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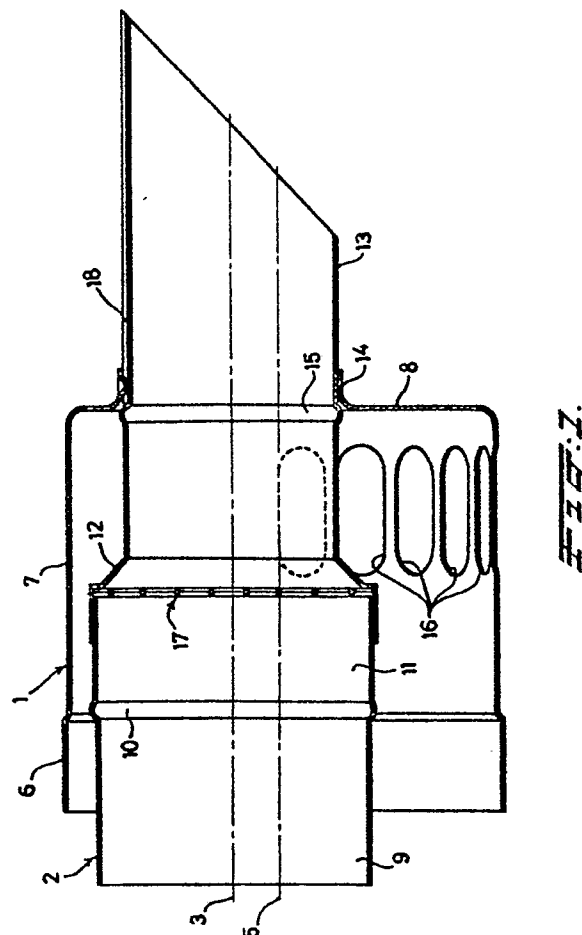
71 Applicant: **FASTO B.V.**
Spoorstraat 2
NL-9528 PN Buinen(NL)

72 Inventor: **Stapenséa, Jan Aede**
10/12, De Hoek
NL-9466 PD Gasteren(NL)

74 Representative: **Reynvaan, Lambertus**
Johannes, Ir. et al
EXTERPATENT B.V. P.O. Box 90649
NL-2509 LP 's-Gravenhage(NL)

54 Horizontal double-walled flue.

57 Horizontal double-walled flue for a forced-draught heating appliance, intended for passing through a wall. The double-walled flue comprises an essentially horizontal flue pipe (2) situated inside a suction pipe (1) for combustion air, the outflow aperture of the flue pipe viewed in the direction of flow being some distance past the inlet of the suction pipe. The suction pipe has at its free end an essential vertical end wall (8) through which the flue pipe (2) is passed with a suitable seal, and a number of apertures (16) forming the inlet of the suction pipe are provided in the bottom half of the cylindrical wall of the suction pipe near the said end wall.



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Horizontal double-walled flue.

The present invention relates to a horizontal double-walled flue, in particular for a forced-draught heating appliance, intended for passing through a wall or the like, comprising an essentially horizontal flue pipe situated inside a suction pipe for combustion air, the outflow aperture of the flue pipe viewed in the direction of flow being some distance past the inlet of the suction pipe and the central axis of the flue pipe in the vertical plane of symmetry lying some distance above the central axis of the suction pipe.

Such a double-walled flue is known from FR-A-2069101 in which the inlet for the suction of combustion air is in the form of an annular aperture lying concentrically round the flue pipe.

Such known designs have the disadvantage that rainwater can easily penetrate into the inlet or outlet. Besides, the inlet can be obstructed by icing in the winter, due to condensation of the flue gases, with the result that the proper functioning of the heating appliance is adversely affected.

The object of the present invention is to provide a flue of the above-mentioned type, in which these disadvantages are avoided in an efficient manner. This object is achieved according to the invention in that the suction pipe has at its free end an essentially vertical end wall, through which the flue pipe is passed with a suitable seal, and a number of apertures forming the inlet of the suction pipe are provided in the bottom half of the cylindrical wall of the suction pipe near the said end wall.

This design has the advantage that the inlet apertures for combustion air are screened against falling rainwater, while the eccentric arrangement of the flue pipe inside the suction pipe produces a large free space in the bottom part of the suction pipe, so that suction of outside air takes place with the minimum of resistance.

In a preferred embodiment of the invention the suction apertures are arranged in a row next to each other in the peripheral direction, and the flue pipe narrows in the region which - viewed in the direction of flow of the flue gases - lies in front of the row of suction apertures and bounds said apertures.

The inlet apertures are thus distributed along the bottom part of the periphery of the suction pipe, while the flue pipe narrows in this region, which ensures a good air supply, on the one hand, and results in an acceleration of the flue gases, on the other, so that they are expelled with a greater "throw".

In order to avoid raining-in in the flue pipe, the

free end of the flue pipe is slanted off in such a way that the top end edge overlaps the bottom end edge.

The invention will be explained in greater detail with reference to the attached drawing, in which:

Fig. 1 shows a longitudinal section of the horizontal double-walled flue according to the invention; and

Fig. 2 is a front view of the flue of Fig. 1.

As can be seen from Fig. 1, the horizontal double-walled flue comprises an outer pipe 1 for the suction of combustion air and an inner pipe 2 for the discharge of the flue gases. The inner pipe has a central axis 3 which in the vertical plane of symmetry 4 (see Fig. 2) lies some distance above the central axis 5 of the outer pipe 1.

The outer pipe has a coupling part 6 for the connection to a preceding pipe part (not shown in the drawing) and continues into a cylindrical part 7 which is shut off at the free end of the outer pipe by an end wall 8 which is essentially perpendicular to the wall 7.

The inner pipe 2 also has a coupling piece 9 for the connection to a preceding pipe part (not shown in the drawing) and continues via a ridged edge 10 into a cylindrical part 11. This cylindrical part 11 narrows via a conical part 12 to the cylindrical part 13, which is conveyed through the end wall 8 with a suitable seal. The seal comprises a collar 14 which is formed in the wall 8, rests against the pipe part 13, and mates with a thickened part 15 in the pipe part 13.

The free end of the pipe part 13 is slanted off in such a way that the top part of the end edge overlaps the bottom part of the end edge. The pipe part is preferably cut off at an angle of approximately 45°.

The cylindrical part 7 of the outer pipe has in the peripheral direction a row of apertures 16 which are situated near the end wall 8 and extend along the bottom half of the pipe part 7. The apertures 16 are each oblong in shape and extend in the lengthwise direction of the pipe 7.

The inner pipe 1 narrows via the conical part 12, in such a way that the apertures 16 are situated essentially at the level of the pipe part 13 with smaller diameter. This design on the one hand produces a good inflow of air through the apertures 16 and, on the other, the flue gases are accelerated due to the narrowing, so that the "throw" is increased. This increased throw has a beneficial effect on the air infeed and also prevents plume formation when the outside air is cold.

The inner pipe 1 is also provided with a wire

grid 17, which is fitted at the point where the pipe part 11 passes into the conical part 12. This wire grid serves to prevent foreign objects from being able to penetrate into the flue.

The part 13 of the inner pipe projecting beyond the suction pipe must have a fixed direction relative to the outer pipe. For this purpose, the part 13 is provided with a ridge 18 which extends in the lengthwise direction of said pipe part 13 and mates with an indentation in the collar 14, so that the inner pipe can be passed through the wall 8 in only one way.

It will be clear that the invention is not restricted to the embodiment shown and described here, but that a large number of modifications are possible within the scope of the invention.

Claims

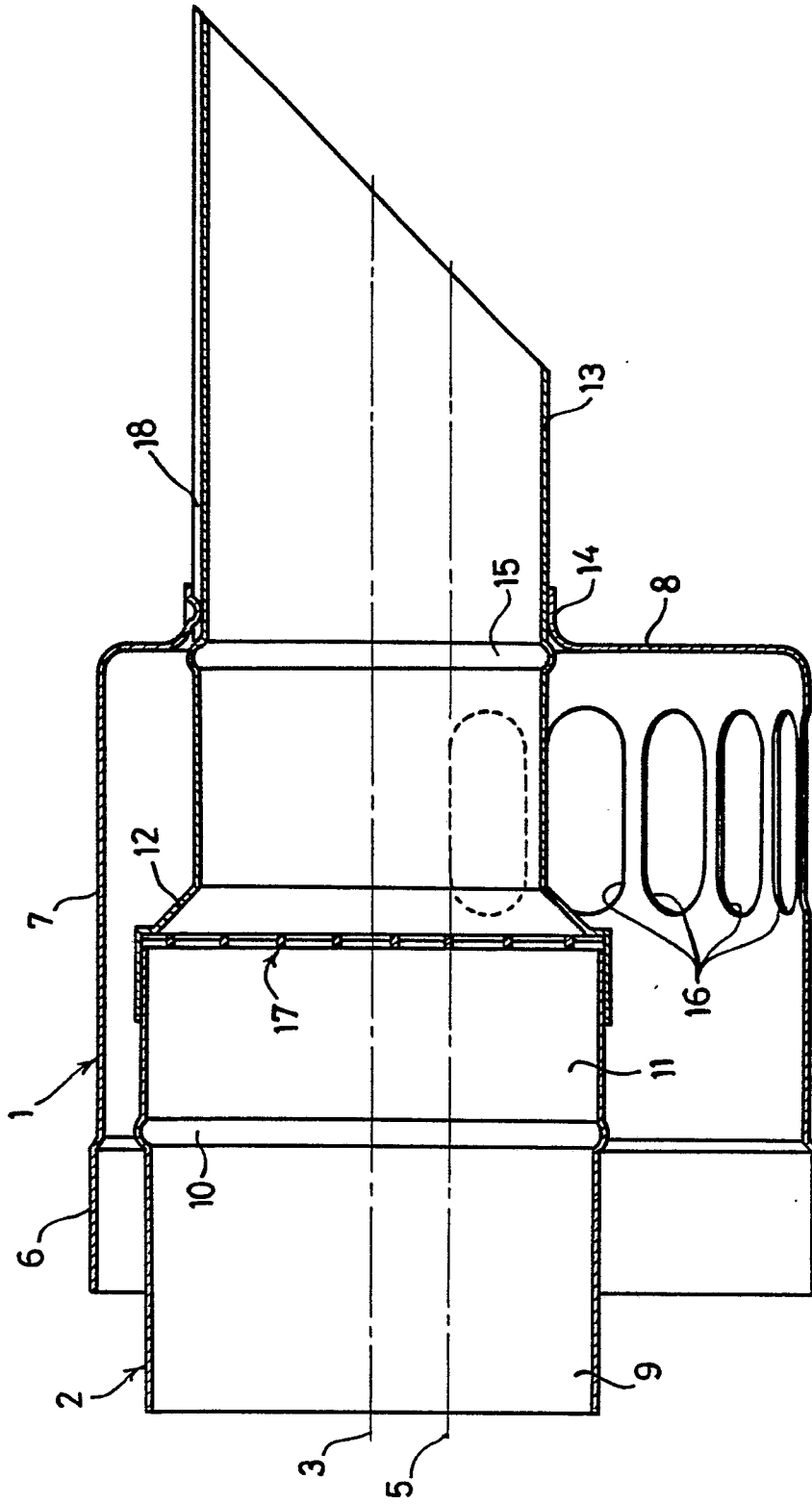
1. Horizontal double-walled flue, in particular for a forced-draught heating appliance, intended for passing through a wall or the like, comprising an essentially horizontal flue pipe (2) situated inside a suction pipe (1) for combustion air, the outflow aperture of the flue pipe viewed in the direction of flow being some distance past the inlet of the suction pipe, and the central axis (3) of the flue pipe in the vertical plane of symmetry lying some distance above the central axis (5) of the suction pipe **characterized** in that the suction pipe (1) has at its free end an essentially vertical end wall (8), through which the flue pipe (2) is passed with a suitable seal, and a number of apertures (16) forming the inlet of the suction pipe are provided in the bottom half of the cylindrical wall of the suction pipe near the said end wall.

2. Flue according to Claim 1, **characterized in that** the suction apertures (16) are arranged in a row next to each other in the peripheral direction, and the flue pipe narrows in the region (12) which - viewed in the direction of flow of the flue gases - lies in front of the row of suction apertures and bounds said apertures.

3. Flue according to Claim 1 or 2, **characterized in that** the free end of the flue pipe is slanted off in such a way that the top end edge overlaps the bottom end edge.

4. Flue according to Claim 2, **characterized in that** a wire grid (17) is disposed in the flue pipe near the transition where said pipe narrows.

5. Flue according to one or more of the preceding Claims 1-4, **characterized in that** the suction apertures (16) comprise slotted holes extending in the lengthwise direction of the suction pipe.



1. 6. 7.

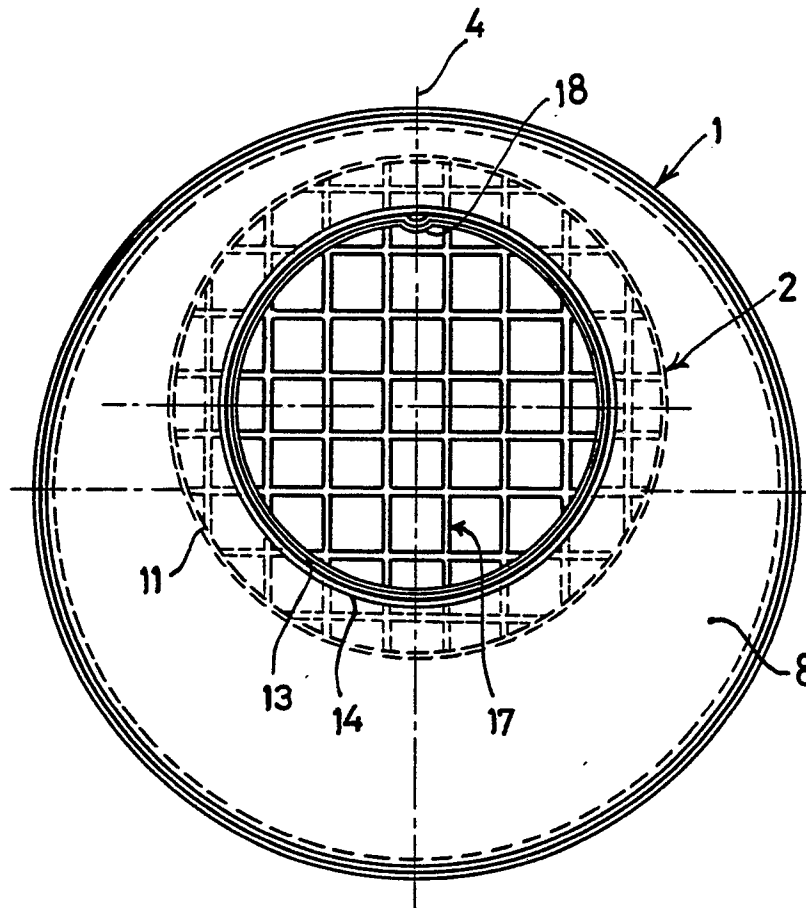


FIG. 2.



| 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.4) |
| D,A | FR-A-2 069 101 (METAALWARENFABRIEK JOH. TH. BENRAAD N.V.) * Page 4, lines 25-31; figure * --- | 1,4 | F 23 L 17/04 |
| A | GB-A-1 258 325 (POTTERTON INTERNATIONAL LTD) * Page 2, lines 34-38; figures * --- | 1 | |
| A | FR-A-1 499 530 (HALLER-MEURER-WERKE AG) * Whole document * ----- | 1 | |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl.4) |
| | | | F 23 L F 23 J F 24 C |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 15-02-1989 | Examiner BORRELLI R.M.G.A. |
| 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 | | | |