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(54) **AN OVEN WITH TWO COMPARTMENTS**

(57) The present invention relates to an oven (1) comprising a body (3); a cooking chamber (2) which is disposed in the body (3) and wherein the cooking process is performed; a fan protection plate (4) which forms the rear wall of the cooking chamber (2); a separator (5) which divides the cooking chamber (2) into an upper compartment (6) and a lower compartment (7); a first fan (10) which is disposed at the level of the upper compartment (6) between the fan protection plate (4) and the body (3); at least one first air hole (12) which is provided on the

fan protection plate (4) at the level of the first fan (10); a second fan (11) which is disposed at the level of the lower compartment (7) between the fan protection plate (4) and the body (3); at least one second air hole (13) which is provided on the fan protection plate (4) at the level of the second fan (11); and a wall (8) which extends between the fan protection plate (4) and the body (3), along the fan protection plate (4), and which separates the first fan (10) and the second fan (11) in an airtight manner.

EP 4 372 285 A1

Description

[0001] The present invention relates to an oven which is divided into the compartments, wherein separate cooking processes are carried out in two separate compartments.

[0002] In ovens where the cooking process is carried out in separate compartments by being divided into two compartments, the user divides the cooking chamber into two compartments, upper and lower, with a separator. The separator is generally mounted in the cooking chamber by being slid in the horizontal plane. In this type of state of the art ovens, a separate heater and fan are used for each compartment. This ensures that each compartment cooks different foods at different temperatures.

[0003] Different functions can be operated at different temperatures in ovens which can be divided into two compartments by means of the separator. In order for the functions selected in different compartments to work correctly and to obtain the correct temperatures set in said compartments, heat and air transfer between the two compartments must be minimized. Moreover, it is desired that the odors do not mix while cooking different types of foodstuffs in different compartments.

[0004] In the state of the art embodiments, since there is heat transfer from the high-temperature compartment to the low-temperature compartment, it becomes difficult to obtain highly different temperatures between the two compartments. However, even if two separate compartments are obtained in the ovens which are divided into two compartments by means of the separator, the odor of different foodstuffs in the separate compartments mixes with each other through the gap between the fan protection plate and the oven casing. Moreover, after the separator is placed in the oven, homogeneous cooking cannot be performed in either compartment due to the air circulation which occurs at the leak points. Again, in the ovens divided into two compartments by means of the separator, heat transfer occurs between the compartments due to the gap between the fan protection plate and the oven casing, and the temperatures set as mentioned above cannot be reached.

[0005] In the state of the art ovens which are divided into two by means of the separator, the air passage between the compartments while performing functions with the fan due to the gap between the fan protection plate and the oven casing prevents homogeneous cooking.

[0006] In the state of the art United States Patent No. US7087863, an oven is disclosed, which is divided into two compartments and which can perform cooking at two different temperatures.

[0007] In the state of the art International Patent Application No. WO2013050546, an oven is disclosed, which is divided into two compartments, upper and lower, by means of a separator.

[0008] Another state of the art embodiment is disclosed in United States Patent Application No. US2002060215. This document describes an oven which is divided into

two compartments by means of a separator, and the heaters located next to each compartment can be installed and removed.

[0009] The aim of the present invention is the realization of an oven which is divided into the compartments, wherein separate cooking processes are carried out in two separate compartments.

[0010] The oven realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a body; a cooking chamber which is disposed in the body and wherein the cooking process is performed; a fan protection plate which forms the rear wall of the cooking chamber; a separator which divides the cooking chamber into a lower compartment and an upper compartment; a first fan which is disposed at the level of the upper compartment between the fan protection plate and the body; at least one first air hole which is provided on the fan protection plate at the level of the first fan; a second fan which is disposed at the level of the lower compartment between the fan protection plate and the body; at least one second air hole which is provided on the fan protection plate at the level of the second fan; and a wall which extends between the fan protection plate and the body, along the fan protection plate, and which separates the first fan and the second fan in an airtight manner.

[0011] Thus, since air passage from the lower compartment to the upper compartment and from the upper compartment to the lower compartment is prevented between the fan protection plate and the rear wall of the body, the mixing of odors between the lower and upper compartments is prevented during different cooking operations in the lower and upper compartments. Moreover, during the cooking process in each of the lower and upper compartments, heat transfer in the area between the fan protection plate and the rear wall of the body is minimized. Thus, the thermal effectiveness of the lower and upper compartments is increased and energy losses are minimized. Moreover, by closing the gap between the fan protection plate and the rear wall of the body, the air to be blown into the lower and upper compartments by the first and second fans during the cooking process in the lower and upper compartments is prevented from passing from the lower compartment to the upper compartment or from the upper compartment to the lower compartment such that homogeneous cooking is ensured in the lower and upper compartments. Furthermore, since sealing is provided in the area between the fan protection plate and the rear wall of the body, the mixing of lower and upper compartment air is prevented, thus eliminating inefficiency and flow rate reduction.

[0012] In an embodiment of the present invention, the wall placed between the fan protection plate and the rear wall of the body in order to prevent air passage between the lower and upper compartments is a sheet metal profile. In this embodiment of the present invention, the wall completely closes the gap between the fan protection plate and the rear wall. Thus, homogeneous cooking is

ensured in the lower and upper compartments by preventing the air blown into the upper compartment by the first fan and into the lower compartment by the second fan from passing between the lower and upper compartments.

[0013] In another embodiment of the present invention, the wall has a hollow quadrangular profile. In this embodiment of the present invention, one short edge of the wall contacts the rear surface of the fan protection plate, and the other short edge contacts the front surface of the rear wall of the body. In the preferred embodiment of the present invention, the inside of the wall in the form of a quadrangular profile is filled with sealing material. Thus, air tightness is ensured between the upper compartment and the lower compartment and thermal conduction is minimized. Preferably, insulation materials with low thermal conductivity coefficients such as glass wool, rock wool, stone wool and ceramic wool are used as sealing materials.

[0014] In another embodiment of the present invention, the oven comprises a "U" shaped wall, the open end of which contacts the rear surface of the fan protection plate. When the wall is mounted in place, the open end is closed with the fan protection plate, thus creating a closed volume. In this embodiment, the open end of the wall is closed with the "U" shaped recess of the fan protection plate. Thus, by extending the path for the passage of air, the pressure is increased and air leakage is minimized.

[0015] In another embodiment of the present invention, the oven comprises two arms which extend from the upper and lower surfaces of the wall to bear against the rear surface of the fan protection plate. Thus, the wall is joined with the fan protection plate by means of the arms, creating a closed volume. In this embodiment of the present invention, the oven comprises a sealing member which is disposed between the arms and the fan protection plate in order to ensure complete sealing on the surfaces of the arms in contact with the rear surface of the fan protection plate.

[0016] By means of the present invention, since air passage from the lower compartment to the upper compartment and from the upper compartment to the lower compartment is prevented between the fan protection plate and the rear wall of the body, the mixing of odors between the lower and upper compartments is prevented during different cooking operations in the lower and upper compartments. Moreover, during the cooking process in each of the lower and upper compartments, heat transfer in the area between the fan protection plate and the rear wall of the body is minimized. Thus, the thermal effectiveness of the lower and upper compartments is increased and energy losses are minimized. In addition, the problem of not manufacturing the fan protection plate by the deep drawing method and the problem of not using enamel in the middle part of the fan protection plate due to the coating depth are eliminated.

[0017] An oven realized in order to attain the aim of the present invention is illustrated in the attached figures,

where:

Figure 1 - is the sideways perspective view of the oven.

Figure 2 - is the cross-sectional perspective view of the oven.

Figure 3 - is the cross-sectional view of an embodiment of the present invention.

Figure 4 - is the cross-sectional view of another embodiment of the present invention.

Figure 5 - is the cross-sectional view of yet another embodiment of the present invention.

Figure 6 - is the cross-sectional view of another embodiment of the present invention.

Figure 7 - is the cross-sectional view of yet another embodiment of the present invention.

[0018] The elements illustrated in the figures are numbered as follows:

1. Oven
2. Cooking chamber
3. Body
4. Fan protection plate
5. Separator
6. Upper compartment
7. Lower compartment
8. Wall
9. Arm
10. First fan
11. Second fan
12. First air hole
13. Second air hole
14. Sealing member

[0019] The oven (1) comprises a body (3); a cooking chamber (2) which is disposed in the body (3) and where-in the cooking process is performed; a fan protection plate (4) which forms the rear wall of the cooking chamber (2);

a separator (5) which divides the cooking chamber (2) into an upper compartment (6) and a lower compartment (7); a first fan (10) which is disposed at the level of the upper compartment (6) between the fan protection plate (4) and the body (3); at least one first air hole (12) which is provided on the fan protection plate (4) at the level of the first fan (10); a second fan (11) which is disposed at the level of the lower compartment (7) between the fan protection plate (4) and the body (3); at least one second air hole (13) which is provided on the fan protection plate (4) at the level of the second fan (11); and a wall (8) which extends between the fan protection plate (4) and the body (3), along the fan protection plate (4), and which separates the first fan (10) and the second fan (11) in an airtight manner (Figure 1 and Figure 2).

[0020] Thus, since air passage from the lower compartment (7) to the upper compartment (6) and from the upper compartment (6) to the lower compartment (7) is prevented between the fan protection plate (4) and the rear wall of the body (3), the mixing of odors between the upper and lower compartments (6 and 7) is prevented during different cooking operations in the upper and lower compartments (6 and 7). Moreover, during the cooking process in each of the upper and lower compartments (6 and 7), heat transfer in the area between the fan protection plate (4) and the rear wall of the body (3) is minimized. Thus, the thermal effectiveness of the upper and lower compartments (6 and 7) is increased and energy losses are minimized. Moreover, by closing the gap between the fan protection plate (4) and the rear wall of the body (3), the air to be blown into the upper and lower compartments (6 and 7) by the first and second fans (10 and 11) during the cooking process in the upper and lower compartments (6 and 7) is prevented from passing from the lower compartment (7) to the upper compartment (6) or from the upper compartment (6) to the lower compartment (7) such that homogeneous cooking is ensured in the upper and lower compartments (6 and 7). Furthermore, since sealing is provided in the area between the fan protection plate (4) and the rear wall of the body (3), the mixing of upper and lower compartment (6 and 7) air is prevented, thus eliminating inefficiency and flow rate reduction.

[0021] In the embodiment of the present invention, the wall (8) and the separator (5) are aligned on the same horizontal plane.

[0022] In an embodiment of the present invention, the wall (8) placed between the fan protection plate (4) and the rear wall of the body (3) in order to prevent air passage between the upper and lower compartments (6 and 7) is a sheet metal profile. In this embodiment of the present invention, the wall (8) completely closes the gap between the fan protection plate (4) and the rear wall. Thus, homogeneous cooking is ensured in the upper and lower compartments (6 and 7) by preventing the air blown into the upper compartment (6) by the first fan (10) and into the lower compartment (7) by the second fan (11) from passing between the upper and lower compartments (6

and 7).

[0023] In another embodiment of the present invention, the wall (8) has a hollow quadrangular profile. In this embodiment of the present invention, one short edge of the wall (8) contacts the rear surface of the fan protection plate (4), and the other short edge contacts the front surface of the rear wall of the body (3) (Figure 3). In the preferred embodiment of the present invention, the inside of the wall (8) in the form of a quadrangular profile is filled with sealing material. Thus, air tightness is ensured between the upper compartment (6) and the lower compartment (7) and thermal conduction is minimized. Preferably, insulation materials with low thermal conductivity coefficients such as glass wool, rock wool, stone wool and ceramic wool are used as sealing materials (Figure 4).

[0024] In another embodiment of the present invention, the oven (1) comprises a "U" shaped wall (8), the open end of which contacts the rear surface of the fan protection plate (4). When the wall (8) is mounted in place, the open end is closed with the fan protection plate (4), thus creating a closed volume. In this embodiment, the open end of the wall (8) is closed with the "U" shaped recess of the fan protection plate (4). Thus, by extending the path for the passage of air, the pressure is increased and air leakage is minimized (Figure 7).

[0025] In another embodiment of the present invention, the oven (1) comprises two arms (9) which extend from the upper and lower surfaces of the wall (8) to bear against the rear surface of the fan protection plate (4). Thus, the wall (8) is joined with the fan protection plate (4) by means of the arms (9), creating a closed volume. In this embodiment of the present invention, the oven (1) comprises a sealing member (14) which is disposed between the arms (9) and the fan protection plate (4) in order to ensure complete sealing on the surfaces of the arms (9) in contact with the rear surface of the fan protection plate (4) (Figure 5 and Figure 6).

[0026] By means of the present invention, since air passage from the lower compartment (7) to the upper compartment (6) and from the upper compartment (6) to the lower compartment (7) is prevented between the fan protection plate (4) and the rear wall of the body (3), the mixing of odors between the upper and lower compartments (6 and 7) is prevented during different cooking operations in the upper and lower compartments (6 and 7). Moreover, during the cooking process in each of the upper and lower compartments (6 and 7), heat transfer in the area between the fan protection plate (4) and the rear wall of the body (3) is minimized. Thus, the thermal effectiveness of the upper and lower compartments (6 and 7) is increased and energy losses are minimized. In addition, the problem of not manufacturing the fan protection plate (4) by the deep drawing method and the problem of not using enamel in the middle part of the fan protection plate (4) due to the coating depth are eliminated.

Claims

1. An oven (1) **comprising** a body (3); a cooking chamber (2) which is disposed in the body (3) and wherein the cooking process is performed; a fan protection plate (4) which forms the rear wall of the cooking chamber (2); a separator (5) which divides the cooking chamber (2) into an upper compartment (6) and a lower compartment (7); a first fan (10) which is disposed at the level of the upper compartment (6) between the fan protection plate (4) and the body (3); at least one first air hole (12) which is provided on the fan protection plate (4) at the level of the first fan (10); a second fan (11) which is disposed at the level of the lower compartment (7) between the fan protection plate (4) and the body (3); and at least one second air hole (13) which is provided on the fan protection plate (4) at the level of the second fan (11); **characterized by** a wall (8) which extends between the fan protection plate (4) and the body (3), along the fan protection plate (4), and which separates the first fan (10) and the second fan (11) in an airtight manner.

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2. An oven (1) as in Claim 1, **characterized by** the wall (8) which is located on the same horizontal plate as the separator (5).

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3. An oven (1) as in Claim 1, **characterized by** the wall (8) manufactured from sheet metal profile, placed between the fan protection plate (4) and the rear wall of the body (3) in order to prevent air passage between the upper and lower compartments (6 and 7).

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4. An oven (1) as in Claim 3, **characterized by** the wall (8) which has a hollow quadrangular profile.

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5. An oven (1) as in Claim 3 or 4, **characterized by** the wall (8) which has sealing material therein.

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6. An oven (1) as in Claim 1, **characterized by** a "U" shaped wall (8), the open end of which contacts the rear surface of the fan protection plate (4).

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7. An oven (1) as in Claim 1, **characterized by** two arms (9) which extend from the upper and lower surfaces of the wall (8) to bear against the rear surface of the fan protection plate (4).

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8. An oven (1) as in Claim 7, **characterized by** a sealing member (14) which is disposed between the arms (9) and the fan protection plate (4) in order to ensure complete sealing on the surfaces of the arms (9) in contact with the rear surface of the fan protection plate (4).

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Figure 1

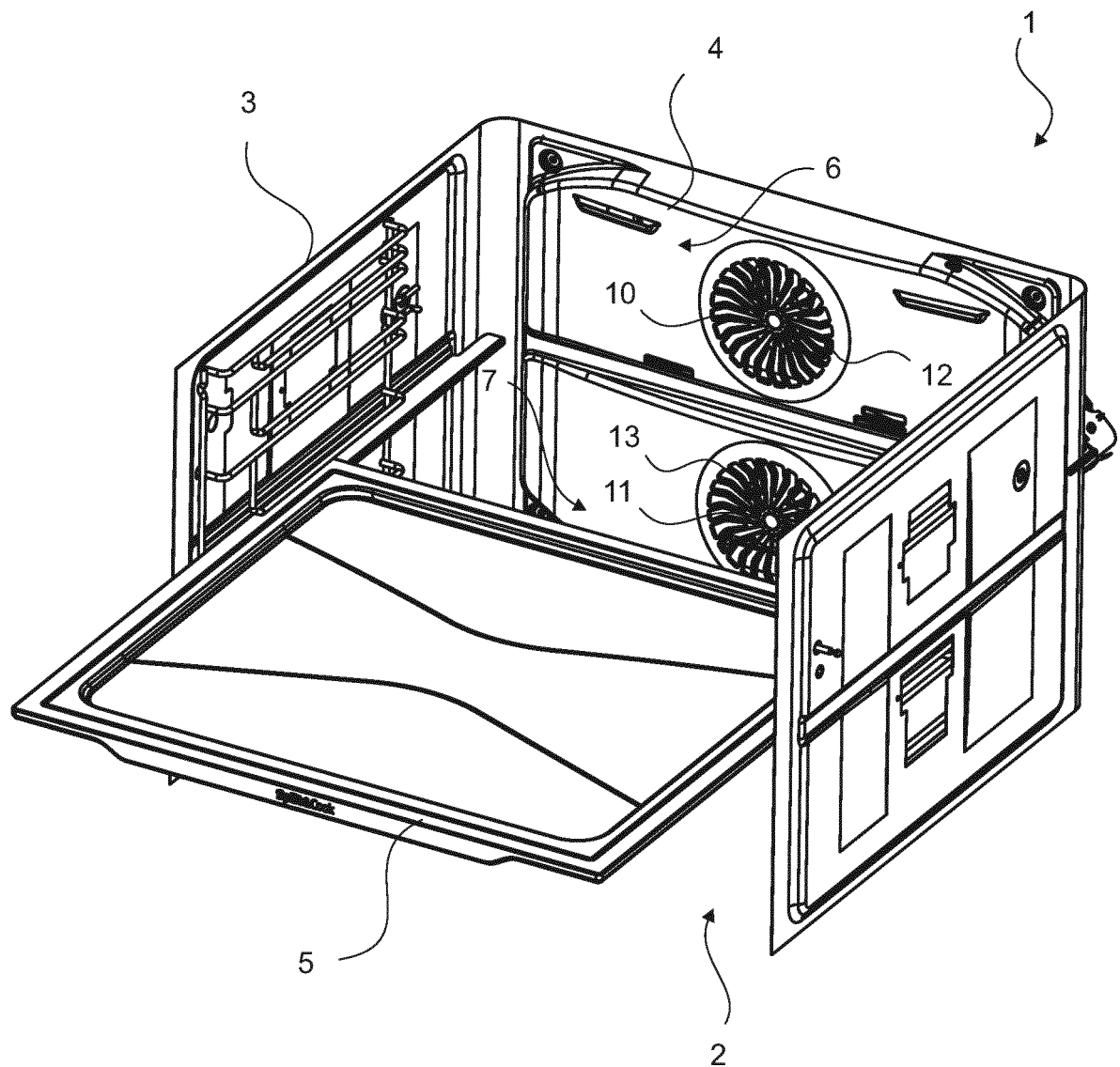


Figure 2

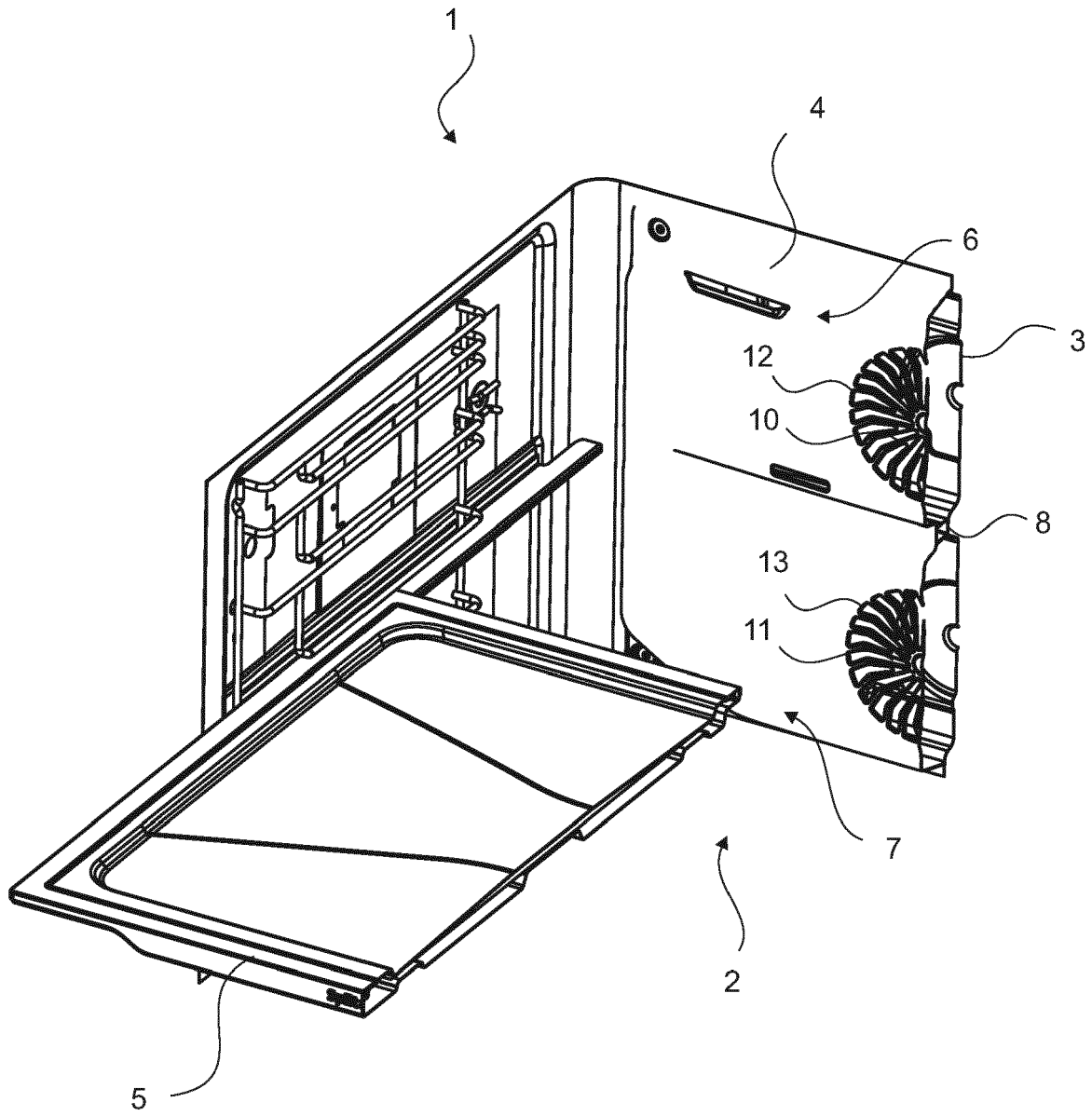


Figure 3

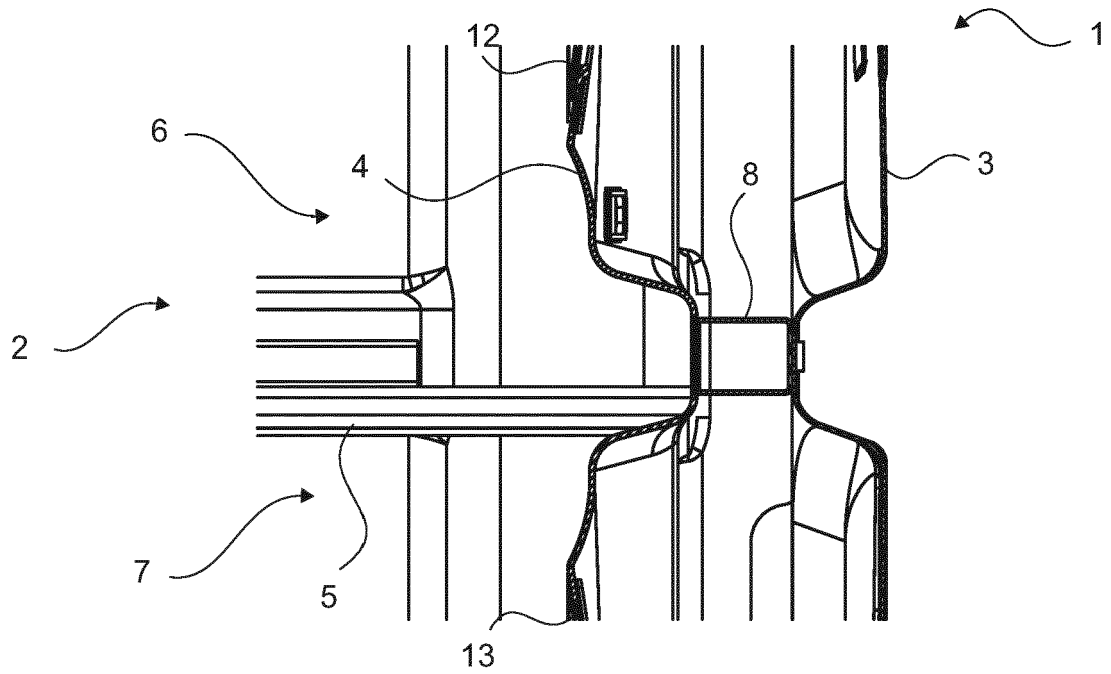


Figure 4

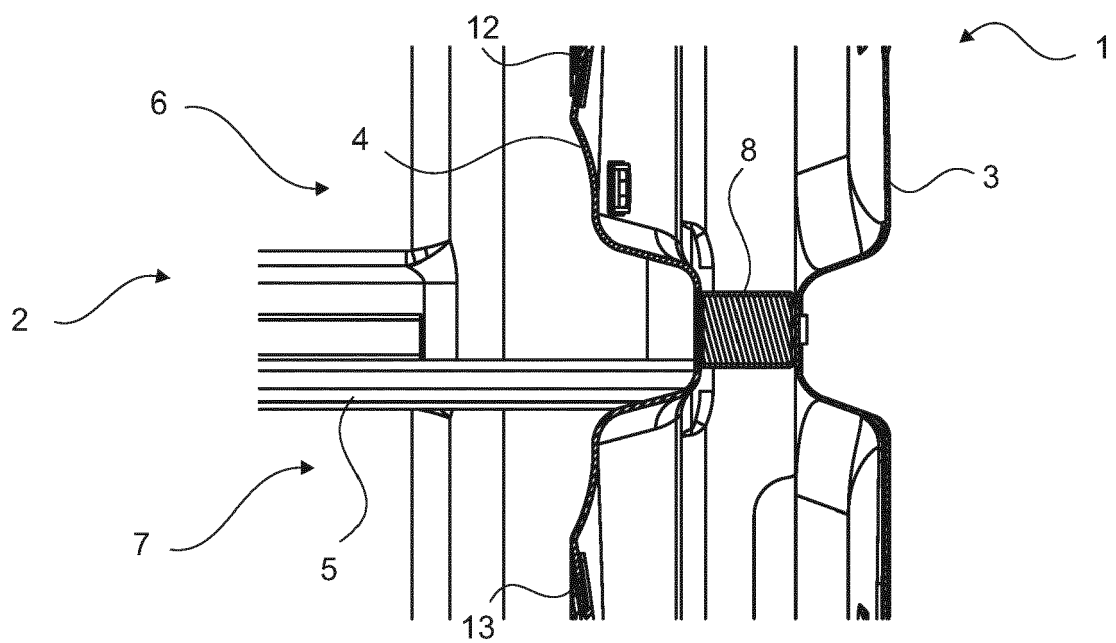


Figure 5

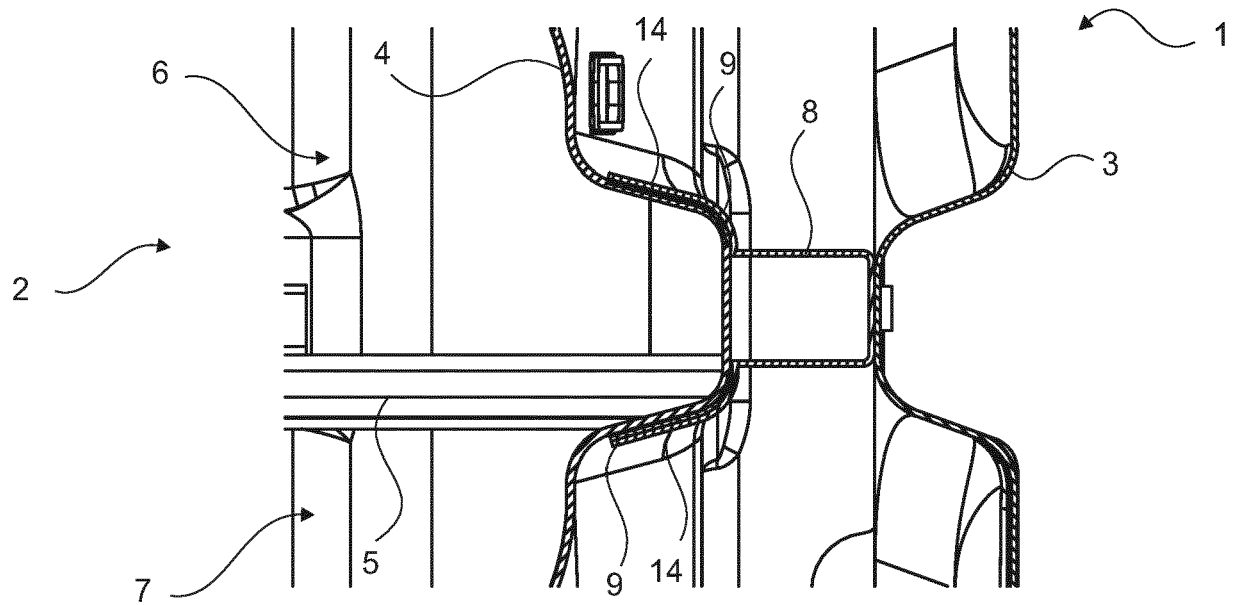


Figure 6

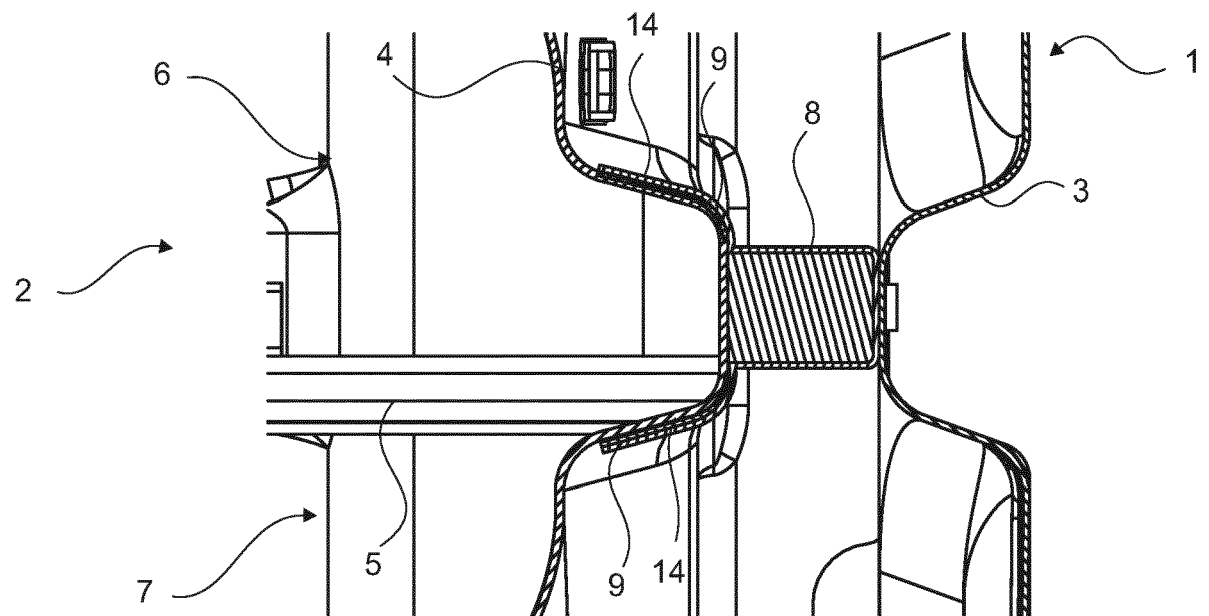
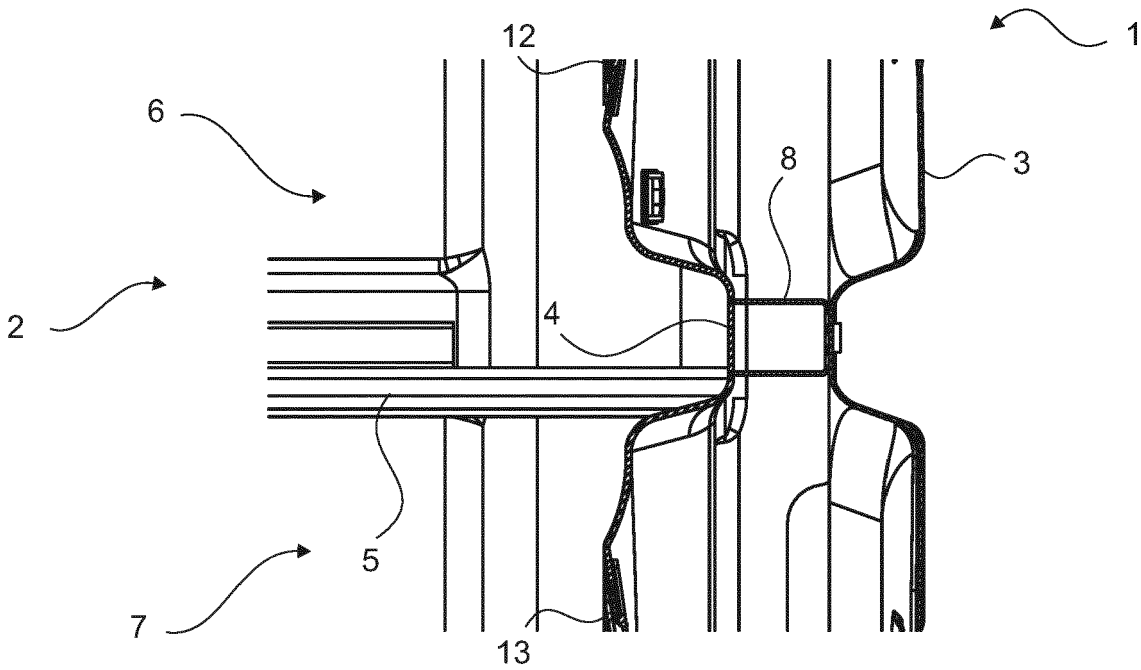


Figure 7





EUROPEAN SEARCH REPORT

Application Number

EP 23 20 7205

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EPO FORM 1503 03.82 (P04C01)

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			TECHNICAL FIELDS SEARCHED (IPC)
			F24C H05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 March 2024	Examiner Meyers, Jerry
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	

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 23 20 7205

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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06-03-2024

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