

(19)



(11)

EP 4 543 143 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.04.2025 Bulletin 2025/17

(51) International Patent Classification (IPC):
H05B 6/76 ^(2006.01) **F24C 15/02** ^(2006.01)

(21) Application number: **23204920.5**

(52) Cooperative Patent Classification (CPC):
H05B 6/763

(22) Date of filing: **20.10.2023**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **BÖCKLER, Marco**
91541 Rothenburg ob der Tauber (DE)
• **WINKELMANN, Klaus**
91541 Rothenburg ob der Tauber (DE)
• **STARK, Andreas**
91541 Rothenburg ob der Tauber (DE)
• **HAAG, Stephan**
91541 Rothenburg ob der Tauber (DE)

(71) Applicant: **ELECTROLUX APPLIANCES AKTIEBOLAG**
105 45 Stockholm (SE)

(74) Representative: **Electrolux Group Patents**
AB Electrolux
Group Patents
S:t Göransgatan 143
105 45 Stockholm (SE)

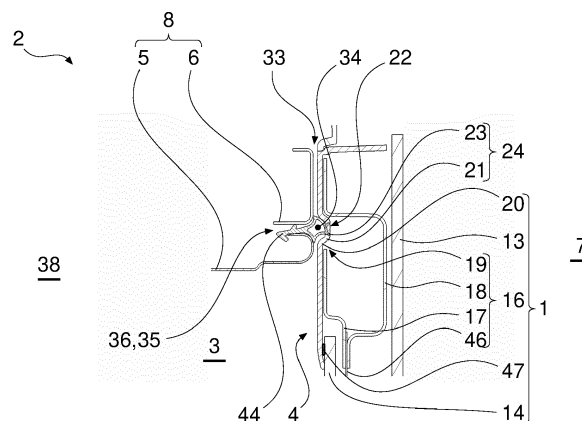
(54) OVEN DOOR FOR A DOMESTIC OVEN HAVING A MICROWAVE HEATING FUNCTION

(57) The invention relates to an oven door (1) for a domestic oven (2) having a microwave heating function for heating comestibles in a cavity (3), the oven door (1) comprising at least the following components:

- at least two structural columns (9,10) for holding at least one glass pane (11,12,13) and having a joint connection (15) for moving the oven door (1) relative to a cavity assembly (8);
- a microwave shutter (16) for trapping microwave radiation leaking from the cavity (3) of the cavity assembly (8), the microwave shutter (16) including a guard plate (17) and a locking plate (18) forming a trap opening (19) around the front opening (4) when closed; and

- a cavity-side cover element (20) holding an innermost glass pane (14), the cover element (20) being configured to form a trim surface and a gasketing contact for closing the front opening (4) of the cavity assembly (8). The oven door (1) is particularly characterized in that the cover element (20) has at least one groove (21) with which, in that state closing the front opening (4), the gasketing contact is formed and which is formed recessed from the front side (7) of the cavity assembly (8). The invention further relates to a domestic oven (2) with microwave heating function for heating comestibles.

With the oven door proposed here, good sealing of the cavity can be achieved with low space requirements.

**Fig. 6****EP 4 543 143 A1**

Description

[0001] The invention relates to an oven door for a domestic oven having a microwave heating function for heating comestibles in a cavity, the oven door comprising at least the following components:

- at least two structural columns for holding at least one glass pane and having a joint connection for moving the oven door relative to a cavity assembly;
- a microwave shutter for trapping microwave radiation leaking from the cavity of the cavity assembly, the microwave shutter including a guard plate and a locking plate forming a trap opening around the front opening when closed; and
- a cavity-side cover element holding an innermost glass pane, the cover element being configured to form a trim surface and a gasketing contact for closing the front opening of the cavity assembly. The oven door is particularly characterized in that the cover element has at least one groove with which, in that state closing the front opening, the gasketing contact is formed and which is formed recessed from the front side of the cavity assembly. The invention further relates to a domestic oven with microwave heating function for heating comestibles.

[0002] For example, from documents EP 2 731 404 A1 and EP 3 340 739 A1 an oven door structure is known which is adapted for a microwave oven. That oven door structure comprises an inner door structure with a wave choke of metal that in the closed door state needs to form a defined narrow gap with a metal front cavity frame that surrounds the oven cavity for safely avoiding leakage of microwave radiation during operation.

[0003] In addition, it comprises a so-called door cover which consists of a polymer frame that carries the inner door glass that faces the oven cavity, wherein the door cover is attached to the inner side of the oven door and covers all components of the inner door that are attached to the outer door frontal glass pane, such as the microwave door choke and the so-called door columns which are attached to the inner side of the front glass pane and to which the wave choke, the door cover and the door hinges can be attached.

[0004] In addition, the cooking chamber of a cooking oven generally is sealed or isolated regarding the humidity and temperature of its internal atmosphere for reasons of functionality and energy consumption. Therefore, ovens have an elastic gasket between the cooking chamber, called cavity, and the oven door. As known from e.g., EP 2 815 629 A1, a door gasket can for example be hooked in between the cavity and front cavity frame or can be pressed into the gap of the front cavity frame and the cavity. Such a gasket has a geometry at the fixing end, formed as a hook, in order to rest on the front cavity frame.

[0005] Furthermore, the gap between front cavity frame and door on microwave ovens is only 1 mm [one millimeter], so that there is no space to have an explicit gasket profile to include technical features e.g., for enhanced steam tightness. During operation, the oven gasket is simply compressed by the closing force applied by the door.

[0006] Still further, from e.g., EP 2 747 515 B1 a combined microwave plus steam oven i.e., having both a microwave source and a steam generator, is known which correspondingly comprises a wave choke in the door and an elastic steam seal that is arranged in a dedicated notch formed between the oven cooking chamber and the oven front cavity frame.

[0007] Further, often microwave ovens comprise a simple thin elastic steam gasket which is simply fixed on the inside of the oven door and faces the front cavity frame in the closed position of the door. These ovens often do not have a gap between the oven cavity and the front cavity frame, but the front cavity frame is connected in direct continuation of the oven cavity. In fact, the above-described microwave ovens with a gap between the cavity and the front cavity frame are advanced microwave ovens, wherein the walls of the cavity are thermally decoupled from the front cavity frame and hence from the outer housing of the oven for reducing thermal energy losses from the oven cavity to the outer oven housing.

[0008] The aim is to find a cost-effective solution that provides both good sealing properties against steam and the requirements for shielding against microwave radiation. Furthermore, a type-independent design is desired, which can be used without further ado, regardless of the type of oven, i.e. also without microwave heating function and/or steam cooking function.

[0009] On this basis, the present invention is based on the task of at least partially overcoming the disadvantages known from the prior art. The features according to the invention result from the independent claims, for which advantageous embodiments are shown in the dependent claims. The features of the claims can be combined in any technically sensible manner, whereby the explanations from the following description as well as features from the figures, which comprise supplementary embodiments of the invention, can also be used for this purpose.

[0010] The invention relates to an oven door for a domestic oven having a microwave heating function for heating comestibles in a cavity, wherein

the oven door is configured to close a front opening of a cavity frame at the front side of a cavity assembly of a domestic oven framing the cavity, the front side being the side of the domestic oven accessible in use,
the oven door comprising at least the following components:

- at least two structural columns for holding at least one glass pane and comprising a joint connection for moving the oven door relative to a cavity assembly;
- a microwave shutter for trapping microwave radiation leaking from the cavity of the cavity assembly, the microwave shutter comprising a guard plate and a locking plate forming a trap opening around the front opening in the closed state; and
- a cavity-side cover element having an innermost glass pane, the cover element being configured to form a trim surface and a gasketing contact for closing the front opening of the cavity assembly.

[0011] The oven door is particularly characterized in that the cover element has at least one groove with which, in that state closing the front opening, the gasketing contact is formed and which is formed recessed from the front side of the cavity assembly.

[0012] The spatial directions used herein refer to the intended use in operation. In this regard, the orientation to the earth-gravity-field, if designated by something as above, is defined. Further, a user side or front side is defined as that side to which the user has intended access (for example, via a door to a domestic oven), where something is designated as being located in front, the rear side being the side opposite the user side that is usually inaccessible (often intended for at least one connection and/or facing a wall). In some applications, for example in the case of stovetops or domestic ovens with a hearth, one (possibly further) user side is the top side. The sides or lateral elements are arranged between front and rear and extending along the earth-gravity-field, often referred to as left or right, but thus not arranged below or above between front and rear. It should be noted that often a connection is not or not solely provided at the rear, but also alternatively or additionally at the side, bottom and/or top. The direction between the rear side and the front side is referred to as the insertion axis and the direction transverse to this (upwards, downwards, left and/or right) is referred to as radial.

[0013] Unless explicitly stated to the contrary, ordinal numbers used in the preceding and following descriptions are for the purpose of clear distinction only and do not reflect any order or ranking of the designated components. An ordinal number greater than one does not imply that another such component must necessarily be present.

[0014] The domestic oven for which the oven door is configured is functionally designed, for example, as conventionally known. The domestic oven is configured for heating comestibles using microwave radiation, and preferably in addition by radiation. For this purpose, the cavity assembly comprises a (inner) cavity frame in which a cavity is formed. The walls of the cavity frame enclose an inner space (the cavity) on several sides, in which comestibles can be placed.

[0015] The (inner) cavity frame of the cavity is preferably formed in one piece. Alternatively or additionally, the (inner) cavity frame is composed of several structural elements which are, for example, screwed, riveted, welded or soldered on. The (inner) cavity frame is preferably a formed, for example deepdrawn, sheet metal component. The cavity is preferably closed using the cavity frame on five sides of an imaginary cuboid, whereby the shape of the cavity is often somewhat more complex than the shape of a cuboid, for example with beveled edges and corners, indentations and passages. Passages are formed, for example, for structural elements, such as screws, light, ventilation, supply lines and/or an inlet for microwave radiation from a microwave source located outside the cavity. In one embodiment, at least one passage is not closed when used in a domestic oven, but is merely suitably covered to prevent excessive leakage of microwave radiation. A front opening is formed to the front side of the cavity, which can be closed using the oven door of the domestic oven.

[0016] In one embodiment, the domestic oven is further configured for steam cooking, accordingly including at least one inlet and outlet for steam from at least one steam source disposed outside the cavity and/or at least one steam source disposed inside the cavity. Accordingly, such a domestic oven comprises a water source, for example a tank and/or a water connection for a household water pipe. In this embodiment, it is often necessary, at least desired, or required for safety regulations or a desired service life that the cavity element is double enamelled.

[0017] The cavity element or its interior is visible to the user from the front side through the front opening when the door is fully open. A front cavity frame is attached to the front side of the cavity element. The front side is the side which, in use, faces the groove and can be closed with the door of the domestic oven.

[0018] In use, the domestic oven is integrated into a kitchen unit, for example, so that the rear side opposite the front side is not accessible, for example, it is aligned with a wall. The lateral sides of the domestic oven are adjacent, for example, to adjacent kitchen elements, for example cabinet elements or other kitchen appliances, or at least one lateral side is exposed. The top side, or rather its surface normals facing away from the cavity of the cavity assembly, faces upward, and the bottom side faces downward, with respect to the earth-gravity-field. It should be noted that the sides are described here in idealized form and, as indicated above, often do not correspond to the shape of the walls of the cavity assembly and are or should be precisely aligned with the earth-gravity-field only in technical terms, for example with the aid of a standard household spirit level.

[0019] In principle, it is not excluded that the cavity assembly also partially covers the front side with a wall, i.e. also partially encloses the cavity at the front. In a preferred embodiment, the cavity assembly does not comprise a wall that encloses the cavity to the front side. Nevertheless, at least one flange is provided, for example, which extends at least in part parallel to the front side, preferably outwardly, i.e. away from the front opening of the cavity. In one embodiment, such a flange is formed circumferentially in the plane of the front side. Such a flange is arranged, for example, for connection to an

outer cavity frame.

[0020] In an advantageous embodiment, the front cavity frame (here also called outer cavity frame) is configured as a door frame to oppose the oven door of the domestic oven. The front cavity frame is permanently, preferably directly, connected to the inner cavity frame of the respective cavity. The front cavity frame then correspondingly comprises a receptacle for a hinge or joint for the oven door and/or a gasket element for sealingly abutting the oven door when the latter is closed. Often, the front cavity frame includes a plurality of openings for venting, for example, to remove heat and/or moisture from the insides of the oven door.

[0021] In one embodiment, the front cavity frame itself is not completely closed by the oven door of the domestic oven, but a channel is provided to the outside, for example to the front side. Nevertheless, an interior space of the cavity assembly is completely closed, i.e., on all six sides, with the help of the oven door (in the sealed state), at least with respect to microwave radiation.

[0022] It should be noted that microwave radiation in some embodiments is allowed to escape to a permissible small extent also to the front side, i.e., through an oven door or a gap between the oven door and the (inner or outer) cavity frame or through the gasket element, respectively. However, the microwave radiation is then reduced to such an extent that it is classified as harmless and can therefore be regarded as technically shielded. The microwave radiation is then also referred to hereafter as blocked.

[0023] It should be noted that in one embodiment, the (inner) cavity frame surrounds the front opening of the cavity assembly. It should further be noted that, in one embodiment, the front cavity frame of the cavity assembly is connected to the inner cavity frame immediately adjacent the front opening. Alternatively, or in a range deviating therefrom, the front cavity frame is connected to the inner cavity frame outside the front opening, i.e. towards the top side, the bottom side or one of the lateral sides, respectively, at a distance from the front opening.

[0024] In an advantageous embodiment, a circumferential gap (preferably formed completely circumferentially, i.e. uninterruptedly) is formed between the front cavity frame and the inner cavity frame. Such a circumferential gap is open, for example, for receiving a gasket element. In one embodiment, the circumferential gap is partially closed at least once, preferably several times, for forming a connecting element between the front cavity frame and the inner cavity frame. The front cavity frame is preferably formed in one piece. Alternatively or additionally, the front cavity frame has further structural elements which are, for example, screwed, riveted, welded or soldered on and are mounted before, during or after the connection to the inner cavity frame of the cavity assembly.

[0025] The structural columns of the oven door are connected laterally on the outside, often with an offset inwards (i.e., towards each other), in use perpendicular with the front glass, for example glued and/or screwed. The structural columns also have a joint connection or a receptacle for a respective hinge element (for example, a hinge or, preferably, a multi-stage snap joint). In one embodiment, the structural columns are merely plugged on and can be easily separated (for example for cleaning).

[0026] One or more glass panes are inserted between the two structural columns, which are arranged along the insertion axis between the front glass pane and the innermost glass pane and are therefore referred to as intermediate (glass) panes. These serve to provide thermal insulation and are preferably back-ventilated. It may be noted that the (glass) panes are preferably made from glass material. However, other material may be used to serve as transparent and heat resistant for the use-case of heating comestibles. Notwithstanding the above mention material used the panes are referred to being glass panes.

[0027] In one embodiment, at least one of the intermediate panes is provided with a microwave radiation-reflecting or microwave radiation-absorbing coating and/or doping to protect it from penetrating microwave radiation.

[0028] In a preferred embodiment, a door handle is firmly connected to the front glass pane and/or the structural columns so that the oven door can be opened manually by means of the door handle. It should be noted that the oven door can alternatively also be moved using an electric actuator, for example after actuation at a control interface or after an automatic program sequence.

[0029] In a preferred embodiment, at least one of the structural columns comprises a safety lug which, when the front opening is closed, interacts with a fuse switch in such a way that only then can the microwave source (for example a magnetron) be switched on in such a way that microwave radiation can be introduced into the cavity. Using the safety lug, it is thus ensured that the cavity is completely shielded from leakage of radiation when the microwave heating function is started.

[0030] The microwave shutter is a metallic element, preferably a sheet metal element, which is configured to shield against microwave radiation. In the viewing area exposed by the innermost glass, a microwave grid is preferably provided, which is preferably held by the microwave shutter or is formed integrally with it. This microwave grid provides an unobstructed view into the cavity.

[0031] A guard plate and a locking plate are provided outside the visible area. The guard plate and the locking plate are aligned with respect to each other and with respect to the (inner and/or outer) cavity frame in such a way that microwave radiation due to reflections and/or electrical capacitor effects cannot penetrate the gap (or only in a sufficiently small dosage). The locking plate has a radial, i.e. (with respect to the insertion axis) outwardly pointing, overlap with the (inner

and/or outer) cavity frame with respect to the front opening. The guard plate recedes forward from the locking plate and a chamber is formed between the guard plate and the locking plate. When the oven door is in its closing state, this chamber is open towards the rear side of the domestic oven so that a trap opening is formed around the front opening.

[0032] The cover element is created as an aesthetic oven-inside trim surface, whereby the cover element may have further tasks. For example, the cover element is configured to guide air between the glass panes. For example, the cover element is arranged as a fastening element for at least one of the inner glass panes, for the microwave lane trap or parts thereof and/or for further elements. Preferably, the cover element is mechanically fixed (preferably detachable) to the structural columns of the oven door. The cover element is made in one piece or in several pieces. The cover element is made of a plastic and/or a metal material.

[0033] Besides the innermost glass pane, in the closed state the cover element is the element of the oven door that is closest to the cavity and the cavity frame. It is now proposed here that the cover element has a groove with which, in the closed state, the gasketing contact (preferably via a gasket element made of a soft, preferably elastomeric, plastic) to the cavity assembly is formed. In one embodiment, the gasketing contact is provided solely for thermal insulation.

[0034] This groove offers the advantage that more space is created between the cover element and the cavity assembly at the front opening for a gasketing contact, but at the same time a gap lying radially further out (relative to the insertion axis) can be kept narrow, for example below 2 mm [two millimetres], preferably 1 mm or less. Radially inward to the groove, there is again space for the at least one inner glass pane and for the microwave shutter.

[0035] At the same time, a cover element with such a groove is not limited to such an application, but can also be used without restrictions, for example, in a domestic oven without a microwave heating function. Also, in this case, it is not mandatory that one or the only gasket element of the cavity assembly come into gasketing contact with the groove. It should be noted that in the closed state of the groove, preferably (but not necessarily) only the groove base is in gasketing contact with a gasket element.

[0036] Preferably, for low-cost production the groove is singleshaped, for example trapezoidal. Additionally or alternatively, the groove is for example formed from sheet metal using deep drawing or coining, or can be easily removed from a forming die or forming tool without an undercut.

[0037] It is further proposed in an advantageous embodiment of the oven door that the groove of the cover element has on the rear side an outwardly projecting projection, wherein the projection is formed projecting into the trap opening of the microwave shutter.

[0038] In this embodiment, the cover element, at least in the area of the groove, preferably as a whole, is made so thin that the groove protrudes on its side (in the closed state) facing away from the front opening of the domestic oven, i.e. on the rear side of the groove in relation to its gasketing function with the cavity side, for example almost (i.e. only with the addition of the material thickness) with the same dimensions as the groove. This rear side projection of the groove, which thus extends forward with respect to the domestic oven, is positioned in the trap opening of the microwave shutter. Thus, a particularly compact design of the oven door is possible, with at the same time a significantly larger space for a gasket element of the cavity assembly of the domestic oven.

[0039] It is further proposed in an advantageous embodiment of the oven door that the groove of the cover element is formed circumferentially around the innermost glass pane.

[0040] In this embodiment, the groove is formed without interruptions, so that a gasket element can also be implemented in the same way without interruptions or without changes in its axial extension. Preferably, a simple and as short as possible section is formed, which thus extends around the innermost glass pane. For example, a rectangle with only rounded corners is formed. Alternatively, an indentation or bulge is formed for further elements in deviation from a simple rectangle, which is preferably guided jointly by the groove and the gasket element.

[0041] It is further proposed in an advantageous embodiment of the oven door that the groove of the cover element in the closed state is arranged for gasketing contact with a front side gasket element of the cavity assembly of the domestic oven, wherein a steam barrier is formed by the gasket element together with the groove.

[0042] A gasket element is proposed here, with which a steam barrier can be formed together with the groove. The oven door is thus excellently suited for a domestic oven with a steam cooking function, and preferably at the same time with a microwave heating function. The gasket element can be designed with a comparatively large axial expansion despite a small minimum gap between the cover element and the cavity assembly. This means that a soft material, a gas-filled (closed or open) void and/or a more complex lip structure can be used on the gasket element.

[0043] It is further proposed in an advantageous embodiment of the oven door that the cover element is formed at least in part from a plastic material.

[0044] In this embodiment, the cover element can be produced at particularly low cost. In one embodiment, for example, a so-called organic sheet is formed. In one embodiment, for example, the cover element is injection molded or injection pressed. In one embodiment, several different materials, different plastics and/or different additives in certain areas are bonded, preferably cast, together.

[0045] It is further proposed in an advantageous embodiment of the oven door that the cover element comprises a groove element made of a plastic material in which the groove is formed, wherein preferably a trim element of a metal is

further provided by the cover element.

[0046] It is proposed here that the groove is arranged in a region of the cover element, which is formed as a (preferably separate) groove element made of a plastic material. This opens up the possibility of designing the groove individually for specific purposes or for different domestic ovens. For example, modularity is created so that the desired groove element can be selected from a number of different separate groove elements in a production line.

[0047] In an advantageous embodiment, a trim element is further provided next to the groove element, which is mainly used for aesthetic purposes. In one embodiment, the drawing element and/or the groove element also perform a mechanical task, such as fastening and/or securing the inner glass panes and/or the microwave shutter, as well as the other components of the cover element or each other. In one embodiment, the groove element and the cover element are connected to each other in such a way that they cannot be detached from each other without causing damage.

[0048] It is further proposed in an advantageous embodiment of the oven door that the cover element comprises a receptacle for one of the glass panes of the oven door, wherein preferably the receptacle is comprised by the groove element according to an embodiment as described above.

[0049] In one embodiment, the innermost glass pane is glued to the cover element. In one embodiment, a form-fitting receptacle is formed, preferably with the elasticity of the cover element being so great that the glass pane in question can be inserted into the receptacle with sufficient pure-elastic deformation of the retaining element of the receptacle. The glass pane in question is then fixed and secured in the receptacle without further action.

[0050] In a preferred embodiment, the receptacle for at least one of the glass panes is formed by the (preferably separate) groove element of the cover element. For example, the groove element is designed to be relatively soft for this purpose and is mechanically supported by another area or element of the cover element (for example the trim element) and thus stiffened for the handling by a user.

[0051] It is further proposed in an advantageous embodiment of the oven door that the cover element comprises a, preferably circumferential, pre-sealing lip configured for gasketing contact with the cavity frame of the cavity assembly at the front opening, wherein preferably the pre-sealing lip is comprised by the groove element according to an embodiment as described above.

[0052] Particularly during steam cooking, but also when heating foodstuffs with high moisture, (water) condensate builds up on the oven door and on the walls of the cavity. To prevent the condensate from dripping to the outside, it is suggested here that a pre-sealing lip be provided. Alternatively or additionally, the pre-sealing lip together with the (e.g., inner) cavity frame forms the usual steam barrier, and a second, downstream seal is formed by the gasket element (in the closed state) in gasketing contact with the groove. The pre-sealing lip is preferably soft, for example made of a silicone or other elastomeric plastic material, and the cover element or the (optional, preferably separate) groove element is preferably made entirely of this plastic material.

[0053] It is further proposed in an advantageous embodiment of the oven door that the cover element comprises a, preferably circumferential, drainage channel for condensate, wherein preferably the drainage channel is comprised by the groove element according to an embodiment as described above.

[0054] As already mentioned above, (water) condensate deposits may form on the oven door and on the walls of the cavity. To prevent the condensate from dripping to the outside, it is suggested here that a drainage channel be provided. By means of this drainage channel, the water can be directed into a drain, for example in a domestic oven with a steam cooking function for returning to a water supply for the steam source. In one embodiment, the aforementioned pre-sealing lip is a cavity-side edge of the drainage channel.

[0055] In a particularly simple embodiment, the drainage channel is a circumferential groove with its opening radially outward. In this case, only the upper and lateral parts of the drainage channel are designed for the effective conduction of condensed water. Alternatively or additionally, the cover element or the groove element alone is offset relative to the innermost glass pane in the direction of the cavity (i.e. inwardly of the oven) in such a way that, in the open state, a sufficiently rimmed collecting basin is formed for condensate on the innermost glass, so that the water present in a normal quantity can only flow over from such a sufficient pivoting angle of the oven door when the water is thereby discharged into a drain.

[0056] In an advantageous embodiment, the drainage channel is encompassed by the (preferably separate) groove element as mentioned above, and thus a simple component with several functions can be formed, for example, such a groove element comprises the groove for the gasket element of the cavity assembly, the pre-sealing lip as described above and the drainage channel described above, and preferably a receptacle for the innermost glass pane. In one embodiment, this groove element is formed from a plastic material, preferably using multi-component molding, with regionally different material elasticity. Alternatively or additionally, a different elasticity is created using suitable material cross-sections.

[0057] It is further proposed in an advantageous embodiment of the oven door that the cover element is plugged onto at least one of the structural columns.

[0058] In this advantageous embodiment, the cover element is supported directly over the structural columns, preferably detachably (for example for cleaning), for example clipped. Alternatively, the cover element is screwed and/or

glued to the front glass pane, preferably via the structural columns. Preferably, at least one of the glass panes, especially the innermost glass pane, is connected to the structural columns solely using the cover element.

[0059] According to a further aspect, a domestic oven with microwave heating function for heating comestibles is proposed, comprising at least the following components:

- an oven door according to an embodiment as described above;
- a cavity assembly having a cavity framed by a cavity frame for containing comestibles and, at the front side, a front opening in the cavity frame closable using the oven door; and
- a microwave source for generating microwave radiation for heating comestibles located in the cavity of the cavity assembly,

wherein a, preferably circumferential, gasket element is provided at the front opening of the cavity assembly, which gasket element is in gasketing contact with the groove of the oven door in the closed state.

[0060] The domestic oven proposed herein with microwave heating function, and preferably with steam cooking function, for comestibles housed inside (the cavity of) the cavity assembly comprises a cavity assembly as previously described. The cavity assembly, respectively its front opening, is closable by an oven door, namely in an embodiment according to the preceding description, in cooperation with the cavity frames by means of a gasket element. The domestic oven is designed, for example, as already described above with reference to the oven door. In this respect, reference is made to the description there.

[0061] The microwave source, for example a magnetron, is preferably arranged outside the cavity of the cavity assembly and the microwave radiation is guided into the cavity via a corresponding radiation conduit.

[0062] In one embodiment as a complete assembly or as a complete end product as it is obtainable by a user, control electronics configured to control the functions of the domestic oven and at least indirectly controllable via a control interface is also arranged outside the cavity element. In one embodiment, the control electronics are integrated into power electronics. Alternatively, the control electronics are separate from the power electronics and preferably spatially separated. In one embodiment of the domestic oven as a system, for example, the control electronics are common control electronics for other elements, such as a cooking hob.

[0063] Furthermore, a control interface is provided in this assembly or in the end product, in which the functions of the domestic oven can be operated by the user, for example, using buttons, using a touch display and/or via wireless communication to an external separate control element. The control interface is configured to operate the functions of the domestic oven and is connected to the control electronics for communication.

[0064] And last but not least, a supply connection for, for example, water for the steam source and/or electricity is provided in this assembly or in the terminal device, whereby the power consumption is preferably controlled using the control electronics.

[0065] Here, a groove is provided in the oven door, by means of which a good sealing can be created for thermal insulation (when heating comestibles using the air in the cavity) and/or for retaining steam (when cooking with steam), but also for shielding from penetrating microwave radiation. A gasket element with a large axial extension and/or a particularly small minimum gap between the oven door and the cavity frame can be created.

[0066] It is further proposed in an advantageous embodiment of the domestic oven that the domestic oven comprises a steam source configured to steam cook comestibles located in the cavity of the cavity assembly.

[0067] In an advantageous embodiment, the steam source comprises a water source, for example a wall connection and/or a water tank, and an evaporator, and preferably an overflow for discharging liquid water. In an advantageous embodiment, the steam source is designed without a pump and is controlled solely by the forces of gravity, for example preventing unintentional leakage by using a siphon device with a siphon level at a set filling level and causing intentional (almost) complete leakage (for example for cleansing, dissolving lime deposits) by overfilling the system above the siphon level. For this purpose, only a control valve and a defined supply pressure range (e.g. using the water tank in a raised position) are necessary. Alternatively, a pump and possibly another control valve are provided.

[0068] It is further proposed in an advantageous embodiment of the domestic oven that a minimum gap is formed between the cover element of the oven door and the cavity frame at the front side of the cavity assembly, wherein a distance between the oven door and the front side of less than 2 mm, preferably 1 mm or less, is formed by the minimum gap.

[0069] The distance, i.e. the shortest intended connection between two opposing surfaces, is preferably less than 2 mm [two millimetres], preferably 1 mm [one millimetre] or less. Using the small minimum gap, very good shielding against microwave radiation leakage can be achieved. In a preferred embodiment, the gap has a constant minimum (apart from the groove) in the radial extension from the area of overlap of the guard plate and the cavity frame in question to a bend in the cover element following on the outside. It should be noted that the gap is formed between the cover element and at least one of the cavity frames and its dimensions are defined, for example, radially inside the gasket element with the (inner and/or outer) cavity frame and outside the gasket element with the front cavity frame.

[0070] It is further proposed in an advantageous embodiment of the domestic oven that the gasket element comprises

an enclosed void between the groove and a front side gasket mount of the cavity frame of the cavity assembly.

[0071] It is proposed that an open or closed void (filled with a gas, for example air) is provided in the gasket element, using which a desired elasticity and snugging of the sealing lips of the gasket element is achieved when the front opening is closed using the oven door. The gasket element is then received in the groove or is plunged into the groove. For example, the gasket element can be designed with a material thickness of more than 0.5 mm [five tenths of a millimetre] around the void and at the same time a minimum gap between the oven door and the cavity frame of less than 2 mm, preferably 1 mm or less, can be set. At the same time, one or more separate sealing lips of the gasket element can be positioned in the groove of the cover element of the oven door, because they can be pressed against the surface of the groove by using the (preferably enclosed) gas in the void.

[0072] It is further proposed in an advantageous embodiment of the domestic oven that the front side of the cavity assembly has two cavity frames which are spaced apart from one another with a circumferential gap at the front side,

wherein the gasket element is accommodated in this circumferential gap and a choke profile is arranged on the rear side of the gasket element, embracing the circumferential gap and thus blocking it against microwave radiation,

wherein preferably the choke profile is clamped onto the two cavity frames spaced apart by the circumferential gap.

[0073] In an advantageous embodiment, the two cavity frames are provided for better thermal insulation, for example an insulating material is provided at least in places between the two cavity frames of the cavity assembly. Advantageously, a gasket element for gasketing contact with the oven door is arranged in a circumferential gap between these two cavity frames. For example, an inner cavity frame is designed as the cavity frame described above, which frames the cavity on five sides. For example, an front cavity frame as described above is then the second (outer) cavity frame.

[0074] For example, at least one of the two cavity frames is provided with a rearwardly extending flange, wherein the gasket element can be pushed or pressed into the circumferential gap, and by means of a hooked barb at the end it is secured by means of the hooked barb against falling out using the respective flange of the cavity frame.

[0075] The choke profile is configured to prevent, to a technical degree, the passage of at least such microwave radiation that has been introduced into the cavity assembly. This means that a permissible or uncritical amount of microwave radiation is allowed to pass through. This is not a matter of protecting a user. Rather, the electronics arranged in the domestic oven and outside the cavity element are protected from an excessive intensity or recurrence of microwave radiation. Here, for example, the probability of a radiation angle is also taken into account for an estimation of a recurrence, so that not necessarily every slot has to be blocked, but, for example, a coverage of, for example, at least 70% [seventy percent] to 90% of a passage area to be blocked is sufficient. Alternatively, (at least technically) complete coverage is achieved.

[0076] In one embodiment, the choke profile is set up in such a way that, in use, it overlaps both a cavity side flange and a frame side flange. Such a choke profile is easy to install and at the same time forms an effective barrier against microwave radiation. For this purpose, the choke profile is formed with a microwave radiation absorbing and/or reflecting material. Such a material is, for example, a metal or a plastic with itself electrically conductive properties or embedded additives, for example metallic particles or fibres. Preferably, the choke profile is a cold-formed sheet metal element, whereby, in addition to metallic sheets, so-called prepregs and organo-sheets are also a suitable material.

[0077] In an advantageous embodiment, the choke profile is self-retaining, whereby a very low level of frictional adhesion or spot soldering or welding is sufficient for self-retaining due to the purely static load. Preferably, the choke profile is self-retaining in such a way that it is highly unlikely or certain not to fall off during transport without further securing. Preferably, apart from placing the choke profile, no other measure is necessary for (self-retaining) mounting of the choke profile.

[0078] In an advantageous design, the choke profile overlaps the two flanges of the two cavity frames in such a way that contact is formed, preferably directly, with both the cavity side flange and the frame side flange. Preferably, the choke profile is of one-piece and simple design, whereby further separate elements are not provided and are not mounted later. For example, the choke profile is designed as a U-profile, with the two flanges engaging in the U-profile in the assembled state. Using the at least one choke profile, the control electronics are adequately protected from microwave radiation and thus a failure of the domestic oven due to damage by microwave radiation is virtually excluded.

[0079] The invention described above is explained in detail below against the relevant technical background with reference to the accompanying drawings, which show preferred embodiments. The invention is in no way limited by the purely schematic drawings, it being noted that the drawings are not dimensionally accurate and are not suitable for defining dimensional relationships. It is illustrated in

Fig. 1: a schematic side sectional view of a domestic oven with microwave heating function and steam cooking function;

Fig. 2: in a spatial view, a domestic oven without an oven door;

Fig. 3: a rear side view of an oven door;

- Fig. 4: in a detailed view, a groove of an oven door in a first embodiment;
 Fig. 5: a section detail view of a gasket element of a domestic oven for a steam barrier;
 Fig. 6: in a schematic section detail view, a steam barrier of a domestic oven in a first embodiment;
 Fig. 7: in a detailed view, a groove of an oven door in a further embodiment;
 5 Fig. 8: in a cut-away detail view, a steam lock of a domestic oven in a further embodiment; and
 Fig. 9: in a schematic section detail view, a steam barrier in a further embodiment.

[0080] In Fig. 1, a schematic side sectional view of a domestic oven 2 with microwave heating function and (purely optional) steam cooking function is shown. The domestic oven 2 comprises an oven door 1 and a cavity assembly 8. The cavity assembly 8 here comprises a microwave source 30, an (optional) steam source 32, an front (or outer) cavity frame 6, a (inner) cavity frame 5 and a front opening 4. The inner cavity frame 5, the front cavity frame 6 and the oven door 1 enclose a cavity 3. The cavity 3 is adapted for the introduction of comestibles.

[0081] The microwave source 30 is configured to generate microwave radiation for heating the comestibles located in the cavity 3 of the cavity assembly 8. In this embodiment, the front cavity frame 6 is configured as a door frame for the oven door 1 of the domestic oven 2. The front cavity frame 6 is permanently connected to the inner cavity frame 5 of the cavity 3 here. In this embodiment example, the inner cavity frame 5 of the cavity 3 is formed in one piece and surrounds the front opening 4 of the cavity assembly 8.

[0082] In this embodiment, the domestic oven 2 is further configured for steam cooking, with a steam source 32 disposed within the cavity 3.

[0083] In this embodiment, the oven door 1 comprises a top cover element 48, a microwave shutter 16, an innermost glass pane 14, a front glass pane 11, a front (intermediate) glass pane 12, an inner (intermediate) glass pane 13, and a cover element 20. The oven door 1 is configured for closing the front opening 4 of the inner cavity frame 5 at the front side 7 of the cavity assembly 8 of a domestic oven 2 framing the cavity 3. In this connection, the oven door 1 is movably mounted using an oven door connection 45 (not shown here, compare Fig. 2) for opening and closing the front opening 4. The microwave shutter 16 is formed, for example, as a metallic element (for example, using deep-drawing from a sheet metal element), which is configured to shield the environment of the domestic oven 2 from microwave radiation.

[0084] The cover element 20 is configured to form a (inside) trim surface and a gasketing contact for closing the front opening 4 of the cavity assembly 8. The cover element 20 has at least one groove 21 (compare Fig. 3) with which the gasketing contact is formed in that state closing the front opening 4 and which is formed recessed from the front side 7 of the cavity assembly 8.

[0085] The microwave shutter 16 is configured in such a way that microwave radiation cannot penetrate the gap 33 due to reflections and/or electrical capacitor effects (or only in a sufficiently small dosage).

[0086] The (intermediate) glass panes 12, 13 are used for thermal isolation, for example using rear ventilation. For example, the innermost glass 14 and/or at least one of the two (intermediate) panes 12, 13 is coated and/or doped to reflect or absorb microwave radiation.

[0087] In Fig. 2, a domestic oven 2 without oven door 1, for example according to Fig. 1, is shown in a spatial view. The domestic oven 2 comprises a control interface 31, a gasket element 23, an oven door connection 45 and a cavity 3, which is enclosed by a top side 40, a bottom side 41 and two lateral sides 39.

[0088] The front opening 4 of the cavity 3 is arranged at the front side 7, of the here approximately cube-shaped cavity assembly 8.

[0089] The control interface 31 is configured for operating the functions of the domestic oven 2 and can be operated, for example, using buttons, a touch display and/or via wireless communication (for example, using a smartphone) and is connected in a communicating manner to control electronics. The control electronics (not shown here) are arranged outside the cavity 3, for example on the top side 40. The oven door connection 45 is enclosed within the front cavity frame 6 and is designed, for example, as a hinge or joint for the oven door 1. A gasket element 23 is arranged around the front opening 4, which insulates the cavity 3 from the outside and is configured, for example, as a steam barrier 24 (in the case of a domestic oven 2 with a steam source 32) and/or barrier for microwave radiation.glass pane

[0090] In Fig. 3, an oven door 1 is shown in a rear side view. Visible here from the oven door 1 is a (small part of the) door handle 50, a front glass pane 11, a microwave grid 46, a groove 21, a joint connection 15, an innermost glass pane 14, a cover element 20, two safety lugs 49, and a top cover element 48. The top cover element 48 is preferably configured to guide the air between the glass panes 11, 12, 13, 14 of the oven door 1 and is mechanically firmly connected to the cover element 20 and/or the (here concealed) structural columns 9, 10 (compare Fig. 8). The door handle 50, for example, is firmly connected to the structural columns 9, 10 and is configured for manual operation of the oven door 1 and thus for opening or closing the domestic oven 2. It should be noted that the oven door 1 can alternatively also be moved using an electric actuator.

[0091] The cover element 20 is configured (like a conventionally designed one) to form a sight surface and a gasketing contact for closing the front opening 4 of a corresponding cavity assembly 8 (not shown here, compare Fig. 2). The cover element 20 proposed here is mechanically fixedly connected to the front glass pane 11 and the door handle 50 as well as

the joint connection **15** (for example formed by the structural columns **9,10** (compare Fig. **8**) of the oven door **1**.

[0092] The cover element **20** comprises a groove **21**, with which a gasketing contact between the cavity assembly **8** and the oven door **1** can be represented in a closed state with the corresponding front opening **4** of a cavity assembly **8** (not shown here, compare Fig. **2**). The groove **21** shown here is formed circumferentially without interruptions around the innermost glass pane **14**, so that a gasket element **23** (not shown here, compare Fig. **5**) can also be implemented in the same way circumferentially without interruptions or without changes in the axial extension. Here, a simple and as short as possible section is formed, which thus extends around the innermost glass pane **14**.

[0093] The joint connection **15** is arranged for moving the oven door **1** relative to a cavity assembly **8** (compare Fig. **1**). The safety lugs **49**, together with a safety switch (not shown), are configured to enable a microwave source **30** to be turned on or to emit microwave radiation into the cavity **3** when the front opening **4** is closed. The safety lugs **49** thus ensure that a cavity **3** is completely shielded from radiation when a microwave heating function is started.

[0094] A microwave grid **46** is provided in the viewing area exposed by the innermost glass pane **14**, which is preferably enclosed by a microwave shutter **16** (not shown here, compare Fig. **6**). The microwave grid **46** allows an unobstructed view into the cavity **3** despite efficient shielding against the penetration of microwave radiation. The microwave grid **46** is designed, for example, as expanded metal.

[0095] Fig. **4** shows a detailed view of a groove **21** of an oven door **1** according to Fig. **3** in a first embodiment. The oven door **1** comprises a groove **21**, a cover element **20**, an innermost glass pane **14**, and a microwave grid **46**.

[0096] In this embodiment, the groove **21** is integral with the cover element **20**. This groove **21** offers the advantage that more space is created for gasketing contact between the cover element **20** and the cavity assembly **8** at the front opening **4**, but at the same time a gap **33** that is located radially further out (with respect to the insertion axis) can be kept narrow. Radially inward to the groove **21**, there is again space for the at least one innermost glass pane **14** and for the microwave shutter **16** (compare Fig. **6**) or a microwave grid **46**.

[0097] In Fig. **5**, a gasket element **23** of a steam barrier **24** of a domestic oven **2** is shown in a section detail view. The following description refers to Fig. **1** to Fig. **4**, insofar reference is made to the description there without exclusion of generality purely for the sake of clarity.

[0098] The cavity assembly **8** shown here comprises an front cavity frame **6** which, as shown, has a frame side (or radially outer) flange **43** to the right in the direction of insertion. Furthermore, the cavity assembly **8** comprises an inner cavity frame **5**, by which the cavity **3** is enclosed on five sides. The inner cavity frame **5** comprises a cavity side (or radially inner side) flange **42**. A circumferential gap **36** is formed by the frame side flange **43** and the cavity side flange **42**, which is designed here as a gasket mount **35** for the gasket element **23**. The circumferential gap **36** is preferably formed without interruption, i.e. completely circumferentially, so that a gasket element **23** can also be designed completely circumferentially or (at least on the circumferential gap side) with a constant profile.

[0099] The gasket element **23** is arranged within the gasket mount **35** and includes (purely optionally) a hooked barb **44**. The hooked barb **44** is configured to hook behind the end of one of the two (here the cavity side) flanges **42**, so that the gasket element **23** is arranged within the gasket mount **35** in an at least loss-proof (preferably fixed) manner.

[0100] The gasket element **23** shown here further comprises (purely optionally) a void **34**, which is enclosed by a (for example soft) material and is filled with a gas (for example air). The void **34** is configured for being compressed using the oven door **1** in a closed state of the domestic oven **2**. Thus, the gasket element **23** is designed as a particularly efficient steam barrier **24** against leakage of steam from inside the cavity **3**.

[0101] In this advantageous embodiment, the gasket element **23** shown has five sealing lips. The first sealing lip **51** is configured radially opposite the hooked barb **44** for sealing abutment against the respective other (here frame-side) flange **43** inclined towards the oven door **1**. The second sealing lip **52** is configured for sealing contact with the top face of the front cavity frame **6**, inclined towards the rear side **38**, and is thus a pre-seal for the first sealing lip **51**. The third sealing lip **53** is configured for sealing contact with the top face of the inner cavity frame **5**, resting flat, and is thus a pre-seal for a seal formed by the hooked barb **44**. For a desired sealing effect, the second sealing lip **52** and third sealing lip **53** are preferably already pressed sufficiently strongly against the respective cavity frame **5, 6** as a result of the tensile force of the hooked barb **44**. The fourth sealing lip **54** and fifth sealing lip **55** are configured for sealing contact with the oven door **1**, preferably in its groove **21**, and are inclined radially inward and radially outward, respectively. In the closed state of the domestic oven **2**, the fourth sealing lip **54** and fifth sealing lip **55** are pushed away from each other as a result of friction and are thus efficiently pressed against the oven door **1**.

[0102] Purely optionally, the circumferential gap **36** between the two flanges **42,43** of the cavity frames **5,6** is covered by a choke profile **37**. The choke profile **37** is configured for shielding against microwave radiation, namely for protecting (especially electronic) components (radially) outside the cavity **3**. The choke profile **37** shown here is particularly preferably designed as a metallic profile with a plurality of spaced apart tongues on the (radial) inner side running completely around or with interruptions (for example for a connection between the front cavity frame **6** and the inner cavity frame **5**), so that the choke profile **37** can be pushed onto and/or clamped onto the flanges **42, 43** irrespective of the course (straight or curved).

[0103] Fig. **6** shows a schematic section detail view of a steam barrier **24** of a domestic oven **2** in a first embodiment. The

domestic oven **2** comprises a cavity assembly **8** and an oven door **1**, of which a steam barrier **24** is formed. Using the cavity assembly **8** and the (closed) oven door **1**, the cavity **3** arranged on the left as shown is (completely) enclosed. With regard to the cavity frames **5, 6** and the gasket element **23**, reference is made to Fig. 5 and the associated description.

[0104] In this closed state, a convection barrier, for example a steam barrier **24**, is formed by the gasket element **23** with the groove **21** on the door side. For this purpose, the gasket element **23** is (elastically) deformed by the oven door **1** in such a way that the gap **33** between the cavity assembly **8** and the oven door **1** of the gasket element **23** is closed.

[0105] The cover element **20** here has a groove **21** for receiving the gasket element **23** or its door-side sealing lips **54, 55**, respectively. The cover element **20** is designed here as a thin (preferably coined sheet) element and therefore has a corresponding projection **22** on the rear side of the groove **21**. As shown further below, a fixed connection is formed between the cover element **20** and the innermost glass pane **14**, here purely optionally using a gluing **47**.

[0106] The microwave shutter **16** is arranged between the cover element **20** and the next (for example according to Fig. 1 the inner intermediate) glass pane **13**. The microwave shutter **16** comprises a guard plate **17**, a locking plate **18** and a microwave grid **46**. The microwave shutter **16** is configured to shield microwave radiation from the cavity **3** so that only a sufficiently small dose of microwave radiation can pervade to an user in front of the domestic oven **2**. The microwave grid **46** is arranged in the viewing area released by the innermost plate **14**, which in the embodiment shown (purely optionally) is held between the locking plate **18** and the guard plate **17** of the microwave shutter **16** (e.g. welded, soldered and/or pressfit-stemmed).

[0107] The guard plate **17** and the locking plate **18** are provided outside the visible area. The guard plate **17** and the locking plate **18** are aligned with each other and with the inner cavity frame **5** of the cavity **3** in such a way that microwave radiation cannot penetrate (or only in a sufficiently small dosage) through the gap **33** due to reflections and/or electrical capacitor effects. The locking plate **18** has a radial, i.e. outwardly pointing, overlap with the inner cavity frame **5** of the cavity **3** with respect to the front opening **4** (with respect to the insertion axis). The locking plate **18** projects back from the guard plate **17** and a chamber is formed between the locking plate **18** and the guard plate **17**. This chamber is open (in the closed state) towards the rear side **38** of the domestic oven **2**, so that a trap opening **19** is formed around the front opening **4**.

[0108] The projection **22**, which is caused by the groove **21** for the gasket element **23**, is received in this trap opening **19**, thus the projection **22** is formed projecting axially into this chamber of the microwave shutter **16**. Thus, an existing installation space for more room for a voluminous gasket element **23** is created. Thus, the required safety for the microwave heating function and at the same time an efficient steam barrier **24** is created in a small installation space, preferably in the same installation space as without such a voluminous gasket element **23**.

[0109] It should be noted that the cover element **20** with the groove **21** can also be used for a domestic oven **2** without the steam cooking function, so that economies of scale can be achieved due to the usability in different domestic ovens **2**.

[0110] Fig. 7 shows a detailed spatial view of a groove **21** of an oven door **1** in a further embodiment. The detail shown is largely identical to the embodiment shown in Fig. 4, without excluding generality, purely for the sake of clarity, so that reference is made to the description there and only the differences are discussed here.

[0111] The groove **21** has a somewhat more complex design here. This becomes clear in the sectional view in Fig. 8.

[0112] Individual fingers of the guard plate **17** are visible here, which are partially covered by the cover element **20**. This is a particularly cost-effective design of the microwave shutter **16**, because this guard plate **17** does not require any complex forming (compare Fig. 6 or Fig. 9).

[0113] In this embodiment, the cover element **20** is made in two parts (irrespective of the other differences, purely optional) and comprises a groove element **25** and a trim element **26**. The groove element **25** is made of a plastic material, for example.

[0114] Using the groove element **25**, the groove **21** can be designed individually for specific purposes or for different domestic ovens **2**.

[0115] The trim element **26** is mainly used for aesthetic purposes. In this embodiment, the trim element **26** and/or the groove element **25** are also used to perform a mechanical task, for example, to fasten and/or secure the inner glass panes **12, 13, 14** and/or the guard plate **17** of the microwave shutter **16**, as well as the respective other components of the cover element **20**, or each other, respectively. In this embodiment, the groove element **25** and the cover element **20** are connected to each other in such a way that they cannot be detached from each other in a non-destructive manner.

[0116] Fig. 8 shows a section detail view of a steam barrier **24** of a domestic oven **2** in a further embodiment. The embodiment shown here is largely identical to the embodiment shown in Fig. 5 and Fig. 6, without excluding generality, purely for the sake of clarity, so that reference is made to the description there and only the differences are discussed here. In contrast to the illustration in Fig. 6, the cavity **3** is arranged here on the right as shown. For example, the cover element **20** is designed as shown in Fig. 7, whereby the trim element **26** is not shown here and only the groove element **25** with the groove **21** is shown.

[0117] In addition to the groove **21**, the cover element **20** further comprises a pre-sealing lip **28** and a drainage channel **29**. Here, too, (e.g. due to a minimum required material thickness) the groove **21** causes a projection **22** towards the front side **7** and is arranged in the front opening **4** of the microwave shutter **16** for use without affecting the installation space.

[0118] Possible (water) condensate deposits on the oven door **1** (e.g., due to a steam cooking function of the domestic

oven **2**) can be reduced using a pre-sealing lip **28**. For this purpose, the pre-sealing lip **28** has a radial extension (in relation to the insertion direction). This radial extension of the pre-sealing lip **28** is in direct contact with the inner cavity frame **5** of the cavity **3**. The pre-sealing lip **28** is made, for example, of a plastic material and is formed (here purely optionally in one piece) connected to the cover element **20**.

[0119] Irrespective of the presence of a pre-sealing lip **28**, the drainage channel **29** is provided here to prevent accumulated condensate from dripping outside the domestic oven **2** as far as possible. By means of this drainage channel **29**, the water can be directed into a drain in the bottom region of the inner cavity frame **5** of the cavity **3**, for example in the case of a domestic oven **2** with a steam cooking function for returning to a water supply for the steam source **32**. In this embodiment, the aforementioned pre-sealing lip **28** is a cavity-side edge of the drainage channel **29**. In this embodiment, the drainage channel **29** and the pre-sealing lip **28** are enclosed by the groove element **25**.

[0120] Irrespective of the presence of a pre-sealing lip **28** and/or a drainage channel **29**, a receptacle **27** for the innermost glass pane **14** is formed by the cover element **20** or the groove element **25**. For example, the groove element **25** is designed to be elastic in such a way that the innermost glass pane **14** can be inserted and held in this receptacle **27** using elastic deformation alone. Alternatively or additionally, the innermost glass pane **14** is adhesively fixed in the receptacle **27**.

[0121] One of the structural columns **9** can be seen in the background. The structural columns **9**, **10** have (preferably slide-in) receptacles **27** for one or more (intermediate) glass panes **12**, **13**, of which only the inner (intermediate) glass pane **13** is visible here (according to a design form of the oven door **1** as shown in Fig. 1).

[0122] Fig. 9 shows a schematic section detail view of a Steam barrier **24** in a further embodiment. The embodiment shown here is largely identical to the embodiment shown in Fig. 8, without excluding generality, purely for the sake of clarity, so that reference is made to the description there and only the differences are discussed here.

[0123] For example, that area of cavity **3** is shown here which in use in the earth-gravity-field is the lower area. The cover element **20** is also designed here with a pre-sealing lip **28** and a drainage channel **29** of the same shape (due to a complete circulation). The drainage channel **29** is open at the bottom and thus makes a minor contribution to conducting condensate in this area of the oven door **1**. However, with a low complexity of the construction of the cover element **20**, the pre-sealing lip **28** is thus also exposed here at the bottom part in the same way as at the sides and on the top for a desired elasticity.

[0124] With the oven door proposed here, good sealing of the cavity can be achieved with low space requirements.

List of reference numerals

[0125]

1	oven door	33	gap
2	domestic oven	34	void
3	cavity	35	gasket mount
4	front opening	36	circumferential gap
5	inner cavity frame	37	choke profile
6	front/outer cavity frame	38	rear side
7	front side	39	lateral side
8	cavity assembly	40	top side
9	structural columns	41	bottom side
10	structural columns	42	cavity side flange
11	front glass pane	43	frame side flange
12	front intermediate pane	44	hooked barb
13	inner intermediate pane	45	oven door connection
14	innermost glass pane	46	microwave grid
15	joint connection	47	gluing
16	microwave shutter	48	top cover element
17	guard plate	49	safety lug
18	locking plate	50	door handle
19	trap opening	51	first sealing lip
20	cover element	52	second sealing lip
21	groove	53	third sealing lip
22	projection	54	fourth sealing lip
23	gasket element	55	fifth sealing lip
24	steam barrier		

(continued)

25	groove element
26	trim element
27	receptacle
28	pre-sealing lip
29	drainage channel
30	microwave source
31	control interface
32	steam source

Claims

1. An oven door (1) for a domestic oven (2) having a microwave heating function for heating comestibles in a cavity (3), wherein

the oven door (1) is configured to close a front opening (4) of a cavity frame (5) at the front side (7) of a cavity assembly (8) of a domestic oven (2) framing the cavity (3), the front side (7) being the side of the domestic oven (2) accessible in use,
the oven door (1) comprising at least the following components:

- at least two structural columns (9,10) for holding at least one glass pane (11,12,13) and comprising an joint connection (15) for moving the oven door (1) relative to a cavity assembly (8);
- a microwave shutter (16) for trapping microwave radiation leaking from the cavity (3) of the cavity assembly (8), the microwave shutter (16) comprising a guard plate (17) and a locking plate (18) forming a trap opening (19) around the front opening (4) in the closed state; and
- a cavity-side cover element (20) having an innermost glass pane (14), the cover element (20) being configured to form a trim surface and a gasketing contact for closing the front opening (4) of the cavity assembly (8),

characterised in that

the cover element (20) has at least one groove (21) with which, **in that** state closing the front opening (4), the gasketing contact is formed and which is formed recessed from the front side (7) of the cavity assembly (8).

2. The oven door (1) according to claim 1, wherein
the groove (21) of the cover element (20) is formed circumferentially around the innermost glass pane (14).

3. The oven door (1) according to claim 1 or 2, wherein

the groove (21) of the cover element (20) in the closed state is arranged for gasketing contact with a front side gasket element (23) of the cavity assembly (8) of the domestic oven (2),
wherein a steam barrier (24) is formed by the gasket element (23) together with the groove (21).

4. The oven door (1) according to one of the preceding claims, wherein
the cover element (20) is formed at least in part from a plastic material.

5. The oven door (1) according to claim 4, wherein
the cover element (20) comprises a groove element (25) made of a plastic material in which the groove (21) is formed, wherein preferably a trim element (26) made of a metal is further provided by the cover element (20).

6. The oven door (1) according to any one of the preceding claims, wherein

the cover element (20) has a receptacle (27) for one of the glass panes (14) of the oven door (1),
wherein preferably the receptacle (27) is comprised by the groove element (25) according to claim 6.

7. The oven door (1) according to any one of the preceding claims, wherein

the cover element (20) comprises a, preferably circumferential, pre-sealing lip (28) which is configured for gasketing contact with the cavity frame (5) of the cavity assembly (8) at the front opening (4), wherein preferably the pre-sealing lip (28) is comprised by the groove element (25) according to claim 6.

8. The oven door (1) according to any one of the preceding claims, wherein the cover element (20) comprises a, preferably circumferential, drainage channel (29) for condensate, wherein preferably the drainage channel (29) is comprised by the groove element (25) according to claim 6.

9. The oven door (1) according to claim 1 or 2 or any of claims 3 to 8, wherein

the groove (21) of the cover element (20) has on the rear side an outwardly projecting projection (22), wherein the projection (22) is formed projecting into the trap opening (19) of the microwave shutter (16).

10. The oven door (1) according to one of the preceding claims, wherein the cover element (20) is plugged onto at least one of the structural columns (9,10).

11. A domestic oven (2) with microwave heating function for heating comestibles, comprising at least the following components:

- an oven door (1) according to any one of the preceding claims;
- a cavity assembly (8) having a cavity (3) framed by a cavity frame (5) for containing comestibles and having at the front side (7), a front opening (4) in the cavity frame (5) closable using the oven door (1); and
- a microwave source (30) for generating microwave radiation for heating comestibles located in the cavity (3) of the cavity assembly (8),

wherein a, preferably circumferential, gasket element (23) is provided at the front opening (4) of the cavity assembly (8), which gasket element (23) is in gasketing contact with the groove (21) of the oven door (1) in the closed state.

12. The domestic oven (2) according to claim 11, wherein the domestic oven (2) comprises a steam source (32) configured to steam cook comestible located in the cavity (3) of the cavity assembly (8).

13. The domestic oven (2) according to claim 11 or claim 12, wherein

a minimum gap (33) is formed between the cover element (20) of the oven door (1) and the cavity frame (5) at the front side (7) of the cavity assembly (8), wherein a distance between the oven door (1) and the front side (7) of less than 2 mm, preferably 1 mm or less, is formed by the minimum gap (33).

14. The domestic oven (2) according to any one of claim 11 to claim 13, wherein the gasket element (23) comprises an enclosed void (34) between the groove (21) and a front side gasket mount (35) of the cavity frame (5) of the cavity assembly (8).

15. The domestic oven (2) according to any one of claims 11 to 14, wherein

the front side (7) of the cavity assembly (8) has two cavity frames (5,6) which are spaced apart from one another with a circumferential gap (36) at the front side (7), wherein the gasket element (23) is accommodated in this circumferential gap (36) and a choke profile (37) is arranged on the rear side of the gasket element (23), embracing the circumferential gap (36) and thus blocking microwave radiation, wherein preferably the choke profile (37) is clamped onto the two cavity frames (5,6) spaced apart from the circumferential gap (36).

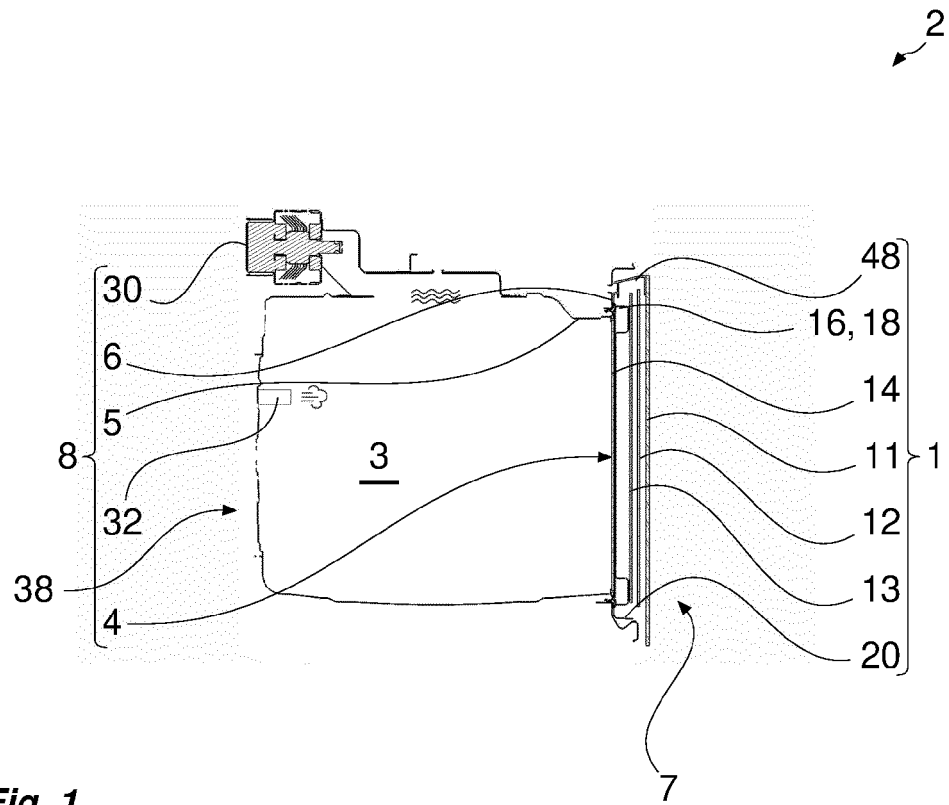


Fig. 1

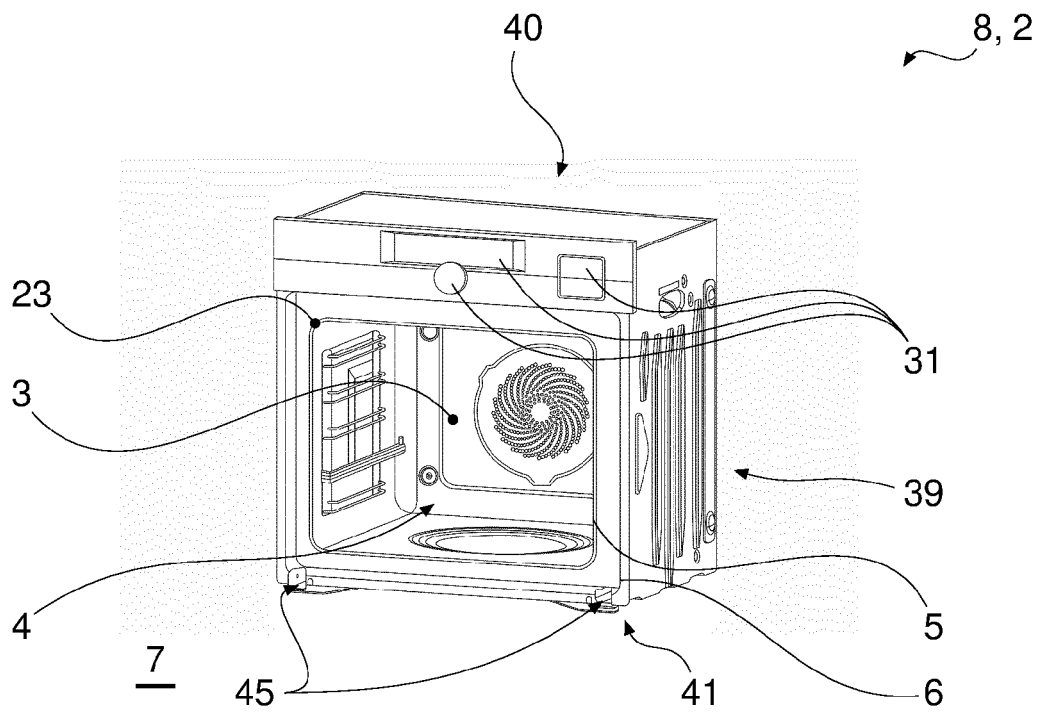


Fig. 2

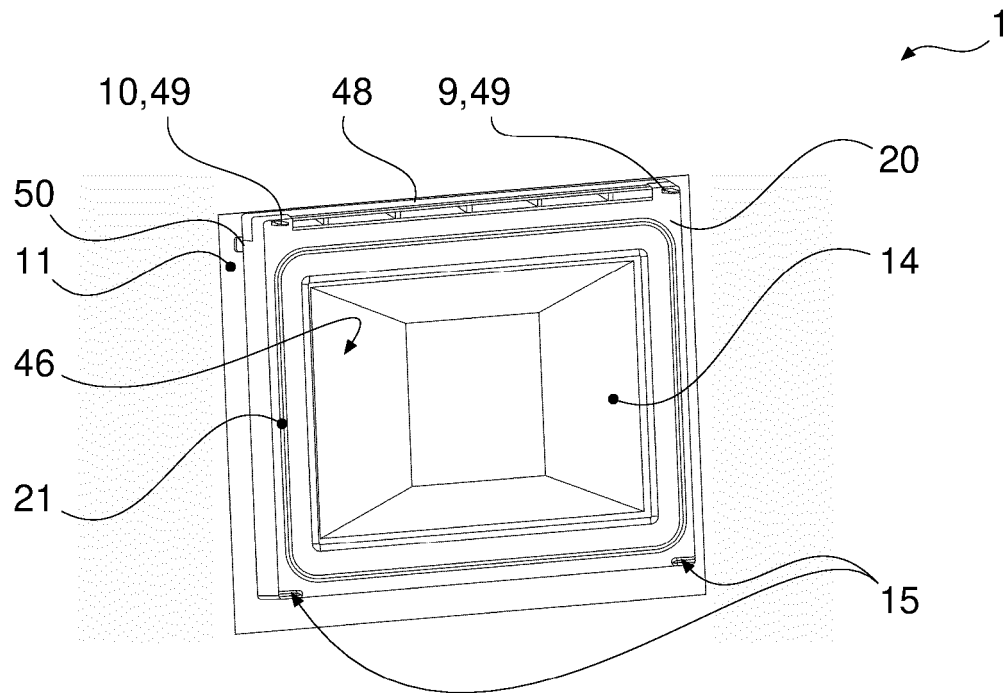


Fig. 3

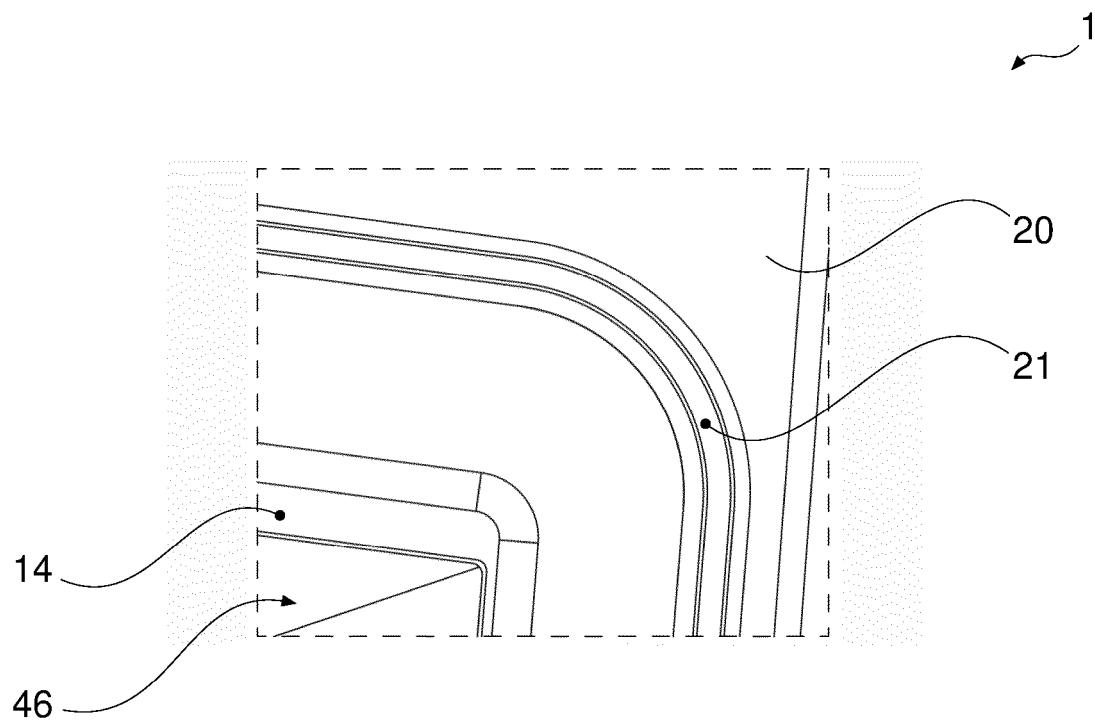


Fig. 4

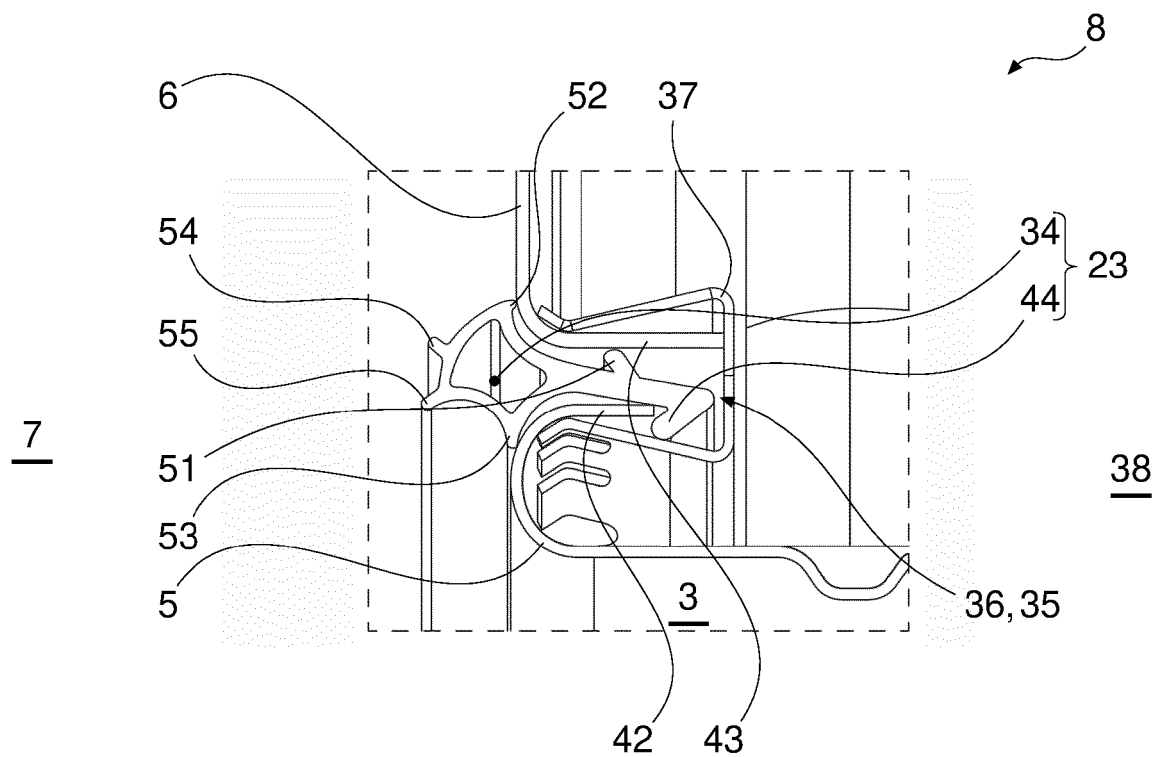


Fig. 5

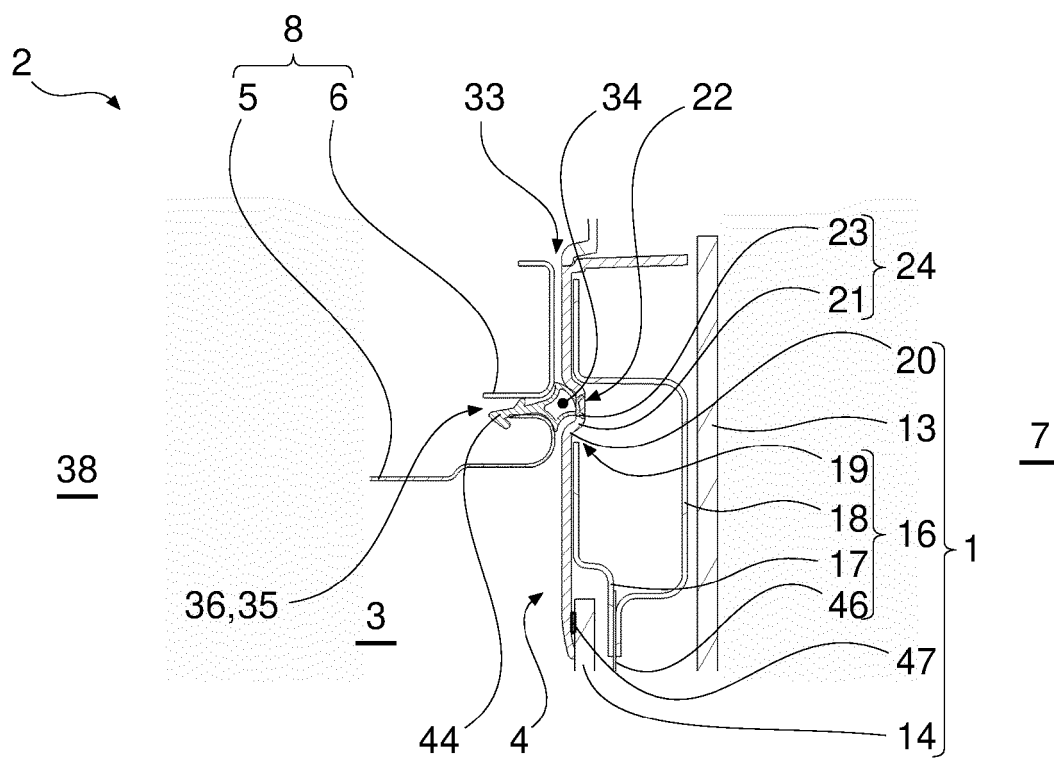


Fig. 6

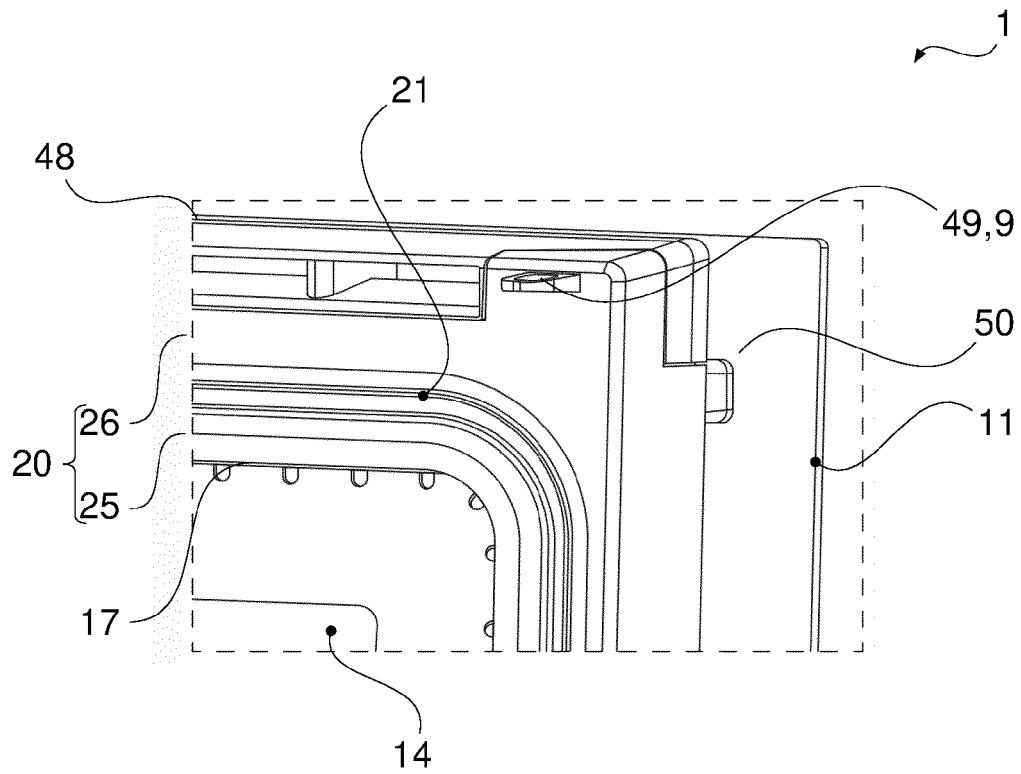


Fig. 7

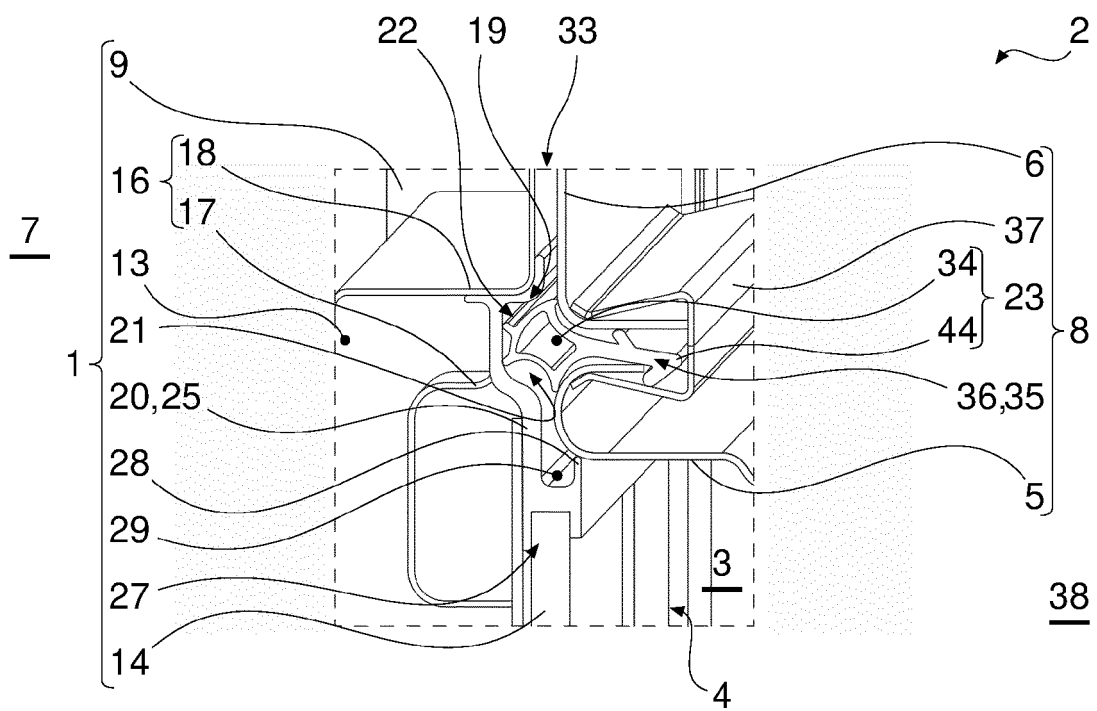


Fig. 8

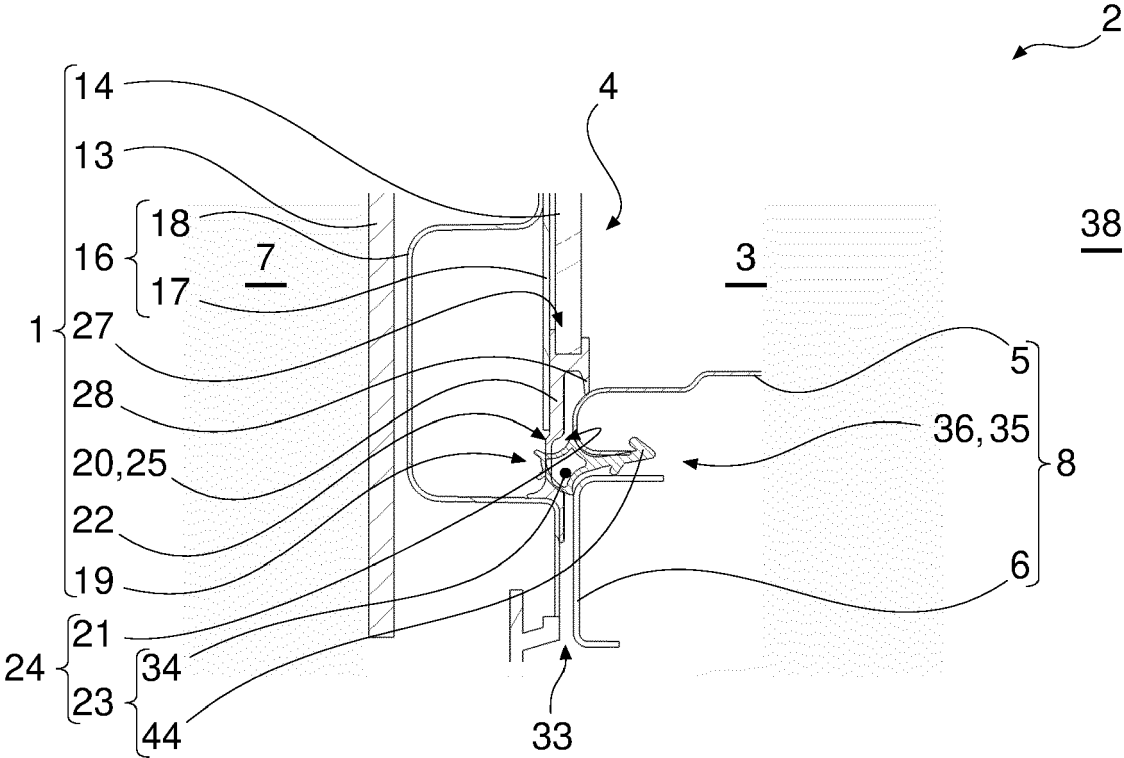


Fig. 9



EUROPEAN SEARCH REPORT

Application Number

EP 23 20 4920

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	EP 2 747 515 A1 (MIELE & CIE [DE]) 25 June 2014 (2014-06-25) * paragraph [0001]; figure 2 * -----	1-15	INV. H05B6/76 F24C15/02
A	CH 637 794 A5 (RAYTHEON CO [US]) 15 August 1983 (1983-08-15) * figure 2 * -----	1-15	
A	DE 198 05 302 A1 (BOSCH SIEMENS HAUSGERÄTE [DE]) 19 August 1999 (1999-08-19) * figure 2 * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			H05B F24C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		21 March 2024	Pierron, Christophe
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			

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 23 20 4920

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

21-03-2024

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2747515 A1	25-06-2014	DE 102012112805 A1	26-06-2014
		EP 2747515 A1	25-06-2014
CH 637794 A5	15-08-1983	AU 518080 B2	10-09-1981
		CA 1113547 A	01-12-1981
		CH 637794 A5	15-08-1983
		DE 2848658 A1	31-05-1979
		DE 7833340 U1	17-04-1980
		FR 2410224 A1	22-06-1979
		JP S5475643 A	16-06-1979
		NL 7811594 A	29-05-1979
DE 19805302 A1	19-08-1999	NONE	

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 2731404 A1 [0002]
- EP 3340739 A1 [0002]
- EP 2815629 A1 [0004]
- EP 2747515 B1 [0006]