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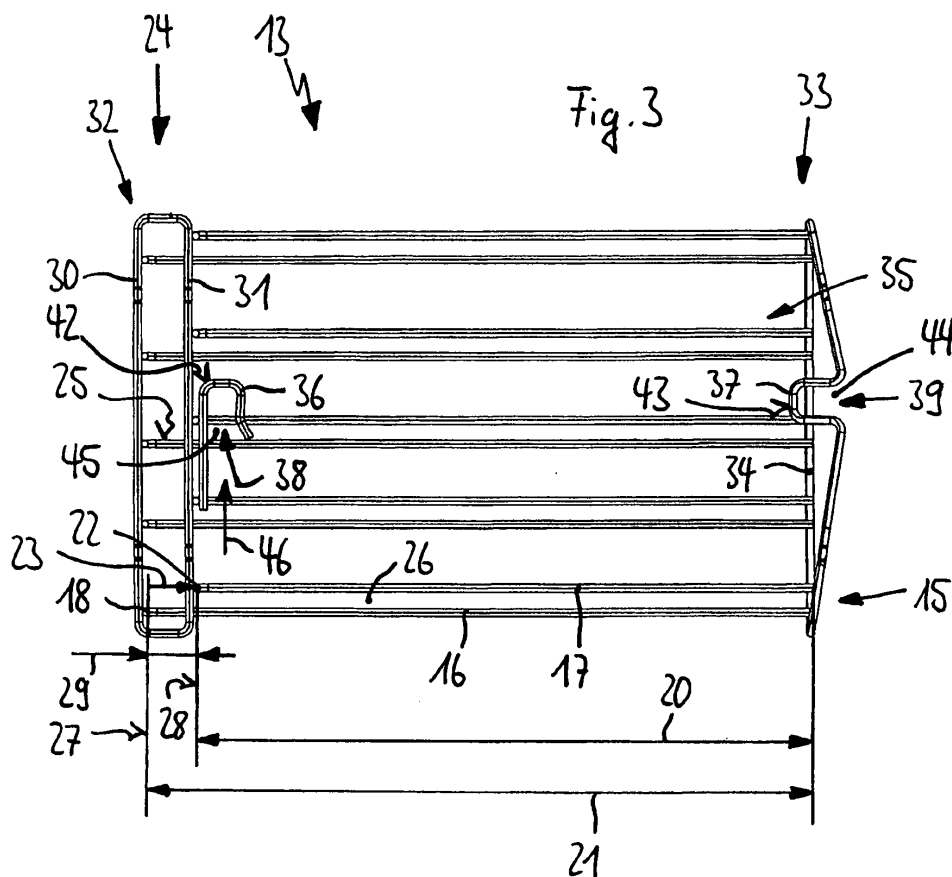
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(54) **Side frame for an inserting device and method for fixing a side frame**

(57) To further develop inserting devices for a cooking compartment of a cooking appliance, the invention proposes a side frame for an inserting device of a cooking compartment, which comprises both guiding devices for support systems for items to be cooked and also holding

devices for holding the side frame on holding elements of a side wall of the cooking compartment, wherein at least one of the holding devices comprises an elastically deformable accommodation region for holding elements of the cooking compartment.



## Description

**[0001]** The invention relates to a side frame for an inserting device of a cooking compartment, which comprises both guide devices for support systems for items to be cooked as well as holding devices for holding the side frame on holding elements of a side wall of the cooking compartment. Furthermore, the invention relates to a method for fixing a side frame of an inserting device for support systems for items to be cooked on a side wall of a cooking compartment in which the side frame is inserted into the cooking compartment, and the side frame is fixed on holding elements of the cooking compartment by means of holding devices.

**[0002]** To make it easier in cooking appliances to insert, in particular, trays for items to be cooked, on which an item to be cooked can be cooked, into a cooking compartment, provision is almost always made in such a cooking compartment for inserting devices, which have several guiding devices, in which an oven tray can safely be positioned in the cooking compartment. The inserting devices can hereby be formed by side walls of the cooking compartment.

**[0003]** Inserting devices consisting of additional frames, however, are also well known from the state of the art. For example, a household appliance comprising a cooking compartment, in which lateral accommodation devices are arranged, is known from patent specification DE 101 25 247 C1. Support systems for items to be cooked can be inserted into the cooking compartment at different levels and can be positioned in the cooking compartment by means of the accommodation devices. To be able to safely guide the support systems for items to be cooked in every one of the levels by means of the accommodation devices, the accommodation devices encompass pairs of bars, which run horizontally, between which the support systems for items to be cooked can be inserted so as to be incapable of being tilted.

**[0004]** Frequently, the inserting devices are also fixed in the cooking compartment as exchangeable frames so that the inserting devices can be arbitrarily arranged in the cooking compartment, according to the requirements. An example for this is shown in published patent application DE 10 2004 001 683 A1, in which guiding elements of an inserting device, which run approximately horizontally, can be individually fastened on side walls of a device muffle. The guiding elements provide support surfaces for baking trays or the like, which are inserted into the device muffle. To keep the baking trays from tilting, each guiding element comprises, in its front third, a vertical stop so that the danger of a critical tilting of the baking trays out of the device muffle can be reduced. Advantageously, each of the guiding elements can be independently detached from the side walls so that guiding elements, which are not needed, can be removed from the device muffle without any problems. Thus, the guiding elements, which are not needed, also do not need to be heated, which can reduce the heating time of the

device muffle. However, the respective attachment of the individual guiding elements is quite extensive and laborious.

**[0005]** It is the object of the invention to further develop generic inserting devices so that fixing, in particular of side frames of the inserting device in a cooking compartment of a cooking device can be carried out in a particularly comfortable manner.

**[0006]** This object is solved by means of a side frame for an inserting device of a cooking compartment, which comprises both guiding devices for support systems for items to be cooked and also holding devices for holding the side frame on holding elements of a side wall of the cooking compartment, where at least one of the holding devices comprises an elastically deformable accommodation region for holding elements of the cooking compartment.

Since at least one of the holding devices comprises an elastically deformable accommodation region for holding elements of the cooking compartment, the side frame can be fastened particularly easily on corresponding holding elements of the cooking compartment. This is firstly because tolerances between the side-frame-side holding devices and the cooking-compartment-side holding elements both in the vertical and in the horizontal direction can advantageously be compensated in a structurally particularly simple manner by means of the elastically deformable accommodation region. Secondly, an indexing mechanism between the holding devices and the holding elements can advantageously be implemented in a constructively simple manner by means of the elastically deformable accommodation region.

**[0007]** The term "side frame" hereby comprises any device, by means of which a side part, which preferably comprises more than one guiding device for support systems for items to be cooked, can be provided within a cooking compartment of a cooking appliance. The side frame can hereby be made of a wire material or tube material so that it is easy to erect and not much material must be heated.

**[0008]** In the present case, an inserting device substantially consists of two side frames, which correspond with one another and which can be placed laterally in a cooking compartment. Preferably, the side frames can be individually fastened on side walls of the cooking compartment.

**[0009]** The designation "guide devices" means regions of the side frame which are provided for guiding support systems for items to be cooked. It shall be understood that suitable guide devices can be configured in numerous ways. In the present case, the guide devices are preferably formed by means of horizontally running elements which run from a front insertion side of the side frame to a rear stop side of the side frame. The horizontally running elements or guide devices define the axial extension of the side frame in the sense of the subject matter of the invention.

**[0010]** For example, a guide device consists of a lower

support rod and a guide rod disposed thereover. The support system for items to be cooked is thus guided particularly well. Any unintentional critical tilting of the support system for items to be cooked is furthermore prevented in a particularly reliable manner in that the guide rod is at least more than a third of the support rod length. In particular with a support system for items to be cooked, which has already been further inserted into the guiding device, a tilting of the support system for items to be cooked can still be prevented, because the further inserted end of the support system for items to be cooked immediately knocks against the guide rod in response to a tilting movement and a further tilting is prevented. This is particularly advantageous when hot liquids, such as hot, liquid drippings, for example, are located in or on the support system for items to be cooked. Smaller tilting movements are already sufficient here to make it possible for the liquid drippings to spill over the front edge of the support system for items to be cooked. Such a tilting, however, can be prevented by means of the present support system for items to be cooked, which is designed to be sufficiently long, whereby severe burn injuries can be prevented.

**[0011]** Furthermore, the support rod and the guide rod advantageously reinforce the side frame so that even large loads can be accommodated without problems.

**[0012]** The term "support rod" describes a region of the side frame, on which a support system for items to be cooked can be placed and can thus be safely stored in a cooking compartment. It shall be understood that the support rod can be designed in different ways for this purpose. For example, it can also be made of a sheet steel angle. It is formed in a particularly simple manner if it is fabricated of a wire material or a tube material, as is the side frame.

**[0013]** Something similar applies to the "guide rod" explained herein with reference to the producibility. However, the guide rod does not serve as a support for the support system for items to be cooked but as a counter bearing, by means of which any inadvertent tilting of the support system for items to be cooked can be prevented. For this purpose, the guide rod is always arranged above a corresponding support rod. A support rod and a guide rod, which corresponds thereto, thus each form an inseparable rod pair.

**[0014]** Each rod pair consisting of support rod and guide rod substantially form in each case one of the guiding devices of the side frame. At the same time, provision is preferably also made in the rear region of the side frame for a stop rod, which can prevent a support system for items to be cooked from being inserted too far.

**[0015]** The term "insertion side" hereby describes the side of the side frame, which is open in such a manner that a support system for items to be cooked, for example, can be placed onto the support rod and can subsequently be inserted into the inserting compartment. Accordingly, the inserting side of a side part, which is properly arranged in a cooking compartment, is the side of the side

part, which faces a cooking compartment access opening.

**[0016]** The designation "stop side" describes a rear side of the side frame which, when a side frame is correctly arranged in a cooking compartment, is that side of the side part which faces away from a cooking compartment access opening.

**[0017]** The holding elements can advantageously be configured as retaining lugs, which project out from the side walls of the cooking compartment, so that the elastically deformable accommodation regions of the holding devices of the side frames can engage onto these. The holding devices can engage particularly safely onto the holding elements if the holding elements have a peripheral groove into which, for example, a spring steel wire of the holding device can engage at least partially. Such a safe hold can also be achieved whereby the holding elements are configured as conical and taper toward the side wall of the cooking compartment with regard to their diameter.

**[0018]** It shall be understood that the holding device can be configured in numerous ways. Structurally, it is particularly advantageous if at least one of the holding devices comprises a resilient element which is bent toward the accommodation region. In a particularly simple embodiment, the holding device can form this resilient accommodation element itself, for example, by means of a spring wire having suitable diameter.

**[0019]** In order that good engagement can be achieved with holding elements of a side wall, it is advantageous if the accommodation region is configured as U-shaped. The holding devices of the side frame can thus correspond reliably with the holding elements.

**[0020]** A first holding device of the side frame can be fixed particularly simply on a holding element of the cooking compartment if an accommodation region has a horizontal access opening, which is substantially axially aligned and accessible. Thus, the side frame can be prefixed on a rear holding element of the cooking compartment in a simple and uncomplicated manner during insertion into the cooking compartment preferably by means of a rear holding device provided on the rear side of the side frame.

**[0021]** If another accommodation region advantageously has a vertical access opening, which is substantially radially aligned and accessible, the side frame can be turned about the rear holding element by means of a rotational movement and hereby engage onto another holding element of the cooking compartment. The side frame is hereby fixed particularly rapidly and reliably on a side wall of the cooking compartment.

**[0022]** "Substantially axially aligned and accessible" means in this context that the horizontal access opening is disposed in the side frame in accordance with the axial alignment of the guide devices in the side frame.

**[0023]** In this context, the designation "substantially radially aligned and accessible" describes that the vertical access opening is turned by more than 45°, preferably

by 90°, with respect to the axial alignment of the guiding devices.

**[0024]** The preferred positions and alignments of the respective access openings of the elastically deformable accommodation regions can be seen clearly from the illustrations of the figures still to be explained subsequently.

**[0025]** In order to be able to fix the side frame on the side wall of the cooking compartment during the insertion into the cooking compartment, it is advantageous if the horizontal access opening is disposed in the area of a stop side of the side frame. The side frame can hereby easily be pre-fixed in the rear region of the cooking compartment.

**[0026]** A final fixing of the side frame can be handled particularly well if the vertical access opening is disposed in the area of an insertion side of the side frame.

**[0027]** The object of the invention is also achieved by a method for fixing a side frame of an insertion device for support systems for items to be cooked on a side wall of a cooking compartment, in which the side frame is inserted into the cooking compartment and the side frame is fixed by means of holding devices on holding elements of the cooking compartment, wherein the method is **characterized in that** a first holding device of the side frame is rotatably mounted on a first holding element with a substantially translational movement of the side frame, the side frame is then turned about the first holding element and a second holding device of the side frame is hereby fixed on a second holding element with a rotational movement of the side frame.

**[0028]** With such a movement sequence, the side frame can be handled particularly simply and fixed in the cooking compartment so that a frequently very tricky mounting of an inserting device on a cooking appliance is omitted.

The invention will be explained in more detail below by means of exemplary embodiments. Reference is thereby made to the drawings, wherein

FIG. 1 shows a perspective view of a cooking appliance comprising a cooking compartment and an inserting device, which can be arranged therein, comprising side frames, whereby a guide rod end lies axially behind a support rod end on an insertion side of a guiding device,

FIG. 2 shows a perspective view of the cooking compartment of the cooking appliance from FIG. 1 comprising a side frame arranged on a side wall of the cooking compartment and

FIG. 3 shows a side view of the side frame from FIG. 2,

FIG. 4 shows a view of the side frame on the side wall of the cooking compartment during an installation phase prior to engagement of a vertical holding device of the side frame on a holding element of the side wall,

FIG. 5 is a further side view of the side frame during

engagement of the vertical holding device on the holding element and

FIG. 6 is a last side view of the side part in the fully fixed state on the side wall of the cooking compartment, in each case in a schematic illustration. Corresponding parts and dimensions are provided with the same reference numerals in Figures 1 to 3.

**[0029]** The cooking appliance 1 shown in Figure 1 encompasses a housing 2, by means of which provision is made in particular for a cooking compartment 3 for cooking items to be cooked. The cooking compartment 3 can be accessed from the front via a cooking compartment access opening 4, wherein the cooking compartment access opening 4 can be closed by means of a cooking compartment door 5 in the front region 6 of the cooking appliance 1. A control panel 7, by means of which the cooking appliance 1 can be put into operation and can be operated, is located above the cooking compartment access opening 4.

**[0030]** The illustration 10 according to Figure 2 allows for a very good view into the cooking compartment 3 of the cooking appliance 1, wherein, for the sake of clarity, only the housing rear wall 11 and the right housing side 12 of the housing 2 are illustrated here.

**[0031]** A side frame 13 (see also in particular Figure 3) is fastened to the right housing side 12 in the cooking compartment 3. The side frame 13 is a first component of an inserting device of the cooking compartment 3, which is not shown in detail herein, wherein in this exemplary embodiment the inserting device substantially consists of the side frame 13 and a further side frame, which is not illustrated herein, and which can be correspondingly arranged on the left housing side 14 of the housing 2 in a mirror-inverted manner to the side frame 13.

**[0032]** Different cooking compartment horizontal levels (not explicitly shown herein) can be created in the cooking compartment 3 by means of the inserting device consisting of the two side frames 13, in that support systems for items to be cooked (not illustrated herein) can be correspondingly inserted into guiding devices 15 (only numbered in an exemplary manner) of the side frames 13, which are arranged at different levels.

**[0033]** Each of the guiding devices 15 is formed by means of a support rod 16 and a guide rod 17. The support rod 16 hereby mainly serves the purpose of allowing a support system for items to be cooked to be placed and deposited thereon, respectively, so as to be able to insert the support system for items to be cooked into the cooking compartment 3 on a selected cooking compartment horizontal level. The guide rod 17 substantially serves the purpose of preventing the support system for items to be cooked, which is placed onto the support rod 16, from being able to inadvertently tilt above an insertion-side support rod end 18 according to a tilting direction 19. To reduce the danger of such a tilting of the support system for items to be cooked, the guide rod 17 encom-

passes a guide rod length 20 (see Figure 3), which is at least more than a third of a support rod length 21 of the support rod 16.

**[0034]** Such a shortening of the guide rod 17 as compared to the support rod 16 can advantageously be used to leave an insertion-side guide rod end 22 axially 23 behind the insertion-side support rod end 18 at the insertion side 24 of the guiding device 15.

**[0035]** In so doing, an overlap-free support region 25 is created on the insertion side 24 on the support rod 16 on which a support system for items to be cooked can be placed particularly well onto the support rod 16 so that an otherwise common and inconvenient threading of the support system for items to be coked into an inserting compartment 26 of the guiding device 15 can be avoided. This is particularly advantageous when hot items to be cooked are already located on the support system for items to be cooked.

**[0036]** Advantageously, the support rod end 18 ends in a first vertical plane 27, while the guide rod end 22 ends in a second vertical plane 28. According to the illustration of Figure 3, the two vertical planes 27, 28 are at right angles to the plane of the paper, while the support rod 16 and the guide rod 17 run in the plane of the paper.

**[0037]** The vertical planes 27 and 28 are arranged so as to be substantially parallel to one another. Furthermore, they are arranged at a distance 29 to one another so that the support rod end 18 and the guide rod end 22 are also arranged so as to be apart from one another by this distance 29, provided that they are located in the respective vertical plane 27, 28.

**[0038]** The side part 13 experiences a particularly good stability since all of the support rods 16 are connected with one another by means of a first vertical rod 30 in the region of the insertion side 24 and since all of the guide rods 17 are connected with one another by means of a further vertical rod 31 in the region of the insertion side 24. In this exemplary embodiment, the two vertical rods 30 and 31 are designed as a double rod 32, to which in each case all of the support rods 16 and all of the guide rods 17 are welded.

**[0039]** A stop rod 34, which in particular connects all of the horizontal rods 16 and 17 with one another, runs vertically in the rear region 33 of the side frame 13. The support rod 16 and the guide rod 17 are thus oriented substantially horizontally within the cooking compartment 3 and each form a rod pair 35 of the guiding device 15.

**[0040]** Furthermore, the side frame 13 has a radial holding device 36 and an axial holding device 37, by means of which the side frame 13 can be reliably fastened to the right housing side 12.

**[0041]** The side frame 13 as well as all of its rods 16, 17, 30, 31 and 34 are made of a heat-insensitive spring steel, so that even high temperatures, as can occur in a cooking compartment 3, do not affect the entire side frame 13.

**[0042]** Since in this exemplary embodiment, the hold-

ing devices 36 and 37 are also made of heat-insensitive spring steel, an elastically deformable, radially accessible accommodation region 38 can be formed in a structurally particularly simple manner with respect to the radial holding device 36 and an elastically deformable, axially accessible accommodation region 39 can be formed with respect to the axial holding device 37. Due to the elastic deformability, tolerances can be compensated particularly well by means of the holding devices 36 and 37 with respect to a front holding element 40 and a rear holding element 41 (see in particular Figures 2 and 4 to 6), which are both provided on the side wall 12 of the cooking appliance 1. In this case, the front holding element 40 is located in the region of the cooking compartment access opening 4, while the rear holding element 41 is disposed deeper in the cooking compartment 3.

**[0043]** In this case, the elastically deformable accommodation regions 38 and 39 are formed as substantially U-shaped so that they can clamp well, that is on three sides, with the holding elements 40 and 41. The holding elements 40, 41 are each provided with a peripheral groove (not numbered here) on their cylindrical circumferential surfaces (not numbered here), so that a spring steel wire used for the holding devices 36, 37 can lie at least partially in the respective groove.

**[0044]** In order to provide the elastically deformable accommodation regions 38 and 39 in a structurally simple manner, the holding devices 36 and 37 are each formed from a curved resilient accommodation element 42 and 43.

**[0045]** The side frame 13 can be mounted particularly simply since the axially accessible accommodation region 39 has a horizontal access opening 44, which is substantially axially 23 aligned and accessible and since the radially accessible accommodation region 38 has a vertical access opening 45, which is substantially radially 46 aligned and accessible.

**[0046]** In particular with the side frame 13 explained hereinbefore, mounting on a side wall 12 or 14 of the cooking appliance 1 can be accomplished particularly simply. The handling of the side frame 13 during arrangement on the respective holding elements 40, 41 is configured very simply in that the first holding device or the axial holding device 37 of the side frame 13 is rotatably mounted on the first or rear holding element 41 with a substantially translational movement 47 (see Figure 4) of the side frame 13, the side frame 13 is then turned about the first holding element 41, and a second holding device or the radial holding device 36 of the side frame 13 is hereby fixed on the second or front holding element 40 with a rotational movement 48 (see Figure 5) of the side frame 13.

**[0047]** For the sake of clarity, in particular in Figures 2 and 4 to 6, not all the components described here are provided with their respective reference numerals. However, the previously described side frame 13 is identical in all the representations, this being shown viewed from the cooking compartment 3 according to Figures 2 and

4 to 6 and viewed from the side wall 12 according to Figure 3

### List of Reference Numerals

#### [0048]

1	cooking appliance
2	housing
3	cooking compartment
4	cooking compartment access opening
5	cooking compartment door
6	front region
7	control panel
10	illustration
11	housing rear wall
12	right housing side
13	side frame
14	left housing side
15	guiding device(s)
16	support rod
17	guide rod
18	insertion-side support rod end
19	tilting direction
20	guide rod length
21	support rod length
22	insertion-side guide rod end
23	axial
24	insertion side
25	overlap-free support region
26	insertion compartment
27	first vertical plane
28	second vertical plane
29	distance
30	first vertical rod
31	second vertical rod
32	double rod
33	rear region
34	stop rod
35	rod pair
36	radial holding device
37	axial holding device
38	radially accessible accommodation region
39	axially accessible accommodation region
40	front holding element
41	rear holding element
42	front curved resilient accommodation element
43	rear curved resilient accommodation element
44	horizontal access opening
45	vertical access opening
46	radial
47	substantially translational movement
48	rotational movement

### Claims

1. A side frame (13) for an inserting device of a cooking

compartment (3), which comprises both guiding devices (15) for support systems for items to be cooked and also holding devices (36, 37) for holding the side frame (13) on holding elements of a side wall (12, 14) of the cooking compartment (3),

**characterized in that** at least one of the holding devices (36, 37) comprises an elastically deformable accommodation region (38, 39) for holding elements (40, 41) of the cooking compartment (3).

2. The side frame (13) according to claim 1, **characterized in that** at least one of the holding devices (36, 37) comprises a resilient accommodation element (42, 43), which is curved toward an accommodation region (38, 39).

3. The side frame (13) according to claim 1 or 2, **characterized in that** the accommodation region (38, 39) is configured as U-shaped.

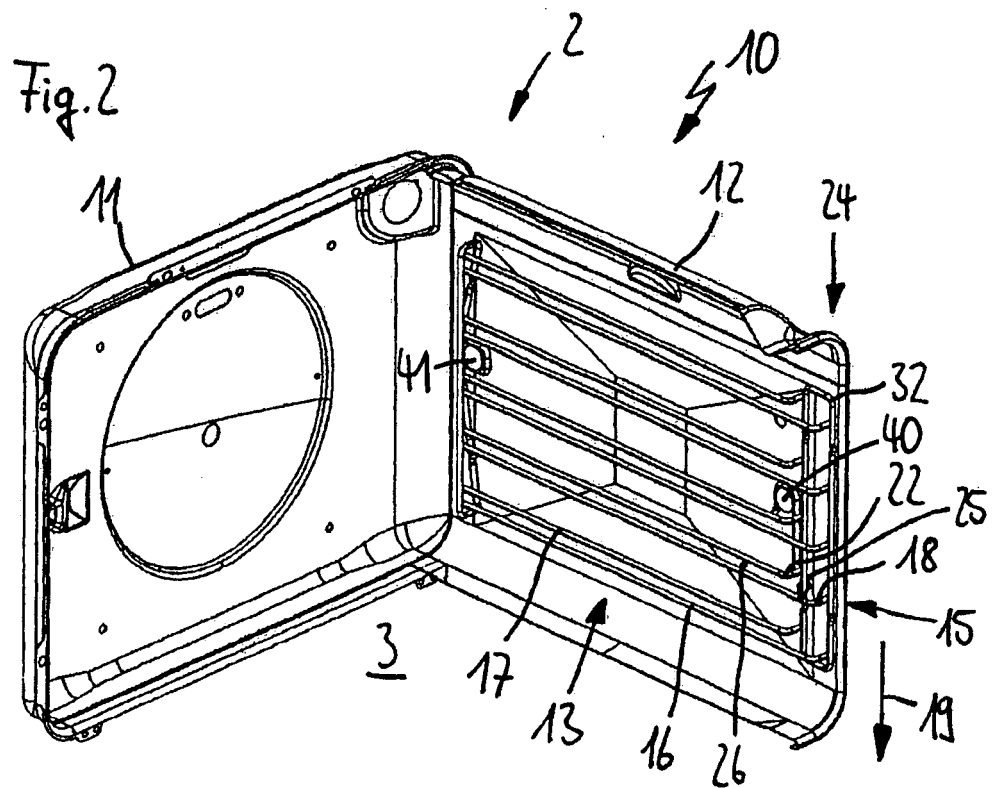
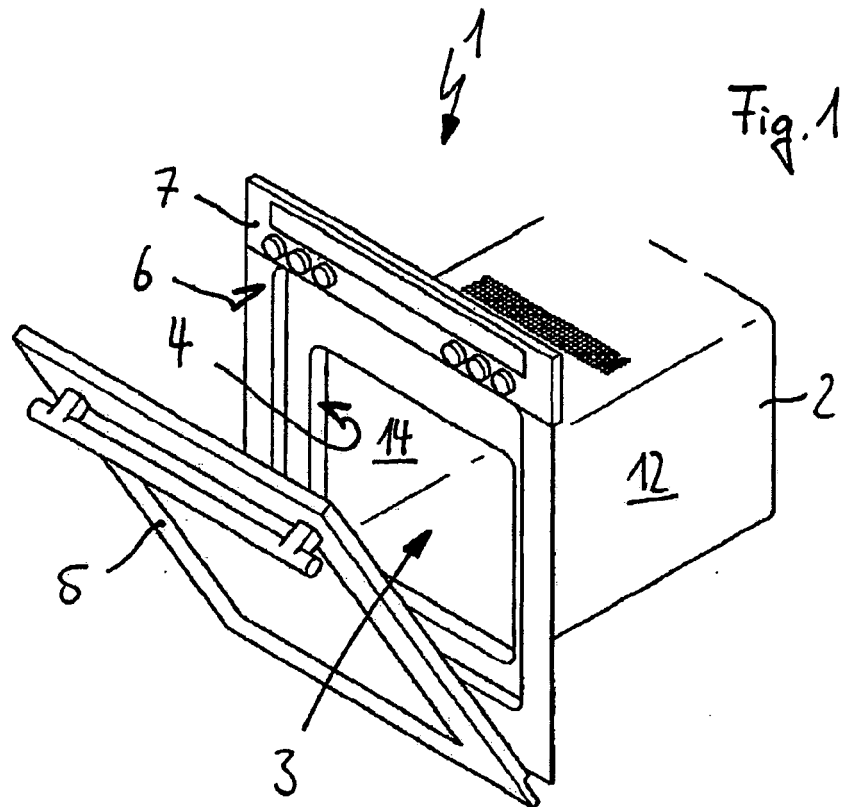
4. The side frame (13) according to one of claims 1 to 3, **characterized in that** one accommodation region (39) has a horizontal access opening (44), which is substantially axially (23) aligned and accessible.

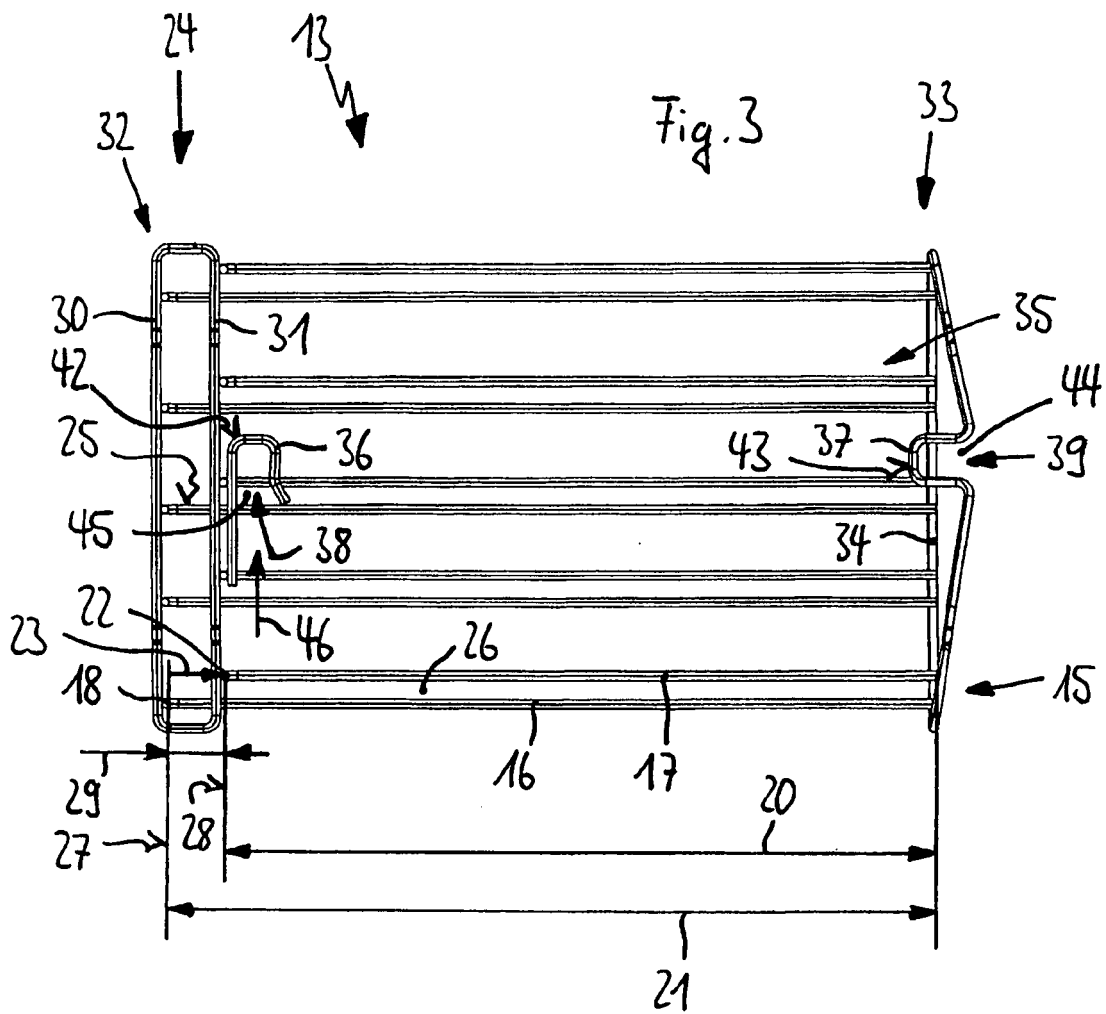
5. The side frame (13) according to one of claims 1 to 4, **characterized in that** a further accommodation region (38) has a vertical access opening (45), which is substantially radially (46) aligned and accessible.

6. The side frame (13) according to one of claims 1 to 5, **characterized in that** the horizontal access opening (44) is disposed in the region of a stop side of the side frame (13).

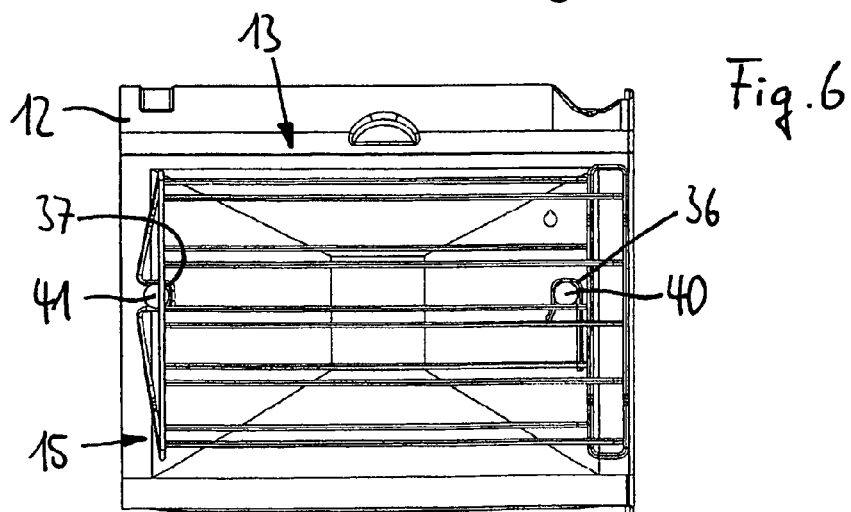
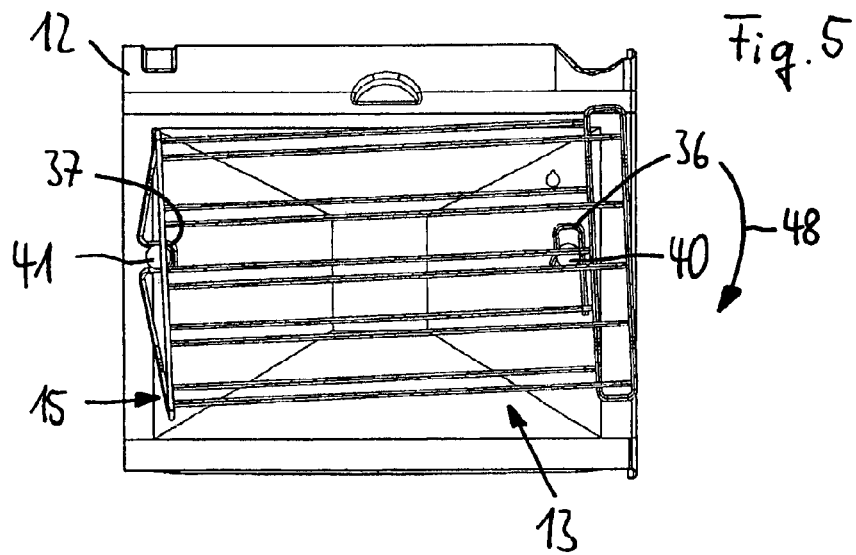
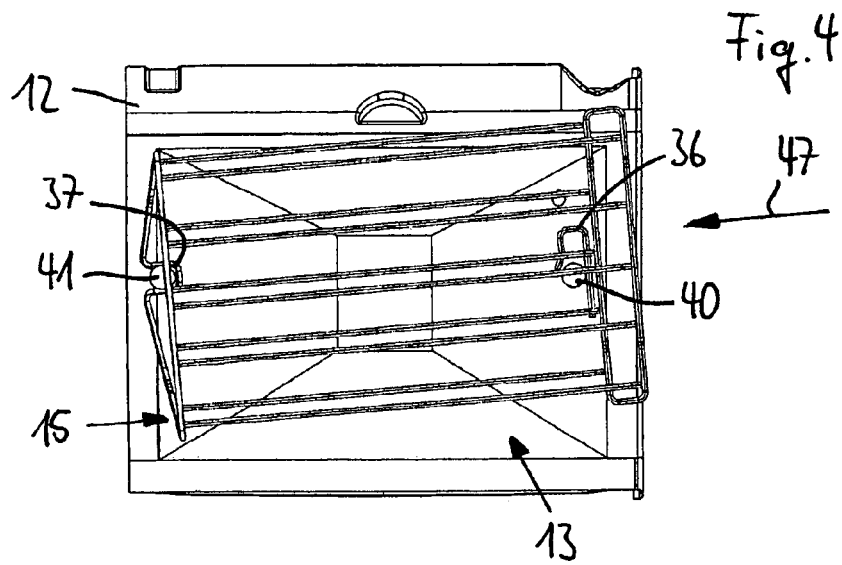
7. The side frame (13) according to one of claims 1 to 6, **characterized in that** the vertical access opening (45) is disposed in the region of an insertion side (24) of the side frame (13).

8. A method for fixing a side frame (13) of an insertion device for support systems for items to be cooked on a side wall (12, 14) of a cooking compartment (3), in which the side frame (13) is inserted into the cooking compartment (3) and the side frame (13) is fixed by means of holding devices (36, 37) on holding elements (40, 41) of the cooking compartment (3), **characterized in that** a first holding device (37) of the side frame (13) is rotatably mounted on a first holding element (41) with a substantially translational movement (47) of the side frame (13), the side frame (13) is then turned about the first holding element (41), and a second holding device (37) of the side frame (13) is hereby fixed on a second holding element (40) with a rotational movement (48) of the side frame (13).











European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 08 00 3161

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Place of search The Hague		Date of completion of the search 8 July 2008	Examiner Rodriguez, Alexander
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 08 00 3161

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