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(54) **Door system for closing a feeding opening of the cooking cavity of a cooking oven**

Türensystem zur Schließung einer Zufuhrvorrichtung zum Garraum eines Backofens

Système de porte pour fermer une ouverture d'alimentation de cavité de cuisson d'un four de cuisson

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## Description

**[0001]** The invention relates to a cooking oven, especially home cooking oven, with a cooking cavity and with a door system assigned to a feeding opening for closing the feeding opening of the cooking cavity of said cooking oven, where the door system comprises a pull our system, where the door system comprises a door which is movable using the pull out system from the feeding opening away and/or to the feeding opening and which is, in addition, movable with respect to the pull out system.

**[0002]** A pull out system of a door of a cooking oven can be implemented by a sliding carriage, for example, and makes it possible to bring the food onto the baking tray and to take it from the baking trays without taking out the baking trays. These are fixed at the inner side of the door using supporting clements and are moved with the door which opens by horizontal shifting out of the cooking cavity and closes into the opposite direction. Therefore, the baking tray makes it possible that the operator does not have to grab into the hot cooking cavity any more to take out or to bring in the baking trays.

**[0003]** From the state of the art, different embodiments of horizontally guided oven doors are known.

**[0004]** In DE 102 11 519 A1, a sliding carriage is disclosed where at the inner side of the door several carrying devices are attached. These carrying devices are used for carrying and transverse moving of baking trays.

**[0005]** The transverse movement of the baking trays is performed by a telescope device. By this, the baking trays are pulled out of the area in front of the oven to the side and food as well as the baking tray itself can be taken out. Disadvantageous is here the considerably increased required space as for completely extending the baking tray to the side at least a clearance as wide and as long as the cooking oven is necessary beside the oven. Also it is inconvenient to operate the sliding carriage from a side area, as the mobility of the operator is usually limited by other furniture or similar things.

**[0006]** DE 94 06 630 U1 and DE 39 24 588 A1 disclose further embodiments of sliding carriages with the same basic idea of the lateral movement and which therefore comprise the same disadvantages.

**[0007]** DE 27 40 607 A1 discloses an oven door, which is movable horizontally out of the cooking cavity and which comprises holders for baking trays at its inner side.

**[0008]** This door is, by transverse partitioning, splitted into an upper and a lower area. The upper part of the door is foldably connected with the front with the lower door part. Therefore, the baking trays are accessible from the front, however, they can only be attached at the lower door part, in the lower patt of the cooking oven. So the cooking cavity of the cooking oven cannot be used completely, also the number of baking trays, which can be attached, is limited.

**[0009]** DE 44 44 316 A1 shows a sliding carriage, whose baking trays are moved upwards along a moving path in a vertical direction out of the door area, guided by a holding device, and therefore can be taken out above the door area. Here, the access to the baking trays is limited and only the highest baking tray is accessible which is undesired if something is supposed to be added or taken out in the middle or lower tray during the cooking operation.

**[0010]** In DE 90 17 148 U1, a revolvable door for a baking oven is disclosed, which is, in an opened position, movable into the cooking oven and whose baking trays are rotatable using a rotatable basic plate. The basic plate can stay inside the cooking cavity but can also be moved out of the cooking cavity for moving out the baking trays. The door can be opened independently from the baking trays or closes the cooking cavity behind the extracted baking trays. The rotating mechanism of the door as well as the mechanism of the baking trays is carried out using the base plate, which complicates its operation. The disadvantage compared to the pull out mechanism of sliding carriages is here the less convenient handling and that the operator must grab into the hot cavity to pull out the baking trays or the door which has been pushed in.

**[0011]** In DE 196 09 105 C2, a sliding carriage with pivotable door is disclosed which is moved horizontally away from the cooking cavity by a pull out mechanism and where, at the door inner side, baking trays are attached. A pivoting device with an distance part which constitutes the arm for rotating related to a vertical axis, allows the rotation of the door. This rotation is carried out using guideways which are attached on the cover plate and can be facilitated by rollers or, alternatively, by a connection link where the door is moved in a guidance which is fixed on the pull out devices. The pivoting device is implemented in this way to maintain the stability in the sliding carriage. The traverse plate and the pivot point in the center are necessary for the stability of the door. At every rotation of the door, the baking trays and the door tilt out over the lateral side area of the traverse plate to both sides which increases the required place besides the cooking oven in both directions. A further disadvantage is the rotation using guideways or the connection link as, for example, by dirt these guides can be effected or jam.

**[0012]** Document EP 0 794 389 discloses the preamble of claim 1.

**[0013]** Therefore, from the state of the art many different embodiments of door systems are known which allow the access to baking trays by their door arrangements. Disadvantageous is, however, that the access was, up to now, accomplished only with a complicated operation of the door mechanism or with insufficient operating comfort with respect to the accessibility of several baking trays. The reason for this is, that no satisfying solution has been found up to now, which also satisfies the demand for the stability.

**[0014]** Therefore, it is an object of the invention, to propose a cooking oven, especially home cooking oven with new a door system which moves the baking trays out of the cooking cavity and makes them accessible, where

the stability and the degree of rotation of the door is improved significantly.

**[0015]** This object is solved by a cooking oven, especially home cooking oven, according to claim 1,

a) with a cooking cavity and
b1) with a door system assigned to a feeding opening for closing the feeding opening of the cooking cavity of said cooking oven,
b2) where the door system comprises a pull out system,
b3) where the door system comprises a door which is movable using the pull out system from the feeding opening away and/or to the feeding opening and which is, in addition, movable with respect to the pull out system,
c) wherein the door is pivotable in its movable state with respect to the pull out system around a vertical pivot axis and where the door is movable around the pivot axis in the center of the door,
d1) where a control unit is attached or arranged in and/or at the door,
d2) where the control unit comprises at least one locking or snapping device for locking or fixing the door with respect to the pull out system on the one hand and for releasing or disconnecting the door with respect to the pull out system on the other hand,
e1) where the locking or snapping device comprises at least one locking or snapping slider, which is connected with a folding or swinging joint,
e2) where the distance of the folding joint to a distance bolt determines the lifting of the locking or snapping slider,
e3) so that the door in a pull out position and/or during the pull out movement can be brought alternatively in a state which is fixed with respect to the pull out system or into a state which is movable with respect to the pull out system.

**[0016]** Advantageous embodiments are described particularly in the dependent claims.

**[0017]** Preferably, the pull out movement of the door using the pull our system proceeds at least partially along a horizontal direction. If sliding carriages are used, this can be the known opening and closing of the door. As an alternative, it is also possible to move the door via a further vertical and/or horizontal axis by pulling it out via the pull out system to a higher, deeper and/or laterally shifted position relative to the cooking cavity.

**[0018]** To maintain the stability of the door system, it is advantageous, if the door stays fixed until the desired pull out position or pivot position is reached. Only if a rotational movement is desired, this is allowed by the control unit according to the invention. The door is pivotable in is movable state relatively to the pull out system around a vertical pivot axis.

**[0019]** The pivot axis is situated in the door center, which improves the stability of the door system according to the invention. Thus, the access to the door interior is enabled by the rotation.

**[0020]** Preferably, the rotational movement is carried out by a rotation mechanism below the bottom of the door. This is carried out preferably by a pivot bearing. This pivot bearing can be integrated into the pull out system of the door system and is therefore located directly underneath the door, where the pivot axis is located preferably in the door center or in a side area of the door.

**[0021]** Preferably, the control unit can be in different positions. Preferably, in a first position of the control unit, the door is located in its state relatively stationary with respect to the pull out system. In this case, the control unit causes a fixing of the door at the pull out system, preferably in a snapping position. By this, the door stays relatively fixed during pulling out and pushing in of the door system and admits no pivoting. Furthermore, further snapping positions are possible, where for handling of the items to be cooked, a relatively fixed position of the door is desired.

**[0022]** Preferably, in a second position of the control unit, the door is in its state relatively movable to the pull out system. Therefore, the movement of the door can easily be controlled and operated by the operator. The rotation can optionally be carried out to the left or to the right. This can be determined by the user individually depending on the open space or at will.

**[0023]** The control unit comprises at least one locking or snapping device for locking or fixing the door relatively to the pull out system on the one hand and for releasing or disconnecting the door relatively to the pull out system on the other hand.

**[0024]** The locking and/or fixing in the control unit is advantageously implemented by moving a snapping slider which can be lifted by a folding joint which is attached with distance to a distance bolt by a height h to release the snapping position of the door for rotation. The locking or snapping device comprises at least one locking or snapping slider, which is connected with a folding or swinging joint, where the distance of a folding joint to a distance bolt determines the lifting of the locking or snapping slider. The control device according the invention can also comprise more than one snapping slider which can be moved conjointly or individually.

**[0025]** Preferably, the locking or snapping slider comprises a protrusion which engages through the door bottom into the pull out system in a locking or snapping position and thus avoids every movement of the door with respect to the pivot axis. The protrusion is the lower part of the snapping slider which ensures the locking by its form and its material. This protrusion can be attached to the snapping slider or integrally formed with the snapping slider.

**[0026]** In the second position of the control device, especially for rotating the door, the protrusion of the snapping slider is lifted out of the pull out system particularly by the height h, or is out of engagement and thus allows the rotation into an arbitrary direction around the pivot

axis of the door.

**[0027]** The snapping slider is, in a preferred embodiment, made at least partially out of plastics and/or is at least partially formed as a spring part. However, also other materials and forms are applicable.

**[0028]** This spring part is preferably arranged unmovable in a horizontal direction, preferably in the door interior space. This is carried out advantageously by a predetermined position of the snapping slider between supporting elements on the one hand and between a counter spring and a distance sleeve on the other hand.

**[0029]** Furthermore, the distance bolt can constitute a pivoting axis and/or a pivoting point of the folding joint. The door preferably comprises a front plate as an outer surface and the distance bolt is preferably located in the area or plane of the front plate, advantageously centered in an opening of the front plate. Thus, the control device is operated in an outer door area and the snapping slider is moved via the folding joint into the door interior space.

**[0030]** Advantageously, a limiting block extends through the opening of the front plate, where the limiting block comprises an outer area which is bigger than the opening of the front plate. Preferably, the limiting block also comprises an inner area which is smaller then the opening of the front plate and is preferably attached through the opening of the front plate. This aims the exact alignment of the limiting block into the door, as with this, the outer and the inner area of the limiting block comprise defined dimensions and the arrangement can not slip away.

**[0031]** The limiting block preferably comprises a bore which preferably proceeds angular to the door interior space. Depending on if the first or the second position is desired to be the not operated position, the bore can proceed upwards or downwards. The folding joint preferably proceeds through this bore. Upper and lower stopping faces can limit the path of the folding joint, especially when operating the control unit. The stopping faces preferably are situated at the edges or walls of the bore. If the control device is desired to be not operated in a first position, then the bore normally proceeds upwards so that the folding joint lifts the snapping slider when it is operated.

**[0032]** Furthermore, the outer area of the limiting block can be provided with a cover. The cover preferably comprises an opening for an operating arm of the folding joint. Via this operating arm, the control device is operated. The opening is not substantially bigger then the action range of the operating arm. Therefore, the cover provides a protection against dirt and/or jamming.

**[0033]** This effect can be improved, if the cover moves with the control unit in a vertical movement, when the control unit is operated. This effects that the small opening of the cover does not limit the movement of the operating arm.

**[0034]** Preferably, a stop unit is arranged in the door interior which supports the folding joint in a state of the door or in a first position of the control unit. The stop unit is, in a preferred embodiment, attached at a interior plate in the door interior.

**[0035]** Preferably, a fixing element is attached in a rear part or at the inner end of the folding joint, where it holds the snapping slider in its position and/or prevents a detachment of the snapping slider from the folding joint. Preferably, the fixing element is a nut, which is screwed on a thread provided at the folding joint. This allows an exchange of the snapping slider in need of repair as well as an easy assembling of the snapping slider. However, also a rigid fixing of the snapping slider by known detachable or non-detachable connections of the folding joint is possible.

**[0036]** In a preferred embodiment, the folding joint is an extension of the door handle protruding into the door interior and/or the door handle is the operating arm of the folding joint.

**[0037]** Preferably, the control unit is a door handle automatic, with transforms the different positions of the control device by moving of the door handle so that preferably no further operating elements are necessary.

**[0038]** Preferably, the door handle of the door handle automatic is in one position aligned horizontally and in another position tilted around an operating angle $\alpha$ in a plane based on a side view of the door, preferably 15°. The folding movement can be carried out upwards as well as downwards. An operating angle of about 15° allows a convenient operation movement, however, also another angle is possible as an operating angle. Furthermore, the door handle can be used as a pivoting arm for the operator to rotate the door which increases the operating comfort.

**[0039]** As an alternative, the door handle of the door handle automatic can be brought from the first position of the door handle automatic into a second position of the door handle automatic by rotating around its horizontal axis. To achieve this, merely the folding joint has to be moved downwards or upwards when the door handle is rotated.

**[0040]** Preferably, the door handle of the door handle automatic is aligned horizontally in a first position and, in a second position, is tilted with respect to a plane of a front view of the door. In this respect, the door handle has its point of application in the control unit and operates it by moving of the handle.

**[0041]** In an advantageous embodiment, the control unit is operated using a separate control device, for example a push button, an arm or a handle, preferably attached at the door system and/or the control panel and/or the pull out system.

**[0042]** According to a preferred embodiment, the door comprises other snapping positions in the rotated state, which are implemented by the same principle of a snapping position of the unrotated door by engaging the snapping slider in predetermined snapping openings in the corresponding positions. Preferably, the snapping positions are located in states where the door is rotated by 180° and/or 90° to the left or to the right. Particularly ad-

vantageous are snapping positions with a rotation of 180° and/or 90° to the left or to the right, as then the access to the baking trays from the front is particularly easy and the door handle is still very easy to operate.

**[0043]** In an advantageous embodiment, the rotation of the door is carried out using a rotable U-clamp attached to the pull out system. It particularly rotates the door and is attached at the pivot point by a pintle or bolt.

**[0044]** Preferably, the U-clamp comprises a horizontal track adapted to the bottom of the door and/or two swords protruding vertically upwards from the track to hold the door.

**[0045]** In an advantageous embodiment, the swords of the U-clamp reach at least two thirds of the door height. This ensures or improves the stability of the door.

**[0046]** Preferably, the swords of the U-clamp are included into door columns of the door. This facilitates the assembling and improves the stability of the door.

**[0047]** In an advantageous embodiment, the door columns enclose the sword of the U-clamp several times, preferably three times. This enables the door columns to carry the force implied by the baking trays.

**[0048]** Preferably, the door columns are arranged at the left or at the right side of the door.

**[0049]** Preferably, the door columns are made from plastics, alternatively the door columns can also be made from metal or partly out of plastic.

**[0050]** Preferably, supporting elements are provided at the door for at least one baking tray. For stabilizing of the door, glass holders can be used in the doors which support and stabilize the interior glass which carries the baking trays via the supporting elements. Finally, for locking and fixing, the transverse bar is inserted into the door columns.

**[0051]** The heavy load caused by the weight of the baking trays is thus carried conjointly by the different components of the door which also create the needed stability for rotating the door in the door center. The supporting elements can be fixed at the interior glass of the door as well as at the frame or at an own device for fixing the supporting elements.

**[0052]** The invention comprises a cooking oven, especially a home cooking oven, with at least one cooking cavity and with a door system, according to the invention, assigned to the feeding opening for sealing or closing the feeding opening.

**[0053]** Furthermore, the invention relates to a cooking oven according to one of the claims 1 to 9, where

a) the door comprises a front plate and at least one interior plate,
b) where two door columns are attached to the front plate for carrying the front plate and
c) where the interior plate is attached to the door columns,
d) where preferably the interior plate is fixed to the door system by plate holders protruding along the height of the door columns

**[0054]** In an advantageous embodiment the plate holders are clipped into the door columns. This enables a very easy assembling of the door system.

**[0055]** Preferably, the door columns comprise at least one elongated slot, where the at least one elongated slot is surrounded by the door column and/or with a distance to the front end of the door column in order to increase the gluing area for fixing the door columns to the front plate. This enables a very stable fixing of the door columns at the front plate.

**[0056]** In an advantageous embodiment, the plate holders comprise at least one elongated slot, where the elongated slot is surrounded by the plate holder and/or with a distance to the front end of the plate holder in order to increase the gluing area for fixing the door columns to the front plate, where preferably the at least one elongated slot of the plate holders and the at least one elongated slot of the door columns are arranged over each other. By this, a good air flow can be achieved while at the same time, the interior plate can be fixed in a stable way.

**[0057]** Preferably, the interior plate is carried at its lower end by at least two support elements, which are attached to the lower end of the door columns, where the support elements comprise a base area for carrying the interior plate and an adjoining holding peg protruding upwards and/or perpendicular to the base area to prevent the plate from sliding down from the support element, where the holding peg has a height of less than 7 mm, preferably less than 5 mm. This eases the disassembling of the door system as holding pegs with a height of less than 7 mm, preferably of less than 5 break infrequent as the are affected with lower forces when disassembling the door system. In a very advantageous embodiment, the holding pegs have a height of 3 mm.

**[0058]** The invention will be described further in the following by means of a preferred embodiment. Therein, also figures will be referenced, where it shows

FIG 1 the assembled door,

FIG 2 the support for the interior plates,

FIG 3 the assembling of the glass holders and the transverse bar,

FIG 4 the door handle automatic in a not operated position in a lateral sectional view of the door handle area,

FIG 5 the door handle automatic in a not operated position in a lateral sectional view of the lower door area,

FIG 6 the door handle automatic in a not operated position in a side view,

FIG 7 the door handle automatic in an operated position in a lateral sectional view of the door

handle area,

FIG 8 the door handle automatic in an operated position in a lateral sectional view of the lower door area,

FIG 9 the door handle automatic in an operated position in a side view,

FIG 10 the door guidance with a U-clamp,

FIG 11 the cooking oven with the door system in snapping position and

FIG 12 the cooking oven with door system with pulled out, rotated door.

**[0059]** Corresponding part are provided with the same reference signs.

**[0060]** FIG 1 to 3 show the door system according to the invention. FIG 1 shows the door in a completely assembled state. The door 1 comprises a front plate 11 and an interior plate 12.

**[0061]** The interior plate 12 comprises screwed support elements 13 for carrying not shown baking trays. For holding the interior plate 12, laterally glass holders 15 are attached.

**[0062]** These glass holders 15, in turn, are locked and holded by the transverse bar 16. At the front plate of the door 1, the door handle 21 is attached in a horizontal alignment.

**[0063]** FIG 2 shows the door columns 14 according to the invention which are shown here as plastic parts, each made of one piece. The insertion of the swords 32 according to FIG 10 is carried out from the bottom. The door columns 14 comprise connecting notches 141 which allow the clipping in of the plate holder 15 in a simple and safe way. The upper surface of the door columns 14 comprises connecting notches 142 for clipping in the transverse bar 16. The door handle 21 guides through each of the two openings 111 in the front plate 11 a folding joint 23 which serves for operating the door handle automatic shown with details in FIG 4 and 5. One of the openings 111 comprises the snapping slider 22 attached to the folding joint. In its upper area, it is fixed between a distance sleeve 27 and a nut 28.

**[0064]** FIG 3 shows the attachment of the plate holders 15 and the transverse bar 16. The plate holders 15 are clipped into the connecting notches 141 using connecting pivots 151. The transverse bar 16 is afterwards clipped into the connecting openings 142 of the door columns 14. The transverse bar 16 comprises openings for ventilating the door interior via the air suction channel 45, which is shown in FIG 11.

**[0065]** Each door column 14 comprises two elongated slots 143 and 144 arranged along the outer side of each door column 14.

**[0066]** Furthermore, each plate holder 15 comprises two elongated slots 153 and 154, also arranged along the outer side of each plate holder 15.

**[0067]** The slots 143 and 153 on the one hand, and the slots 144 and 154 on the other hand are arranged over each other to enable the ventilation of the door, especially for pyrolysis ovens.

**[0068]** The elongated slots 143 and 144 are surrounded by the door columns 14 and arranged with distance d1 from the front end 145 of the door columns 14 in order to increase the gluing area 61 for fixing the door columns to the front plate 11.

**[0069]** The interior plate 12 is carried by at least two support elements 63 and 64 which are attached at the lower end of the door columns 14.

**[0070]** The support element 63 comprises a base area 63A for carrying the interior plate 12 and an adjoining holding peg 63B protruding upwards and/or perpendicular to the base area 63A to prevent the plate from sliding down from the support element 63. The holding peg 63B has a height h2 of less than 5 mm, preferably of 3 mm.

**[0071]** The support element 64 comprises a base area 64A for carrying the interior plate 12 and an adjoining holding peg 64B protruding upwards and/or perpendicular to the base area 64A to prevent the plate from sliding down from the support element 64. The holding peg 64B has a height h2 of less than 5 mm, preferably of 3 mm.

**[0072]** FIG 4 to 6 show the door handle automatic 2 in a first position. In FIG 4, the door handle 21 is aligned in a horizontal position with respect to the door side. The door handle 21 reaches with the corresponding folding joint 23 through the opening 111 of the front plate 11. The limiting block 25 proceeds through the opening of the front plate 111. The distance bolt 24, which is a pivot point for a tilting movement, is located on the level of the front plate 11. In a rear part of the folding joint 23 and so in the door interior, the snapping slider 22 is attached to the folding joint 23. Between the snapping slider 22 and the front plate 11, a distance sleeve 27 is attached, which holds the snapping slider in a position corresponding to its form. The snapping slider 22 protrudes vertically downwards, comprising the complete height of the door. The snapping slider is brought into a position underneath the distance bolt 24 as well as underneath the pivoting area of the folding joint 23 by a counter spring 224, which enables linear guidance of the snapping slider 22 in operation. This position is fixed in a horizontal direction via upper and lower supporting elements 222, 223 so that only a movement in vertical direction is possible. The operating arm protrudes through a cover 26 into the door interior. The cover comprises an opening 261, which is only marginally bigger then the operating arm at this place. Furthermore, the opening 261 comprises bevellings at its outer edges. By moving in a vertical direction when operating the door handle automatic 2, the opening 261 is large enough to allow the level movement of the door handle 21.

**[0073]** Inside the cover 26, the limiting block 25 is located. It protrudes through the opening 111 of the front

plate, is, in an outer area, with respect to the front plate 11, larger than its opening 111 and, in an inner area of the door, smaller then the opening of the front plate 11. The inner area of the limiting block 25 is surrounded by the distance sleeve 27. The folding joint 23 proceeds through a bore 251 of the limiting block 25. This bore 251 proceeds upwards from the outside to the inside, however with an incline which also admits an horizontal position of the folding joint 23. The horizontal position of the folding joint 23 is supported by a stop unit 29 which is attached to an intermediate plate. The folding joint 23 is seated on the stop unit 29 with an end directed to the door interior. A nut 28, which is also attached at this end of the folding joint 23, prevents a releasing of the snapping slider 22 from the folding joint 23. The nut 28, however, is screwed up so far that it will not touch the stop unit 29.

**[0074]** FIG 5 shows the lower supporting elements 222 for stabilizing the linear guidance of the snapping slider 22. Below the door bottom, the snapping slider 22 comprises a protrusion 221 for snapping into the pull out system. It is stuck with the height h1 in corresponding, not shown openings or in a corresponding opening in the pullout system. The protrusion 221 therefore blocks a rotational movement of the door. The door handle 21 for operating the snapping slider 22 is here an operating arm which can move the folding joint 23 upwards by folding, as shown in FIG 7.

**[0075]** FIG 6 shows the protrusion 221 of the snapping slider 22 in a snapping position with horizontal door handle 21 in a not operated position of the door handle automatic.

**[0076]** FIG 7 to 9 show the door handle automatic 2 in a second, operated position. Here, the door handle 21 is brought into a position folded downwards by an operating angle $\alpha$ viewed from the door side. Here, the folding joint 23 is moved upwards by the same operating angle $\alpha$ through the distance bolt 24. Therefore, the folding joint 23 moves upwards in the limiting block 25. Therefore, the folding joint 23 is moved inside the bore 251 in an inner area of the limiting block 25 to the upper edge. In this way, the limiting block 25 defines the height h1 the snapping slider 22 is lifted. The folding joint 23 pulls the snapping slider upwards by the height h1.

**[0077]** To prevent the protrusion 221 from being pulled into the door interior space, an upper horizontal portion of the snapping slider 22 is also moved by the height h1 and touches the distance sleeve 27 after reaching the height h1. The cover 26 also moves downwards during operation around the operating angle $\alpha$ to allow the folding movement by the operating angle $\alpha$ in spite of a small opening 261.

**[0078]** FIG 8 shows the snapping slider 22 pulled upwards by the height h1 where the protrusion 221 of the snapping slider 22 at the door bottom is also pulled at least largely into the inside of the door by the height h1 so that it can not engage into the door guidance 34 according to FIG 10 any more. As soon as the protrusion 221 of the snapping slider 22 it not engaged with the door guidance 34 any more, the rotation of the door 1 is possible.

**[0079]** FIG 9 shows the lifted protrusion 221 of the snapping slider 22 with operated door handle automatic 2 and tilted door handle 21, respectively.

**[0080]** FIG 10 shows the pull out system 3 of the door system. In the door area, the U-clamp 31 is arranged. It comprises two swords 32 protruding vertically upwards. The U-clamp 31 is fixed in the pivot point 33 with the door guidance 34, and its swords 32 hold the door columns of the door. The bottom guidance 35 of the U-clatnp comprises openings 351 which are arranged in a not rotated state over holes 341 in the door guidance 34 of the pullout system which have the same size. This allows a ventilation of the door. By this, air can be sucked through the door into the oven or into the casing of the oven to cool the door as well as the oven itself or the casing.

**[0081]** FIG 11 shows an assembled cooking oven 4 with the door system 5 in a pull out position A. The door 1 is in a fixed and not rotated position and can be pushed in and pulled out at the door handle 21 like a common fixed door. Thus, not shown baking trays can be moved out of the cooking cavity 42 when opening and moved into the cooking cavity 42 when closing. The feeding opening 43 is tightly closed with the door 1 by a sealing 41. A ventilation is possible via the air suction channel 45 of the cooking oven 4.

**[0082]** FIG 12 shows the cooking oven 4 with rotated door 1 of the door system 5 in a pull out position A. A vertically arranged pivot axis D can be seen within the center of the door and through the middle of the door guidance 34 which allows the not shown baking trays attached to the supporting elements 13 to rotate to both sides.

**[0083]** The rotatable front plate 11 is followed at its bottom by a non rotatable bottom front plate 37. Both plates are parallel if the door is on a non rotated state. However, if the door is rotated, the bottom front plate 37 stays unrotated.

**References**

**[0084]**

| | |
|---|---|
| 1 | door |
| 11 | front plate |
| 111 | opening of front plate |
| 12 | interior plate |
| 13 | support elements |
| 14 | door column |
| 141 | connecting notch |
| 142 | connecting notch |
| 143, 144 | elongated slots |
| 145 | front end |
| 15 | glass holder |

(continued)

| | |
|---|---|
| 151 | connecting pivot |
| 153, 154 | elongated slots |
| 16 | transverse bar |
| 2 | control unit |
| 21 | door handle. |
| 22 | snapping slider |
| 221 | protrusion of snapping slider |
| 222 | lower supporting element |
| 223 | upper supporting element |
| 224 | counter spring |
| 252 | stopping faces |
| 23 | folding joint |
| 24 | distance bolt / pivot |
| 25 | limiting block |
| 251 | bore |
| 26 | cover |
| 261 | cover opening |
| 27 | distance sleeve |
| 28 | nut |
| 29 | stop unit |
| 3 | pull out system |
| 31 | U-clamp |
| 32 | sword |
| 33 | pivot point |
| 34 | door guidance |
| 35 | bottom guidance |
| 37 | bottom front plate |
| 4 | cooking oven |
| 41 | sealing |
| 42 | cooking cavity |
| 43 | feeding opening |
| 44 | control panel |
| 45 | air suction channel |
| 61 | gluing area |
| 63, 64 | support elements |
| 63A, 64A | base area |
| 63B, 64B | holding pegs |
| 5 | door system |
| $\alpha$ | operating angle |
| A | pull out position |
| D | pivot axis |
| h1, h2 | height |
| d1 | distance |

## Claims

**1.** Cooking oven (4), especially home cooking oven,

a) with a cooking cavity (42) and
b1) with a door system (5) assigned to a feeding opening (43) for closing the feeding opening (43) of the cooking cavity (42) of said cooking oven,
b2) where the door system (5) comprises a pull out system (3),
b3) where the door system (5) comprises a door (1) which is movable using the pull out system (3) from the feeding opening (43) away and/or to the feeding opening (43) and which is, in addition, movable with respect to the pull out system (3),
**characterized in that**
c) the door (1) is pivotable in its movable state with respect to the pull out system (3) around a vertical pivot axis (D) and where the door (1) is movable around the pivot axis (D) which is in the center of the door,
d1) where a control unit (2) is attached or arranged In and/or at the door (1),
d2) where the control unit (2) comprises at least one locking or snapping device for locking or fixing the door (1) with respect to the pull out system (3) on the one hand and for releasing or disconnecting the door (1) with respect to the pull out system (3) on the other hand,
e1) where the locking or snapping device comprises atleast one locking or snapping slider (22), which is connected with a folding or swinging joint (23),
e2) where the distance of the folding joint (23) to a distance bolt (24) determines the lifting of the locking or snapping slider (22),
e3) so that the door (1) in a pull out position (A) and/or during the pull out movement can be brought alternatively in a state which is fixed with respect to the pull out system (3) or into a state which is movable with respect to the pull out system (3).

**2.** Cooking oven (4) according to claim 1, where at its door (1), supporting elements (13) for at least one baking tray are provided.

**3.** Cooking oven (4) according to one of the preceding claims, where the control unit (2) comprises two positions, where, in a first position of the control unit (2), the door (1) is located in its state stationary with respect to the pull out system (3) and, in a second position of the control unit (2), the door (1) is in its state movable with respect to the pull out system (3).

**4.** Cooking oven (4) according to claim 1, where a protrusion (221) of the locking or snapping slider (22) engages through the door bottom into the pull out system (3) In a locking or snapping position and, in a related or disconnected position, is lifted out of the pull out system (3) or is out of engagement and/or where the locking or snapping slider (22) is at least partially a spring, which is advantageously arranged unmovable in a horizontal direction between sup-

porting elements (222, 223) on the one hand and between a counter spring (224) and a distance sleeve (27) on the other hand and/or where the door (1) comprises a front plate (11) as an outer surface and a distance bolt (24) constitutes a pivoting axis of the folding joint (23), which is located advantageously in the plane of the front plate (11).

**5.** Cooking oven (4) according to claim 4, where a limiting block (25) extends through an opening (111) of the front plate (11) with an outer area which is bigger than the opening (111) of the front plate (11) and with an inner area which is smaller then the opening (111) of the front plate (11), and/or where the limiting block (25) comprises a bore (251), which proceeds angular to the door (1) interior space, where upper and lower stopping faces (252) limit the path of the folding joint (23) and/or where the outer area of the limiting block (25) is provided with a cover (26), where the cover (26) provides an opening for an operating arm of the folding joint (23), which is not substantially bigger than its action range.

**6.** Cooking oven (4) according to one of the claims 1, 4 or 5, where a stop unit (29) supports the folding joint (23) in a fixed state of the door (1) or in the first position of the control unit (2) and/or where a fixing element (28), especially a nut, is attached in a rear part of the folding joint (23), where this holds the snapping slider (22) in its position and/or where the folding joint (23) is an extension of a door handle (21) protruding into the door handle (21).

**7.** Cooking oven (4) according to one of the preceding claims, where the control unit (2) is a door handle automatic and/or where the door handle (21) of the door handle automatic (2) is in one position aligned horizontally and in another position tilted around an operating angle $\alpha$ in a plane based on a side view of the door (1), preferably 15° and/or where the door handle (21) of the door handle automatic (2) is an arm which is aligned horizontally in a first position and which, in a second position of the door handle automatic (2), is tilted with respect to a plane of a front view of the door (1).

**8.** Cooking oven (4) according to one of the preceding claims, where the control unit (2) is operated using a push button at the door system (5) and/or a control panel (44) and/or where the door (1) comprises snapping positions in a rotated state, preferably in a position of the door (1) which is rotated by 180° and/or 90°.

**9.** Cooking oven (4) according to one of the preceding claims, where the U-clamp (31) comprises a horizontal track adapted to the bottom of the door (1) and two swords (32) protruding vertically upwards from the track to hold the door (1) and/or where the swords (32) of the U-clamp (31) reach at least two thirds of the door height and/or where the swords (32) of the U-clamp (31) are included into door columns (14) of the door (1) and/or where the door columns (14) enclose the sword (32) of the U-clamp (31) several times, preferably three times.

**10.** Cooking oven (4) according to one of the claims 1 to 9, where

a) the door (1) comprises a front plate (11) and at least one interior plate (12),
b) where two door columns (14) are attached to the front plate for carrying the front plate (11) and
c) where the at least one interior plate (12) is attached to the door columns (14),
d) where preferably the at least one interior plate (12) is fixed to the door system (5) by plate holders (15) protruding along the height of the door columns (14).

**11.** Cooking oven (4) according to claim 10, where the plate holders (15) are clipped into the door columns (14).

**12.** Cooking oven (4) according to claim 10 or 11,

a) where the door columns (14) comprise at least one elongated slot (143, 144),
b) where the at least one elongated slot (143, 144) is surrounded by one of the door columns (14) and/or with a distance (d1) to the front end (145) of the door column (14) in order to increase the gluing area (61) for fixing the door columns (14) to the front plate (11).

**13.** Cooking oven (4) according to claim 12,

a) where the plate holders (15) comprise at least one elongated slot (153, 154),
b) where the at least one elongated slot (153, 154) is surrounded by one of the plate holders (15) and/or with a distance (d1) to the front end of said plate holder (15) in order to increase the gluing area (61) for fixing the door columns (14) to the front plate (11),
c) where preferably the at least one elongated slot (153, 154) of the plate holders (15) and the at least one elongated slot (143, 144) of the door columns (14) are arranged over each other,

**14.** Cooking oven (4) according to one of claims 10 to 13,

a) where the interior plate (12) is carried at its lower end by at least two support elements (63, 64),
b) which are attached to the lower end of the

door columns (14),
c) where the support elements (63, 64) comprise a base area (63A, 64A) for carrying the interior plate (12) and an adjoining holding peg (63B, 64B) protruding upwards and/or perpendicular to the base area (63A, 64A) to prevent the plate from sliding down from the support element (63, 64),
d) where the holding peg (63B, 64B) has a height (h2) of less than 7 mm, preferably less than 5 mm.

**15.** Method for operating a cooking oven (4) according to one of the preceding claims,
where the pull out movement of the door (1) using the pull out system (3) proceeds at least partially along a horizontal direction and/or
where the control unit (2) is a door handle automatic, which transforms the different positions of the control device (2) by moving of the door handle (21) and/or where the door handle (21) of the door handle automatic (2) is brought from a first position of the door handle automatic (2) into a second position of the door handle automatic (2) by rotating around its horizontal axis and/or
where the control unit (2) is operated using a push button at the door system (5) and/or the control panel (44) and/or where the control unit (2) is operated using an arm at the door system (5) and/or
where the rotation of the door (1) is carried out using a rotatable U-clamp (31) attached to the pull out system (3), and/or
where the cooking oven (4) is according to claim 4 and the cover (26) moves with the control unit (2) in a vertical movement, when the control unit (2) is moved.

**Patentansprüche**

**1.** Bratofen (4), insbesondere Haushaltsbratofen,

a) mit einem Bratraum (42) und
b1) mit einem Türsystem (5), das einer Zuführungsöffnung (43) zum Schließen der Zuführungsöffnung (43) des Bratraums (42) des Bratofens zugeordnet ist,
b2) wobei das Türsystem (5) ein Auszugsystem (3) umfasst,
b3) wobei das Türsystem (5) eine Tür (1) umfasst, die unter Verwendung des Auszugsystems (3) von der Zuführungsöffnung (43) weg und/oder zu der Zuführungsöffnung (43) hin beweglich ist und die zudem mit Bezug auf das Auszugsystem (3) beweglich ist,
**dadurch gekennzeichnet, dass**
c) die Tür (1) in ihrem beweglichen Zustand mit Bezug auf das Auszugsystem (3) um eine vertikale Drehachse (D) drehbar ist und wobei die Tür (1) um die Drehachse (D) beweglich ist, die sich in der Mitte der Tür befindet,
d1) wobei eine Steuerungseinheit (2) in und/oder an der Tür (1) angebracht oder angeordnet ist,
d2) wobei die Steuerungseinheit (2) wenigstens eine Sperr- oder Einschnappvorrichtung zum Verriegeln oder Befestigen der Tür (1) mit Bezug auf das Auszugsystem (3) einerseits und zum Lösen oder Trennen der Tür (1) mit Bezug auf das Auszugsystem (3) anderseits aufweist,
e1) wobei die Sperr- oder Einschnappvorrichtung wenigstens einen Sperr- oder Einschnappschieber (22) umfasst, der mit einem Klapp- oder Drehgelenk (23) verbunden ist,
e2) wobei der Abstand des Klappgelenks (23) zu einem Abstandsbolzen (24) das Anheben des Sperr- oder Einschnappschiebers (22) bestimmt,
e3) so dass die Tür (1) in einer Auszugposition (A) und/oder während der Auszugsbewegung alternativ in einen Zustand, der mit Bezug auf das Auszugsystem (3) fest ist, oder in einen Zustand, der mit Bezug auf das Auszugsystem (3) beweglich ist, versetzt werden kann.

**2.** Bratofen (4) gemäß Anspruch 1, wobei an dessen Tür (1) Tragelemente (13) für wenigstens ein Backblech vorgesehen sind.

**3.** Bratofen (4) gemäß einem der vorangehenden Ansprüche, wobei die Steuerungseinheit (2) zwei Positionen umfasst, wobei in einer ersten Position der Steuerungseinheit (2) die Tür (1) in ihrem stationären Zustand mit Bezug auf das Auszugsystem (3) angeordnet ist und in einer zweiten Position der Steuerungseinheit (2) die Tür (1) in ihrem beweglichen Zustand mit Bezug auf das Auszugsystem (3) angeordnet ist.

**4.** Bratofen (4) gemäß Anspruch 1, wobei ein Vorsprung (221) des Sperr- oder Einschnappschiebers (22) durch die Unterseite der Tür in das Auszugsystem (3) in einer Sperr- oder Einschnappstellung eingreift und in einer verbundenen oder getrennten Position aus dem Auszugsystem (3) herausgehoben wird oder sich außerhalb des Eingriffs befindet, und/oder wobei der Sperr- oder Einschnappschieber (22) wenigstens teilweise eine Feder ist, die vorteilhafter Weise unbeweglich in einer horizontalen Richtung zwischen Tragelementen (222, 223) einerseits und zwischen einer Gegenfeder (224) und einer Abstandhülse (27) anderseits angeordnet ist, und/oder wobei die Tür (1) eine Frontplatte (11) als Außenoberfläche umfasst und ein Abstandsbolzen (24) eine Drehachse des Klappgelenks (23) bildet, die vorteilhafter Weise in der Ebene der Frontplatte (11)

angeordnet ist.

**5.** Bratofen (4) gemäß Anspruch 4, wobei sich ein Begrenzungsblock (25) durch eine Öffnung (111) der Frontplatte (11) erstreckt, mit einer Außenoberfläche, die größer ist als die Öffnung (111) der Frontplatte (11), und mit einer Innenoberfläche, die kleiner als die Öffnung (111) der Frontplatte (11) ist, und/oder wobei der Begrenzungsblock (25) eine Bohrung (251) umfasst, die in einem Winkel zum Innenraum der Tür (1) verläuft, wobei obere und untere Anschlagflächen (252) den Weg des Klappgelenks (23) begrenzen und/oder wobei die Außenoberfläche des Begrenzungsblocks (25) mit einer Abdekkung (26) versehen ist, wobei die Abdeckung (26) eine Öffnung für einen Betätigungsarm des Klappgelenks (23) bereithält, die nicht wesentlich größer als dessen Funktionsradius ist.

**6.** Bratofen (4) gemäß einem der Ansprüche 1, 4 oder 5, wobei eine Anschlageinheit (29) das Klappgelenk (23) in einem festen Zustand der Tür (1) oder in der ersten Position der Steuerungseinheit (2) unterstützt und/oder wobei ein Befestigungselement (28), insbesondere eine Schraubenmutter, in einem hinteren Teil des Klappgelenks (23) angebracht ist, wo dieses den Einschnappschieber (22) in seiner Stellung hält und/oder wobei das Klappgelenk (23) eine Verlängerung eines Türgriffes (21) ist, die in den Türgriff (21) hinein ragt.

**7.** Bratofen (4) gemäß einem der vorangehenden Ansprüche, wobei die Steuerungseinheit (2) eine Türgriffautomatik ist und/oder wobei der Türgriff (21) der Türgriffautomatik (2) in einer Position horizontal angeordnet ist und in einer anderen Position um einen Arbeitswinkel $\alpha$ in einer Ebene basierend auf einer Seitenansicht der Tür (1) gekippt ist, vorzugsweise 15°, und/oder wobei der Türgriff (21) der Türgriffautomatik (2) ein Arm ist, der in einer ersten Position horizontal angeordnet ist und der in einer zweiten Position der Türgriffautomatik (2) mit Bezug auf eine Ebene einer Frontansicht der Tür (1) gekippt ist.

**8.** Bratofen (4) gemäß einem der vorangehenden Ansprüche, wobei die Steuerungseinheit (2) unter Verwendung einer Drucktaste am Türsystem (5) und/oder eines Bedienfeldes (44) betätigt wird und/oder wobei die Tür (1) Einschnapppositionen in einem gedrehten Zustand umfasst, vorzugsweise in einer Position der Tür (1), die um 180° und/oder 90° gedreht ist.

**9.** Bratofen (4) gemäß einem der vorangehenden Ansprüche, wobei die U-Klemme (31) eine horizontale, an die Unterseite der Tür (1) angepasste Schiene und zwei Arme (32) umfasst, die von der Schiene vertikal aufwärts vorstehen, um die Tür (1) zu halten, und/oder wobei die Arme (32) der U-Klemme (31) wenigstens zwei Drittel der Türhöhe erreichen und/oder wobei die Arme (32) der U-Klemme (31) in Türsäulen (14) der Tür (1) eingebracht sind und/oder wobei die Türsäulen (14) das den Arm (32) der U-Klemme (31) mehrere Male umschließen, vorzugsweise drei Mal.

**10.** Bratofen (4) gemäß einem der Ansprüche 1-9, wobei

a) die Tür (1) eine Frontplatte (11) und wenigstens eine Innenplatte (12) umfasst,
b) wobei zwei Türsäulen (14) an der Frontplatte angebracht sind, um die Frontplatte (11) zu tragen, und
c) wobei die wenigstens eine Innenplatte (12) an den Türsäulen (14) angebracht ist,
d) wobei vorzugsweise die wenigstens eine Innenplatte (12) am Türsystem (5) mittels Plattenhaltern (15) befestigt ist, die entlang der Höhe der Türsäulen (14) vorragen.

**11.** Bratofen (4) gemäß Anspruch 10,
wobei die Plattenhalter (15) in die Türsäulen (14) geklammert sind.

**12.** Bratofen (4) gemäß Anspruch 10 oder 11,

a) wobei die Türsäulen (14) wenigstens einen länglichen Schlitz (143, 144) umfassen,
b) wobei der wenigstens eine längliche Schlitz (143, 144) von einer der Türsäulen (14) umschlossen und/oder in einem Abstand (d1) zum vorderen Ende (145) der Türsäule (14) angeordnet ist, um die Klebefläche (61) zum Befestigen der Türsäulen (14) an der Frontplatte (11) zu vergrößern.

**13.** Bratofen (4) gemäß Anspruch 12,

a) wobei die Plattenhalter (15) wenigstens einen länglichen Schlitz (153, 154) umfassen,
b) wobei der wenigstens eine längliche Schlitz (153, 154) von einem der Plattenhalter (15) umschlossen und/oder in einem Abstand (d1) zum vorderen Ende des Plattenhalters (15) angeordnet ist, um die Klebefläche (61) zum Befestigen der Türsäulen (14) an der Frontplatte (11) zu vergrößern,
c) wobei vorzugsweise der wenigstens eine längliche Schlitz (153, 154) des Plattenhalters (15) und der wenigstens eine längliche Schlitz (143, 144) der Türsäulen (14) übereinander angeordnet sind.

**14.** Bratofen (4) gemäß einem der Ansprüche 10 bis 13,

a) wobei die Innenplatte (12) an ihrem unteren

Ende von wenigstens zwei Tragelementen (63, 64) getragen wird,
b) die am unteren Ende der Türsäulen (14) angebracht sind,
c) wobei die Tageelemente (63, 64) eine Grundfläche (63A, 64A) zum Tragen der Innenplatte (12) und einen angrenzenden Haltestift (63B, 64B), der aufwärts und/oder senkrecht zur Grundfläche (63A, 64A) vorragt, um die Platte daran zu hindern, vom Tragelement (63, 64) abzurutschen, umfassen,
g) wobei der Haltestift (63B, 64B) eine Höhe (h2) von weniger als 7 mm, vorzugsweise weniger als 5 mm, aufweist.

**15.** Verfahren zum Betrieb eines Bratofens (4) gemäß einem der vorangehenden Ansprüche,
wobei die Auszugsbewegung der Tür (1) unter Verwendung des Auszugsystems (3) wenigstens teilweise in eine horizontale Richtung erfolgt, und/oder
wobei die Steuerungseinheit (2) eine Türgriffautomatik ist, welche die unterschiedlichen Positionen der Steuerungsvorrichtung (2) durch Bewegen des Türgriffes (21) umwandelt, und/oder
wobei der Türgriff (21) der Türgriffautomatik (2) durch Rotation um seine horizontale Achse aus einer ersten Position der Türgriffautomatik (2) in eine zweite Position der Türgriffautomatik (2) gebracht wird, und/oder
wobei die Steuerungseinheit (2) unter Verwendung einer Drucktaste am Türsystem (5) und/oder des Bedienfeldes (44) bedient wird und/oder wobei die Steuerungseinheit (2) unter Verwendung eines Arms am Türsystem (5) bedient wird, und/oder
wobei die Rotation der Tür (1) unter Verwendung einer drehbaren U-Klemme (31) ausgeführt wird, die am Auszugsystem (3) angebracht ist, und/oder
wobei der Bratofen (4) gemäß Anspruch 4 ausgeführt ist und sich die Abdeckung (26) mit der Steuerungseinheit (2) in einer vertikalen Bewegung bewegt, wenn die Steuerungseinheit (2) bewegt wird.

**Revendications**

**1.** Four de cuisson (4), en particulier un four de cuisson domestique,

a) avec une cavité de cuisson (42), et
b1) avec un système de porte (5) affecté à une ouverture d'alimentation (43) pour fermer l'ouverture d'alimentation (43) de la cavité de cuisson (42) dudit four de cuisson,
b2) dans lequel le système de porte (5) comprend un système rétractable (3),
b3) dans lequel le système de porte (5) comprend une porte (1) qui est mobile à l'aide du système rétractable (3) à partir de l'ouverture d'alimentation (43) à distance et/ou vers l'ouverture d'alimentation (43) et qui est, de plus, mobile par rapport au système rétractable (3),
**caractérisé en ce que**:
c) la porte (1) peut pivoter dans son état mobile par rapport au système rétractable (3) autour d'un axe de pivot vertical (D) et dans lequel la porte (1) et mobile autour de l'axe de pivot (D) qui est au centre de la porte,
d1) dans lequel une unité de commande (2) est fixée ou agencée dans et/ou au niveau de la porte (1),
d2) dans lequel l'unité de commande (2) comprend au moins un dispositif de blocage ou d'encliquetage pour bloquer ou fixer la porte (1) par rapport au système rétractable (3) d'une part et pour libérer ou déconnecter la porte (1) par rapport au système rétractable (3) d'autre part,
e1) dans lequel le dispositif de blocage ou d'encliquetage comprend au moins une glissière de blocage ou d'encliquetage (22), qui est raccordée avec un joint pliant ou oscillant (23),
e2) dans lequel la distance du joint pliant (23) jusqu'à un boulon d'espacement (24) détermine la levée de la glissière de blocage ou d'encliquetage (22),
e3) de sorte que la porte (1) dans une position rétractable (A) et/ou pendant le mouvement rétractable peut être amenée, en variante, dans un état dans lequel elle est fixe par rapport au système rétractable (3) ou dans un état dans lequel elle est mobile par rapport au système rétractable (3).

**2.** Four de cuisson (4) selon la revendication 1, dans lequel au niveau de sa porte (1), on prévoit des éléments de support (13) pour au moins un plateau de cuisson.

**3.** Four de cuisson (4) selon l'une quelconque des revendications précédentes, dans lequel l'unité de commande (2) comprend deux positions, où, dans une première position de l'unité de commande (2), la porte (1) est positionnée dans son état fixe par rapport au système rétractable (3) et, dans une deuxième position de l'unité de commande (2), la porte (1) est dans son état mobile par rapport au système rétractable (3).

**4.** Four de cuisson (4) selon la revendication 1, dans lequel une saillie (221) de la glissière de blocage ou d'encliquetage (22) se met en prise à travers le fond de porte dans le système rétractable (3) dans une position de blocage ou d'encliquetage et, dans une position relative ou déconnectée, est levée du système rétractable (3) ou est hors de mise en prise et/ou dans lequel la glissière de blocage ou d'encliquetage (22) est au moins partiellement un ressort

qui est avantageusement agencé de manière immobile dans une direction horizontale entre les éléments de support (222, 223) d'une part et entre un contre-ressort (224) et un manchon d'espacement (27) d'autre part et/ou dans lequel la porte (1) comprend une plaque avant (11) en tant que surface externe et un boulon d'espacement (24) constitue un axe de pivotement du joint pliant (23) qui est positionné de manière avantageuse dans le plan de la plaque avant (11).

**5.** Four de cuisson (4) selon la revendication 4, dans lequel un bloc de limitation (25) s'étend à travers une ouverture (111) de la plaque avant (11) avec une zone externe qui est plus grande que l'ouverture (111) de la plaque avant (11) et avec une zone interne qui est plus petite que l'ouverture (111) de la plaque avant (11), et/ou dans lequel le bloc de limitation (25) comprend un alésage (251) qui avance de manière angulaire vers l'espace intérieur de la porte (1), dans lequel des faces de butée supérieure et inférieure (252) limitent la trajectoire du joint pliant (23) et/ou dans lequel la zone externe du bloc de limitation (25) est prévue avec un couvercle (26), dans lequel le couvercle (26) fournit une ouverture pour un bras de commande du joint pliant (23) qui n'est pas sensiblement plus grand que sa plage d'action.

**6.** Four de cuisson (4) selon l'une quelconque des revendications 1, 4 ou 5, dans lequel une unité de butée (29) supporte le joint pliant (23) dans un état fixe de la porte (1) ou dans la première position de l'unité de commande (2) et/ou dans lequel un élément de fixation (28), en particulier un écrou, est fixé dans une partie arrière du joint pliant (23), dans lequel celui-ci maintient la glissière d'encliquetage (22) dans sa position et/ou dans lequel le joint pliant (23) est une extension d'une poignée de porte (21) faisant saillie dans la poignée de porte (21).

**7.** Four de cuisson (4) selon l'une quelconque des revendications précédentes, dans lequel l'unité de commande (2) est une poignée de porte automatique et/ou dans lequel la poignée de porte (21) de la poignée de porte automatique (2) est dans une position alignée horizontalement et dans une autre position inclinée autour d'un angle de commande $\alpha$ dans une plan basé sur une vue latérale de la porte (1), de préférence à 15° et/ou dans lequel la poignée de porte (21) de la poignée de porte automatique (2) est un bras qui est aligné horizontalement dans une première position et qui, dans une seconde position de la poignée de porte automatique (2), est incliné par rapport au plan d'une vue de face de la porte (1).

**8.** Four de cuisson (4) selon l'une quelconque des revendications précédentes, dans lequel l'unité de commande (2) est commandée à l'aide d'un bouton poussoir au niveau du système de porte (5) et/ou un panneau de commande (44) et/ou dans lequel la porte (1) comprend des positions d'encliquetage dans un état entraîné en rotation, de préférence dans une position de la porte (1) qui est entraînée en rotation à 180° et/ou à 90°.

**9.** Four de cuisson (4) selon l'une quelconque des revendications précédentes, dans lequel la pince en U (31) comprend un chemin horizontal adapté au fond de la porte (1) et deux socles (32) faisant saillie verticalement vers le haut à partir du chemin pour maintenir la porte (1) et/ou dans lequel les socles (32) de la pince en U (31) atteignent au moins deux tiers de la hauteur de la porte et/ou dans lequel les socles (32) de la pince en U (31) sont inclus dans des colonnes de porte (14) de la porte (1) et/ou dans lequel les colonnes de porte (14) entourent le socle (32) de la pince en U (31) plusieurs fois, de préférence trois fois.

**10.** Four de cuisson (4) selon l'une quelconque des revendications 1 à 9, dans lequel:

a) la porte (1) comprend une plaque avant (11) et au moins une plaque intérieure (12),
b) dans lequel deux colonnes de porte (14) sont fixées sur la plaque avant pour porter la plaque avant (11), et
c) dans lequel la au moins une plaque intérieure (12) est fixée aux colonnes de porte (14),
d) dans lequel de préférence, la au moins une plaque intérieure (12) est fixée sur le système de porte (5) par des supports de plaque (15) faisant saillie le long de la hauteur des colonnes de porte (14).

**11.** Four de cuisson (4) selon la revendication 10, dans lequel les supports de plaque (15) sont fixés dans les colonnes de porte (14).

**12.** Four de cuisson (4) selon la revendication 10 ou 11,

a) dans lequel les colonnes de porte (14) comprennent au moins une fente allongée (143, 144),
b) dans lequel la au moins une fente allongée (143, 144) est entourée par l'une des colonnes de porte (14) et/ou avec une distance (d1) jusqu'à l'extrémité avant (145) de la colonne de porte (14) afin d'augmenter la zone de collage (61) pour fixer les colonnes de porte (14) sur la plaque avant (11).

**13.** Four de cuisson (4) selon la revendication 12,

a) dans lequel les supports de plaque (15) com-

prennent au moins une fente allongée (153, 154),
b) dans lequel la au moins une fente allongée (153, 154) est entourée par l'un des supports de plaque (15) et/ou avec une distance (d1) jusqu'à l'extrémité avant dudit support de plaque (15) afin d'augmenter la zone de collage (61) pour fixer les colonnes de porte (14) sur la plaque avant (11),
c) dans lequel, de préférence, la au moins une fente allongée (153, 154) des supports de plaque (15) et la au moins une fente allongée (143, 144) des colonnes de porte (14) sont agencées l'une sur l'autre.

**14.** Four de cuisson (4) selon l'une des revendications 10 à 13,

a) dans lequel la plaque intérieure (12) est portée au niveau de son extrémité inférieure par au moins deux éléments de support (63, 64),
b) qui sont fixés sur l'extrémité inférieure des colonnes de porte (14),
c) dans lequel les éléments de support (63, 64) comprennent une zone de base (63A, 64A) pour porter la plaque intérieure (12) et une cheville de support (63B, 64B) attenante faisant saillie vers le haut et/ou perpendiculaire à la zone de base (63A, 64A) pour empêcher la plaque de glisser vers le bas à partir de l'élément de support (63, 64),
d) dans lequel la cheville de support (63B, 64B) a une hauteur (h2) inférieure à 7 mm, de préférence inférieure à 5 mm.

**15.** Procédé pour actionner un four de cuisson (4) selon l'une des revendications précédentes,
dans lequel le mouvement rétractable de la porte (1) à l'aide du système rétractable (3) se poursuit au moins partiellement le long d'une direction horizontale et/ou
dans lequel l'unité de commande (2) est une poignée de porte automatique qui transforme les différentes positions du dispositif de commande (2) en déplaçant la poignée de porte (21), et/ou
dans lequel la poignée de porte (21) de la poignée de porte automatique (2) est amenée d'une première position de la poignée de porte automatique (2) à une seconde position de la poignée de porte automatique (2) en tournant autour de son axe horizontal, et/ou
dans lequel l'unité de commande (2) est commandée à l'aide d'un bouton poussoir au niveau du système de porte (5) et/ou du panneau de commande (44) et/ou dans lequel l'unité de commande (2) est commandée à l'aide d'un bras au niveau du système de porte (5), et/ou
dans lequel la rotation de la porte (1) est réalisée à l'aide d'une pince pivotante en U (31) fixée sur le système rétractable (3), et/ou
dans lequel le four de cuisson (4) est selon la revendication 4 et le couvercle (26) se déplace avec l'unité de commande (2) dans un mouvement vertical, lorsque l'unité de commande (2) est déplacée.

FIG 1

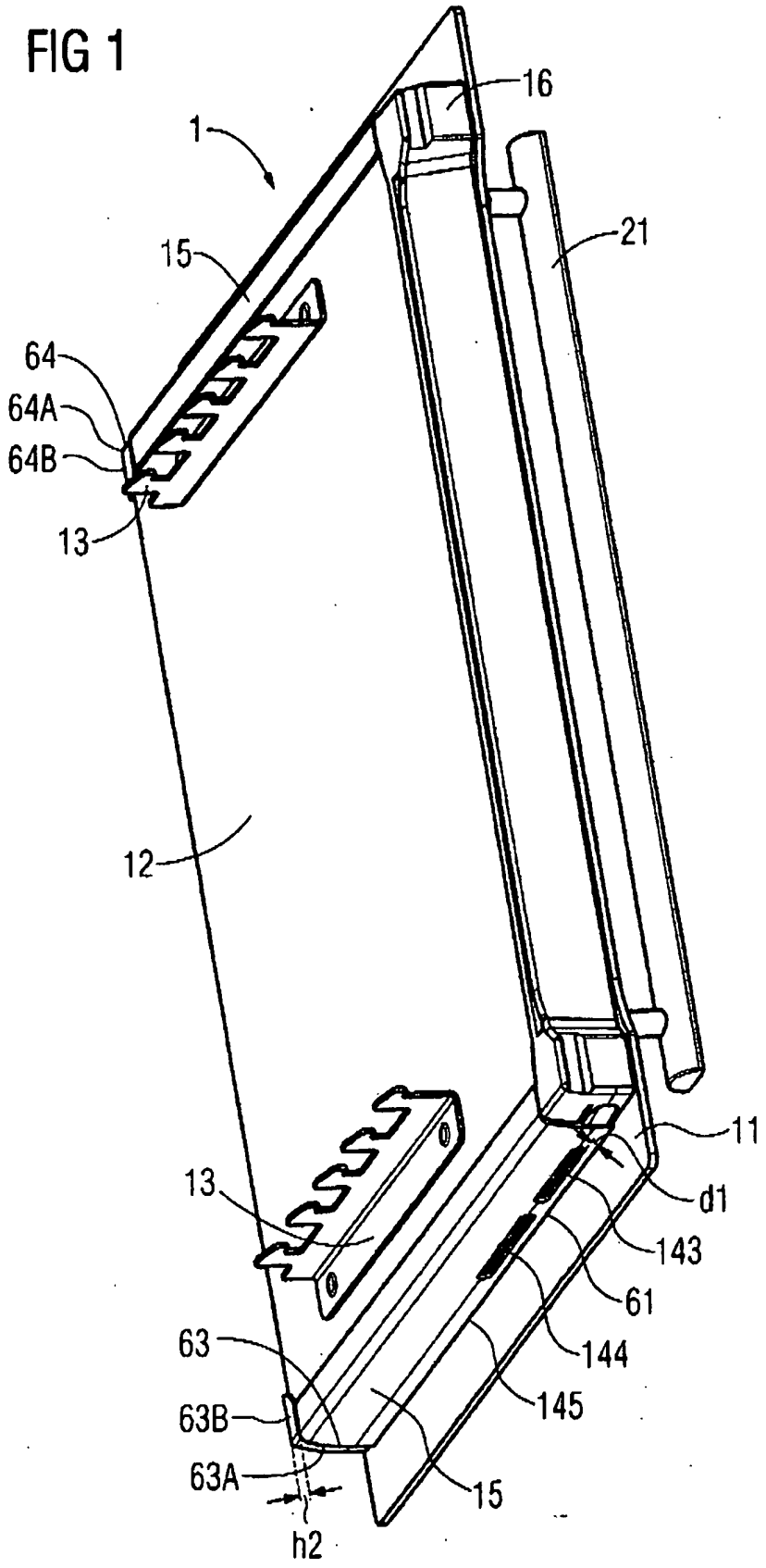


FIG 2

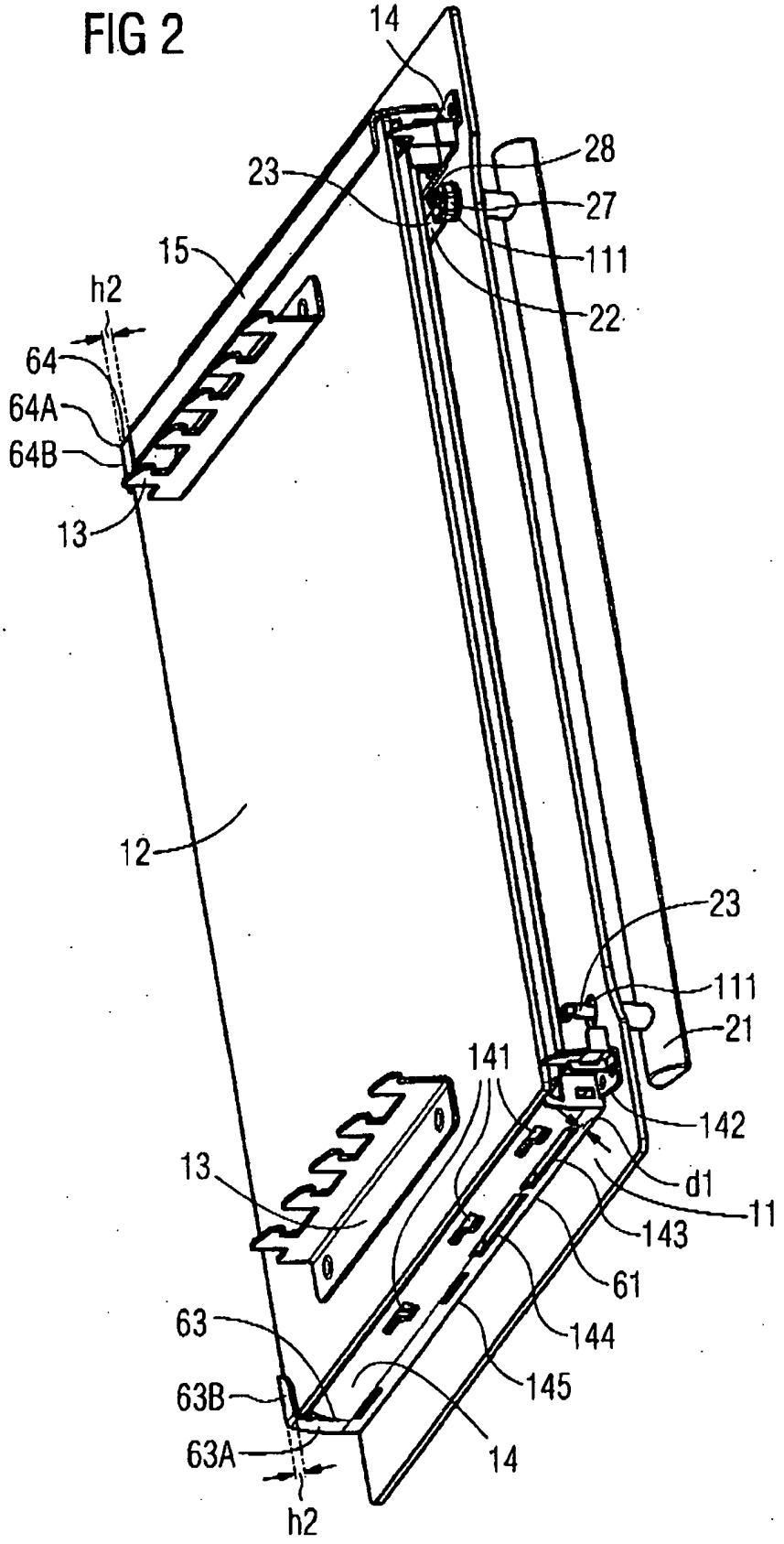

14
28
23
27
15
111
h2
22
64
64A
64B
13
12
23
111
21
141
142
13
d1
11
143
61
63
144
145
63B
63A
14
h2

FIG 3

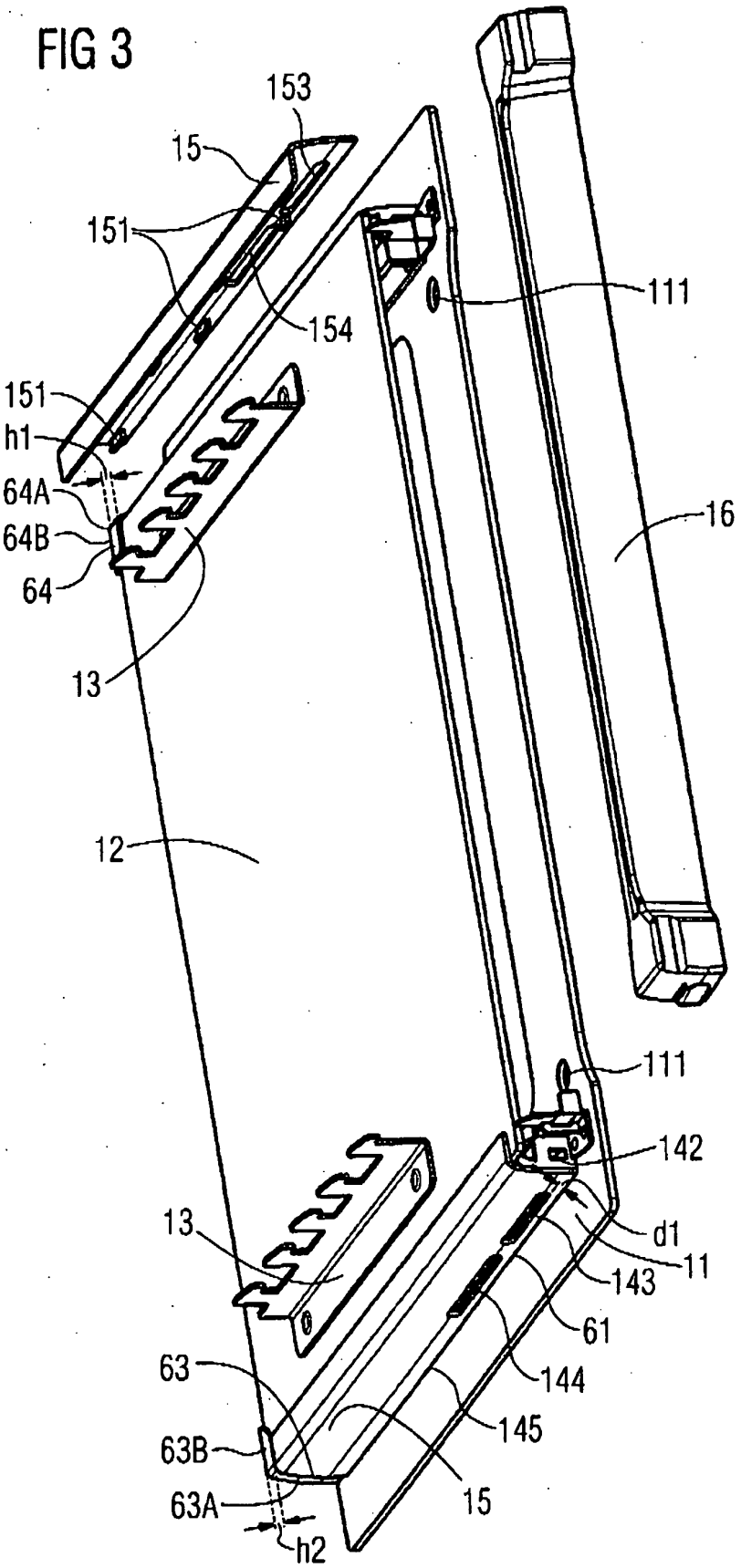

153
15
151
154
111
151
h1
64A
64B
64
16
13
12
111
142
13
d1
11
143
61
63
144
145
63B
15
63A
h2

FIG 4

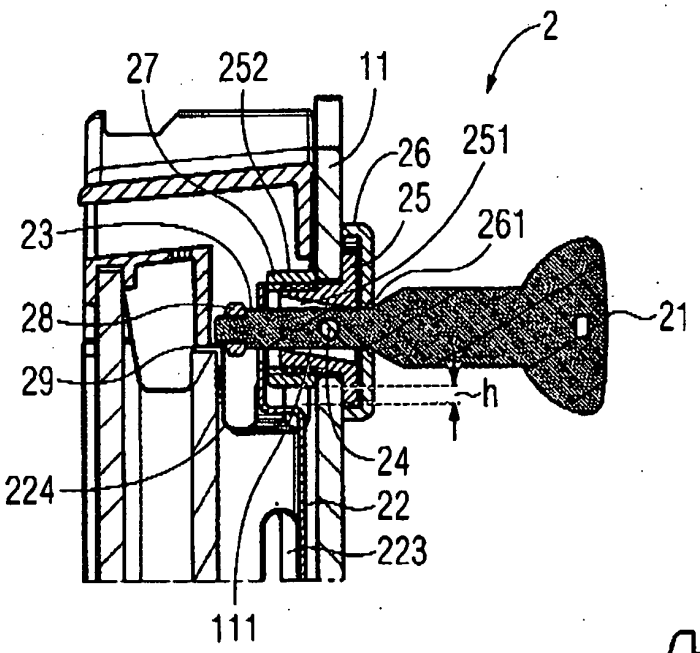



FIG 5

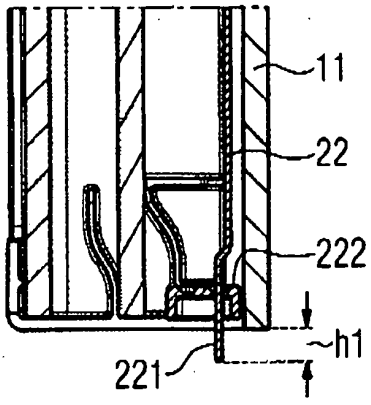



FIG 6

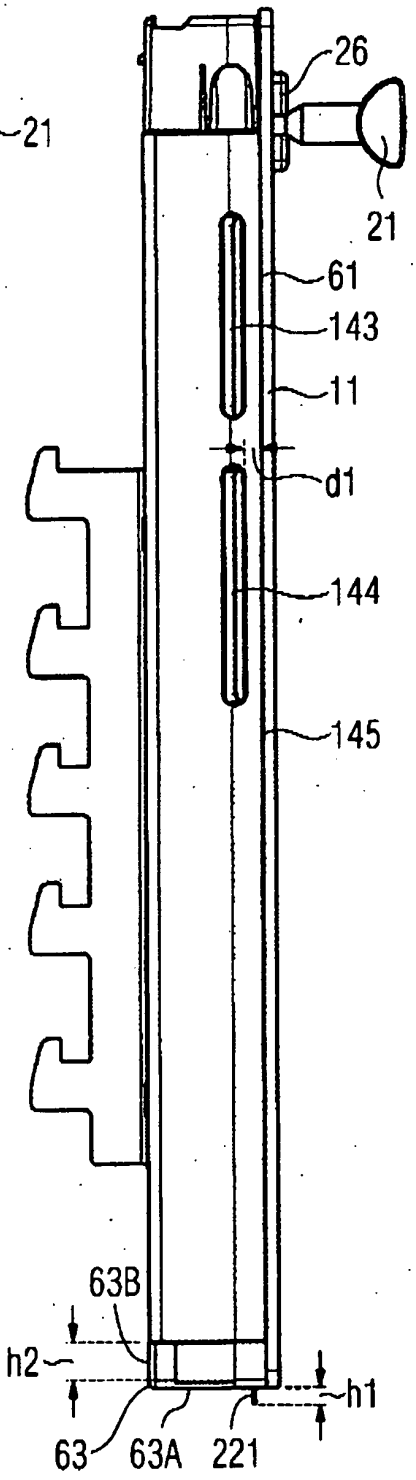


FIG 7

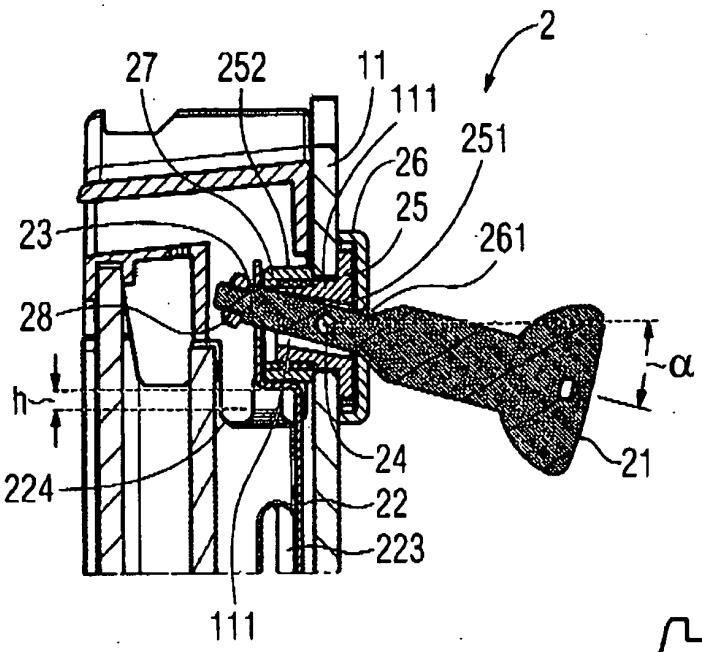



FIG 8

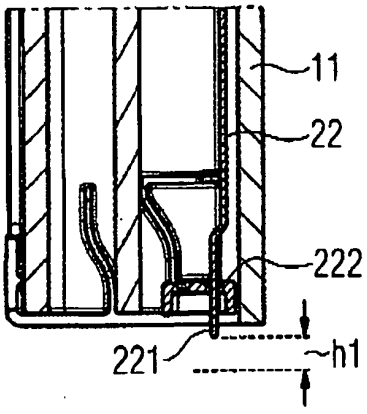



FIG 9

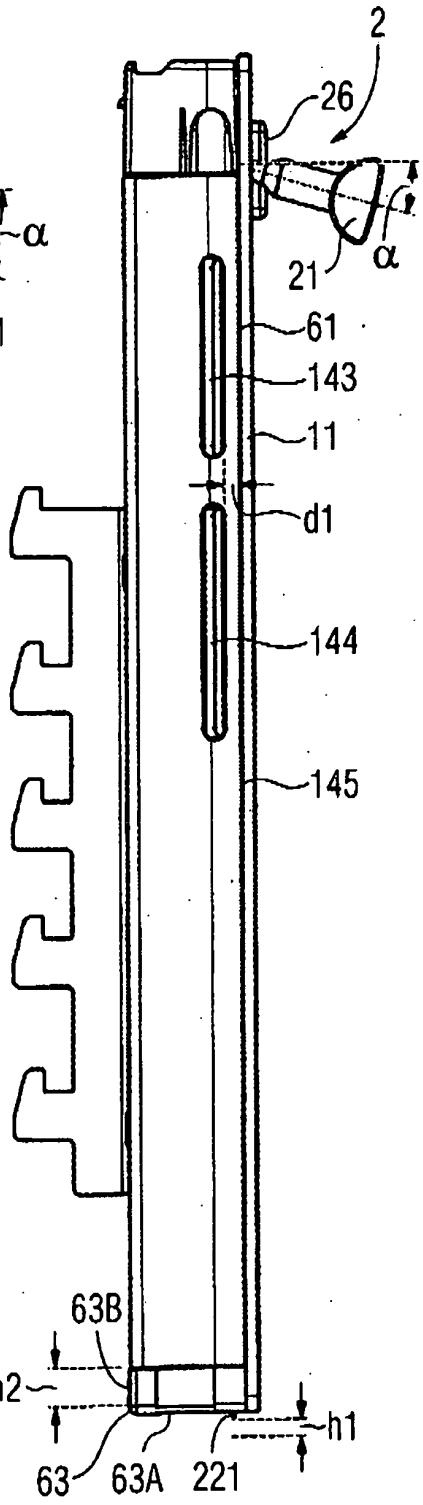


FIG 10

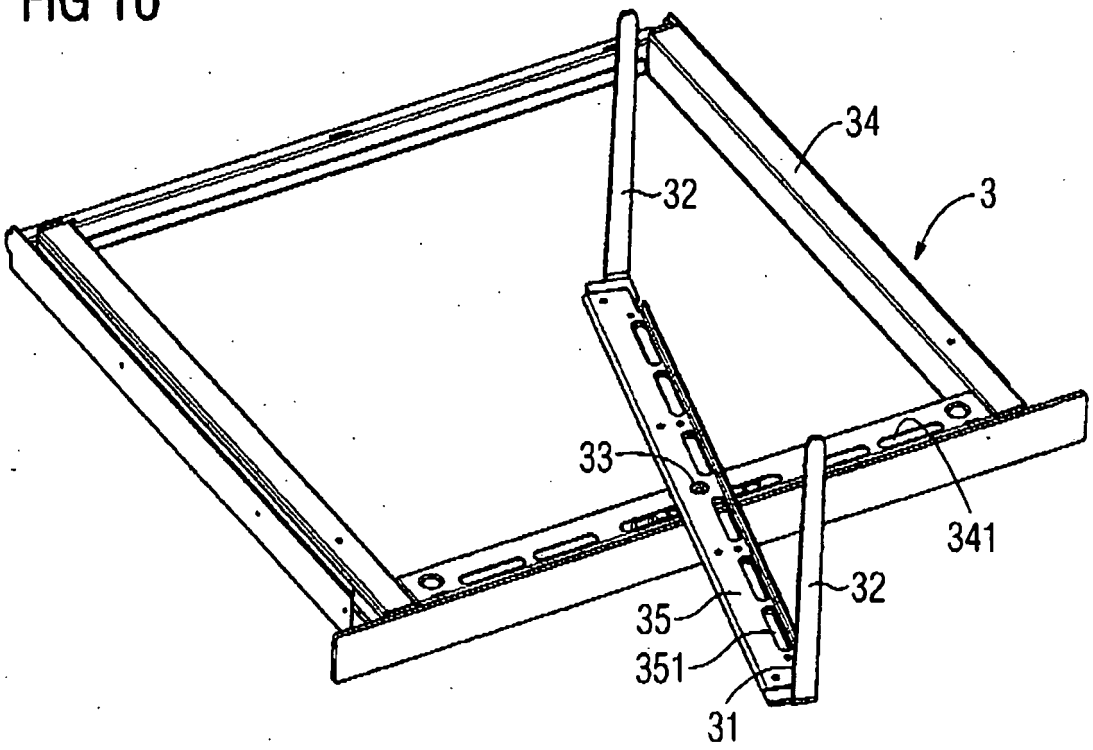
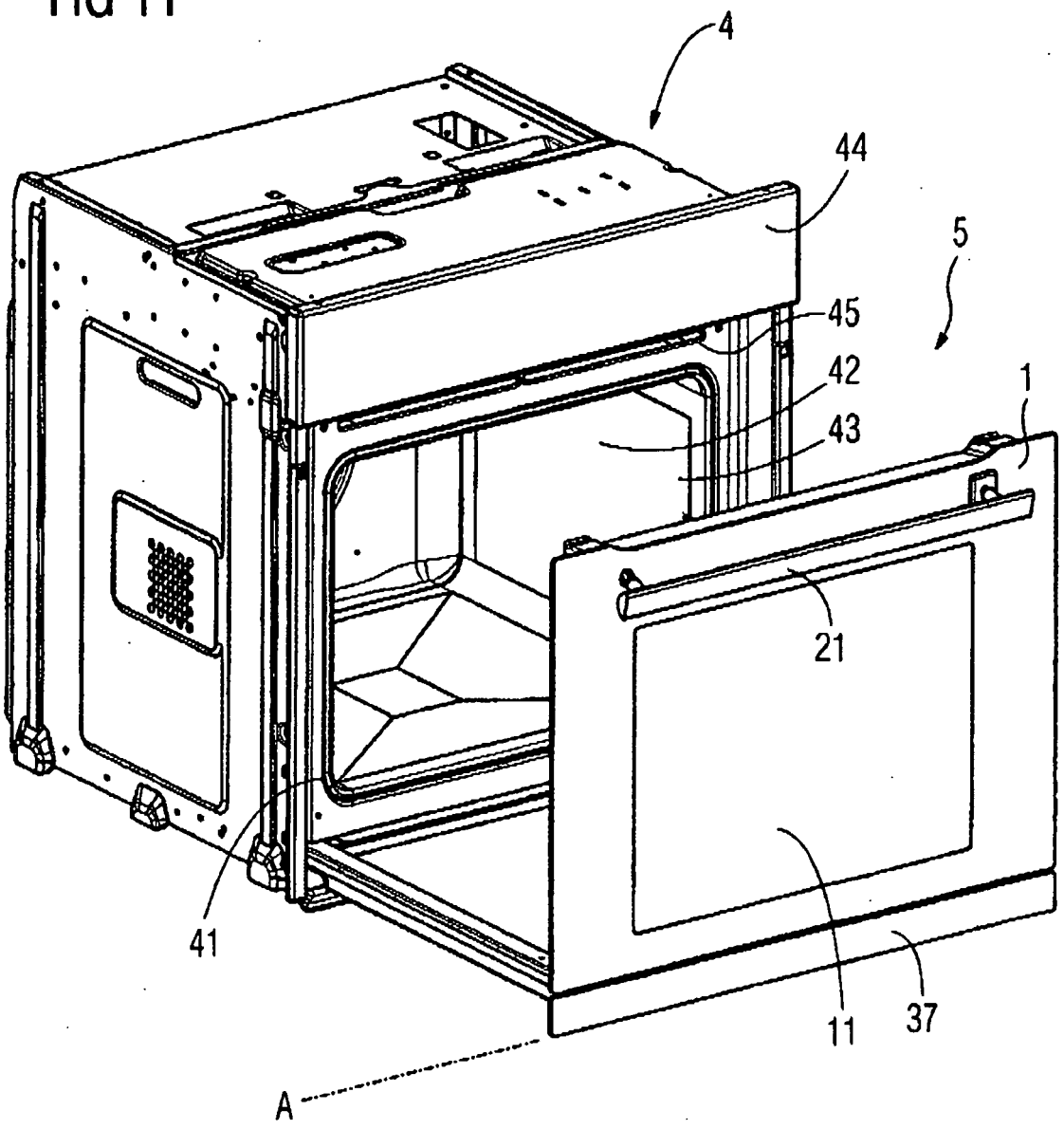


FIG 11



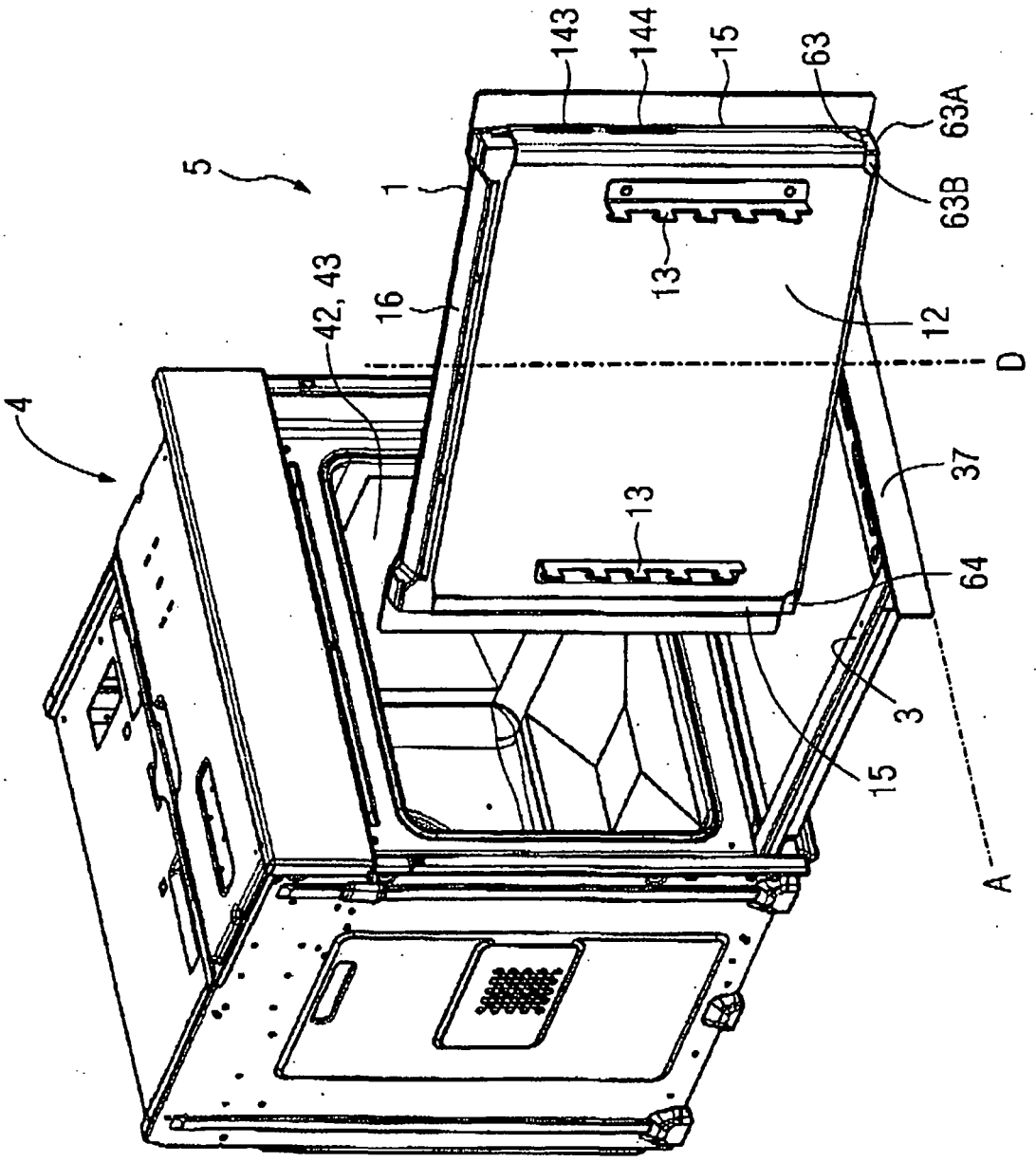



FIG 12

## REFERENCES CITED IN THE DESCRIPTION

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