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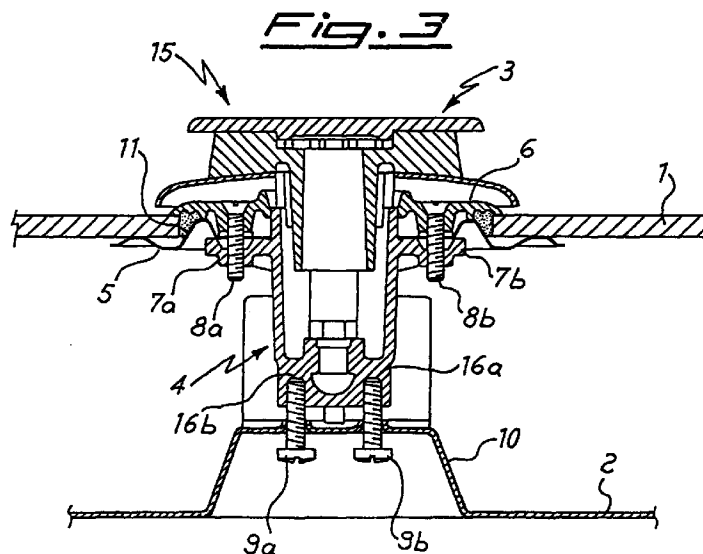
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(54) Gas burner

(57) A gas burner (15) for domestic appliances of the type comprising a body (4) of the burner and a feeder head (3) for use in hobs with a top plate (1) with at least one hole for housing said burner. The body of the burner is supported elastically by elastic fixing

means (5,6) at the edge of said hole and comprises means (9a,9b) for centering it with respect to the plate. These centering means allow for axial movement of the body of the burner with respect to the plate.



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Description

[0001] The present invention refers to gas burners for domestic appliances, particularly susceptible to use in hobs provided with plates made of pyroceram or other brittle material having holes in correspondence with the burners.

[0002] There is increasingly widespread use of ceramic or glass material, and especially pyroceram, in cooking plates for domestic cookers due to the ease of maintenance as well as to aesthetic reasons.

[0003] According to a known technique, the use of gas burners with such cooking plates requires holes in the cooking plate suitable for housing the burners, in such a way that the feeder heads of the burners remain in a raised position above the plate.

[0004] However, when cooking plates made of brittle material such as ceramic, glass or pyroceram are joined with traditional gas burners, generally made of metal, certain measures must be taken in order to avoid dangerous breakage of the plate itself.

[0005] In fact, a serious drawback of joining materials such as pyroceram and metal materials in hobs is the mutual interference which is generated between the plate and the burners due to their different coefficients of thermal expansion and different heating/cooling times. In a normal thermal cycle in the use of the burner, this could cause great internal stress in the brittle material were there not a certain gap between the burner and the plate and were the burner not free to move with respect to the plate. Therefore, in order to solve this problem, which can lead to frequent breakage of the brittle material, and to make the hob safe even should the plate break, recent embodiments of hobs comprise a box-type frame beneath the pyroceram plate, provided with support elements for the burners in correspondence with the holes obtained in said plate. The gas burners are mounted using elastic means on the support elements of the frame so that they can slide along their axis, while the holes in the plate are suitably sized with respect to the size of each burner, to allow reduced transversal movement of the latter. Moreover, there are matching elements on the side walls of each burner which fit into the lower surface of the plate in order to keep each burner in position, opposing the upward thrust exerted by the elastic means.

[0006] The European patent application No. 0.727.619 in the name of SCHOTT GLASWERKE, for example, provides the use of flat springs on the lower wall of the box-type frame in order to support the gas burners in correspondence with the holes in the upper plate made of pyroceram.

[0007] In order to avoid the penetration of liquids or extraneous particles between the burners and the plate and their deposit inside the box-type frame, it is also known to interpose a tight seal, that may be elastically strained, between the edge of each hole in the plate and the body of the burner housed in it, or, in any case,

between the burner and the plate.

[0008] The United States patent No. 5.313.929, in the name of SCHOTT GLASWERKE, illustrates, for example, the use in cooking plates made of brittle materials of a first seal interposed between the burner and the upper surface of the plate and a second seal interposed between a support integral with the burner and the lower surface of the same plate.

[0009] These embodiments however, present the drawback of not being easy to assemble, since the interposition of thrusting elastic means between the bottom frame and the cooking plate makes it difficult to insert the burners into the respective holes.

[0010] Moreover, it is necessary to fix the plate, for example using silicone-base glues, to a supporting housing, so as to prevent the action of the elastic means on the burners and that of the burners on the plate by means of the above mentioned matching elements, pushing the plate upwards and out of its housing.

[0011] A further drawback of the above embodiments is that the seal cannot be easily fitted between the burner and the edge of the hole in the plate so as to ensure that the seal is completely tight since the force exerted by the elastic means makes this operation difficult.

[0012] A scope of the present invention is to solve the above mentioned problems by supplying a gas burner suitable for use in hobs with a plate made of brittle material such as pyroceram with holes obtained in it, which is easy to install and does not require that the plate be fixed in place.

[0013] A further scope of the present invention is to supply a gas burner which allows for the easy fitting in an optimal position of a tight seal between the edge of each hole in the plate and the respective burner.

[0014] These scopes are achieved by the gas burner for domestic appliances suitable for use in hobs with an upper plate with at least one hole for housing the burner and a lower box-type frame, as claimed in the main claim.

[0015] The gas burner according to the invention is particularly suitable for use in hobs with an upper plate made of brittle material with at least one hole for housing the burner, and comprises a burner body and a removable feeder head. The burner body is supported at the hole by elastic fixing means and moreover has means for centering it with respect to the plate. These centering means allow the burner to move along its axis with respect to the plate, but prevent it from rotating with respect to said axis.

[0016] According to a peculiar aspect of the present invention, the elastic fixing means comprise an elastic element set against an opposing flange which define a housing suited to elastically restrain the edge of the hole in the plate made of brittle material.

[0017] According to another aspect of the present invention, the centering means may be connected to a box-type frame placed beneath the plate and comprise

at least one pivot integral with the body of the burner and suited to fitting into the corresponding hole in said frame, in such a way that the burner is free to slide along its axis.

[0018] In a particular embodiment of the present invention, the elastic fixing means are connected to the body of the burner by means of registrable means of restraint.

[0019] According to a preferred embodiment of the present invention, said means of restraint comprise a threaded screw and a bracket integral with the body of the burner.

[0020] A preferred embodiment of the invention will be shown in the appended figures, in order to illustrate the invention but not intended to be limitative thereof, wherein:

figure 1 is a side view of a gas burner used in a hob with a plate made of brittle material, according to the invention;

figure 2 is a top view of the body of the burner in figure 1;

figure 3 is an A-A section view of figure 2 of the burner according to the invention; and

figure 4 is a B-B section view of figure 2 of the same burner.

[0021] With reference to figures 1 and 3, the burner, which as a whole is marked 15, according to a preferred embodiment of the present invention, is mounted on a cooking plate 1 made of pyroceram or other brittle material, in correspondence with a hole obtained in said plate 1 in order to house it. Beneath the plate 1 there is a box-type frame 2 which, in traditional embodiments, serves to support the burners. The burner 15 is moreover surrounded by a support grill 14 for domestic cooking utensils.

[0022] The burner 15 is also provided, see figure 2, with a spark plug 12 and a thermocouple 13. As illustrated in figures 2, 3 and 4, the burner 15 comprises a body of the burner 4 and a removable feeder head 3 fitted to the body of the burner 4.

[0023] On the upper surface of the body of the burner 4 there are two brackets 7a and 7b which are cut into the body 4 and are diametrically opposed, each with a threaded hole to house two corresponding restraining screws 8a and 8b. Between each bracket 7a and 7b and each corresponding screw 8a and 8b, there is a circular flange 6 and a Belleville washer 5 which surround the body of said burner 4 and have holes for the screws 8a and 8b to fit into. The Belleville washer 5 and the circular flange 6 define together a housing suited to restraining the free edge of the hole in the plate 1. In particular, the Belleville washer 5 exerts an opposing action with respect to the circular flange 6 which determines the elastic fixing of the body of the burner 4 on the plate 1.

[0024] The distance between the washer 5 and the flange 6 may be regulated by means of the screws 7a

and 7b, as a function of the thickness of the plate 1 and the conformation of the washer 5 and the flange 6.

[0025] The body of the burner 4 comprises moreover a seal 11, preferably made of silicon material, interposed between the Belleville washer 5 and the flange 6. The action of the washer 5 on the seal 11 is such as to keep said seal 11 in constant contact with the plate 1 so as to ensure an optimum seal even in the case of transversal or axial displacement of the body 4.

[0026] With particular reference to figures 2 and 4, the Belleville washer 5 and the circular flange 6 have circular holes to house the spark plug 12 and the thermocouple 13. At the bottom wall of the body of the burner 4, there are two internal threads 16a and 16b suited respectively to housing two screws 9a and 9b. The screws 9a and 9b are also filled into two corresponding openings to be found on a projecting part 10 of the bottom of the box-type frame 2.

[0027] The screws 9a and 9b serve principally to centre the body of the burner 4 on the frame 2, and therefore with respect to the plate 1, preventing the body of the burner 4 from rotating on its axis. The distance between the heads of the screws 9a and 9b and the bottom wall of the body of the burner 4 defines moreover the maximum axial displacement possible of said body of the burner 4. According to this embodiment, the burner 15 is able to move axially and to a limited extent transversally, with respect to the pyroceram plate 1, while still keeping the seal 11 interposed between the body of the burner 4 and the edge of the hole in said plate 1, thus ensuring an optimum seal.

[0028] Moreover, the installation of the burner 15 on the plate 1 is facilitated by the fact that there are no forces exerting an upward thrust on the plate 1, but only relative forces between the plate 1 and the burner 15. This makes it possible to simply position the cooking plate 1 on supports without any need for fixing said plate 1 definitively to a housing.

[0029] Finally, the mounting of the burner 15 is not hampered by the elastic elements. In fact, it is possible to advantageously position the edges of the hole in the plate 1 in the housing defined by the Belleville washer 5 and the flange 6, maintaining, due to the screw 8a and 8b, sufficient distance between the washer 5 and the flange 6. Only subsequently, is it possible to tighten the screws 8a and 8b to the brackets 7a and 7b, pressing the washer 5 and the flange 6 together so that the washer 5 may exert the desired opposing action on the flange 6 and therefore the body of the burner 4 be fixed elastically to the plate 1.

Claims

1. A gas burner for domestic appliances of the type comprising a body of the burner and a feeder head for use in hobs with a top plate with at least one hole for housing said burner, characterized in that said body of the burner is supported elastically by

elastic fixing means at the edge of said hole and comprises centering means of said body of the burner with respect to said top plate, said centering means allowing for axial movement of said body of the burner with respect to said plate.

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2. A burner according to claim 1 characterized in that said elastic fixing means comprise at least one elastic element set against at least one opposing flange. 10
3. A burner according to either of the preceding claims, characterized in that said elastic fixing means are connected to said body of the burner by registrable means of restraint. 15
4. A burner according to claim 3, characterized in that said registrable means of restraint comprise at least one screw and at least one bracket with a threaded hole for housing said screw. 20
5. A burner according to any of the preceding claims characterized in that the burner comprises at least one seal element which acts on the edge of said hole in said plate and connected to said burner by said elastic fixing means. 25
6. A burner according to claims 2 and 5 characterized in that said at least one seal element is interposed between said elastic element and said opposing flange. 30
7. A burner according to any of the claims from 2 to 6, characterized in that said at least one elastic element is a flat spring or a Belleville washer. 35
8. A burner according to any of the preceding claims, characterized in that said centering means are mounted on a box-type frame located beneath said plate. 40
9. A burner according to claim 8, characterized in that said centering means comprise at least one pivot.
10. A burner according to claim 9, characterized in that said at least one pivot comprises a threaded part to cooperate with a corresponding internal thread in the lower part of said body of the burner and a screw head axially fitted against said threaded part. 45
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11. The use of a burner according to any of the preceding claims for use with plates made of pyroceram or other brittle material. 55

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Fig. 2

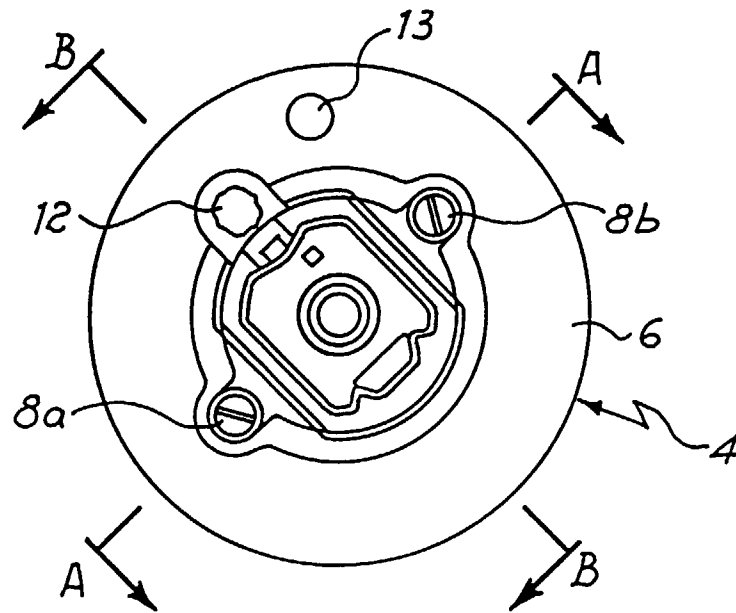
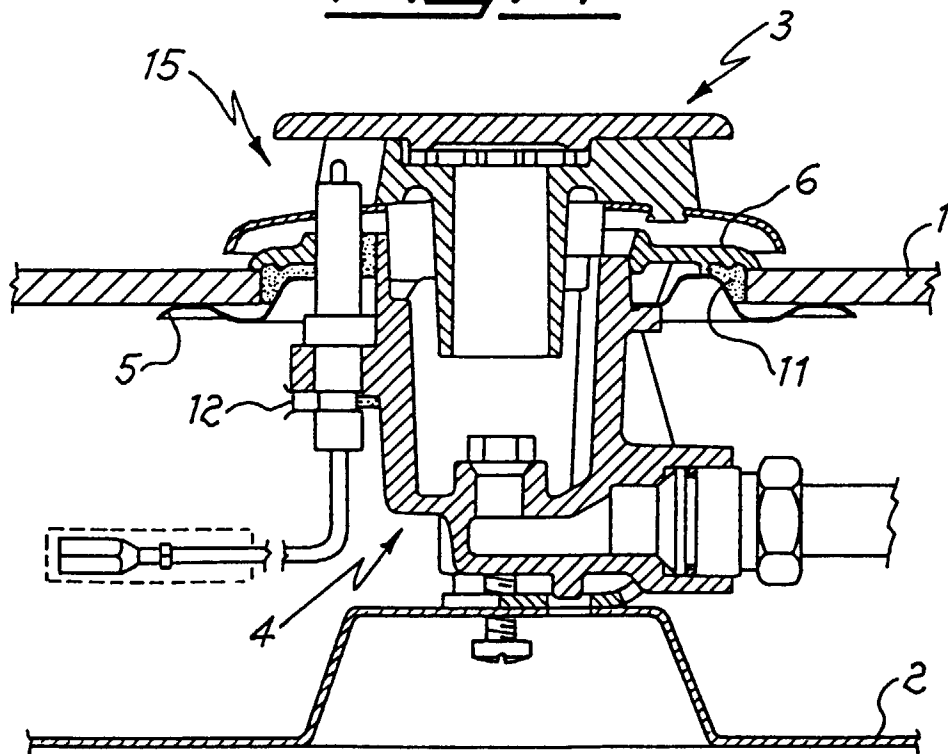


Fig. 4





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0358

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	DE 297 17 322 U (SCHOTT GLASWERKE) 4 December 1997 * page 4, paragraph 2 - page 5, paragraph 3 * * page 6, paragraph 4 - page 7, paragraph 1 * * page 8, paragraph 4 - page 9, paragraph 2 * * figure 6 *	1-5,7-11	F23D14/06
Y	EP 0 536 619 A (SCHOTT GLASWERKE ; ZEISS STIFTUNG (DE)) 14 April 1993 * column 6, line 1 - column 6, line 15 * * column 7, line 13 - column 7, line 30 * * figures 1-4 *	1-5,7-11	
D	& US 5 313 929 A		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F23D F24C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 November 1998	Examiner Phoa, Y
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 83 0358

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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09-11-1998

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29717322 U	04-12-1997	NONE	
EP 0536619 A	14-04-1993	DE 4133409 A	15-04-1993
		AT 119264 T	15-03-1995
		CA 2080170 A	10-04-1993
		DE 59201531 D	06-04-1995
		ES 2069951 T	16-05-1995
		GR 3015874 T	31-07-1995
		JP 6193839 A	15-07-1994
		US 5313929 A	24-05-1994

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82