(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 865 264 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
12.12.2007 Bulletin 2007/50

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

(21) Application number: **06380157.5**

(22) Date of filing: **09.06.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(71) Applicant: **FAGOR, S.COOP.**
20500 Mondragon (Gipuzkoa) (ES)

(72) Inventors:
- **Zubiate Gorosabel, Urtzi**
  20550 Aretxabaleta (Gipuzkoa) (ES)
- **Galarraga Lekunona, Andoni**
  20213 Idiazabal (Gipuzkoa) (ES)
- **Armendariz Ramos, Joan Ignacio**
  20540 Eskoriatza (Gipuzkoa) (ES)

(74) Representative: **Igartua, Ismael**
Apartado 213
(Dpto. Propiedad Industrial)
20500 Mondragon (Gipuzkoa) (ES)

(54) Oven with mechanism for extracting a tray

(57) A domestic oven with a mechanism for extracting a tray from the oven, said oven (1) comprising an internal enclosure (10) into which can be introduced at least one tray (4), and a door (11) that insulates said internal enclosure (10) from the exterior when it is closed. The mechanism comprises an extraction support (5a, 5b), disposing of a surface of guidance (51) of said extraction support (5a,5b) with an inclination of a specific angle (Ø). Said mechanism also comprises a tray support (6a,6b) on which is disposed the tray (4) and which is adapted to support and slide in relation to the surface of guidance (51). When the door (11) is opened, due to the inclination of said surface of guidance (51), said tray support (6a,6b) can slide by gravity towards the exterior of said oven (1) thereby moving said tray (4) in conjunction with said tray support (6a,6b).

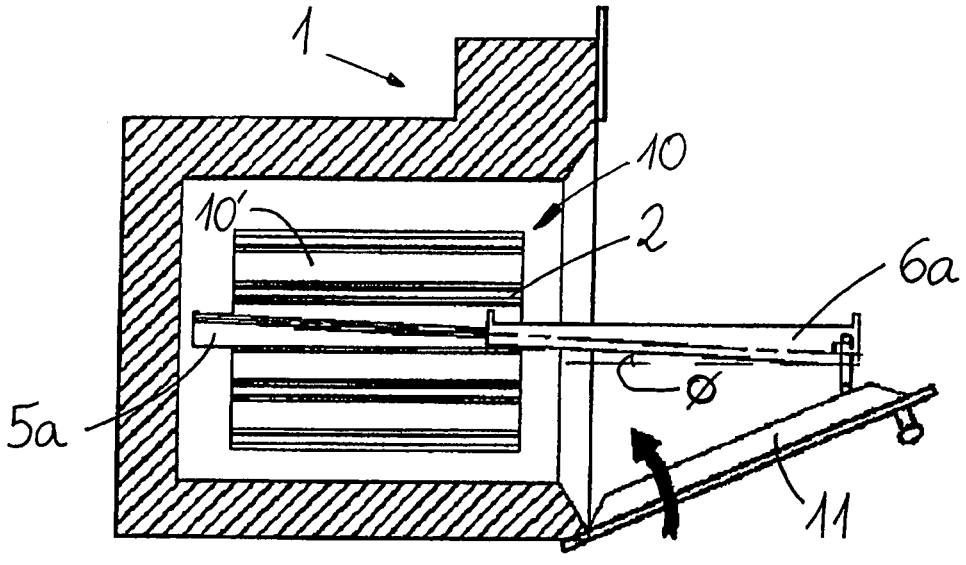

FIG. 1

EP 1 865 264 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to the internal constituent parts of the internal enclosure of a domestic oven.

PRIOR ART

[0002] Conventional domestic ovens are adapted to dispose of at least one tray and/or grilles in their internal enclosure. Known domestic ovens comprise a plurality of guiding supports disposed in parallel on the side walls of their internal enclosures, said guiding supports being used as supports and guides for the trays and grilles disposed in said internal enclosures.

[0003] ES 1 039 421 U discloses a domestic oven with a plurality of guiding supports disposed in parallel on the side walls of its internal enclosure, said guiding supports being used as supports and guides for movable grilles, a tray being disposed on said grille in order to introduce it into said internal enclosure. If a user wishes to remove a tray from said internal enclosure, said user opens a door on said oven to access said internal enclosure, and manually causes the displacement of said grille, and therefore of said tray, towards the exterior of said internal enclosure.

DISCLOSURE OF THE INVENTION

[0004] It is an object of this invention to provide a mechanism for the automatic extraction of a tray from a domestic oven, when the door of said domestic oven is opened.

[0005] The mechanism of the invention is used for the automatic extraction of a tray from a domestic oven. Said oven comprises an internal enclosure into which can be introduced at least one tray disposed on a movable grille, and a door that insulates said internal enclosure from the exterior when it is closed. The mechanism comprises an extraction support that is fixed to both sides of the grille by fixing means, a surface of guidance of said extraction support being disposed at an inclination of a certain angle in relation to the horizontal, said inclination descending towards the exterior of said internal enclosure. Said mechanism also comprises a tray support on which the tray is disposed and which is adapted to support and slide in relation to the surface of guidance of said extraction support, the door of the oven preventing said sliding when it is closed.

[0006] Thus, when the door of the oven is opened and due to the descending inclination of the surface of guidance of the extraction support and to gravity, the tray support slides on said extraction support, and moves out of the internal enclosure of said oven. The tray moves in conjunction with said tray support, said tray moving out of said internal enclosure, said tray being made available to the user automatically, thereby preventing said user from having to remove said tray from said internal enclosure manually, thus reducing the risk of said user being burnt, and facilitating access to said tray for the adding of an ingredient, for example.

[0007] These and other advantages and characteristics of the invention will be made evident in the light of the drawings and the detailed description thereof.

DESCRIPTION OF THE DRAWINGS

[0008]

Fig. 1 shows a first embodiment of the mechanism of the invention, in an oven.

Fig. 2 shows a grille on which the mechanism of Fig. 1 is disposed.

Fig. 3 shows a tray disposed on the mechanism of Fig. 1.

Fig. 4 is a side view of a second embodiment of the mechanism of the invention.

Fig. 5 shows limiter means of the mechanism of Fig. 1.

Fig. 6 shows the element of union of the mechanism of Fig. 1.

Fig. 7 is a partial view of a guide of the mechanism of Fig. 4, in which the extraction spring is shown.

Fig. 8 is a side view of a guide of the mechanism of Fig. 4, in which the extraction tab is shown.

DETAILED DISCLOSURE OF THE INVENTION

[0009] The mechanism of the invention is used in a domestic oven 1 of the type shown in figure 1. Said oven 1 comprises an internal enclosure 10 in which can be disposed at least one tray 4 which is disposed on a movable grille 3 shown in figure 2, and a door 11 that insulates said internal enclosure 10 from the exterior when it is closed. Each side wall 10' of said internal enclosure 10 comprises at least one guiding support 2 substantially horizontal and parallel to each other, said grille 3 being supported and guided by said guiding supports 2, a number of grilles 3 equal to the number of guiding supports 2 comprised on each side wall 10' of said internal enclosure 10 being introduced.

[0010] Figures 2 and 3 show an embodiment of the inventive mechanism that comprises an extraction support 5a, 5b that is fixed to both sides 3a and 3b of the grille 3 by fixing means 53, 54, which can be for example two rivets 53 and 54 for each side 3a, 3b. Said grille 3 comprises a rod 30 substantially horizontal to each side

3a and 3b, the rivets 53 and 54 being riveted to the corresponding rod 30 in order to fix said extraction support 5a, 5b to said grille 3. Said extraction support 5a, 5b is fixed to said grille 3 so that a surface of guidance 51 of said extraction support 5a, 5b and shown in figure 3 is disposed with an inclination of a specific angle Ø in relation to the horizontal, which can be for example approximately 3°, said inclination descending towards the exterior of the internal enclosure 10 of the oven 1. As shown in figure 4, said extraction support 5a, 5b can comprise at least one regulation groove 52 substantially vertical to each side that is crossed by one of the rivets 53 and 54 of the fixing means 53, 54, so that by adjusting the height at which said rivet 53, 54 crosses said regulation groove 52 said specific angle Ø of inclination can be adjusted.

[0011] On the surface of guidance 51 of the extraction support 5a, 5b is disposed a tray support 6a, 6b that can be slid in relation to said extraction support 5a, 5b, the tray 4 being disposed on a supporting surface 68 of said tray support 6a, 6b, and said tray 4 being introduced in the internal enclosure 10 of the oven 1 or said tray 4 moving out of said internal enclosure 10 as a result of said sliding. When said tray 4 is in said internal enclosure 10 and the door 11 of said oven 1 is closed, said door 11 prevents said sliding. When said door 11 is opened, due to said descending inclination of said surface of guidance 51 and to gravity, the tray support 6a, 6b can slide towards the exterior of said oven 1, said tray 4 being moved in conjunction with said tray support 6a, 6b, said tray 4 moving out of said internal enclosure 10. With said tray 4 disposed on said tray support 6a, 6b and outside said internal enclosure 10, when the door 11 is closed said door 11 pushes said tray support 6a, 6b, which slides and introduces itself into said internal enclosure 10, said tray 4 being introduced into said internal enclosure 10 in conjunction with said tray support 6a, 6b. To ensure that said support 11 does not scratch when pushing the tray support 6a, 6b, said tray support 6a, 6b can comprise at least one supporting element 65 on which it pushes said door 11, said supporting element 65 being of a material that does not scratch said door 11, such as plastic, for example.

[0012] The tray support 6a, 6b comprises limiter means 64 that cooperate with the grille 3 so that said tray support 6a, 6b does not slide in relation to the extraction support 5a, 5b on opening the door 11 of the oven 1, when the tray 4 is not required to move out of the internal enclosure 10 of said oven 1. Said limiter means 64 comprise a spindle 64 shown in figure 5 and which is connected to said tray support 6a, 6b, said spindle 64 being able to be moved in a direction of displacement X. In this way, said spindle 64 cooperates with a projection 31 of said grille 3, preventing said tray support 6a, 6b from sliding in relation to said extraction support 5a, 5b. By moving said spindle 64 in said direction of displacement X, said spindle 64 can be released from said cooperation, said tray support 6a, 6b being able to slide in relation to said extraction support 5a, 5b.

[0013] In a first embodiment, the supporting surface 68 of the tray support 6a, 6b can be substantially horizontal, the tray 4 remaining in a substantially horizontal position when disposed on said tray support 6a, 6b. In a second embodiment shown in figure 4, said supporting surface 68 can also be parallel to the surface of guidance 51 of the extraction support 5a, 5b, said supporting surface 68 comprising a specific angle Ø of inclination. In said second embodiment, said tray support 6a, 6b comprises at least one shoe 60 preferably on its exterior end 61, so that when a tray 4 is disposed on said tray support 6a, 6b, said tray 4 is supported on said shoe 60, said tray 4 being disposed in a substantially horizontal position. Said shoe 60 is connected to said exterior end 61 by a screw 60', for example, and said tray support 6a, 6b can also comprise at least one vertical window 62 on said exterior end 61, the height of the shoes 60 being regulated by said vertical window 62 in accordance with the specific angle Ø of inclination that has been regulated.

[0014] The extraction support 5a, 5b comprises a first support 5a fixed to one of the sides 3a of the grille 3 and a second support 5b fixed to the other side 3b of said grille 3, each support 5a and 5b comprising a surface of guidance 51 with the specific angle Ø of inclination and a regulation groove 52 to regulate said specific angle Ø of each surface of guidance 51. The tray support 6a, 6b, at the same time, comprises a first guide 6a that slides in relation to said first support 5a and a second guide 6b that slides in relation to said second support 5b, the tray 4 being disposed on said guides 6a and 6b. When the supporting surface 68 is parallel to the surface of guidance 51, each guide 6a and 6b comprises a shoe 60 disposed on its corresponding exterior end 61, so that when said tray 4 is disposed on said tray support 6a, 6b, said tray 4 is disposed on said shoes 60 remaining in a substantially horizontal position, each guide 6a and 6b then comprising a vertical window 62 on said exterior end 61.

[0015] Preferably, each guide 6a, 6b also comprises a supporting element 65 disposed on the exterior end 61 of the corresponding guide 6a, 6b, although said tray support 6a, 6b can comprise a connecting element 69 fixed to the exterior end 61 of each guide 6a, 6b thereby connecting both guides 6a, 6b, said supporting element 65 being disposed on said connecting element 69 as shown in figure 6. Said supporting element 65 can comprise a cylindrical form, for example, or any other type of form that acts so that said door 11 pushes on said supporting element 65 on closing. Said two guides 6a and 6b can also be connected by connecting means 7 with the shape of a rod, for example, so that said guides 6a and 6b slide in parallel in relation to said extraction support 5a, 5b. Said connecting means 7 can be disposed on the exterior ends 61 or on the interior ends 61' of said guides 6a and 6b.

[0016] Each guide 6a and 6b of the tray support 6a, 6b can be hollow, sliding means (not shown in the figures) being disposed in their interior, such as balls for example.

Each support 5a and 5b comprises a stop (not shown in the figures) which cooperates with the sliding means of the corresponding guide 6a, 6b, thereby preventing said sliding means from moving, preventing therefore said guide 6a, 6b from continuing to slide and coming free from said support 5a, 5b, thus preventing said slide 6a, 6b from falling to the floor. Each guide 6a and 6b comprises extraction means 63 and 66 that assist with the sliding of said guides 6a and 6b in relation to their corresponding support 5a, 5b when the door 11 of the oven 1 is opened. Said extraction means can comprise an extraction spring 66 housed in their interior and fixed to its exterior end 61, as shown in figure 7. Said extraction spring 66 is compressed when said door 11 of the oven 1 is closed, being decompressed when said door 11 is opened, said extraction spring 66 pushing said sliding means, assisting with the sliding of said guides 6a and 6b in relation to the extraction support 5a, 5b.

[0017] The extraction means can comprise an extraction tab 63 on their exterior end 61 instead of said extraction spring 66 and said displacement means, as shown in figure 8. Said extraction tab 63 is compressed when the door 11 of the oven 1 is closed, so that when said door 11 is opened, said extraction tab 63 is decompressed and cooperates with the grille 3 or with the corresponding support 5a, 5b, thereby assisting with the sliding of said guides 6a and 6b in relation to the extraction support 5a, 5b.

Claims

1. Mechanism for extracting a tray from a domestic oven, said oven (1) comprising an internal enclosure (10) into which can be introduced at least one tray (4) disposed on a movable grille (3), and a door (11) that insulates said internal enclosure (10) from the exterior when it is closed, **characterised in that** the mechanism comprises an extraction support (5a,5b) that is fixed to both sides (3a,3b) of the grille (3) by fixing means (53,54), thereby disposing of a surface of guidance (51) of said extraction support (5a,5b) with an inclination of a specific angle (Ø) in relation to the horizontal and said inclination descending towards the exterior of said internal enclosure (10), said mechanism also comprising a tray support (6a, 6b) on which is disposed the tray (4) and which is adapted to support and slide in relation to the surface of guidance (51) of said extraction support (5a,5b), the door (11) of the oven (1) preventing said sliding when it is closed, so that when said door (11) is opened, due to the descending inclination of said surface of guidance (51), said tray support (6a,6b) can slide by gravity towards the exterior of said oven (1) thereby moving said tray (4) in conjunction with said tray support (6a,6b).

2. Mechanism according to the preceding claim, wherein the extraction support (5a,5b) comprises at least one substantially vertical regulation groove (52) crossed by the fixing means (53,54) that fix said extraction support (5a,5b) to the grille (3), so that the specific angle (Ø) of inclination of the surface of guidance (51) of said extraction support (5a,5b) can be regulated, thereby adjusting the height at which said fixing means (53,54) cross said regulation groove (52).

3. Mechanism according to any of the preceding claims, wherein the fixing means (53,54) comprise rivets (53,54) and the grille (3) comprises a rod (30) substantially horizontal to each side (3a,3b), said rivets (53,54) being riveted to said rod (30) in order to fix the extraction support (5a,5b) to said grille (3).

4. Mechanism according to any of the preceding claims, wherein the tray support (6a,6b) comprises limiter means (64) that can cooperate with the grille (3) to prevent said tray support (6a,6b) from sliding in relation to the extraction support (5a,5b) when the door (11) of the oven (1) is opened, thereby preventing the tray (4) disposed on said tray support (6a,6b) from moving out of the internal enclosure (10) of the oven (1).

5. Mechanism according to any of the preceding claims, wherein the tray support (6a,6b) comprises a substantially horizontal supporting surface (68) on which the tray (4) is disposed, so that said tray (4) remains in a substantially horizontal position.

6. Mechanism according to any of claims 1 to 4, wherein the tray support (6a,6b) comprises a supporting surface (68) on which the tray (4) is disposed substantially parallel to the surface of guidance (51) of the extraction support (5a,5b), at least one shoe (60) being disposed on said supporting surface (68) and said tray being disposed on said shoe (60), so that said tray (4) remains in a substantially horizontal position.

7. Mechanism according to the preceding claim, wherein the tray support (6a,6b) comprises at least one vertical window (62), the height of the shoe (60) being regulated by said vertical window (62), so that the tray (4) can remain in a substantially horizontal position with different specific angles (Ø) of inclination of said tray support (6a, 6b) .

8. Mechanism according to any of the preceding claims, wherein the extraction support (5a,5b) comprises a first support (5a) fixed to one of the sides (3a) of the grille (3) that comprises a surface of guidance (51) with the specific angle (Ø) of inclination and a second support (5b) fixed to the other side (3b) of said grille (3) that comprises a surface of guidance

(51) with the specific angle (Ø) of inclination, the tray support (6a,6b) comprising a first guide (6a) that slides in relation to said first support (5a) and a second guide (6b) that slides in relation to said second support (5b), the tray (4) being disposed on said guides (6a,6b).

9. Mechanism according to the preceding claim, wherein the two guides (6a,6b) of the support tray (6a,6b) are connected by connecting means (7), so that said guides (6a,6b) can slide in parallel in relation to the supports (5a,5b).

10. Mechanism according to either of claims 8 and 9, wherein the guides (6a,6b) of the tray support (6a, 6b) comprise extraction means (63,66) that assist with the sliding of the guides (6a,6b) in relation to the supports (5a,5b) when the door (11) of the oven (1) is opened.

11. Mechanism according to the preceding claim, wherein the guides (6a,6b) of the tray support (6a, 6b) are hollow and comprise sliding means disposed in their interior, each guide (6a,6b) also comprising an extraction spring (66) in their interior fixed to an exterior end (61) of the corresponding guide (6a,6b) and which is compressed when the door (11) of the oven (1) is closed, so that when said door (11) is opened, said extraction spring (66) is compressed, thereby pushing the corresponding sliding means, said guides (6a,6b) thus sliding in relation to the supports (5a,5b).

12. Mechanism according to claim 10, wherein each guide (6a,6b) of the tray support (6a,6b) comprises an extraction tab (63) on their exterior end (61), said extraction tabs (63) being compressed when the door (11) of the oven (1) is closed, so that when said door (11) is opened said extraction tabs (63) are decompressed, thereby cooperating with the grille (3), said guide (6a,6b) thus sliding in relation to the supports (5a,5b).

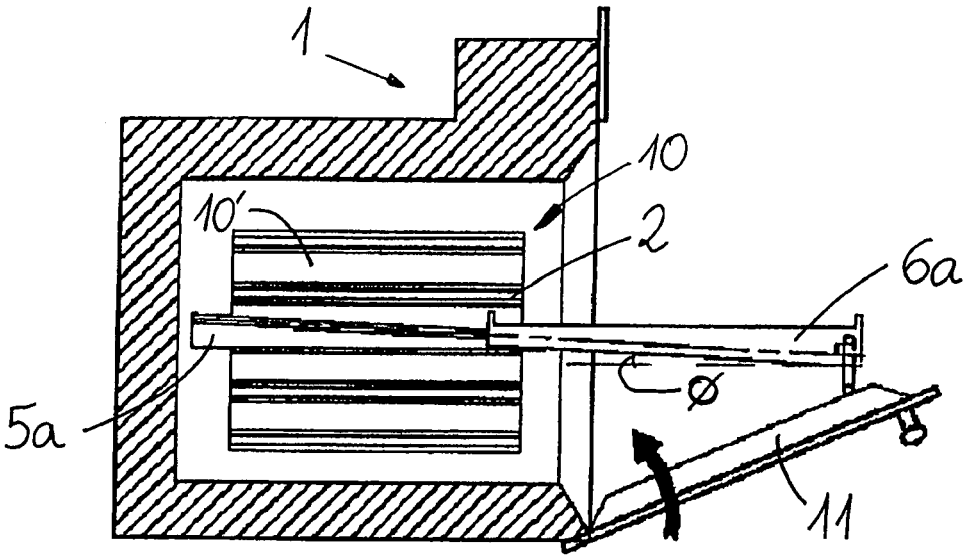

FIG. 1

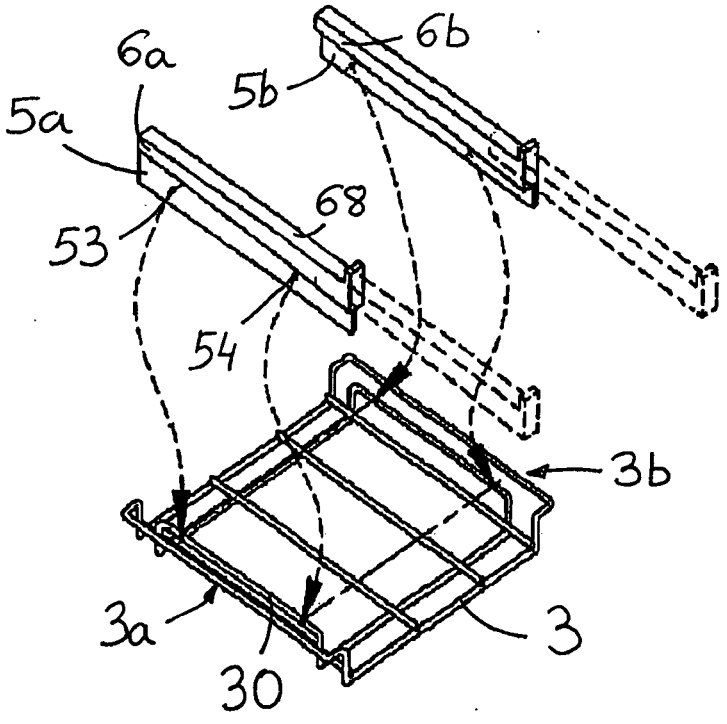

FIG. 2

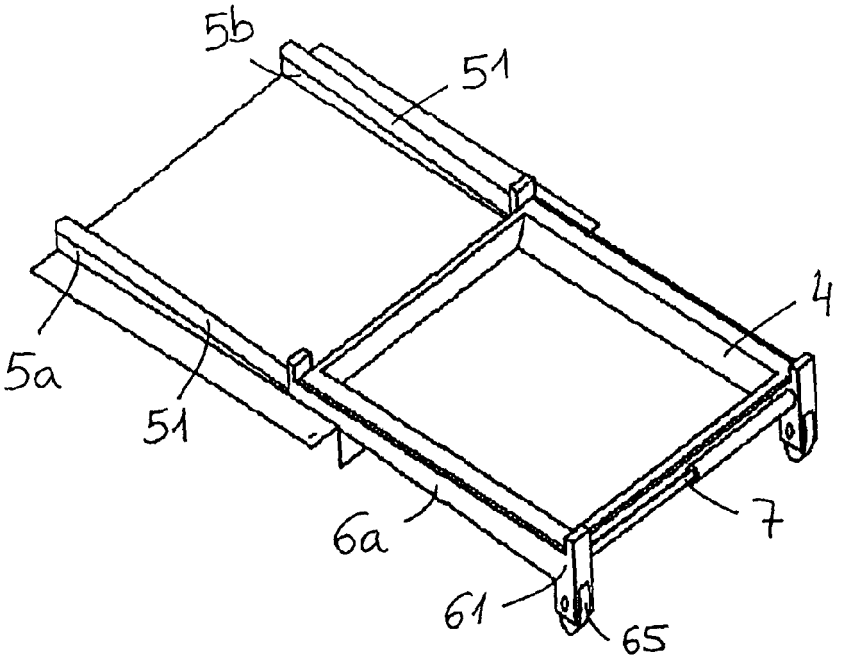

FIG. 3

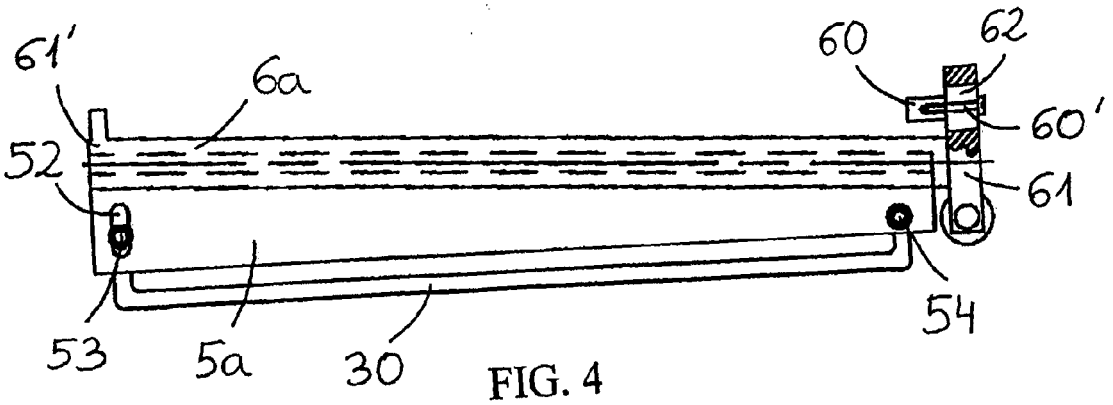

FIG. 4

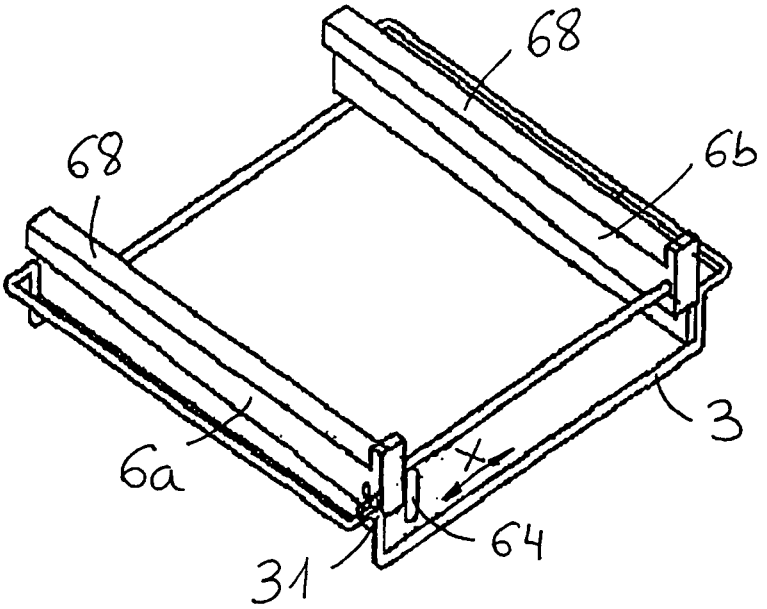

FIG. 5

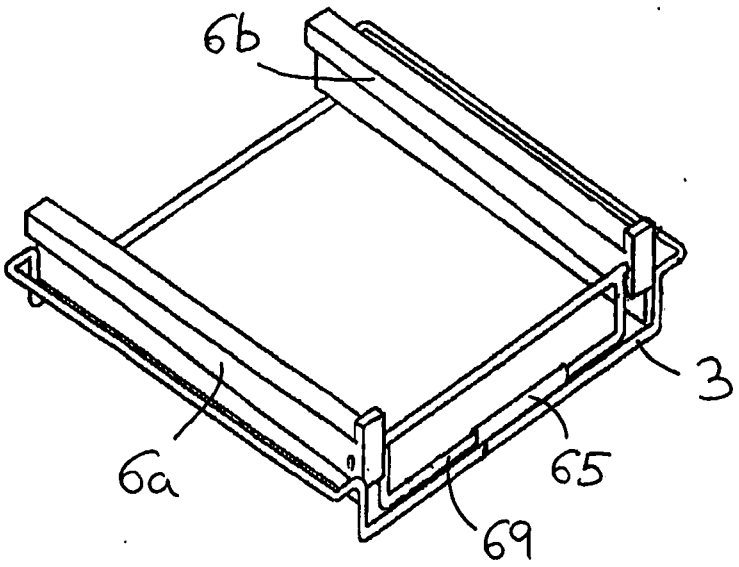

FIG. 6

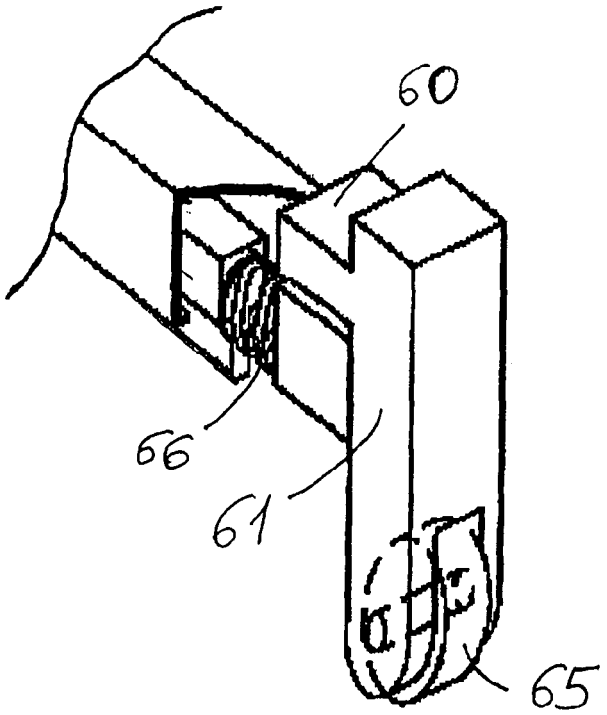

FIG. 7

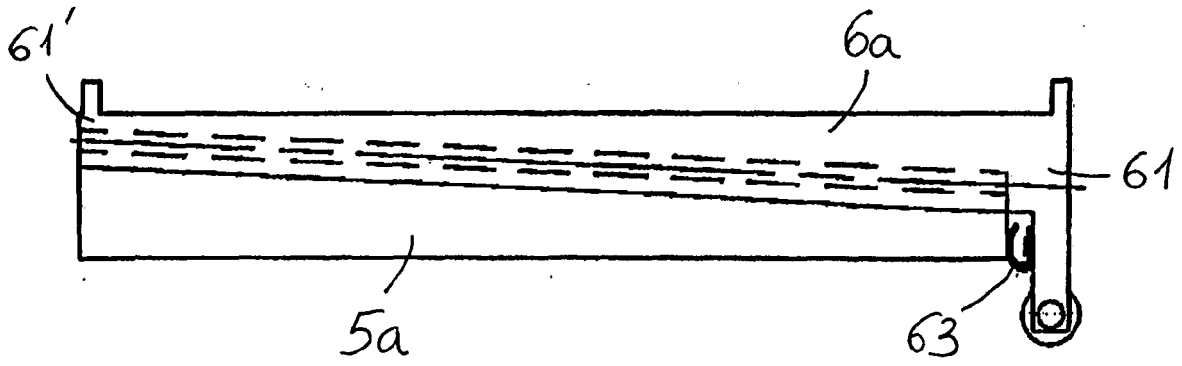

FIG. 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 38 0157

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	DE 75 07 245 U (DE DIETRICH & CIE) 7 August 1975 (1975-08-07) * page 2, lines 1-12; figure *	1	INV. F24C15/16
A	EP 0 931 985 A2 (FAGOR S COOP LTDA [ES] FAGOR S COOP [ES]) 28 July 1999 (1999-07-28) * page 1; figure 1 *	1	
A	US 2006/065265 A1 (ERDMANN KLAUS [US] ET AL) 30 March 2006 (2006-03-30) * paragraphs [0009], [0024]; figures *	1	
A	US 2006/102015 A1 (BAKER EDWARD [US] ET AL) 18 May 2006 (2006-05-18) * figures *	1	
A	EP 1 420 210 A (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 19 May 2004 (2004-05-19) * column 3, lines 35-44; figures 1-3 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 January 2007	VON MITTELSTAEDT, A

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 06 38 0157

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.

16-01-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 7507245 U	07-08-1975	FR 2266110 A1	24-10-1975
EP 0931985 A2	28-07-1999	DE 69819295 D1	04-12-2003
		DE 69819295 T2	26-08-2004
		ES 1039421 U1	16-12-1998
		PT 931985 T	31-03-2004
US 2006065265 A1	30-03-2006	CA 2515172 A1	27-03-2006
US 2006102015 A1	18-05-2006	NONE	
EP 1420210 A	19-05-2004	DE 10253156 A1	27-05-2004

EPO FORM P0459

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

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

- ES 1039421 U **[0003]**