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(72) Inventor: **Van Dijk, Floris**
6984 AA Doesburg (NL)

(74) Representative: **De Hoop, Eric**
Octrooibureau Vriesendorp & Gaade
P.O. Box 266
2501 AW Den Haag (NL)

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(71) Applicant: **UBBINK NEDERLAND B.V.**
6984 AA Doesburg (NL)

(54) **Horizontal roof or exterior wall passage**

(57) Horizontal roof or exterior wall passage comprising a pipe assembly having an inner pipe for forming a first passage and an outer pipe surrounding the inner pipe for forming a substantially annular passage between the inner pipe and the outer pipe,
 wherein the inner pipe at both ends of the outer

pipe is placed centrally within the outer pipe,
 wherein a centre line of the inner pipe and a centre line of the outer pipe diverge from each other from a first end towards a second end of the outer pipe, and
 wherein the pipe assembly comprises adapting means for bringing the centre lines of the inner pipe and the outer pipe towards each other at the second end.

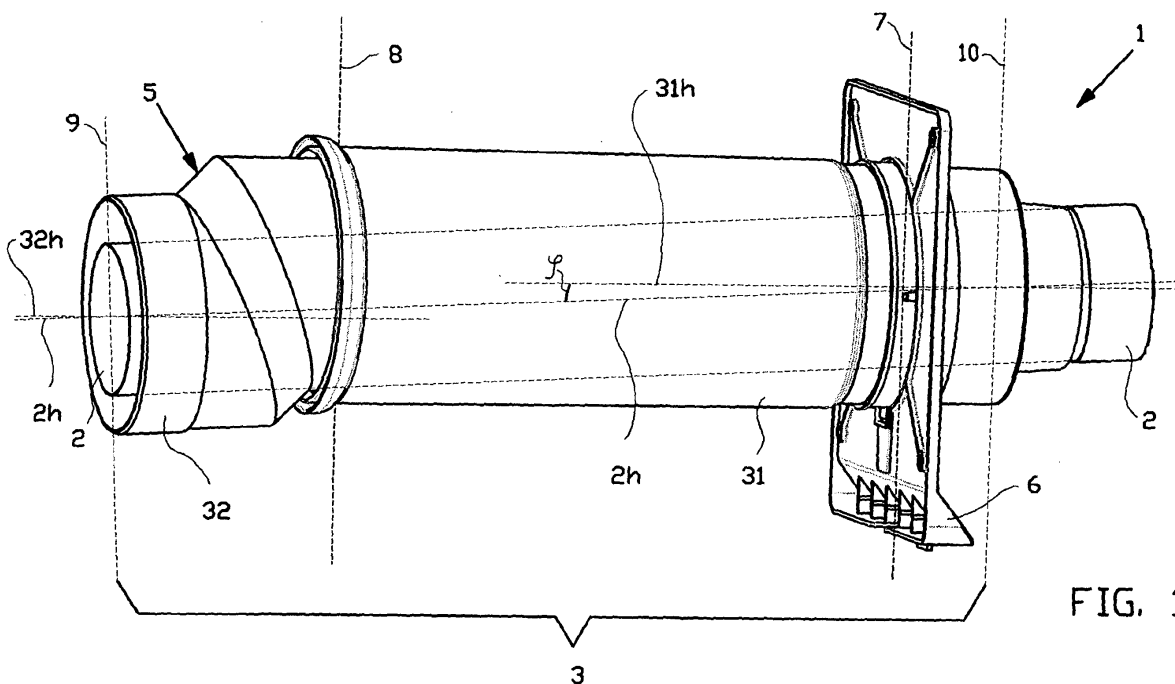


FIG. 1

Description

[0001] The invention relates to a horizontal roof or exterior wall passage having substantially concentric pipes. The invention further relates to a connection portion for a horizontal roof or exterior wall passage.

[0002] Concentric exterior wall passages are provided with an inner pipe for forming a first passage for the discharge of flue gasses and an outer pipe that surrounds the inner pipe for forming a substantially annular passage between the inner pipe and the outer pipe for the supply of air. For condensing heating appliances such as for instance high efficiency boilers, the first passage has to be placed at a slope for discharging condense water to the appliance. In case of concentric wall or exterior wall passages a slope can be realised by means of an inclined set-up of the inner pipe with respect to the outer pipe, wherein the outer pipe is usually placed horizontally in the wall.

[0003] In the known exterior wall passage, the inner pipe is placed centrically at the side facing the boiler, the inner side, for a good connection to the boiler pipe. As a result of the inclined set-up of the inner pipe with respect to the outer pipe, the inner pipe at the outside of the exterior wall passage, however, is placed eccentrically with respect to the outer pipe.

[0004] A drawback of the eccentric placement of the inner pipe at the outside is that at the inflow side of the annular passage a significant difference of pressure may arise in case there is question of a difference pressure plane between the inner pipe and the outer pipe, for instance due to a fall wind or a rise wind.

[0005] It is an object of the invention to improve on this.

[0006] From a first aspect the invention to that end provides a horizontal roof or exterior wall passage comprising a pipe assembly having an inner pipe for forming a first passage and an outer pipe surrounding the inner pipe for forming a substantially annular passage between the inner pipe and the outer pipe,

wherein the inner pipe at both ends of the outer pipe is placed centrically within the outer pipe,

wherein a centre line of the inner pipe and a centre line of the outer pipe diverge from each other from a first end towards a second end of the outer pipe, and

wherein the pipe assembly comprises adapting means for bringing the centre lines of the inner pipe and the outer pipe towards each other at the second end.

[0007] The centre lines of the inner pipe and the outer pipe coincide or intersect at the first end of the outer pipe, as a result of which the inner pipe is centrically placed within the outer pipe at that location. Furthermore because from the first end of the outer pipe the centre line of the inner pipe diverges with respect to the centre line of the outer pipe, the inner pipe is placed inclined with respect to the outer pipe at that location. This inclined position ensures the desired slope of the inner pipe in a substantially horizontally placed outer pipe of

the horizontal roof or exterior wall passage. The adapting means of the pipe assembly ensure a change in direction of at least one of the said centre lines so that the centre lines of the inner pipe and the outer pipe coincide or intersect at the second end of the outer pipe. At both ends of the outer pipe a centric position of the inner pipe with respect to the outer pipe is realised in this way despite the inclined position of the inner pipe with respect to the outer pipe. As a result the inner pipe can be placed at a slope in a horizontally placed outer pipe and on the one hand a proper connection to the boiler pipe at the inside is possible and on the other hand the radial width of the annular opening of the second passage at the outside is practically constant over the circumference, as a result of which the above-mentioned drawback is largely overcome.

[0008] According to a first further development the outer pipe comprises a first and a second outer pipe portion having first and second centre lines, respectively, wherein the first centre line of the first outer pipe portion and the centre line of the inner pipe, at least the part of the inner pipe that is surrounded by the first outer pipe portion, are substantially straight and intersect at the first end of the outer pipe, and wherein the second outer pipe portion comprises adapting means for at that location at least partially bringing the second centre line of the second outer pipe portion out of line with the first centre line of the first outer pipe portion, wherein the centre lines of the inner pipe and the second outer pipe portion intersect at the second end of the outer pipe.

[0009] In this further development the outer pipe, particularly the second outer pipe portion, is provided with adapting means. In this simple embodiment the adapting means of the second pipe portion ensure, at least partially, the correct spatial placement of the inner pipe with respect to the outer pipe.

[0010] In a first embodiment of the outer pipe the adapting means of the second outer pipe portion comprise a twin elbow. By means of this twin elbow, the centre line of the second pipe portion is saltatorily shifted or tilted with respect to the first outer pipe portion. Because of the twin elbow the centre lines of the outer pipe portions are placed staggered with respect to each other or receded.

[0011] In a second embodiment of the outer pipe the adapting means of the second outer pipe portion comprise a reducer, preferably an eccentric reducer. This reducer forms a further means for more or less smoothly shifting the centre line of the second outer pipe portion with respect to the first outer pipe portion.

[0012] According to a second further development the inner pipe comprises a first and a second inner pipe portion, wherein a centre line of the first inner pipe portion and a centre line of the outer pipe, at least the portion of the outer pipe that surrounds the first inner pipe portion, are substantially straight and intersect at the first end of the outer pipe, and wherein the second inner pipe portion comprises adapting means for at that location at

least partially bringing the centre line of the second inner pipe portion out of line with the centre line of the first inner pipe portion, wherein the centre lines of the outer pipe and the second inner pipe portion intersect at the second end of the outer pipe.

[0013] In this further development the inner pipe, particularly the second inner pipe portion, is provided with adapting means. The adapting means of the second inner pipe portion here ensure, at least partially, the correct spatial placement of the inner pipe with respect to the outer pipe.

[0014] In an embodiment both the inner pipe and the outer pipe may comprise a first and second pipe portion. Both the second outer pipe portion and the second inner pipe portion may comprise adapting means here. Preferably the first and second inner pipe portion are surrounded by the first and second outer pipe portion, respectively.

[0015] In a first embodiment of the inner pipe the adapting means of the first inner pipe portion comprise a twin elbow.

[0016] In a second embodiment of the inner pipe the adapting means for the first connection portion comprise a reducer, preferably an eccentric reducer.

[0017] In a further embodiment the adapting means of the second outer pipe portion and of the second inner pipe portion comprise a bend. As a result the second end of the pipe assembly can be placed at an angle to the first end of the pipe assembly. Preferably the second outer pipe portion comprises a substantially squared bend. As a result the boiler can easily be connected to a roof or exterior wall passage that is placed immediately above or adjacent to the boiler.

[0018] It is furthermore advantageous when the first outer pipe portion and the second outer pipe portion are formed as separate pipe members, wherein the first and/or the second outer pipe portion comprise coupling means for coupling the first and second outer pipe portion to each other. Using separate first and second outer pipe portions is logistically advantageous: the available straight outer pipes of the known concentric wall or exterior wall passages can be used for the horizontal roof or exterior wall passage according to the invention, as the first outer pipe portion.

[0019] Preferably the second outer pipe portion at a side oriented towards the first outer pipe portion comprises a pipe member that can be slid fittingly in or around the first outer pipe portion. This pipe member offers a simple coupling means. Moreover, if the pipe member is long enough, the length of the outer pipe can be adjusted by means of this pipe member to the thickness of the exterior wall or to the thickness of the roof structure.

[0020] In comparable manner the first inner pipe portion and the second inner pipe portion may also be formed as separate pipe members, wherein the first and/or the second inner pipe portion comprise coupling means for coupling the first and second inner pipe por-

tion to each other. Here as well the available straight inner pipes of the known concentric wall or exterior wall passages can be used for the horizontal roof or exterior wall passage according to the invention, as first inner pipe portion.

[0021] Preferably the second inner pipe portion at a side oriented towards the first inner pipe portion comprises a pipe member that can be slid fittingly in or around the first inner pipe portion.

[0022] A combination of first and second inner pipe portions and first and second outer pipe portions that have been formed as separate pipe members is also possible.

[0023] Preferably the diameters of the first and second pipe portions of the outer pipe or of the inner pipe are practically equal.

[0024] Preferably the first outer pipe portion is placed at a side of the horizontal roof or exterior wall passage that can be placed inside the house. As a result the extension of the horizontal roof or exterior wall passage can be kept limited outside the area of the exterior wall or the roof.

[0025] Preferably the inner pipe and the outer pipe are straight cylindrical, at least at an end of the horizontal roof or exterior wall passage that can be placed inside the house. This facilitates the connection to the pipes that are between the roof or exterior wall passage and the boiler, inside the house.

[0026] Preferably near an end of the outer pipe a holder is placed for centrically placing an inner pipe. Preferably such a holder is placed near both ends of the outer pipe.

[0027] In an embodiment the second outer pipe portion comprises a reducer that comprises the adapting means and a straight-cylindrical member, which preferably are formed as separate pipe members. In a comparable manner the second inner pipe portion may also be formed.

[0028] Preferably the outer pipe is provided with attachment means for attaching the outer pipe to an exterior wall or roof, preferably in a substantially horizontal position of at least the first outer pipe portion of the outer pipe. In an embodiment said attachment means comprise a wall plate.

[0029] From a second aspect the invention provides an inner pipe or outer pipe for a horizontal roof or exterior wall passage, provided with adapting means as described above.

[0030] From a third aspect the invention provides an inner pipe portion or outer pipe portion for a horizontal roof or exterior wall passage, provided with adapting means as described above.

[0031] From a fourth aspect the invention provides a pipe for a horizontal roof or exterior wall passage comprising, a first and a second straight-cylindrical end, adapting means for at that location at least partially bringing a centre line of the second end out of line with a centre line of the first end, wherein a holder is placed

in the pipe near the second end for centrally placing an inner pipe. Preferably the pipe forms an outer pipe portion for a horizontal roof or exterior wall passage as described above.

[0032] Preferably this pipe at the first end preferably comprises coupling means for coupling the pipe to a further pipe. Preferably the adapting means comprise a twin elbow, a bend or a reducer.

[0033] From a fifth aspect the invention provides a pipe for a horizontal roof or exterior wall passage comprising a first and second straight cylindrical end, adapting means for at that location at least partially bringing a centre line of the second end out of line with a centre line of the first end, wherein a holder is placed around the pipe near the second end for centrally placing the pipe in an outer pipe. Preferably the pipe forms an inner pipe portion for a horizontal roof or exterior wall passage as described above.

[0034] Preferably this pipe at the first end comprises coupling means for coupling the pipe to a further pipe. Preferably the adapting means comprise a twin elbow, a bend or a reducer.

[0035] The invention will be elucidated on the basis of the exemplary embodiment shown in the attached figures, in which:

Figure 1 shows a view of an exterior wall passage according to the invention;

Figures 2A and 2B show a first embodiment of an exterior wall passage according to the invention;

Figures 3A, 3B and 3C show a second embodiment of an exterior wall passage according to the invention;

Figure 4 shows a view of a connection member according to the invention;

Figure 5 shows a cross-sectional view of a third embodiment of an exterior wall passage according to the invention;

Figure 6 shows a cross-sectional view of a first embodiment of a horizontal roof passage according to the invention; and

Figure 7 shows a cross-sectional view of a second embodiment of a horizontal roof passage according to the invention.

[0036] The horizontal exterior wall passage 1 of figure 1 is provided with an inner pipe 2 and an outer pipe 3. The position of the inner pipe 2 in the outer pipe 3 is schematically shown by means of a dotted line. The outer pipe 3 comprises a first outer pipe portion 31 and a second outer pipe portion 32 that is provided with a twin elbow 5. The outer pipe 3 is furthermore provided with

a wall plate 6 by which means the exterior wall passage 1 connects to an exterior wall 7 (indicated by means of a dotted line). The second outer pipe portion 32 connects to the end of the first outer pipe portion 31 near the inner wall 8 (indicated by means of the dotted line). The inner pipe 2 in the shape of a straight pipe is placed centrally at both ends 9, 10 of the outer pipe 3; both at the end 9 of the second outer pipe portion 32 extending away from the first outer pipe portion 31, the centre line 2h of the inner pipe 2 intersects the centre line 32h of the second outer pipe portion 32, and at the end 10 of the first outer pipe portion 31 extending away from the second outer pipe portion 32 the centre line 2h of the inner pipe 2 intersects the centre line 31h of the first outer pipe portion 31. The angle φ between the centre line 2h of the inner pipe 2 and the centre line 31h of the first outer pipe portion 31 preferably is 3 degrees or more. Due to the twin elbow 5, a centric position of the inner pipe 2 is realised at both ends of the outer pipe 3 despite an inclined position of the straight inner pipe 2 with respect to the first outer pipe portion 31.

[0037] In a first exemplary embodiment as shown in figures 2A and 2B the second outer pipe portion 41 is provided with a pipe member 11 that can be fittingly slid in the first outer pipe portion 31. With this sliding version of the exterior wall passage according to the invention the overall length of the outer pipe 3 of the exterior wall passage 1 can be adjusted to the thickness of the exterior wall.

[0038] The exterior wall passage 1 further comprises a holder 13-15 for centrally placing (centre lines of the inner and pipe portion intersect) the inner pipe 2 in the first outer pipe portion 31 at the location of the end 10 extending away from the second outer pipe portion 41 (outer end of the pipe portion 3). Said holder is designed like a compound sleeve having an inner ring 14, an outer ring 13 and one or more ribs 15 that connect both rings 13 and 14 to each other. Here the outer ring 13 can be placed against an inner surface of the first pipe portion 31 of the pipe portion 3, and the inner ring 14 can be placed on the inner pipe 2. The sleeve as shown in figure 2B is provided with spaced apart ribs 15 that are arranged distributed over the circumference. Such a compound sleeve can also be placed at the other end of the exterior wall passage 1, that means at the end 9 of the second outer pipe portion 32 (inner end of the pipe portion 3) that extends away from the first outer pipe portion 41.

[0039] Figures 3A, 3B and 3C show a second exemplary embodiment of the wall passage according to the invention. In this rigid version the second outer pipe portion 42 is provided with a short pipe member 12 that serves for a proper connection between the first outer pipe portion 31 and the second outer pipe portion 42. The second outer pipe portion 42 according to this second embodiment, is provided with a wall plate 16 by which means the second outer pipe portion 42 can be attached to the wall. This wall plate 16 also ensures a

sealing for the opening in the wall.

[0040] In this second exemplary embodiment the end of the first outer pipe portion 31 of the outer pipe 3 preferably connects to the inner wall 8. To that end the first outer pipe portion 31 has to be made to size. An alternative is to use a first outer pipe portion that comprises two pipe members that can slide telescopically in each other. In this way the length of the outer pipe can be adjusted to the thickness of the wall.

[0041] A view of the second outer pipe portion 42 according to this second exemplary embodiment is shown in figure 3C. In this figure it can also be seen that the inner pipe 2 is connected to the second outer pipe portion 42 by means of a compound sleeve 13, 14 and 15 as described above.

[0042] An outer pipe member 43 for use as a second outer pipe portion 42 in an exterior wall passage of figures 3A, 3B and 3C is shown in figure 4. This outer pipe member 43 is provided with a twin elbow 5 that is visible via the inside of the outer pipe member 43. Between this twin elbow 5 and the pipe member 12 the outer pipe member 43 is provided with an edge 17 that projects to the outside, with which edge the outer pipe member 43 can be placed in a wall plate as shown in figure 3C. This projecting edge 17 is preferably provided with a line of break 18. By means of this line of break 18 a part of this circumferential edge 17 can be removed when using the outer pipe member 43 without wall plate 16. As a result a uniform outer pipe member can be realised that be used both with and without wall plate.

[0043] A third exemplary embodiment of a wall passage according to the invention is shown in figure 5. In this exemplary embodiment the inner pipe comprises a first inner pipe portion 21 and a second inner pipe portion 22. The first outer pipe portion 31 and the first inner pipe portion 21 are designed in a manner comparable with the horizontal exterior wall passage of figure 1.

[0044] The second outer pipe portion 44 comprises a squared elbow or bend 45 as a result of which the centre line 32h of the second outer pipe portion 44 runs substantially parallel to the inner wall 8. The second inner pipe portion 23 comprises a bend 23. The dimensions of the two bends 45, 23 are chosen such that at the location of the inner end 9 of the second outer pipe portion 44, the centre line 32h of the second outer pipe portion 44 and the centre line of the second inner pipe portion 22 intersect, or as shown in figure 5, coincide.

[0045] A first embodiment of a horizontal roof passage is shown in figure 6. The passage is placed in an opening in a roof structure having an outer side 50 and an inner side 51. The build-up of the passage is comparable with the build-up of the exterior wall passage as shown in figure 2, wherein the wall plate 6 has been left out.

[0046] A second embodiment of a horizontal roof passage is shown in figure 7. Here the passage is built in in a horizontal passage tile 52. Here as well the build-up of the passage is comparable to the build-up of the

exterior wall passage as shown in figure 2.

[0047] The horizontal roof or exterior wall passage according to the invention can also be used in non-condensing heating appliances. However, it is desirable then to place an interception device for condensate between the non-condensing heating appliance and the horizontal roof or exterior wall passage.

10 Claims

1. Horizontal roof or exterior wall passage comprising a pipe assembly having an inner pipe for forming a first passage and an outer pipe surrounding the inner pipe for forming a substantially annular passage between the inner pipe and the outer pipe,
 - wherein the inner pipe at both ends of the outer pipe is placed centrically within the outer pipe,
 - wherein a centre line of the inner pipe and a centre line of the outer pipe diverge from each other from a first end towards a second end of the outer pipe, and
 - wherein the pipe assembly comprises adapting means for bringing the centre lines of the inner pipe and the outer pipe towards each other at the second end.
2. Horizontal roof or exterior wall passage according to claim 1, wherein the outer pipe comprises a first and a second outer pipe portion having first and second centre lines, respectively,
 - wherein the first centre line of the first outer pipe portion and the centre line of the inner pipe, at least the part of the inner pipe that is surrounded by the first outer pipe portion, are substantially straight and intersect at the first end of the outer pipe,
 - wherein the second outer pipe portion comprises adapting means for at that location at least partially bringing the second centre line of the second outer pipe portion out of line with the first centre line of the first outer pipe portion, wherein the centre lines of the inner pipe and the second outer pipe portion intersect at the second end of the outer pipe,
 - wherein the adapting means of the second outer pipe portion preferably comprise a twin elbow and/or a reducer, and
 - wherein the second outer pipe portion preferably is placed at a side of the horizontal roof or exterior wall passage that can be placed inside the house.
3. Horizontal roof or exterior wall passage according to claim 1 or 2, wherein the inner pipe comprises a first and a second inner pipe portion,
 - wherein a centre line of the first inner pipe portion and a centre line of the outer pipe, at least the portion of the outer pipe that surrounds the first inner pipe portion, are substantially straight and inter-

sect at the first end of the outer pipe,

wherein the second inner pipe portion comprises adapting means for at that location at least partially bringing the centre line of the second inner pipe portion out of line with the centre line of the first inner pipe portion, wherein the centre lines of the outer pipe and the second inner pipe portion intersect at the second end of the outer pipe, and

wherein the first and second inner pipe portion preferably are surrounded by the first and second outer pipe portion, respectively.

4. Horizontal roof or exterior wall passage according to claims 2 or 3, wherein the adapting means of the second outer pipe portion and/or of the second inner pipe portion comprise a bend, a twin elbow and/or a reducer.

5. Horizontal roof or exterior wall passage according to any one of the claims 2, 3 or 4,

wherein the first outer pipe portion and the second outer pipe portion are formed as separate pipe members,

wherein the first and/or the second outer pipe portion comprise coupling means for coupling the first and second outer pipe portion to each other, and

wherein the second outer pipe portion at a side oriented towards the first outer pipe portion preferably comprises a pipe member that can be slid fittingly in or around the first outer pipe portion.

6. Horizontal roof or exterior wall passage according to any one of the claims 3, 4 or 5,

wherein the first inner pipe portion and the second inner pipe portion are formed as separate pipe members,

wherein the first and/or the second inner pipe portion comprise coupling means for coupling the first and second inner pipe portion to each other, and

wherein the second inner pipe portion at a side oriented towards the first inner pipe portion preferably comprises a pipe member that can be slid fittingly in or around the first inner pipe portion.

7. Horizontal roof or exterior wall passage according to any one of the preceding claims, wherein the inner pipe and the outer pipe are straight cylindrical, at least at an end of the horizontal roof or exterior wall passage that can be placed inside the house.

8. Horizontal roof or exterior wall passage according to any one of the preceding claims, wherein near an end of the outer pipe preferably a holder is placed for centrically placing an inner pipe.

9. Inner pipe or outer pipe for a horizontal roof or ex-

terior wall passage, provided with adapting means according to any one of the preceding claims.

10. Inner pipe portion or outer pipe portion for a horizontal roof or exterior wall passage, provided with adapting means according to any one of the claims 2-10.

11. Pipe for a horizontal roof or exterior wall passage comprising:

a first and a second straight-cylindrical end, adapting means for at that location at least partially bringing a centre line of the second end out of line with a centre line of the first end,

wherein a holder is placed in the pipe near the second end for centrically placing an inner pipe,

wherein the pipe at the first end preferably comprises coupling means for coupling the pipe to a further pipe, and

wherein the adapting means preferably comprise a twin elbow, a bend or a reducer.

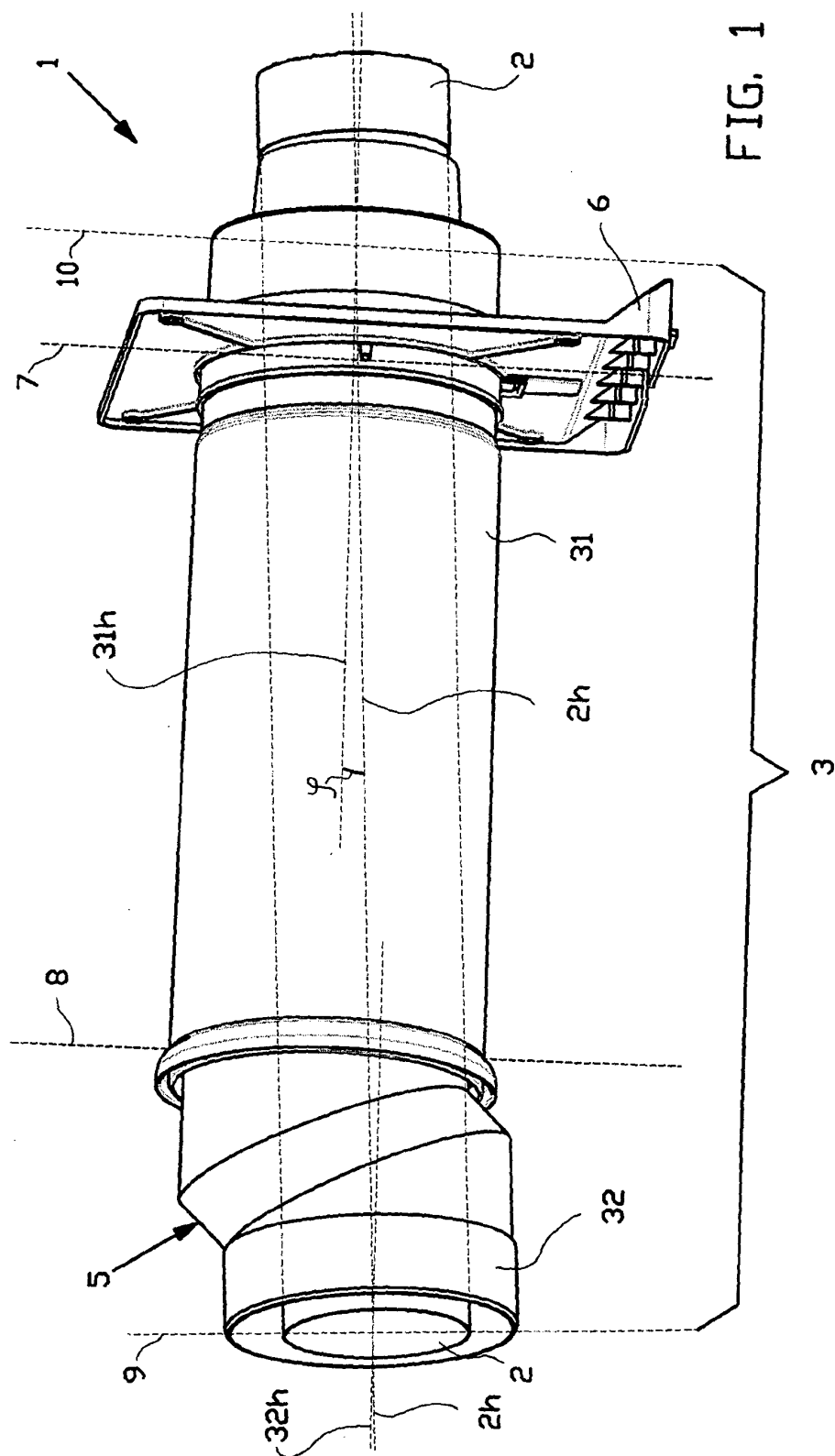
12. Pipe for a horizontal roof or exterior wall passage comprising

a first and second straight cylindrical end, adapting means for at that location at least partially bringing a centre line of the second end out of line with a centre line of the first end,

wherein a holder is placed around the pipe near the second end for centrically placing the pipe in an outer pipe,

wherein the pipe at the first end preferably comprises coupling means for coupling the pipe to a further pipe, and

wherein the adapting means preferably comprise a twin elbow, a bend or a reducer.



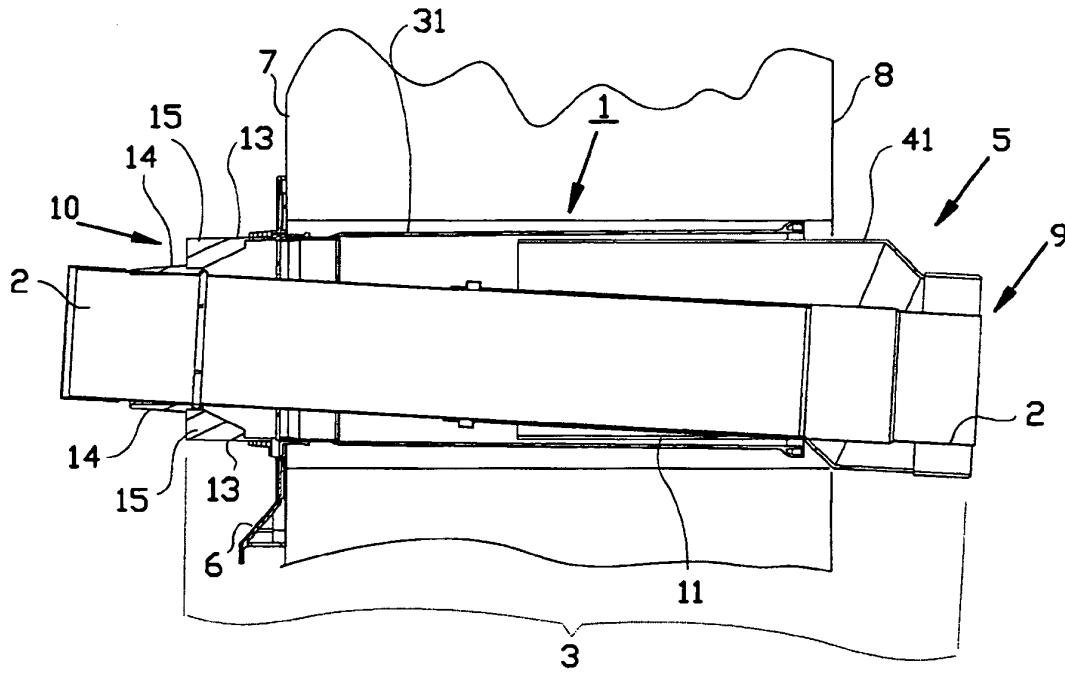


FIG. 2A

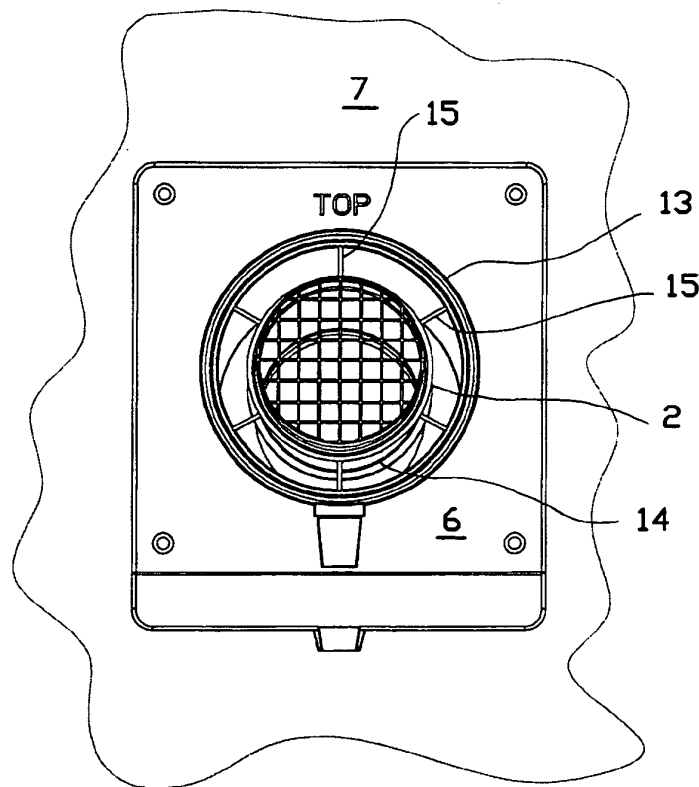


FIG. 2B

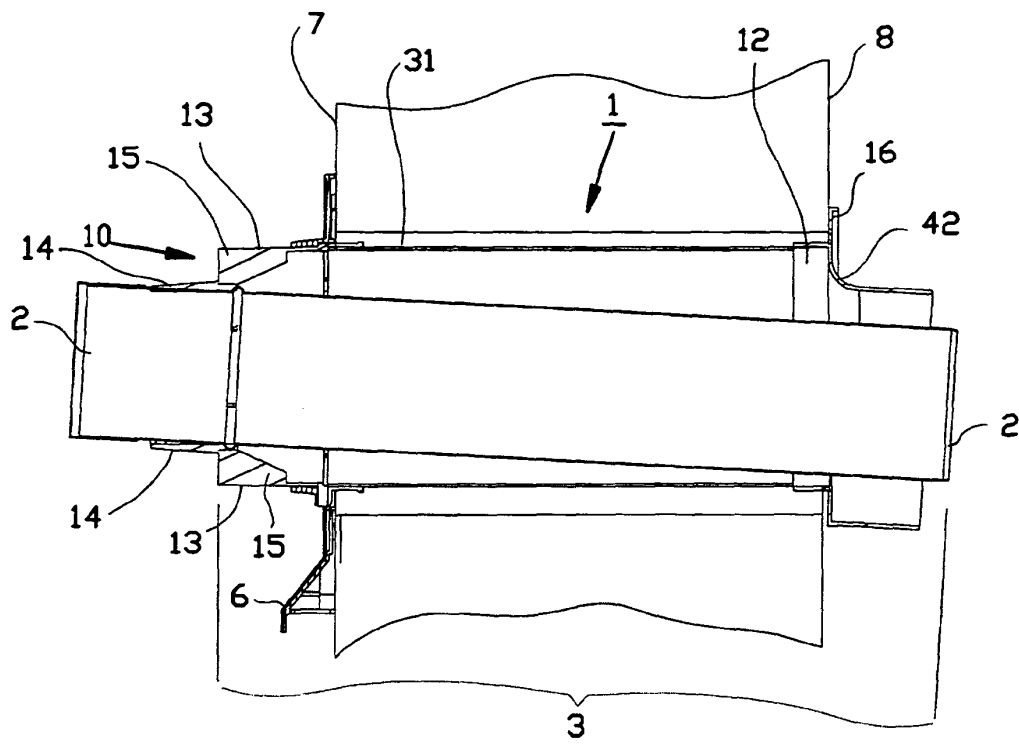


FIG. 3A

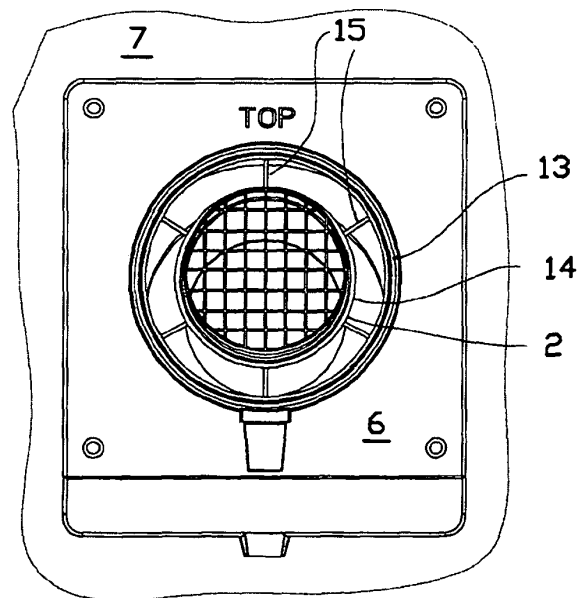


FIG. 3B

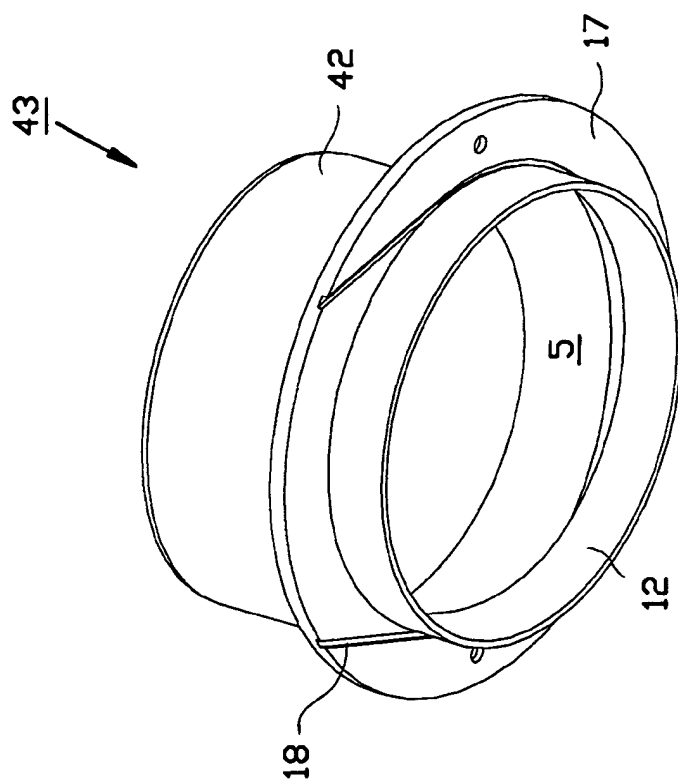


FIG. 4

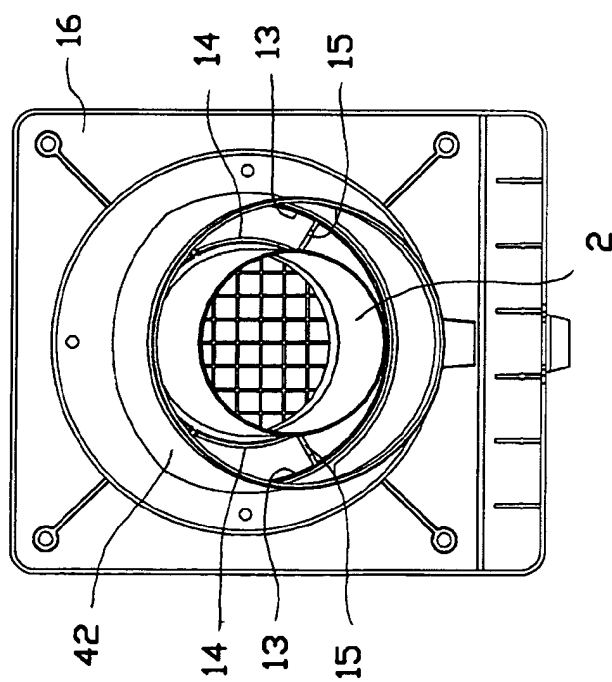


FIG. 3C

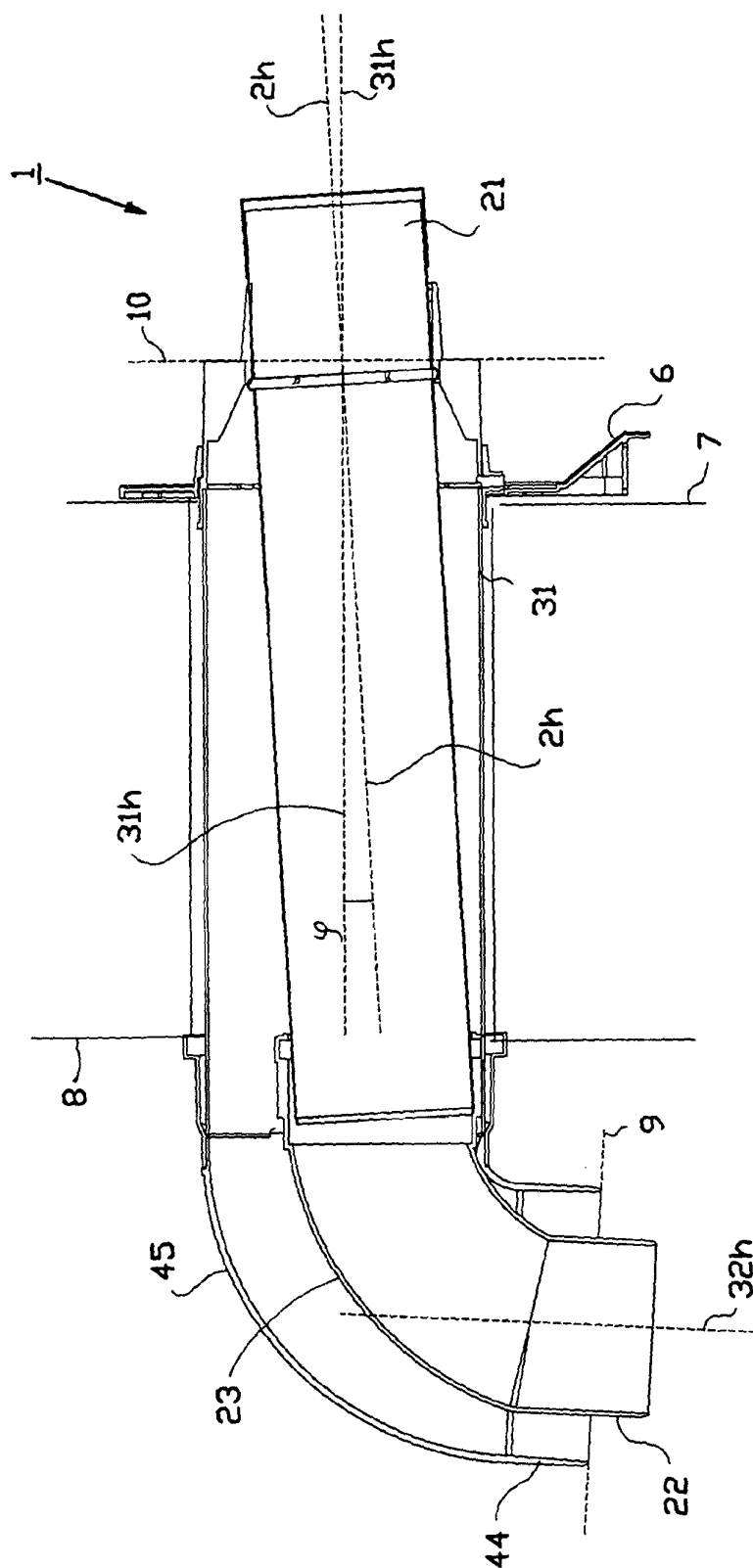


FIG. 5

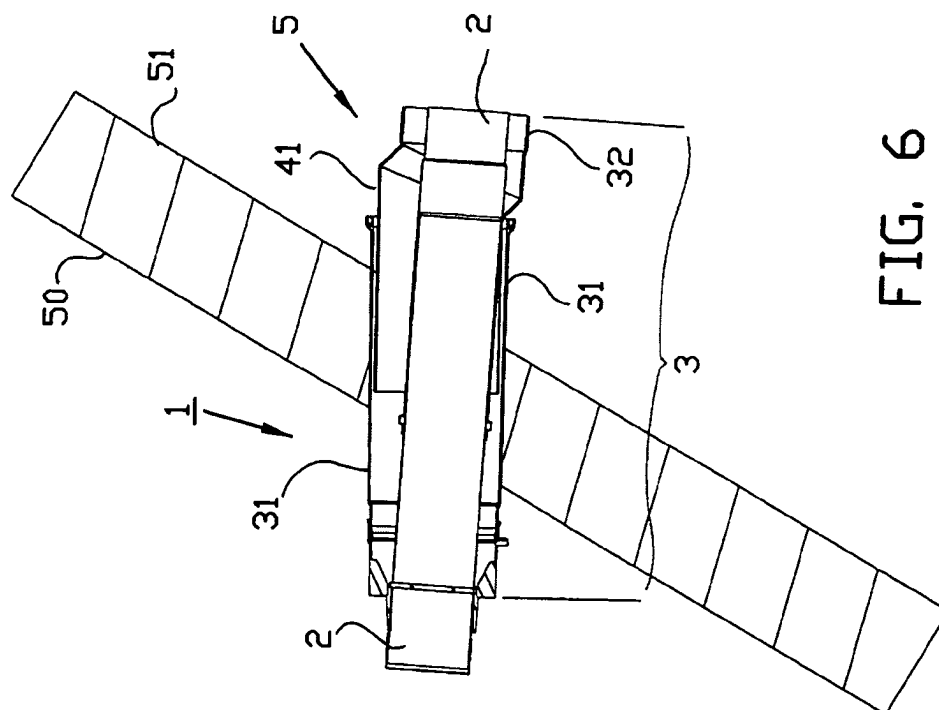


FIG. 6

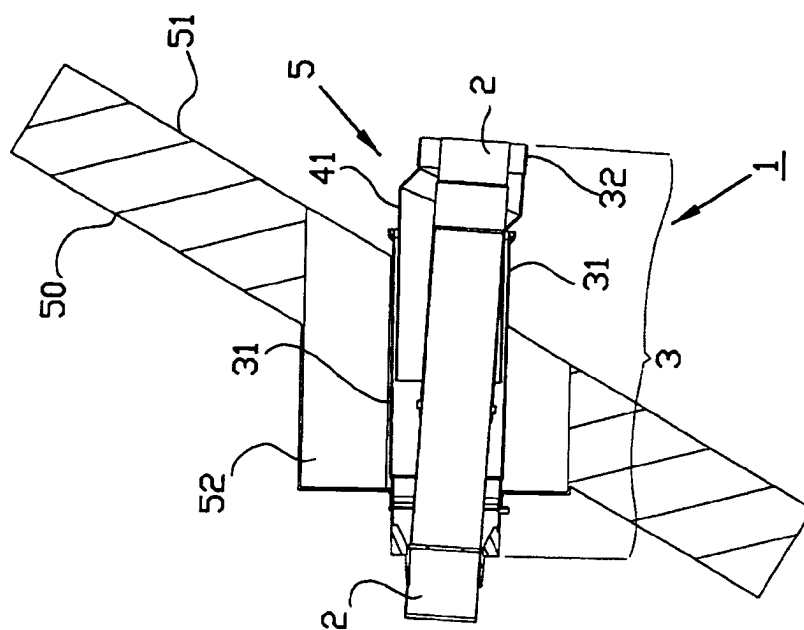


FIG. 7



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 07 6079

DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 July 2004	Examiner Mougey, M
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 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 04 07 6079

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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