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(54) **COOKING OVEN WITH OVEN CAVITY AND COOLING CHANNEL**

BACKOFEN MIT OFENMUFFEL UND KÜHLKANAL

FOUR DE CUISSON COMPORTANT UNE CAVITÉ DE FOUR ET UN CANAL DE REFROIDISSEMENT

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Description

[0001] The present invention relates to a cooking oven with an oven cavity and a cooling channel.

[0002] In a cooking oven food is prepared within an oven cavity. The food is inserted into and removed from the oven cavity through a front opening. Said front opening is closable by an oven door. The oven door includes a glass window cooled down by a cooling system. Said cooling system sucks air from the interior of the oven door. The cooling system is formed by cooling ducts surrounding the oven cavity. A cooling fan on the top of the oven cavity circulates air within the cooling ducts.

[0003] During the cooking process steam and vapour in the interior of the oven cavity may condensate at the glass window of the oven door. In order to avoid the condensation of steam and vapour at the glass window of the oven door, a system for removing steam and vapour from the oven cavity is provided. The oven cavity has an aperture connected to the cooling system. Steam and vapour are sucked through said aperture by the cooling fan. The aperture is connected to the cooling system via a guiding channel. The guiding channel and the aperture form a passage for the steam and vapour sucked by the cooling fan. In order to avoid leakages, a sealing element is required between the guiding channel and the aperture.

[0004] Usually, the cooling channel is preassembled in a subsidiary station, while the oven cavity and the cooling channel are fixed to the housing in the main production line. This requires the sealing element at the correct position of the guiding channel and the aperture.

[0005] EP 2 444 737 A1 discloses an oven cavity with an exhaust air channel. The exhaust air channel comprises a cover plate on its top side. A cavity opening is connected with a waste steam channel, which are arranged in an depression of plate. The exhaust air channel is on its bottom side delimited by the plate.

[0006] DE 199 49 724 A1 discloses an oven cavity with an exhaust air channel which are connected via a collar structure.

[0007] It is an object of the present invention to provide a cooking oven, which allows an improved sealing between the oven cavity and the cooling channel by low complexity.

[0008] The object is achieved by the cooking oven according to claim 1.

[0009] According to the present invention a cooking oven with an oven cavity and a cooling channel is provided, wherein:

- the oven cavity includes at least one cavity opening formed in a top wall of the oven cavity,
- the cooling channel includes at least one guiding channel formed in a bottom wall of the cooling channel,
- the cavity opening is connected to the guiding channel,

- the cavity opening is surrounded by a first structure,
- the guiding channel is surrounded by a second structure, and
- the first structure and the second structure are formed complementary to each other.

[0010] The complementary first structure and second structure provide a mechanical sealing between the cavity opening and the guiding channel. Any further sealing elements are not required.

[0011] Preferably, the cooling channel is arranged above the oven cavity.

[0012] Further, the oven cavity may be fixed at a housing of the cooking oven.

[0013] In a similar way, the cooling channel may be fixed at the housing of the cooking oven.

[0014] For example, the oven cavity is fixed at side walls of the cooking oven by screws.

[0015] Similarly, the cooling channel may be fixed at the side walls of the cooking oven by screws.

[0016] In particular, the first structure is formed rotation-symmetrically in view of the cavity opening.

[0017] In a similar way, the second structure is formed rotation-symmetrically in view of the guiding channel.

[0018] For example, the first structure is embossed around the cavity opening.

[0019] Similarly, the second structure may be embossed around the guiding channel.

[0020] Moreover, the oven cavity and the cooling channel are indirectly connected to each other.

[0021] Preferably, the oven cavity is made of carbon steel. Further, the oven cavity may be made of stainless steel.

[0022] Preferably, the cooling channel is made of carbon steel. Further, the cooling channel may be made of stainless steel.

[0023] Novel and inventive features of the present invention are set forth in the appended claims.

[0024] The present invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates a schematic partial exploded sectional side view of a cooking oven according to a preferred embodiment of the present invention,

FIG 2 illustrates a more detailed schematic partial exploded sectional side view of the cooking oven according to the preferred embodiment of the present invention,

FIG 3 illustrates a schematic perspective view of a guiding channel in a bottom wall of a cooling channel for the cooking oven according to the preferred embodiment of the present invention,

FIG 4 illustrates a schematic perspective view of a

cavity opening in a top wall of an oven cavity for the cooking oven according to the preferred embodiment of the present invention,

FIG 5 illustrates a schematic partial side view of the cooking oven according to the preferred embodiment of the present invention, and

FIG 6 illustrates a schematic partial perspective view of the cooking oven according to the preferred embodiment of the present invention.

[0025] FIG 1 illustrates a schematic partial exploded sectional side view of a cooking oven 10 according to a preferred embodiment of the present invention.

[0026] The cooking oven 10 comprises an oven cavity 12 and a cooling channel 14. The cooling channel 14 is arranged above the oven cavity 12. A cavity opening 16 is formed in a top wall of the oven cavity 12. A guiding channel 18 is formed in a bottom wall of the cooling channel 14. When the cooling channel 14 is put onto the oven cavity 12, then the cavity opening 16 and the guiding channel 18 are connected indirectly to each other.

[0027] A first structure 22 is formed around the cavity opening 16. A second structure 24 is formed around the guiding channel 18. The first structure 22 and the second structure 24 are formed complementary to each other. The first structure 22 and the second structure 24 provide a mechanical sealing between the cavity opening 16 and the guiding channel 18.

[0028] FIG 2 illustrates a more detailed schematic partial exploded sectional side view of the cooking oven 10 according to the preferred embodiment of the present invention.

[0029] The guiding channel 18 of the cooling channel 14 is arranged above the cavity opening 16 of the oven cavity 12. The first structure 22 around the cavity opening 16 and the second structure 24 around the guiding channel 18 are formed complementary to each other.

[0030] FIG 3 illustrates a schematic perspective view of the guiding channel 18 formed in the bottom wall of the cooling channel 14 for the cooking oven 10 according to the preferred embodiment of the present invention.

[0031] The second structure 24 is formed around the guiding channel 18. Said second structure 24 is formed complementary to the first structure 22 formed around the cavity opening 16. The second structure 24 is formed rotation-symmetrically in view of the guiding channel 18.

[0032] Preferably, the cooling channel 14 is made of carbon steel. Further, the cooling channel 14 may be made of stainless steel.

[0033] FIG 4 illustrates a schematic perspective view of the cavity opening 16 in the top wall of an oven cavity 12 for the cooking oven 10 according to the preferred embodiment of the present invention.

[0034] The first structure 22 is formed around the cavity opening 16. Said first structure 22 is formed complemen-

tary to the second structure 24 formed around the guiding channel 18. The first structure 22 is formed rotation-symmetrically in view of the cavity opening 16.

[0035] Preferably, the oven cavity 12 is made of carbon steel. Further, the oven cavity 12 may be made of stainless steel.

[0036] FIG 5 illustrates a schematic partial side view of the cooking oven 10 according to the preferred embodiment of the present invention.

[0037] The cooking oven 10 comprises the oven cavity 12 and the cooling channel 14, wherein the cooling channel 14 is arranged above the oven cavity 12. The first structure 22 around the cavity opening 16 and the second structure 24 around the guiding channel 18 are engaged with each other. The engagement between the first structure 22 and the second structure 24 provide the mechanical sealing between the cavity opening 16 and the guiding channel 18.

[0038] Any further sealing elements are not required.

[0039] FIG 6 illustrates a schematic partial perspective view of the cooking oven 10 according to the preferred embodiment of the present invention.

[0040] The cooking oven 10 comprises two side walls 20. The oven cavity 12 is attached at said side walls 20 by screws. Moreover, the cooling channel 14 is attached at the side walls 20 by screws.

[0041] At the assembling of the cooking oven 10, the oven cavity 12 is fixed to the housing of said cooking oven 10. Then, the cooling channel 14 is laid on the oven cavity 12, wherein the first structure 22 and the second structure 24 come into contact. The complementary surfaces of the first structure 22 and the second structure 24 align the correct position of the cooling channel 14 relative to the oven cavity 12. At last, the cooling channel 14 is fixed by screws to the housing of the cooking oven 10.

[0042] The cooling channel 14 and the oven cavity 12 are indirectly connected to each other.

[0043] Although an illustrative embodiment of the present invention has been described herein with reference to the accompanying drawings, it is to be understood that the present invention is not limited to that precise embodiment, and that various other changes and modifications may be affected therein by one skilled in the art. The scope of the invention is defined by the appended claims.

List of reference numerals

[0044]

10	cooking oven
12	oven cavity
14	cooling channel
16	cavity opening
18	guiding channel
20	side wall
22	first structure
24	second structure

Claims

1. A cooking oven (10) with an oven cavity (12) and a cooling channel (14), wherein:

- the oven cavity (12) includes at least one cavity opening (16) formed in a top wall of the oven cavity (12),
- the cooling channel (14) includes at least one guiding channel (18) formed in a bottom wall of the cooling channel (14),
- the cavity opening (16) is connected to the guiding channel (18),
- the cavity opening (16) is surrounded by a first structure (22),
- the guiding channel (18) is surrounded by a second structure (24), and
- the first structure (22) and the second structure (24) are formed complementary to each other.

2. The cooking oven according to claim 1, **characterised in that** the cooling channel (14) is arranged above the oven cavity (12).

3. The cooking oven according to claim 1 or 2, **characterised in that** the oven cavity (12) is fixed at a housing (20) of the cooking oven (10).

4. The cooking oven according to any one of the preceding claims, **characterised in that** the cooling channel (14) is fixed at the housing (20) of the cooking oven (10).

5. The cooking oven according to any one of the preceding claims, **characterised in that** the oven cavity (12) is fixed at side walls (20) of the cooking oven (10) by screws.

6. The cooking oven according to any one of the preceding claims, **characterised in that** the cooling channel (14) is fixed at the side walls (20) of the cooking oven (10) by screws.

7. The cooking oven according to any one of the preceding claims, **characterised in that** the first structure (22) is formed rotation-symmetrically in view of the cavity opening (16).

8. The cooking oven according to any one of the preceding claims, **characterised in that** the second structure (24) is formed rotation-symme-

trically in view of the guiding channel (18).

9. The cooking oven according to any one of the preceding claims, **characterised in that** the first structure (22) is embossed around the cavity opening (16).

10. The cooking oven according to any one of the preceding claims, **characterised in that** the second structure (24) is embossed around the guiding channel (18).

11. The cooking oven according to any one of the preceding claims, **characterised in that** the oven cavity (12) and the cooling channel (14) are indirectly connected to each other.

12. The cooking oven according to any one of the preceding claims, **characterised in that** the oven cavity (12) is made of carbon steel.

13. The cooking oven according to any one of the claims 1 to 11, **characterised in that** the oven cavity (12) is made of stainless steel.

14. The cooking oven according to any one of the preceding claims, **characterised in that** the cooling channel (14) is made of carbon steel.

15. The cooking oven according to any one of the claims 1 to 13, **characterised in that** the cooling channel (14) is made of stainless steel.

Patentansprüche

1. Garofen (10) mit einem Ofenhohlraum (12) und einem Kühlkanal (14), wobei:

- der Ofenhohlraum (12) mindestens eine Hohlraumöffnung (16) aufweist, die in einer oberen Wand des Ofenhohlraums (12) ausgebildet ist,
- der Kühlkanal (14) mindestens einen Führungskanal (18) aufweist, der in einer unteren Wand des Kühlkanals (14) ausgebildet ist,
- die Hohlraumöffnung (16) mit dem Führungskanal (18) verbunden ist,
- die Hohlraumöffnung (16) von einer ersten Struktur (22) umgeben ist,
- der Führungskanal (18) von einer zweiten Struktur (24) umgeben ist und

- die erste Struktur (22) und die zweite Struktur (24) komplementär zueinander ausgebildet sind.
2. Garofen nach Anspruch 1, **dadurch gekennzeichnet, dass** der Kühlkanal (14) über dem Ofenhohlraum (12) angeordnet ist.
3. Garofen nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Ofenhohlraum (12) an einem Gehäuse (20) des Garofens (10) befestigt ist.
4. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Kühlkanal (14) an dem Gehäuse (20) des Garofens (10) befestigt ist.
5. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Ofenhohlraum (12) mittels Schrauben an Seitenwänden (20) des Garofens (10) befestigt ist.
6. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Kühlkanal (14) mittels Schrauben an den Seitenwänden (20) des Garofens (10) befestigt ist.
7. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Struktur (22) bezüglich der Hohlraumöffnung (16) rotationssymmetrisch ausgebildet ist.
8. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die zweite Struktur (24) bezüglich des Führungskanals (18) rotationssymmetrisch ausgebildet ist.
9. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Struktur (22) um die Hohlraumöffnung (16) herum geprägt ist.
10. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die zweite Struktur (24) um den Führungskanal (18) herum geprägt ist.
11. Garofen nach einem der vorhergehenden Ansprüche,
- dadurch gekennzeichnet, dass** der Ofenhohlraum (12) und der Kühlkanal (14) indirekt miteinander verbunden sind.
12. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Ofenhohlraum (12) aus Kohlenstoffstahl besteht.
13. Garofen nach einem der Ansprüche 1 bis 11, **dadurch gekennzeichnet, dass** der Ofenhohlraum (12) aus Edelstahl hergestellt ist.
14. Garofen nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Kühlkanal (14) aus Kohlenstoffstahl hergestellt ist.
15. Garofen nach einem der Ansprüche 1 bis 13, **dadurch gekennzeichnet, dass** der Kühlkanal (14) aus Edelstahl hergestellt ist.
- Revendications**
1. Four de cuisson (10) avec une cavité de four (12) et un canal de refroidissement (14), dans lequel :
- la cavité de four (12) inclut au moins une ouverture de cavité (16) formée dans une paroi supérieure de la cavité de four (12),
 - le canal de refroidissement (14) inclut au moins un canal de guidage (18) formé dans une paroi inférieure du canal de refroidissement (14),
 - l'ouverture de cavité (16) est raccordée au canal de guidage (18),
 - l'ouverture de cavité (16) est entourée par une première structure (22),
 - le canal de guidage (18) est entouré par une seconde structure (24), et
 - la première structure (22) et la seconde structure (24) sont formées complémentirement l'une à l'autre.
2. Four de cuisson selon la revendication 1, **caractérisé en ce que** le canal de refroidissement (14) est agencé au-dessus de la cavité de four (12).
3. Four de cuisson selon la revendication 1 ou 2, **caractérisé en ce que** la cavité de four (12) est fixée au niveau d'un logement (20) du four de cuisson (10).
4. Four de cuisson selon l'une quelconque des revendications précédentes, **caractérisé en ce que**

le canal de refroidissement (14) est fixée au niveau du logement (20) du four de cuisson (10).

5. Four de cuisson selon l'une quelconque des revendications précédentes,
caractérisé en ce que
la cavité de four (12) est fixée au niveau de parois latérales (20) du four de cuisson (10) par des vis. 5
6. Four de cuisson selon l'une quelconque des revendications précédentes,
caractérisé en ce que
le canal de refroidissement (14) est fixée au niveau des parois latérales (20) du four de cuisson (10) par des vis. 10
15
7. Four de cuisson selon l'une quelconque des revendications précédentes,
caractérisé en ce que
la première structure (22) est formée symétriquement en rotation, en vue de l'ouverture de cavité (16). 20
8. Four de cuisson selon l'une quelconque des revendications précédentes,
caractérisé en ce que
la seconde structure (24) est formée symétriquement en rotation, en vue du canal de guidage (18). 25
9. Four de cuisson selon l'une quelconque des revendications précédentes,
caractérisé en ce que
la première structure (22) est gaufrée autour de l'ouverture de cavité (16). 30
10. Four de cuisson selon l'une quelconque des revendications précédentes,
caractérisé en ce que
la seconde structure (24) est gaufrée autour du canal de guidage (18). 35
40
11. Four de cuisson selon l'une quelconque des revendications précédentes,
caractérisé en ce que
la cavité de four (12) et le canal de refroidissement (14) sont indirectement raccordés l'un à l'autre. 45
12. Four de cuisson selon l'une quelconque des revendications précédentes,
caractérisé en ce que la cavité de four (12) est faite d'acier au carbone. 50
13. Four de cuisson selon l'une quelconque des revendications 1 à 11,
caractérisé en ce que
la cavité de four (12) est faite d'acier inoxydable. 55
14. Four de cuisson selon l'une quelconque des revendications précédentes,

caractérisé en ce que

le canal de refroidissement (14) est fait d'acier au carbone.

- 5 15. Four de cuisson selon l'une quelconque des revendications 1 à 13,
caractérisé en ce que
le canal de refroidissement (14) est fait d'acier inoxydable.

FIG 1

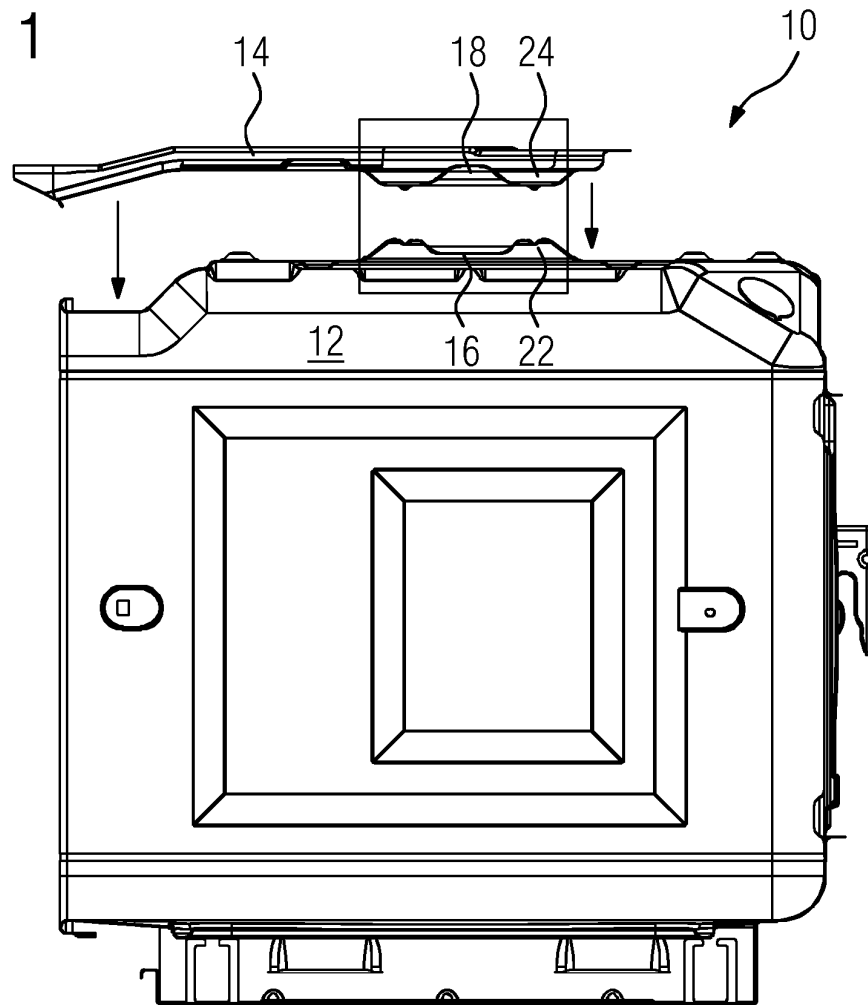


FIG 2

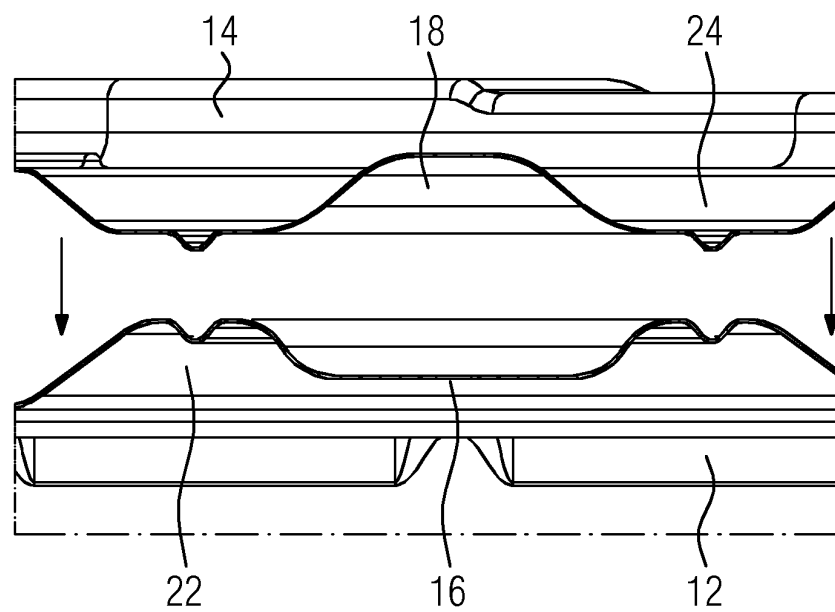


FIG 3

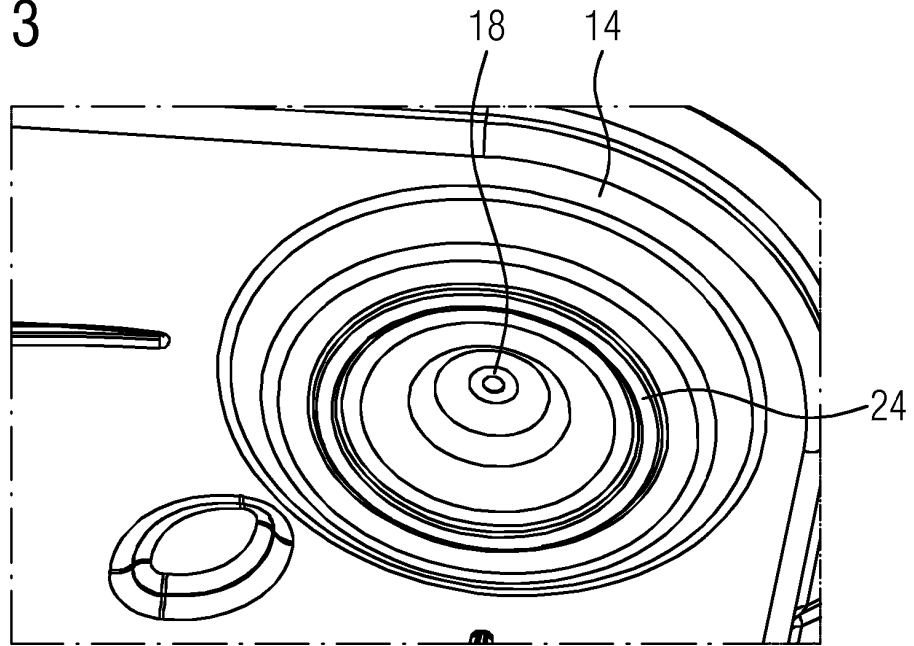


FIG 4

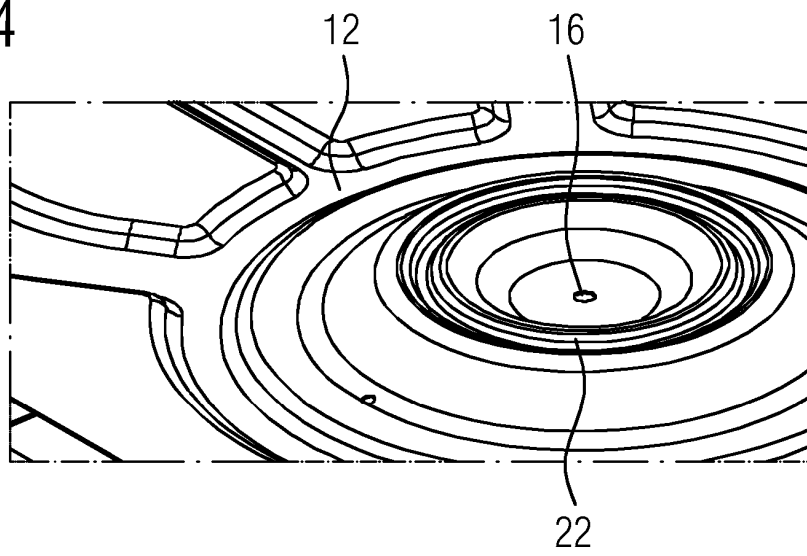


FIG 5

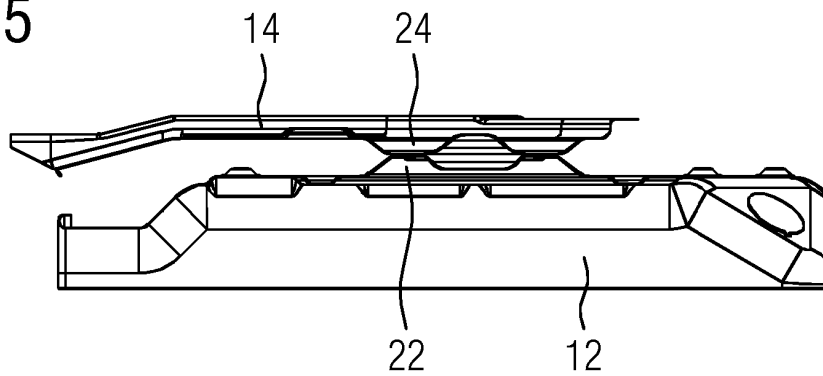
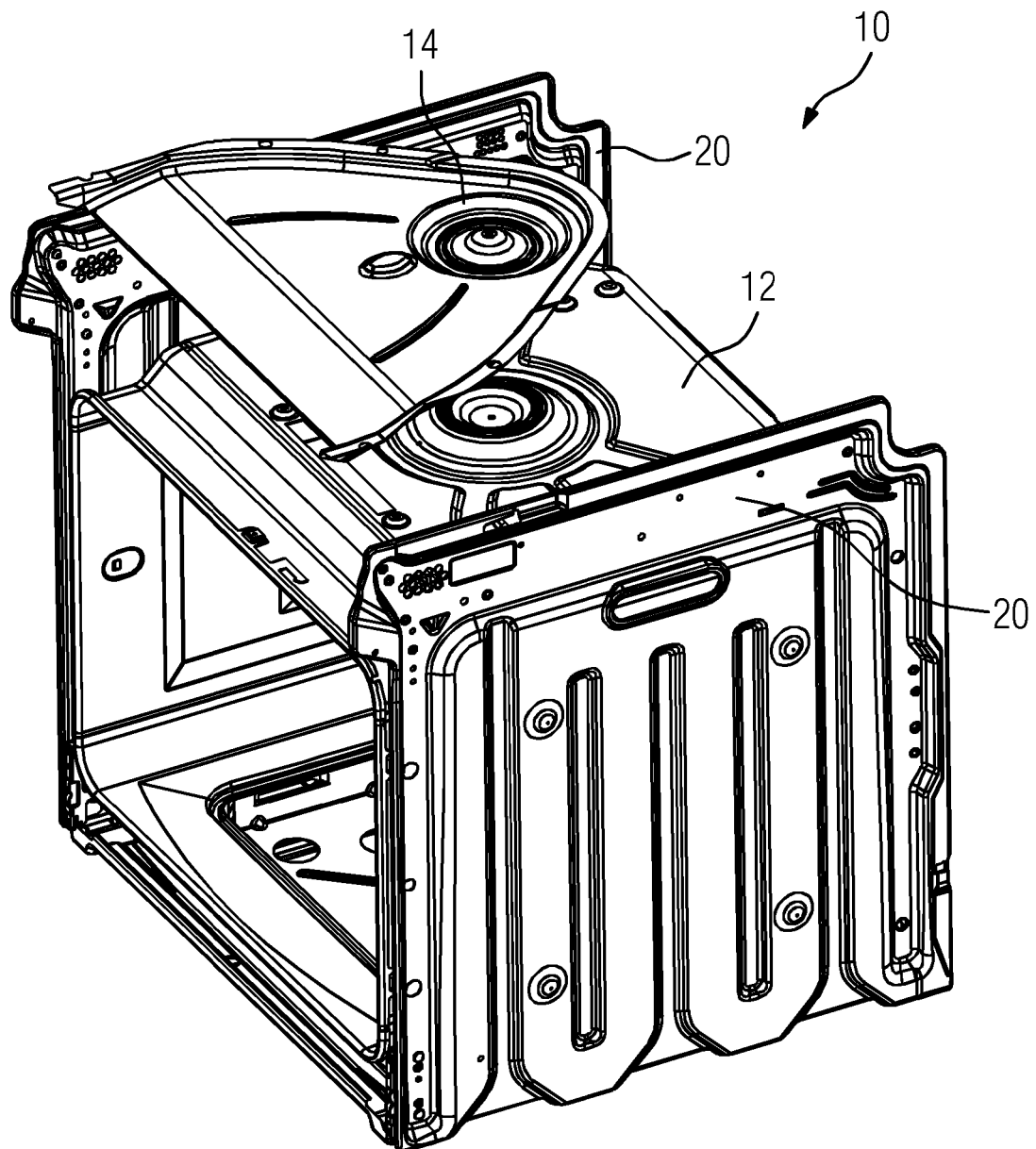


FIG 6



REFERENCES CITED IN THE DESCRIPTION

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