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(54) Door for food cooking oven

(57) A door for a food cooking oven, of the type comprising a perimetric frame (11) to which two mutually opposite and facing glass panes, respectively an inner pane (12) and an outer pane (13), are rigidly coupled, delimiting an air gap (14). Hinge means (15) are associated with the perimetric frame (11) and are suitable to allow the opening and closure of the door (10). The perimetric frame (11) is constituted by two parallel tubular metallic uprights (17) connected by two parallel tubular cross-members (18). The end portions (19) of said cross-members (18) are inserted and fixed in complementarily shaped openings (20) formed in corresponding internal sides (21) of the uprights (17). The cross-members (18) are fixed to the uprights (17) by way of threaded elements (22).

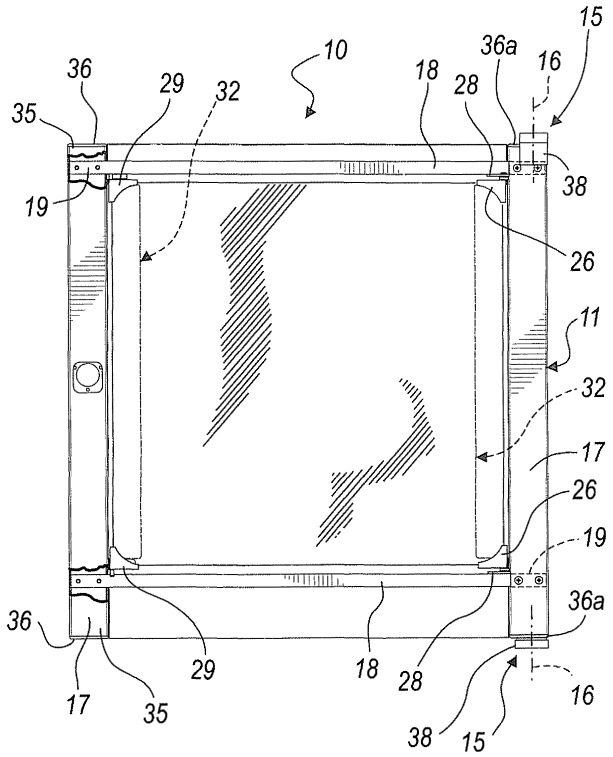

Fig. 1

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Description

[0001] The present invention relates to a door for a food cooking oven.

[0002] It is known that cooking ovens are constituted by a box-like container closed at the front by a door which is pivoted about a horizontal or vertical axis.

[0003] Typically, the door is constituted by a perimetric frame, to which two mutually opposite and facing glass panes, respectively an inner pane and an outer pane, are rigidly coupled, forming an air gap.

[0004] The need for the double glass pane resides in that the pane that is directly exposed to the cooking chamber becomes very hot, while the outer pane is heated far less, thus allowing to view the inside of the cooking chamber without the risk of bums due to accidental contact with the glass pane.

[0005] In many configurations, the internal glass pane is pivoted to the perimetric structure to allow access to the inside of the air gap in order to keep it clean.

[0006] The perimetric frame is constituted generally by a structure of components made of shaped metal plate, which are welded to each other.

[0007] As it is known, producing shaped metal plate components entails machines and equipment that have a certain industrial cost, and so do the equipment and labor linked to the operations for welding said components.

[0008] The aim of the present invention is to provide a door for a food cooking oven that can be manufactured more simply than known types of door.

[0009] Within this aim, an object of the present invention is to provide a door for a food cooking oven which is structurally simple and at the same time very strong.

[0010] Another object of the present invention is to provide a door for a food cooking oven that can be assembled quickly.

[0011] Another object of the present invention is to provide a door for a food cooking oven that can be manufactured in a simplified manner with respect to known types of door by means of known equipment and technologies.

[0012] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a door for a food cooking oven, of the type comprising a perimetric frame to which two mutually opposite and facing glass panes, respectively an inner pane and an outer pane, are rigidly coupled, delimiting an air gap, hinge means being associated with said perimetric frame and being adapted to allow the opening and closure of the door, characterized in that said perimetric frame is constituted by two parallel tubular metallic uprights connected by two parallel tubular cross-members, the end portions of which are inserted and fixed in complementarily shaped openings formed in corresponding internal sides of said uprights, said cross-members being fixed to said uprights by way of threaded elements.

[0013] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a rear view of a door according to the invention;

Figure 2 is a sectional plan view of a portion of a door according to the invention;

Figure 3 is an exploded view of the door according to the invention.

[0014] It is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0015] With reference to the figures, a door for a food cooking oven according to the invention is generally designated by the reference numeral 10.

[0016] The door 10 comprises a perimetric frame 11, to which two mutually opposite and facing glass panes, respectively an inner pane 12 and an outer pane 13, are rigidly coupled, delimiting an air gap 14.

[0017] Hinge means 15 suitable to allow the opening and closure of said door, such as for example two mutually opposite coaxial hinges 16 (shown schematically by means of the axis drawn in broken lines), are associated with the perimetric frame 11.

[0018] The perimetric frame 11 is constituted by two parallel tubular metallic uprights 17, which are connected by two parallel tubular cross-members 18.

[0019] The end portions 19 of the tubular cross-members 18 are inserted and fixed in complementarily shaped openings 20 formed in corresponding inner sides 21 of the uprights 17.

[0020] The uprights 17 and cross-members 18 have a quadrangular transverse cross-section; in particular, the uprights 17 have a rectangular cross-section, while the cross-members 18 have a square cross-section.

[0021] The uprights and cross-members are produced starting from tubular bars cut by means of laser cutting machines; the openings 20 also are provided by means of laser cutting machines.

[0022] Laser cutting allows to provide extremely precise cuts, with optimum dimensional control of the cut components, with evident advantages in terms of precision of the couplings; in practice, the cutting regions are provided with corresponding finishes.

[0023] Each cross-member 18 is fixed to the uprights 17 by virtue of threaded elements 22 (shown schematically in broken lines), which are arranged through first through holes 23, provided in the rear face of the uprights 17, and second through holes 24, provided in the rear face of the cross-members 18, at the end portions 19.

[0024] The threaded elements 22 are constituted by screws, the heads of which abut against the rear face of the uprights 17 and the threaded stems of which engage female threads arranged inside the tubular portion of the cross-members 18 (or optionally self tapping screws

which engage the edges of the second holes 24).

[0025] Means 25 for pivoting to the cross-members 18 proximate to an upright 17 are associated with the internal glass pane 12.

[0026] The pivoting means 25 comprise two first corner elements 26, in which the corner portions of the internal glass pane 12 that correspond to the portion thereof to be pivoted are inserted.

[0027] A pivot 27 protrudes from each first corner element 26 and is pivoted about a corresponding first block 28, which is fixed to a corresponding (lower or upper) cross-member 18.

[0028] Each first block 28 is fixed for example to the cross-member 18 by way of screws (not shown in the figures).

[0029] At the corners of the edge of the internal glass pane 12 that lies opposite the pivoting edge there are two second corner elements 29, provided with means 30 for reversible engagement with a corresponding second block 31, which is fixed to the corresponding cross-member 18 (the upper one), in practice opposite the first blocks 28.

[0030] The reversible engagement means 30, not shown in detail in the figures, are constituted for example by a device for engaging a tab in a complementarily shaped hook by elastic deformation of said hook.

[0031] A predominantly longitudinally elongated bracket 32 is fixed vertically to each upright 17 substantially so as to follow the central part of the upright.

[0032] Each bracket 32 is provided with a flat surface 33 for rigidly coupled contact with the internal face of the outer glass pane 13.

[0033] In particular, each bracket 32 is predominantly L-shaped, with a first part 32a which is fixed to the internal side of the upright 17 and a second part 32b, which is perpendicular to the first part 32a and forms the flat surface 33 on which the internal glass pane 13 is fixed, for example by means of adhesive material.

[0034] Each bracket 32 is fixed to the corresponding upright 17 by virtue of threaded elements (not shown in the figures), which pass through respective holes provided in the first part 32a and on the upright 17.

[0035] The uprights 17, by being obtained by cutting extruded metal bars, have open ends 35; for this reason, the door 10 comprises closure inserts 36 made of plastic material, which are inserted in the ends 35.

[0036] The hinge means 15 of the door 10 comprise two hinges 16, each constituted by a pivot 37, which is coaxial to the hinge axis and protrudes from a bracket 38 for fixing to the box-like container of the oven.

[0037] The pivot 37 is inserted in a complementarily shaped seat 39 formed in a corresponding closure insert of an upright, termed hinge insert 36a.

[0038] In practice it has been found that the invention thus described achieves the intended aim and objects.

[0039] In particular, the present invention provides a door for a food cooking oven which is provided with a perimetric frame composed of uprights and cross-members obtained from tubular bars, which are easily commercially available and are laser-cut to the intended size.

[0040] Advantageously, the frame can be composed by using threaded elements, such as self-tapping screws or bolts, as fixing elements.

[0041] Manufacture of the hinges also is simplified, obtaining plastic hinges which are coupled easily to the corner ends of the perimetric frame.

[0042] Production is thus simplified, since it is sufficient to use commercially available metal bars and a laser cutting machine, while assembly can be performed conveniently by way of threaded connection systems.

[0043] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0044] The disclosures in Italian Utility Model Application No. PD2005U000080 from which this application claims priority are incorporated herein by reference.

[0045] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A door for a food cooking oven, of the type comprising a perimetric frame (11) to which two mutually opposite and facing glass panes, respectively an inner pane (12) and an outer pane (13), are rigidly coupled, delimiting an air gap (14), hinge means (15) being associated with said perimetric frame (11) and being adapted to allow the opening and closure of the door (10), **characterized in that** said perimetric frame (11) is constituted by two parallel tubular metallic uprights (17) connected by two parallel tubular cross-members (18), the end portions (19) of said cross-members (18) being inserted in complementarily shaped openings (20) formed in corresponding internal sides (21) of said uprights (17), said cross-members (18) being fixed to said uprights (17) by way of threaded elements (22).

2. The door according to claim 1, **characterized in that** said uprights (17) and said cross-members (18) have a quadrangular transverse cross-section.

3. The door according to claim 2, **characterized in that** said uprights (17) and said cross-members (18) are cut by means of laser-cutting machines and the cutting regions are provided with corresponding geometric tolerances and finishes.

4. The door according to claim 3, **characterized in that**

it comprises two predominantly longitudinally extended brackets (32), which are fixed vertically on said uprights (17), each bracket being provided with a flat surface (33) for rigidly coupled contact for said external glass pane (13).

5. The door according to claim 4, **characterized in that** said two predominantly longitudinally extended brackets (32) are fixed to said uprights (17) by way of threaded elements which pass through respective holes provided in said two predominantly longitudinally extended brackets (32) and in said uprights (17).

6. The door according to claim 5, **characterized in that** each predominantly longitudinally extended bracket (32) is predominantly L-shaped, with a first part (32a), which is fixed to the inner side (21) of said upright (17), and a second part (32b), which is perpendicular to said first part (32a) and forms said flat surface (33) on which said inner glass pane (13) is fixed.

7. The bracket according to claim 6, **characterized in that** said outer glass pane (13) is fixed to said predominantly longitudinally extended brackets (32) by means of adhesive.

8. The bracket according to claim 7, **characterized in that** means (25) for pivoting to said cross-members (18) are associated with said inner glass pane (12) proximate to an upright (17) and are constituted by two first corner elements (26), on which the corner portions of said inner glass pane (12) that correspond to the portion to be pivoted of said pane (12) are inserted, pins (27) protruding from said first corner elements (26) and being pivoted on first blocks (28) which are fixed to corresponding said cross-members (18).

9. The bracket according to claim 8, **characterized in that** it comprises at least one second corner element (29) for one of the two remaining corners of said inner glass pane (12), which is provided with means (30) for reversible engagement with a corresponding second block (31), which is fixed to a corresponding said cross-member (18) opposite said first blocks (28).

10. The door according to claim 9, **characterized in that** it comprises closure inserts (36), which are made of plastic material and are inserted in the ends (35) of said uprights (17).

11. The door according to claim 10, **characterized in that** said hinge means (15) of said door comprise two hinges (16), each hinge being constituted by a pivot (37) which is coaxial to the hinge axis, protrudes from a bracket (3 8) for fixing to the box-like container of the oven, and is inserted in a complementarily shaped seat (39) formed in a corresponding said closure insert (36a) of an upright (17).

12. The bracket according to one or more of the preceding claims, **characterized in that** said cross-members (18) are fixed to said uprights (17) by way of threaded elements (22), which pass through first through holes (23) provided in said uprights (17) and through second through holes (24) provided in said cross-members (18).

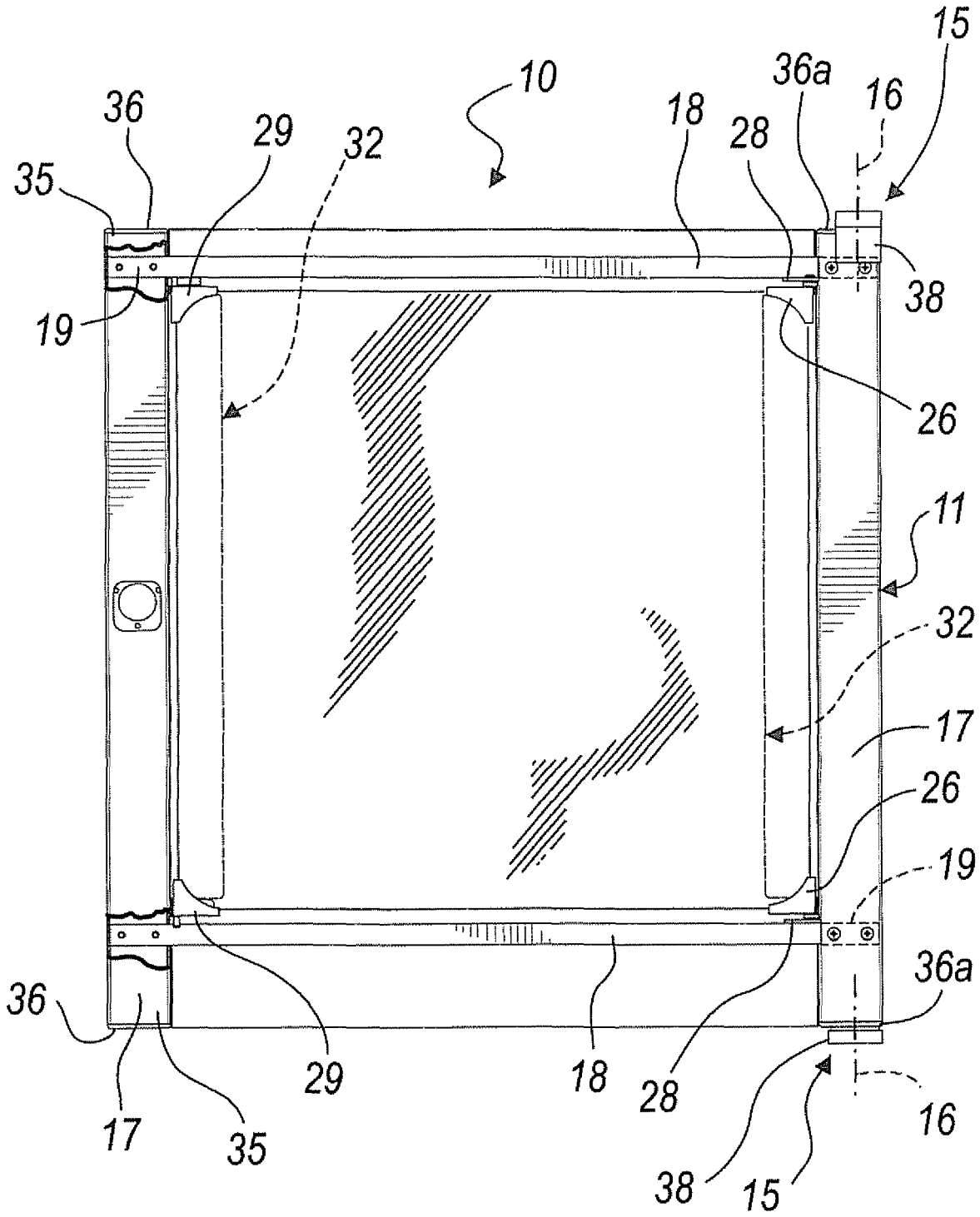
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Fig. 1

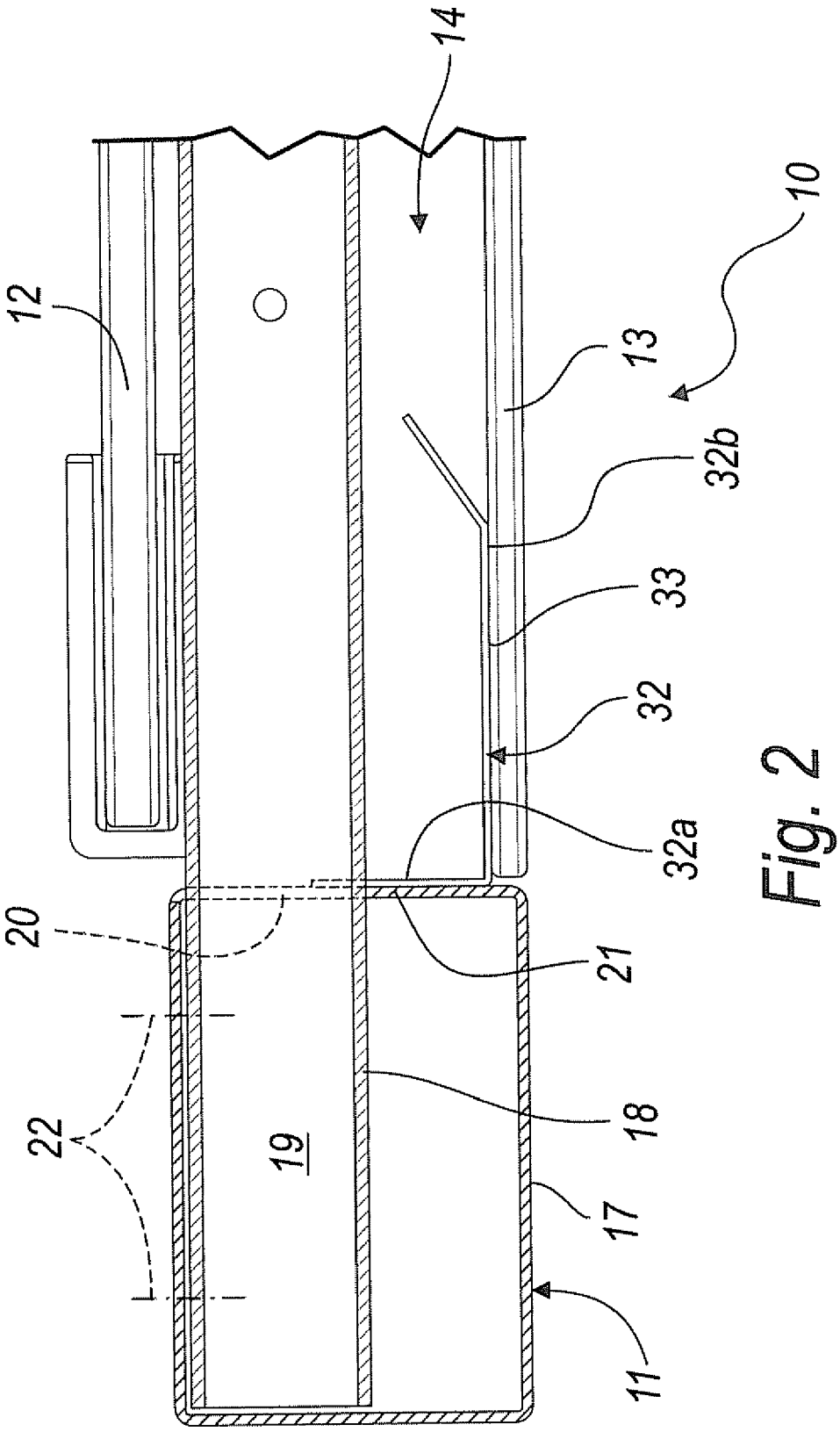

Fig. 2

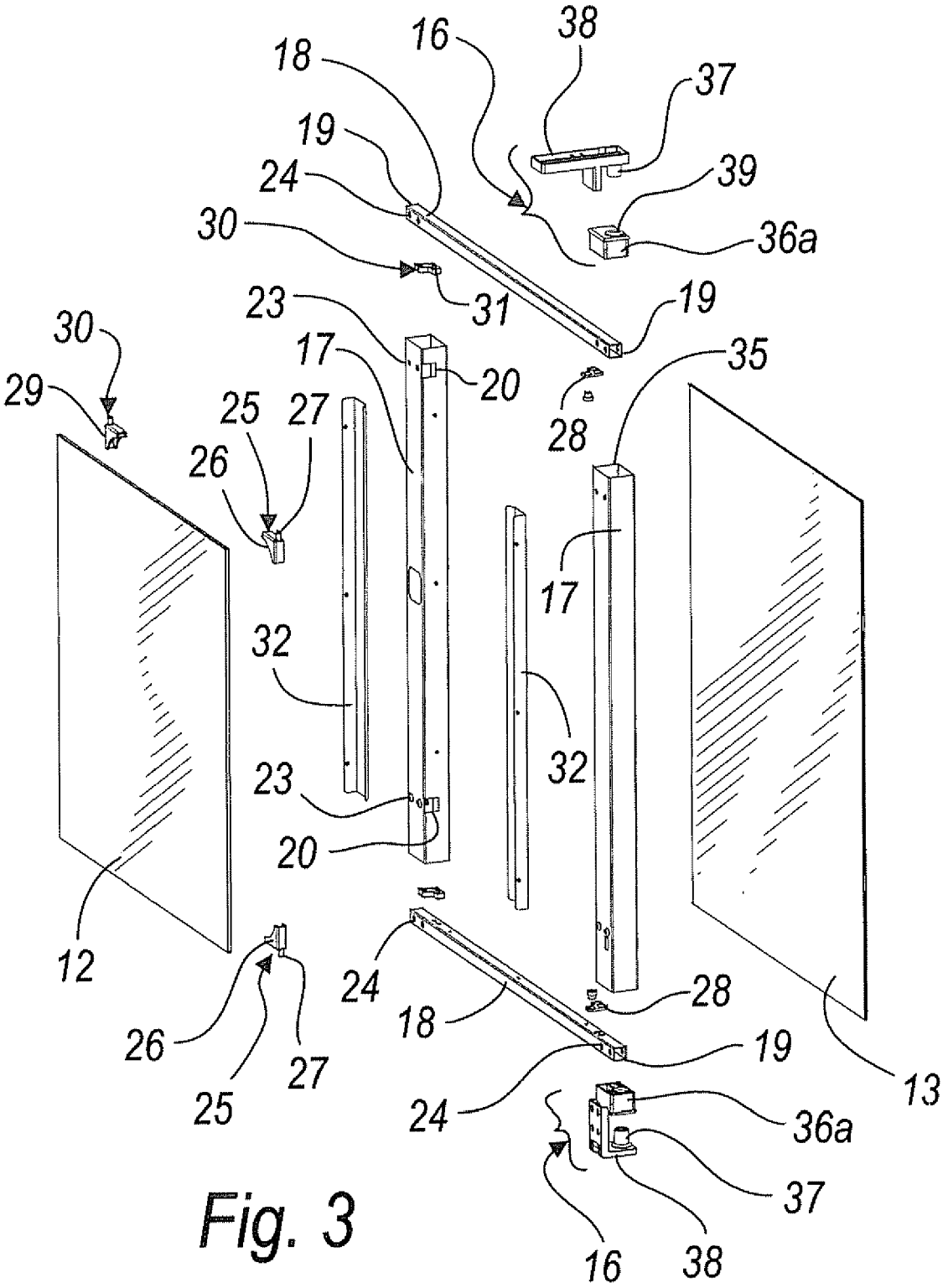
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Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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