(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 933 092 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.06.2008 Bulletin 2008/25

(21) Application number: **07020584.4**

(22) Date of filing: **22.10.2007**

(51) Int Cl.:
F24B 1/02 *(2006.01)* ***F24B 5/02*** *(2006.01)*
F23L 1/02 *(2006.01)* ***F23B 50/12*** *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(30) Priority: **13.12.2006 IT VR20060191**

(71) Applicant: **COLA S.R.L.**
37040 Arcole (VR) (IT)

(72) Inventor: **Ferroli, Dante**
37032 Monteforte D'Alpone
(Prov. of Verona) (IT)

(74) Representative: **Alagem Modiano, Lara S. et al**
Modiano & Associati
Via Meravigli, 16
20123 Milano (IT)

(54) Brazier holder particularly for stoves

(57) A brazier holder (1), particularly for stoves fueled by pellets, woodchips, cereals, corn, vegetable-derived fuels, biomasses and the like, comprising a containment body (11) which defines a receptacle (12) for a lower portion (13) of a combustion brazier (9), a duct (14) for supplying and distributing air to the brazier being defined between the combustion brazier (9) and the containment body (11) and having a fluid connection, via a supply port (15), to an air supply duct (16), at least one flue (18) for supplying air to the flame generated by the brazier (9) being provided, the flue (8) or flues having an extraction port (19) which has a fluid connection to the supply and distribution duct (14) and a discharge opening (20) which ends substantially in a region which is struck by the flame.

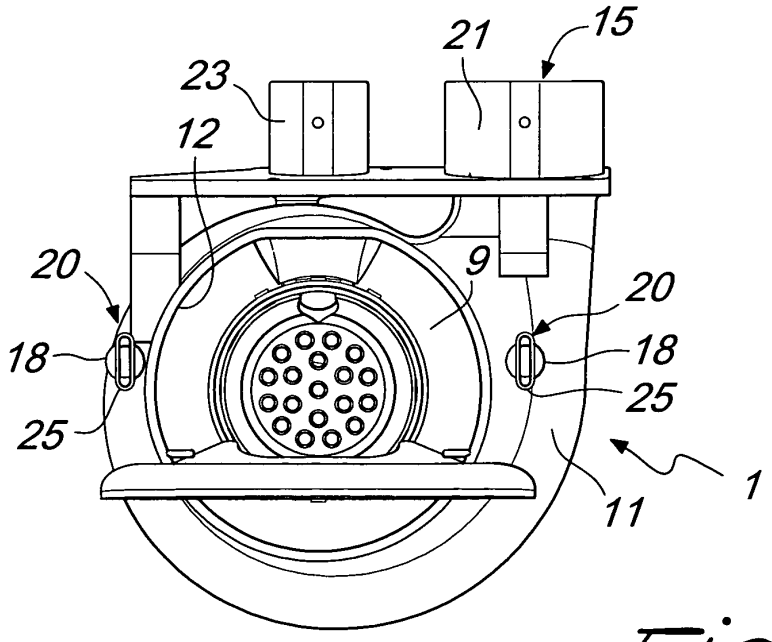

Fig. 7

EP 1 933 092 A1

Description

[0001] The present invention relates to a brazier holder particularly for stoves and/or boilers fueled with pellets, woodchips, cereals, corn, vegetable-derived fuels, biomasses and the like.

[0002] Stoves, for example fueled by pellets, are commercially available which are composed of an outer frame inside which there is, at the front, a combustion chamber, behind which there is a tank for containing the fuel, from the base of which a screw feeder draws the fuel, for example the pellets, in order to feed it to the combustion brazier.

[0003] In some cases, the containment tank can be arranged laterally to the combustion chamber or "remotely", i.e., outside the external frame.

[0004] The combustion brazier is supported by a brazier holder, which is connected, by means of an inlet, to an air supply duct which ends at an intake for drawing air from outside the stove.

[0005] In practice, as a consequence of the partial vacuum provided in the combustion chamber due to the actuation of extraction means, the air required for combustion is drawn from outside through the supply duct.

[0006] Currently, brazier holders are used which are substantially made of pressed and folded metal plate and are shaped like a parallelepiped, and within which braziers are arranged which have, in an upward region, a peripheral abutment portion which is designed to rest against the upper edge of the brazier holder and, in a downward region, a portion for containing the fuel, which is generally frustum-shaped so that a region for feeding the air to the brazier is provided between the inner walls of the brazier holder and the outer walls of the containment portion, such region having a fluid connection to the supply duct.

[0007] For this purpose, the air supply duct is connected to an intake port which is provided generally on the longer side of the parallelepiped.

[0008] It is evident from what has been described above that a supply duct and a brazier thus provided do not allow to supply the air to the brazier uniformly, since it is not possible to produce a continuous flow of air around it.

[0009] Moreover, stationary air pockets typically form at the corners and edges of the brazier holder and contribute to reduce drastically the supply air stream that is actually conveyed into the brazier.

[0010] In order to overcome this drawback, brazier holders have been devised which are again made of folded sheet metal but define, together with the brazier, a curved supply duct. In this case, the lower portion of the brazier is constituted by a receptacle which has a substantially circular transverse cross-section with openings provided both at the lateral part and at the bottom.

[0011] Although such known devices eliminate some of the drawbacks observed in brazier holders shaped like a parallelepiped (in particular stagnation of air at the edges), they do not allow a constant supply of air toward the brazier along the entire extension of the supply duct.

[0012] Finally, it should be noted that in currently commercially available stoves the air is supplied to the brazier exclusively through openings which are provided at the containment portion of said brazier; this situation, in some cases, does not allow to utilize fully the combustion potential, and consequently part of the heating value is evacuated by means of the combustion flue gases.

[0013] The aim of the present invention is to provide a brazier holder which is capable of eliminating or at least reducing drastically the drawbacks observed above in currently commercially available brazier holders.

[0014] Within this aim, an object of the present invention is to provide a brazier holder which allows to supply a constant stream of air to the brazier along the entire extension of the air supply duct.

[0015] Another object of the present invention is to provide a brazier holder which can offer better operating efficiency.

[0016] Another object of the invention is to provide a brazier holder which can allow to optimize combustion, preventing part of the heating value of the fuel from being evacuated together with the combustion flue gases.

[0017] Still another object of the present invention is to provide a brazier holder which has a simple structure, is highly durable and has a competitive production cost, so that its use is advantageous also from an economical standpoint.

[0018] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a brazier holder, particularly for stoves fueled by pellets, woodchips, cereals, corn, vegetable-derived fuels, biomasses and the like, which comprises a containment body which defines a receptacle for a lower portion of a combustion brazier, a duct for supplying and distributing air to the brazier being defined between said combustion brazier and said lateral containment body and having a fluid connection, via a supply port, to an air supply duct, characterized in that it comprises at least one flue for supplying air to the flame generated by said brazier, said at least one flue having an extraction port which has a fluid connection to said supply and distribution duct and a discharge opening which ends substantially in a region which is struck by said flame.

[0019] Further characteristics and advantages of the invention will become better apparent from the description of some preferred but not exclusive embodiments of a brazier holder according to the present invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a pellet-fueled stove;
Figure 2 is a front elevation view of the stove of Figure 1;
Figure 3 is a sectional view of the stove, taken along the line III-III of Figure 2;
Figure 4 is a sectional view of the stove, taken along

the line IV-IV of Figure 2;
Figure 5 is an enlarged-scale front elevation view of the brazier holder associated with the brazier;
Figure 6 is a side elevation view of the brazier holder associated with the brazier shown in Figure 5;
Figure 7 is a top elevation view of the brazier holder associated with the brazier shown in Figures 5 and 6;
Figure 8 is a sectional view of the brazier holder associated with the brazier along the line VIII-VIII of Figure 5;
Figure 9 is an exploded perspective view of the brazier holder associated with the brazier.

[0020] In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0021] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0022] With reference to the figures, the present invention relates to a brazier holder, generally designated by the reference numeral 1, particularly for stoves 10 which can be fueled with pellets, woodchips, cereals, corn, vegetable-derived fuels, biomasses, and the like.

[0023] The stove 10 comprises an outer enclosure 2, which is constituted generally by a back 3, by a lateral containment region 4 and by a front hatch 5, which is typically at least partially transparent.

[0024] Within the enclosure 2, and particularly in a region which is adjacent to the front hatch 5, there is a combustion chamber 6, to the rear of which there is a fuel containment tank 7.

[0025] Of course, the containment tank 7 can be provided laterally to the combustion chamber 6 or even "remotely", i.e., outside the enclosure 2.

[0026] Supply means, such as for example a screw feeder 8, draw the fuel, for example the pellets, from the base of the containment tank 7 to feed it to a brazier 9.

[0027] The brazier holder 1 comprises a containment body 11, which defines a receptacle 12 for a lower portion 13 of the combustion brazier 9.

[0028] Between the combustion brazier 9 and the containment body 11 there is a duct 14 for supplying and distributing air to the brazier 9.

[0029] The air supply and distribution duct 14 has a fluid connection, by means of a supply port 15, to an air supply duct 16, which in turn ends with an external air intake 17.

[0030] According to the present invention, the brazier holder 1 comprises at least one flue 18 for feeding the air to the flame generated by the brazier 9 during the operation of the stove 10.

[0031] In particular, such at least one flue 18 has an extraction port 19 which has a fluid connection to the supply and distribution duct 14 and, on the opposite side, a discharge opening 20 which ends substantially with a region which is struck by the flame.

[0032] In order to allow a better flow of air from the supply and distribution duct 14 toward the supply flue or flues 18, the brazier holder 1 comprises means for gradually accelerating the air that passes through the air supply and distribution duct 14.

[0033] Such means for gradual acceleration of the air ensure not only optimum and more efficient inflow of air to the brazier 9 through openings provided at the lower portion 13 of the brazier 9, but also generate a sort of turbulence within the supply and distribution duct 14, such turbulence facilitating the flow of part of the air toward the intake flue or flues 18.

[0034] Moreover, such means for gradually accelerating the air are adapted to allow a substantially constant flow-rate of the air along the supply and distribution duct 14.

[0035] With particular reference to the embodiment shown in the figures, in order to provide the acceleration means the brazier holder 1 can have the lateral portion of its containment body 11 which has a spiral shape, as shown clearly in particular in the sectional view of Figure 4 and in the top elevation view of Figure 7.

[0036] According to a particularly important aspect of the present invention, the brazier holder 1 comprises at least two supply flues 18, which are spaced along the extension of the supply and distribution duct 14.

[0037] Advantageously, as shown, the two supply flues 18 are arranged in diametrically opposite regions with respect to the flame extension axis.

[0038] In greater detail, in order to allow to optimize combustion, the supply flue or flues 18 protrude, with the respective discharge opening 20, above the combustion brazier 9.

[0039] More particularly, the respective discharge opening or openings 20 of the supply flues 18 can be constituted by a diffusion head 25, which is adapted to generate an air stream which has a flattened cross-section provided with at least one component which is substantially parallel to the main direction of extension of the flame.

[0040] According to another important aspect of the invention, the supply port 15 is provided at the end portion of an insertion sleeve 21, which is rigidly coupled to the containment body 11 and is associable with an end portion 22 of the air supply duct.

[0041] Likewise, the containment body 11 of the brazier holder 1 has a containment sleeve 23, which lies along a direction which is substantially parallel and spaced with respect to the longitudinal direction of the insertion sleeve 21, which is designed to accommodate part of the ignition means 24.

[0042] The containment sleeve 23 also is rigidly coupled and conveniently provided monolithically with respect to the brazier holder 1.

[0043] Operation of a brazier holder according to the invention is evident from what has been described above.

[0044] Moreover, it has been found experimentally that by using the supply flues 18, the unburnt gas and dust content in the combustion flue gases is extremely low, with obvious benefits in terms of environmental impact and pollution.

[0045] In particular, it has been found that thanks to the presence of the supply flues 18 it is possible to utilize in practice the entire heating value of the fuel, increasing combustion efficiency.

[0046] Moreover, the flow of air through the supply flues is facilitated by the turbulence generated within the supply and distribution duct and by the higher temperature of the top region of said flues.

[0047] All the characteristics of the invention indicated above as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

[0048] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0049] Thus, for example, it is possible to provide intermediate discharge openings also along the extension of the supply flues 18 and not only at the upper ends.

[0050] It is further possible to associate with the stove 10 combined inserts which are provided for example with a food warmer or with cooking ovens.

[0051] Finally, the combustion chamber can be of the dry type, as shown, but also of the wet type.

[0052] In practice it has been found that the invention has achieved the intended aim and objects in all of the embodiments.

[0053] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements.

[0054] All the details may further be replaced with other technically equivalent elements.

[0055] The disclosures in Italian Patent Application No. VR2006A000191 from which this application claims priority are incorporated herein by reference.

[0056] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A brazier holder, particularly for stoves fueled by pellets, woodchips, cereals, corn, vegetable-derived fuels, biomasses and the like, comprising a containment body which defines a receptacle for a lower portion of a combustion brazier, a duct for supplying and distributing air to the brazier being defined between said combustion brazier and said containment body and having a fluid connection, via a supply port, to an air supply duct, **characterized in that** it comprises at least one flue for supplying air to the flame generated by said brazier, said at least one supply flue having an extraction port which has a fluid connection to said supply and distribution duct and a discharge opening which ends substantially in a region which is struck by said flame.

2. The brazier holder according to claim 1, **characterized in that** it comprises means for gradually accelerating the air that passes through said air supply and distribution duct.

3. The brazier holder according to one or more of the preceding claims, **characterized in that** said means for gradually accelerating the air are adapted to generate an at least partially turbulent flow of the air that passes through said supply and distribution duct.

4. The brazier holder according to one or more of the preceding claims, **characterized in that** it comprises at least two supply flues which are spaced along the extension of said supply and distribution duct.

5. The brazier holder according to one or more of the preceding claims, **characterized in that** said at least two supply flues are arranged in diametrically opposite regions with respect to the longitudinal axis of said flame.

6. The brazier holder according to one or more of the preceding claims, **characterized in that** said at least one flue protrudes, with the respective discharge opening, above said brazier.

7. The brazier holder according to one or more of the preceding claims, **characterized in that** the respective discharge opening of said at least one flue comprises a diffusion head which is adapted to generate a stream of air with a flattened cross-section which has at least one component which is substantially parallel to the main direction of extension of said flame.

8. The brazier holder according to one or more of the preceding claims, **characterized in that** said means for gradually accelerating the air are adapted to allow a substantially constant flow-rate of the air along said supply and distribution duct.

9. The brazier holder according to one or more of the preceding claims, **characterized in that** said containment body has a lateral portion which has a spiral shape.

10. The brazier holder according to one or more of the preceding claims, **characterized in that** said supply port is provided at an insertion sleeve which is rigidly coupled to said containment body and can be asso-

ciated with an end portion of an air supply duct.

11. The brazier holder according to one or more of the preceding claims, **characterized in that** said insertion sleeve is provided monolithically with said brazier holder.

12. The brazier holder according to one or more of the preceding claims, **characterized in that** said containment body has a containment sleeve which lies along a direction which is substantially parallel and spaced with respect to the longitudinal direction of said insertion sleeve and is designed to accommodate the ignition means.

13. The brazier holder according to one or more of the preceding claims, **characterized in that** said containment sleeve is provided monolithically with said brazier holder.

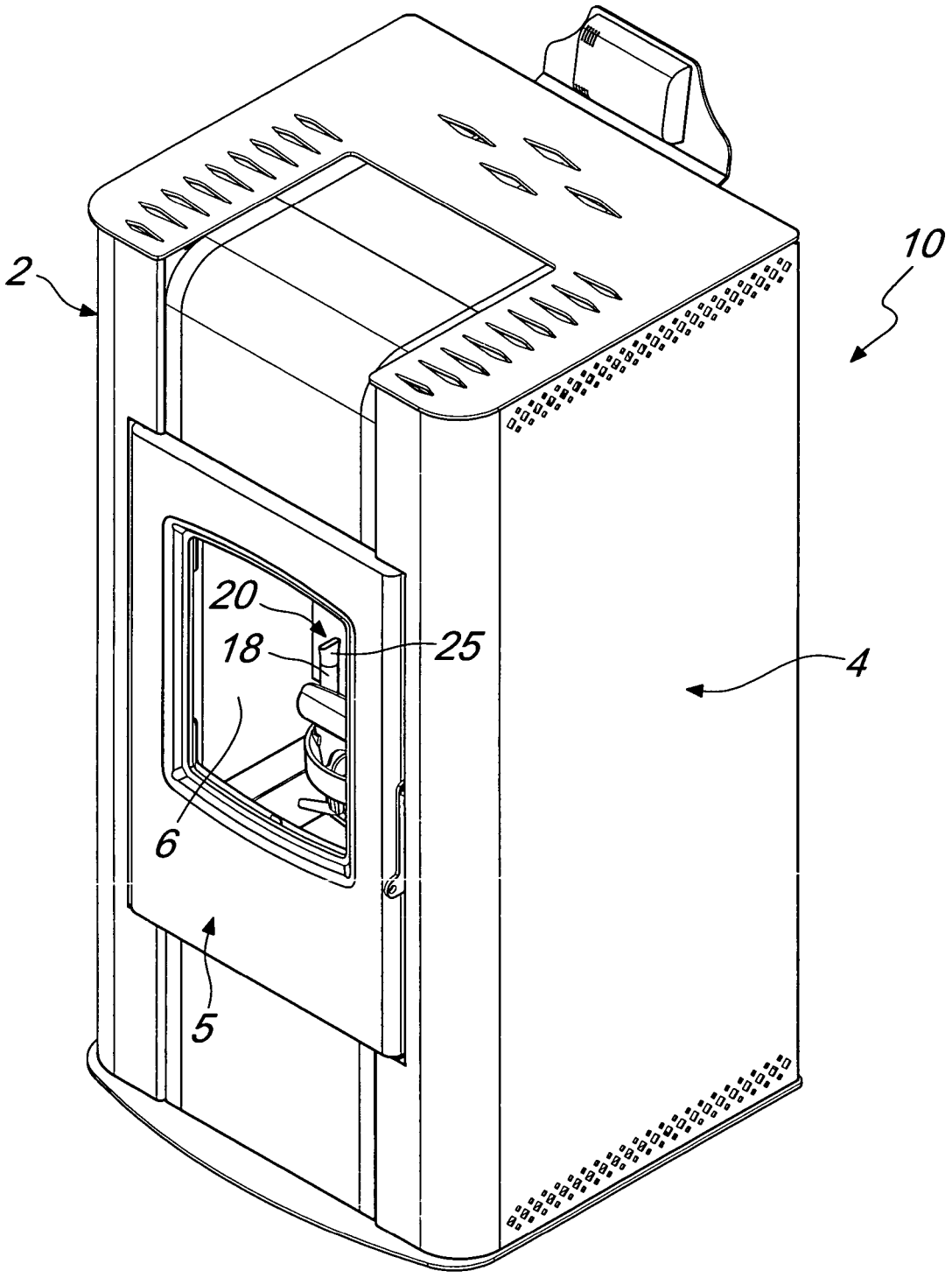

Fig. 1

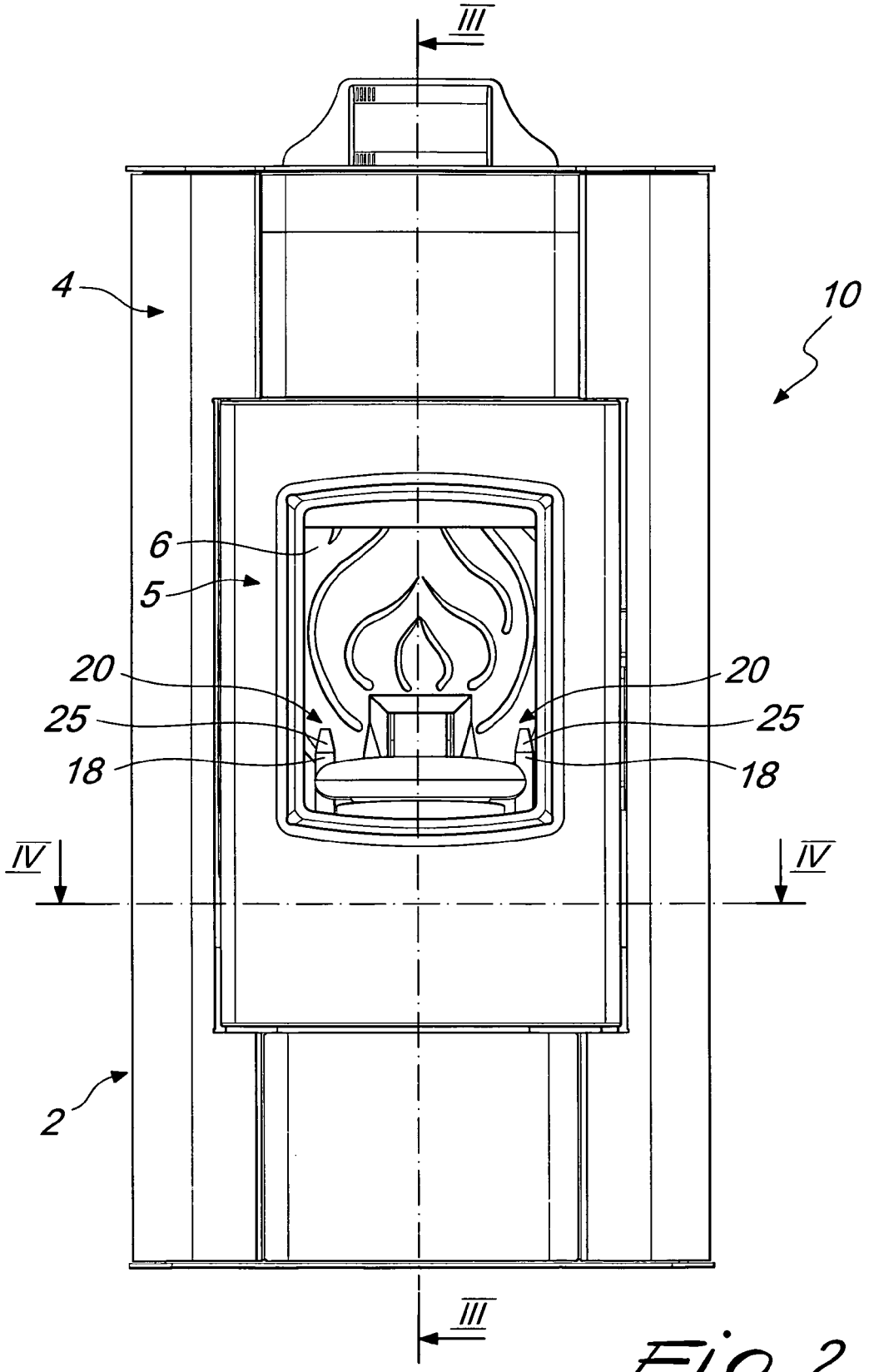

Fig. 2

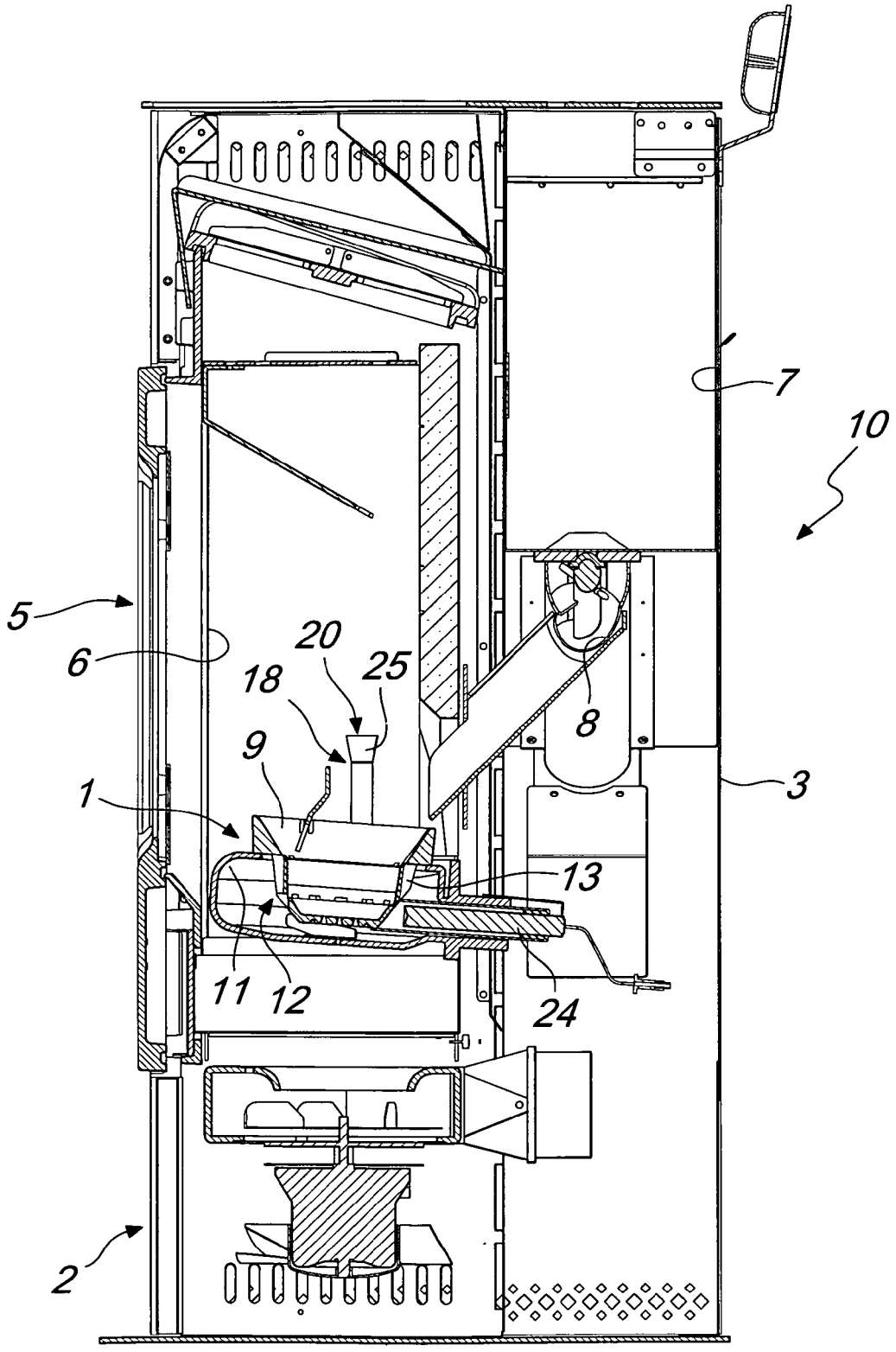

Fig. 3

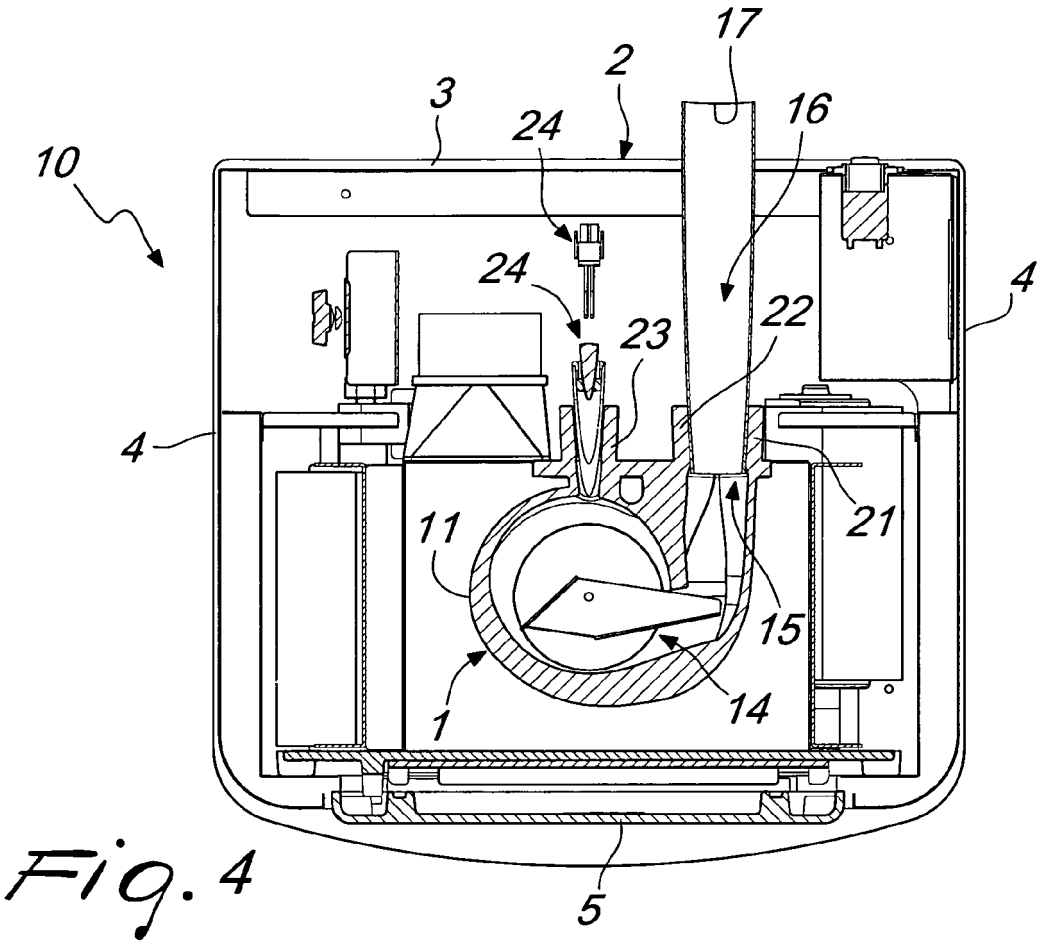
17
2
3
16
24
10
24
4
23
22
4
21
11
15
1
14
5

Fig. 4

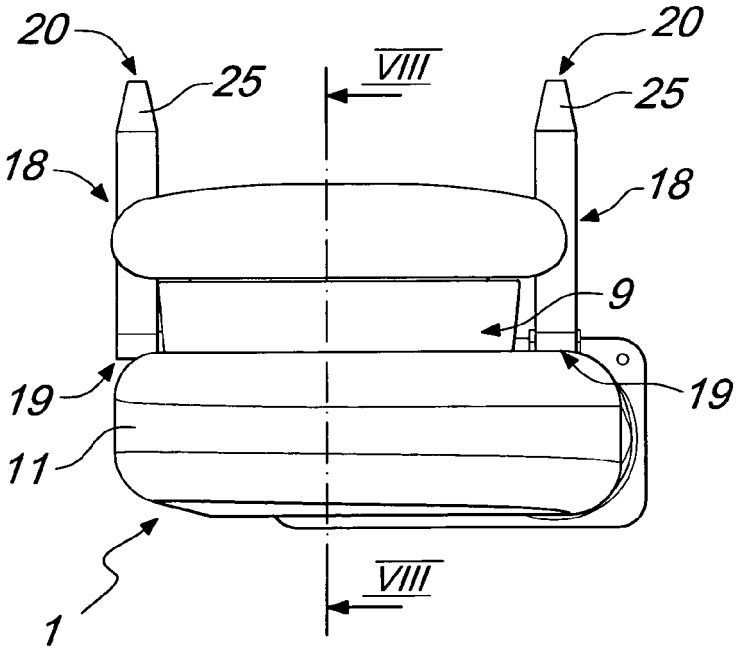
20
20
25
VIII
25
18
18
9
19
19
11
VIII
1

Fig. 5

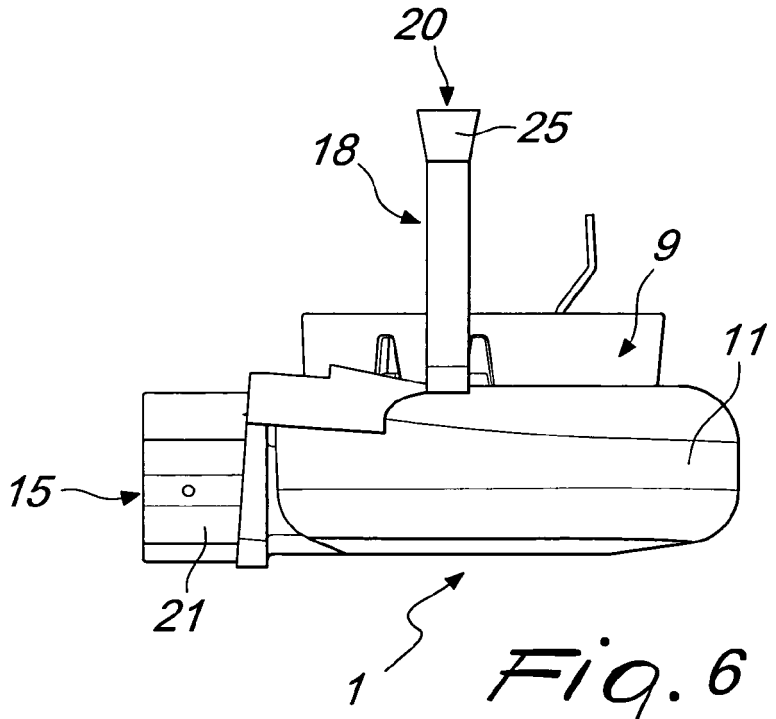

Fig. 6

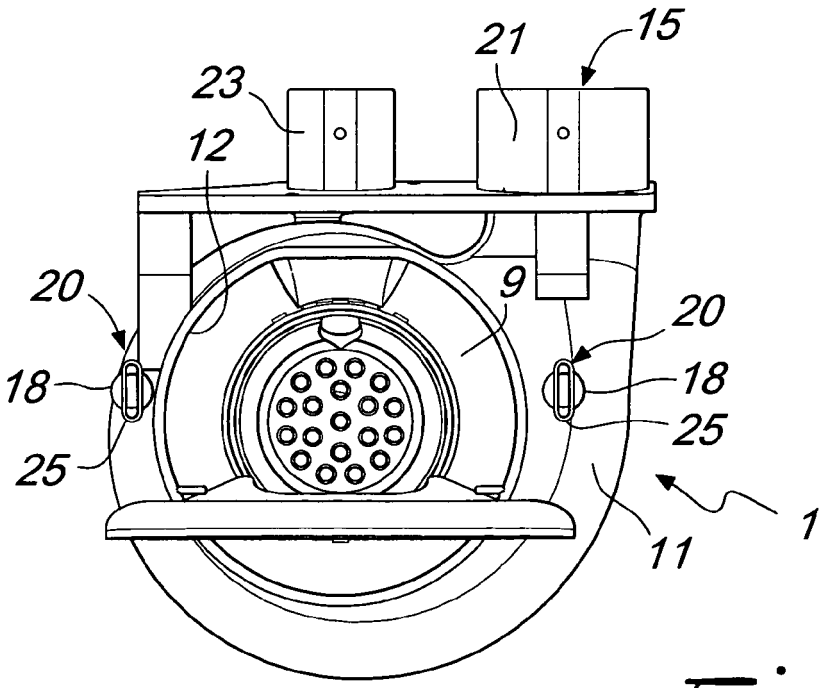

Fig. 7

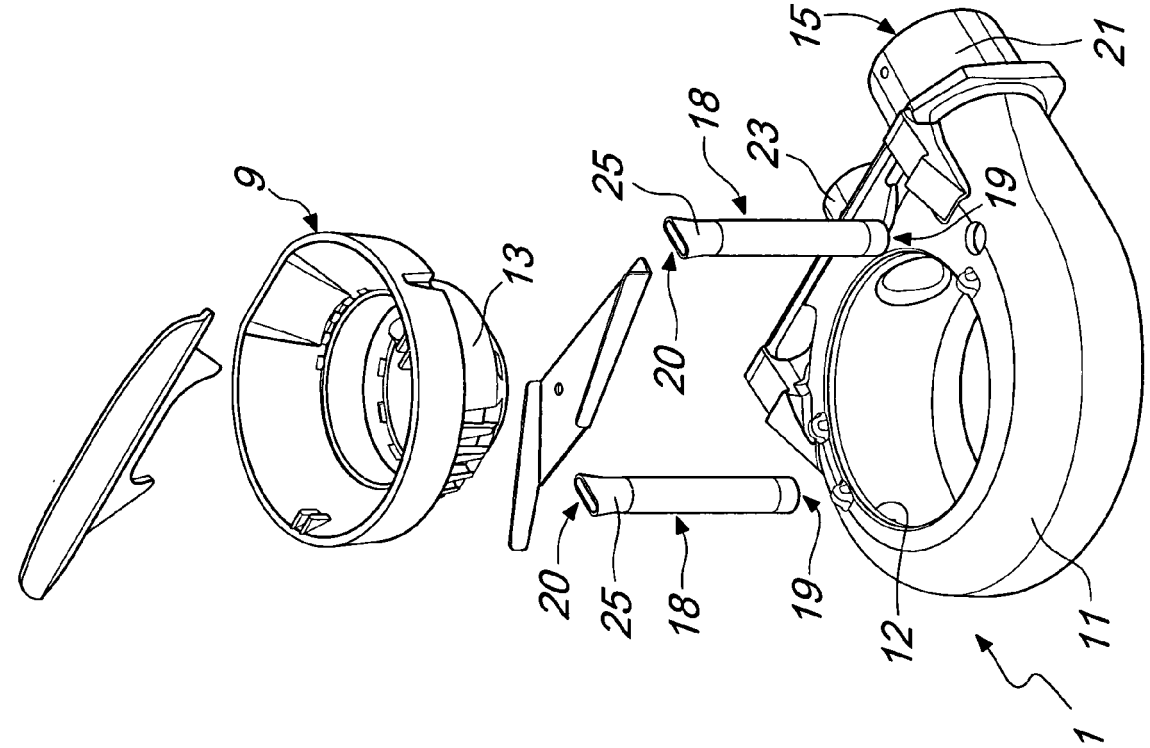

Fig. 9

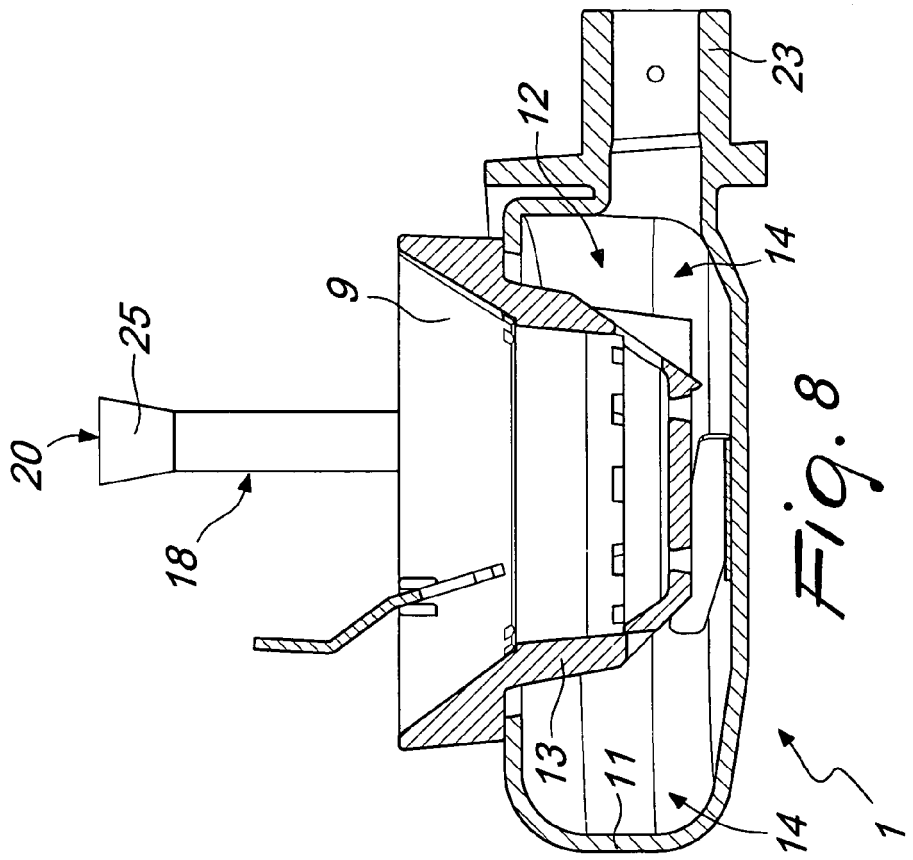

Fig. 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 02 0584

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	EP 1 477 734 A (KWB KRAFT UND WAERME AUS BIOMA [AT]) 17 November 2004 (2004-11-17) * paragraphs [0006], [0018], [0020]; figures 1-3 *	1-3,6, 8-13 4,5,7	INV. F24B1/02 F24B5/02 F23L1/02 F23B50/12
X	FR 2 558 934 A (TELEC 2000 [FR]) 2 August 1985 (1985-08-02) * page 3, line 34 - page 4, line 11; figures 1,2 *	1,4,6	
Y A	WO 80/02452 A (TOVERCO BV [NL]; WINTERSWIJKSCHE STEEN KALK [NL]; NIEMEIJER W [NL]; SC) 13 November 1980 (1980-11-13) * page 4, lines 32-37; figures 1,2 *	4,5,7 12,13	
A	US 3 149 625 A (MARGETTS JOHN L) 22 September 1964 (1964-09-22) * column 2, lines 34-53; figure 3 *	1-13	
A	US 5 285 738 A (CULLEN LESLIE D [US]) 15 February 1994 (1994-02-15) * columns 12-13, lines 67-9; figure 6 *	1-11	TECHNICAL FIELDS SEARCHED (IPC) F24B F23L
A	GB 331 555 A (JEAN PAUL GOOSSENS) 4 July 1930 (1930-07-04) * figures 1,4 *	1-11	F23B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 April 2008	Rodriguez, Alexander

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 02 0584

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-04-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1477734 A	17-11-2004	AT 412308 B	27-12-2004
		AT 7392003 A	15-05-2004
FR 2558934 A	02-08-1985	NONE	
WO 8002452 A	13-11-1980	DE 7923777 U1	31-01-1980
		EP 0019962 A1	10-12-1980
		JP 56500471 T	09-04-1981
		NL 7903693 A	12-11-1980
US 3149625 A	22-09-1964	GB 1019613 A	09-02-1966
		GB 1019611 A	09-02-1966
US 5285738 A	15-02-1994	NONE	
GB 331555 A	04-07-1930	NONE	

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT VR20060191 A **[0055]**