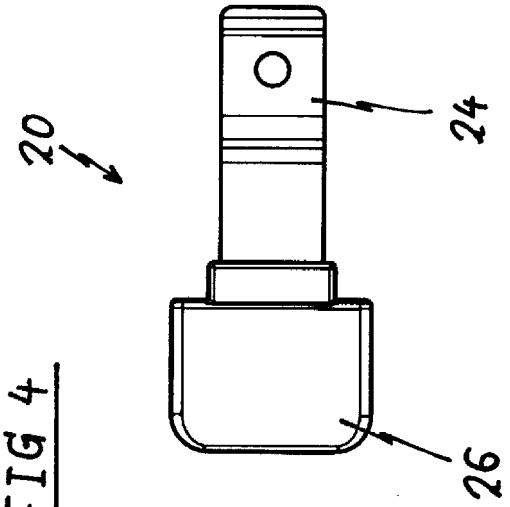
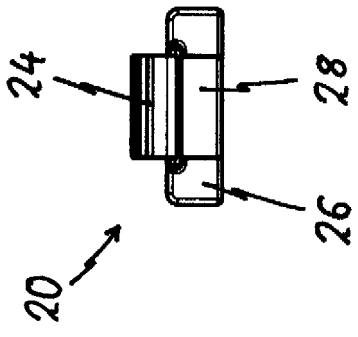


FIG 5



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EUROPEAN SEARCH REPORT

Application Number
EP 18 16 4707

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 Y	EP 2 532 973 A1 (ELECTROLUX HOME PROD CORP [BE]) 12 December 2012 (2012-12-12) * paragraphs [0001], [0028], [0031], [0035], [0036], [0039], [0040], [0045], [0046], [0047]; figures 1-4 * -----	1,2,4-15 3	INV. F24C15/02 E05C19/06 ADD. E05B63/00
X	DE 81 37 042 U1 (BOSCH-SIEMENS HAUSGERÄTE GMBH) 18 March 1982 (1982-03-18) * page 1, line 1 - page 1, line 4; figures 1, 2 * * page 1, line 14 - page 1, line 21 * * page 1, line 28 - page 1, line 31 * -----	1,2,5-9, 11-14	
X	DE 10 2006 007328 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 30 August 2007 (2007-08-30) * paragraphs [0001], [0011], [0032], [0033], [0034], [0035]; figures 1, 5 * -----	1,2,5-9, 11-14	
Y	US 2016/215985 A1 (BLOUIN ÉRIC [CA]) 28 July 2016 (2016-07-28) * figure 5 * * paragraph [0065] * -----	3	TECHNICAL FIELDS SEARCHED (IPC) F24C F25D A47L E05C E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 September 2018	Jalal, Rashwan

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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24-09-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2532973 A1	12-12-2012	NONE	
DE 8137042 U1	18-03-1982	NONE	
DE 102006007328 A1	30-08-2007	DE 102006007328 A1	30-08-2007
		SE 0700291 A	17-08-2007
US 2016215985 A1	28-07-2016	CA 2878537 A1	19-07-2016
		US 2016215985 A1	28-07-2016

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