

(19)



(11)

EP 2 000 740 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
31.10.2012 Bulletin 2012/44

(51) Int Cl.:
F24C 15/02 ^(2006.01)

(21) Application number: **07109512.9**

(22) Date of filing: **04.06.2007**

(54) **Cooking oven with side opening door and stopper**

Backofen mit seitlicher Öffnungstür und Stopper

Four de cuisson avec porte à ouverture latérale et butoir

(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 MT NL PL PT RO SE
SI SK TR**

(43) Date of publication of application:
10.12.2008 Bulletin 2008/50

(73) Proprietor: **Electrolux Home Products
Corporation N.V.
1130 Brussel (BE)**

(72) Inventor: **Capacci, Mirko
47100, Forli (IT)**

(74) Representative: **Baumgartl, Gerhard Willi et al
Electrolux Dienstleistungs GmbH
Group Intellectual Property
90327 Nürnberg (DE)**

(56) References cited:
**EP-A- 0 706 012 EP-A- 0 823 830
EP-A- 1 477 064 DE-B3-102005 047 080
GB-A- 400 750**

EP 2 000 740 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention describes an improved kind of oven for cooking food, preferably intended for home use, comprising a laterally opening door for gaining access into and closing the cooking cavity of such oven.

[0002] While reference is specially made throughout the following description to a food cooking oven of the built-in type, it will nevertheless be appreciated that what is being explained, illustrated and generally set forth in the same specification shall be understood as equally applying to - and thus used in - food cooking oven that is integrated in a free-standing cooking appliance that includes both a cooking oven and a cooking surface, i.e. a cooktop.

[0003] The ovens, which the present invention refers to, are largely known as such in the art, as they are for instance described in the European patent application No. 07107938.2.

[0004] DE 10 2005 047 080 B3 discloses a hinge for a door of a microwave oven having an equipment sided hinge part and a door-sided hinge part. An equipment sided guiding bolt is arranged, where the guiding bolt is guided in a door-sided guiding curve. A door-sided guiding bolt is guided into an equipment sided guiding curve. The door-sided guiding curve comprises curved end-regions between which a rectilinear area or an opposed curved area is provided, where the hinge-joint is symmetrical. This document discloses the preamble of claim 1.

[0005] GB 400 750 discloses a hinge for oven and like doors, comprising a socket member 10 on the door 6 engaging a pin 9 carried by a bracket 8 on the frame 7, a recess 12 cut in the lower part of the socket member and an upstanding rib 11 on the bracket 8 engaging with the walls of the recess to limit the movement of the door.

[0006] The present invention solves the following two drawbacks generated by the laterally opening door in a cooking oven, i. e.:

- 1) when the door is being opened, it tends to rotate to almost 180°, until to go to bump into the front sides of the appliances or furniture placed close and next door of the oven itself,
- 2) if however its position swings around a rotation of about 90°, the user may accidentally go into contact with its inner surface; as it usually is very hot, it easily may burn or hurt the user's hand.

[0007] It would therefore be desirable, and it is actually a main purpose of the present invention, to provide an oven for food cooking applications, which is provided with a side-hinged door, in which the above drawbacks have been avoided, by automatically stopping the rotation of the side-hinged door when it reaches a pre-defined position.

[0008] According to the present invention, these aims, along with further ones that will become apparent from

the following disclosure, are reached in a kind of cooking oven provided with a sidewise opening door that incorporates the features and characteristics as defined and recited in the appended claims.

[0009] Advantages and features of the present invention will anyway be more readily understood from the description that is given below by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is an outer view of a closed side opening door in a cooking oven according to the invention,
- Figure 2 is an outer and simplified perspective view of a device according to the present invention, in two mounting positions and with the respective enlargements,
- Figure 3 is a perspective view and a related enlargement of a first component of the invention,
- Figure 4 is a perspective view of the inner edge of a door in a cooking oven according to the present invention,
- Figure 4A shows a second component according to the present invention, in two enlarged view, and in reciprocal embodiments,
- Figure 5 and 5A illustrate a top view and a respective enlargement of a half-opened door in a cooking oven provided with the devices of this invention,
- Figure 6 is an outer perspective view of the devices of figures 5 and 5A, the door being half-opened, according to the present invention.

[0010] With reference to Figure 1 and 5, a food cooking oven according to the present invention comprises:

- a cooking cavity capable of being closed by a door 2 that is hinged on a vertical side edge 3 thereof, and
- a vertical plate 5 attached on the front portion of the side outer wall 6 of said cooking cavity, and which is close to said vertical edge 3.

[0011] In correspondence of said vertical edge, a vertical support 7, connected to said edge, is attached, which is also integral with the door; between said vertical support and said plate suitable hinges are engaged through known means, and which allow the door to laterally rotate, i. e. with respect to a vertical axis "X" passing both through said vertical support 7, and through said plate.

[0012] It comprises, on at least a top or bottom extreme, a first horizontal flat element 10 ending with a vertical prolongation 11; also said vertical support 7 comprises a respective second horizontal flat element 12, apt to rotate around said vertical axis "X".

[0013] In the interference position, the two surfaces (S1, S2) of said vertical prolongation (11) and of said appendix (13), which about each other, are flat and contact on their respective front sides.

[0014] Said horizontal elements 10 and 12 are so implemented to be adjacent, and almost into contact, to each other, as usual for the common hinges; moreover the element 12 is provided with a horizontally extending appendix 13.

[0015] According to the invention, said vertical prolongation 11 and said appendix 13 are sized and reciprocally placed so as to reciprocally interfere to each other when the vertical support 7 is being rotated from a first position to a second pre-defined position.

[0016] Basically, said vertical prolongation 11 realizes a "Stopper", which is firm with the oven frame, and which prevents the door, to which said appendix 13 is connected, from rotating from a first position, next to the closing position, to a second and pre-defined position closer to the opened position, so achieving the main scope of the invention.

[0017] It was also noted that an optimum compromise, between the need of avoiding a too wide door opening and a too limited opening, which wouldn't avoid the risk of skin burning, consists in determining to around 120° the door rotation angle, to which the door itself is stopped by said prolongation 11, here acting as an interference stopper.

[0018] Of course, as shown in the figures, the implementation of the just described elements may be advantageously carried out not only on one extremity of said plate and on said support 7, but on both said extremities; however such information seems to be fully obvious to a man skilled in the art and therefore, being intended that what has been previously explained and what follows may be applied on both the upper and lower door edges, will not further discussed.

[0019] With regard to the door hinge, advantageously and for constructive, more than functional reasons, it is implemented by engaging said first flat horizontal element 10 with said second flat horizontal element 12; such engagement is implemented preferably by placing a vertical pivot 14 on one of said elements, and a corresponding vertical through-hole 15 on the other element.

[0020] Apparently the material implementation of such solution may be reversed, in the sense that, obviously, the vertical pivot 14 and the through-hole 15 may be changed in their position, differently from what shown in the figures; but such obvious possibility will not further considered.

[0021] Moreover, in order to simplify the implementation and the mounting of the involved components, and with ref. to the figures 2, 3 and 5A, said first horizontal flat element 10 is arranged leaning ahead with respect to the plane of the access mouth of the cooking cavity.

[0022] As especially shown in figures 2 and 3, an improved embodiment consists in placing said vertical prolongation 11 on a lateral side with respect to the direction

leaning ahead of said horizontal flat element 10; such improvement indeed allows a simpler realization both of said prolongation 11 and of the corresponding appendix 13.

5 [0023] With ref. to the figures, and especially to the figures 4A and 5A, in said interference position, the two contact surfaces, respectively S1 and S2 of said vertical prolongation and of said appendix, reciprocally abutting, are flat and contact each other in a substantially front position.

Claims

10 1. Food cooking oven comprising:

- a cooking cavity (1),
- a door (2) provided to close said cooking cavity, said door being hinged on a vertical side edge (3) thereof,
- a vertical plate (5), attached on the front portion of the side outer wall (6) of said cooking cavity, and close to said vertical edge (3),
- vertical support (7) for said door connected to said edge (3),
- rotating connecting means able to hinge with rotating movement said vertical support (7) with said plate (5), wherein said vertical plate (5) comprises, on at least a bottom extremity, a first horizontal flat element (10), to whose end a vertical prolongation (11) is connected,
- said vertical support (7) comprises a respective second horizontal flat element (12) apt to rotate around a vertical "X" axis, and arranged in a position close to said first flat element (10), and provided with a horizontally extending appendix (13), wherein said vertical prolongation (11) and said appendix (13) are so sized to interfere each other when said vertical support (7) is being rotated from a first position, when the door is almost closed, to a second pre-defined position

wherein said first horizontal flat element (10) is leaning out with respect to the opening mouth plane of the cooking cavity,

wherein in the interference position the two surfaces (S1, S2) of said vertical prolongation (11) and of said appendix (13), which abut each other, contact on their respective front sides,

wherein said vertical prolongation (11) is placed laterally with respect to the leaning out direction of said first horizontal flat element (10), **characterized in that** the two surfaces (S1, S2) of said vertical prolongation (11) and of that appendix (13) which about each other, are flat, and **in that** it comprises, on at least a top or bottom extreme, a first horizontal flat element (10) ending with a vertical prolongation (11).

2. Cooking oven according to claim 1, **characterized in that** said second pre-defined position corresponds to a door opening angle greater than 90° and preferably of 120°.
3. Cooking oven according to claim 1 or 2, **characterized in that** said first flat horizontal element (10) and said second horizontal flat element (12) are hinged each other, preferably by a vertical pivot (14) arranged on one of said elements, and a corresponding vertical hole (15) placed on the other element.

Patentansprüche

1. Ofen zum Garen von Lebensmitteln, umfassend:

- einen Garraum (1),
- eine Tür (2), die vorgesehen ist, um den Garraum zu verschließen, wobei die Tür an einer vertikalen Seitenkante (3) desselben angelenkt ist,
- eine vertikale Platte (5), die am Frontabschnitt der seitlichen Außenwand (6) des Garraums und in der Nähe der vertikalen Kante (3) angebracht ist,
- eine vertikale Halterung (7) für die Tür, die mit der Kante (3) verbunden ist,
- rotierende Verbindungsmittel, die geeignet sind, die vertikale Halterung (7) mit einer Drehbewegung an die Platte (5) anzulenken, wobei die vertikale Platte (5) an mindestens einem unteren Ende ein erstes horizontales ebenes Element (10) umfasst, mit dessen Ende eine vertikale Verlängerung (11) verbunden ist,
- wobei die vertikale Halterung (7) ein jeweiliges zweites horizontales ebenes Element (12) umfasst, das geeignet ist, um eine vertikale "X"-Achse zu rotieren, in einer Position in der Nähe des ersten ebenen Elements (10) angeordnet ist und mit einem sich horizontal erstreckenden Fortsatz (13) versehen ist, wobei die vertikale Verlängerung (11) und der Fortsatz (13) derart bemessen sind, dass sie miteinander interferieren, wenn die vertikale Halterung (7) von einer ersten Position, wenn die Tür fast geschlossen ist, zu einer zweiten vordefinierten Position rotiert wird,

wobei das erste horizontale ebene Element (10) in Bezug auf die Ebene der Öffnung des Garraums hinausgeneigt ist, wobei in der Interferenzposition die zwei Oberflächen (S1, S2) der vertikalen Verlängerung (11) und des Fortsatzes (13), die aneinander anstoßen, sich an ihren jeweiligen Frontseiten berühren,

wobei die vertikale Verlängerung (11) in Bezug auf die Richtung der Hinausneigung des ersten horizon-

talen ebenen Elements (10) seitlich angeordnet ist, **dadurch gekennzeichnet, dass** die zwei Oberflächen (S1, S2) der vertikalen Verlängerung (11) und des Fortsatzes (13), die aneinander anstoßen, eben sind und dass an mindestens einem oberen oder unteren Ende ein erstes horizontales ebenes Element (10) vorgesehen ist, das mit einer vertikalen Verlängerung (11) endet.

2. Garofen nach Anspruch 1, **dadurch gekennzeichnet, dass** die zweite vordefinierte Position einem Türöffnungswinkel von mehr als 90° und vorzugsweise von 120° entspricht.
3. Garofen nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das erste ebene horizontale Element (10) und das zweite horizontale ebene Element (12) vorzugsweise durch einen vertikalen Drehzapfen (14) aneinander angelenkt sind, der an einem der Elemente angeordnet ist, und dass ein entsprechendes vertikales Loch (15) an dem anderen Element angeordnet ist.

Revendications

1. Four de cuisson alimentaire comprenant :

une cavité de cuisson (1),
 une porte (2) prévue pour fermer ladite cavité de cuisson, ladite porte étant articulée sur son côté latéral vertical (3),
 une plaque verticale (5) fixée sur la partie avant de la paroi externe latérale (6) de ladite cavité de cuisson, et à proximité dudit bord vertical (3),
 un support vertical (7) pour ladite porte raccordée audit bord (3),
 des moyens de raccordement rotatifs pouvant s'articuler avec le mouvement de rotation dudit support vertical (7) avec ladite plaque (5), dans lequel ladite plaque verticale (5) comprend, sur au moins une extrémité inférieure, un premier élément plat horizontal (10), à une extrémité duquel un prolongement vertical (11) est raccordé, ledit support vertical (7) comprend un second élément plat horizontal (12) respectif apte pour tourner autour d'un axe en « X » vertical et agencé dans une position à proximité dudit premier élément plat (10), et prévu avec un appendice (13) s'étendant horizontalement, dans lequel ledit prolongement vertical (11) et ledit appendice (13) sont dimensionnés pour interférer l'un avec l'autre lorsque ledit support vertical (7) est entraîné en rotation à partir d'une première position, lorsque la porte est presque fermée, jusqu'à une seconde position prédéfinie, dans lequel ledit premier élément plat horizontal (10) est penché par rapport au plan de la bouche

d'ouverture de la cavité de cuisson,
 dans lequel, dans la position d'interférence, les
 deux surfaces (S1, S2) dudit prolongement ver-
 tical (11) et dudit appendice (13), qui viennent
 en butée entre eux, sont en contact sur leurs 5
 côtés avant respectifs,
 dans lequel ledit prolongement vertical (11) est
 placé latéralement par rapport à la direction d'in-
 clinaison dudit premier élément plat horizontal
 (10), **caractérisé en ce que** les deux surfaces 10
 (S1, S2) dudit prolongement vertical (11) et dudit
 appendice (13), qui viennent en butée entre eux,
 sont plates et **en ce qu'il** comprend, sur au
 moins une extrémité supérieure ou inférieure,
 un premier élément plat horizontal (10) se ter- 15
 minant par ledit prolongement vertical (11).

2. Four de cuisson selon la revendication 1, **caracté-
 risé en ce que** ladite seconde position prédéfinie 20
 correspond à un angle d'ouverture de porte supé-
 rieur à 90° et de préférence de 120°.
3. Four de cuisson selon la revendication 1 ou 2, **ca-
 ractérisé en ce que** ledit premier élément plat ho- 25
 rizontal (10) et ledit second élément plat horizontal
 (12) sont articulés l'un par rapport à l'autre, de pré-
 férence par un pivot vertical (14) agencé sur l'un des-
 dits éléments, et un trou vertical (15) correspondant
 placé sur l'autre élément.

30

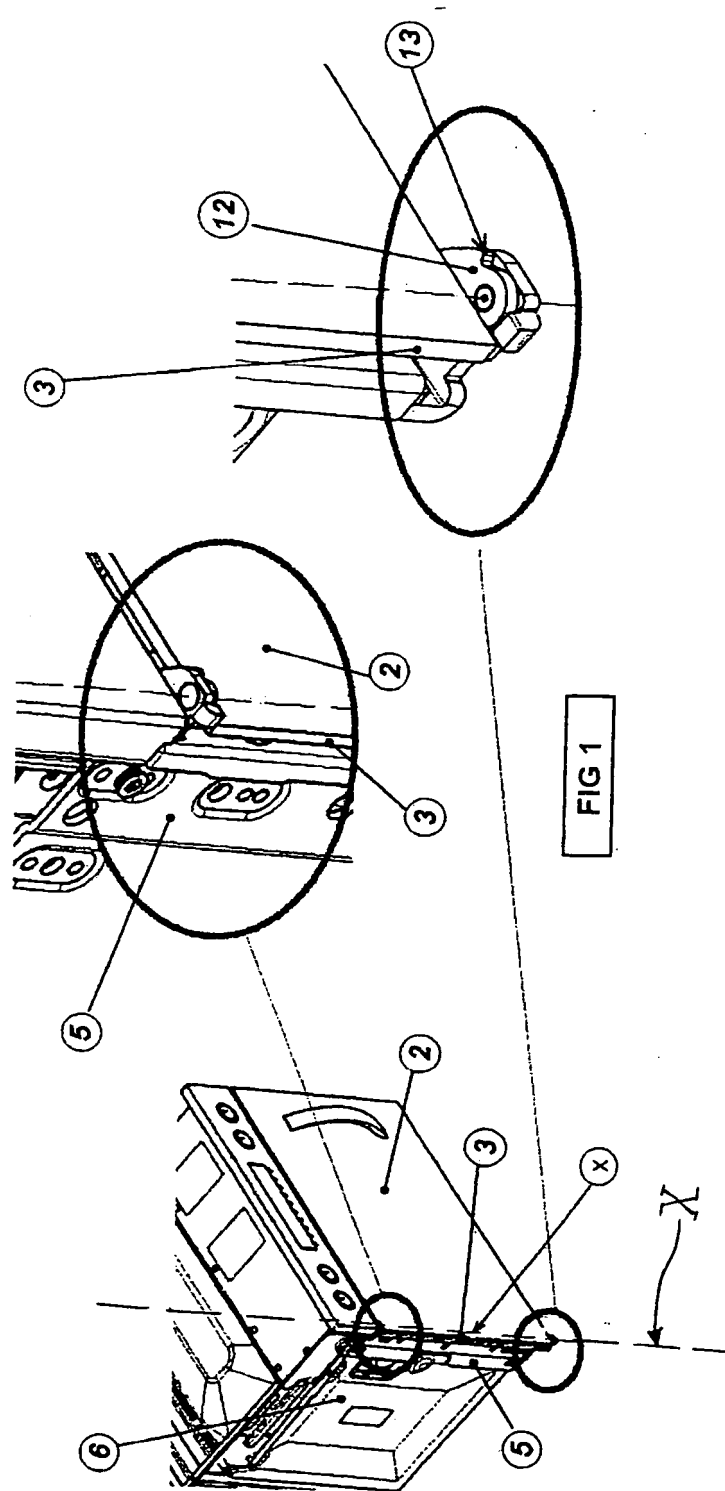
35

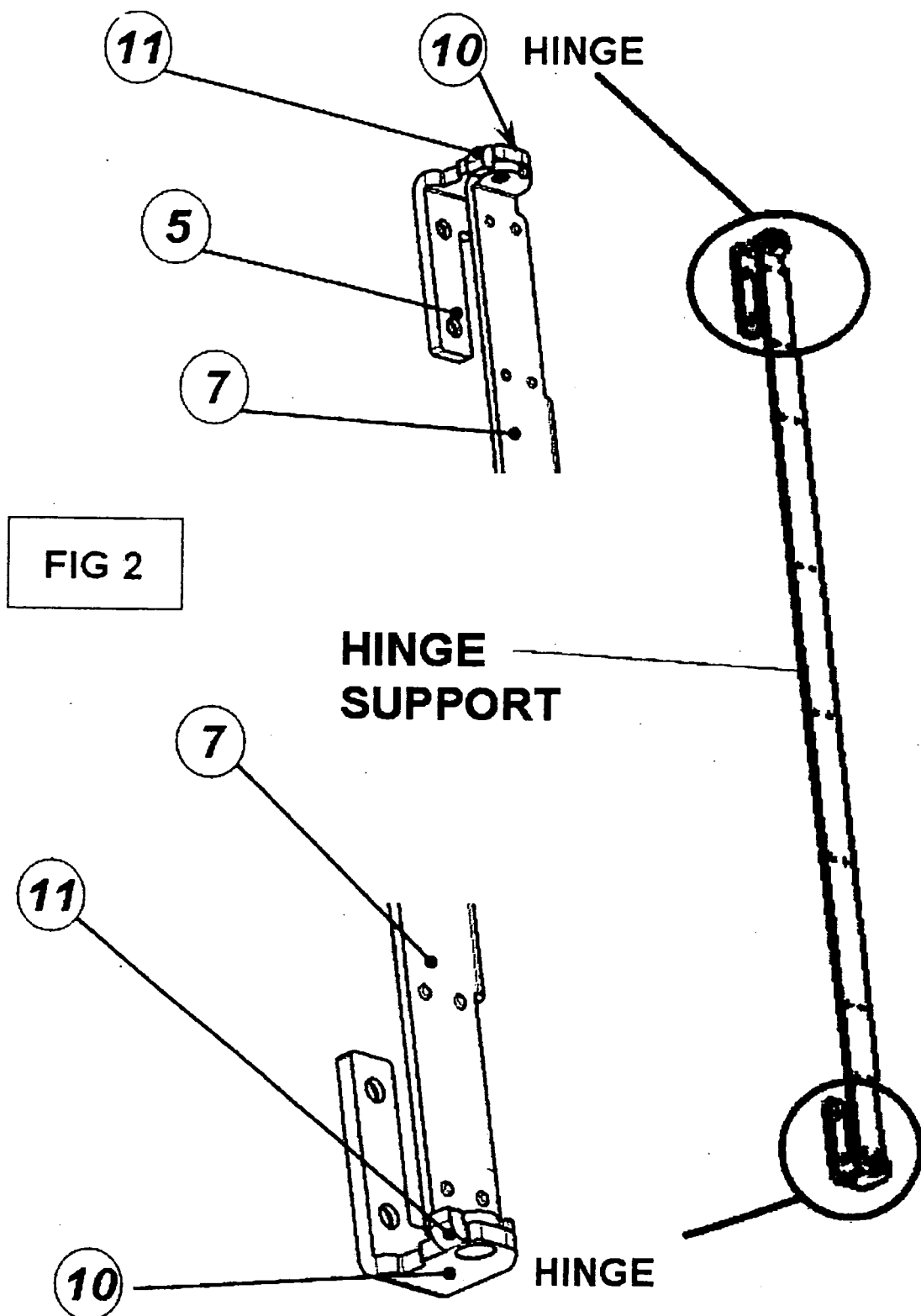
40

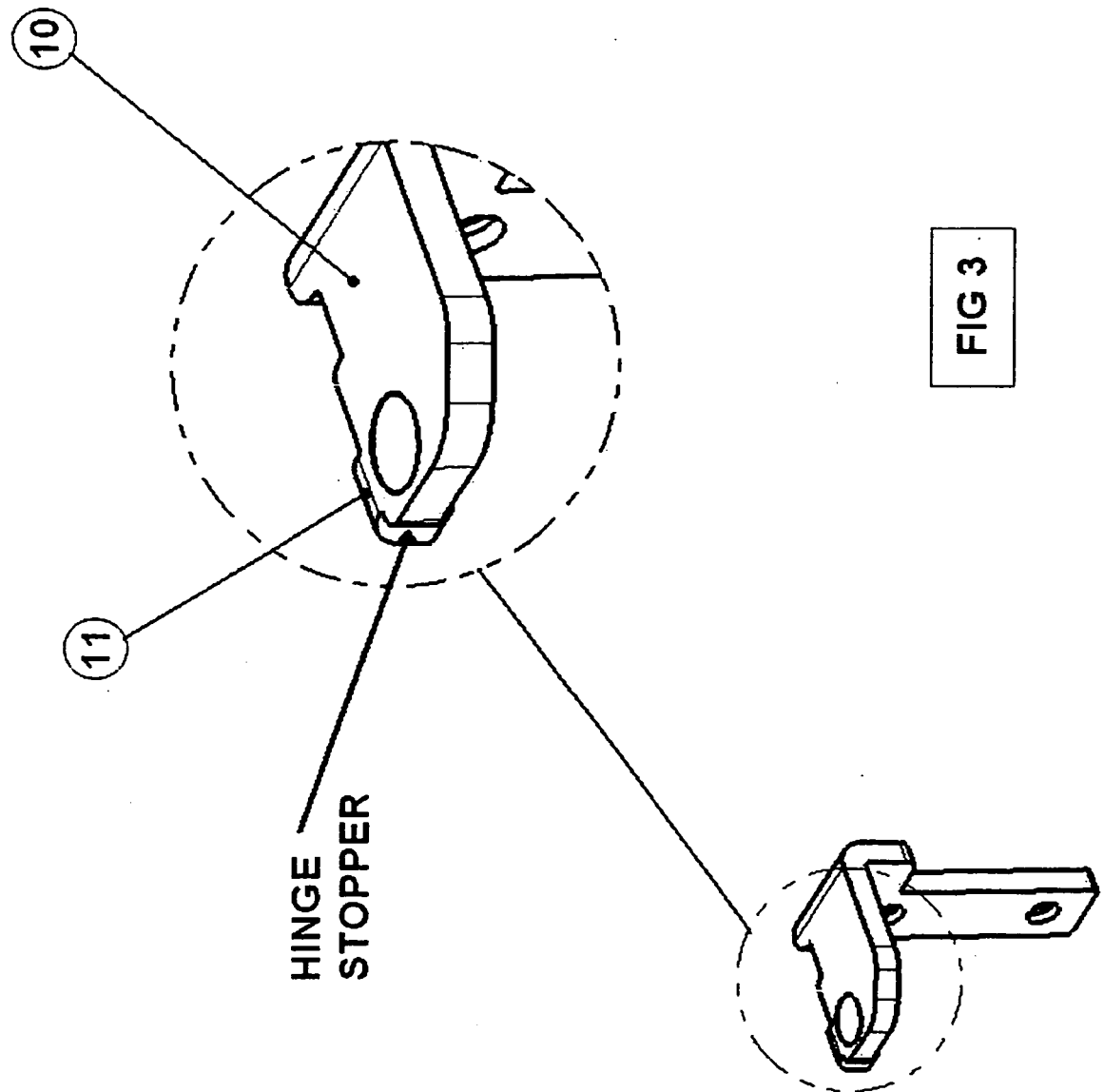
45

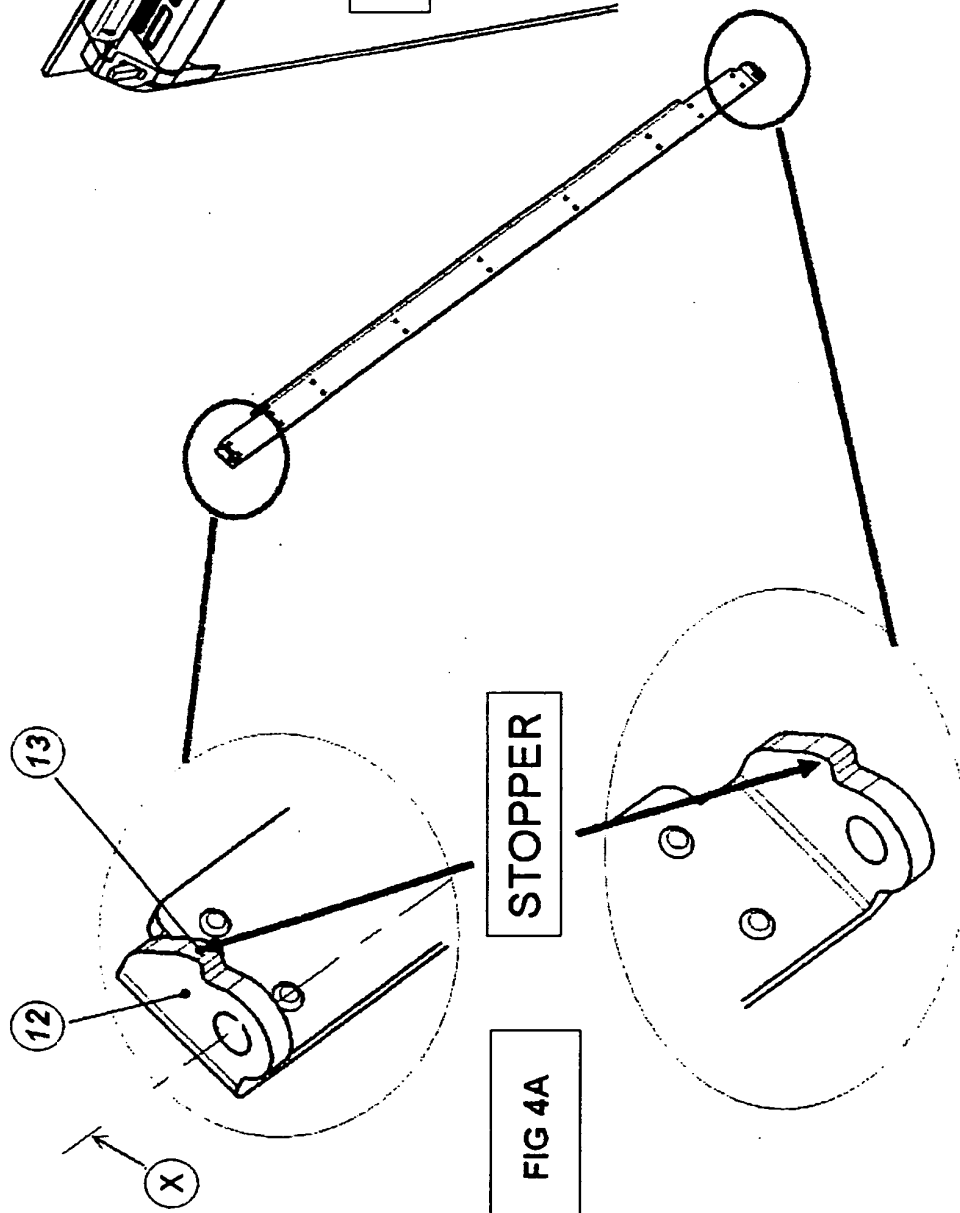
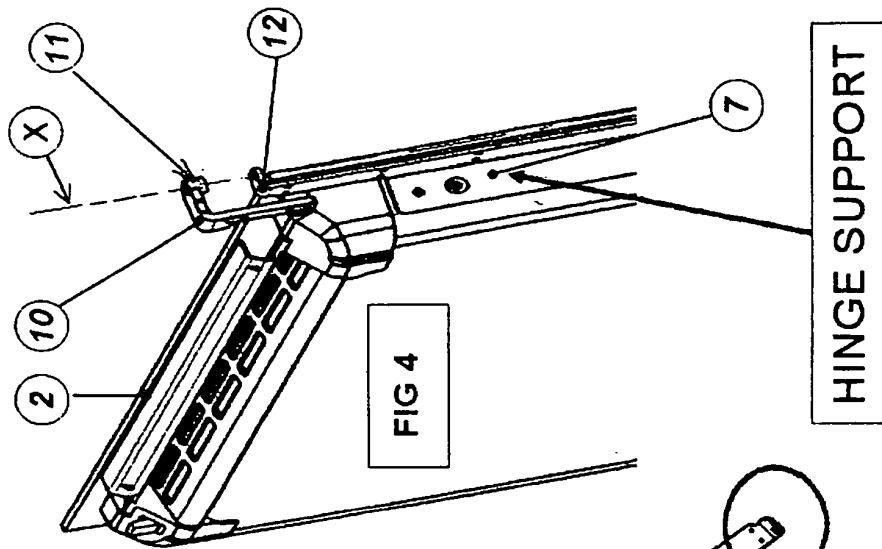
50

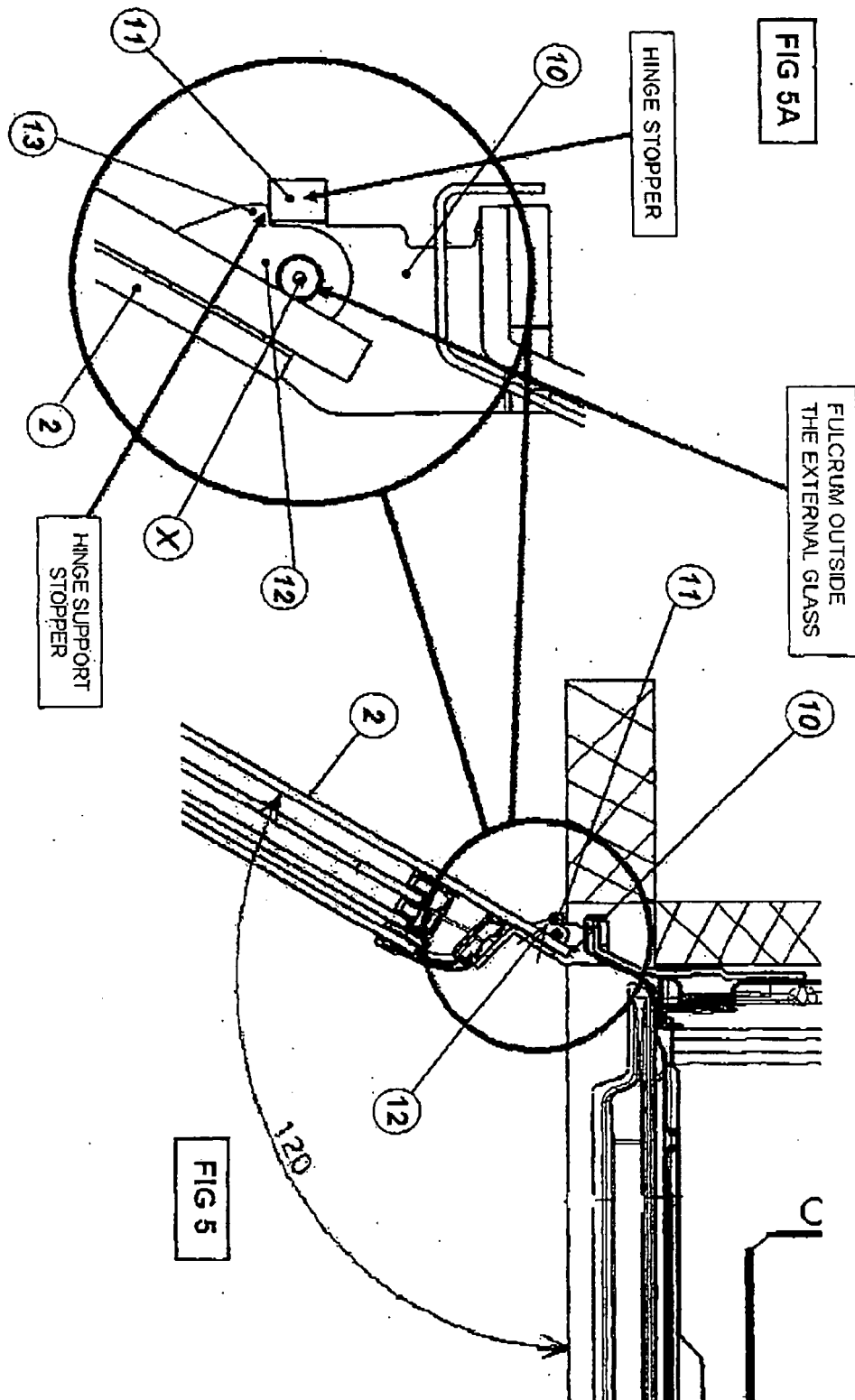
55

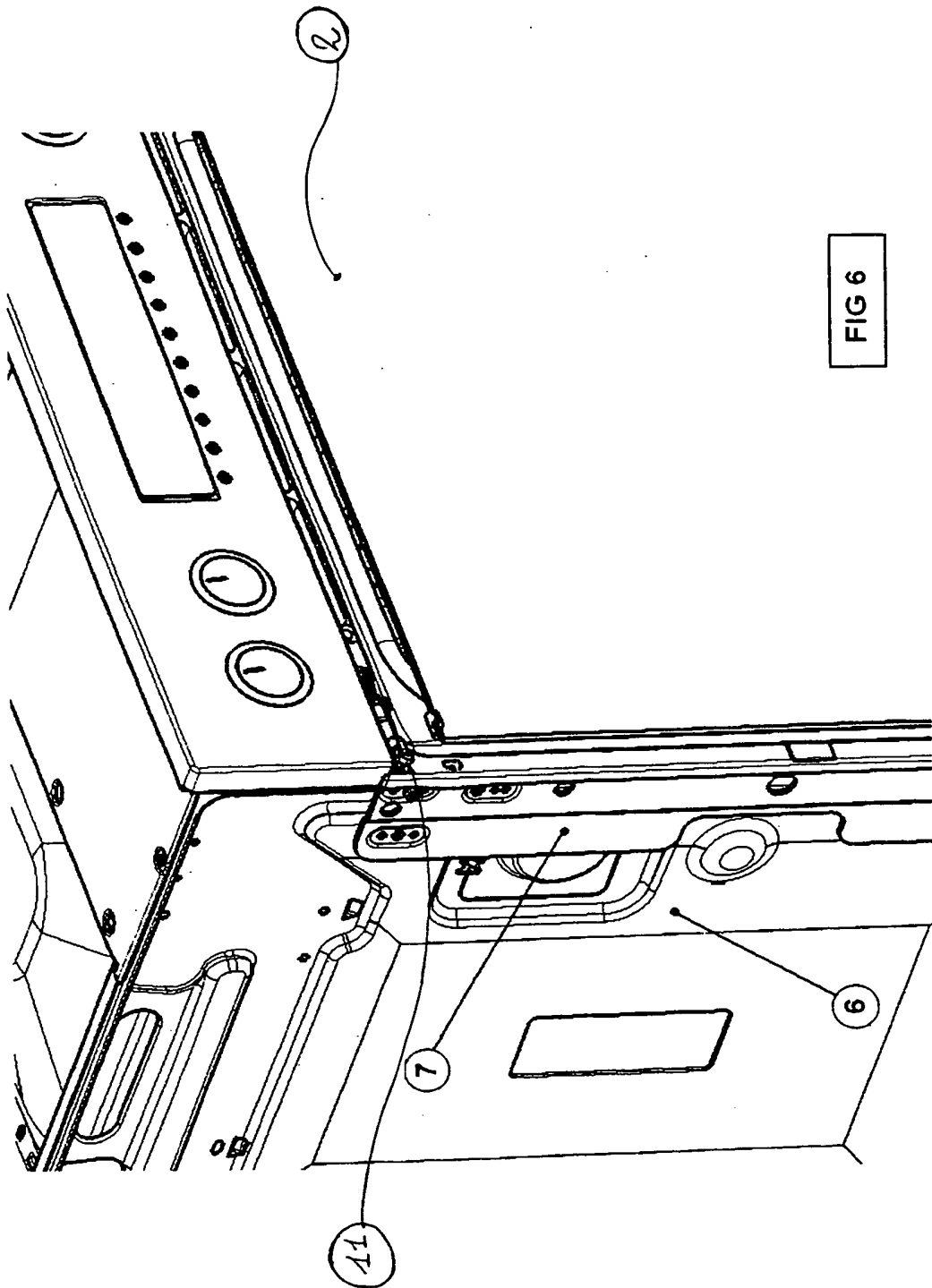












REFERENCES CITED IN THE DESCRIPTION

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

- DE 07107938 [0003]
- DE 102005047080 B3 [0004]
- GB 400750 A [0005]