



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.03.2007 Bulletin 2007/12

(51) Int Cl.:
F24C 15/34 (2006.01)

(21) Application number: **05108505.8**

(22) Date of filing: **15.09.2005**

(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

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(54) **Domestic oven**

(57) In a domestic oven including a cavity with a back wall and side walls, these latter comprise elements of refractory insulating material obtained by means of an extrusion process and assembled together. The refrac-

tory elements present a double wall flat structure and comprise longitudinal grooves adapted to cooperate with corresponding tenons for assembling purposes. The refractory material may be based on clay or ceramic.

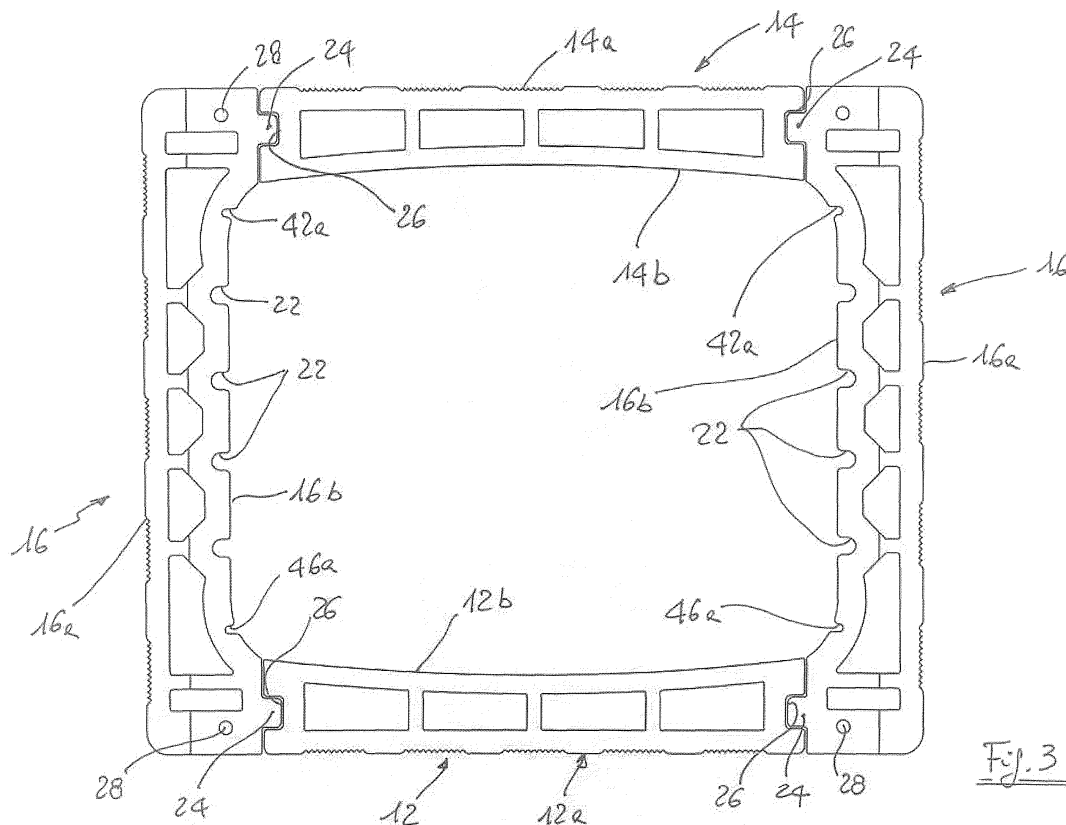


Fig. 3

Description

[0001] The present invention relates to a domestic oven comprising a cavity with a back wall and side walls.

[0002] The back wall and the side walls of a domestic oven are usually made of metal sheets assembled together. In particular, the side walls are defined by a single metal skirt bent in an annular configuration and soldered at its ends, to which a metal back wall is soldered or fixed.

[0003] In order to reduce the thermal dispersion from the oven and to avoid an excessive increase of temperature of the furniture adjacent the built-in oven, the metal sheets of the cavity have to be provided with insulation material, for instance panels of glass or rock wool. Then these panels are covered with auxiliary metal sheets that define the external final shape of the oven. All this assembling process is quite complex and moreover there are recycling problems (mainly due to the use of a big amount of insulating material) at the end of the useful life of the oven.

[0004] A solution is known from GB-A-2188401 in which the oven chamber is moulded from insulating ceramic foam. Even if with this known solution is possible to avoid completely the use of metal sheets and of glass/rock wool for the oven, nevertheless the peculiar kind of material (ceramic foam) and the moulding process (which needs expensive moulds) both reduce the advantages of passing from the traditional method of assembling metal sheets to the use of a structural moulded ceramic foam for defining the oven chamber.

[0005] There are also several documents showing the advantages of using baking devices composed of refractory insulating material to be used in traditional "metal" ovens. US-A-4127108 discloses a baking device of refractory stoneware comprising a bottom plate, a hood mounted on it with a front open end and a lid closing the open end, for baking rye flour bread and other forms of bread. The baking device disclosed by US-A-6101930 includes a rectangular base and a pair of said walls, with the main purpose of reducing heat fluctuations thanks to the use of refractory insulating materials.

[0006] All these known solutions, even if useful in improving the cooking process, do not help in reducing the final cost of the domestic oven while increasing the thermal insulation properties thereof.

[0007] It is an object of the present invention to provide an improved oven which has production costs sensibly lower than those of the known ovens, has very good thermal insulation property and reduces problems of waste disposal at the end of the useful life of the oven.

[0008] According to the invention, the side walls of the cavity comprise elements of refractory insulating material assembled together.

[0009] With the term "refractory insulating material" we mean all the materials based on clay (baked clay or fire clay) as well as ceramic material. Preferably the refractory insulating material are all the known clays which can be easily extruded through dies and that are fired in in-

dustrial ovens or kilns. The elements that form the side walls of the oven according to the invention are therefore preferably made through an extrusion process, followed by drying and firing in an industrial oven or kiln for getting solid stone-like elements. This feature reduces dramatically the overall cost of the oven compared to the known methods in which the cavity of refractory material is moulded. Moreover the use of elements of refractory insulating material reduce the transportation cost of the cavity, since the elements can be packed together therefore reducing the volume of the product to be shipped.

[0010] According to another preferred feature of the present invention, each of said elements presents a double wall structure. This feature reduces the weight of the oven without decreasing the heat insulation properties of the elements.

[0011] In order that the invention may be clearly understood and readily carried into effect specific embodiments of the invention will now be described by way of example with reference to the accompanying drawings, in which:

- figure 1 is a perspective front view of an oven according to the invention, in which the oven door has been removed for sake of clarity;
- figure 2 is a perspective rear view of the oven of figure 1;
- figure 3 is a cross section along line III-III of figure 2,
- figure 4 is a perspective view of a component of the oven of figure 1;
- figure 5 is a perspective view of another component of the oven of figure 1; and
- figure 6 is a cross section of an element of the oven according to a second embodiment of the invention.

[0012] With reference to the drawings, with 10 it is indicated a domestic oven comprising a cavity 10a having side walls defined by a bottom element 12, a top element 14 and side elements 16 assembled together. The rectangular elements 12, 14 and 16 are structural double wall elements obtained by firing extruded pieces of clay, therefore using a technique well known in the field of bricks. The clay used for the above structural elements is preferably a fire clay which can withstand temperature up to°C, even if the composition of the clay is not critical in view of the usual temperatures reached in a domestic oven. The elements 12, 14 and 16 are sandwiched between a front metal frame 18 and a back metal cover 20 which both have L-bent edges for enclosing the outside contour of the said elements in the assembled configuration thereof.

[0013] Figure 3 shows in detail the shape of the baked clay or fire clay elements 12, 14 and 16. All the elements have external flat surfaces respectively 12a, 14a and 16a that define a rectangular cross section. The bottom element 12 and the top element 16 have concave interior surfaces 12b and 14b respectively. The side elements 16 are identical, and comprise an interior surface 16b

having parallel longitudinal grooves 22 for supporting wire racks R, dripping pans P or similar oven accessories (figure 1). Moreover, each of the side elements 16 presents, adjacent to its top and bottom portion (with reference to the assembled configuration of the oven) tongues or tenons 24 that cooperate with corresponding grooves 26 provided on side walls of the bottom and top elements 12 and 14 for assembling the elements together in a predetermined configuration. Tenons 24 have widths slightly smaller than the widths of grooves 26 so as to be receivable therein.

[0014] For keeping the elements 12, 14, and 16 in the predetermined configuration shown in figure 3, the side elements 16 are provided with longitudinal holes 28 into which are placed rods 30 projecting outside of the oven 10 through opening 33 in the front frame 18 and through opening 36 in the back cover 20 of the oven. The ends of the rods are threaded so that the front frame 18 and the back cover 20 are tightened against the clay elements by means of nuts 30a.

[0015] The front frame 18 (figure 4) has an opening 18a whose contour matches approximately the cross section of the interior surfaces of the cavity 10a, and is provided with a gasket 32 (figure 1). The vertical edges of the opening 18a are not aligned with the interior surfaces 16b of the side elements 16 in order to allow the racks or dripping pans to be inserted into the grooves 22. The front frame 18 presents cut-outs 34 where hinge brackets (not shown) will be mounted for supporting the oven door (which is of the traditional type), and upper brackets 36 for mounting the oven front panel and user interface 38 (figure 1).

[0016] The back cover 20 of the oven 10 (figure 5) has holes 40 for installing a top heating coil 42 (figure 1) and holes 44 for mounting a bottom heating coil 46. Such heating coils 42 and 46 are laterally inserted in corresponding longitudinal grooves 42a and 46a (figure 3) provided in the side elements 16. Moreover the back cover presents centrally a hole 48 for mounting a rear fan, and it is provided with a metal auxiliary frame 50 (figure 2) fixed to bent pieces 52 of the back cover 20 (by means of screws or similar fasteners) and used for installing the electric motor of the fan and other components of the oven (not shown). The back cover 20 is covered by a traditional insulation panel (not shown) and supports an auxiliary back wall 49 in the cavity 10a covering the ventilation fan as well as a possible auxiliary heating element around the fan.

[0017] Figure 6 shows a second embodiment of the oven, in which the side elements 16 are provided, on the interior surface 16b thereof, of longitudinal ridges 54 for supporting racks R or dripping pans P.

[0018] The refractory insulating elements 12, 14 and 16 are preferably uncoated since the tests performed by the applicant have shown that the use of uncoated clay elements are extremely beneficial in adsorbing water vapour originated during the cooking process. In the above tests the temperature of the outside surfaces of the re-

fractory insulating elements has been constantly much lower than the temperature of traditional oven (the inside temperature being equal). Moreover the inside temperature has been much more stable than in traditional ovens.

Claims

1. A domestic oven (10) comprising a cavity (10a) with a back wall and side walls, **characterised in that** the side walls comprise elements (12, 14, 16) of refractory insulating material assembled together.
2. An oven according to claim 1, **characterised in that** said elements (12, 14, 16) are obtained by means of an extrusion process.
3. An oven according to claim 1 or 2, **characterised in that** each of said elements (12, 14, 16) presents a double wall substantially flat structure.
4. An oven according to claim 3, **characterised in that** the elements comprise a top element (14), a bottom element (12) and two side elements (16).
5. An oven according to claim 4, **characterised in that** the top and the bottom elements (14, 12) comprise longitudinal grooves (26) adapted to cooperate with corresponding tenons (24) provided in the upper and lower side portions of the side elements (16).
6. An oven according to any of the preceding claims, **characterised in that** said elements (12, 14, 16) are assembled together by means of longitudinal rods (30) acting on the back wall (20) and on a front metal frame (18) sandwiching the elements (12, 14, 16) between them.
7. An oven according to claim 6, **characterised in that** the front frame (18) presents an opening (18a) corresponding to the inner profile of the cavity (10a).
8. An oven according to claim 6, **characterised in that** the front frame (18) presents means (34) for installing a door of the oven (10).
9. An oven according to claim 6, **characterised in that** the front frame (18) presents upper portions (36) for supporting a control panel (38).
10. An oven according to claim 6, **characterised in that** the back wall (20) comprises means (50) for supporting a fan.
11. An oven according to claim 4, **characterised in that** the side elements (16) present longitudinal grooves (22) or ridges (54) for supporting racks or the like (R,

P).

12. An oven according to any of the preceding claims, **characterised in that** it comprises heating elements (42, 46) placed at the top and at the bottom of the cavity (10a). 5

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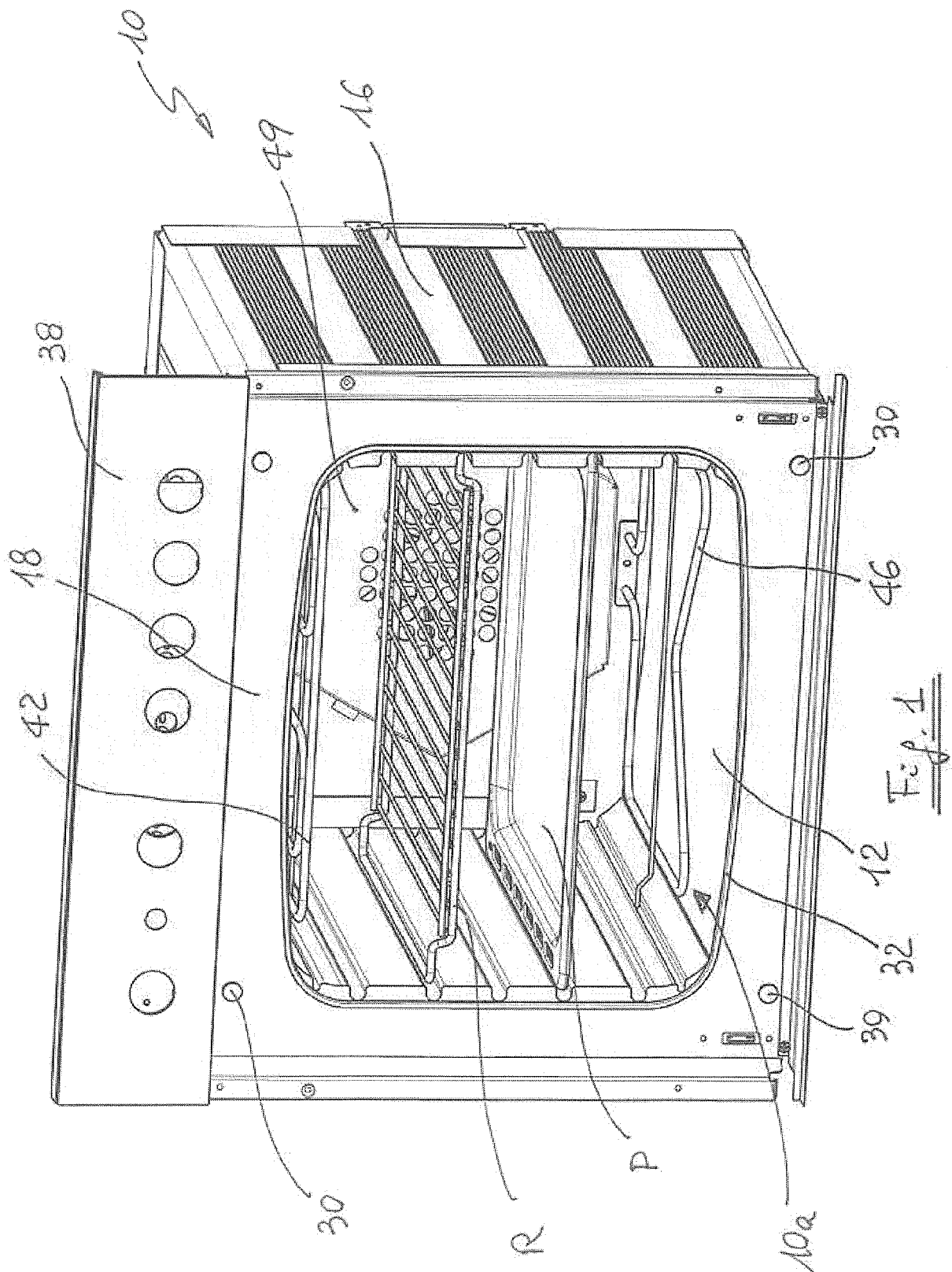
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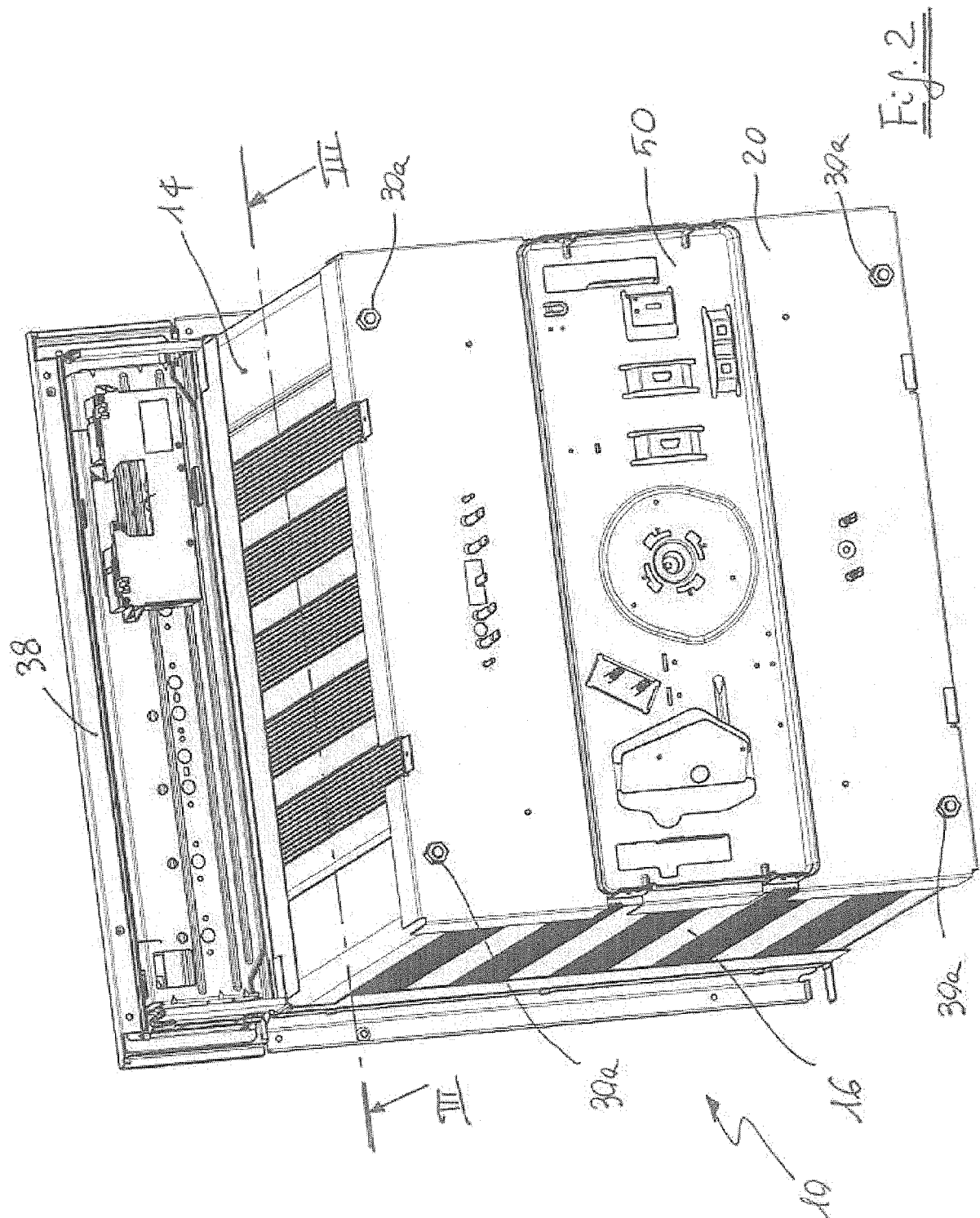
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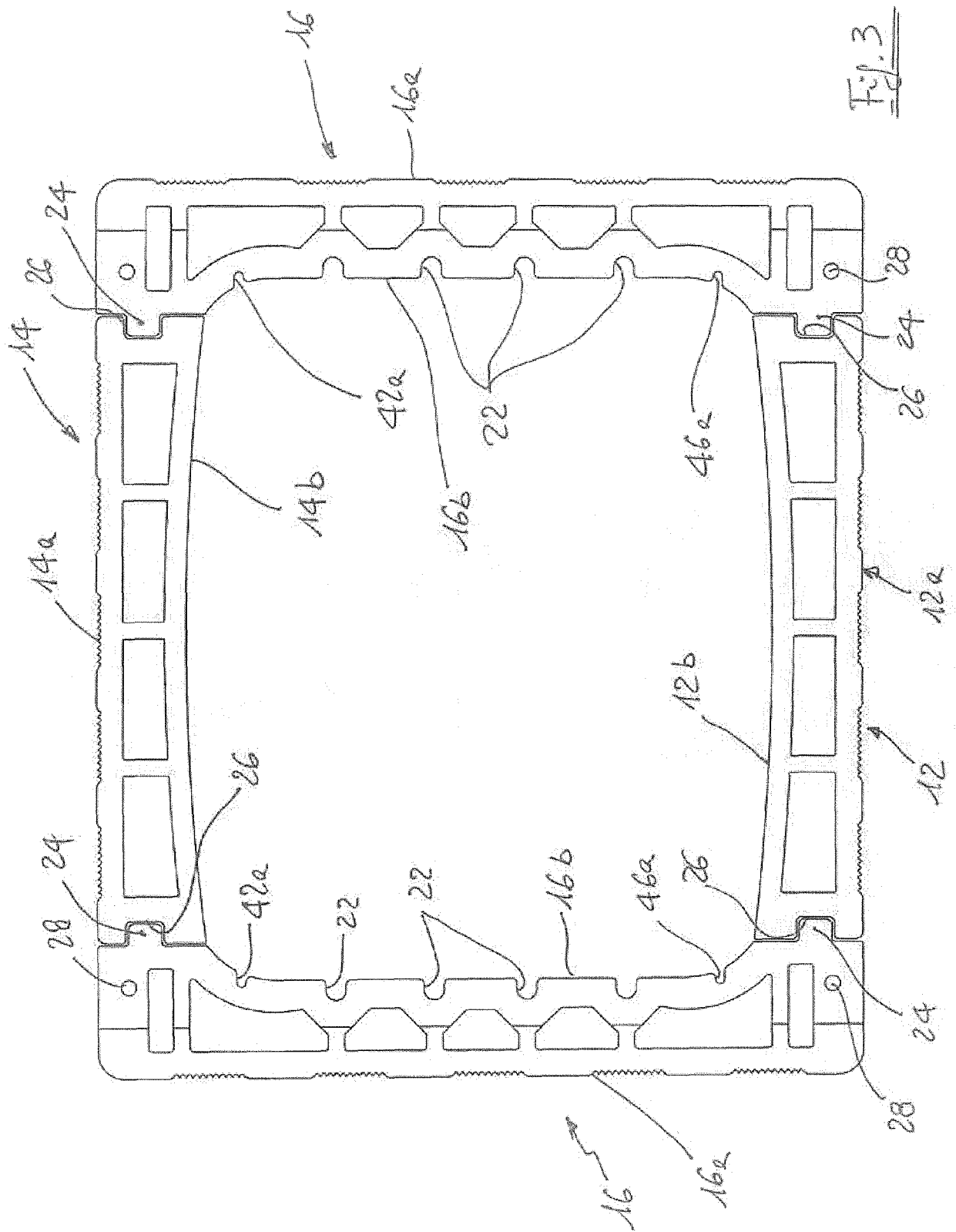
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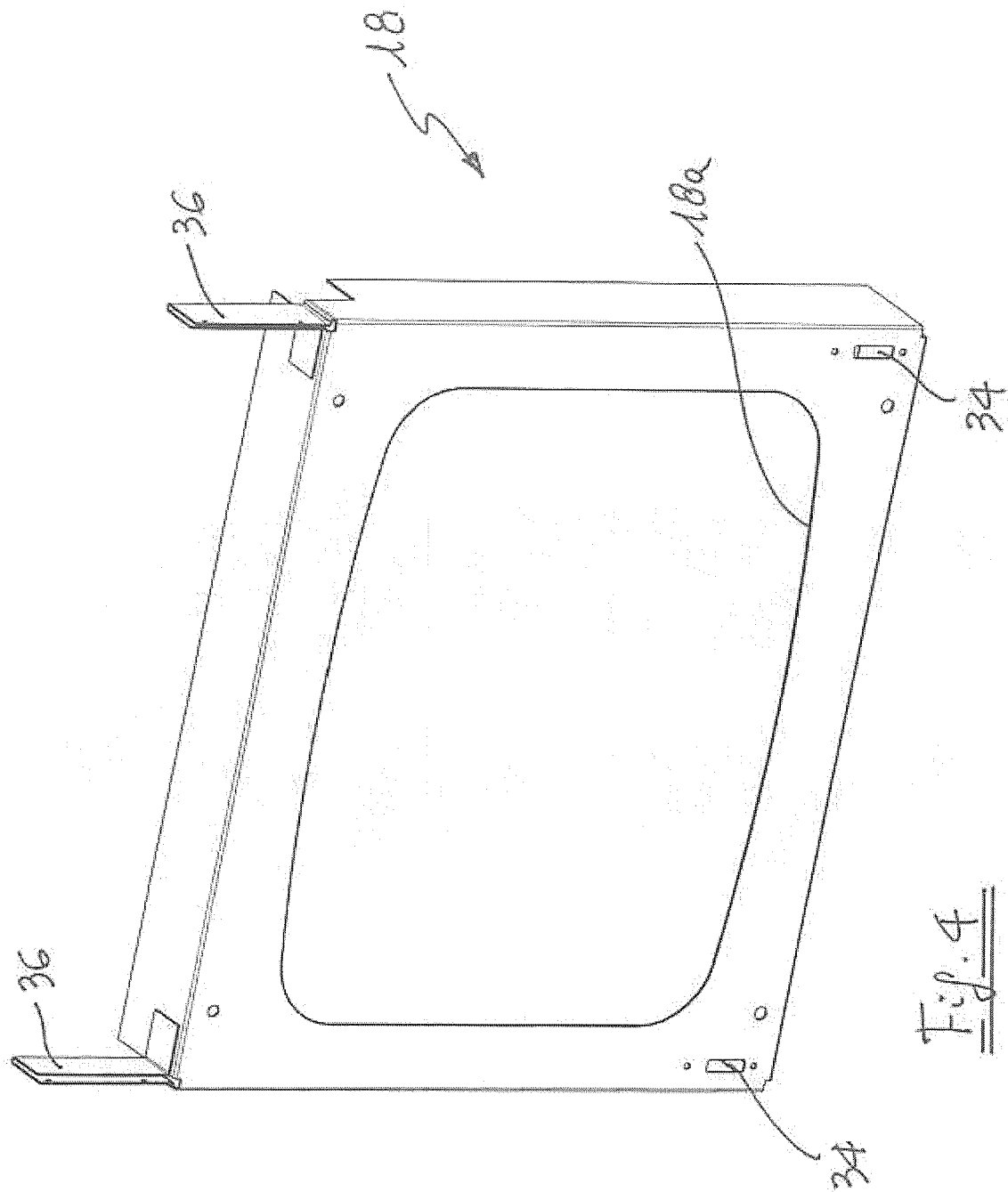
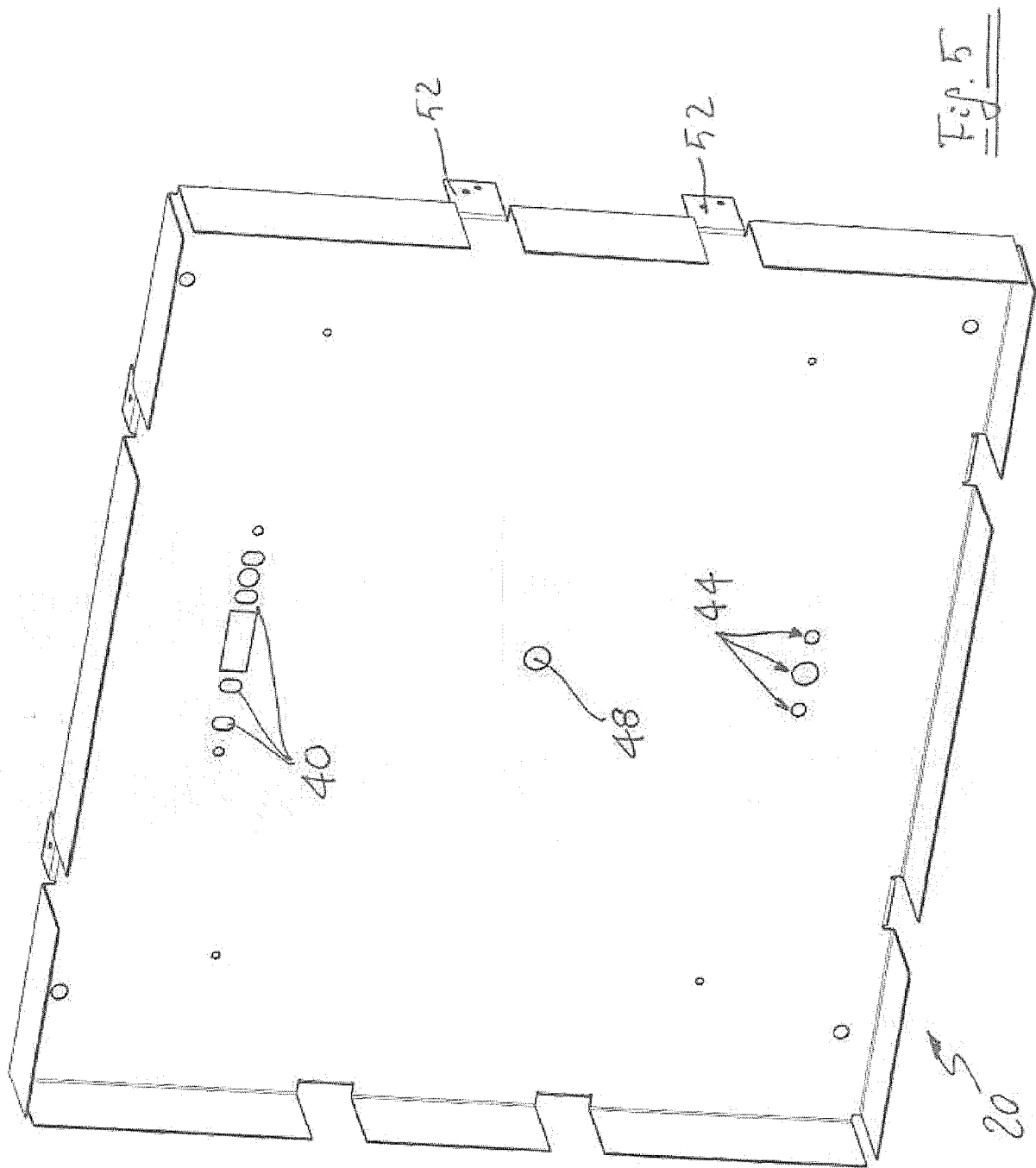


Fig. 4



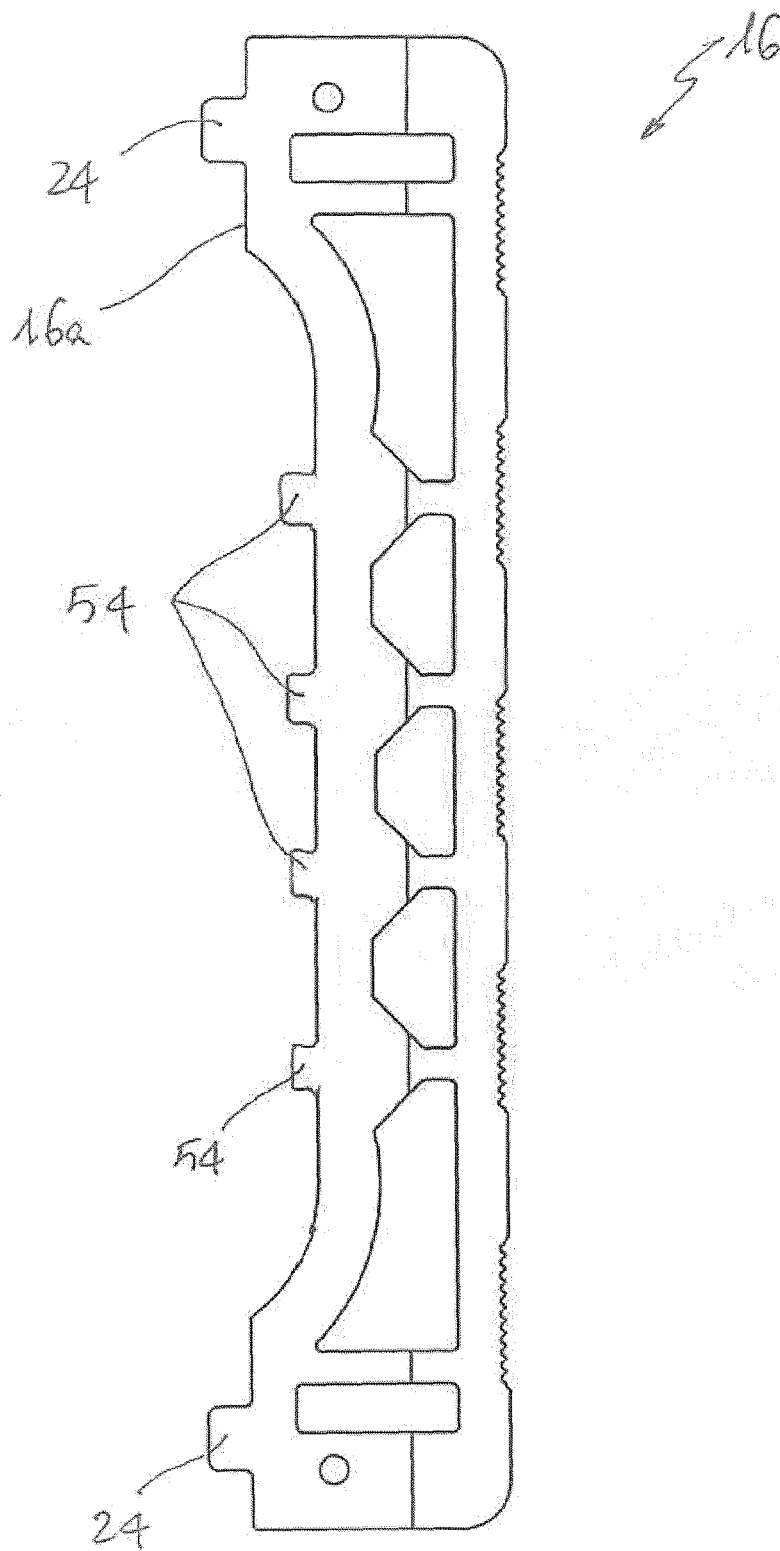


Fig. 6



European Patent
Office

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Application Number
EP 05 10 8505

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 21 December 2005	Examiner 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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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