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(72) Inventors:
• **Tridello, Cris**
33080 Porcia (PN) (IT)
• **Lampitelli, Francesco**
33080 Porcia (PN) (IT)

(71) Applicant: **Electrolux Home Products Corporation N.V.**
1130 Brussel (BE)

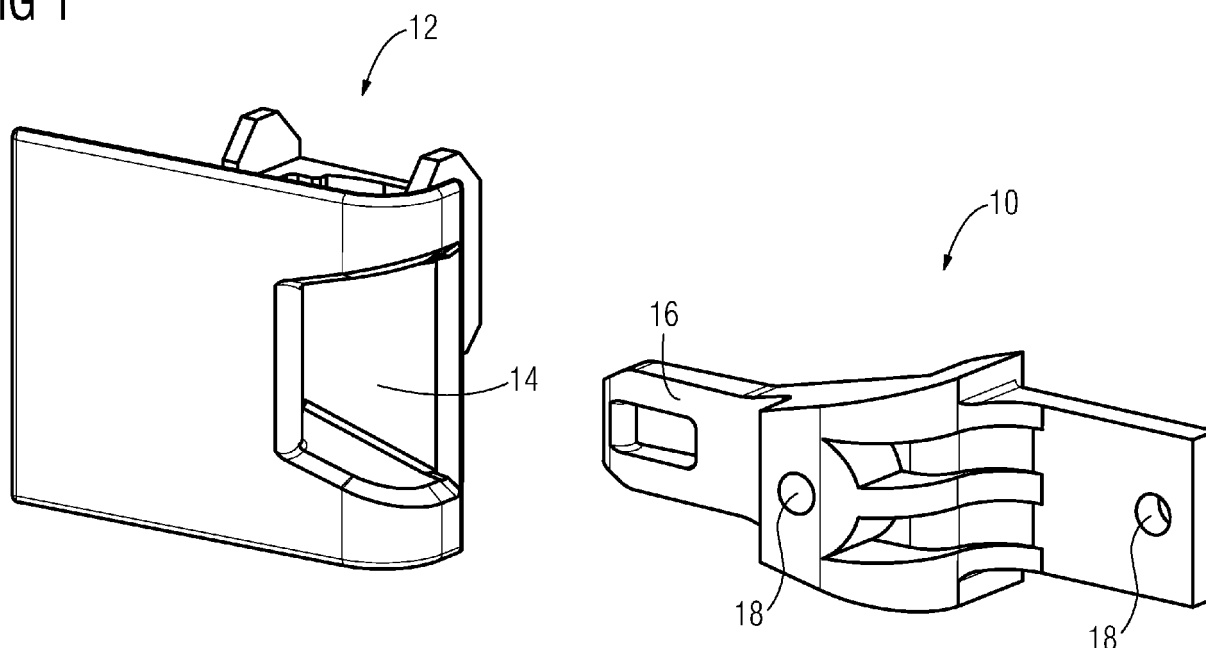
(74) Representative: **Baumgartl, Gerhard Willi**
Electrolux Dienstleistungs GmbH
Group Intellectual Property
90327 Nürnberg (DE)

(54) **A cooking oven including a swinging oven door and a closure system for said oven door**

(57) The present invention relates to a cooking oven (20) including a swing oven door (22) and a closure system (10, 12) for said swing oven door (22). The closure system comprises a hook element (10) attached or attachable at the cooking oven. The closure system comprises a hook seat element (12) attached or attachable at the cooking oven. The hook seat element (12) includes

an opening (14) for receiving a hook (16) projecting from the hook element (10). The hook element (10) and the hook seat element (12) are detachably connectable by a latching mechanism. The hook element (10) is attached or attachable at an oven frame (32) of an oven chassis (30), and the hook seat element (12) is attached or attachable at a door frame (26) of an oven door (22) of the cooking oven (20).

FIG 1



Description

[0001] The present invention relates to a cooking oven including a swing oven door and a closure system for said swing oven door according to the preamble of claim 1.

[0002] A closure system for a swing door of a household appliance is an important device. If the household appliance is an oven, then the closure system must be heat-resistant in order to guarantee the closing and sealing of the oven door. The most closure systems comprise a hook element and a hook seat element, wherein an opening in the hook seat element receives a hook projecting from the hook element. Usually the hook element is assembled at the door, and the hook seat element is placed at a door frame, front frame or chassis of the household appliance. The hook element sticks out from the oven door, which may disturb the user and impairs the security.

[0003] WO 2007/080146 A2 discloses a closure system comprising the hook seat at the oven frame and the hook at the oven door. However, the mechanism of the hook is complex.

[0004] US 7,735,480 discloses a closure system for two oven doors. The closure system comprises a moveable hook at the oven frame and the hook seat at the oven door.

[0005] It is an object of the present invention to provide a cooking oven including a swing door and a closure system for said swing door, wherein said closure system is improved by low complexity.

[0006] The object of the present invention is achieved by the cooking oven including a swing door and a closure system for said swing door according to claim 1.

[0007] According to the present invention the hook element is attached or attachable at an oven frame of an oven chassis, and the hook seat element is attached or attachable at a door frame of an oven door of the cooking oven. There are not any parts at the oven door, which stick out from the dimensions of said oven door. Thus, the oven door has a very compact structure. In particular, there are not any dangerous elements extending from the oven door. Further, it is easy to clean the oven door.

[0008] Preferably, the hook element is arranged at a vertical part of the oven frame.

[0009] In particular, the hook element is arranged at a position of the vertical part of the oven frame such that the hook seat element is arranged about at half height of the vertical part of the door frame.

[0010] Further, the hook element may be covered by a side wall of the cooking oven, so that the hook element is invisible for a position lateral of the cooking oven in an open state of the oven door.

[0011] According to the preferred embodiment of the present invention the hook seat element is inserted or insertable in a recess of the door frame, so that the hook seat element forms an integrated part of the door frame.

[0012] Advantageously, the shape of the hook seat el-

ement is adapted to the shape of the door frame. Thus, the hook seat element can be geometrically and optically adapted to the door frame.

[0013] Further, the door frame and the hook seat element are made of the same plastic materials. This supports the optical adaption of the hook seat element to the door frame.

[0014] For example, the hook seat element is fixed or fixable by one screw at the door frame.

[0015] In a similar way, the hook element is fixed or fixable by at least one screw at the oven frame. In particular, the hook element is fixed or fixable by two screws at the oven frame.

[0016] For example, the hook element is made of metal. Alternatively or additionally, the hook element is made of plastics. Thus, the design of the hook element may be adapted to the design of the cooking oven.

[0017] In order to obtain a vertical centring of the oven door, the shape of the opening and/or the shape of the hook may be formed in such way that an automatic vertical centring of the oven door is performed during closing said oven door.

[0018] Further, the opening and/or the hook may have a conical shape, so that the automatic vertical centring of the oven door is performed during closing said oven door.

[0019] At last, the present invention relates to a closure system for a swing oven door of a cooking oven, wherein the closure system is provided for the cooking oven mentioned above.

[0020] The novel and inventive features believed to be the characteristic of the present invention are set forth in the appended claims.

[0021] The invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates an exploded perspective view of a closure system for an oven door of a cooking oven according to a preferred embodiment of the present invention,

FIG 2 illustrates a perspective view of the cooking oven according to the preferred embodiment of the present invention,

FIG 3 illustrates a side view of the oven door for the cooking oven according the preferred embodiment of the present invention,

FIG 4 illustrates a rear view of the oven door for the cooking oven according to the preferred embodiment of the present invention,

FIG 5 illustrates a side view of the cooking oven according to the preferred embodiment of the present invention,

FIG 6 illustrates an exploded perspective rear view of

the oven door for the cooking oven according to the preferred embodiment of the present invention, and

FIG 7 illustrates a perspective view of an oven chassis of the cooking oven according to the preferred embodiment of the present invention.

[0022] FIG 1 illustrates an exploded perspective view of a closure system for an oven door 22 of a cooking oven 20 according to a preferred embodiment of the present invention. The closure system includes a hook element 10 and a hook seat element 12.

[0023] The hook element 10 comprises a hook 16 projecting from said hook element 10. The hook 16 includes a clearance hole, so that the hook is formed as a bail. Further, the hook element 10 comprises two screw holes 18. The screw holes are provided for fastening the hook element 10 in a fixed position at a chassis frame 32 of the cooking oven 20. In this example, the hook element 10 is formed as a single-piece part.

[0024] The hook seat element 12 comprises an opening 14 for receiving the hook 16 of the hook element 10. The hook seat element 12 is provided for a door frame 26 of the oven door 22.

[0025] FIG 2 illustrates a perspective view of the cooking oven 20 according to the preferred embodiment of the present invention.

[0026] The oven door 22 is arranged at a front side of the cooking oven 20 and is provided for closing an oven cavity. The oven door 22 is fastened at the cooking oven 20 by at least one hinge-joint arranged at one side of an oven frame 32. In this example, the oven door 22 is fastened at the left hand side of the oven frame 32. The hook element 10 is fastened at the right hand side of the oven frame 32. The hook seat element 12 is fastened at the right hand side of the oven door 22.

[0027] The oven door 22 includes a front panel 24 and a door frame 26. The front panel 24 is a plane sheet element and forms the outer side of the oven door 22. The door frame 26 of the oven door 22 is at the inner side of the front panel 24. The hook seat element 12 is attached at the door frame 26 of the oven door 22. The hook seat element 12 is inside a recess of the door frame 26, so that the hook seat element 12 forms an integrated part of the door frame 26.

[0028] In FIG 2 the hook element 10 and the hook seat element 12 are shown in a detailed perspective view A by an enlarged scale. The detailed perspective view A clarifies that the hook seat element 12 is an integrated part of the door frame 26, and the corresponding hook element 10 is fastened at the right hand side of the oven frame 32. In the closed state of the oven door 22, the hook 16 is received by the opening of the hook seat element 12.

[0029] FIG 3 illustrates a side view of the oven door 22 for the cooking oven 20 according to the preferred embodiment of the present invention.

[0030] The front panel 24 forms the outer side of the oven door 22. The door frame 26 of the oven door 22 is attached at the inner side of the front panel 24. The door frame 26 is preferably made of plastics. The hook seat element 12 is inside the recess of the door frame 26. The cross sections of the hook seat element 12 and the door frame 26 have at least partially the same shape, so that the hook seat element 12 forms the integrated part of the door frame 26.

[0031] A detailed side view B in FIG 3 shows the hook seat element 12 and a portion of a vertical part of the door frame 26 by an enlarged scale. The detailed side view B clarifies that the hook seat element 12 forms the integrated part of the door frame 26, wherein the shape of the hook seat element 12 is adapted to the shape of the door frame 26. Further, the hook seat element 12 is preferably made of plastics. In particular, the hook seat element 12 is made of the same plastics as the door frame 26. Thus, the hook seat element 12 may be geometrically and optically adapted to door frame 26.

[0032] FIG 4 illustrates a rear view of the oven door 22 for the cooking oven 20 according to the preferred embodiment of the present invention. The door frame 26 is attached at the inner side of the front panel 24 of the oven door 22. The hook seat element 12 is arranged about at half height of the vertical part of the door frame 26.

[0033] A detailed rear view C in FIG 4 clarifies that the shape of the hook seat element 12 is adapted to the shape of the door frame 26. Further, the hook seat element 12 comprises a bar inside the opening 14 for latching the hook element 10 and the hook seat element 12, wherein the bar penetrates through the clearance hole of hook 16. Thus, the bar inside the opening 14 and the clearance hole of hook 16 form a latching mechanism.

[0034] FIG 5 illustrates a side view of the cooking oven 20 according to the preferred embodiment of the present invention. The oven door 22 is in an open state. FIG 5 clarifies that the hook seat element 12 is arranged about at half height of the vertical part of the door frame 26. Further, the hook seat element 12 is geometrically and optically adapted to door frame 26.

[0035] There are no parts at the oven door 22, which stick out from the dimensions of said oven door 22. The oven door 22 has a compact structure. It is easy to clean the oven door 20. In addition, the hook element 10 is covered by a side wall of the cooking oven, so that the hook element 10 is invisible for a position lateral of the cooking oven in an open state of the oven door, as depicted in FIG 5.

[0036] Further, the hook element 10 and the hook seat element 12 allow a vertical centring of the oven door 22 at the oven frame 32, since the hook 16 of the hook seat element 12 and the opening 14 of the hook seat element 12 are angled near the joint zones. The hook 16 of the hook seat element 12 and/or the opening 14 of the hook seat element 12 are conical. When the oven door 22 is closed by the user, then the oven door 22 obtains automatically the correct position. Vertical misalignments of

the oven door 22 at the oven frame 32 are avoided.

[0037] FIG 6 illustrates an exploded perspective rear view of the oven door 22 for the cooking oven 20 according to the preferred embodiment of the present invention. FIG 6 clarifies that the hook seat element 12 is installed or installable in the recess of the door frame 26, wherein the cross sections of the hook seat element 12 and the door frame 26 have substantially the same shape, so that the hook seat element 12 forms the integrated part of the door frame 26.

[0038] A detailed perspective view D by an enlarged scale is shown in FIG 6. The hook seat element 12 is fixable in the recess of the door frame 26 by a screw 28, wherein said screws is inserted into door frame 26 from its inner side. This contributed to an easy assembling of the oven door 22 and the cooking oven 20.

[0039] FIG 7 illustrates a perspective view of an oven chassis 30 of the cooking oven 20 according to the preferred embodiment of the present invention. The oven frame 32 encloses the oven cavity. The hook element 10 is attached at the right vertical part of the oven frame 32, in a fixed position, such that the hook seat element 12 is arranged about at half height of the vertical part of the door frame 26.

[0040] A detailed perspective view E by an enlarged scale is shown in FIG 7. The hook element 10 is fastened by two screws 34 at the right vertical part of the oven frame 32. The screws 34 are directed from the outer side to the inner side of the oven frame 32. The screws 34 are introduced into the screw holes 18 of the hook element 10.

[0041] The closure system according to the present invention is not only provided for the cooking oven 20. In general, the closure system with the hook element 10 and the hook seat element 12 may be also installed in other household appliances.

[0042] 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 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

[0043]

10 hook element
12 hook seat element
14 opening
16 hook
18 screw hole
20 cooking oven
22 oven door

24 front panel
26 door frame
28 screw for the hook seat element
30 oven chassis
32 oven frame
34 screw for the hook element

A detailed perspective view in FIG 2
B detailed side view in FIG 3
C detailed rear view in FIG 4
D detailed perspective view in FIG 6
E detailed perspective view in FIG 7

15 Claims

1. A cooking oven (20) including a swing oven door (22) and a closure system (10, 12) for said swing oven door (22), wherein

- the closure system comprises a hook element (10) attached or attachable at the cooking oven,
 - the closure system comprises a hook seat element (12) attached or attachable at the cooking oven,
 - the hook seat element (12) includes an opening (14) for receiving a hook (16) projecting from the hook element (10), and
 - the hook element (10) and the hook seat element (12) are detachably connectable by a latching mechanism,
- characterized in, that**
the hook element (10) is attached or attachable at an oven frame (32) of an oven chassis (30), and the hook seat element (12) is attached or attachable at a door frame (26) of an oven door (22) of the cooking oven (20).

2. The cooking oven according to claim 1, **characterized in, that**
the hook element (10) is arranged at a vertical part of the oven frame (32).

3. The cooking oven according to claim 1 or 2, **characterized in, that**
the hook seat element (12) is arranged at a half height of a vertical part of the door frame (26).

4. The cooking oven according to any one of the preceding claims, **characterized in, that**
the hook element (10) is covered by a side wall of the cooking oven (20), so that the hook element (10) is invisible for a position lateral of the cooking oven (20) in an open state of the oven door (22).

5. The cooking oven according to any one of the preceding claims,

characterized in, that

the hook seat element (12) is inserted or insertable in a recess of the door frame (26), so that the hook seat element (12) forms an integrated part of the door frame (26).

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6. The cooking oven according to claim 5,

characterized in, that

the shape of the hook seat element (12) is adapted to the shape of the door frame (26).

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7. The cooking oven according to any one of the preceding claims,

characterized in, that

the door frame (26) and the hook seat element (12) are made of the same plastic materials.

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8. The cooking oven according to any one of the preceding claims,

characterized in, that

the hook seat element (12) is fixed or fixable by one screw (28) at the door frame (26).

20

9. The cooking oven according to any one of the preceding claims,

characterized in, that

the hook element (10) is fixed or fixable by at least one screw (34) at the oven frame (32).

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10. The cooking oven according to claim 9,

characterized in, that

the hook element (10) is fixed or fixable by two screws (34) at the oven frame (32).

30

11. The cooking oven according to any one of the preceding claims,

characterized in, that

the hook element (10) is made of metal.

35

12. The cooking oven according to any one of the claims 1 to 10,

characterized in, that

the hook element (10) is made of plastics.

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13. The cooking oven according to any one of the preceding claims,

characterized in, that

the shape of the opening (14) and/or the shape of the hook (16) are formed in such way that an automatic vertical centring of the oven door (22) is performed during closing said oven door (22).

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14. The cooking oven according to claim 13,

characterized in, that

the opening (14) and/or the hook (16) have a conical shape, so that the automatic vertical centring of the oven door (22) is performed during closing said oven door (22).

55

15. A closure system for a swing oven door of a cooking oven,

characterized in, that

the closure system is provided for the cooking oven according to any one of the claims 1 to 14.

FIG 1

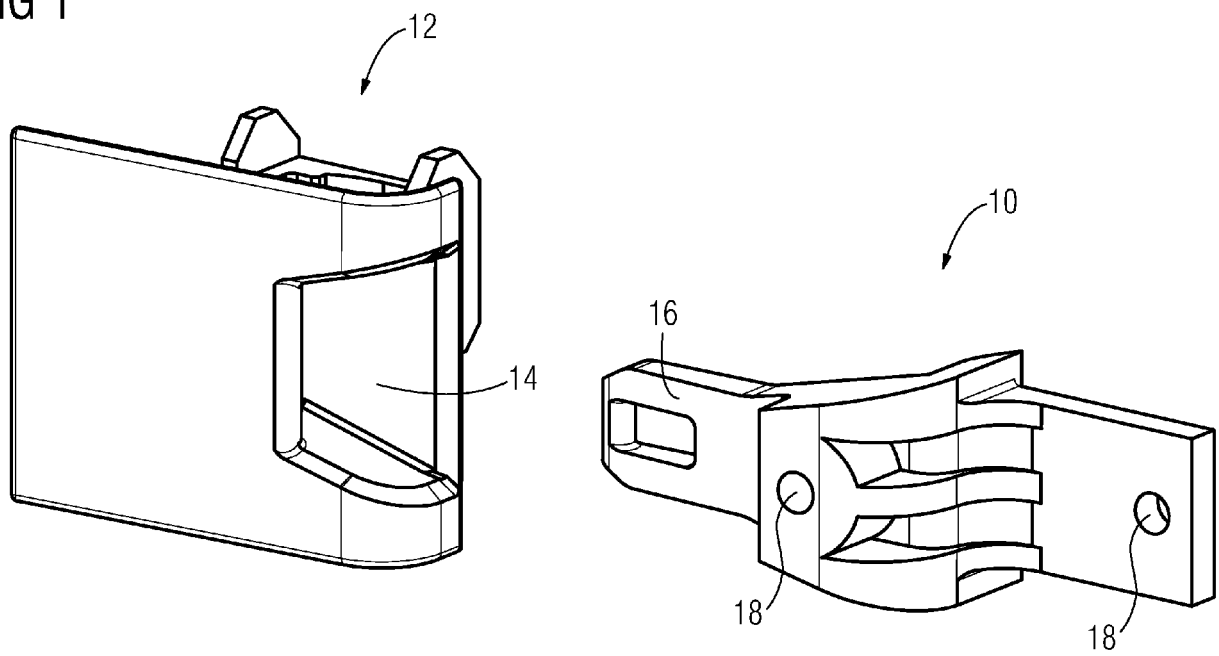


FIG 2

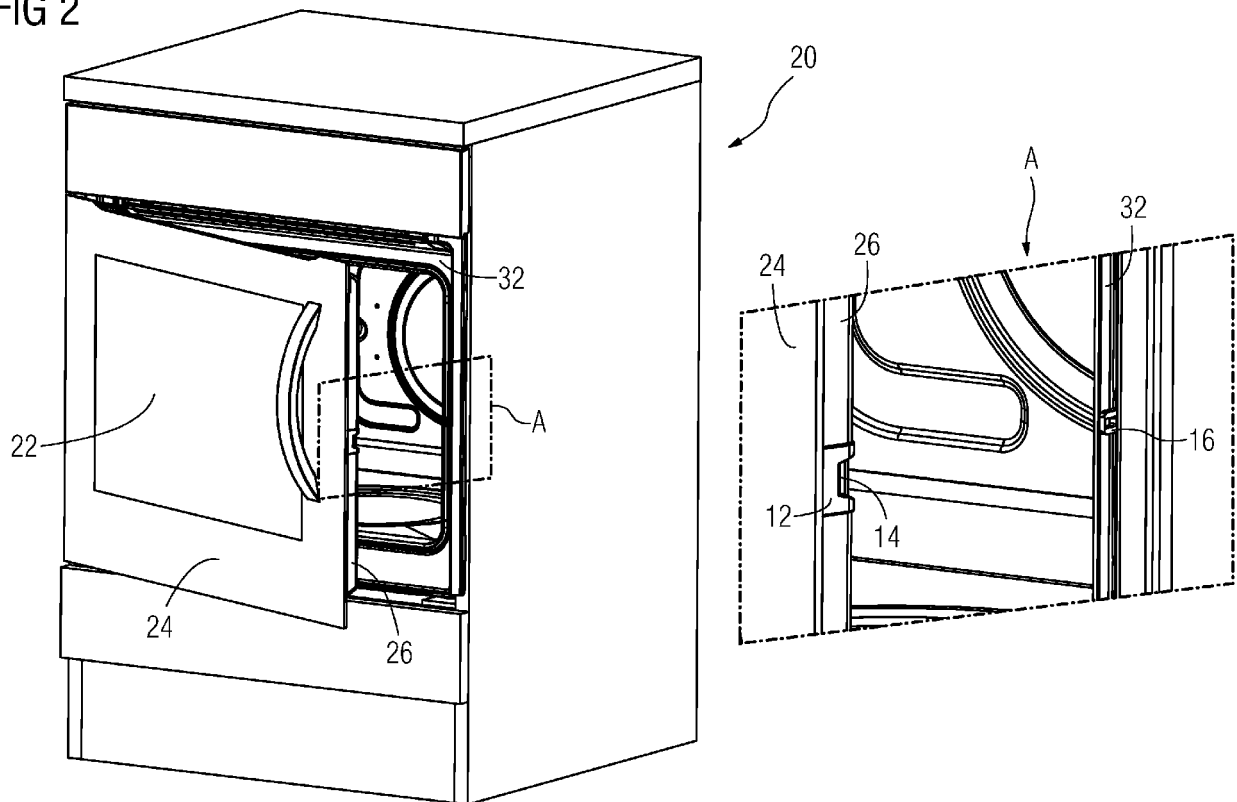


FIG 3

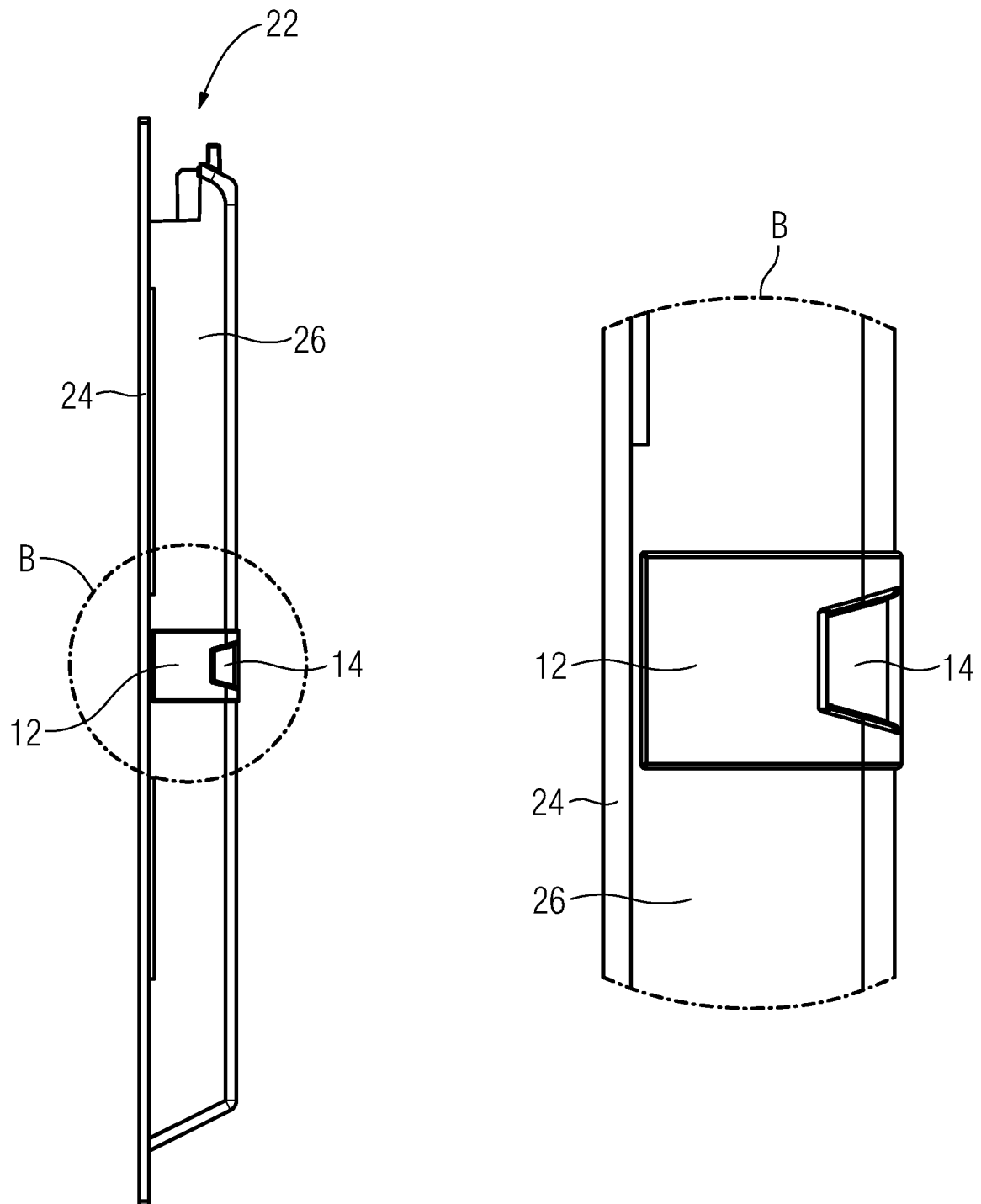


FIG 4

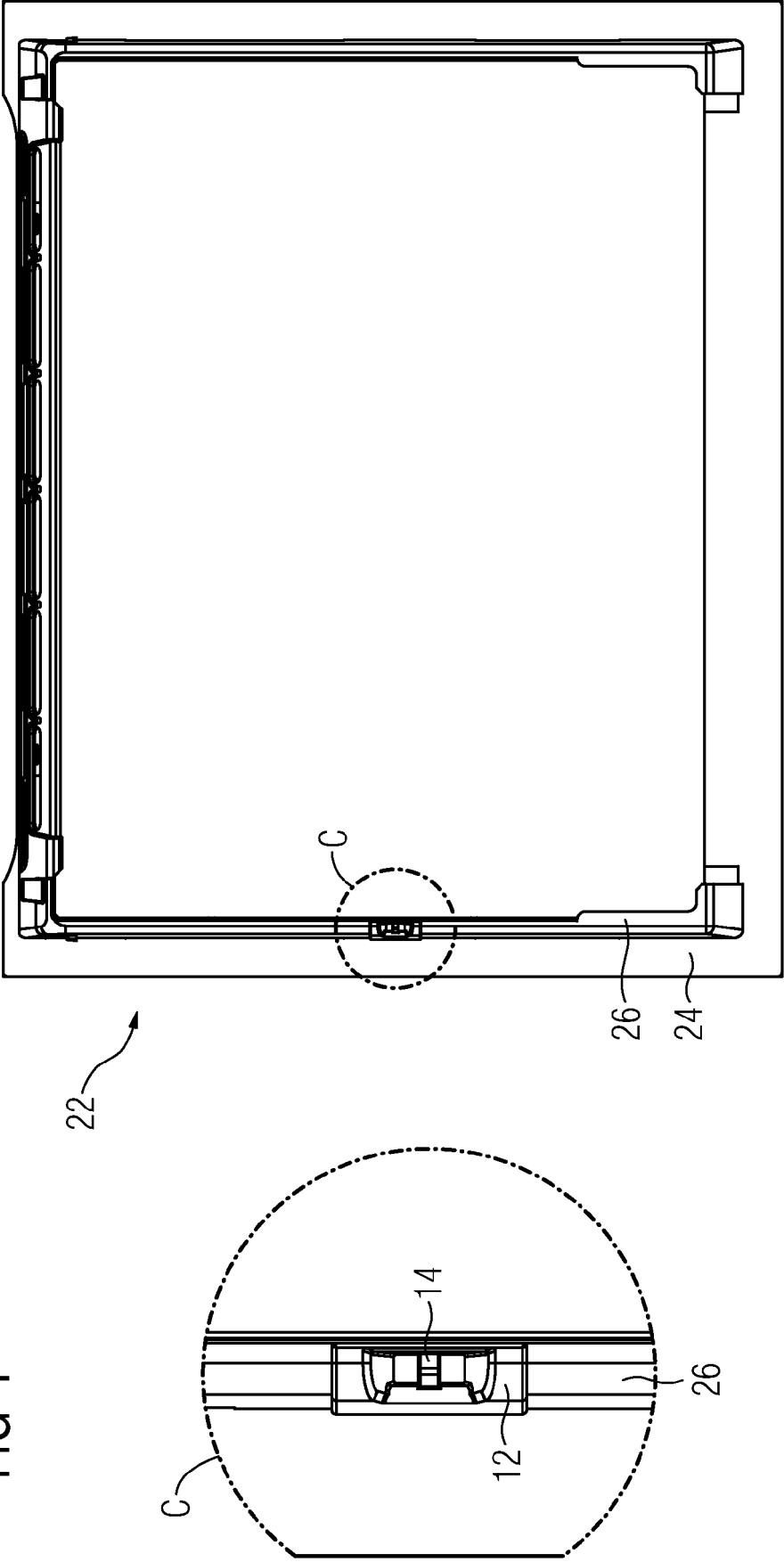
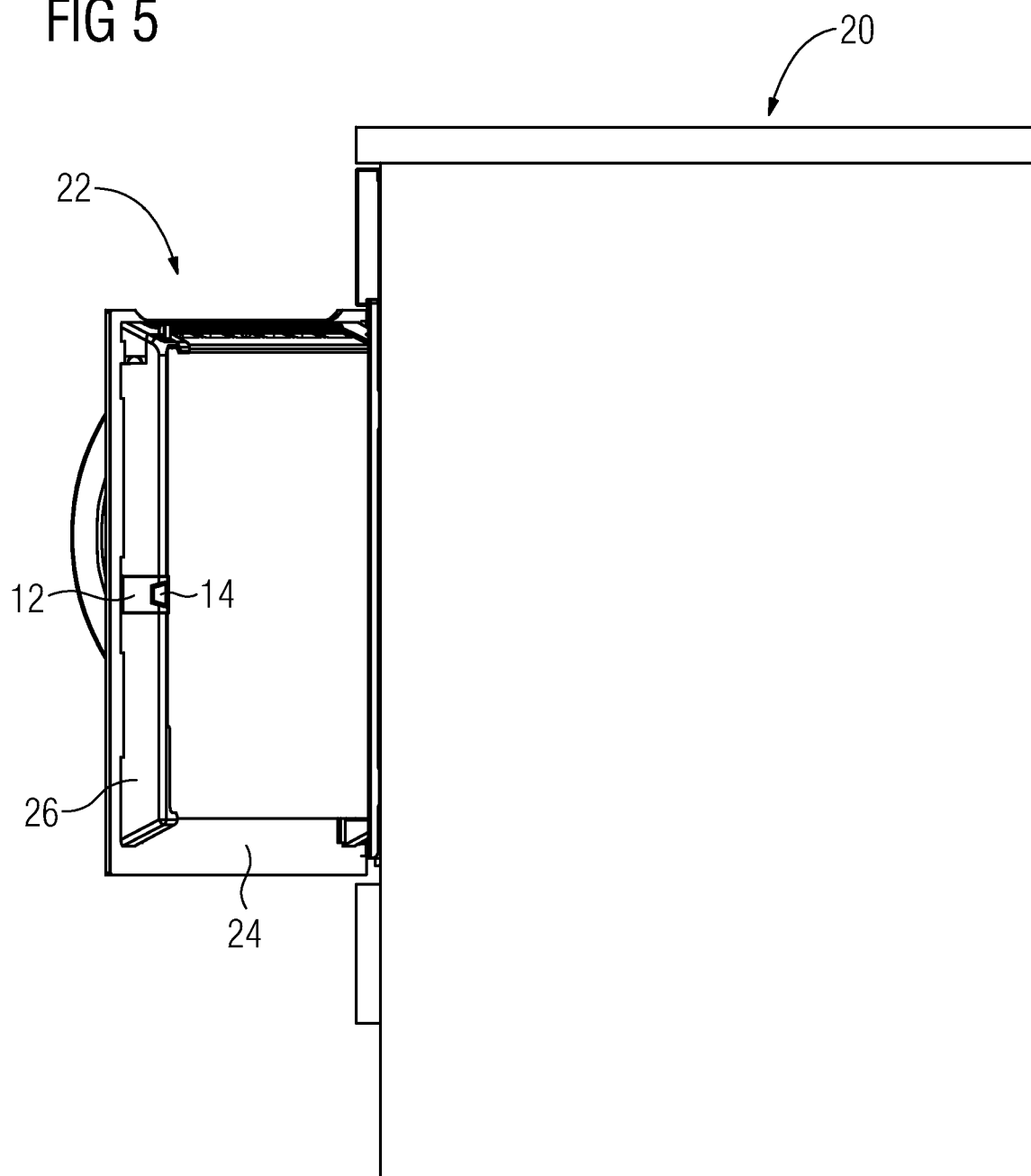


FIG 5



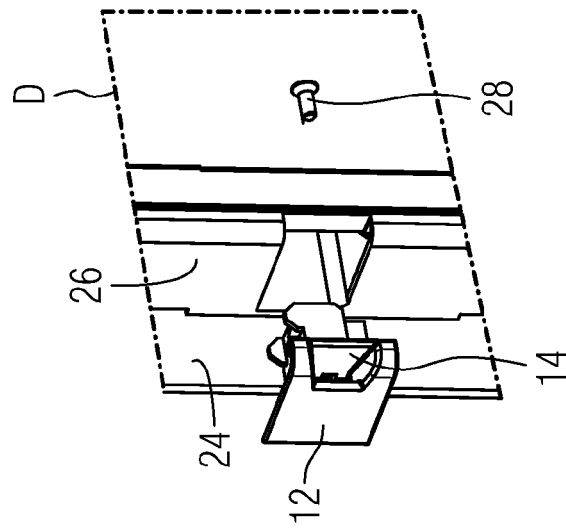
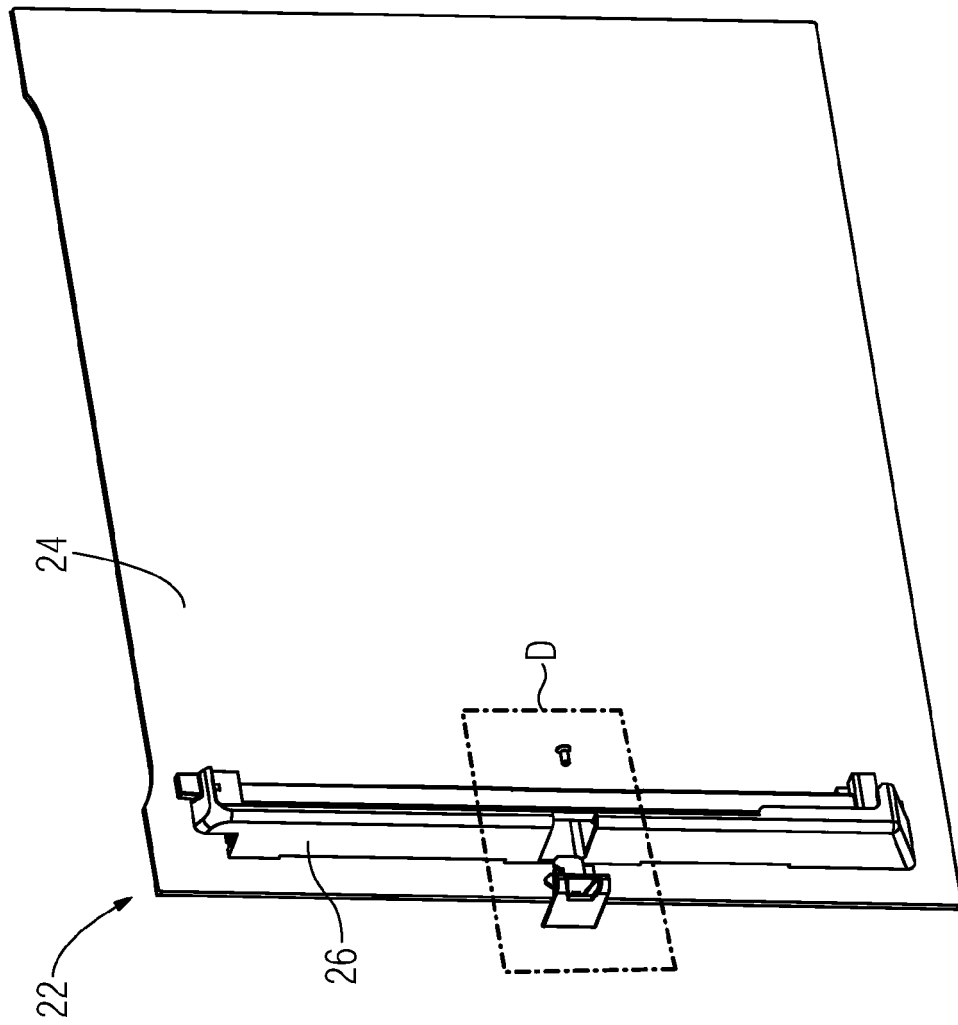
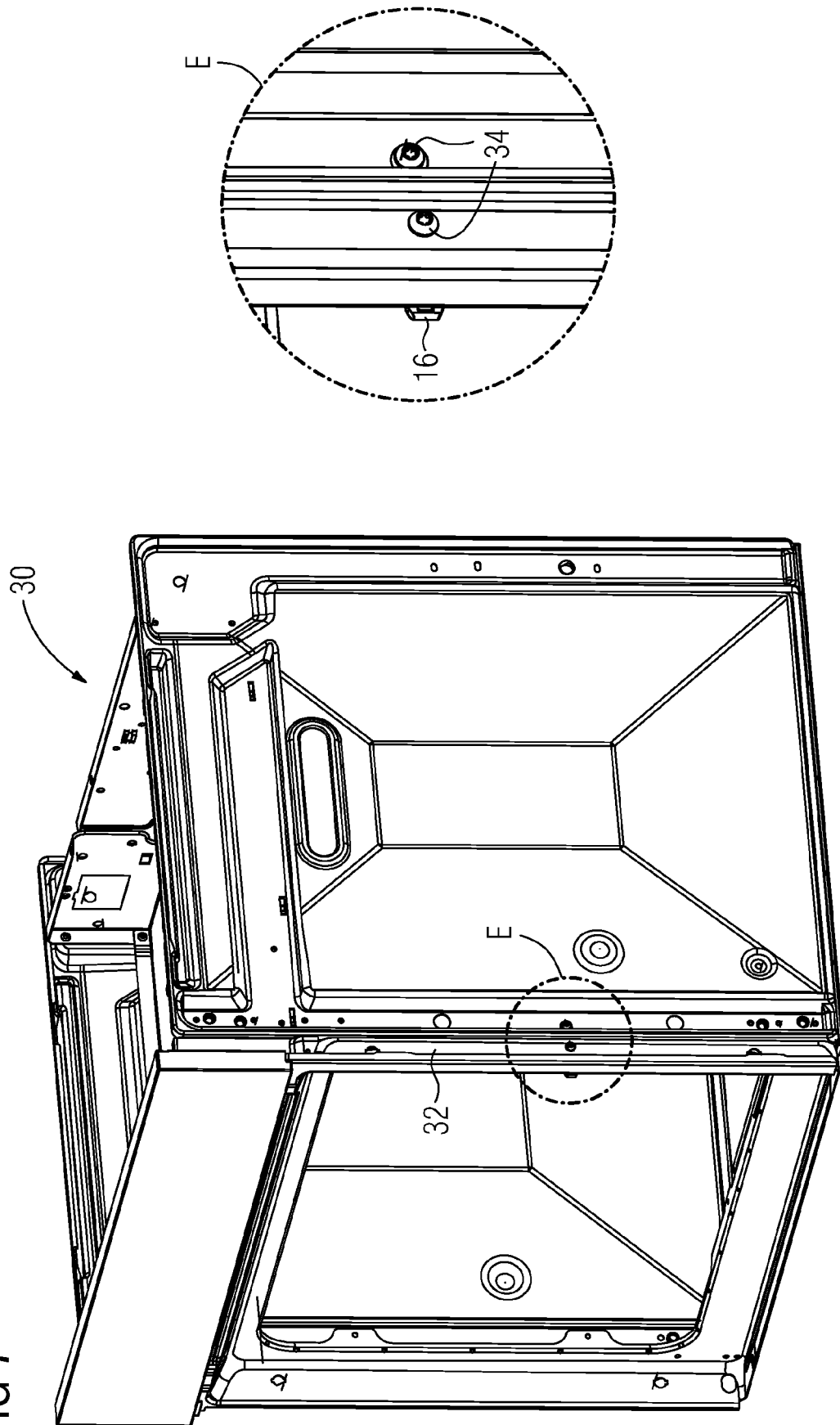


FIG 6

FIG 7





EUROPEAN SEARCH REPORT

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Place of search		Date of completion of the search	Examiner
The Hague		25 September 2012	Adant, Vincent
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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