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(54) **PROCESS OF ASSEMBLING A MUFFLE TO THE STRUCTURE OF AN OVEN AND OVEN
INCLUDING A MUFFLE ASSEMBLED ACCORDING TO THE PROCESS**

VERFAHREN ZUR MONTAGE EINER MUFFEL AN DIE STRUKTUR EINES OFENS UND OFEN MIT
EINER NACH DIESEM VERFAHREN MONTIERTEN MUFFEL

PROCÉDÉ D'ASSEMBLAGE D'UN MOUFLE À LA STRUCTURE D'UN FOUR ET FOUR
COMPRENANT UN MOUFLE ASSEMBLÉ SELON LE PROCÉDÉ

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Description

[0001] The present invention relates to a process of assembling a muffle inside an external bearing structure of a domestic cooking oven.

[0002] The present invention further relates to a domestic cooking oven whose muffle is assembled and fastened to the external bearing structure according to the aforementioned assembly process.

[0003] Ovens are known in which the muffle is fastened to the external frame through a plurality of screws. In the known ovens, interposed between the muffle and the frame there is a connecting element, which is screwed both to the muffle and to the frame.

[0004] However, such fastening of the muffle to the frame has the drawback of concentrating the strains resulting from the weight of the muffle around the holes in which the screws are engaged, generating a concentration of localised tension that can harm the structural solidity of the oven.

[0005] Furthermore, the known fastening process of the muffle to the frame is lengthy and expensive.

[0006] A further drawback is due to the fact that the fastening of a plurality of screws to the muffle can compromise subsequent surface finishing processes on the internal surfaces of the muffle, such as, for example, painting or lacquering.

[0007] Document GB2417770A discloses a cooking oven having a muffle fastened in an outer housing and formed of a lower base, a casing (defined by two side walls and a rear wall) and an upper ceiling. A fastening unit connects a rearward region of the lower base with the outer housing and comprises two connecting means, integrally formed in the corner regions of the lower base. Each connecting means comprises a horizontal strap integrally connected to a vertical strap defining a contact surface for coupling to the outer housing.

[0008] Document EP0173543A2 discloses a cooking oven wherein a bracket is welded to the rear end of a muffle. This bracket comprises projecting tags that clip into slots formed in a pair of metal straps that are connected to an external bearing structure in order to hold the muffle in place.

[0009] Document FR2561357A1 discloses a cooking oven whose muffle has an enclosure comprising an upper portion and a lower portion, respectively attached to the upper side and to the lower side of a U-shaped central body forming two side walls and a rear wall.

[0010] Document US2,557,496 discloses a domestic oven comprising a muffle constructed over two oven pieces, each substantially U-shaped in vertical cross-section, and provided with a plate extending across one end to form a rear end closure for the oven.

[0011] GB 817 518 A discloses a further cooking oven and is considered to represent the closest prior art.

[0012] A principal object of the present invention is to resolve one or more of the problems found in the prior art.

[0013] An object of the present invention is to provide a domestic cooking oven equipped with a stable fastening between the muffle and the external bearing structure of the oven.

[0014] A further object of the present invention is to provide process of assembling a muffle inside a bearing structure of a domestic cooking oven that is simple, quick, rational and cheap to perform.

[0015] These objects and others, which will become more apparent from the following description, are substantially reached by a process of assembling a muffle inside an external bearing structure of a domestic cooking oven and a domestic cooking oven comprising a muffle assembled in accordance with the aforementioned process, according to the contents of one or more of the appended claims.

[0016] In a 1st aspect, a domestic cooking oven (1) is envisaged, comprising:

- an external bearing structure (2);
- a muffle (3) housed inside the external bearing structure (2) and comprising a lateral wall (31) and a first and a second covering element (32, 33) engaged with the lateral wall (31) respectively at an upper and a lower end portion (318, 319) of the lateral wall (31) such as to define a cooking chamber;
- a door (4) for accessing the cooking chamber, associated with the bearing structure (2),

wherein the lateral wall (31) of the muffle (3) comprises a first and a second side (311, 312) parallel to each other and a transversal wall (313) interposed between, and extending orthogonally to, the first and second sides (311, 312),

and wherein the muffle (3) comprises at least one flange (10) extending transversally to the lateral wall (31) and at least partially at the first and second sides (311, 312) and/or at the transversal wall (313), the oven (1) further comprising at least one fixing bracket (20) configured for constraining the muffle (3) to the bearing structure (2), said at least one fixing bracket (20) being welded to said at least one flange (10) and being engaged with the external bearing structure (2).

[0017] In a 2nd aspect, in accordance with the 1st aspect, the lateral wall (31) is constituted by a single part and/or the covering elements (32, 33) of the muffle (3) are non-removably engaged with the lateral wall (31), particularly through welding. In a 3rd aspect, in accordance with the 1st or the 2nd aspect, the external bearing structure (2) comprises at least a first and a second panel (21, 22) engaged respectively with the first and second side (311, 312) of the muffle (3) and equipped with one or more constraining portions (25), said at least one fixing bracket (20) being engaged with the first and the second panel (21, 22) at the respective constraining portions (25) through one or more screws or through bolting or similar

fastening means.

[0018] In a 4th aspect, in accordance with the 1st or 2nd or 3rd aspect, said at least one fixing bracket (20) has at opposite end portions of the bracket (20) one or more coupling portions (210) configured to be engaged with means for moving the muffle (3), such as means for lifting the muffle (3).

[0019] A 5th aspect envisages a process of assembling a muffle (3) inside a bearing structure (2) of a domestic cooking oven (1) in accordance with any one of the preceding aspects, the process comprising the steps of:

- providing a muffle (3) comprising:
 - a) a lateral wall (31) comprising a first and a second side (311, 312) parallel to each other and a transversal wall (313) interposed between, and extending orthogonally to, the first and second sides (311, 312),
 - b) a first and a second covering element (32, 33) arranged respectively above and below the lateral wall (31) so as to define a cooking chamber, the muffle (3) comprising at least one flange (10) extending at least in proximity of connecting angular portions between the transversal wall (313) and the first and second sides (311, 312) said at least one flange (10) comprising a substantially flat guide surface (105) extending away from, in particular orthogonally to, the lateral wall (31) of the muffle (3),
- providing at least one fixing bracket (20),
- providing a first and a second panel (21, 22) of the external bearing structure (2);
- positioning said at least one fixing bracket (20) abuttingly to the guide surface (105) of said at least one flange (10),
- welding said at least one fixing bracket (20) at the respective flange (10), the welding between said at least one fixing bracket (20) and the respective flange (10) having a plurality of discrete welding spots (6),

following said welding, engaging said first and said second panel (21, 22) through said at least one bracket (20) respectively at the first and the second side (311, 312) of the muffle (3).

[0020] In a 6th aspect, in accordance with any one of the preceding aspects, said at least one flange (10) is defined at at least one of the first and the second covering elements (32, 33).

[0021] In a 7th aspect, in accordance with the 5th or 6th aspect, the process comprises the step of engaging the first and the second covering element (32, 33) with the muffle (3) respectively at an upper and a lower end portion (318, 319) of the lateral wall (31) so as to define a cooking chamber, said engagement defining said at least one flange (10).

[0022] In an 8th aspect, in accordance with the 5th or 6th or 7th aspect, the muffle (3) defines a cooking chamber delimited perimetally by the first and by the second side (311, 312) and by the first and the second covering element (32, 33), the process comprising the step of fastening a facade (5) to the muffle (3) perimetally with respect to said cooking chamber of the muffle (3).

[0023] In a 9th aspect, in accordance with the 8th aspect, the fastening of the facade (5) to the muffle (3) is performed before the engagement of the first and the second panel (21, 22) to the muffle (3).

[0024] In a 10th aspect, in accordance with the 9th aspect, after fastening the facade (5), the process comprises a step of engaging the first and the second panel (21, 22) with the facade (5).

[0025] In an 11th aspect, in accordance with any one of the aspects from the 5th to the 10th, the process comprises the engagement of a rear panel (23) with the first and the second panel (21, 22) so as to close the external bearing structure (2) from the rear.

[0026] There now follows, by way of non-limiting example, a detailed description of one or more preferred embodiments of the invention, in which:

figure 1 represents a side view of a domestic cooking oven according to the present invention;
 figure 2 represents an axonometric view of the muffle of the oven of figure 1;
 figure 3 shows a detail of figure 2;
 figure 4 represents a rear view of the muffle of the oven of figure 1;
 figure 5 represents a view from above of the muffle engaged with the external bearing structure of the oven in accordance with the present invention, with some elements removed;
 figure 6 represents the section VI-VI of figure 5 with some elements removed;
 figure 7 shows a detail of figure 6;
 figure 8 represents an exploded view of the oven according to the present invention;
 figure 9 represents an exploded view from above of the oven according to the present invention.

[0027] With reference to the figures, 1 indicates overall a domestic cooking oven. The oven 1 comprises an external bearing structure 2, a muffle 3 housed inside the external bearing structure 2 and defining a cooking chamber and a door 4 that allows access to the cooking chamber.

[0028] The oven 1 further comprises a facade 5 associated with the bearing structure 2 at a front portion of the oven 1 perimetally with respect to an access mouth to the cooking chamber.

[0029] The facade 5 may have two side uprights 51 and an upper and lower portion 52, 53 arranged transversally to the two side uprights 51.

[0030] The external bearing structure 2 is adapted to structurally support the muffle 3 and comprises a first and

a second panel 21, 22 and a rear panel 23. The first and the second panel 21, 22 are positioned laterally with respect to the muffle 3 and are reciprocally parallel, while the rear panel 23 is positioned at a rear portion of the oven 1 (opposite the access mouth to the cooking chamber) and is interposed between them in the orthogonal direction.

[0031] The first and the second panel 21, 22 are engaged with the muffle 3, for example through one or more set screws or through bolting or similar fastening means.

[0032] In particular, the first and the second panel 21, 22 may have one or more constraining portions 25 at which they may be engaged to the muffle 3 through at least one of the aforementioned fastening means, as illustrated in figure 2 with reference to the first panel 21.

[0033] With regard to the muffle 3, it comprises a lateral wall 31 and a first and a second covering element 32, 33, which are engaged to the lateral wall 31 at an upper and lower end portion 318, 319 of the lateral wall 31. The engagement of the first and the second covering element 32, 33 to the lateral wall 31 may be made for example through welding, in particular through continuous welding. In the context of the present description, continuous welding means welding defining a welding seam substantially extending without interruption. Continuous welding is opposed to "discrete" welding, a term which in the context of the present description means welding that has a plurality of discrete welding spots. Examples of "discrete" welding are spot welding and tack welding.

[0034] Returning to the muffle 3, the lateral wall 31 in turn comprises a first and a second side 311, 312 reciprocally parallel and a transversal wall 313, which is interposed between the first and the second side 311, 312 and extends orthogonally to them. In other words, the lateral wall 31 of the muffle 3 has a substantially C-shaped profile (see figure 8) defined by the transversal orientation of the first and the second side 311, 312 with respect to the transversal wall 313.

[0035] The first and the second side 311, 312 of the muffle 3 may have one or more engagement portions 71 at which they may be constrained to the facade 5 at respective engagement portions 72 of the side uprights 51 of the facade 5, for example, through one or more set screws or through bolting or similar fastening means. For example, figure 8 illustrates a plurality of engagement portions 71 of the first side 311 of the muffle 3 and an engagement portion 72 of one of the two uprights 51.

[0036] The first and the second side 311, 312 are respectively engaged with the first and the second panel 21, 22 as will be described in more detail below. The first and the second side 311, 312 may further be engaged with the facade 5.

[0037] The cooking chamber defines the internal volume of the oven 1 adapted to house the food intended to be heated or cooked and is defined laterally by the sides 311, 312, at the rear by the transversal wall 313 and at the top and bottom, respectively, by the first and the second covering element 32, 33 of the muffle 3.

[0038] With regard to the door 4, it is arranged in a front portion of the oven 1 and is rotatably engaged with the bearing structure 2; it may for example be hinged to the lower portion 53 of the facade 5. The door 4 substantially constitutes a front wall of the oven 1 movable between at least one closed position wherein the cooking chamber is not accessible from the outside and an open condition wherein the cooking chamber is accessible from the front through the access mouth.

[0039] The door 4 is equipped with a handle 41 which enables the easy grip and movement between the closed and the open position.

[0040] The oven 1 further comprises one or more flanges 10 defined at the first and/or the second covering element 32, 33 and one or more fixing brackets 20 for fixing the muffle 3 to the bearing structure 2. The fixing brackets 20 constitute the elements for constraining the muffle 3 to the bearing structure 2 and for that purpose are engaged both with the muffle 3 (at the flanges 10) and with the bearing structure 2. Each flange 10 extends transversally, in particular orthogonally, with respect to the lateral wall 31 and at least partially at the first and the second side 311, 312.

[0041] Advantageously, the flanges 10 extend in proximity of connecting angular portions between the transversal wall 313 and the first and second sides 311, 312, as illustrated in figure 2 and in figure 3. Each flange 10 arranged at connecting angular portions of the lateral wall may extend both along at least one of the first and the second side 311, 312 and along the transversal wall 313; for example, each flange 10 may have a lateral portion 108 extending at the first and/or the second side 311, 312 and a transversal portion 109 extending at the transversal wall 313.

[0042] Preferably, the length of the lateral portions 108 of the flanges 10 which extend at the respective sides 311, 312 of the lateral wall 31 is shorter than the length of the respective sides 311, 312.

[0043] From a geometric point of view, each flange 10 has a guide surface 105 substantially flat and that extends away from the lateral wall 31 of the muffle 3 in the orthogonal direction. Such guide surface 105 abuts with a corresponding substantially flat surface of the brackets 20, which will be described in more detail below.

[0044] In accordance with a preferred embodiment of the present invention, the first and the second covering element 32, 33 comprise respectively a first and a second flange 101, 102. The first and the second flange 101, 102 may comprise two lateral portions 108 extending respectively at the first and the second side 311, 312 and a transversal portion 109 that extends interposed between the two lateral portions 108, connecting them. In other words, both flanges 101, 102 may extend continuously at the first side 311 of the transversal wall 313 and at the second side 312 of the lateral wall 31 of the muffle 3, having a substantially C-shaped profile. With regard to the fixing brackets 20, they have a coupling portion 208 to a flange 10 and a transversal portion 209 to the cou-

pling portion 208. The coupling portion 208 has a substantially flat surface 205 in abutment with the guide surface 105 of the flange 10 with which the bracket 20 is engaged.

[0045] The coupling portion 208 has edges which, at opposite end portions of the bracket 20, may have coupling portions 210 which, in a step of the assembly process subsequent to the engagement of the brackets 20 with the respective flanges 10 of the muffle 3 and prior to the engagement of the brackets 20 with the external bearing structure 2, may be intended to be engaged with means for moving the muffle 3.

[0046] An example of movement means may be comprised by a device for lifting the muffle 3 adapted to raise the muffle 3 and support it in a suspended position within the enamelling or lacquering oven.

[0047] For example, the coupling portions 210 may have a substantially V-shaped conformation, as shown in figure 5.

[0048] The brackets 20 may also have one or more holes at the coupling portion 208 and/or the transversal portion 209; such holes may be engaged by fastening means (for example set screws) for fastening the muffle 3 to the external bearing structure 2, in particular to the rear panel 23.

[0049] From a dimensional point of view, the brackets may have a higher thickness SS than a thickness SF of the respective flange to which the bracket 20 is coupled. For example, the thickness SF of each bracket 20 may be comprised between 1 and 2.5 mm, in particular it may be substantially equal to 1.5 or 2 mm, while the thickness of each flange 10 may be comprised between 0.2 and 1 mm, in particular substantially equal to 0.5 mm.

[0050] Such thickness SS of the brackets 20 enables structural solidity to be given to the fastening between the muffle 3 and the external bearing structure 2, to which the brackets 20 are constrained.

[0051] With regard to the thickness SF of the flanges 10, it has contained values such as those mentioned above, hence allowing to save on material and to make the covering elements 32, 33 lighter, consequently reducing the total weight of the muffle 3.

[0052] The oven 1 may comprise at least one first and a second fixing bracket 201, 202, engaged respectively with the first and the second flange 101, 102.

[0053] In accordance with a preferred embodiment of the present invention, the oven 1 comprises a first, a second, a third and a fourth fixing bracket 201, 202, 203, 204.

[0054] The first and the third bracket 201, 203 are engaged with the first flange 101 at opposite ends of the first flange 101 in proximity of connecting angular portions of the lateral wall 31, as shown in figure 2 and in figure 4.

[0055] Likewise, the second and the fourth bracket 202, 204 are engaged with the second flange 102 at opposite ends of the second flange 102 in proximity of connecting angular portions of the lateral wall 31, as shown in figure 2 and in figure 4.

[0056] Substantially, the muffle 3 has at the top a first flange 101 with which the first and the third bracket 201, 203 are engaged and at the bottom a second flange 102 with which the second and the fourth bracket 202, 204 are engaged.

[0057] The first and the third fixing brackets 201, 203 can be engaged with the first flange 101 so that its substantially flat surface 205 abuts onto the guide surface 105 above the first flange 1, as shown in the detail of figure 7 with reference to the first flange 101 and the first fixing bracket 201.

[0058] The second and the fourth fixing bracket 202, 204 can be engaged with the second flange 102, 101 so that its substantially flat surface 205 abuts on the guide surface 105 below the second flange 1, as shown in figure 2.

[0059] In other words, the first and the third fixing brackets 201, 203 can be coupled above the first flange 101, while the second and the fourth fixing brackets 202, 204 can be coupled below the second flange 102. In accordance with such engagement between the fixing brackets 20 and flanges 10, the transversal portions 209 of the brackets 20 engaged with the first and the second flange 101, 102 are reciprocally facing one another at the lateral wall 31 of the muffle 3, as shown in figure 2 and in figure 4.

[0060] The brackets 20 are engaged to the flanges 10 through welding.

[0061] In accordance with a preferred embodiment of the present invention, the welding has a plurality of discrete welding spots 6, as shown in the detail of figure 3. Preferably, the welding of the brackets 20 to the respective flanges 10 is spot welding or tack welding.

[0062] The present invention further relates to a process of assembling a muffle 3 inside an external bearing structure 2 of a domestic cooking oven 1.

[0063] The muffle is assembled by engaging the first and the second covering elements 32, 33 respectively at the upper and lower end portions 318, 319 of the lateral wall 31 so as to define a cooking chamber. Following the assembly of the muffle 3, one or more brackets 20 are engaged with the first and the second flange 101, 102 with the substantially flat surfaces 205 of the brackets 20 in abutment on the respective guide surfaces 105 of the flanges 101, 102. After positioning the brackets 20 with respect to the flanges 10, the brackets 20 are welded to the flanges 10 at a plurality of discrete welding spots 6. The welding may be performed so that adjacent discrete welding spots 6 are equidistant, in order to equally distribute the stress and strain acting on the bracket 20. Such stress and strain is due to the static load resulting from the weight of the muffle 3 and any dynamic loads, due, for example, to the movement or transport of the oven 1.

[0064] Advantageously such welding can be performed automatically by an appropriate welding machine, hence not involving the manual intervention of operators.

[0065] Following the welding, the first and the second

panel 21, 22 are respectively engaged with the first and the second side 311, 312 by means of brackets 20. For example, the first and the second panel 21, 22 may be engaged with the muffle 3 at the respective constraining portions 25 of the panels 21, 22 through one or more set screws. The set screws cross the brackets 20 at the transversal portions 209 (for example crossing one or more holes defined therein) and are engaged with the panels 21, 22 at the respective constraining portions 25.

[0066] After welding, the facade 5 is fastened to the muffle 3 perimetally with respect to the access mouth of the cooking chamber.

[0067] The first and the second panel 21, 22 of the external bearing structure 2 may be engaged with the side uprights 51 of the facade 5 at the respective engagement portions 71, 72, for example through one or more screws or through bolting or similar fastening means.

[0068] Furthermore, in order to close the oven 1 at the rear, the rear panel 23 is engaged with the first and the second panel 21, 22 and/or the muffle 3 (for example at one or more holes in the brackets 20) through the engagement of one or more fastening elements, such as set screws.

[0069] The present invention makes it possible to obtain one or more of the following advantages and to resolve one or more of the problems encountered in the prior art. First of all the invention allows the times, costs and complexity of the process of assembling the muffle inside the external bearing structure of an oven to be reduced.

[0070] The present invention further enables the process of assembling the muffle inside the external bearing structure of the oven to be automated.

[0071] The present invention further enables a solid and stable fastening of the muffle to the external bearing structure of the oven to be obtained without operating on the lateral wall of the muffle. The present invention hence allows the muffle to be fastened to the bearing structure of the oven non-invasively with respect to the lateral wall of the muffle; such fastening therefore does not compromise the final performance of any subsequent processing on the surface finish of the muffle surfaces facing towards the cooking chamber of the oven.

[0072] The present invention further allows a light and at the same time strong muffle to be made.

[0073] The invention is moreover convenient to use, easy to implement and simple and economical to construct.

Claims

1. Domestic cooking oven (1) comprising:

- an external bearing structure (2);
- a muffle (3) housed inside the external bearing structure (2) and comprising a lateral wall (31) and a first and a second covering element (32,

33) engaged with the lateral wall (31) respectively at an upper and a lower end portion (318, 319) of the lateral wall (31) such as to define a cooking chamber;

- a door (4) for accessing the cooking chamber, associated with the bearing structure (2),

wherein the lateral wall (31) of the muffle (3) comprises a first and a second side (311, 312) parallel to each other and a transversal wall (313) interposed between, and extending orthogonally to, the first and second sides (311, 312),

wherein the muffle (3) comprises at least one flange (10) extending transversally to the lateral wall (31) and at least partially at the first and second sides (311, 312) and/or at the transversal wall (313), the oven (1) further comprising at least one fixing bracket (20) configured for constraining the muffle (3) to the bearing structure (2), said at least one fixing bracket (20) being engaged with the external bearing structure (2) and

wherein said at least one flange (10) has a substantially flat guide surface (105) extending away from, in particular orthogonally to, the side wall (31) of the muffle (3), said at least one fixing bracket (20) has a respective substantially flat surface (205) abuttingly coupled to the guide surface (105) of the respective flange (10) and a transversal portion (209), in particular orthogonal to, said substantially flat surface (205) and the muffle (3) comprises at least a first and a second flange (101, 102) respectively defined at the first and second covering elements (32, 33).

characterized in that

- said at least one fixing bracket (20) is welded to said at least one flange (10) at the guide surface (105) and
- said at least one fixing bracket (20) is engaged with the external bearing structure (2) at said transversal portion (209).

2. Domestic cooking oven (1) according to claim 1, wherein said at least one flange (10) extends at least in proximity of connecting angular portions between the transversal wall (313) and the first and second sides (311, 312).

3. Domestic cooking oven (1) according to claim 1 or 2, wherein said at least one flange (10) extends for a whole width of the transversal wall (313) and, without interruption, at least partially at the first and second sides (311, 312).

4. Domestic cooking oven (1) according to any one of the preceding claims, wherein said at least one fixing bracket (20) is coupled to said at least one flange (10) in proximity of at least one connecting angular portion between the transversal wall (313) and the

first and second sides (311, 312).

5. Domestic cooking oven (1) according to any one of the preceding claims, wherein the weld between said at least one fixing bracket (20) and the respective flange (10) has a plurality of discrete welding spots (6). 5
6. Domestic cooking oven (1) according to any one of the preceding claims, wherein the oven (1) comprises at least a first and a second fixing bracket (201, 202) welded to said at least one flange (10), or respectively to said first and second flanges (101, 102), at least in proximity of the connecting angular portions between the transversal wall (313) and the first and second sides (311, 312), and/or wherein the oven (1) comprises at least a first, a second, a third and a fourth fixing bracket (201, 202, 203, 204), the first and third fixing brackets (201, 203) being welded to the first flange (101) of the first covering element (32) respectively in proximity of connecting angular portions between the transversal wall (313) and the first and second sides (311, 312) and the second and fourth fixing brackets (202, 204) being welded to the second flange (102) of the second covering element (33) respectively in proximity of the connecting angular portions between the transversal wall (313) and the first and second sides (311, 312). 10 15 20 25
7. Domestic cooking oven (1) according to any one of the preceding claims, wherein said at least one flange has a thickness (SF) and said at least one fixing bracket has a thickness (SS), the fixing bracket thickness (SS) being greater than the flange thickness (SF). 30
8. Process of assembling a muffle (3) inside an external bearing structure (2) of a domestic cooking oven (1) according to any one of the preceding claims, the process comprising the steps of: 40
 - providing a muffle (3) comprising:
 - a) a side wall (31) comprising a first and a second side (311, 312) parallel to each other and a transversal wall (313) interposed between, and extending orthogonally to, the first and second sides (311, 312), 45
 - b) a first and a second covering element (32, 33), 50
 - engaging the first and second covering elements (32, 33) with the side wall (31) of the muffle (3), respectively at an upper and a lower end portion (318, 319) of the side wall (31) in order to define a cooking chamber, said muffle (3) comprising at least one flange (10) extending at least in proximity of connecting angular portions 55

between the transversal wall (313) and the first and second sides (311, 312), said at least one flange (10) comprising a substantially flat guide surface (105) extending away from, in particular orthogonally to, the side wall (31) of the muffle (3),

- providing at least one fixing bracket (20),
- providing a first and a second panel (21, 22) of the external bearing structure (2),
- positioning said at least one fixing bracket (20) in abutment to the guide surface (105) of said at least one flange (10),
- engaging said first and second panels (21, 22) by means of said at least one bracket (20) respectively at the first and second sides (311, 312) of the muffle (3);

characterized in that

a welding step is performed between said positioning step and said engaging step, in said welding step at least one fixing bracket (20) is welded at the respective flange (10), the weld between said at least one fixing bracket (20) and the respective flange (10) having a plurality of discrete welding spots (6).

9. Process according to the preceding claim, wherein the step of welding said at least one bracket (20) to the respective flange (10) is performed by spot welding or tack welding.

Patentansprüche

1. Heimkochofen (1), umfassend: 35

- eine äußere Tragstruktur (2);
- eine Muffel (3), die im Inneren der äußeren Tragstruktur (2) untergebracht ist, und eine seitliche Wand (31) und ein erstes und ein zweites Abdeckungselement (32, 33), die mit der seitlichen Wand (31) jeweils an einem oberen und einem unteren Endbereich (318, 319) der seitlichen Wand (31) derart im Eingriff stehen, dass sie eine Kochkammer definieren, umfasst;
- eine der Tragstruktur (2) zugeordnete Tür (4), um auf die Kochkammer zuzugreifen,

wobei die seitliche Wand (31) der Muffel (3) eine erste und eine zweite Seite (311, 312), die parallel zu einander sind, und eine Querwand (313), die zwischen die ersten und zweiten Seiten (311, 312) zwischengesetzt ist und sich orthogonal zu denselben erstreckt, umfasst,

wobei die Muffel (3) mindestens einen Flansch (10) umfasst, der sich quer zu der seitlichen Wand (31) und mindestens teilweise an den ersten und zweiten Seiten (311, 312) und/oder an der Querwand (313) erstreckt, wobei der Ofen (1) weiter mindestens eine

Fixierklammer (20) umfasst, die eingerichtet ist, um die Muffel (3) an der Tragstruktur (2) festzuhalten, wobei die mindestens eine Fixierklammer (20) mit der äußeren Tragstruktur (2) im Eingriff steht, und wobei der mindestens eine Flansch (10) eine im Wesentlichen flache Führungsoberfläche (105) aufweist, die sich weg von, insbesondere orthogonal zu, der Seitenwand (31) der Muffel (3) erstreckt, wobei die mindestens eine Fixierklammer (20) eine entsprechende im Wesentlichen flache Oberfläche (205), die mit der Führungsoberfläche (105) des entsprechenden Flanschs (10) anschlagend gekoppelt ist, und einen Querbereich (209), insbesondere orthogonal zu der im Wesentlichen flachen Oberfläche (205) aufweist, und die Muffel (3) mindestens einen ersten und einen zweiten Flansch (101, 102) umfasst, die jeweils an den ersten und zweiten Abdeckungselementen (32, 33) definiert sind,
dadurch gekennzeichnet, dass

- die mindestens eine Fixierklammer (20) an der Führungsoberfläche (105) an den mindestens einen Flansch (10) geschweißt ist, und
 - die mindestens eine Fixierklammer (20) an dem Querbereich (209) mit der äußeren Tragstruktur (2) im Eingriff steht.
2. Heimkochofen (1) nach Anspruch 1, wobei der mindestens eine Flansch (10) sich mindestens in Nähe von verbindenden Winkelbereichen zwischen der Querwand (313) und den ersten und zweiten Seiten (311, 312) erstreckt.
 3. Heimkochofen (1) nach Anspruch 1 oder 2, wobei der mindestens eine Flansch (10) sich über eine gesamte Breite der Querwand (313) und ohne Unterbrechung mindestens teilweise an den ersten und zweiten Seiten (311, 312) erstreckt.
 4. Heimkochofen (1) nach einem der vorstehenden Ansprüche, wobei die mindestens eine Fixierklammer (20) in Nähe mindestens eines verbindenden Winkelbereichs zwischen der Querwand (313) und den ersten und zweiten Seiten (311, 312) an den mindestens einen Flansch (10) gekoppelt ist.
 5. Heimkochofen (1) nach einem der vorstehenden Ansprüche, wobei die Schweißung zwischen der mindestens einen Fixierklammer (20) und dem entsprechenden Flansch (10) eine Vielzahl von einzelnen Schweißpunkten (6) aufweist.
 6. Heimkochofen (1) nach einem der vorstehenden Ansprüche, wobei der Ofen (1) mindestens eine erste und eine zweite Fixierklammer (201, 202) umfasst, die mindestens in Nähe der verbindenden Winkelbereiche zwischen der Querwand (313) und den ersten und zweiten Seiten (311, 312) an den mindes-

tens einen Flansch (10) oder jeweils an die ersten und zweiten Flansche (101, 102) geschweißt ist, und/oder wobei der Ofen (1) mindestens eine erste, eine zweite, eine dritte und eine vierte Fixierklammer (201, 202, 203, 204) umfasst, wobei die ersten und dritten Fixierklammern (201, 203) jeweils in Nähe von verbindenden Winkelbereichen zwischen der Querwand (313) und den ersten und zweiten Seiten (311, 312) an den ersten Flansch (101) des ersten Abdeckungselements (32) geschweißt sind, und die zweiten und vierten Fixierklammern (202, 204) jeweils in Nähe der verbindenden Winkelbereiche zwischen der Querwand (313) und den ersten und zweiten Seiten (311, 312) an den zweiten Flansch (102) des zweiten Abdeckungselements (33) geschweißt sind.

7. Heimkochofen (1) nach einem der vorstehenden Ansprüche, wobei der mindestens eine Flansch eine Dicke (SF) aufweist und die mindestens eine Fixierklammer eine Dicke (SS) aufweist, wobei die Dicke (SS) der Fixierklammer größer ist als die Dicke (SF) des Flanschs.

8. Verfahren zum Zusammenbau einer Muffel (3) ins Innere einer äußeren Tragstruktur (2) eines Heimkochofens (1) nach einem der vorstehenden Ansprüche, wobei das Verfahren die folgenden Schritte umfasst:

- Bereitstellen einer Muffel (3), die umfasst:

- a) eine Seitenwand (31) die eine erste und eine zweite Seite (311, 312), die parallel zu einander sind, und eine Querwand (313), die zwischen die ersten und zweiten Seiten (311, 312) zwischengesetzt ist und sich orthogonal zu denselben erstreckt, umfasst,
- b) ein erstes und ein zweites Abdeckungselement (32, 33),

- in Eingriff Bringen der ersten und zweiten Abdeckungselemente (32, 33) mit der Seitenwand (31) der Muffel (3) jeweils an einem oberen und einem unteren Endbereich (318, 319) der Seitenwand (31), um eine Kochkammer zu definieren, wobei die Muffel (3) mindestens einen Flansch (10) umfasst, der sich mindestens in Nähe von verbindenden Winkelbereichen zwischen der Querwand (313) und den ersten und zweiten Seiten (311, 312) erstreckt, wobei der mindestens eine Flansch (10) eine im Wesentlichen flache Führungsoberfläche (105) umfasst, die sich die sich weg von, insbesondere orthogonal zu, der Seitenwand (31) der Muffel (3) erstreckt,

- Bereitstellen mindestens einer Fixierklammer (20),

- Bereitstellen mindestens einer ersten und einer zweiten Platte (21, 22) der äußeren Tragstruktur (2),
- Positionieren der mindestens einen Fixierklammer (20) in Anschlag an die Führungsfläche (105) des mindestens einen Flanschs (10),
- in Eingriff Bringen der ersten und zweiten Platten (21, 22) mittels der mindestens einen Klammer (20) jeweils an den ersten und zweiten Seiten (311, 312) der Muffel (3);

dadurch gekennzeichnet, dass

zwischen dem Positionierschritt und dem Eingriffsschritt ein Schweißschritt durchgeführt wird, wobei in dem Schweißschritt mindestens eine Fixierklammer (20) an den entsprechenden Flansch (10) geschweißt wird, wobei die Schweißung zwischen der mindestens einen Fixierklammer (20) und dem entsprechenden Flansch (10) eine Vielzahl von einzelnen Schweißpunkten (6) aufweist.

9. Verfahren nach dem vorstehenden Anspruch, wobei der Schritt des Schweißens der mindestens einen Klammer (20) an den jeweiligen Flansch (10) durch Punktschweißen oder Heftschweißen durchgeführt wird.

Revendications

1. Four de cuisson ménager (1) comprenant :

- une structure portante externe (2) ;
- un moufle (3) logé à l'intérieur de la structure portante externe (2) et comprenant une paroi latérale (31) et un premier et un deuxième élément de recouvrement (32, 33) en prise avec la paroi latérale (31) respectivement au niveau d'une portion d'extrémité supérieure et d'une portion d'extrémité inférieure (318, 319) de la paroi latérale (31) de manière à définir une chambre de cuisson ;
- une porte (4) pour accéder à la chambre de cuisson, associée à la structure portante (2),

dans lequel la paroi latérale (31) du moufle (3) comprend un premier et un deuxième côté (311, 312) parallèles l'un à l'autre et une paroi transversale (313) interposée entre, et s'étendant orthogonalement à, les premier et deuxième côtés (311, 312), dans lequel le moufle (3) comprend au moins une bride (10) s'étendant transversalement à la paroi latérale (31) et au moins partiellement au niveau des premier et deuxième côtés (311, 312) et/ou au niveau de la paroi transversale (313), le four (1) comprenant en outre au moins un support de fixation (20) configuré pour contraindre le moufle (3) sur la struc-

ture portante (2), ledit au moins un support de fixation (20) étant en prise avec la structure portante externe (2) et

dans lequel ladite au moins une bride (10) présente une surface de guidage sensiblement plate (105) s'éloignant de, en particulier orthogonalement à, la paroi latérale (31) du moufle (3), ledit au moins un support de fixation (20) présente une surface respective sensiblement plate (205) couplée en butée à la surface de guidage (105) de la bride respective (10) et une portion transversale (209), en particulier orthogonale à, ladite surface sensiblement plate (205) et le moufle (3) comprend au moins une première et une deuxième bride (101, 102) définie respectivement au niveau des premier et deuxième éléments de recouvrement (32, 33),

caractérisé en ce que

- ledit au moins un support de fixation (20) est soudé à ladite au moins une bride (10) au niveau de la surface de guidage (105) et
- ledit au moins un support de fixation (20) est en prise avec la structure portante externe (2) au niveau de ladite portion transversale (209).

2. Four de cuisson ménager (1) selon la revendication 1, dans lequel ladite au moins une bride (10) s'étend au moins à proximité de portions angulaires de liaison entre la paroi transversale (313) et les premier et deuxième côtés (311, 312).

3. Four de cuisson ménager (1) selon la revendication 1 ou 2, dans lequel ladite au moins une bride (10) s'étend pour une largeur totale de la paroi transversale (313) et, sans interruption, au moins partiellement au niveau des premier et deuxième côtés (311, 312).

4. Four de cuisson ménager (1) selon l'une quelconque des revendications précédentes, dans lequel ledit au moins un support de fixation (20) est couplé à ladite au moins une bride (10) à proximité d'au moins une portion angulaire de liaison entre la paroi transversale (313) et les premier et deuxième côtés (311, 312).

5. Four de cuisson ménager (1) selon l'une quelconque des revendications précédentes, dans lequel la soudure entre ledit au moins un support de fixation (20) et la bride respective (10) présente une pluralité de points de soudure discrets (6).

6. Four de cuisson ménager (1) selon l'une quelconque des revendications précédentes, dans lequel le four (1) comprend au moins un premier et un deuxième support de fixation (201, 202) soudé à ladite au moins une bride (10), ou respectivement auxdites première et deuxième brides (101, 102), au moins à

proximité des portions angulaires de liaison entre la paroi transversale (313) et les premier et deuxième côtés (311, 312), et/ou dans lequel le four (1) comprend au moins un premier, un deuxième, un troisième et un quatrième support de fixation (201, 202, 203, 204), les premier et troisième supports de fixation (201, 203) étant soudés à la première bride (101) du premier élément de recouvrement (32) respectivement à proximité de portions angulaires de liaison entre la paroi transversale (313) et les premier et deuxième côtés (311, 312) et les deuxième et quatrième supports de fixation (202, 204) étant soudés à la deuxième bride (102) du deuxième élément de recouvrement (33) respectivement à proximité des portions angulaires de liaison entre la paroi transversale (313) et les premier et deuxième côtés (311, 312).

7. Four de cuisson ménager (1) selon l'une quelconque des revendications précédentes, dans lequel ladite au moins une bride présente une épaisseur (SF) et ledit au moins un support de fixation présente une épaisseur (SS), l'épaisseur de support de fixation (SS) étant supérieure à l'épaisseur de bride (SF).

8. Procédé d'assemblage d'un moufle (3) à l'intérieur d'une structure portante externe (2) d'un four de cuisson ménager (1) selon l'une quelconque des revendications précédentes, le procédé comprenant les étapes de :

- fourniture d'un moufle (3) comprenant :

- a) une paroi latérale (31) comprenant un premier et un deuxième côté (311, 312) parallèles l'un à l'autre et une paroi transversale (313) interposée entre, et s'étendant orthogonalement à, les premier et deuxième côtés (311, 312),
b) un premier et un deuxième élément de recouvrement (32, 33),

- mise en prise des premier et deuxième éléments de recouvrement (32, 33) avec la paroi latérale (31) du moufle (3), respectivement au niveau d'une portion d'extrémité supérieure et d'une portion d'extrémité inférieure (318, 319) de la paroi latérale (31) afin de définir une chambre de cuisson, ledit moufle (3) comprenant au moins une bride (10) s'étendant au moins à proximité de portions angulaires de liaison entre la paroi transversale (313) et les premier et deuxième côtés (311, 312), ladite au moins une bride (10) comprenant une surface de guidage sensiblement plate (105) s'éloignant de, en particulier orthogonalement à, la paroi latérale (31) du moufle (3),
- fourniture d'au moins un support de fixation

(20),

- fourniture d'un premier et d'un deuxième panneau (21, 22) de la structure portante externe (2),
- positionnement dudit au moins un support de fixation (20) en butée contre la surface de guidage (105) de ladite au moins une bride (10),
- mise en prise desdits premier et deuxième panneaux (21, 22) au moyen dudit au moins un support (20) respectivement au niveau des premier et deuxième côtés (311, 312) du moufle (3) ;

caractérisé en ce que

une étape de soudage est réalisée entre ladite étape de positionnement et ladite étape de mise en prise, dans ladite étape de soudage au moins un support de fixation (20) est soudé au niveau de la bride respective (10), la soudure entre ledit au moins un support de fixation (20) et la bride respective (10) présentant une pluralité de points de soudure discrets (6).

9. Procédé selon la revendication précédente, dans lequel l'étape de soudage dudit au moins un support (20) sur la bride respective (10) est réalisée par soudage par point ou soudage par point d'épinglage.

FIG.1

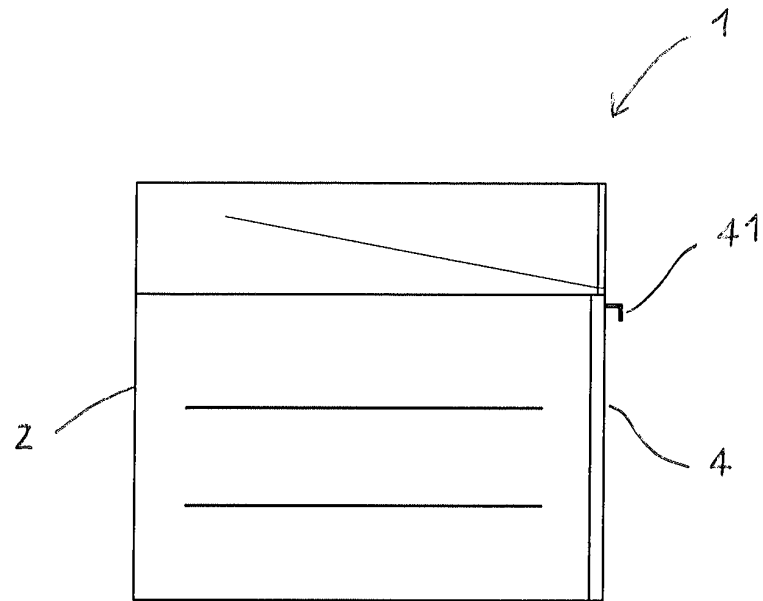
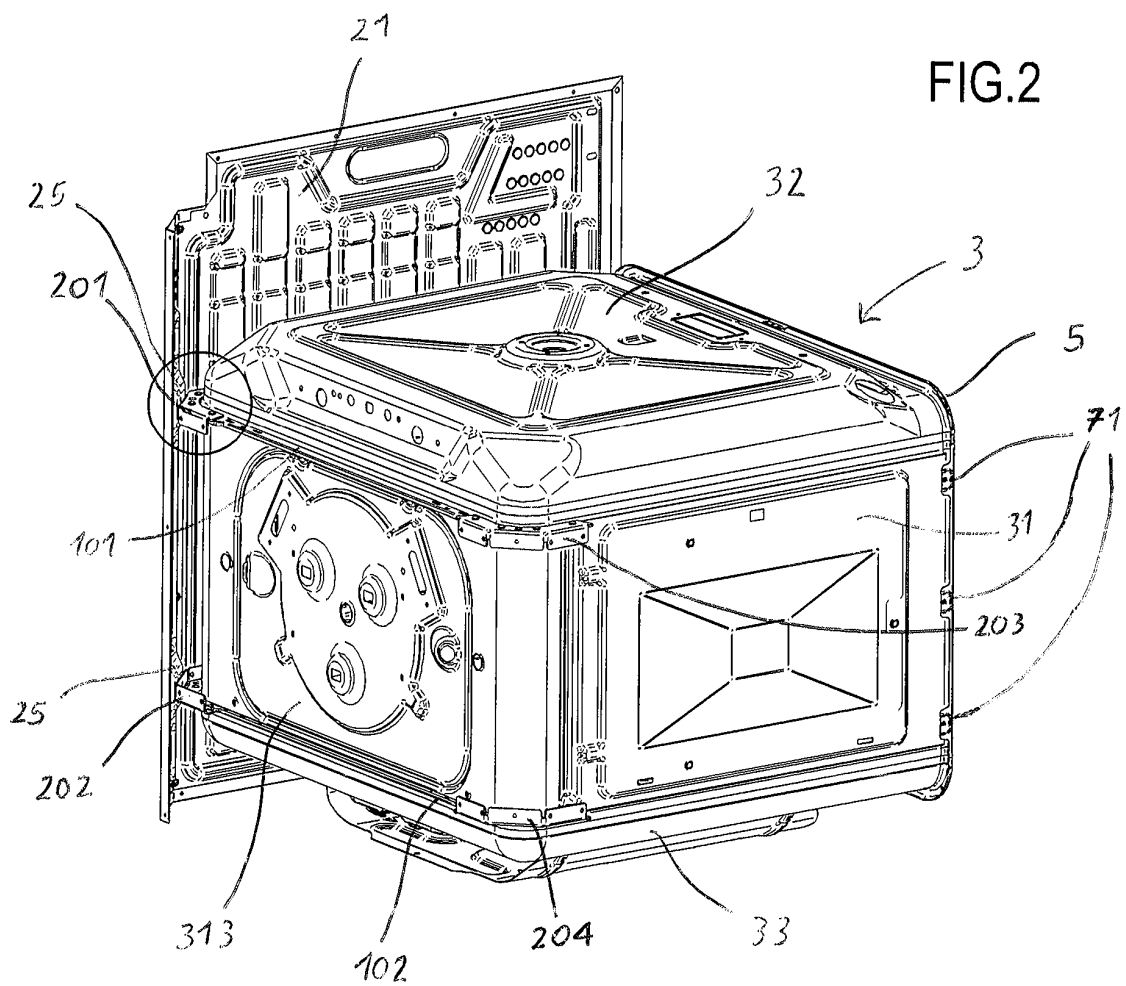


FIG.2



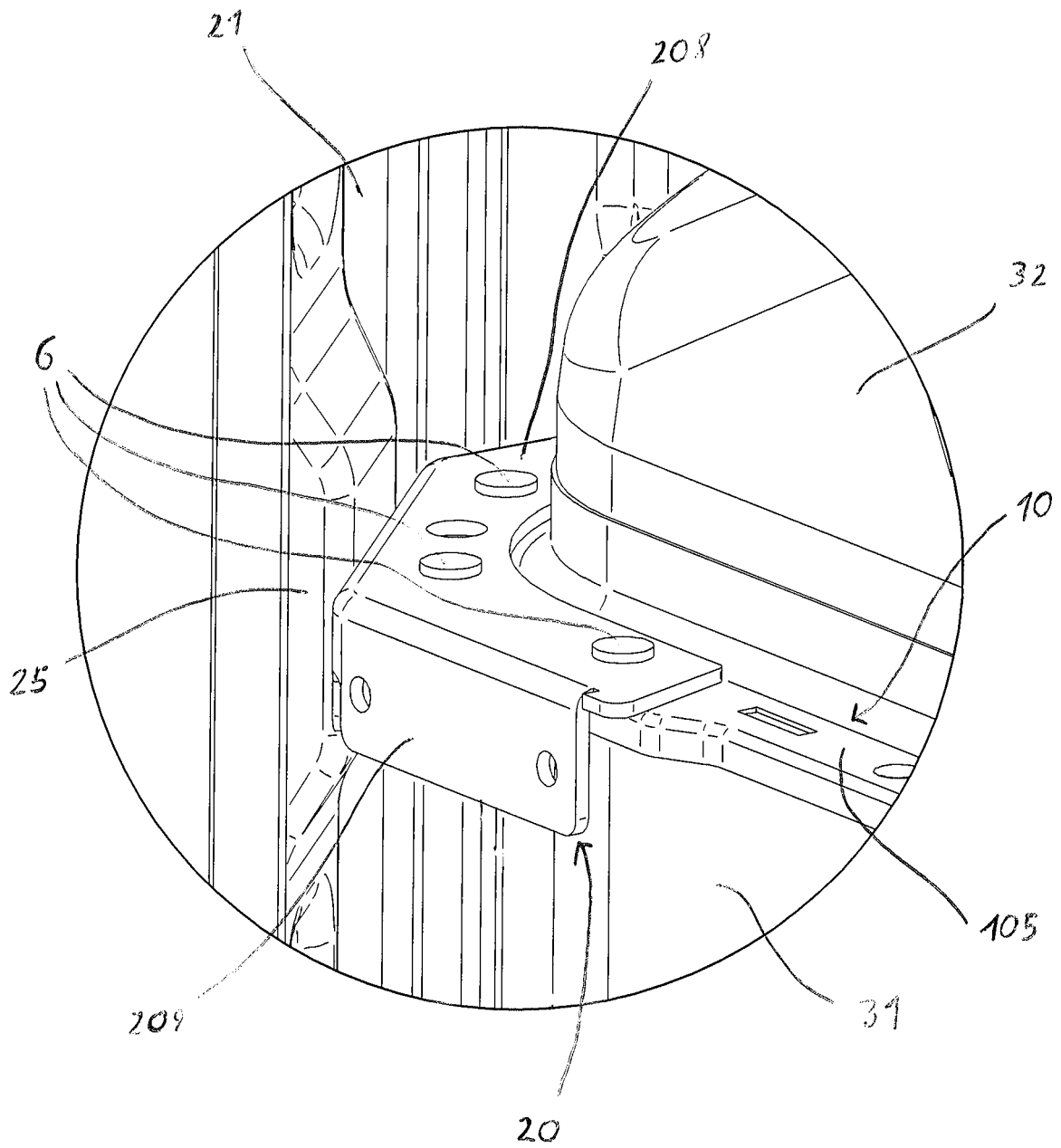


FIG.3

FIG.4

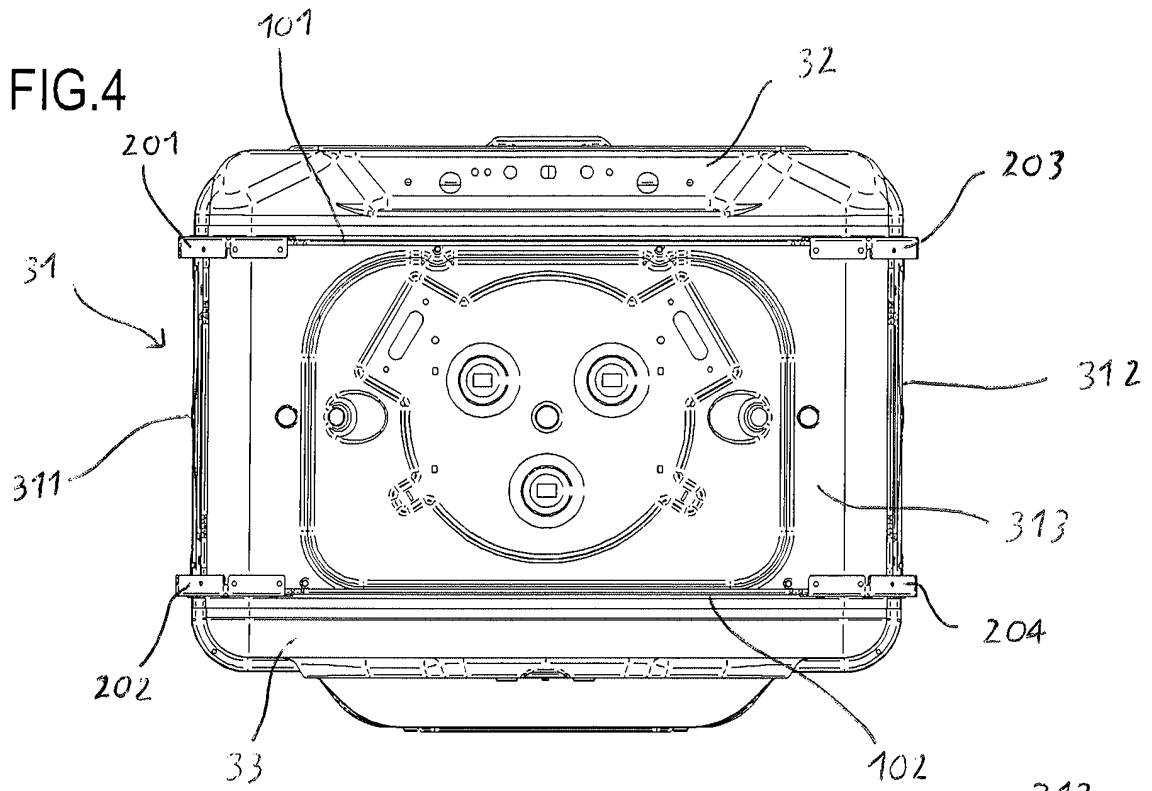
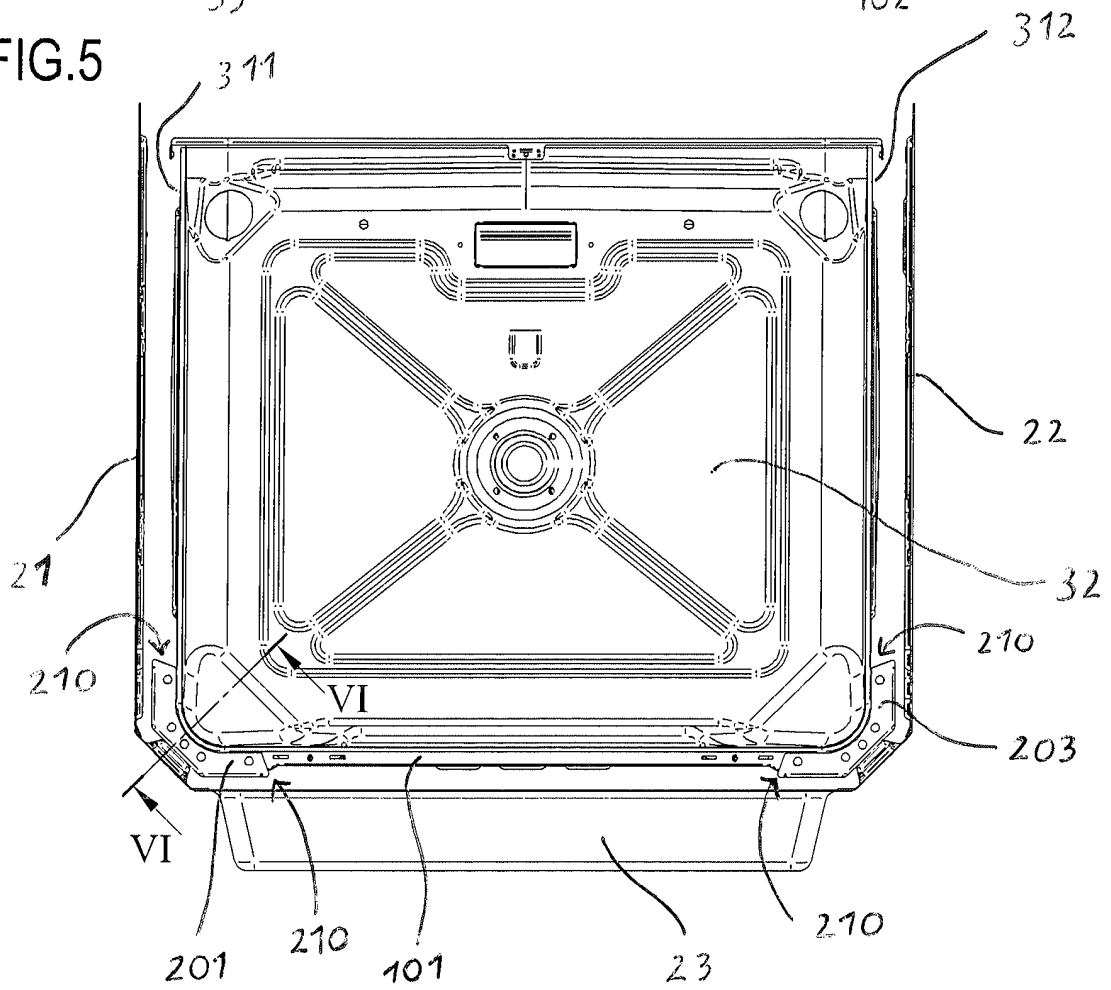


FIG.5



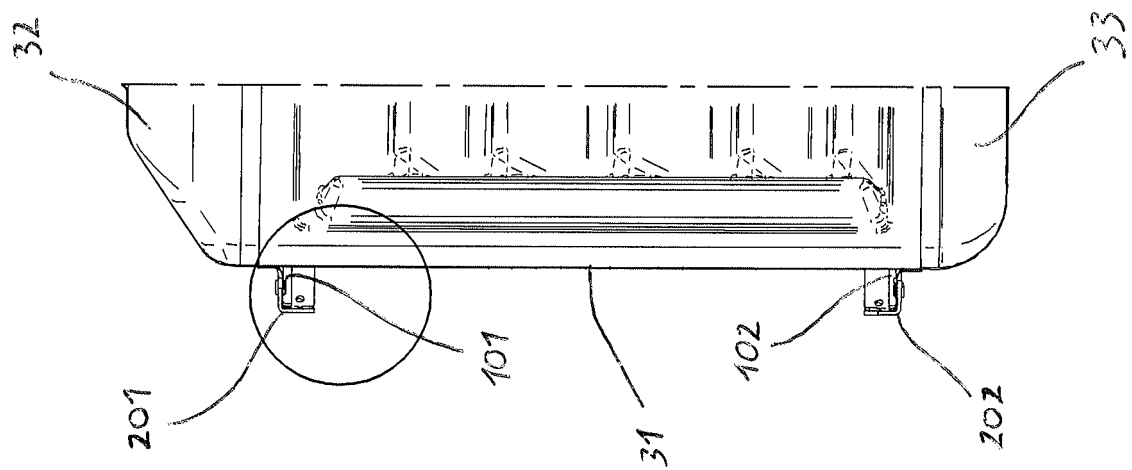


FIG. 6

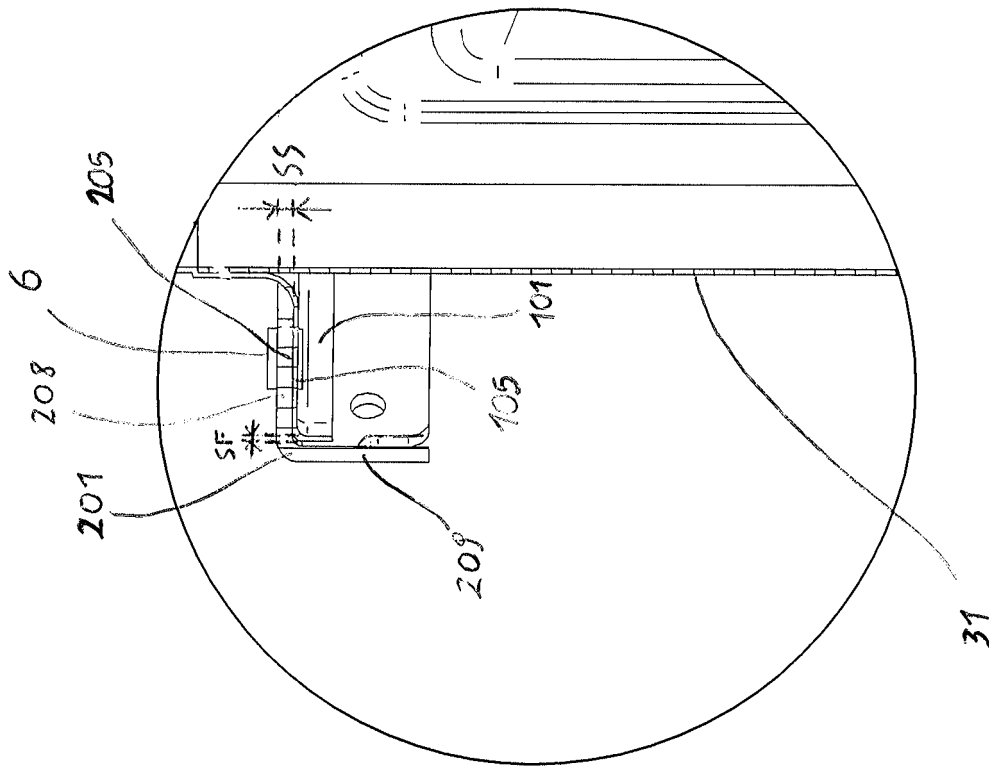


FIG. 7

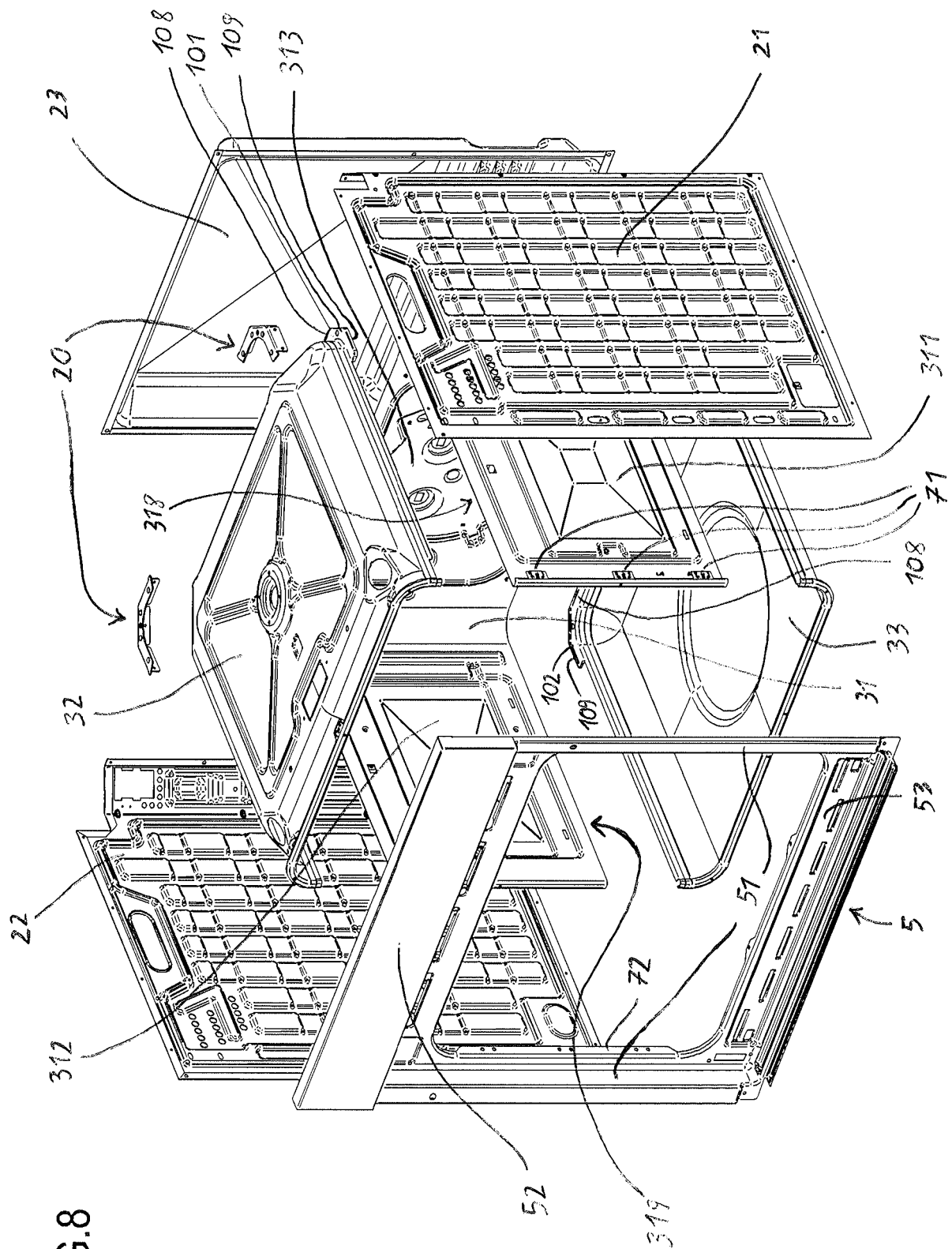


FIG. 8

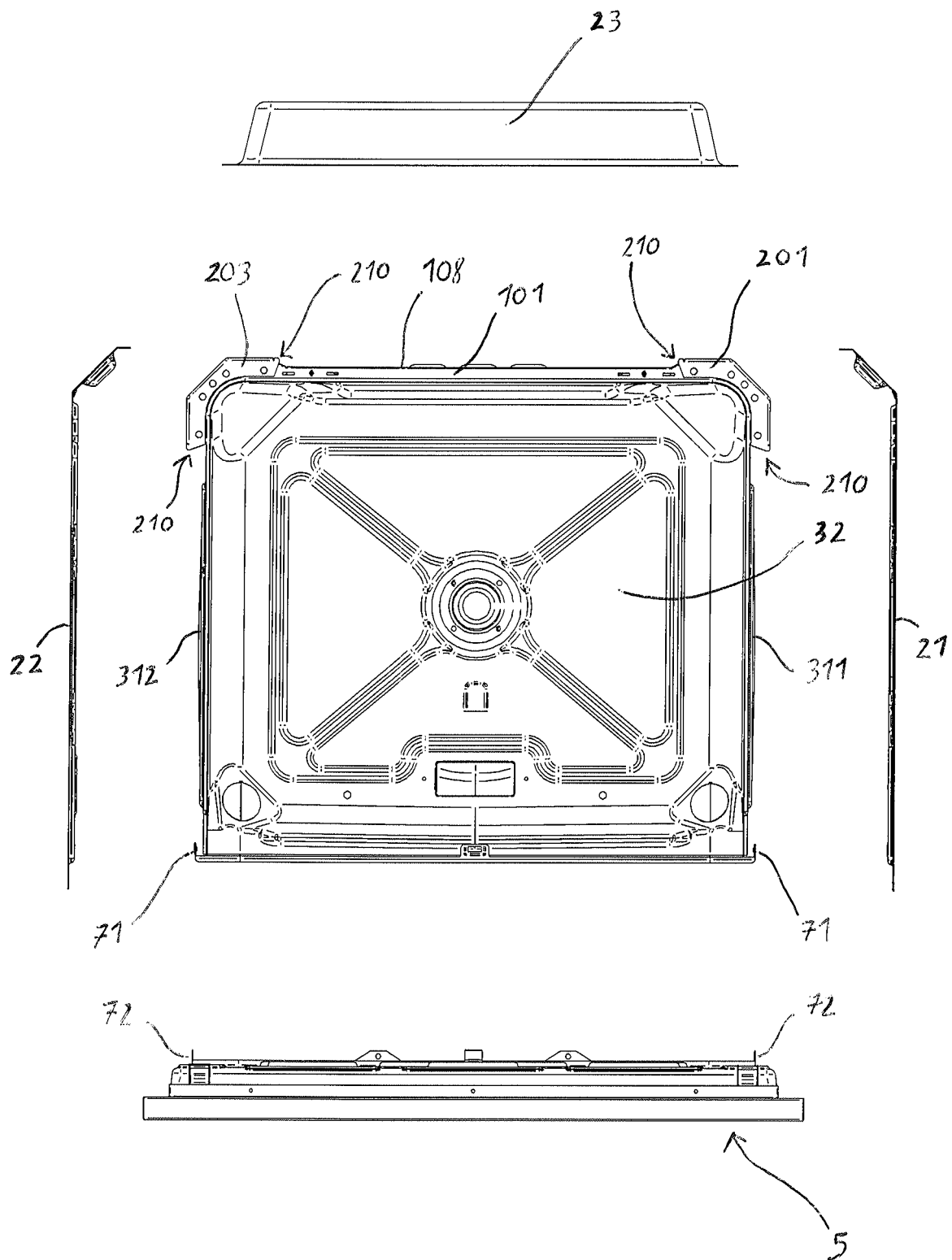


FIG.9

REFERENCES CITED IN THE DESCRIPTION

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