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(54) GAS BURNER WITH SEVERAL FLAME SECTORS

GASBRENNER MIT MEHREREN FLAMMENSEKTOREN

BRULEUR A GAZ A PLUSIEURS SECTEURS DE FLAMME

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(72) Inventor: **PAESANI, Carlo**
I-60021 Camerano (IT)

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(74) Representative: **Piovesana, Paolo**
Via F. Baracca, 5/a
30173 Venezia-Mestre (IT)

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(73) Proprietor: **Defendi Italy S.r.l.**
60021 Camerano (IT)

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Description

[0001] This invention relates to a gas burner with several flame sectors.

[0002] Gas burners for food cooking are known, comprising a burner body fed via a nozzle by a gas flow which entrains a flow of primary air and mixes therewith to form a mixture which when suitably ignited generates a ring of radial flames adjustable in size by a tap positioned upstream of the nozzle.

[0003] In addition to traditional burners comprising one flame ring, so-called "double ring", "triple ring" and double burners are also commercially available. These latter comprise two flame rings controllable separately by one or two feed taps.

[0004] This type of burner has been available for some time, but recently it has been sought to limit its dimensions to enable it to be also used in built-in cooking hobs having a height of about 30 mm, in addition to its use in free-standing cookers.

[0005] Burners of this type generally draw their primary and secondary air from above the cooking utensil so that normal burner operation is not interrupted by possible air movements which may take place within the interior of the cooking appliance, caused for example by the opening of a door in a furniture unit positioned below the cooking hob or by the presence of the oven situated under said hob.

[0006] The document WO9911975-A relates to a burner of small dimensions and hence suitable for mounting in built-in hobs, which comprises three flame rings and uses primary and secondary air taken from above the cooking hob. The air-gas mixture is created by a radial venturi of very low height, and is distributed within the two flame rings via four horizontally disposed radial conduits.

[0007] In this burner, as in similar commercially available burners, the flames are distributed over two or at most three flame rings which are hence directed mostly towards the outside rather than the inside of the base of the pan.

[0008] A drawback of these burners consists of the fact that, as the third ring is provided on a fairly large diameter and as it is directed towards the outside of the cooking utensil, the resultant cooking is not uniform over the entire pan.

[0009] An object of the invention is to eliminate this drawback by providing a flame burner with four or more flames having excellent flame distribution below the pan to hence obtain high cooking efficiency while at the same time maintaining the now well consolidated dimensioning and operating principle.

[0010] This and further objects which will be apparent from the ensuing description are attained according to the invention by a gas burner with several flame sectors for cooking appliances as described in claim 1.

[0011] A preferred embodiment of this invention and a variant thereof are described in detail hereinafter with

reference to the accompanying drawings, in which:

Figure 1 is a plan view of a burner according to the invention,

5 Figure 2 is a section through the burner on the line II-II of Figure 1,

Figure 3 is a plan view of the venturi tube,

10 Figure 4 is a section therethrough on the line IV-IV of Figure 3,

Figure 5 is a plan view of the hollow body,

Figure 6 is a plan view of a different embodiment of the burner, and

15 Figure 7 is a longitudinal section therethrough on the line VI-VI of Figure 6.

[0012] As can be seen from the figures, the burner of the invention comprises a cup piece 2 provided lowerly with a conduit 4 feeding an injector 6. At its upper edge, the cup piece comprises an annular flange 8 for its fixing to the sheet metal 10 of the cooking hob. On the cup 2 there rests a flame divider element, indicated overall by 12 and consisting of two parts, namely the venturi tube 14 and the hollow body 16, these being joined together by connection elements 18.

20 **[0013]** The venturi tube 14 comprises, for its support and centering on the cup piece 2, a flange 20 rigid with a frusto-conical tube piece 22 facing the injector 6 and from which there extend four equiangular radial webs 24 which with the hob 10 and annular flange 8 form radial channels 26 for entry of the primary air.

25 **[0014]** The hollow body 16 presents a circular central portion 28 from which four radial webs 30 extend to form elements by which two annular chambers 32, 34 respectively are joined together.

30 **[0015]** The outer annular chamber 34 comprises along its outer edge a first ring 36 of flame slits and along its inner edge a second ring 38 of flame slits. Said ring is closed upperly by an annular cap 40. The inner annular chamber 32 comprises along its outer edge a third ring 40 of flame slits and along its inner edge a fourth ring 42 of flame slits. The fourth flame ring 42 is formed as four sectors 44, with the flame slits of each sector disposed parallel to each other.

35 **[0016]** The annular chamber 32 is closed upperly by an annular cap 46.

40 **[0017]** With the upper edge of the tube piece 22 the central portion 28 forms a mixing chamber 48 from which there radially extend four conduits 50 which:

- 45
- 50 - convey the air-gas mixture via apertures 52 to the annular chamber 32 which feeds the flame rings 40, 42, and
 - convey the air-gas mixture via apertures 54 to the annular chamber 34 which feeds the flame rings 36 and 38.
- 55

[0018] With the hob 10 and annular flange 8 the flame divider 12 forms channels 56 for the passage of second-

ary air to the second 38, third 40 and fourth 42 flame ring.

[0019] From the foregoing it is apparent that the burner of the invention presents numerous advantages, and in particular:

- it presents excellent flame distribution in that the most inner ring directs its flames towards the central part of the pan,
- it enables primary air and secondary air to be taken from above the hob,
- it is of low height because of the radial configuration of the venturi tube.

[0020] In the embodiment shown in Figures 6 and 7, the central portion 28 comprises on its surface an annular rim 58 in which flame slits 60 are provided.

[0021] The central body also presents a hole 62 feeding a venturi nozzle 64 faced by a closure plate 66.

[0022] This embodiment with five flame rings presents the further advantage that the flame is directed into a very localized central region.

Claims

1. A gas burner with several flame sectors for cooking appliances, comprising:

- a cup (2) provided with an annular flange for its fixing to the cooking hob and provided with only one injector (6) which forms a gas mixture with primary air coming from the external area of the hob (10),
- a flame divider (12) superposed on said cup and comprising a radial venturi consisting in a frustoconical tube (22) facing said injector, and in a horizontal radial portion, formed from an upper portion (43) of said conical tube (22), and a lower face of the central portion (28) facing said frustoconical tube,
- two concentric annular chambers (32, 34) connected to said venturi, each chamber being provided along its outer and inner edges with flame slits forming mutually concentric flame rings (36, 38, 41, 42),
- caps (40, 46) closing said annular chambers (32,34),
- channels (56) formed by the flame divider (12) and the hob (10) for the passage of secondary air to said flame slits.

2. A burner as claimed in claim 1, **characterised by** comprising radial channels (50) presenting apertures (52) which connect them to the annular chamber (32), and in the walls of which there are provided the flame slits of the third (41) and fourth (42) flame rings.

3. A burner as claimed in claim 1, **characterised in that** the fourth flame ring (41) is formed in four sectors (44).

- 5 4. A burner as claimed in claim 3, **characterised in that** the flame slits of each sector (44) are mutually parallel.

- 10 5. A burner as claimed in claim 1, **characterised in that** the flame divider presents a central body (28) comprising a rim in which fifth flame slits (60) are provided and further comprising a hole (62) feeding a venturi nozzle (64).

Patentansprüche

1. Gasbrenner mit mehreren Flammensektoren für Kochgeräte, der umfasst:

- einen Becher (2), der mit einem ringförmigen Flansch für seine Befestigung am Kochfeld versehen ist und mit nur einer Einleitungsvorrichtung (6) versehen ist, die ein Gasgemisch mit Primärluft, die von dem äußeren Bereich des Kochfeldes (10) stammt, erzeugt,
- einen Flammerteiler (12), der dem Becher überlagert ist und ein radiales Venturi-Rohr umfasst, das aus einem der Einleitungsvorrichtung zugewandten kegelstumpfförmigen Rohr (22) und aus einem horizontalen radialen Abschnitt, der aus einem oberen Abschnitt (43) des konischen Rohrs (22) und einer unteren Fläche des Mittelabschnitts (28), die dem kegelstumpfförmigen Rohr zugewandt ist, gebildet ist, besteht,
- zwei konzentrische Ringkammern (32, 34), die mit dem Venturi-Rohr verbunden sind, wobei jede Kammer längs ihrer äußeren und inneren Kanten mit Flammenschlitzen versehen ist, die zueinander konzentrische Flammenringe (36, 38, 41, 42) bilden,
- Kappen (40, 46), die die Ringkammern (32, 34) verschließen,
- Kanäle (56), die durch den Flammerteiler (12) und das Kochfeld (10) gebildet sind, um den Durchgang von Sekundärluft zu den Flammenschlitzen zu ermöglichen.

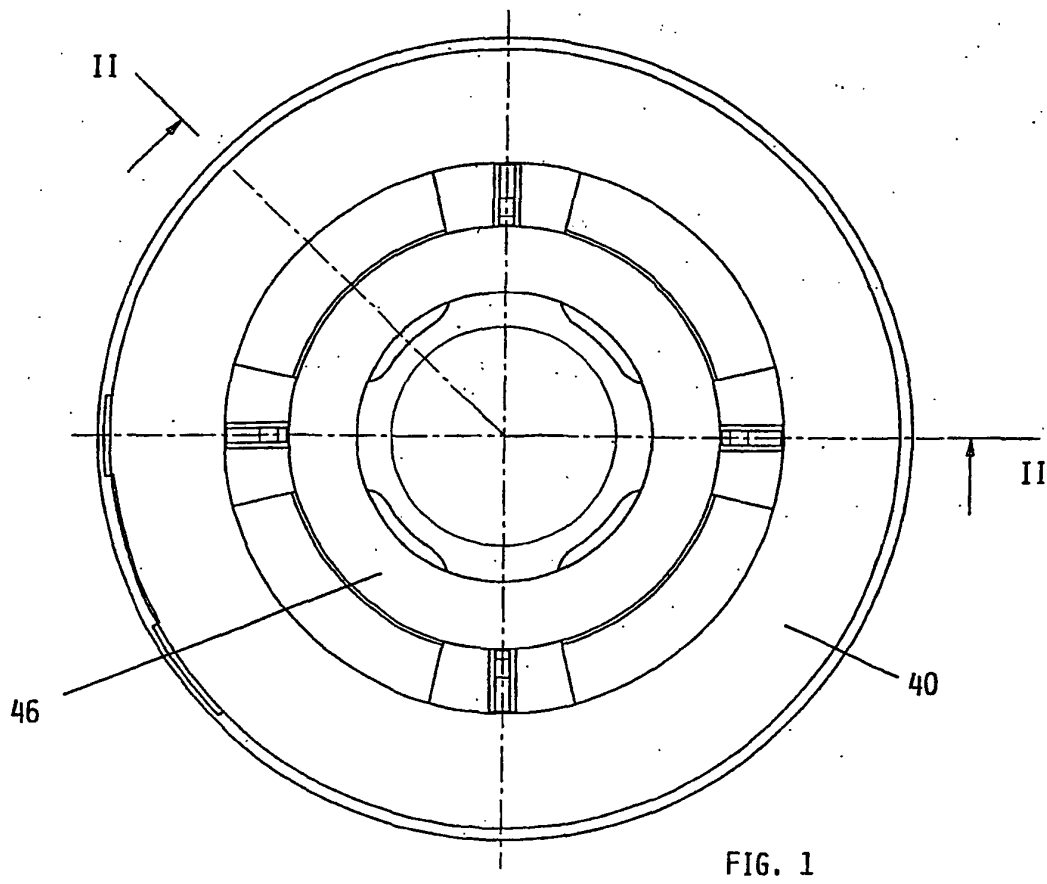
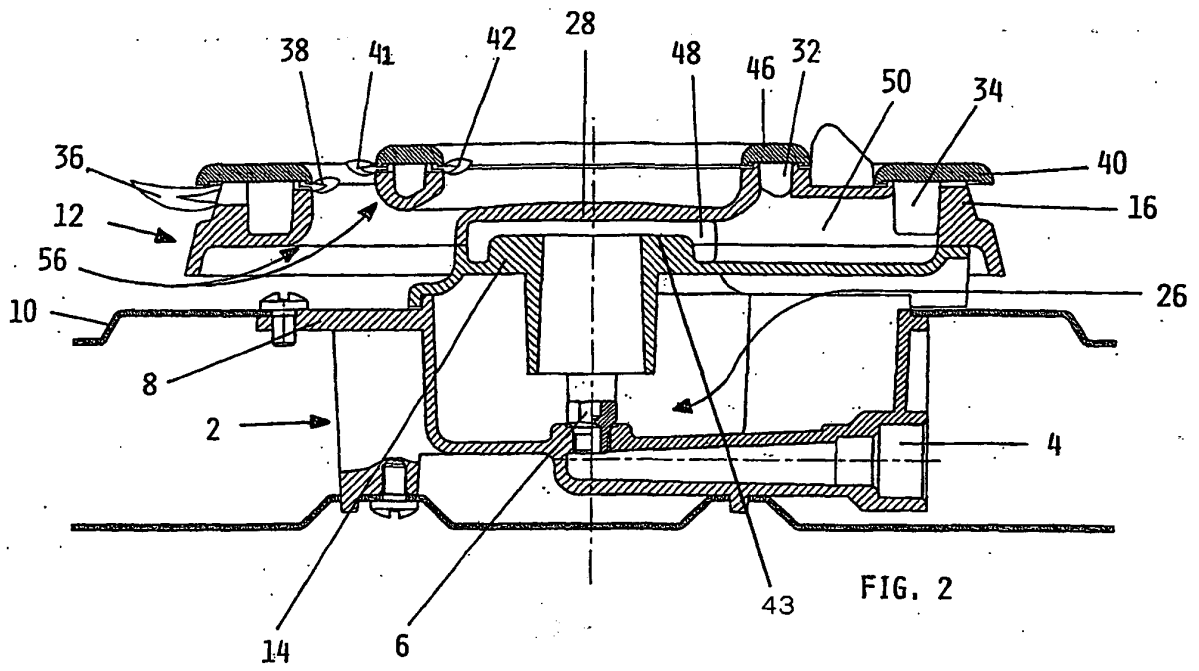
2. Brenner nach Anspruch 1, **dadurch gekennzeichnet, dass** er radiale Kanäle (50) umfasst, die Öffnungen (52) aufweisen, die sie mit den Ringkammern (32) verbinden, wobei in deren Wänden die Flammenschlitze des dritten (41) und des vierten (42) Flammenrings vorgesehen sind.

3. Brenner nach Anspruch 1, **dadurch gekennzeichnet, dass** der vierte Flammenring (41) in vier Sektoren (44) ausgebildet ist.

4. Brenner nach Anspruch 3, **dadurch gekennzeichnet, dass** die Flammenschlitze jeden Sektors (44) zueinander parallel sind. (28) comprenant un rebord dans lequel les cinquièmes fentes à flamme (60) sont ménagées et comprenant en outre un trou (62) alimentant une buse venturi (64).
5. Brenner nach Anspruch 1, **dadurch gekennzeichnet, dass** der Flammenteiler einen Mittelkörper (28) aufweist, der einen Rand umfasst, in dem fünfte Flammenschlitze (60) vorgesehen sind, und ferner ein Loch (62) aufweist, das eine Venturi-Düse (64) speist. 5
10

Revendications

1. Brûleur à gaz avec plusieurs secteurs de flammes pour appareils de cuisson, comprenant : 15
- une coupelle (2) munie d'une bride annulaire pour sa fixation à la plaque de cuisson et munie d'un unique injecteur (6), qui forme un mélange gazeux avec l'air primaire provenant de la zone externe de la plaque (10), 20
 - un diviseur de flamme (12) superposé sur ladite coupelle et comprenant un tube venturi radial constitué d'un tube tronconique (22) faisant face audit injecteur et d'une partie radiale horizontale formée d'une partie supérieure (43) dudit tube conique (22) et d'une face inférieure de la partie centrale (28) faisant face audit tube tronconique, 25
 - deux chambres annulaires concentriques (32, 34) raccordées audit tube venturi, chaque chambre étant pourvue, le long de ses bords externe et interne, de fentes à flamme formant des anneaux de flammes mutuellement concentriques (36, 38, 41, 42), 30
 - des coiffes (40, 46) fermant lesdites chambres annulaires (32, 34), 35
 - des canaux (56) formés par le diviseur de flamme (12) et la plaque (10) pour le passage d'air secondaire vers lesdites fentes à flamme. 40
2. Brûleur selon la revendication 1, **caractérisé en ce qu'il** comprend des canaux radiaux (50) présentant des ouvertures (52) qui les raccordent à la chambre annulaire (32) et dans les parois desquels sont ménagées les fentes à flamme des troisième (41) et quatrième (42) anneaux de flamme. 45
3. Brûleur selon la revendication 1, **caractérisé en ce que** le quatrième anneau de flamme (41) est formé de quatre secteurs (44). 50
4. Brûleur selon la revendication 3, **caractérisé en ce que** les fentes à flamme de chaque secteur (44) sont mutuellement parallèles. 55
5. Brûleur selon la revendication 1, **caractérisé en ce que** le diviseur de flamme présente un corps central



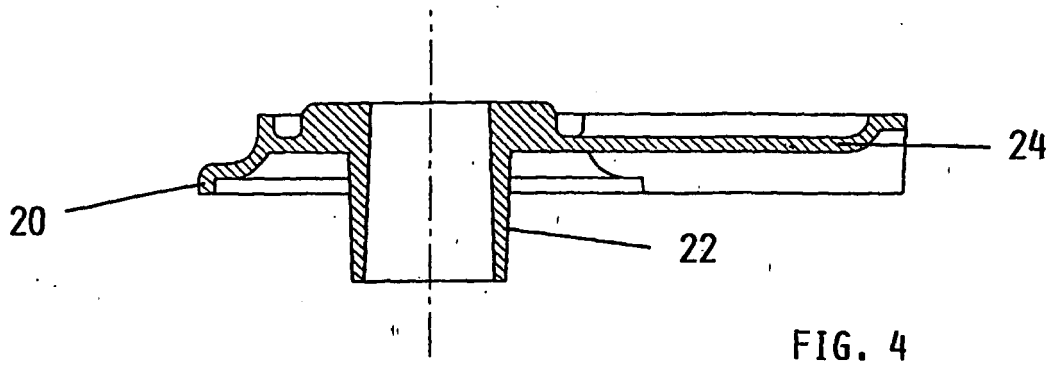


FIG. 4

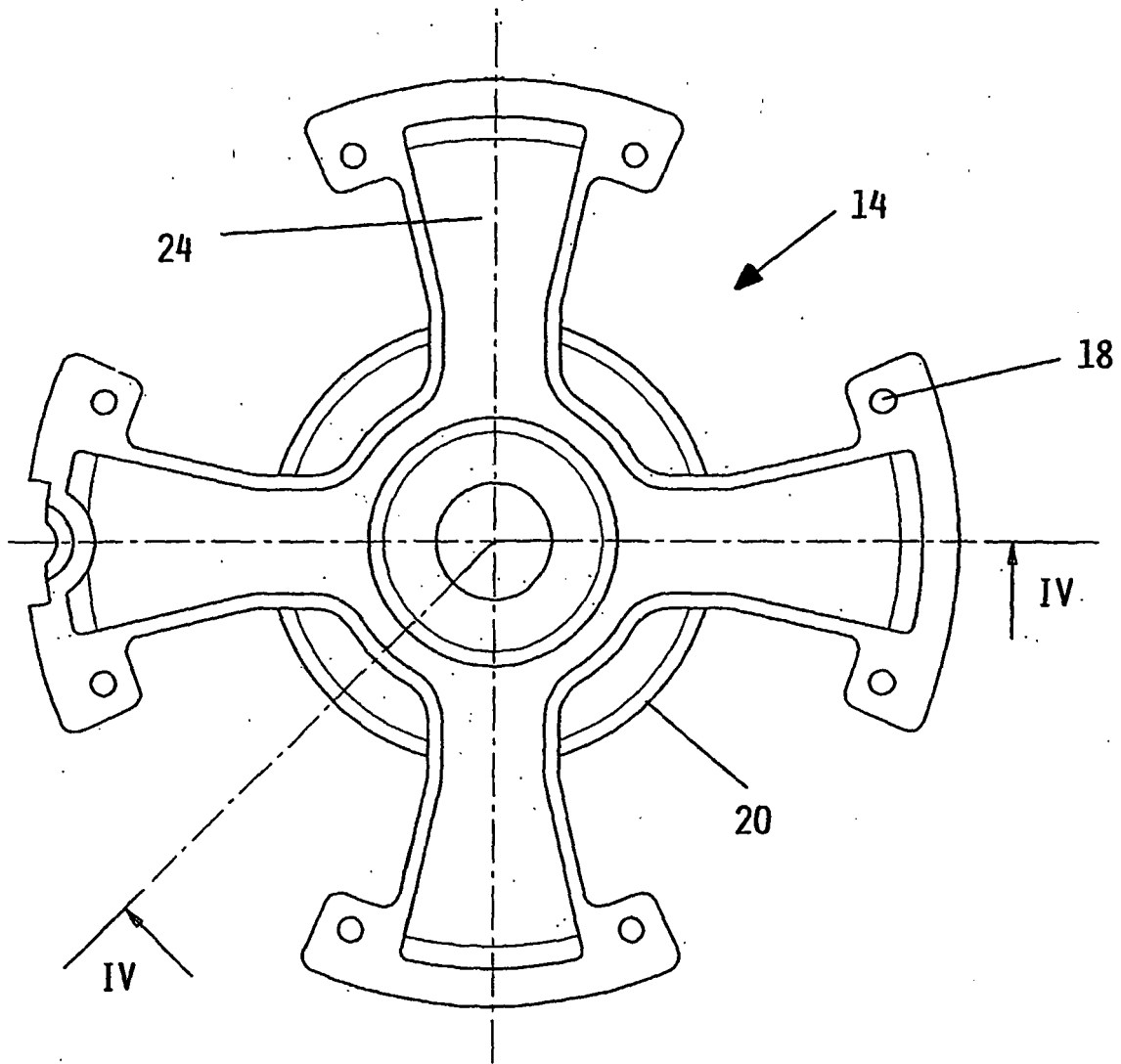


FIG. 3

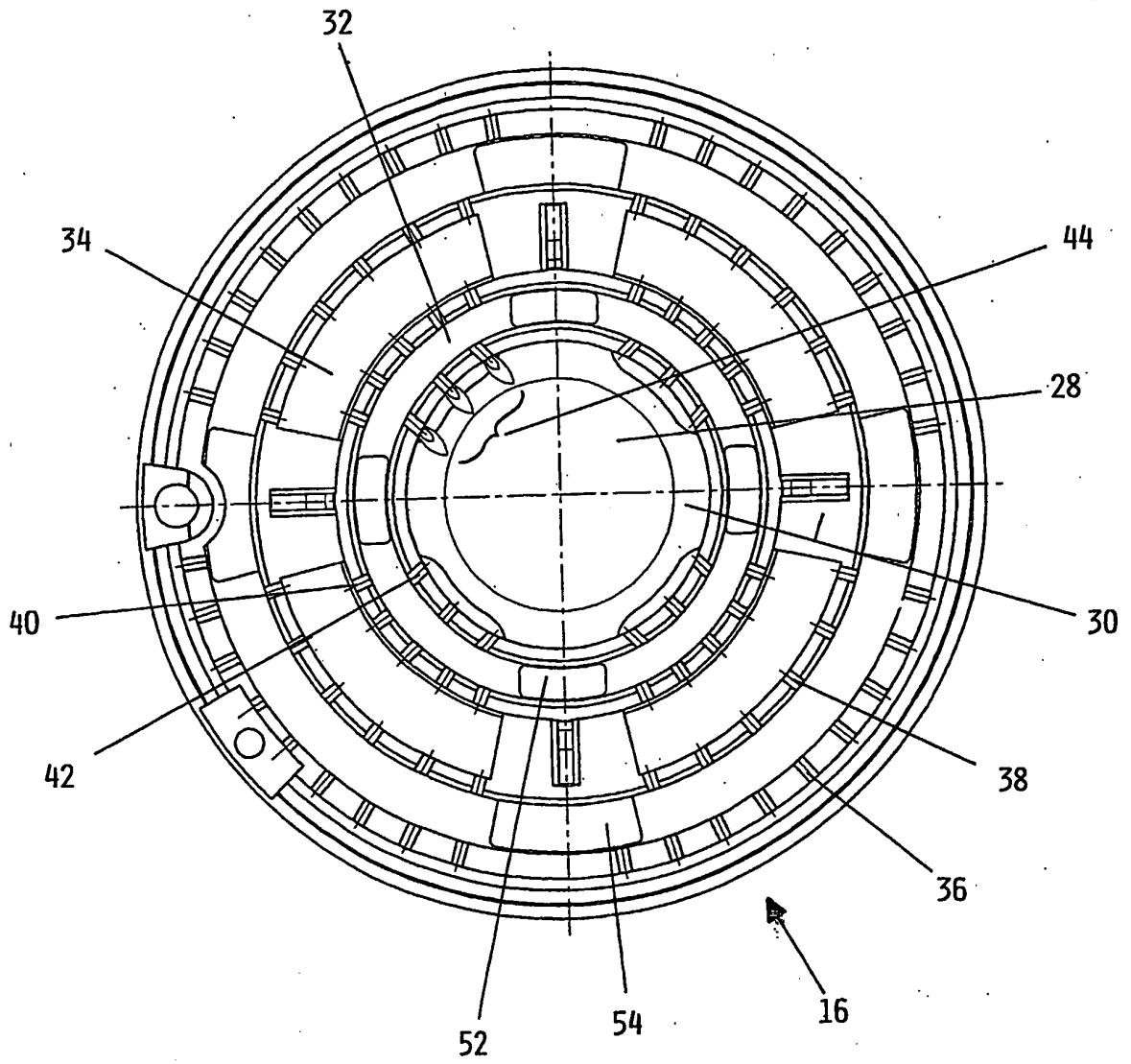


FIG. 5

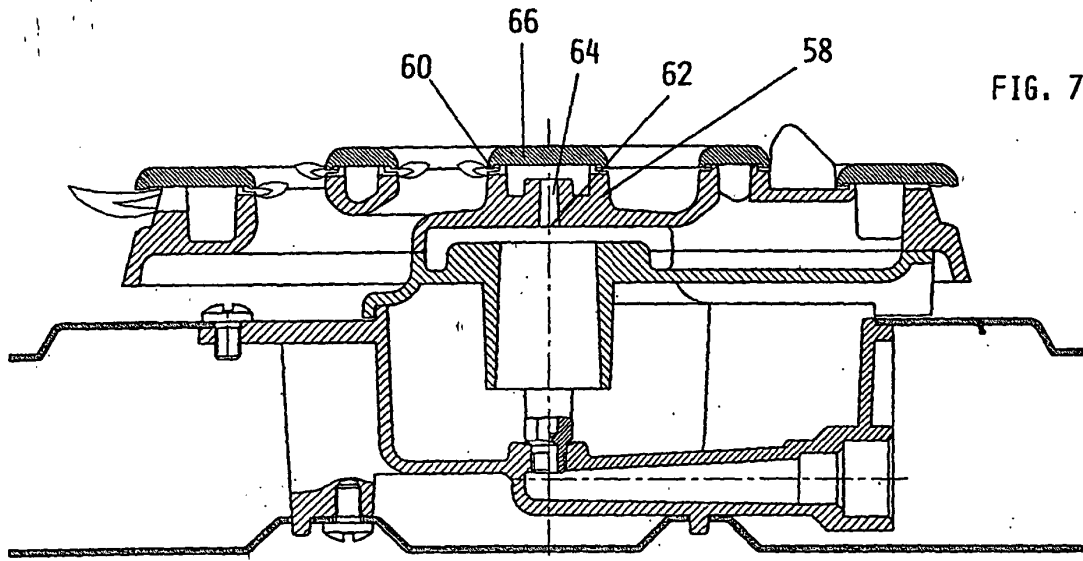


FIG. 7

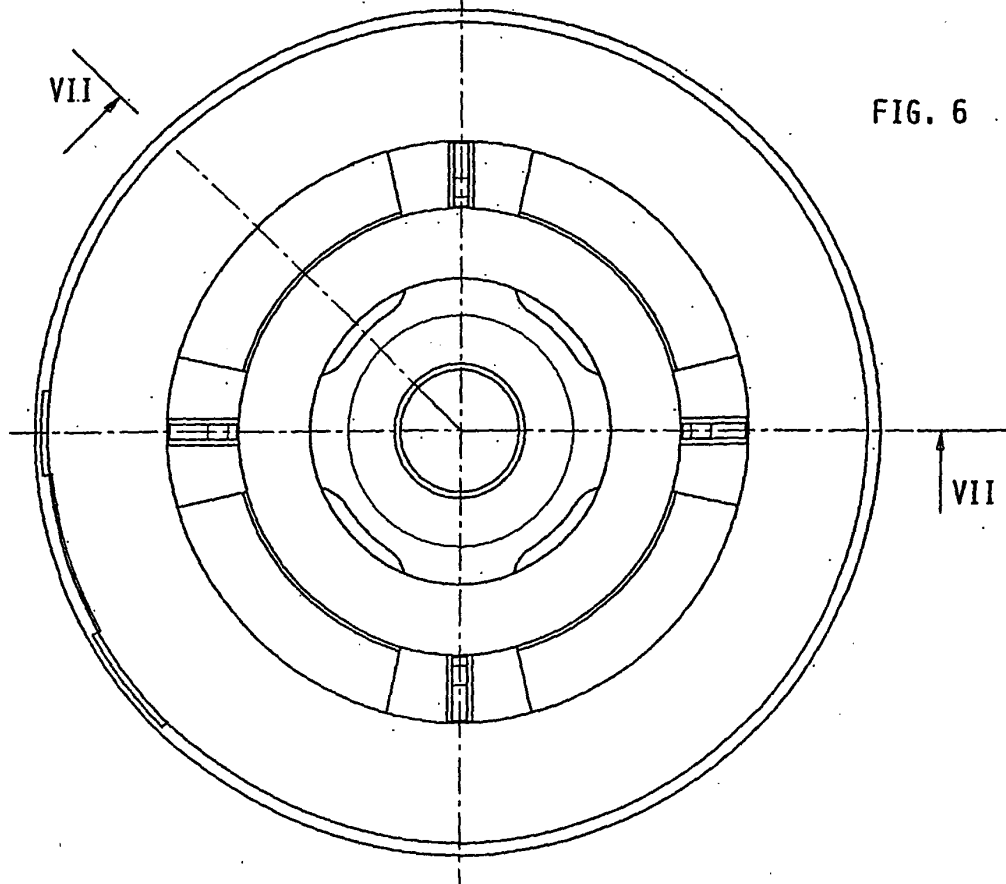


FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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