

(19)



(11)

EP 3 771 867 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.02.2021 Bulletin 2021/05

(51) Int Cl.:
F24C 15/16 ^(2006.01)

(21) Application number: **20183655.8**

(22) Date of filing: **02.07.2020**

(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
Designated Validation States:
KH MA MD TN

(71) Applicant: **BSH Hausgeräte GmbH**
81739 München (DE)

(72) Inventor: **Cigal, Serkan**
59500 TEKIRDAG (TR)

(30) Priority: **30.07.2019 TR 201911518**

(54) AN OVEN HAVING A CONTAINER EXTRACTING ARRANGEMENT

(57) The present invention relates to an oven (1) comprising a body (2), a cooking chamber (3) where the foodstuffs can be cooked, provided inside the body (2), a front opening (6) provided with a door (5) hinged to the body (2), a carrier container (7) which can be placed inside the cooking chamber (3) for carrying the foodstuffs, a pair of telescopic rail devices (4) whereon the carrier container (7) can be positioned, provided on the opposite side walls of the cooking chamber (31) and a container extracting arrangement (8) arranged to at least partially

extract the carrier container (7) out of the cooking chamber (3) whereby the door (5) is coupled to the telescopic rail devices (4) by the container extracting arrangement (8) in such a way that a rotational movement of the door (5) causes an axial movement of the telescopic rail devices (4). In the invention, the container extracting arrangement (8) comprises at least one guiding profile (81) positioned on an inner surface (53) of the door (5) in order to guide an end section (43) of at least one of the associated telescopic rail devices (4).

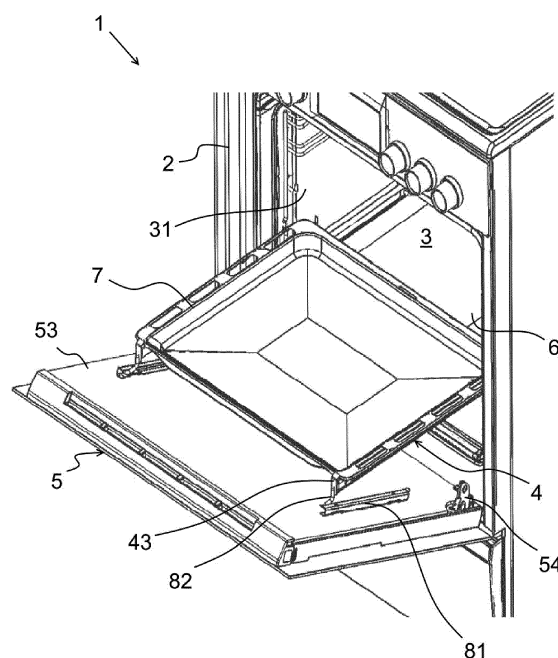


FIG. 2

EP 3 771 867 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to an oven according to the preamble of claim 1.

PRIOR ART

[0002] The document US2013042854 A1 discloses the systems of sliding shelves for ovens. The system includes a lower shelf and an upper shelf. The lower shelf includes a vertical rod; and the upper shelf includes an engagement element, and a stop horizontally distant from said engagement element. The vertical rod of the lower shelf mechanically interacts with the engagement element and with the stop.

[0003] The invention provides an additional improvement, an additional advantage or an alternative to the prior art.

BRIEF DESCRIPTION OF THE INVENTION

[0004] The purpose of the present invention is to provide an oven with a container extracting arrangement having a reliable and easy to use structure.

[0005] The present invention, to achieve the above-mentioned purpose, is an oven comprising a body, a cooking chamber where the foodstuffs can be cooked, provided inside the body, a front opening provided with a door hinged to the body, a carrier container which can be placed inside the cooking chamber for carrying the foodstuffs, a pair of telescopic rail devices whereon the carrier container can be positioned, provided on the opposite side walls of the cooking chamber and a container extracting arrangement arranged to at least partially extract the carrier container out of the cooking chamber whereby the door is coupled to the telescopic rail devices by the container extracting arrangement in such a way that a rotational movement of the door causes an axial movement of the telescopic rail devices. In the invention, the container extracting arrangement comprises at least one guiding profile positioned on an inner surface of the door in order to guide an end section of at least one of the associated telescopic rail devices. Thus, the carrier container can be extracted from the cooking chamber in a reliably manner. In more details, the end section of the telescopic rail device which may be away from the cooking chamber at an angled position of the door, is supported by the door. Therefore, the telescopic rail device where the carrier container which can carry the foodstuffs, is provided on the telescopic rail device, are being stable at any angled position of the door.

Moreover, the telescopic rail devices can be pulled out of the cooking chamber at a desired axial level by the rotational movement of the door, in order to put the carrier container onto the telescopic rail devices in an easily manner. For example, the user can extract a part of the

carrier container positioned on the telescopic rail devices, out of the cooking chamber in a reliably manner or extract the carrier container positioned on the telescopic rail devices, out of the cooking chamber entirely in a reliably manner, according to the rotational movement of the door.

In addition, the subject-matter container extracting arrangement has only a few number of components which provides a cost-effective structure.

[0006] Here, the carrier container can be a grill pan, a baking tray, a grid or suchlike. At least one carrier container can be placed inside the cooking chamber.

[0007] Here, the end section can be formed as a flat surface.

[0008] In a possible embodiment of the invention, the end section is configured with a connection member which connects the telescopic rail device to the door and wherein said connection member has a guided part which is being guided by the guiding profile from one side. Thus, the telescopic rail devices connect with the door in an easily and cost-effective manner. In this way, the rotational movement of the door is being converted to the axial movement of the telescopic rail devices.

Here, the connection member can be fixed to the end section by a welding process, a gluing process, suchlike. Here, the connection member can be a wire element which is configured so as to be connected to the end section from one side and be guided by the guiding profile from the other side.

Moreover, said connection member can be fixed to the end section by a connection element such as a pin which allows a rotation of the connection member.

[0009] In a possible embodiment of the invention, the guiding profile is arranged in such a way that it extends in a direction perpendicular to the telescopic rail devices, when the door is at a vertical position covering the front opening. Thus, the axial movement of the telescopic rail device in a direction away from the cooking chamber can be obtained, when the door is rotatably moved.

[0010] In a possible embodiment of the invention, the guiding profile has a guiding channel extending longitudinally where the guided part is being guided. Thus, the guiding part can be guided along the guiding profile by a sliding movement.

[0011] In a possible embodiment of the invention, the guided part is configured so as to be inside the guiding channel, when the door is at the vertical position. Thus, the container extracting arrangement is being prepared for a following axial movement of the telescopic rail devices.

[0012] In a possible embodiment of the invention, the guiding profile which is essentially in a U-shaped form, is positioned onto the inner surface in such a way that a longitudinal side wall of the guiding profile which is away from the inner surface, is contacting the guided part when the door is rotatably moved. Thus, the rotational movement of the door is being transmitted to the telescopic rail devices in order to convert said the rotational move-

ment to the axial movement of the telescopic rail devices.

[0013] In a possible embodiment of the invention, two guiding profiles are positioned on the opposite sides of the door corresponding the telescopic rail devices. Thus, the pair of telescopic rail devices whereon the carrier container is provided, are supported by the door from opposite sides for stabilizing the telescopic rail devices and the carrier container.

[0014] In a possible embodiment of the invention, the guiding profile has a length arranged to provide a separation of the guided part from the guiding channel, when the door is at an angled position in accordance with the front opening, in order to stop the axial movement of the telescopic rail devices. Thus, the rotational movement of the door can not be restricted by the subject-matter container extracting arrangement. In this way, the door separates from the telescopic rail devices at an angled position of the door and therefore, said door may be at a horizontal position in accordance with the front opening the cooking chamber. For example, an angle provided between the door and the front opening may be approximately 90°.

[0015] In a possible embodiment of the invention, a directing section is provided on the guiding profile for directing the guided part towards inside the guiding channel, when the door is moved from the angled position to the vertical position after the separation of the guided part. Thus, the guiding profile directs the guided part towards the guiding profile and therefore, the container extracting arrangement is being ready for a following axial movement of the telescopic rail devices when the door is at the vertical position again.

[0016] In a possible embodiment of the invention, the guiding profile has a contact wall facing the inner surface for securing the guiding profile to the inner surface by means of an adhesive element. Thus, the guiding profile is secured to the door.

[0017] In a possible embodiment of the invention, at least one connection bracket is secured onto the inner surface and wherein the guiding profile can detachably be connected to the connection bracket by means of a connection element passing through the guiding profile and the connection bracket. Thus, the guiding profiles can be detached from the door. Therefore, the users can clean or wash the guiding profiles, for example in a dish washer.

[0018] In a possible embodiment of the invention, the connection bracket comprises a first connection part where the connection element passes through, and a second connection part for securing the connection bracket to the inner surface by means of an adhesive element. Thus, a connection area for connecting the guiding profile to the door, is provided.

[0019] In a possible embodiment of the invention, the guiding profile comprises a connection section where the connection element passes through, shaped and sized in accordance with the connection bracket, and wherein the guiding profile has an accessing aperture corre-

sponding said connection section. Thus, the user accesses the connection element from outside easily to mount the guiding profile to the door or to demount the guiding profile from the door.

[0020] In a possible embodiment of the invention, each of the telescopic rail devices comprise a fixed rail part which is fastened to the side wall of the cooking chamber, and at least one loose rail part which is being movable relative to one another and relative to the fixed rail part, and wherein the guided part is fixed to said loose rail part. Thus, the axial movement of the telescopic rail device in a direction away from the cooking chamber or in a direction towards the cooking chamber can be obtained, when the door is rotatably moved.

[0021] Further advantages may become apparent from the following description of the figure(s). In the figure, an exemplary embodiment of the invention is shown. The figure, the description and the claims contain a plurality of features in combination. The person having ordinary skill in the art will purposefully also consider the features separately and will find further expedient combinations.

[0022] If there is more than one specimen of a certain object, only one of these is given a reference numeral in the figures and in the description. The description of this specimen may be correspondingly transferred to the other specimens of the object.

[0023] In this context, with the indications "front", "upper", "below", "top", "bottom", "rear", "outer", "inner" etc. the positions and orientations given for intended use and intended arrangement of the household appliance and for a user then standing in front of the household appliance in a closed position and viewing in the direction of the appliance are indicated.

BRIEF DESCRIPTION OF THE FIGURES

[0024] The figures, whose brief explanations are herewith provided, are solely intended for providing a better understanding of the present invention and are as such not intended to define the scope of protection or the context in which said scope is to be interpreted in the absence of the description.

Fig. 1 represents a side view of an oven which the subject-matter container extracting arrangement is provided.

Fig. 2 represents a zoomed isometric view of the oven where the door connected to the telescopic rail devices, is at an angled position.

Fig. 3 represents an another zoomed isometric view of the oven where the door connected to the telescopic rail devices, is at the angled position.

Fig. 4 represents an another zoomed isometric view of the oven where the door connected to the telescopic rail devices, is at the angled position.

Fig. 5 represents a zoomed isometric view of the guiding profile which guides an end section of the

associated telescopic rail device.

Fig. 6 represents an exploded view of the guiding profile.

Fig. 7 represents an isometric view of the guiding profile.

Fig. 8 represents an isometric view of the connection bracket.

Fig. 9 represents a front view of the connection bracket.

DETAILED DESCRIPTION OF THE FIGURES

[0025] In this detailed explanation, the invented subject-matter is explained with examples in order to make the subject more understandable without forming any restrictive effect. According to this, in the detailed explanation below, the subject-matter container extracting arrangement (8) is explained to be applied to a freestanding oven having a cooking chamber (3) given in Fig. 1. The same embodiment can be applied to any kind of domestic oven having a cooking chamber (3). For example, the same embodiment can be applied to the built-in ovens, freestanding ovens, suchlike.

[0026] With reference to Fig. 1, an oven (1) comprises a body (2) and a cooking chamber (3) where the food-stuffs can be cooked, provided inside the body (2). A cooking operation can be realized inside the cooking chamber (3). There is a front opening (6) provided for accessing the cooking chamber (3). Said front opening (6) is provided with a door (5) hinged to the body (2). A carrier container (7) can be placed inside the cooking chamber (3) for carrying the foodstuffs to be cooked. A pair of telescopic rail devices (4) whereon the carrier container (7) can be positioned, provided on the opposite side walls of the cooking chamber (3). There is a container extracting arrangement (8) arranged to at least partially extract the carrier container (7) outside of the cooking chamber (3) with the aid of an axial movement (S) of the telescopic rail devices (4) as a result of a rotational movement (R) of the door (5).

[0027] As can be seen in Fig. 2, the door (5) is hinged to the body (2) by means of at least one hinge (54). In more details, the door (5) can rotatably be moved between a vertical position where said door (5) covers the front opening (6) and an angled position where said door (5) is being angled in accordance with the front opening (6). For example, as shown in Fig. 2, the door (5) is at the angled position. There is a pair of telescopic rail devices (4) provided on the opposite side walls of the cooking chamber (3). Preferably, said telescopic rail devices (4) are identical to each other. The carrier container (7) can be positioned on said telescopic rail devices (4). In a possible embodiment of the invention, the container extracting arrangement (8) comprises at least one guiding profile (81) positioned on an inner surface (53) of the door (5). Said guiding profile (81) guides an end section (43) of the associated telescopic rail device (4) which is closer to the door (5). In more details, when the door (5)

is rotatably moved, the telescopic rail devices (4), and also the carrier container (7) with the aid of the telescopic rail devices (4), move in an axial direction.

[0028] In more details, as can be seen in Fig. 3, the door (5) has an outer door pane (51) facing outside and an inner door pane (52) spaced apart from the outer door pane (51). In a possible embodiment, the inner surface (53) is being a surface of the inner door pane (52) which faces the cooking chamber (3), when the door (5) is at the vertical position. The guiding profiles (81) are secured onto said surface of the inner door pane (52). The end section (43) of the telescopic rail device (4) is being closer to said surface of the inner door pane (52). In a possible embodiment of the invention, as can be seen in Fig 3 and 4, the end section (43) is configured with a connection member (82) which integrates the telescopic rail device (4) to the door (5). Said connection member (82) is connected to the end section (43) from one side. Moreover, the connection member (82) has a guided part (821) which is being guided by the guiding profile (81) from one side. In other words, the connection member (82) is configured so as to be connected the end section (43) from one side and be guided by the guiding profile (81) from the other side. On the other hand, each of the telescopic rail devices (4) comprise a fixed rail part (41) which is fastened to a side wall of the cooking chamber (31). Said telescopic rail devices (4) further comprise at least one loose rail part (42) which is being movable relative to one another and relative to the fixed rail part (41). In the invention, the guided part (821) is connected to said loose rail part (42) which can be moved in the axial direction as a result of the rotational movement (R) of the door (5). In a possible embodiment, two guiding profiles (81) are positioned on the opposite sides of the door (5) corresponding the telescopic rail devices (4). Preferably, two guiding profiles (81) are identical to each other. The guiding profile (81) has a guiding channel (811) extending longitudinally where the guided part (821) is being guided. The guided part (821) is formed by bending a free end of the connection member (82) towards the guiding channel (811). The guiding profiles (81) are positioned onto the inner surface (53) such a way that the guiding channels (811) of the guiding profiles (81) are facing each other. In a possible embodiment of the invention, each of the guiding profile (81) has a length (L) arranged to provide a separation of the guided part (821) from the guiding channel (811), when the door (5) is at the angled position in accordance with the front opening (6). For example, when the door (5) is at a horizontal position where an angle provided between the door (5) and the front opening (6) is approximately 90°, the telescopic rail devices (4) are separated from the door (5). In other words, there is not any connection between the telescopic rail devices (4) and the door (5), when the door (5) is, for example, at the horizontal position.

[0029] With reference to Fig. 5, the side of the connection member (82) where the connection member (82) is connected to the loose rail part (42), extends in a parallel

manner to the end section (43). In a possible embodiment, the guiding profile (81) is provided in essentially U-shaped form. The side of the connection member (82), which is being guided by the guiding channel (811), in shortly the guided part (821), contacts to a longitudinal side wall of the guiding profile (814) which is being away from the inner surface (53). Thus, the rotational movement (R) of the door (5) is being transmitted to the loose rail part (42) in order to convert said the rotational movement (R) to the axial movement (S) of the loose rail part (42). The guided part (821) can move along the guiding channel (811) in accordance with the rotational movement (R) of the door (5). The guided part (821) can separate from the guiding channel (811) at an angled position of the door (5). There is a directing section (813) configured on a side of the guiding profile (81) which is being away from the end section (43) at the angled position of the door (5). Preferably, said directing section (813) is formed by bending an end of the longitudinal side wall of the guiding profile (814). For example, when the door (5) is at the horizontal position and rotatably moved for transitioning said door (5) from horizontal position to vertical position, the directing section (813) directs the guided part (821) towards the guiding channel (811). Thus, the loose rail parts (42) move in an axial direction towards the cooking chamber (3). In the invention, the guiding profiles (81) are detachably connected to the inner surface (53). In more details, the guiding profiles (81) are connected to the inner surface (53) by means of at least one connection bracket (83) and at least one connection element (84).

[0030] As can be seen in Fig. 6, the connection bracket (83) is secured onto the inner surface (53) of the door (5). As can be seen in Fig. 8 and 9, said connection bracket (83) is formed in essentially V-shaped form. In detail, the connection bracket (83) comprises a first connection part (831) having a connection hole (833) where the connection element (84) passes through. The connection bracket (83) further comprises second connection parts (832) which are configured on the opposite sides of said connection bracket (83). Said second connection parts (832) are provided in a parallel manner to the inner surface (53). There is an adhesive element provided between the second connection part (832) and the inner surface (53) in order to connect the connection bracket (83) to the inner surface (53). The first connection part (831) is provided as being away from the inner surface (53), when the connection bracket (83) connected to the inner surface (53). The guiding profile (81) has at least one connection section (816) which is shaped and sized corresponding the connection bracket (83). Said connection section (816) is also provided in essentially V-shaped form. The connection section (816) is configured on a longitudinal contact wall (812) of the guiding profile (81) contacting the inner surface (53). There is a corresponding connection hole (817) which corresponds the connection hole (833), provided on the connection section (816). The connection element (84) passes through the

connection hole (833) and the corresponding connection hole (817) in order to connect the guiding profile (81) to the inner surface (53). Preferably, the guiding profile (81) has two connection section (816) configured on opposite sides of the guiding profile (81). There is at least one connection bracket (83) connected to the inner surface (53) and provided for each corresponding connection section (816) which corresponds to the connection bracket (83). As can be seen in Fig. 7, in a possible embodiment, there is an accessing aperture (815) provided on the longitudinal side wall of the guiding profile (814). Said accessing aperture (815) is provided on the longitudinal side wall of the guiding profile (814) in such a way that it is being corresponding the corresponding connection hole (817).

In a possible embodiment of the invention, the inner door pane (52) of the door (5) is made of glass material; and the guiding profiles (81) and the connection brackets (83) are made of a metal material, for example aluminum.

REFERENCE LIST

[0031]

1. Oven
2. Body
3. Cooking chamber
31. Side wall of the cooking chamber
4. Telescopic rail device
41. Fixed rail part
42. Loose rail part
43. End section
5. Door
51. Outer door pane
52. Inner door pane
53. Inner surface
54. Hinge
6. Front opening
7. Carrier container
8. Container extracting arrangement
81. Guiding profile
 - 811. Guiding channel
 - 812. Contact wall
 - 813. Directing section
 - 814. Side wall of the guiding profile
 - 815. Accessing aperture
 - 816. Connection section
 - 817. Corresponding connection hole
82. Connection member
821. Guided part
83. Connection bracket
 - 831. First connection part
 - 832. Second connection part
 - 833. Connection hole
84. Connection element
- S. Axial movement
- R. Rotational movement
- L. Length

Claims

1. An oven (1) comprising a body (2), a cooking chamber (3) where the foodstuffs can be cooked, provided inside the body (2), a front opening (6) provided with a door (5) hinged to the body (2), a carrier container (7) which can be placed inside the cooking chamber (3) for carrying the foodstuffs, a pair of telescopic rail devices (4) whereon the carrier container (7) can be positioned, provided on the opposite side walls of the cooking chamber (31) and a container extracting arrangement (8) arranged to at least partially extract the carrier container (7) out of the cooking chamber (3) whereby the door (5) is coupled to the telescopic rail devices (4) by the container extracting arrangement (8) in such a way that a rotational movement of the door (5) causes an axial movement of the telescopic rail devices (4),
characterized in that
the container extracting arrangement (8) comprises at least one guiding profile (81) positioned on an inner surface (53) of the door (5) in order to guide an end section (43) of at least one of the associated telescopic rail devices (4).
2. The oven (1) according to Claim 1, wherein the end section (43) is configured with a connection member (82) which integrates the telescopic rail device (4) to the door (5) and wherein said connection member (82) has a guided part (821) which is being guided by the guiding profile (81) from one side.
3. The oven (1) according to Claim 1 or 2, wherein the guiding profile (81) is arranged in such a way that it extends in a direction perpendicular to the telescopic rail devices (4), when the door (5) is at a vertical position covering the front opening (6).
4. The oven (1) according to Claim 2 or 3, wherein the guiding profile (81) has a guiding channel (811) extending longitudinally where the guided part (821) is being guided.
5. The oven (1) according to claims 4, wherein the guided part (821) is configured so as to be inside the guiding channel (811), when the door (5) is at the vertical position.
6. The oven (1) according to claims 4 or 5, wherein the guiding profile (81) which is essentially in a U-shaped form, is positioned onto the inner surface (53) in such a way that a longitudinal side wall of the guiding profile (814) which is away from the inner surface (53), is contacting the guided part (821) when the door (5) is rotatably moved.
7. The oven (1) according to any one of the preceding claims, wherein two guiding profiles (81) are positioned on the opposite sides of the door (5) corresponding the telescopic rail devices (4).
8. The oven (1) according to any one of the claims 2 to 7, wherein the guiding profile (81) has a length (L) arranged to provide a separation of the guided part (821) from the guiding channel (811), when the door (5) is at an angled position in accordance with the front opening (6), in order to stop the axial movement of the telescopic rail devices (4).
9. The oven (1) according to Claim 8, wherein a directing section (813) is provided on the guiding profile (81) for directing the guided part (821) towards inside the guiding channel (811), when the door (5) is moved from the angled position to the vertical position after the separation of the guided part (821).
10. The oven (1) according to any one of the preceding claims, wherein the guiding profile (81) has a contact wall (812) facing the inner surface (53) for securing the guiding profile (81) to the inner surface (53) by means of an adhesive element.
11. The oven (1) according to any one of the claims 1 to 9, wherein at least one connection bracket (83) is secured onto the inner surface (53) and wherein the guiding profile (81) can detachably be connected to the connection bracket (83) by means of a connection element (84) passing through the guiding profile (81) and the connection bracket (83).
12. The oven (1) according to Claim 11, wherein the connection bracket (83) comprises a first connection part (831) where the connection element (84) passes through, and a second connection part (832) for securing the connection bracket (83) to the inner surface (53) by means of an adhesive element.
13. The oven (1) according to any one of the claims 11 or 12, wherein the guiding profile (81) comprises a connection section (816) where the connection element (84) passes through, shaped and sized in accordance with the connection bracket (83), and wherein the guiding profile (81) has an accessing aperture (815) corresponding said connection section (816).
14. The oven (1) according to any one of the claims 4 to 13, wherein each of the telescopic rail devices (4) comprise a fixed rail part (41) which is fastened to the side wall of the cooking chamber (31), and at least one loose rail part (42) which is being movable relative to one another and relative to the fixed rail part (41), and wherein the guided part (821) is fixed to said loose rail part (42).

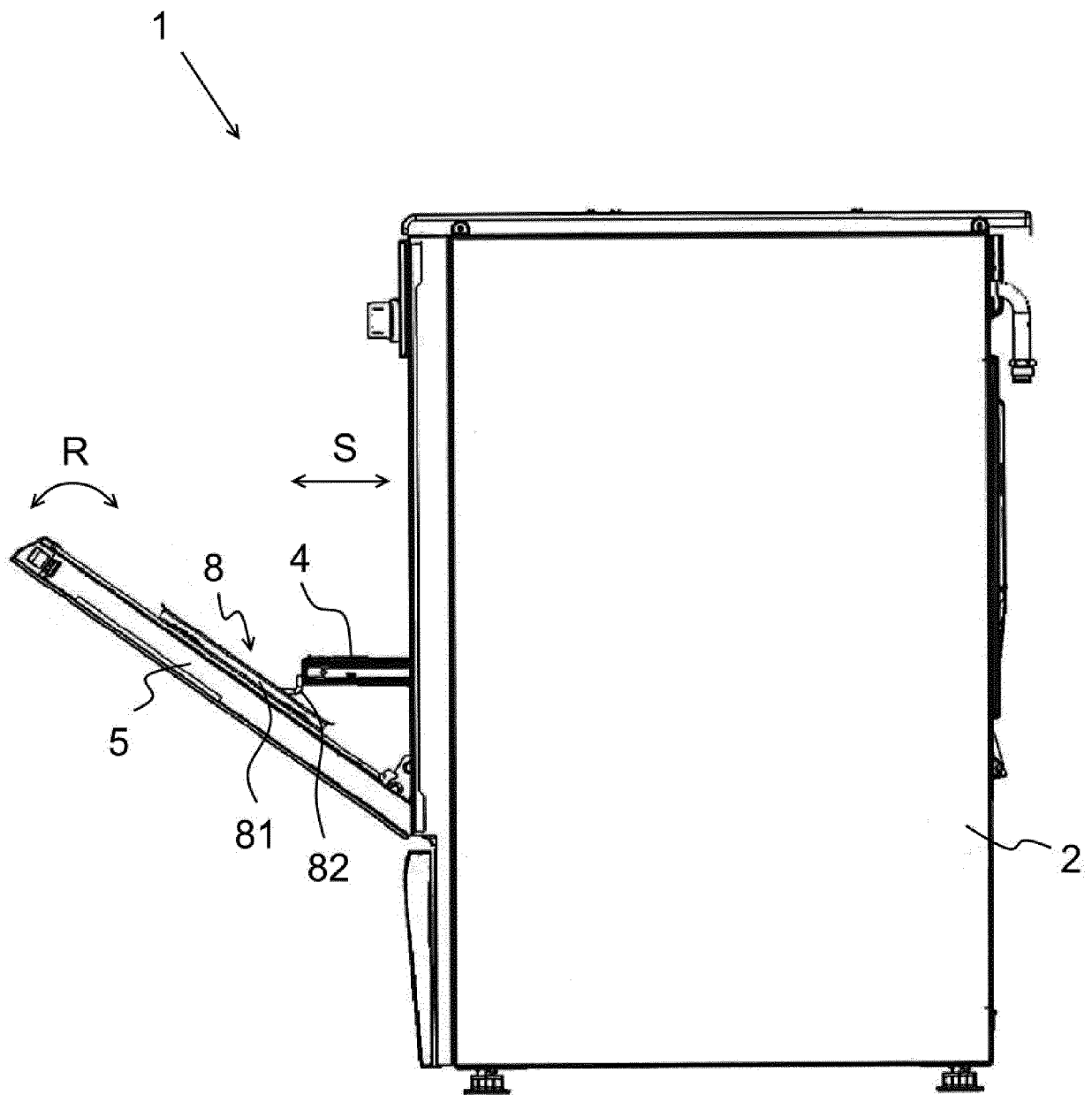


FIG. 1

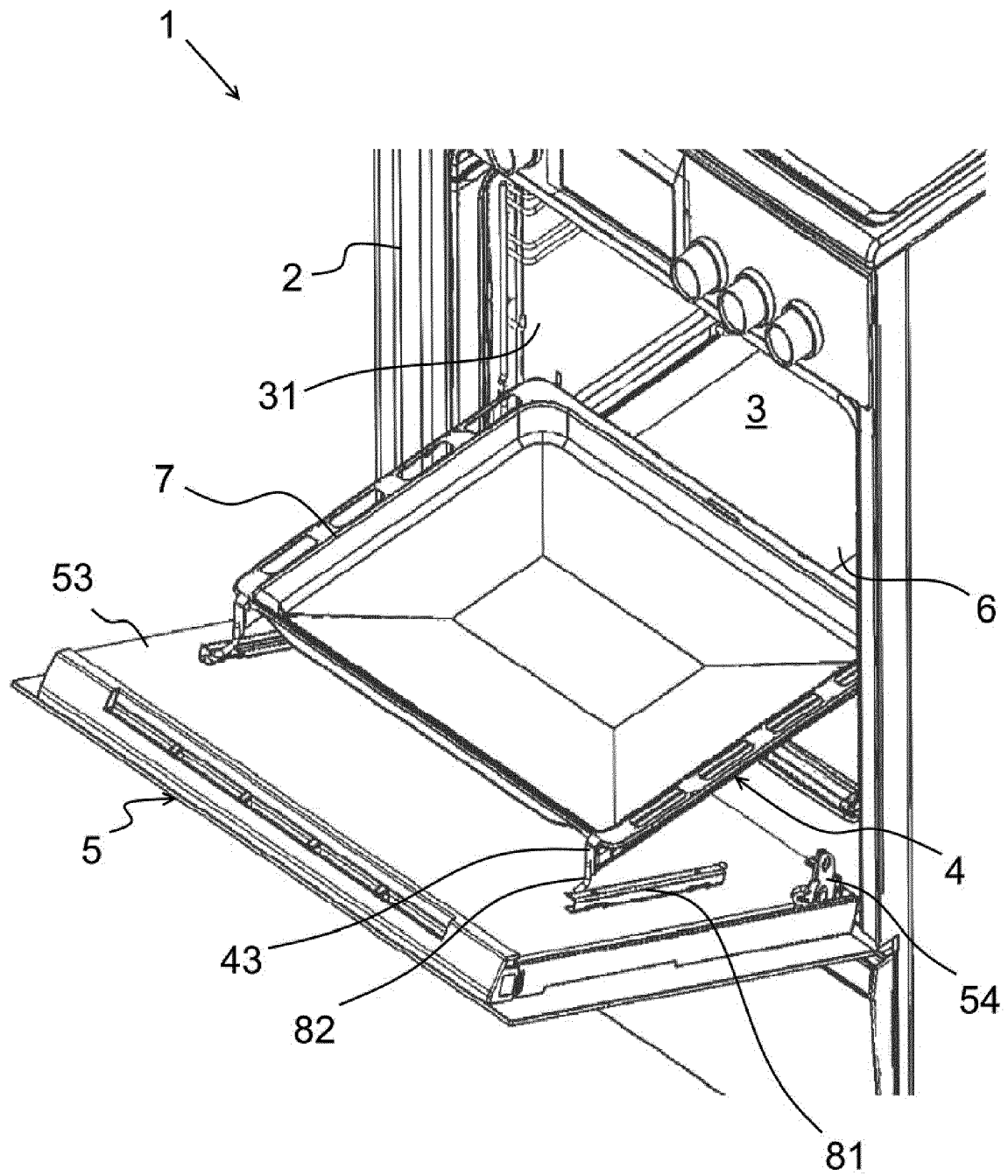


FIG. 2

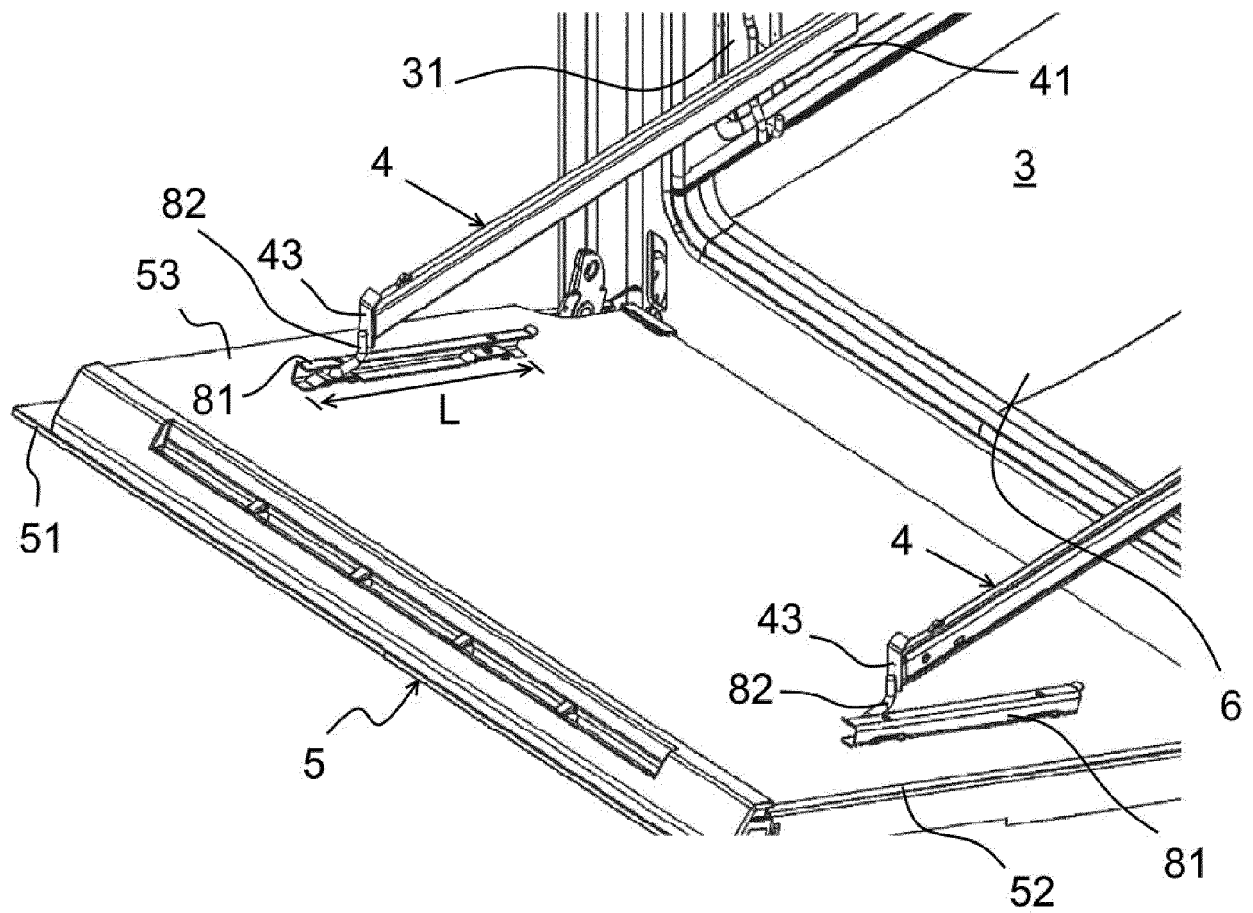


FIG. 3

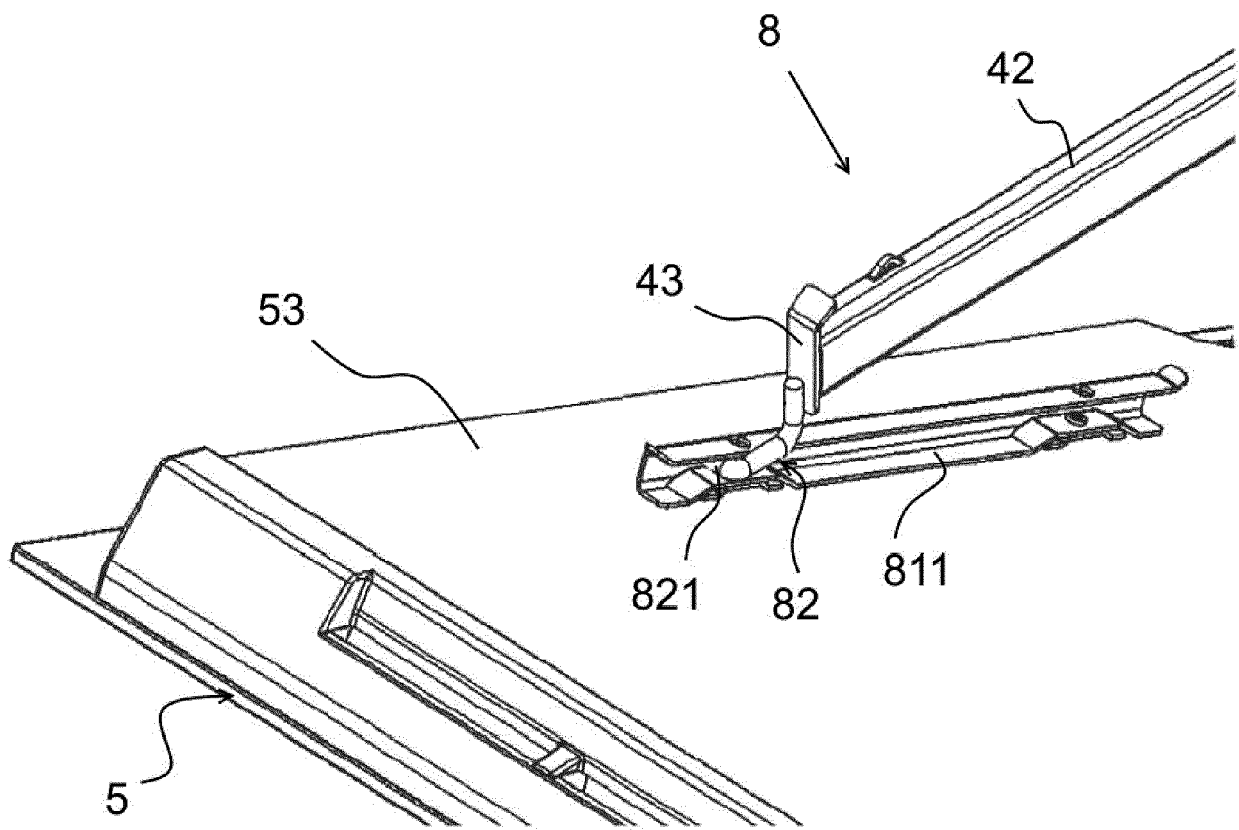


FIG. 4

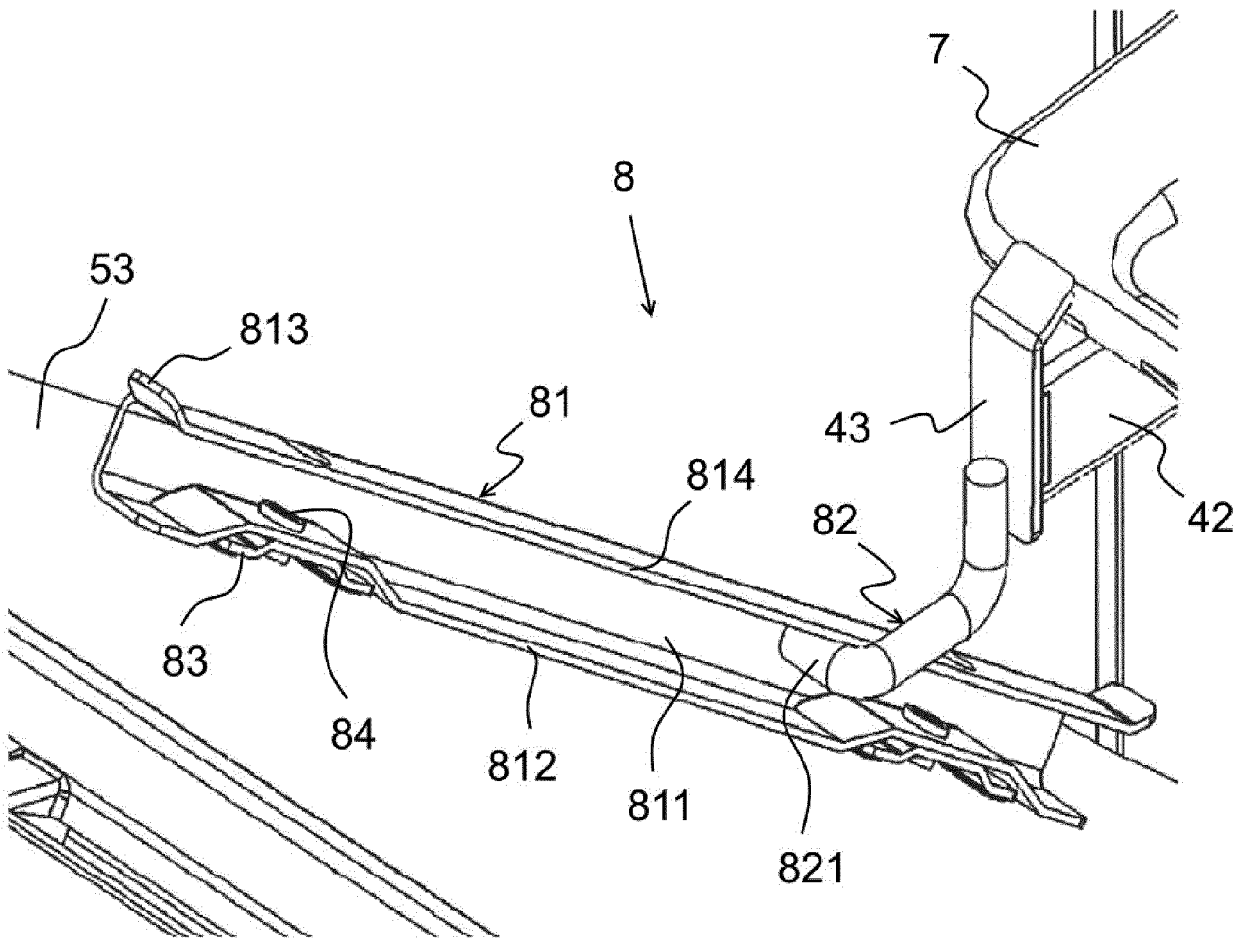


FIG. 5

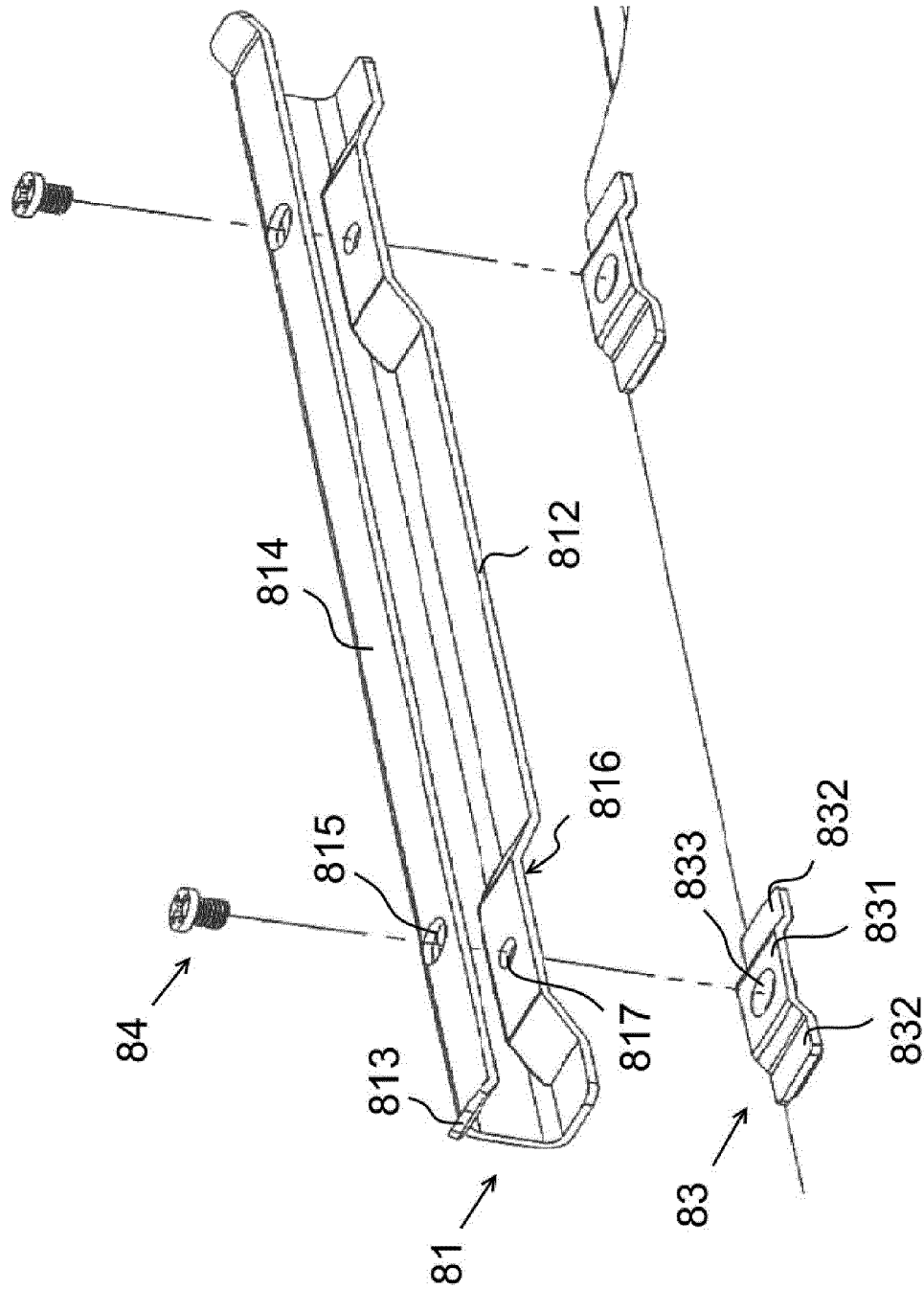


FIG. 6

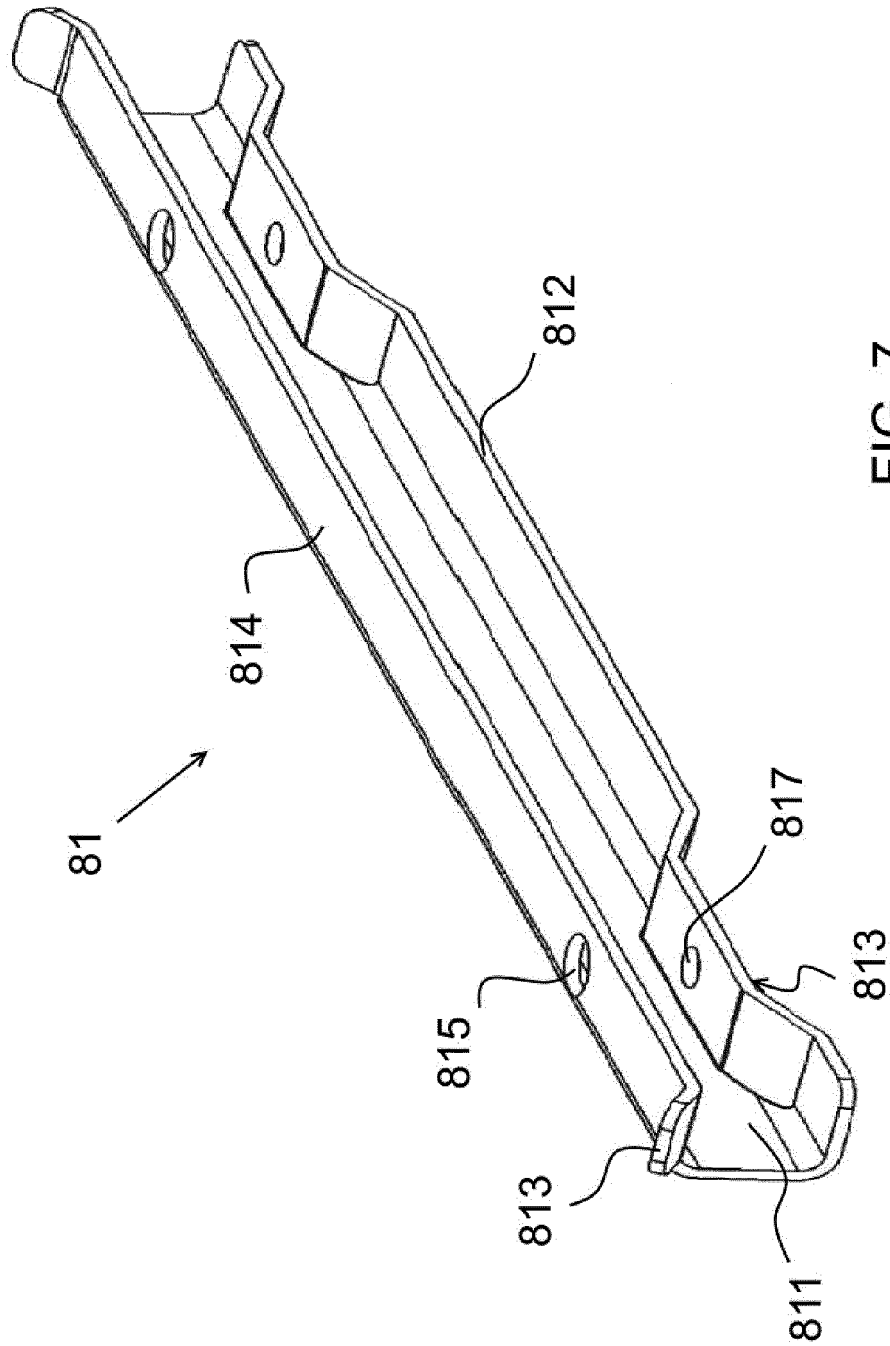


FIG. 7

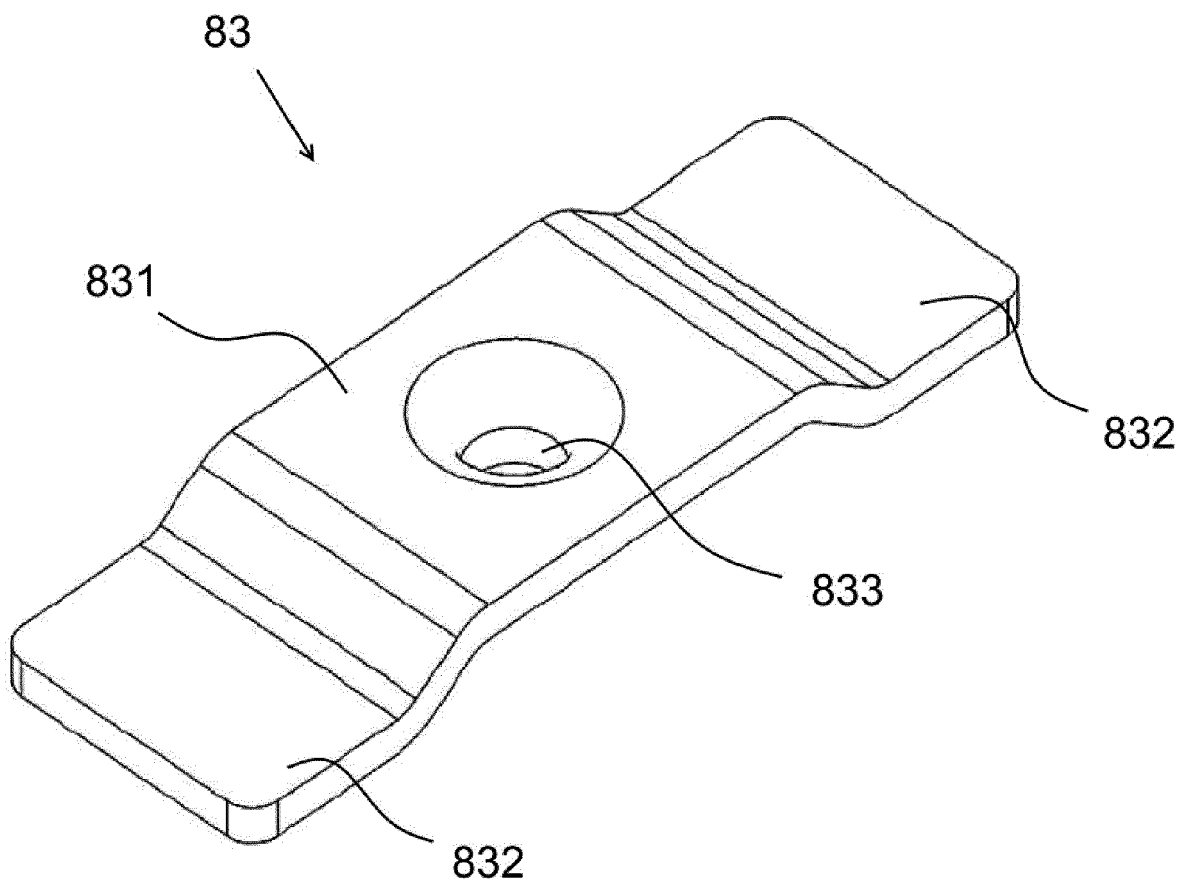


FIG. 8

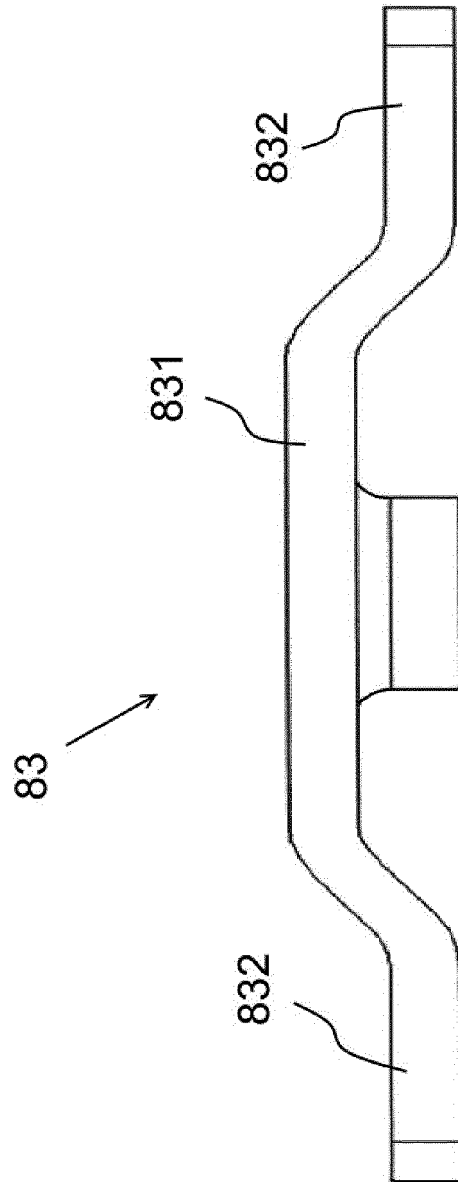


FIG. 9



EUROPEAN SEARCH REPORT

 Application Number
EP 20 18 3655

5

10

15

20

25

30

35

40

45

50

55

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	GB 465 151 A (ESTATE STOVE CO) 3 May 1937 (1937-05-03) * figures 1-3 *	1-14	INV. F24C15/16
A	US 2 525 201 A (BEYNON JOHN K ET AL) 10 October 1950 (1950-10-10) * figures 1-3 *	1-14	
A,D	US 2013/042854 A1 (PADILHA ERAMIS BRAZ [BR] ET AL) 21 February 2013 (2013-02-21) * figures 1-3 *	1-14	
A	WO 2014/082828 A1 (ARCELIK AS [TR]; YANIK OMER [TR]; TURKOZ SERDAR [TR]) 5 June 2014 (2014-06-05) * figures 1-5 *	1-14	
A	WO 2015/197690 A1 (ELECTROLUX APPLIANCES AB [SE]) 30 December 2015 (2015-12-30) * figures 1,2 *	1-14	
A	US 467 292 A (HOOGERZEIL P [US]) 19 January 1892 (1892-01-19) * figure 1 *	1-14	TECHNICAL FIELDS SEARCHED (IPC) F24C
A	EP 2 093 499 A1 (ELECTROLUX HOME PROD CORP [BE]) 26 August 2009 (2009-08-26) * figures 1-3 *	1-14	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 4 December 2020	Examiner Moreno Rey, Marcos
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	

EPO FORM 1503 03.82 (P04C01)

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

EP 20 18 3655

5

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.

04-12-2020

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 465151 A	03-05-1937	NONE	
US 2525201 A	10-10-1950	NONE	
US 2013042854 A1	21-02-2013	BR PI1104204 A2 US 2013042854 A1	06-08-2013 21-02-2013
WO 2014082828 A1	05-06-2014	EP 2926054 A1 WO 2014082828 A1	07-10-2015 05-06-2014
WO 2015197690 A1	30-12-2015	AU 2015279232 A1 EP 3161385 A1 US 2017051922 A1 WO 2015197690 A1	10-11-2016 03-05-2017 23-02-2017 30-12-2015
US 467292 A	19-01-1892	NONE	
EP 2093499 A1	26-08-2009	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 2013042854 A1 [0002]