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(54) **Gas burner assembly, gas cooking hob and gas burner appliance**

(57) The invention in particular is directed to a gas burner assembly (3). It is proposed that the gas burner assembly (3) comprises a cookware support (4), and further a burner crown (5) and burner cap (6) which are attached to the cookware support (4).

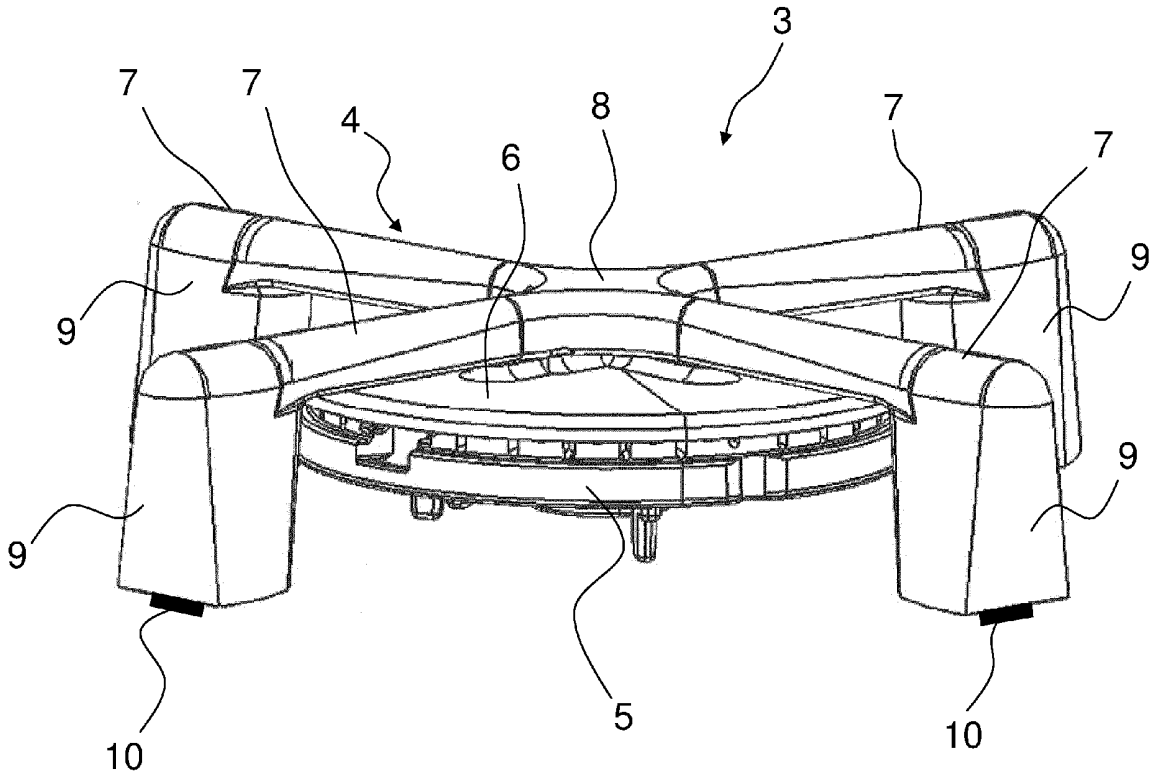

Fig. 2

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Description

[0001] The invention is directed to a gas burner assembly, gas cooking hob and a gas burner appliance.

[0002] Gas cooking hobs are known to be used in household or industrial gas burner or cooking appliances or gas cooking hobs. Such gas cooking hobs as for example known from EP 1 508 001 B1, DE 100 29 632 A1 or DE 195 05 470 C2 can comprise one or more single gas burners.

[0003] In normal use, i.e. during cooking of foodstuff and the like, the cooking hobs and related gas burners will generally be soiled. Therefore, from time to time the cooking hobs and gas burners have to be cleaned. This in general requires removing the gas burners at least partially from the cooking hobs.

[0004] Removing the gas burners from the cooking hobs for cleaning purposes and repositioning them on the cooking hobs again after cleaning often is still labor-intensive. Therefore, there is still scope for improvements in particular relating to removal and repositioning of gas burners from/on cooking hobs.

[0005] Therefore, an object of the invention is to provide a gas burner assembly that can easily be removed from a cooking hob and that can easily be repositioned on the cooking hob again. Further, a gas cooking hob and a gas burner appliance shall be provided.

[0006] This object is solved by claims 1, 7 and 9. Embodiments result from respective dependent claims.

[0007] According to claim 1, a gas burner assembly is provided which comprises a cookware support, a burner crown and a burner cap. The burner crown is attached to a lower side of the cookware support. Further, the burner cap is fixed or attached between the cookware support and burner crown.

[0008] In securing the cookware support, burner crown and burner cap to each other, i. e. by interconnecting the three elements i) cookware support, ii) burner crown and iii) burner cap, these three elements constitute a one-part-piece that can easily be handled. In particular, the proposed gas burner assembly can be removed from a cooking hob in a single movement, not requiring several steps or actions to remove single parts of the gas burner assembly from the cooking hob. In addition, the proposed gas burner assembly can be easily repositioned on the cooking hob again.

[0009] A cookware support is generally used to support or hold a cookware, a pot or pan for example, on a cooking hob. The term "upper side" of the cookware support shall mean the side on which the cookware is placed in normal use of the gas burner assembly. Hence, the lower side of the cookware support is the side averted from the upper side, facing the cooking hob when the cookware support is placed on the cooking hob.

[0010] A burner crown is generally used for atmospheric gas burners, and has on an upper side of its outer rim a plurality of recesses facing the burner cap when assembled. In the assembled state, i.e. when the burner cap is positioned on the burner crown, the recesses together with the burner cap, acting as a type of cover, make up gas ports through which a gas-air mixture can flow out. In normal use, the gas-air mixture flowing out of these gas ports is ignited and respective gas flames can be used to heat the cookware placed on a respective cookware support.

[0011] In an embodiment, the burner crown and, if applicable, the burner cap is/are detachably attached or mounted to the cookware support. In this way single components of the gas burner assembly can be readily exchanged. The burner crown can for example be attached to the cookware support by means of at least one screw, preferably with at least two screws. The at least one screw may pass through aligned openings or holes provided in the burner cap and burner crown, respectively.

[0012] The at least one screw may be screwed into the cookware support from the lower side thereof. If screw holes in the cookware support and respective holes in the burner cap and burner crown are properly aligned, all three components, i. e. the cookware support, the burner cap and burner crown, can automatically be aligned by screwing the at least one screw in a respective screw hole. Notches, pins or other elements for proper alignment of all three elements can be provided in addition.

[0013] In a further embodiment, the cookware support has at least three, preferably at least four, arm-portions, extending in radial direction from a center of the cookware support. Preferably, the arm-portions lie in a common plane and angles between adjacent arm-portions are all the same, i. e. that the arm-portions are equally distributed in said plane.

[0014] Each arm-portion has on its end lying distant to the center of the cookware support a leg-portion projecting from the lower side of the respective arm-portion. Preferably, each leg-portion has on its free end distant from a respective arm-portion an end-piece designed as a bumper or shock-absorber and/or positioning element.

[0015] Note that the screws mentioned above can be screwed into the arm-portions preferably near or at the center of the cookware support.

[0016] Further, the geometry, in particular length, of the arm-portions and leg-portions is such that they spread and extend, with respect to the axial and lateral dimensions, beyond the burner cap and burner crown. This means that the cookware support is a supporting structure for the burner cap and burner crown. In other words, the cookware support carries or holds both the burner cap and burner crown from above, while burner cap and burner crown extend downwards from the lower side of the cookware support. In particular, since the arm-portions and leg-portions spread beyond the burner cap and burner crown in axial direction, the level of the burner cap and burner crown relative to the underlying cooking hob on which the gas burner assembly will be placed can be adjusted by adequately selecting the length of the leg-portions and/or end-pieces.

[0017] The bumpers and/or positioning elements can be designed such that the gas burner assembly, in particular cookware support, will not cause or leave scratches on scratch-sensitive cooking hobs, such as for example cooking hobs made from glass ceramic, stainless steel, aluminum and others. Bumpers or shock absorbers can for example be made from heat-resistant plastics or rubber materials.

[0018] Cooking hobs, on which the gas burner assembly will be placed can comprise respective counterpart elements designed to interact with respective end-pieces, in particular bumpers and/or positioning elements, preferably for proper alignment of the gas burner assembly on the cooking hob.

[0019] In a yet further embodiment, the burner crown, which is preferably of circular or cylindrical shape, has a gas inlet, preferably a gas inlet flange projecting from the lower side of the burner crown. The gas inlet is preferably centered with respect to the lateral dimension of the burner crown. The gas inlet flange projecting from the lower side can easily be coupled with a corresponding gas outlet, probably a flange or opening provided on, in or at the cooking hob, when the gas burner assembly is put and aligned on the cooking hob. Preferably, coupling of the gas inlet and outlet is automatically achieved upon positioning the gas burner assembly to the gas cooking hob.

[0020] Claim 7 is directed to a gas cooking hob. The gas cooking hob comprises at least one section to which a gas burner assembly as described above, including any embodiments thereof, is coupled to. Preferably, the cooking hob, more preferably, the at least one section, comprises a gas outlet, a gas outlet flange or opening for example, coupled to or at least adapted to be coupled to the gas inlet, in particular gas inlet flange, of the burner crown.

[0021] In an embodiment of the gas cooking hob, a number of positioning elements, preferably depressions, adapted and designed to at least partially couple to, preferably receive, a leg-portion and/or end-piece of the cookware support of the gas burner assembly. In this way, the gas burner assembly can properly and quasi automatically be aligned relative to the cooking hob. In particular proper alignment is obtained by simply placing the gas burner assembly, in more detail the cookware support, on the gas cooking hob such that leg-portions and/or end-pieces couple to respective positioning elements.

[0022] Claim 9 is directed to a gas burner appliance comprising at least one gas cooking hob as described above, including any embodiments. As to advantages and advantageous effects of the gas burner appliance, reference is made to the description above.

[0023] Examples of the invention will now be described in connection with the annexed figures, in which:

Fig. 1 shows a gas burner appliance;

Fig. 2 shows a perspective side view of a gas burner assembly;

Fig. 3 shows a bottom view of the gas burner assembly; and

Fig. 4 shows an enlarged view of the gas burner assembly positioned on the gas cooking hob.

[0024] Fig. 1 shows a household gas burner appliance 1 having a gas cooking hob 2 with several gas burner assemblies 3. Note that the gas burner appliance 1 and gas cooking hob 2 will be described only insofar as is necessary for understanding the invention.

[0025] The cooking hob2 comprises in total four gas burner assemblies 3 arranged in the top section of the gas burner appliance 1. Fig. 2 shows a perspective view of one of the gas burner assemblies 3.

[0026] The gas burner assembly 3 comprises a cookware support 4, a burner crown 5 and a burner cap 6. The cookware support 4 has a type of a four-footed x-shape body. In more detail, the cookware support 4 has four arm-portions 7 extending in radial direction from a center 8 of the cookware support 4. The arm-portions 7 are approximately evenly distributed in a common plane spanned by the four arm-portions 7. In the present case, the arm-portions 7 are offset from each other by about 90°.

[0027] Each arm-portion 7 has on its end lying distant from the center 8 a leg-portion 9. The leg-portions 9 extend downwards beyond the lowest level of the burner cap 5.

[0028] Each leg-portion 9 has on its free end, i. e. on its end distant from the respective arm-portion 7, a rubber bumper element 10.

[0029] With the gas burner assembly shown in fig. 2, the burner crown 5 is attached to the cookware support 4, wherein the burner cap 6 is interposed between the burner crown 5 and cookware support 4 and, by the attachment of the burner crown 5, the burner cap 6 is also attached to the cookware support 4.

[0030] Fig. 3 shows a bottom view of the gas burner assembly 3. Here it can be seen, that the burner crown 5 and burner cap 6 are removeably attached to the cookware support 4 by two screws 11. The screws 11 are screwed in from the lower side into respective arm-portions 7. The screws pass respective holes provided in mutual alignment in the burner crown 5 and burner cap 6. In all, by screwing in the screws 11, the burner crown 5 and the burner cap 6 are attached in proper alignment to the cookware support 4.

[0031] By attaching the burner crown 5 and burner cap 6 to the cookware support 4, these three elements can be handled as a one-piece part. Hence, if the gas burner assembly 3 has to be removed from the gas cooking hob 2, the gas burner assembly 3 can be taken away in a single motion. It is not required to remove individual parts of a gas burner unit from the gas burner cooking hob 2. Similarly, if the gas burner assembly 4 has to be placed

on the gas cooking hob 2 again, it can be placed and positioned in a single motion. In addition, mounting and assembly of the gas burner assembly is comparatively easy.

[0032] Fig. 4 shows an enlarged view of the gas burner assembly 3 positioned on the gas cooking hob 2. As can be seen, the rubber bumper elements 10 are in contact with the cooking hob 2. As the rubber bumper elements 10 are made from a comparatively flexible material, scratching of the upper surface of the cooking hob 2 can be prevented.

[0033] Further, the rubber bumper elements 10 also help to properly align the gas burner assembly 3 relative to the cooking hob 2 as they engage or lie in respective depressions. The depressions are arranged and designed such that the gas burner assembly 3 is automatically and properly aligned when the rubber bumper elements 10 lie or engage the depressions.

[0034] As can be seen from Fig. 4, a gas inlet flange 12 projecting from the burner crown 5 lower side (see also Fig. 3) is coupled to a gas outlet (not shown) of the cooking hob 2. Proper coupling of the inlet flange 12 and gas outlet is automatically obtained by adequately placing the gas burner assembly 3 onto the cooking hob 2.

[0035] In the present examples, the crown is of circular, cylindrical shape with the gas inlet flange being centered on the bottom side thereof. The upper rim of the burner crown 5 facing the burner cap 6 has a plurality of, in the present case different sized, recessions 13. The recessions 13 in combination with the burner cap 6 make up gas ports through which a gas-air mixture flows out from a chamber enclosed by the burner crown 5 and burner cap 6. The gas-air mixture flowing out of the gas ports in general is ignited, with respective lambent gas flames heat cookware placed on the cookware support 4.

[0036] In the example configuration described in connection with the figures, the burner crown 5 and burner cap 6 are attached to the cookware support 4 via screws 11. It shall be mentioned that any other type of connection is possible. In particular detachable fixing or fastening elements can be used.

[0037] Further, the burner crown 5 and burner cap 6 are shown to have a circular configuration. It shall however be mentioned, that other geometrical shapes come into question. Last but not least, the cookware support in the present example has four arm-portions 7, which shall not restrict or limit the number of arm-portions 7 to four. Any other configuration of the cookware support, probably also without single arm-portions and leg-portions, may be considered as well, as far as the burner crown and burner cap can be attached to such a configuration in a similar way.

[0038] As can be seen from fig. 2 and fig. 4, the cookware support 4 rests via its rubber bumper elements 10 on the cooking hob 2. The leg-portions 9 and rubber bumper elements 10 are designed such that the burner crown 5 and burner cap 6 are respectively positioned at proper height levels relative to the surface of the gas cooking hob 2. As a consequence, the burner crown 5 can be properly positioned without the need for additional spacers. Such spacers are necessary with known gas burners and generally project from the burner crown lower side, in order to keep the burner crown at appropriate levels above the cooking hob surface. In omitting the spacers, which is possible with the proposed configuration, the mass of the burner crown can be reduced.

[0039] A further advantage of the proposed gas burner assembly 3 is that it can be designed with low overall construction height. In addition, burner body bowls required with known configurations for proper alignment of the burner crown can now be omitted leading to smooth and easy to clean cooking hob surfaces. Furthermore, burner caps and burner crowns as already in use can in principle be used without requiring major amendments and reconstruction work. As a further advantage it can be mentioned, that with the proposed gas burner assembly it is possible to implement burners from low nominal power to high nominal power.

List of reference numerals

[0040]

1	gas burner appliance
2	gas cooking hob
3	gas burner assembly
4	cookware support
5	burner crown
6	burner cap
7	arm-portion
8	center
9	leg-portion
10	bumper element
11	screw
12	gas inlet flange
13	recess

Claims

1. Gas-burner assembly (3) comprising a cookware support (4), a burner crown (5) and a burner cap (6), wherein the burner crown (5) is attached to a lower side of the cookware support (4), and wherein the

burner cap (6) is fixed between the cookware support (4) and burner crown (5).

2. Gas-burner assembly (3) according to claim 1, wherein the burner crown (5) and, if applicable, the burner cap (6) is/are detachably attached to the cookware support (4).

3. Gas burner assembly (3) according to at least one of claims 1 and 2, wherein the burner crown (5) is attached to the cookware support (4) by means of at least one screw (11), preferably my means of at least two screws (11).

4. Gas burner assembly (3) according to claim 3, wherein the at least one screw (11) passes through aligned openings provided in the burner cap (6) and burner crown (5).

5. Gas burner assembly (3) according to at least one of claims 1 to 4, wherein the cookware support (4) has at least three, preferably at least four, arm-portions (7), extending in radial direction from a center (8) of the cookware support (4), and wherein each arm-portion (7) has on its end lying distant to the center (8) of the cookware support (4) a leg-portion (9) projecting from the lower side of the respective arm-portion (7), and wherein, preferably, each leg-portion (9) has on its free end distant from a respective arm-portion (7) an end-piece designed as a bumper (10) and/or positioning element.

6. Gas burner assembly (3) according to at least one of claims 1 to 5, wherein the burner crown (5), preferably being of circular or cylindrical shape, has a gas inlet, preferably a gas inlet flange (12) projecting from the lower side of the burner crown (5), which gas inlet is preferably centered with respect to the lateral dimension of the burner crown (5).

7. Gas cooking hob (2), comprising at least one section to which a gas burner assembly (3) according to at least one of claims 1 to 6 is coupled to.

8. Gas cooking hob (2) according to claim 7, having a number of positioning elements, preferably depressions, adapted and designed to at least partially couple to or receive a leg-portion (9) and/or end-piece (10) of the cookware support (4) of the gas burner assembly (3), respectively.

9. Gas burner appliance (1) comprising at least one gas cooking hob (2) according to at least one of claims 7 and 8.

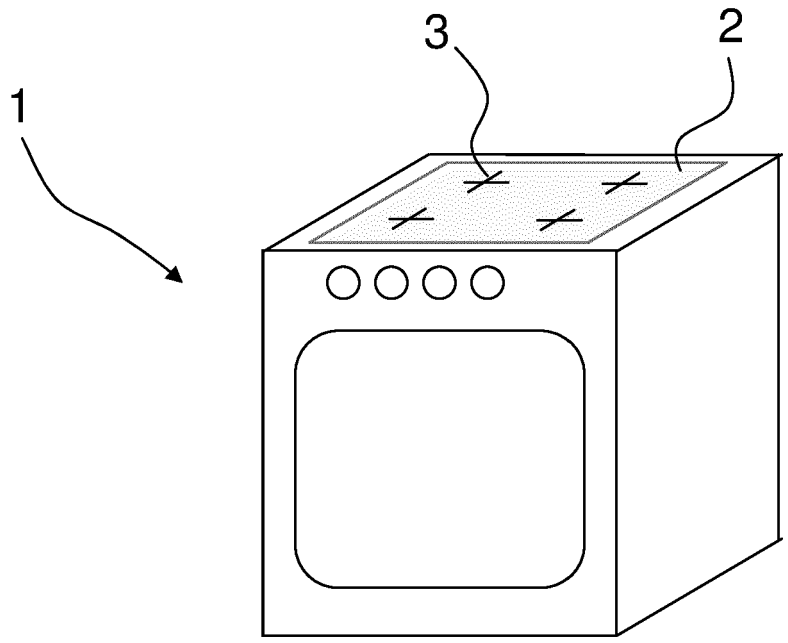

Fig. 1

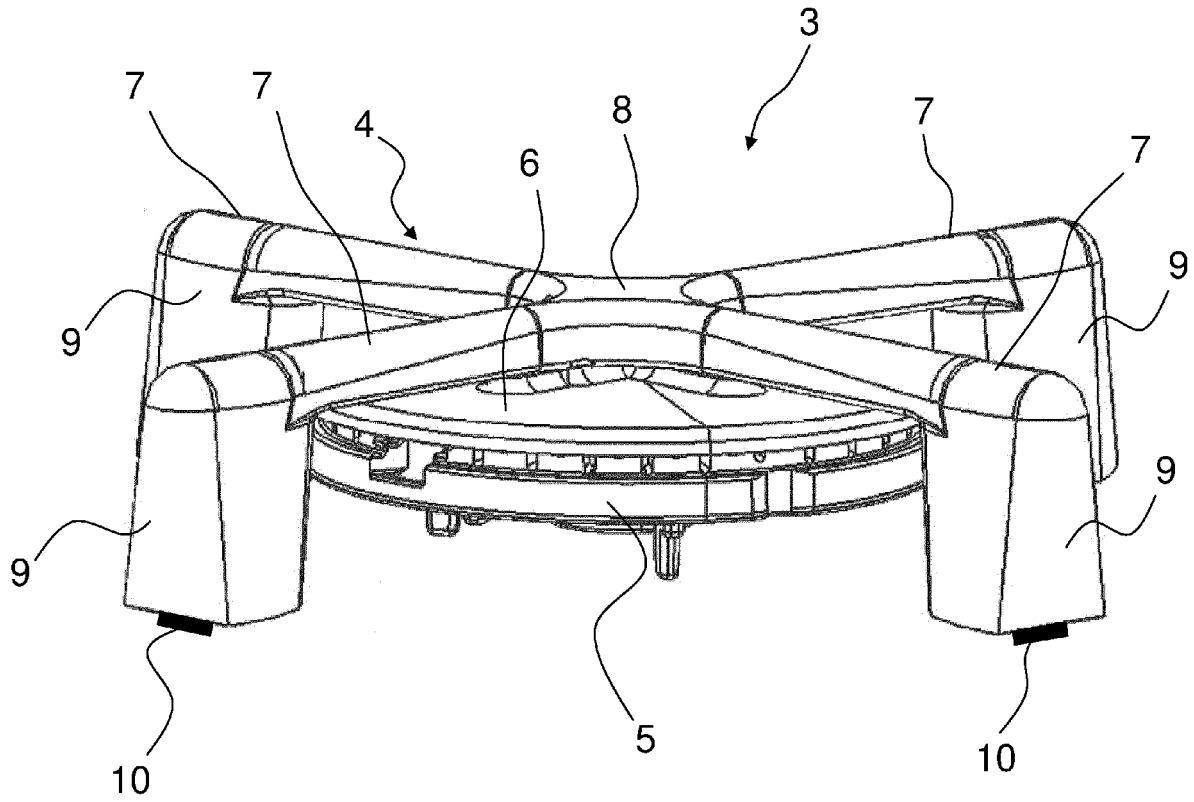

Fig. 2

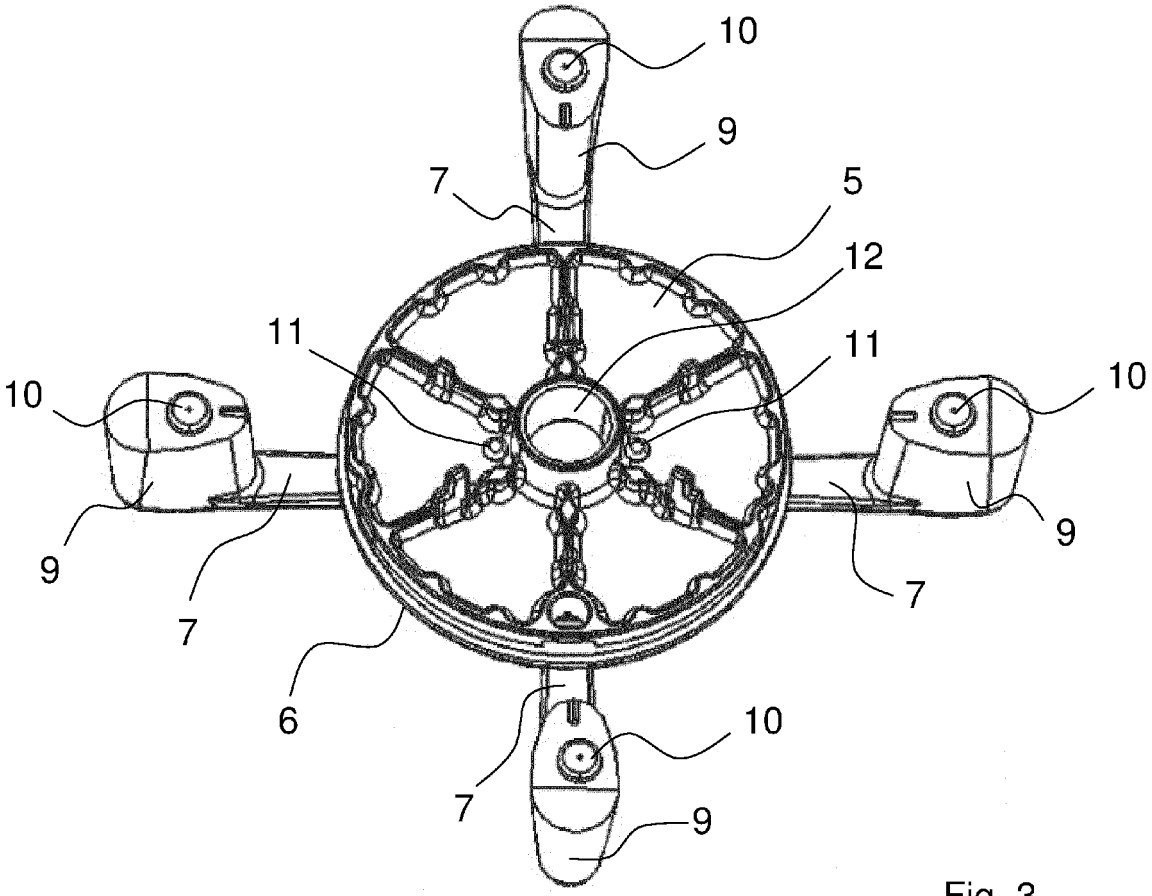

Fig. 3

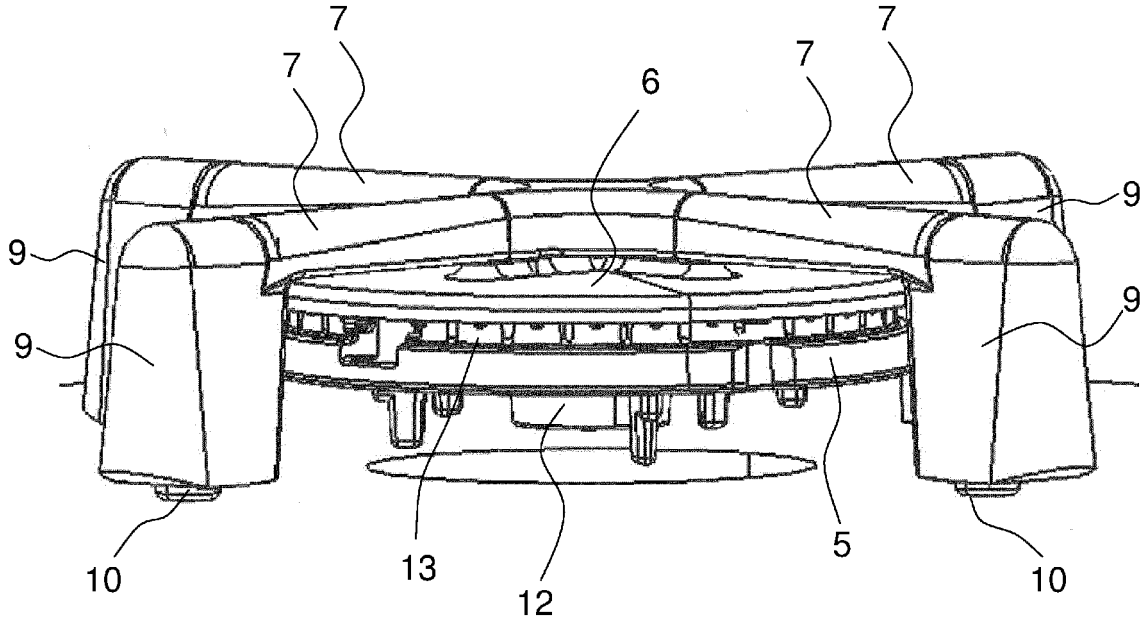

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 11 18 7809

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 April 2012	Moreno Rey, Marcos

CATEGORY OF CITED DOCUMENTS

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