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(54) **Steam oven with a gasket**

Dampfofen mit einer Dichtung

Four à vapeur avec un joint

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(73) Proprietor: **Electrolux Appliances Aktiebolag
105 45 Stockholm (SE)**

(72) Inventors:
• **Böckler, Marco
91541 Rothenburg ob der Tauber (DE)**

• **Ivanovic, Branko
91541 Rothenburg ob der Tauber (DE)**
• **Walter, Matthias
91541 Rothenburg ob der Tauber (DE)**

(74) Representative: **Electrolux Group Patents
AB Electrolux
Group Patents
105 45 Stockholm (SE)**

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Description

[0001] The present application is directed to a steam oven comprising a gasket with at least one longitudinally extending hollow chamber for providing a sealing between a structure surrounding a cooking chamber of the steam oven and a corresponding closure member.

[0002] In cooking appliances such as ovens, microwaves, steamers or combinations thereof for example gaskets are provided between the cooking chamber of the cooking appliance and a corresponding closure member such as a door or lid to avoid fluctuation in temperature and / or escaping of steam. The gasket can be provided at the closure member of the cooking appliance and / or at the circumference of the cooking chamber of the cooking appliance itself which is closed by the closure member. Such a cooking appliance with a gasket is known from GB 723 277 A for example. The gasket is formed as a tube and is made of silicone rubber or glass fibre woven into a tube.

[0003] To avoid injuries of the users and to achieve reliable and optimum cooking results of a cooking appliance a complete continuous sealing around the circumference of the cooking chamber is required. For this purpose circumferential or so-called endless gaskets which form a "closed loop" are used which are installed at a structure surrounding the cooking chamber and / or at a corresponding closure member. Different approaches are known to build such endless gaskets. In US 3 812 316 A a termination band is wrapped around the free ends of a gasket to form a junction thereof to effect a complete seal around the entire periphery of the cavity opening of an oven. The termination band is secured to the free ends by stapling or sewing. Another endless gasket for being mounted around an oven door window is known from US 2004/0026874 A1. The known gasket comprises a length of rope formed by a plurality of interwoven fibrous glass yarns with two free ends wherein the ends of the rope are brought together to form a joint. A termination sleeve is positioned around the joint formed by the two free ends to keep the joint secure and the rope from fraying. The termination sleeve is a preformed tube sufficiently soft to essentially conform to the shape of the rope at the joint. In DE 103 50 197 B4 the free ends of a gasket are connected with each other by heat-resistant adhesive. A sleeve is putted on the blunt ends of the gasket whose joints are arranged opposite to another and form a butt joint. In the overlap area where the sleeve encloses the free ends the sleeve and / or the ends are wetted with adhesive to form an adhesive joint. In operation it has turned out that due to the larger diameter of the gasket in the area of the termination band or sleeve its effectiveness as sealing device is reduced. Furthermore, it has turned out that modifications on oven door window should be provided to be able to properly arrange the gasket with its varying diameter due to the termination band or sleeve to avoid sealing problems.

[0004] In DE 10 2004 039 434 A1 a gasket for a cooking

appliance which consists of two parts, namely a rope of glass fibre with a tubular and a strip-shaped part and a sealing structure partially connected to the outer part of the rope is disclosed. To build an endless gasket the free ends of the rope are connected with a solid plug arranged within the tubular part of the rope. A further endless gasket made from metal wires and glass fibre yarns for devices subject to modest heating and potential internal fire or explosion is known from US 2013/097937 A1. To form a closed-loop gasket a thick walled reinforcement member is jammed into each of the butted ends of the gasket. EP 2 330 356 A1 discloses a cooking appliance with a gasket with a rope core made from glass fibres and metal wires which is coated with a seal body. To form a closed-loop gasket the use of gluing technology or plug-in technology is suggested. To mount a gasket to the door of a thermal device US 2005/198909 A1 suggests to use fasteners which also connects a tubular supporting frame and a tubular sealing layer of the gasket with each other.

[0005] It is an object of the present invention to remove the problems and inconveniences observed with state of the art. In particular a steam oven comprising an endless gasket which ensures a homogeneous sealing behaviour between a cooking chamber and a corresponding closure member of the steam oven and which can be easily installed shall be provided.

[0006] This object is solved by claim 1. Embodiments in particular result from respective dependent claims.

[0007] According to claim 1, a steam oven comprising a gasket with at least one longitudinally extending hollow chamber for providing a sealing between a structure surrounding a cooking chamber of the steam oven and a corresponding closure member is provided. The gasket comprises two free ends, wherein the free ends are connected with each other by an adhesive to form a butt joint and wherein a reinforcement sleeve is arranged within the at least one longitudinally extending hollow chamber of the gasket in the area of the butt joint. By connecting the free ends an endless or so-called "closed loop" gasket is built. It is expedient that the free ends of the gasket are pushed onto the reinforcement sleeve to arrange the reinforcement sleeve within the at least one hollow chamber of the gasket.

[0008] The term "sleeve" shall mean any type of a tubular element, which is flexible in radial direction.

[0009] The term "tubular" shall mean providing an hollow interior of any form, for example circular, elliptical, oval or channel-shaped.

[0010] The gasket as well as the reinforcement sleeve may have any outer contour, for example a profiled outer contour. The at least one longitudinally extending hollow chamber of the gasket and also the hollow interior of the reinforcement sleeve can have a cross section of any form. The gasket may be a tubular gasket of any outer contour with or without one or more sealing lips wherein the hollow interior of the gasket forms a longitudinally extending hollow chamber. The gasket may also be a so-called "hollow section gasket", a gasket providing one

or more longitudinally extending hollow chambers with any outer contour and with or without sealing lips. If the gasket provides more than one longitudinally extending hollow chamber only one, some or all may provide a reinforcement sleeve. Adapted to the requirements of the cooking appliance different types of reinforcement sleeves may be used in the several hollow chambers.

[0011] The invention is based on the recognition that irregularities on the outer contour in the area of a butt joint of a gasket causing sealing problems - for example due to diameter variations or outer profile variations due to an outer jacket surrounding the the butt joint or due to a thick seam or staples used to connect the free ends of a gasket - can be avoided if the free ends of a gasket are connected with each other by an adhesive. For this purpose it is appropriate to wet the end faces of the free ends of the gasket with an adhesive. Thereby a splice between the free ends of a gasket can be established which does not cause any irregularities on the outer contour of the gasket.

[0012] Further on, the invention is based on the recognition that a butt joint is a weak point in a gasket which shall be used to provide a sealing between the cooking chamber of a steam oven and its oven door. If the butt joint breaks open the free ends of the gasket can come loose and the effectiveness of sealing is lessened or even no longer existent.

[0013] Moreover, the invention is based on the consideration that especially during the assembly of a gasket it is sometimes necessary to stretch and / or bend the gasket to put it into the correct position at the circumference of the cooking chamber and / or at the corresponding door or lid of the steam oven. The arising tensile forces and / or bending forces can cause a partial or complete ripping of a gasket at its weak point, the butt joint. In particular bending forces perpendicular to the splice area of a butt joint of a gasket during mounting or during thermal load can easily destroy the butt joint and therewith the sealing capability of the gasket.

[0014] The applicant has found that by arranging a reinforcement sleeve within a longitudinally extending hollow chamber of a gasket in the area of a butt joint not only "unplanned" irregularities on the outer contour of a gasket can be avoided, but also a ripping of the butt joint at the splice between the free ends of a gasket can be avoided. By providing a reinforcement sleeve within a hollow chamber of the gasket the butt joint formed by the via an adhesive connected free ends of the gasket can support the splice between the end faces of the free ends. Thereby ripping or damage of the butt joint can be avoided and a homogeneous sealing effect between cooking chamber and closure member of the steam oven can be achieved.

[0015] In embodiments of the steam oven the outer contour of the reinforcement sleeve is adapted to the inner contour of the at least one longitudinally extending hollow chamber of the gasket. Hereby a consistent support of the butt joint or rather the splice can be achieved

because the outer contour can lie against the inner contour.

[0016] According to the invention the reinforcement sleeve is made from a material of less flexibility in comparison to the material of the gasket. Thereby tensile forces and / or bending forces occurring during assembly of the gasket or thermal load during use of the gasket can be at least partially "absorbed" or compensated by the areas of the gasket beyond the area of the gasket containing the reinforcement sleeve. In contrary to reinforcement sleeves made from the same material as the gasket these reinforcement sleeves will not bend so strongly if the gasket suffers stretching and / or bending, rather the areas of the gasket beyond the area of the gasket containing the reinforcement sleeve will be stretched or bent first. Hereby the risk of damaging of the butt joint or rather a break up of the splice can be reduced. Fitting or replacement of the gasket around the cooking chamber or at the corresponding closure member of the cooking appliance will be facilitated.

[0017] According to the invention the gasket is made from a material based on silicone. Silicone based materials, for example silicone rubber are especially suited for gaskets for cooking appliances because they can withstand high temperatures and provide a gas-tight seal because of their resilience.

[0018] In embodiments of the steam oven the reinforcement sleeve is made from glass fibre reinforced plastic, also called "fibreglass". The plastic material may be epoxy, a thermosetting plastic or thermoplastic. In particular glass fibre reinforced plastic with a plastic matrix of thermosetting plastic is an advantageous material for the reinforcement sleeve: Because due to the three-dimensional network of bonds it is strong and suited for high-temperature applications. Hence it is especially suited for gaskets of cooking appliances. Moreover, a reinforcement sleeve made from glass fibre reinforced plastic still provides flexibility in radial direction, whereby the sealing function of the gasket can be maintained even in the area where the reinforcement sleeve is arranged. Hereby a safe cooking appliance can be provided with which injuries of users can be avoided and stable conditions within the cooking chamber can be achieved.

[0019] In particular in the embodiment with a reinforcement sleeve made from glass fibre reinforced plastic the gasket may be made of a material based on silicone. In this version the reinforcement sleeve comprises a lower flexibility in comparison to the gasket itself, whereby possible forces occurring during assembly of the gasket in the cooking appliance or use of the cooking appliance will have a stronger effect on the areas of the gasket beyond the area of the gasket containing the fibreglass reinforcement sleeve. Through this strain onto the butt joint can be reduced and a ripping of the butt joint avoided.

[0020] In particular in the embodiment with a reinforcement sleeve made from glass fibre reinforced plastic the flexibility of the reinforcement sleeve can adapted by additionally providing a wire mesh, especially a metal-wire

mesh. Dependent on the material of the gasket the flexibility of the reinforcement sleeve can be reduced in a targeted manner by providing a wire mesh of corresponding mesh size or material thickness.

[0021] In embodiments of the steam oven the reinforcement sleeve is made from glass fibre fabric. Glass fibre is an inert material which is heat-resistant and insensitive to steam or moisture and therefore especially suited for gaskets for cooking appliances. Further on, a reinforcement sleeve made from glass fibre fabric is flexible in radial direction whereby the sealing effect of the gasket in the area with the reinforcement sleeve can be maintained because a deformation of the reinforcement sleeve is possible. In particular, the glass fibre fabric can be impregnated or coated with silicone. In this version the reinforcement sleeve can be especially used with a gasket made from a material based on silicone.

[0022] In particular, the glass fibre fabric is knitted or braided. Dependent on mesh size of the fabric or strength of braiding the flexibility of the reinforcement sleeve can be adapted to the flexibility of the gasket. Especially the flexibility of the reinforcement sleeve can be reduced in a targeted manner, so that its flexibility is lower in comparison to the flexibility of the gasket for better protection of the butt joint or rather the splice from ripping or breaking open.

[0023] In embodiments of the steam oven the reinforcement sleeve is made from wire fabric, in particular from metal wire fabric. As well as glass fibre fabric wire fabric can withstand high temperatures whereby it is suited to be used for gaskets for cooking appliances.

[0024] In embodiments of the steam oven the reinforcement sleeve is made from a combination of glass fibre fabric and wire fabric. Thereby it is possible that the reinforcement sleeve comprises a sleeve made from glass fibre fabric which is surrounded by a sleeve of wire fabric or vice versa. However, it is also possible that glass fibres and wires are knitted or braided with each other to form a sleeve. Through corresponding choice of mesh size and / or thickness of the glass fibre or the wire or the percentage share of glass fibre and wire in a "mixed" sleeve the flexibility of the reinforcement sleeve can easily adapted to provide a suited support of the butt joint or rather the splice.

[0025] With same advantages as mentioned before in embodiments in which the reinforcement sleeve is made of glass fibre fabric in embodiments in which the reinforcement sleeve is made from wire fabric or made from a combination of glass fibre fabric and wire fabric a coating or impregnation with silicone can be provided. Further on, the flexibility can be adjusted by choice of mesh size of the fabric or strength of braiding if the fabric is knitted or braided.

[0026] In embodiments of the steam oven the reinforcement sleeve is filled inside. With a heat-resistant filling the flexibility of the reinforcement sleeve can be reduced or rather the support of the butt joint and its splice by the reinforcement sleeve can be increased and / or

adapted in a targeted manner with respect to the material of the gasket. Thereby an optimum relation between flexibility of the material of the gasket and the flexibility of the material of the filled reinforcement sleeve can be adjusted.

[0027] In embodiments of the steam oven the reinforcement sleeve is symmetrically arranged within the at least one longitudinally extending hollow chamber of the gasket with respect to the butt joint. Through this an uniform distribution of loads left and right from the splice area of the butt joint can be achieved. Both areas of the gasket next to the free ends experience the same strengthening by the reinforcement sleeve.

[0028] In embodiments of the steam oven the reinforcement sleeve extends at least 1 cm to 5 cm, particularly 3 cm, within the gasket in both directions with respect to the butt joint. That means the reinforcement sleeve has a total length of at least 2 to 10 cm, particularly 6 cm in case of a symmetrical arrangement of the reinforcement sleeve in the gasket with respect to the butt joint. By such an extension of the reinforcement sleeve of at least 1 cm to 5 cm with respect to the butt joint even in case of an unintentional slight shifting of the reinforcement sleeve in its longitudinal direction the butt joint and its corresponding splice still experience strengthening due to the reinforcement sleeve. It has turned out that in particular an extension of 3 cm provides a good support of the butt joint and still allows an easy arrangement of the reinforcement within the gasket.

[0029] In embodiments of the steam oven the reinforcement sleeve is fixed within the gasket by an adhesive. Thereby an unintentional shifting or moving of the reinforcement sleeve within the gasket can be avoided. In particular a symmetrical or other preferred arrangement of the reinforcement sleeve with respect to the butt joint can be ensured. Expediently the reinforcement sleeve is wetted with the adhesive before the free ends of the gasket are pushed onto the reinforcement sleeve. As adhesive the same adhesive as for the connection of the free ends can be used. For example an heat-resistant and resilient adhesive on silicone basis can be used.

[0030] In embodiments of the steam oven the reinforcement sleeve is fixed to the gasket by at least one fastening element with a hook-shaped or loop-shaped upper part and a hook-shaped bottom part configured to be inserted through openings in the gasket and the reinforcement sleeve aligned below each other and to establish a connection between the gasket and the reinforcement sleeve in the assembled state. It is known for example to fix gaskets to structures via fastening elements with a hook-shaped or loop-shaped upper part and a hook-shaped bottom part which is inserted through openings in the gasket. By providing corresponding openings in the reinforcement sleeve, too, the bottom part of the fastening element can be passed through this openings as well whereby a connection between the reinforcement sleeve and the gasket can be built and unintentional shifting or movement of the reinforcement sleeve can be

avoided and a good sealing quality and support of the butt joint can be ensured. Besides the connection of the gasket and the reinforcement sleeve via at least one fastening element the reinforcement sleeve can be additionally fixed to the gasket by an adhesive as aforementioned.

[0031] In embodiments of the steam oven the gasket is fixed to the structure surrounding the cooking chamber or to the closure member by an adhesive and / or by at least one fastening element. In particular in cases where the reinforcement sleeve is fixed within the gasket by an adhesive the same adhesive could be used for fixing the gasket to the structure surrounding the cooking chamber or to the closure member. Moreover, in particular in cases where the reinforcement sleeve is fixed to the gasket by at least one fastening element with a hook-shaped or loop-shaped upper part this upper part can be used to fix the gasket to the structure surrounding the cooking chamber or to the closure member assumed that a corresponding counterpart is provided. In this case the fastening element has a double function, namely fixation of the reinforcement sleeve to the gasket and fixation of the gasket to the structure surrounding the cooking chamber or to the corresponding closure member.

[0032] As already mentioned, the gasket can be arranged around the cooking chamber and / or at the door or lid of a steam oven.

[0033] As to advantages and advantageous effects of the cooking appliance, in particular steam oven, further reference is made to the description above and below.

[0034] Preferred embodiments of the invention will now be described in connection with the enclosed figures, in which:

- FIG. 1 shows a schematic plan view of an opened steam oven;
- FIG. 2 shows a partially exploded view of an oven door of an alternative steam oven;
- FIG. 3 shows an exploded view of a gasket of a steam oven;
- FIG. 4 shows an exploded view of a part of a gasket providing an alternative fixation of a reinforcement sleeve;
- FIG. 5 shows a reinforcement sleeve of a gasket in more detail;
- FIG. 6 shows a schematic filling of a reinforcement sleeve; and
- FIG. 7 shows a cross sectional view of an alternative gasket.

[0035] Note, that the steam oven will be described only as far as is necessary for covering the invention.

[0036] FIG. 1 shows a schematic plan view of an opened steam oven 2. The steam oven 2 has a control panel 4 with electronic programmer 5 and water drawer 6. Within the cooking chamber 8 of the steam oven 2 a heating element 10, a fan 12 and a steam generator 14 are provided. To avoid the escapement of moisture during steam cooking and to establish constant temperature conditions within the cooking chamber 8 the cooking chamber 8 is surrounded by a circumferential gasket 16. The endless gasket 16 serves to provide a sealing between the cooking chamber 8 of the steam oven 2 and a not depicted oven door.

[0037] In an alternative construction of a steam oven 2 the gasket 16 can be arranged around the window 18 of an oven door 20 to provide a sealing between the cooking chamber 8 of the steam oven 2 and the oven door 20 in its closed position (FIG. 2).

[0038] As can be seen in FIG. 2 the endless or "closed-loop" gasket 16 is built by a butt joint 22 of the free ends 24, 26 of the gasket 16.

[0039] As can be seen in particular in combination with FIG. 3 which shows an exploded view of the gasket 16 the blunt free ends 24, 26 of the gasket 16 are pushed onto a reinforcement sleeve 28 to form a butt joint 22 as indicated by the arrows. The joints 30, 32 or end faces of the free ends 24, 26 are wetted with an adhesive to form a stable splice between the joints 30, 32 or rather a stable butt joint 22. To avoid an unintentional shifting of the reinforcement sleeve 28 the outer surface of the reinforcement sleeve 28 can be wetted with adhesive, too, before pushing on the free ends 24, 26 of the gasket 16.

[0040] An alternative possibility to avoid unintentional shifting of the inserted reinforcement sleeve 28 within the gasket 16 can be seen in FIG. 4. FIG. 4 shows an exploded view of a part of the gasket 16. Gasket 16 as well as reinforcement sleeve 28 are provided with openings 34, 36 in form of slits through which a fastening element 38 can be pushed through. The fastening element 38 provides a loop-shaped upper part 40 and a hook-shaped bottom part 42. The hook-shaped bottom part 42 penetrates from the outside at first the opening 34 in the gasket 16 and then a corresponding opening in the reinforcement sleeve 28 - which is present not visible in FIG. 4 because it is covered by the gasket 16. The hook-shaped bottom part 42 interlocks with the reinforcement sleeve 28 and thereby fixes the reinforcement sleeve 28 to the gasket 16. Due to its loop-shaped upper part 40 the fastening element 38 besides can be used for fixation of the gasket 16 to the periphery of the cooking chamber 8 of the steam oven 2. To provide a good and stable fixation of the reinforcement sleeve 28 to the gasket 16 both free ends 24, 26 are fixed with a fastening element 38 to the reinforcement sleeve 28.

[0041] As can be seen in FIG. 3 the outer contour of the reinforcement sleeve 28 is adapted to the inner contour of the gasket 16. The reinforcement sleeve 28 has a slightly smaller outer diameter in comparison to the

inner diameter of the gasket 16 to facilitate the arrangement of the reinforcement sleeve 28 within the longitudinally extending hollow chamber 44 of the gasket 16 or rather the cavity of the free ends 24, 26 of the gasket 16. The reinforcement sleeve 28 has a total length of 6 cm and is arranged symmetrically within the hollow chamber 44 of the gasket 16 with respect to the butt joint 22 or rather its splice. That means 3 cm of the reinforcement sleeve 28 are arranged within the free end 24 and 3 cm of the reinforcement sleeve 28 are arranged within the free end 26. The present gasket is made from silicone rubber.

[0042] FIG. 5 shows the reinforcement sleeve 28 in more detail. The reinforcement sleeve 28 consists of a glass fibre fabric reinforced by a wire fabric. Glass fibres 46 and wires 48 are interwoven or braided with each other and are coated with silicone. Because the gasket 16 made from silicone rubber provides a higher flexibility in comparison to the reinforcement sleeve 28 a damage of the splice at the butt joint 22 due to stretching or bending forces due to thermal load during use of the gasket 16 or due to installation of the gasket 16 in the steam oven 2 can be avoided. As a result of this constellation the areas of the gasket 16 beyond the area of the gasket 16 containing the reinforcement sleeve 28 will bend first whereby the stretching and bending forces in the area of the butt joint 22 and its splice will be minimized.

[0043] FIG. 6 shows a filling 50 of a reinforcement sleeve 28. The optional filling 50 can be a fibreglass or silica rope. The filling 50 has a smaller cross section with respect to the cross section of the reinforcement sleeve 28 to facilitate its insertion into the reinforcement sleeve 28. By providing a filling 50 within the reinforcement sleeve 28 the flexibility in comparison to the gasket 16 can be further reduced.

[0044] FIG. 7 shows a cross sectional view of an alternative gasket 52. Here a cross section through the gasket 52 at its butt joint 54 with an already inserted reinforcement sleeve 56 is depicted. The gasket 52 is made from silicone rubber and has a profiled outer contour 58. The reinforcement sleeve 56 is made from glass fibre reinforced plastic and is additionally reinforced by a not-visible wire mesh. The reinforcement sleeve 56 is arranged within a longitudinally extending hollow chamber 60 of the gasket 52. It can be seen that the cross section of the reinforcement sleeve 56 does not completely fill the cross section of the hollow chamber 60. Thereby on the one hand a certain flexibility of the gasket 52 in the region of the reinforcement sleeve 56 can be maintained which is necessary to provide a good sealing function of the gasket 52 and on the other hand the butt joint 54 is protected from being ripped due to bending forces by the reinforcement sleeve 56. Reinforcement sleeve 56 is arranged in the hollow chamber 60 in the same manner and provides the same length as reinforcement sleeve 28 of gasket 16. In this respect and in respect of forming the butt joint 54, the possibilities of fastening the gasket 52 and reinforcement sleeve 56 with each other and to

the periphery of the cooking chamber 8 of steam oven 2 and optional filling of reinforcement sleeve 56 it is referred to the corresponding remarks and advantages to gasket 16 and reinforcement sleeve 28 above mentioned.

List of reference numerals

[0045]

2	steam oven
4	control panel
5	electronic programmer
6	water drawer
8	cooking chamber
10	heating element
12	fan
14	steam generator
16	gasket
18	window
20	oven door
22	butt joint
24	free end
26	free end
28	reinforcement sleeve
30	joint
32	joint
34	opening
36	opening
38	fastening element
40	loop-shaped upper part
42	hook-shaped bottom part
44	hollow chamber
46	glass fibres
48	wires
50	filling
52	gasket
54	butt joint of 52
56	reinforcement sleeve of 52
58	outer contour of 52
60	hollow chamber of 52

Claims

1. Steam oven (2) comprising a gasket (16, 52) with at least one longitudinally extending hollow chamber (44, 60) for providing a sealing between a structure surrounding a cooking chamber (8) of the steam oven (2) and a corresponding closure member, wherein
 - a) the gasket (16) comprises two free ends (24, 26) which are connected with each other by an adhesive to form a butt joint (22, 54),
 - b) the gasket (16) is made from a material based on silicone,
 - c) a reinforcement sleeve (28, 56) is arranged within the hollow chamber (44, 60) of the gasket (16, 52) in the area of the butt joint (22, 54),

- d) the reinforcement sleeve (28, 56) is flexible in radial direction, and
- e) the reinforcement sleeve (28, 56) is made from a material of less flexibility in comparison to the material of the gasket (16, 52) so that areas of the gasket (16, 52) beyond of the area of the gasket (16, 52) containing the reinforcement sleeve (28, 56) will be stretched or bent first, if tensile forces and / or bending forces occur.
2. Steam oven (2) according to claim 1, wherein the outer contour of the reinforcement sleeve (28) is adapted to the inner contour of the hollow chamber (44) of the gasket (16).
3. Steam oven (2) according to claim 1 or 2, wherein the reinforcement sleeve (56) is made from glass fibre reinforced plastic.
4. Steam oven (2) according to claim 1 or 2, wherein the reinforcement sleeve (28) is made from glass fibre fabric.
5. Steam oven (2) according to claim 4, wherein the glass fibre fabric is knitted or braided.
6. Steam oven (2) according to claim 4 or 5, wherein the reinforcement sleeve (28) is made from a combination of glass fibre fabric and wire fabric.
7. Steam oven (2) according to at least one of claims 1 to 6, wherein the reinforcement sleeve (28, 52) is filled inside.
8. Steam oven (2) according to at least one of claims 1 to 7, wherein the reinforcement sleeve (28, 52) is symmetrically arranged within the at least one longitudinally extending hollow chamber (44, 60) of the gasket (16, 52) with respect to the butt joint (22, 54).
9. Steam oven (2) according to at least one of claims 1 to 9, wherein the reinforcement sleeve (28, 56) extends at least 1 cm to 5 cm, particularly 3 cm, within the gasket (16, 52) in both directions with respect to the butt joint (22, 54).
10. Steam oven (2) according to at least one of claims 1 to 9, wherein the reinforcement sleeve (28, 56) is fixed within the gasket (16, 52) by an adhesive.
11. Steam oven (2) according to at least one of claims 1 to 10, wherein the reinforcement sleeve (28, 56) is fixed to the gasket (16) by at least one fastening element (38) with a hook-shaped or loop-shaped upper part (40) and a hook-shaped bottom part (42) configured to be inserted through openings (34, 36) in the gasket (16, 52) and the reinforcement sleeve (28, 56) aligned below each other and to establish a

connection between the gasket (16, 52) and the reinforcement sleeve (28, 56) in the assembled state.

12. Steam oven (2) according to at least one of claims 1 to 11, wherein the gasket (16, 52) is fixed to the structure surrounding the cooking chamber (8) or to the closure member by an adhesive and / or by at least one fastening element (38).

Patentansprüche

1. Dampfofen (2), umfassend eine Dichtung (16, 52) mit wenigstens einer sich längs erstreckenden hohlen Kammer (44, 60) zur Bereitstellung einer Abdichtung zwischen einer Struktur, die einen Garraum (8) des Dampfofens (2) umgibt, und einem entsprechenden Verschlusselement, wobei

a) die Dichtung (16) zwei freie Enden (24, 26) umfasst, die durch einen Klebstoff miteinander verbunden sind, um eine Stoßfuge (22, 54) zu bilden,

b) die Dichtung (16) aus einem Material auf Silikonbasis besteht,

c) eine Verstärkungshülse (28, 56) in der hohlen Kammer (44, 60) der Dichtung (16, 52) im Bereich der Stoßfuge (22, 54) angeordnet ist,

d) die Verstärkungshülse (28, 56) in radialer Richtung flexibel ist, und

e) die Verstärkungshülse (28, 56) aus einem Material besteht, das im Vergleich zum Material der Dichtung (16, 52) geringere Flexibilität aufweist, so dass Bereiche der Dichtung (16, 52) hinter dem Bereich der Dichtung (16, 52), der die Verstärkungshülse (28, 56) enthält, zuerst gedehnt oder gebogen werden, wenn Zugkräfte und/oder Biegekräfte auftreten.

2. Dampfofen (2) nach Anspruch 1, wobei die Außenkontur der Verstärkungshülse (28) an die Innenkontur der hohlen Kammer (44) der Dichtung (16) angepasst ist.

3. Dampfofen (2) nach Anspruch 1 oder 2, wobei die Verstärkungshülse (56) aus glasfaserverstärktem Kunststoff besteht.

4. Dampfofen (2) nach Anspruch 1 oder 2, wobei die Verstärkungshülse (28) aus Glasfasergewebe besteht.

5. Dampfofen (2) nach Anspruch 4, wobei das Glasfasergewebe gewirkt oder geflochten ist.

6. Dampfofen (2) nach Anspruch 4 oder 5, wobei die Verstärkungshülse (28) aus einer Kombination von Glasfasergewebe und Drahtgewebe besteht.

7. Dampfofen (2) nach wenigstens einem der Ansprüche 1 bis 6, wobei die Verstärkungshülse (28, 52) innen gefüllt ist.
8. Dampfofen (2) nach wenigstens einem der Ansprüche 1 bis 7, wobei die Verstärkungshülse (28, 52) symmetrisch in der wenigstens einen sich längs erstreckenden hohlen Kammer (44, 60) der Dichtung (16, 52) bezüglich der Stoßfuge (22, 54) angeordnet ist.
9. Dampfofen (2) nach wenigstens einem der Ansprüche 1 bis 9, wobei sich die Verstärkungshülse (28, 56) wenigstens 1 cm bis 5 cm, insbesondere 3 cm, in der Dichtung (16, 52) in beide Richtungen bezüglich der Stoßfuge (22, 54) erstreckt.
10. Dampfofen (2) nach wenigstens einem der Ansprüche 1 bis 9, wobei die Verstärkungshülse (28, 56) in der Dichtung (16, 52) mit einem Klebstoff fixiert ist.
11. Dampfofen (2) nach wenigstens einem der Ansprüche 1 bis 10, wobei die Verstärkungshülse (28, 56) an der Dichtung (16) durch wenigstens ein Befestigungselement (38) mit einem hakenförmigen oder schlaufenförmigen Oberteil (40) und einem hakenförmigen Unterteil (42) befestigt ist, ausgelegt zur Einführung durch Öffnungen (34, 36) in der Dichtung (16, 52) und der Verstärkungshülse (28, 56), die untereinander ausgerichtet sind, und zur Herstellung einer Verbindung zwischen der Dichtung (16, 52) und der Verstärkungshülse (28, 56) im montierten Zustand.
12. Dampfofen (2) nach wenigstens einem der Ansprüche 1 bis 11, wobei die Dichtung (16, 52) an der den Garraum (8) umgebenden Struktur oder an dem Verschlusselement durch einen Klebstoff und/oder durch wenigstens ein Befestigungselement (38) fixiert ist.

Revendications

1. Four à vapeur (2) comprenant un joint d'étanchéité (16, 52) ayant au moins une chambre creuse (44, 60) s'étendant longitudinalement pour assurer une étanchéité entre une structure entourant une chambre de cuisson (8) du four à vapeur (2) et un élément de fermeture correspondant, dans lequel :
 - a) le joint (16) comprend deux extrémités libres (24, 26) qui sont raccordées l'une à l'autre par un adhésif pour constituer un assemblage bout à bout (22, 54),
 - b) le joint (16) est réalisé à partir d'une matière à base de silicone,
 - c) un manchon de renfort (28, 56) est disposé à

l'intérieur de la chambre creuse (44, 60) du joint (16, 52) dans la zone de l'assemblage bout à bout (22, 54),
 d) le manchon renfort (28, 56) est flexible dans le sens radial, et
 e) le manchon de renfort (28, 56) est réalisé à partir d'une matière de moindre flexibilité que la matière du joint (16, 52), de sorte que les zones du joint (16, 52) au-delà de la zone du joint (16, 52) contenant le manchon de renfort (28, 56) s'étireront ou se courberont en premier, si des forces de traction et/ou des forces de courbure se produisent.

2. Four à vapeur (2) selon la revendication 1, dans lequel le contour extérieur du manchon de renfort (28) est adapté au contour intérieur de la chambre creuse (44) du joint (16).
3. Four à vapeur (2) selon la revendication 1 ou 2, dans lequel le manchon de renfort (56) est fabriqué à partir de plastique renforcé à la fibre de verre.
4. Four à vapeur (2) selon la revendication 1 ou 2, dans lequel le manchon de renfort (28) est fabriqué à partir de tissu en fibre de verre.
5. Four à vapeur (2) selon la revendication 4, dans lequel le tissu en fibre de verre est tricoté ou tressé.
6. Four à vapeur (2) selon la revendication 4 ou 5, dans lequel le manchon de renfort (28) est fabriqué à partir d'une combinaison de tissu en fibre de verre et de treillis métallique.
7. Four à vapeur (2) selon l'une quelconque des revendications 1 à 6, dans lequel le manchon de renfort (28, 52) est rempli à l'intérieur.
8. Four à vapeur (2) selon l'une quelconque des revendications 1 à 7, dans lequel le manchon de renfort (28, 52) est disposé symétriquement à l'intérieur de ladite chambre creuse (44, 60) s'étendant longitudinalement du joint (16, 52) par rapport à l'assemblage bout à bout (22, 54).
9. Four à vapeur (2) selon l'une quelconque des revendications 1 à 9, dans lequel le manchon de renfort (28, 56) s'étend sur au moins 1 cm jusqu'à 5 cm, en particulier sur 3 cm, à l'intérieur du joint (16, 52) dans les deux directions par rapport à l'assemblage bout à bout (22, 54).
10. Four à vapeur (2) selon l'une quelconque des revendications 1 à 9, dans lequel le manchon de renfort (28, 56) est fixé à l'intérieur du joint (16, 52) par un adhésif.

11. Four à vapeur (2) selon l'une quelconque des revendications 1 à 10, dans lequel le manchon de renfort (28, 56) est fixé au joint (16) par au moins un élément de fixation (38) ayant une partie supérieure (40) en forme de crochet ou en forme de boucle et une partie inférieure (42) en forme de crochet, configuré pour être inséré par les ouvertures (34, 36) dans le joint (16, 52) et le manchon de renfort (28, 56) alignées l'une sous l'autre et établir un raccord entre le joint (16, 52) et le manchon de renfort (28, 56) quand ceux-ci sont assemblés.
12. Four à vapeur (2) selon l'une quelconque des revendications 1 à 11, dans lequel le joint (16, 52) est fixé à la structure entourant la chambre de cuisson (8) ou à l'élément de fermeture par un adhésif et/ou au moins un élément de fixation (38).

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FIG 1

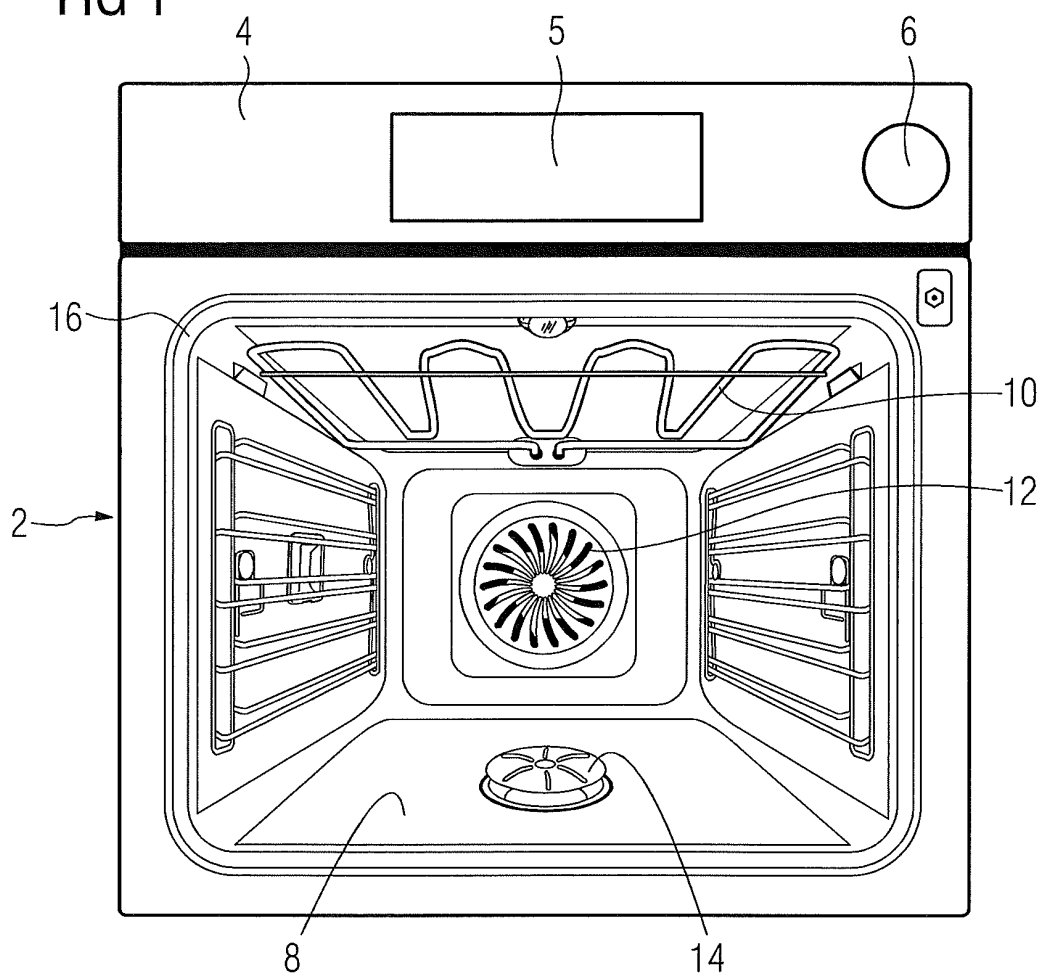


FIG 2

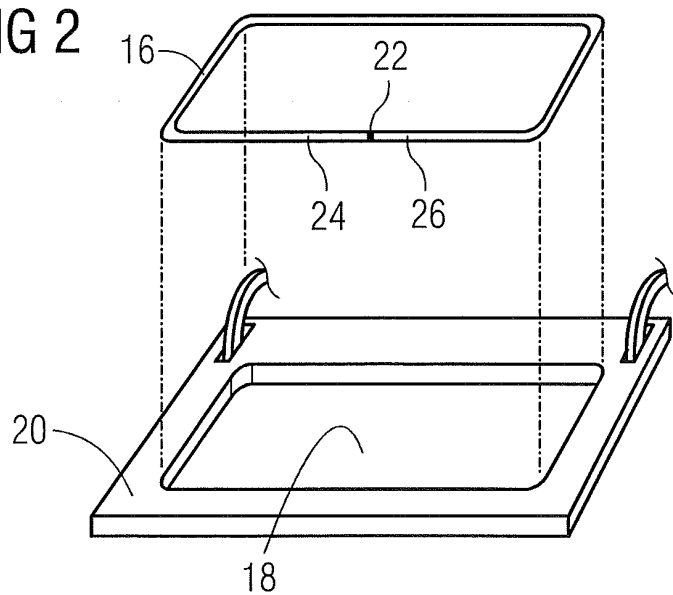


FIG 3

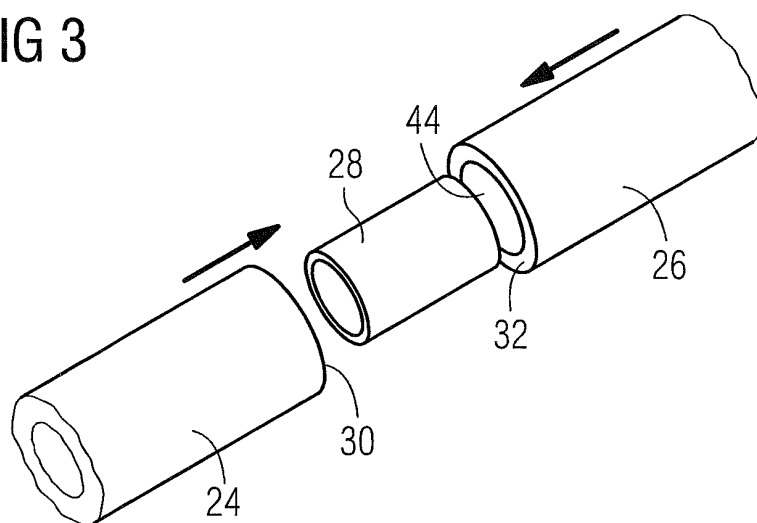


FIG 4

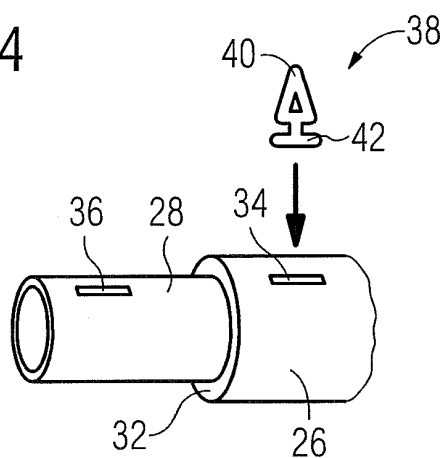


FIG 5

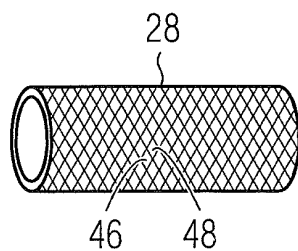


FIG 6

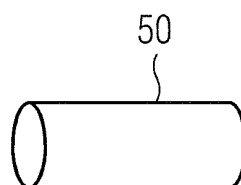
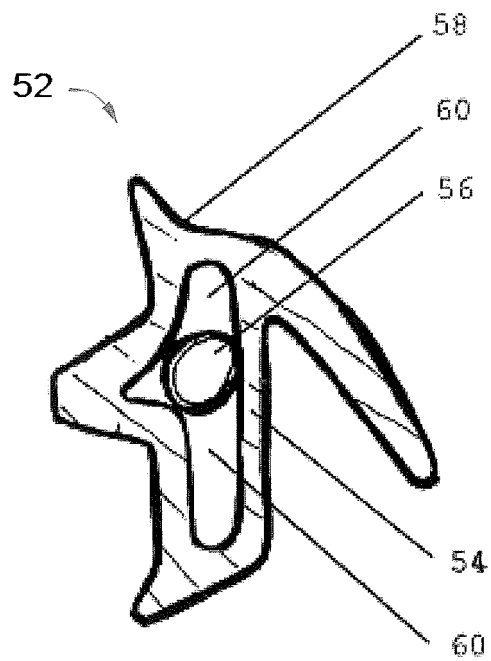


FIG 7



REFERENCES CITED IN THE DESCRIPTION

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