

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 1 042 634 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

24.10.2001 Bulletin 2001/43

(21) Application number: **98943801.5**

(22) Date of filing: **28.07.1998**

(51) Int Cl.7: **F23D 14/06**

(86) International application number:
PCT/EP98/04753

(87) International publication number:
WO 99/08046 (18.02.1999 Gazette 1999/07)

(54) **GAS BURNER WITH SEVERAL FLAME SECTORS**

GASBRENNER MIT MEHREREN FLAMMENSEKTOREN

BRULEUR A GAZ COMPRENANT PLUSIEURS ZONES DE FLAMME

(84) Designated Contracting States:
DE ES FR GB IT NL

(30) Priority: **11.08.1997 IT VE970034**

(43) Date of publication of application:
11.10.2000 Bulletin 2000/41

(73) Proprietor: **OFFICINE MECCANICHE DEFENDI
S.R.L.
60021 Camerano (AN) (IT)**

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

(74) Representative: **Piovesana, Paolo
Corso del Popolo, 70
30172 Venezia-Mestre (IT)**

(56) References cited:
**EP-A- 0 485 645 EP-A- 0 525 299
EP-A- 0 534 301 DE-C- 366 780
FR-A- 2 650 369 FR-A- 2 655 711**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 042 634 B1

Description

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

[0002] Gas burner for food cooking are known. In addition to traditional burners comprising one flame ring, so-called "double ring" or "triple ring" burners and double burners are also available. These latter comprise two flame rings controllable separately by one or two gas feed taps.

[0003] This type of burner which, because of the requirement for greater power to achieve quicker cooking and greater efficiency, has an outer flame diameter greater than traditional burners, has however certain joint or separate drawbacks, and in particular:

- a very low maximum power in the light of the actual burner dimensions, while at the same time having a too high minimum power,
- a certain complexity in changing the nozzle when passing from one type of gas to another,
- "streaming" problems, ie burner extinguishing arising from air movement due to the suction caused by opening the door of the oven or of the furniture item lying below the cooker.

[0004] FR-A-2.650.369 discloses a gas burner fixed to the hob surface of a cooker, the gas burner comprising two concentric flame sectors and two separate gas nozzles, each gas nozzle feeding a flame sector. Primary combustion air for the two gas nozzles and secondary combustion air for both flame sectors is drawn from the exterior of the cooker.

[0005] EP-A-0 485 645 shows a gas burner with two concentric flame sectors, each fed by a separate gas nozzle, wherein primary combustion air for the two nozzles is drawn from the interior of the cooker and secondary combustion air for both sectors is drawn from the exterior of the cooker

[0006] EP-A-0 525 299 shows a gas burner wherein primary air for the inner flame sector originates from the cooker interior and primary air for the outer flame sector originates from the cooker exterior. Secondary combustion air for both sectors is drawn from the exterior of the cooker.

[0007] An object of the invention is to provide a multi flame-ring gas burner having the advantages of known cup burners, while at the same time eliminating their drawbacks.

[0008] This and further objects which will be apparent from the ensuing description are attained according to the invention by a cooker as described in claim 1.

[0009] A preferred embodiment of this invention is described in detail hereinafter with reference to the accompanying drawings, on which:

Figure 1 is a plan view of the burner cup,

Figure 2 is an axial section through the burner on

the line II-II of Figure 1, and

Figure 3 is an axial section therethrough on the line III-III of Figure 1.

5 **[0010]** As can be seen from the figures, the gas burner of the invention comprises substantially a cup 2 and a body 4 external to the hob surface.

[0011] The cup 2 comprises a collar 6 provided with appendices 8 for the support and fixing of the sheet metal 10 which forms the cooker or hob. The cup 2 is divided by a horizontal baffle 12 defining a chamber 13 which is lowerly provided with an aperture 14 closed by a removable cover 16.

10 **[0012]** The lower part of the cup 2 below the baffle 12 houses a gas feed conduit 18 provided with a nozzle 20 positioned horizontally and hence parallel to the sheet metal 10.

[0013] Facing the nozzle 20 there is provided a primary air-gas mixing device consisting of a Venturi tube 22 divided downstream into two conduits 24 which then bend through 90° in a vertical direction to form two columns 26 positioned diametrically about the cup axis.

20 **[0014]** The chamber 13 of the cup 2 houses a second gas feed conduit 28 provided with a nozzle 30 of vertical axis.

25 **[0015]** The body 4 which rests on the cup 2 is connected to a discoidal element 31 provided centrally with a Venturi tube 34 facing the top of the nozzle 30 and supporting a substantially cylindrical flame divider 36 with lateral holes 38. The body 4 is provided with pegs 41 inserted into the discoidal element 31 to form passage channels 35 for secondary air.

30 **[0016]** A flame divider 40 rests on the body 4 to define an annular chamber 44 provided with holes 42. Two vertical conduits 32 cooperating with the cup columns 26 terminate in said chamber 44.

35 **[0017]** The gas burner of the invention operates in the following manner, reference being made to a single gas tap with two exit paths, it being however apparent that the burner can also be fed via two gas taps, one for each flame sector to be formed.

40 **[0018]** It is also apparent that in the illustrated example the gas flow through the conduit 18 is greater than the gas flow through the conduit 28.

45 **[0019]** When the gas tap is in its maximum open position corresponding to maximum gas burner power, the gas enters through the conduits 18 and 28, and in particular:

- 50 - the gas which enters through the conduit 18 and leaves from the nozzle 20 enters the Venturi tube 22 to draw in a large quantity of primary air 50 from below the metal sheeting, to consequently achieve good mixing and hence high power with good combustion. The primary air-gas mixture advances along the conduits 24 and columns 26, to enter the annular chamber 40 via the conduits 32. From this chamber the primary air-gas mixture emerges

through the holes 42 to burn using secondary air originating from above the cooker for its combustion,

- the gas which enters through the conduit 28 and leaves from the nozzle 30 enters the Venturi tube 34 to draw in primary air 46 from the top of the metal sheeting 10. The primary air-gas mixture hence reaches the holes 38, from which it emerges to burn using the secondary air 48 originating from above the metal sheeting 10 and passing through the channels 35.

[0020] On operating the gas tap to adjust the gas flow from maximum to minimum value, the gas quantity entering via the conduits 18 and 28 progressively decreases to hence reduce the flame power and dimensions.

[0021] This operation is at no stage affected by the streaming effect due to the opening or closure of a furniture or oven door located below the hob, which could cause air movement such as to interrupt the normal flow of primary air to the Venturi tube 22 and consequently cause the flames to separate from the holes 40 of the flame divider to the extent of extinguishing them.

[0022] In this respect the flame divider 36 at all stages remains fed because the primary air-gas mixture which feeds it is formed by the primary air 46 originating from above the metal sheeting 10, with the result that the flames leaving the holes 38 immediately re-ignite the mixture leaving the holes 42.

[0023] The effect of adjusting the burner to minimum flow has the effect of interrupting gas feed through the conduit 18, with consequent extinguishing of the flames leaving the holes 42.

[0024] As the flame divider 36 is of small dimensions it enables a very low minimum flow to be maintained as the small gas quantity is distributed over a very small diameter.

[0025] To again return the burner from minimum to maximum flow configuration, the gas tap is again turned to allow the gas to enter through the conduit 18, with formation of a mixture which, as stated, emerges from the holes 42 and ignites by contacts with the flames leaving the holes 38.

[0026] From the aforesaid it is apparent that the gas burner of the invention offers numerous advantages, and in particulars:

- it can deliver a very high power by virtue of the horizontal arrangement of the Venturi tube 22, which can be dimensioned to allow mixing of a considerable quantity of primary air and gas,
- the nozzle 20 can be easily and quickly changed because of the access offered to the chamber 13 by the removability of cover 16, which is fixed to the wall 12 by a screw 48,
- it is substantially insensitive to the streaming effect as one of the injectors is fed with primary air originating from above the hob.

Claims

1. A cooker comprising a hob surface defining an exterior and an interior of said cooker and a gas burner comprising at least two concentric flame sectors (36,40) each fed separately by a corresponding gas nozzle (30,20) whereby said gas nozzles are mutually separated and whereby said gas burner is supported by and fixed to said hob surface such that one (20) of said nozzles draws primary air (50) from the cooker interior to form a mixture which is fed to the outer sector (40), the other nozzle (30) draws primary air (46) from the cooker exterior to form a mixture which is fed to the inner sector (36), the gas/primary air mixtures emerging from the two flame sectors are burnt using secondary air (48) originating from the cooker exterior.
2. A cooker as claimed in claim 1, **characterised in that** said burner consists of a cup (2) housing the two nozzles (20,30), and a body (4) supporting the two flame sectors (36,40).
3. A cooker as claimed in claim 2, **characterised in that** the body (4) supports the outer sector (40) and is connected to a discoidal element (31) centrally supporting one flame sector (36).
4. A cooker as claimed in claim 3, **characterised in that** the body (4) is provided with pegs (41) for insertion into the discoidal element (31), and with this latter forms passage channels (35) for the secondary air (48).
5. A cooker as claimed in claim 1, **characterised in that** said flame sectors consists of rings.
6. A cooker as claimed in claim 1, **characterised in that** a horizontally arranged Venturi tube (22) faces the nozzle (20) feeding the outer ring.
7. A cooker as claimed in claim 6, **characterised in that** the Venturi tube (22) branches into two conduits (24) which then diverge upwards to connect to the body (4).
8. A cooker as claimed in claim 2, **characterised in that** the cup (2) comprises a horizontal baffle (12) defining a chamber (13) which houses the nozzle (30).
9. A cooker as claimed in claim 1, **characterised in that** the chamber (13') housing the nozzle (30) which feeds the central flame sector (36) is closed lowerly.
10. A cooker as claimed in claim 9, **characterised in that** the chamber (13') is provided lowerly with an

aperture (14) facing the feed nozzle (20) for the outer flame sector, said aperture being provided with a removable closure cover (16).

Patentansprüche

1. Kochgerät, umfassend eine Kochfläche, die das Äußere und das Innere des Kochgeräts begrenzt, und einen Gasbrenner, der mindestens zwei konzentrische Flammenabschnitte (36, 40) umfaßt, die jeweils getrennt durch eine entsprechende Gasdüse (30, 20) gespeist werden, wobei die Gasdüsen voneinander getrennt sind und wobei der Gasbrenner von der Kochfläche abgestützt und an dieser befestigt ist derart, daß eine (20) der Düsen Primärluft (50) von dem Inneren des Kochgeräts zur Bildung einer Mischung einzieht, die dem äußeren Abschnitt (40) zugeführt wird, und die andere Düse (30) Primärluft (46) von dem Äußeren des Kochgeräts zur Bildung einer Mischung einzieht, die dem inneren Abschnitt (36) zugeführt wird, wobei die Mischungen aus Gas und Primärluft, die aus den beiden Flammenabschnitten austreten, unter Verwendung von Sekundärluft (48), die von dem Äußeren des Kochgeräts stammt, verbrannt werden.
2. Kochgerät nach Anspruch 1, **dadurch gekennzeichnet, daß** der Brenner aus einem Topf (2), in dem die beiden Düsen (20, 30) aufgenommen sind, und einem Körper (4) besteht, der die beiden Flammenabschnitte (36, 40) abstützt.
3. Kochgerät nach Anspruch 2, **dadurch gekennzeichnet, daß** der Körper (4) den äußeren Abschnitt (40) abstützt und mit einem scheibenförmigen Element (31) verbunden ist, der mittig einen Flammenabschnitt (36) abstützt.
4. Kochgerät nach Anspruch 3, **dadurch gekennzeichnet, daß** der Körper (4) mit Stiften zur Einführung in das scheibenförmige Element (31) ausgestattet ist und mit dem letzteren Durchtrittskanäle (35) für die Sekundärluft (48) bildet.
5. Kochgerät nach Anspruch 1, **dadurch gekennzeichnet, daß** die Flammenabschnitte aus Ringen bestehen.
6. Kochgerät nach Anspruch 1, **dadurch gekennzeichnet, daß** ein waagrecht angeordnetes Venturirohr (22) der Düse (20) zugewandt ist, die den äußeren Ring speist.
7. Kochgerät nach Anspruch 6, **dadurch gekennzeichnet, daß** sich das Venturirohr (22) in zwei Kanäle verzweigt, die dann nach oben um zur Verbindung mit dem Körper (4) auseinander laufen.

8. Kochgerät nach Anspruch 2, **dadurch gekennzeichnet, daß** der Topf (2) eine waagerechte Prallplatte (12) umfaßt, die eine Kammer (13) begrenzt, die die Düse (30) aufnimmt.

9. Kochgerät nach Anspruch 1, **dadurch gekennzeichnet, daß** die Kammer (13'), in der die Düse (30) aufgenommen ist, die den mittigen Flammenabschnitt (36) speist, nach unten geschlossen ist.
10. Kochgerät nach Anspruch 9, **dadurch gekennzeichnet, daß** die Kammer (13') unten mit einer Öffnung (14) versehen ist, die der Zufühdüse (20) für den äußeren Flammenabschnitt zugewandt ist, wobei die Öffnung mit einem abnehmbaren Verschußdeckel (16) versehen ist.

Revendications

1. Un appareil de cuisson comprenant une surface de plaque définissant l'extérieur et l'intérieur dudit appareil de cuisson et un brûleur à gaz comprenant au moins deux secteurs de flamme concentriques (36, 40) alimentés chacun séparément par une buse de gaz correspondante (30, 20), lesdites buses de gaz étant séparées l'une de l'autre et ledit brûleur à gaz étant supporté et fixé sur la surface de plaque de sorte que l'une (20) desdites buses aspire de l'air primaire (50) de l'intérieur de l'appareil de cuisson pour former un mélange qui est amené au secteur extérieur (40), l'autre buse (30) aspire de l'air primaire (46) de l'extérieur de l'appareil de cuisson pour former un mélange qui est amené au secteur intérieur (36), les mélanges de gaz et d'air qui sortent des deux secteurs de flamme étant brûlés en utilisant de l'air secondaire (48) provenant de l'extérieur de l'appareil de cuisson.
2. Un appareil de cuisson comme revendiqué en revendication 1, **caractérisé en ce que** ledit brûleur est constitué d'une coupe (2) contenant les deux buses (20, 30) et d'un corps (4) supportant les deux secteurs de flamme (36, 40).
3. Un appareil de cuisson comme revendiqué en revendication 2, **caractérisé en ce que** le corps (4) supporte le secteur extérieur (40) et est relié à un élément (31) en forme de disque supportant centralement un secteur de flamme (36).
4. Un appareil de cuisson comme revendiqué en revendication 3, **caractérisé en ce que** le corps (4) comprend des doigts (41) d'insertion dans l'élément (31) en forme de disque, ce dernier formant des canaux de passage (35) pour l'air secondaire (48).
5. Un appareil de cuisson comme revendiqué dans la

revendication 1, **caractérisé en ce que** lesdits secteurs de flamme sont formés par des anneaux.

6. Un appareil de cuisson comme revendiqué dans la revendication 1, **caractérisé en ce qu'un** tube de Venturi (22) agencé horizontalement est en regard de la buse (20) d'alimentation du secteur extérieur. 5
7. Un appareil de cuisson comme revendiqué dans la revendication 6, **caractérisé en ce que** le tube de Venturi (22) se partage en deux conduits (24) qui divergent ensuite vers le haut pour liaison au corps (4). 10
8. Un appareil de cuisson comme revendiqué dans la revendication 2, **caractérisé en ce que** la coupe (2) comprend une paroi horizontale définissant une chambre (13) qui contient la buse (30). 15
9. Un appareil de cuisson comme revendiqué dans la revendication 1, **caractérisé en ce que** la chambre (13') contenant la buse (30) qui alimente le secteur de flamme central (36) est fermée vers le bas. 20
10. Un appareil de cuisson comme revendiqué dans la revendication 9, **caractérisé en ce que** la chambre (13') est prévue en bas avec une ouverture (14) en regard de la buse d'alimentation (20) du secteur de flamme extérieur, ladite ouverture étant pourvue d'un couvercle (16) de fermeture amovible. 25 30

35

40

45

50

55

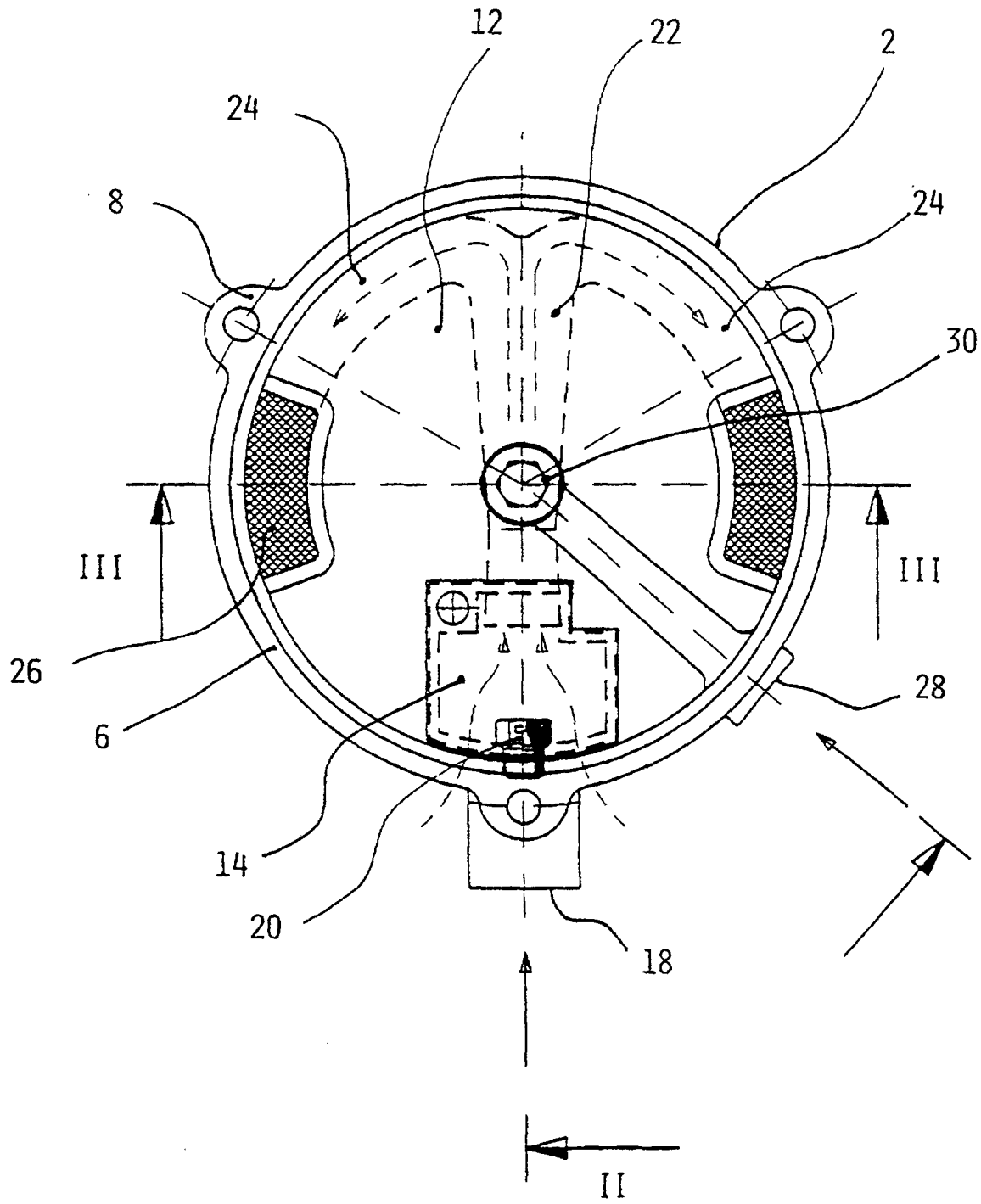


FIG. 1

FIG. 2

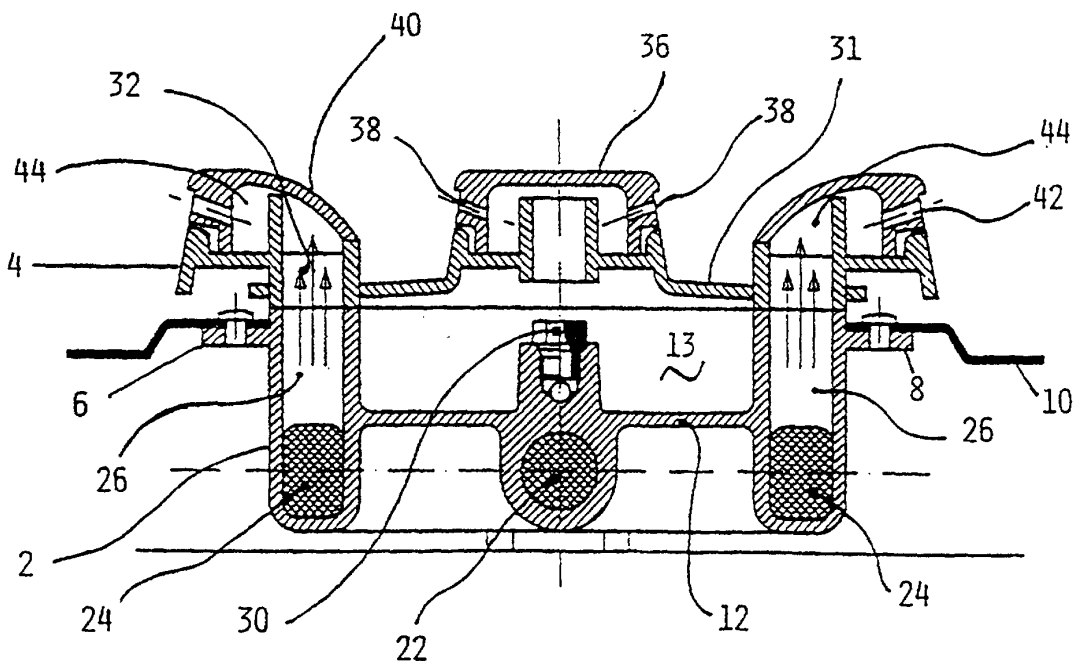
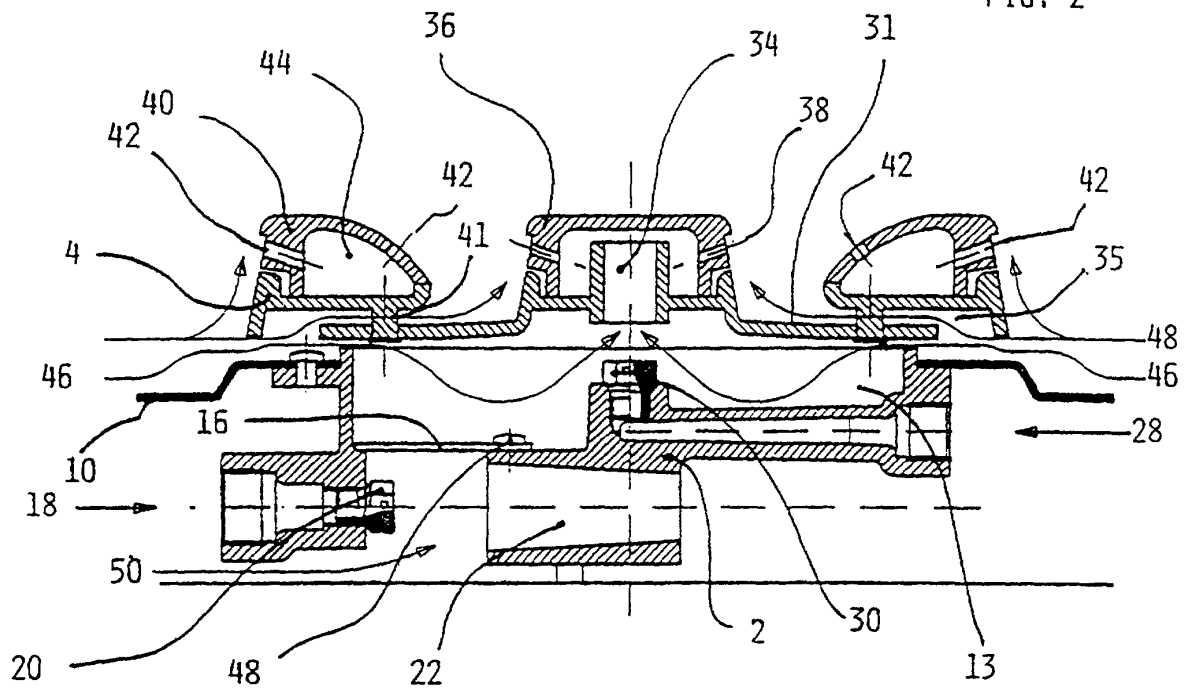


FIG. 3