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(54) **Oven**

(57) The invention relates to an oven (1), especially to a domestic oven, with a cooking cavity (2), wherein a plug connection (3) is arranged in a wall (4) of the cavity (2) for inserting a plug (5) of a thermocouple, wherein the plug connection (3) comprises a socket (6) for receiving

a part (7) of the plug (5). To improve the functionality of the oven especially when using steam, the invention is characterized in that the socket (6) consists of or comprises a sealing element (8) which surrounds at least an entry opening (9) of the socket (6).

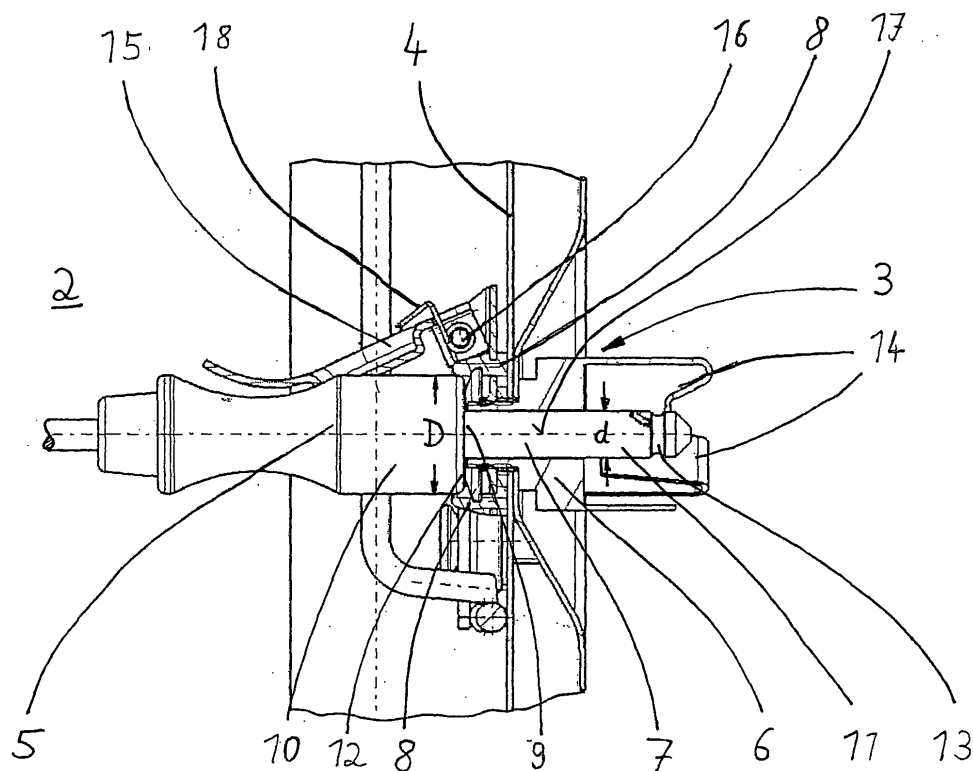


Fig. 2

Description

[0001] The invention relates to an oven, especially to a domestic oven, with a cooking cavity, wherein a plug connection is arranged in a wall of the cavity for inserting a plug of a thermocouple, wherein the plug connection comprises a socket for receiving a part of the plug.

[0002] Ovens of this kind are well known in the art. For some applications a thermocouple device is necessary to survey the temperature within the food, especially for the preparation of meat dishes. Here the centre temperature of the meat is of importance. Sometimes ovens equipped with this option have to show also a steam function, i. e. steam is fed into the cavity for cooking a dish. It can also be necessary to combine the steam operation of the oven with a thermocouple device application.

[0003] The use of a pluggable thermocouple device is problematic due to the following reasons: If the thermocouple device is not in use, i. e. if the plug of the thermocouple is not plugged in, a flap is arranged which seals the opening in the cavity wall, so that no steam can escape. If the plug of the thermocouple is inserted into the socket it has been found that it is possible that steam can escape through the small gap between the socket and the plug.

[0004] So, it can occur that escaping steam corrodes the electrical contacts of the plug connection, as the steam can condensate at the electrical connection. So, a short-circuit can not be excluded. In the worst case a fire can occur. Therefore plug connections for the thermocouple device are sometimes not allowed due to safety requirements.

[0005] Therefore, it is an object of the invention to improve a plug connection for the use of a thermocouple device for surveying the centre temperature of a dish to be prepared in the oven cavity. It should become possible to safely use the thermocouple without problems due to escaping steam.

[0006] The solution of this object according to the invention is characterized in that the socket consists of or comprises a sealing element which surrounds at least an entry opening of the socket.

[0007] The socket can be made from metal, wherein the sealing element is arranged at the entry opening of the socket. The socket is preferably made from stainless steel.

[0008] The sealing element is beneficially attached to the socket by a vulcanising process.

[0009] The plug can have a body part with a cylindrical section with a first diameter and a cylindrical connector element with a reduced diameter, wherein the connector element can intrude into the socket via the entry opening, wherein the axial end of the body part is designed to contact the seal element with a face side.

[0010] The cylindrical connector element can have a groove at its axial end remote from the body part, wherein at least one elastic element is arranged for holding the cylindrical connector element in place by snapping or in-

truding into the groove.

[0011] The plug connection can have a flap which is arranged pivotable at the plug connection around an axis. The axis can be arranged transversely to the longitudinal axis of the plug. The flap can be biased by a spring element. Furthermore, the flap is preferably free from sealing material, i. e. the sealing function is carried out by the above mentioned sealing element.

[0012] The flap can be made from steel, especially from stainless steel. The axis of the flap can also be made from steel, especially from stainless steel.

[0013] Preferably, the sealing element consists of silicon.

[0014] The sealing element can extend into a bore in the cavity wall to seal the socket into the bore. Thereby, no steam can escape between a gap between the bore in the wall and the socket.

[0015] The socket can be designed as a two part design. Both parts of the socket can be connected by means of a screw connection.

[0016] The suggested design has the advantage, that the use of a thermocouple (meatprobe) can take place in a more secure way in a cooking function with low temperature steam as well as during normal cooking operation.

[0017] An easy sealing becomes possible when the thermocouple is used or not without any actions required by the user of the oven.

[0018] The logistics and the assembly for producing the oven is more simple as less parts are necessary to establish the desired function.

[0019] In the drawings an embodiment of the invention is depicted.

FIG 1 shows schematically a perspective view of a domestic oven,

FIG 2 shows the cross sectional view through a plug connection with a plug inserted into the socket of the plug connection and

FIG 3 shows the same cross sectional view, wherein no plug is inserted into the socket of the plug connection.

[0020] FIG 1 shows a domestic oven 1. It has a cooking cavity 2 which can be opened by a door 22 (which is depicted in the opened state) to put food into the cavity 2 and to take cooked food out of it. The oven 1 is equipped with the possibility to survey the centre temperature of a dish which is prepared in the oven 1. Therefore, a wall 4 of the cavity has a bore in which a plug connection 3 is mounted. In FIG 1 an entry opening 9 of the plug connection 3 is shown without inserted thermocouple.

[0021] Details of the proposed design become apparent from figures 2 and 3 where a cross sectional view is shown, in FIG 2 with inserted plug 5 of a thermocouple and in FIG 3 without the same.

[0022] In general, the wall 4 of the cavity 2 has a bore 19 (see FIG 3) which is used to mount the plug connection 3. A socket 6 of the plug connection 3 is designed as a two-part arrangement, the parts being 20 and 21 (see FIG 3). Both parts 20, 21 can be connected by a screw connection.

[0023] The socket 6 is prepared to receive a plug 5 or, more specifically, a part 7 of it. The received part is a cylindrical connector element 11 of the plug 5. The plug 5 has a body part 10 and the cylindrical connector part 11, wherein the diameter D of the body part 10 is bigger than the diameter d of the cylindrical part 11. So, a face side 12 is formed in the transition zone between the body part 10 and the cylindrical connector element 11.

[0024] An important feature of the present invention is that the socket 6 consists of or comprises a sealing element 8 which surrounds at least the entry opening 9 of the socket 6. As can be seen in figure 2, the face side 12 of the body part 10 presses axially against the sealing element 8 when the plug 5 is inserted into the socket 6. To keep the plug 5 in position, the cylindrical connector element 11 has a groove 13 at its axial end in which an elastic element 14 snaps in in the mounted state.

[0025] The sealing element 8 is vulcanized around a steel element, forming the part 20 of the socket 6. It extends into the region of the bore 19, so that the gap between the bore 19 and the socket 6 is also sealed by the sealing element 8.

[0026] To seal the opening 9 when the thermocouple is not used, i. e. if the plug 5 is drawn out of the socket 6, a flap 15 is arranged pivotably around an axis 16. The axis 16 is arranged transversely to the axis 17 of the plug 5. The flap 15 is made of non-corrosion steel and has no sealing element. It is biased by a spring element 18 which forces the flap 15 onto the opening 9 and consequently onto the sealing element 8. The bias force of the spring element 18 is selected in that way that enough pressure is exerted onto the flap 15 to safely close the opening 9 when the thermocouple is not in use.

[0027] Consequently, the bore 19 and the entry opening 9 respectively are sealed in the case that a plug 5 is inserted into the socket 6 and also in the case that no plug 5 is used.

[0028] So, the invention suggests that the sealing element 8 is arranged at the fixed part of the socket 6, not on the flap 15. Hereby, the seal is available and in use in both cases (thermocouple in use or not in use).

[0029] The required parts - except from the sealing element 8 - can be made of stainless steel. The sealing element 8 can be made from high temperature resistant silicon. The sealing element 8 can be directly vulcanized on the steel part of the socket 6. As an additional function the nut to fix the socket 6 at the cavity wall 4 is integrated in the fixed part of the cover.

Reference Numerals

[0030]

1	Oven (domestic oven)
2	Cooking cavity
3	Plug connection
4	Wall of the cavity
5	Plug
6	Socket
7	Part of the plug
8	Sealing element
9	Entry opening
10	Body part
11	Cylindrical connector element
12	Face side
13	Groove
14	Elastic element
15	Flap
16	Axis
17	Axis of the plug
18	Spring element
19	Bore
20	Part of the socket
21	Part of the socket
22	Door
D	First diameter
25	d Reduced diameter

Claims

1. Oven (1), especially domestic oven, with a cooking cavity (2), wherein a plug connection (3) is arranged in a wall (4) of the cavity (2) for inserting a plug (5) of a thermocouple, wherein the plug connection (3) comprises a socket (6) for receiving a part (7) of the plug (5),
characterized in that
the socket (6) consists of or comprises a sealing element (8) which surrounds at least an entry opening (9) of the socket (6).
2. Oven according to claim 1, **characterized in that** the socket (6) is made from metal, wherein the sealing element (8) is arranged at the entry opening (9) of the socket (6).
3. Oven according to claim 2, **characterized in that** the socket (6) is made from stainless steel.
4. Oven according to claim 2 or 3, **characterized in that** the sealing element (8) is attached to the socket (6) by a vulcanising process.
5. Oven according to at least one of claims 1 till 4, **characterized in that** the plug (5) has a body part (10) with a cylindrical section with a first diameter (D) and a cylindrical connector element (11) with a reduced diameter (d), wherein the connector element (11) can intrude into the socket (6) via the entry opening

(9), wherein the axial end of the body part (10) is designed to contact the seal element (8) with a face side (12).

6. Oven according to claim 5, **characterized in that** the cylindrical connector element (11) has a groove (13) at its axial end remote from the body part (10), wherein at least one elastic element (14) is arranged for holding the cylindrical connector element (11) in place by snapping or intruding into the groove (13). 5
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7. Oven according to at least one of claims 1 till 6, **characterized in that** the plug connection (3) has a flap (15) which is arranged pivotable at the plug connection (3) around an axis (16). 15
8. Oven according to claim 7, **characterized in that** the axis (16) is arranged transversely to the longitudinal axis (17) of the plug (5). 20
9. Oven according to claim 8, **characterized in that** the flap (15) is biased by a spring element (18).
10. Oven according to at least one of claims 7 till 9, **characterized in that** the flap (15) is free from sealing material. 25
11. Oven according to at least one of claims 7 till 10, **characterized in that** the flap (15) is made from steel, especially from stainless steel. 30
12. Oven according to at least one of claims 7 till 11, **characterized in that** the axis (16) is made from steel, especially from stainless steel. 35
13. Oven according to at least one of claims 1 till 12, **characterized in that** the sealing element (8) consists of silicon.
14. Oven according to at least one of claims 1 till 13, **characterized in that** the sealing element (8) extends into a bore (19) or into a region of a bore (19) in the cavity wall (4) to seal the socket (6) in the bore (19). 40
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15. Oven according to at least one of claims 1 till 14, **characterized in that** the socket (6) has a two part design.
16. Oven according to claim 15, **characterized in that** both parts (20, 21) of the socket (6) are connected by means of a screw connection. 50

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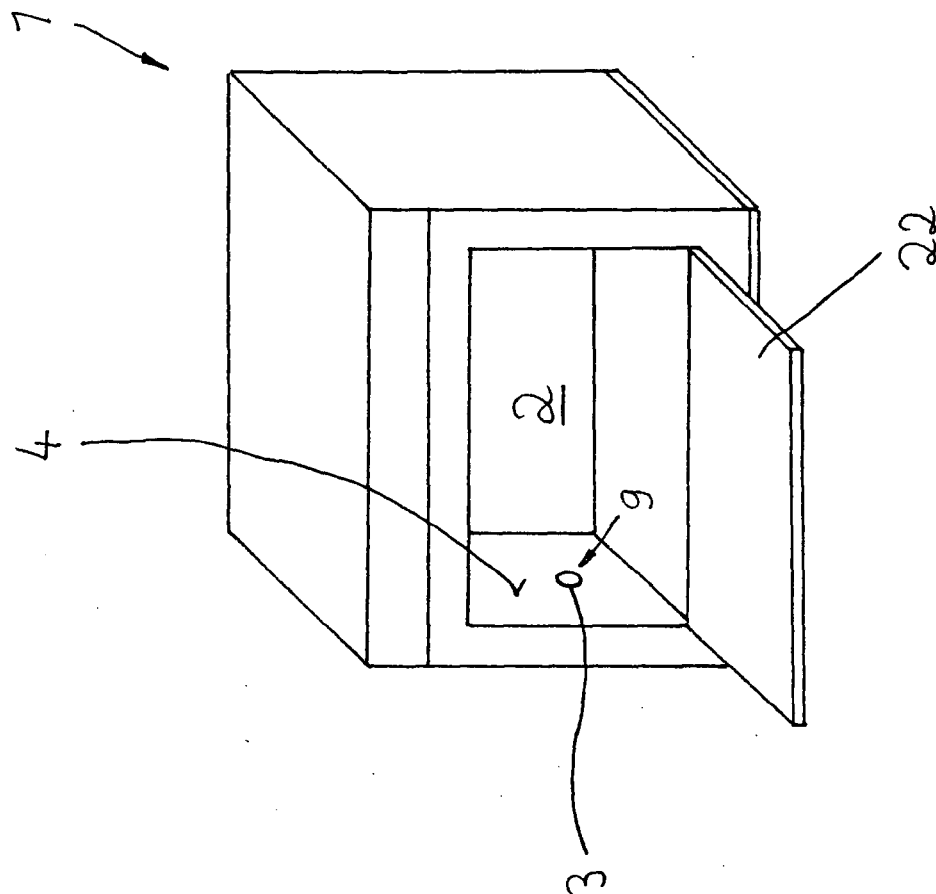


Fig. 1

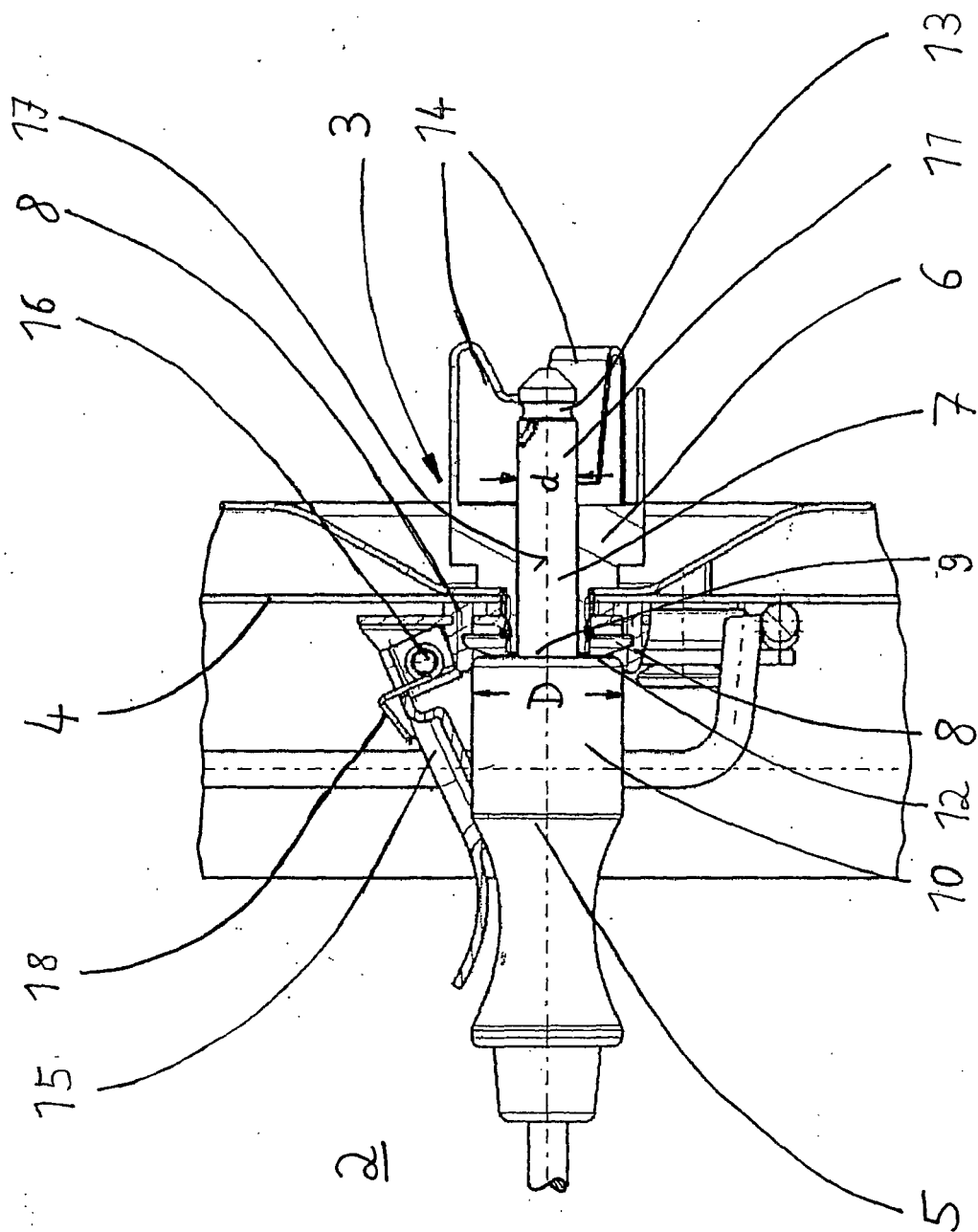


Fig. 2

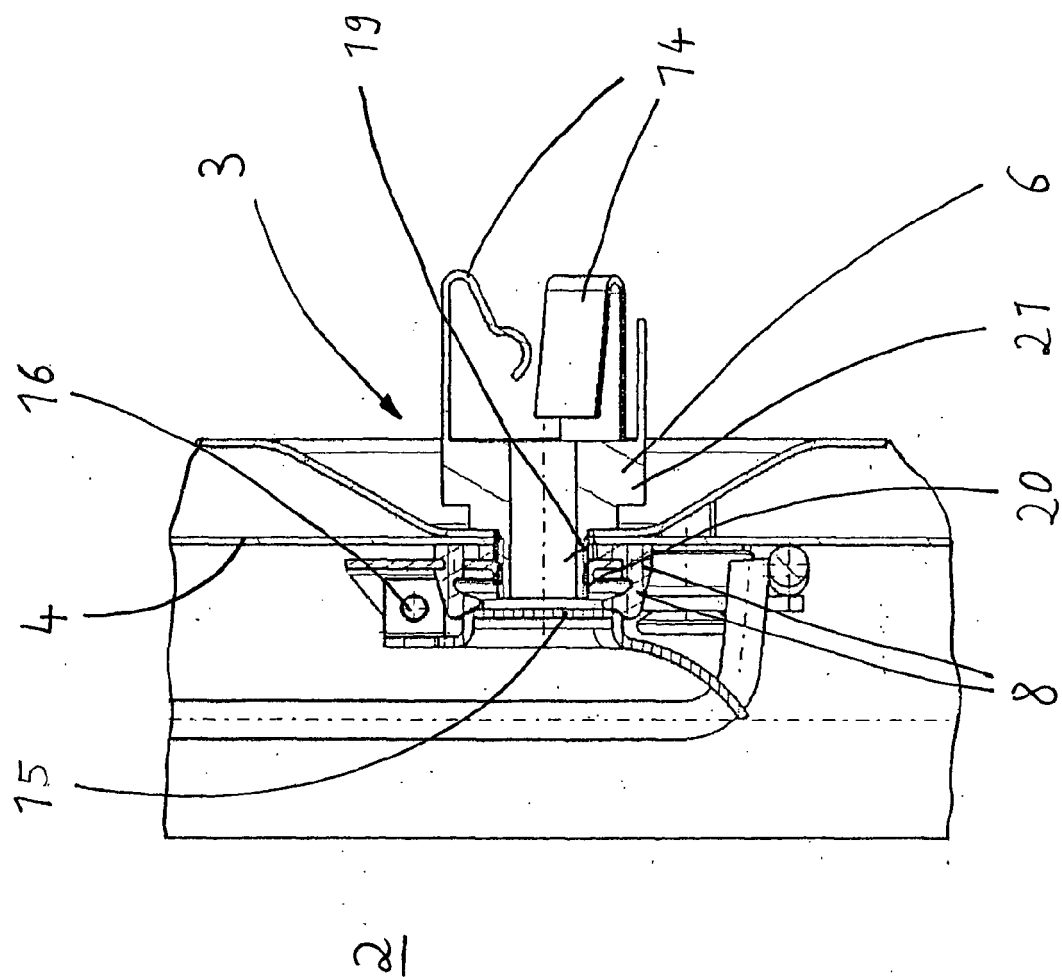


Fig. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 00 1358

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 August 2007	Examiner VON MITTELSTAEDT, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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