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(54) **Device for the passage of channels in cellings or walls**

(57) According to the present invention a device for the passage of cannels in ceilings or walls comprises a pair of sheet pieces in the form of a lower collar (1) or a support plate for mounting below an external ceiling or wall lining and a support plate (2) for mounting below an internal ceiling or wall lining. For the passage of one or more channels (3), the two sheet pieces (1, 2) are formed with at least one opening and the respective opening is provided with a flexible gasket (5, 7) dimensioned for tight-fitting engagement with an external circumferential surface of the corresponding channel (3).

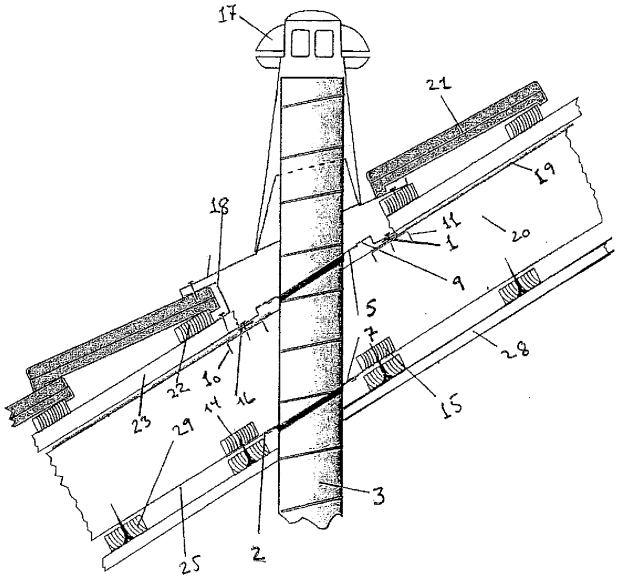

Fig. 1

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Description

[0001] The present invention is relating to a device for the passage of channels in the form of tubes or the like in a ceiling or wall, in particular for venting buildings such as kitchens, bathrooms or soil pipes, from radon, and for natural, mechanical or balanced venting, etc.

[0002] It is today raised far higher requirements as to the consumption of energy in homes and other buildings. It is also strongly focused on that potential occurrences of radon shall be handled and vented to the surrounding outside these. The desire of continuously having an improved internal climate is further presupposing that far more channels have to be passed through ceiling and walls to supply fresh air and to vent the used. In particular in view of the need for reduced energy consumption in buildings of different types, the Norwegian Authorities have by effect from 2009 sharpened the regulations as to achieve reduced energy consumption.

[0003] One of the spots, which can give a relatively large thermal loss and, thus, contribute to an increased heating demand, is where channels for ventilation and supply of fresh air are passed through ceilings and walls. Such passages can additionally cause unwanted and harmful ingress of water, especially in a roof construction. For instance, to be able of complying with the new requirement to reduced use of energy in buildings being in force from 2009, it is therefore necessary to find better solutions in connection with the passage of channels in ceilings and walls.

[0004] The main objective of the present invention is therefore to provide passages being air-tight while preventing ingress of water. According to the invention this is achieved with a device for the passage of channels in ceilings or walls, in which the device is comprising a pair of sheet pieces in the form of a lower collar or a support plate for mounting below an external ceiling or wall lining and a support plate for mounting below a internal ceiling or wall lining, the two sheet pieces for the passage of channels are formed with at least one opening, and the respective opening is provided with a flexible gasket dimensioned for tight-fitting engagement with an external circumferential surface of the corresponding channel.

[0005] Ingress of water can be prevented if at least the sheet piece below the external roofing is formed with a raised portion in an area in connection with the at least one opening having the gaskets. Preferentially, at least the sheet pieces and flexible gaskets facing the exterior can be made of weatherproof materials.

[0006] It can additionally be mentioned that the opening in the lower collar is readily adapted in the longitudinal direction to the fall of the ceiling, whereby the channels within the ceiling passage are perpendicular to the ceiling and nevertheless sealing around the respective channel with the flexible gasket

[0007] Now, the invention is to be further discussed with reference to preferred embodiments shown in the drawing, in which:

Fig. 1 shows schematically a vertical view through an embodiment of the present device for the passage of one tube through a ceiling;

Fig. 2a and 2b illustrate schematically in perspective a vent pipe guard for use along with the embodiment in Fig. 1 and a lower collar and a support plate, respectively, being included in the same embodiment;

Fig. 3 depicts schematically a vertical view through another embodiment for the passage of two tubes;

Fig. 4a and 4b show schematically in perspective a vent pipe guard for use along with the embodiment in Fig. 3 and a lower collar and a support plate, respectively, being includes in the same embodiment;

Fig. 5 illustrates schematically a cut-out in perspective of another embodiment for the passage of two tubes in a wall; and

Fig. 6 to 12 depicts schematically how the embodiment in Fig. 1 can be mounted in a ceiling.

[0008] As shown schematically in Fig. 2b and 4b, the main components of the device according to the invention are a pair of sheet pieces in the form of a lower collar 1 or a support plate for mounting below an external ceiling or wall lining and a support plate 2 for mounting below an internal ceiling or wall lining. In particular when used in a ceiling, the lower collar 1 can be made from a corrosion resistant material, e.g. a plastic covered steel sheet. Further, sheet piece 1 below the external ceiling lining is provided with a raised portion 9 in an area surrounding at least a opening for the passage of channels 3, 4 in the form of tubes or the like in the ceiling or wall. The raised sheet portion is thus preventing ingress of water from an underroof 19, see e.g. Fig. 1, which is involving that the ceiling passage has a sealing situated above a potential flow level for water on the underroof 19. As examples of feasible underroofs, those consisting of foil, roofing paper, plywood and various other simplified underroofs available on the market can be mentioned. Above the underroof 19, the ceiling lining can further comprise roof tiles 21 arranged on underlying laths 22 being arranged in desired distance from the underroof by means of distance laths 23.

[0009] For the passage of channels 3, 4 being denotes tubes hereinafter, the lower collar 1 and support plate 2 for arrangement in the ceiling, as an example, are formed with an opening for each of the tubes. The passage is illustrated for one or two tubes 3, 4 but this is of course not excluding that the two sheet pieces 1, 2 can have openings for more that the tubes depicted. For instance, to avoid unwanted passing of cold or warm air from the exterior and interior of the ceiling or wall, respectively, or ingress of water the respective opening is provided with a flexible gasket 5, 6, 7, 8, see e.g. Fig. 2b and 4b. Each

gasket is dimensioned to be situated in a sealed manner against an outer circumferential surface at the corresponding tube 3, 4, namely around the total tube circumference. In particular the gaskets 5, 6 on the lower collar 1 are flexible weatherproof rubber gaskets of appropriate type. Further, it is understood that all gaskets can be fixed to the respective sheet piece in any suitable manner known in the art. Thereby, it is automatically achieved a water-tight and air-tight passage when using smooth tubes. In case of passages using pipe coils, due to the construction having seams in circles, it should be striven for an arrangement in which the pipe coil is located in a manner involving that each gaskets 5, 6, 7, 8 are not situated over one of the seams but in a smooth portion. However, this is not always possible in practise. The solution is then to fill at least one possibly open space between gaskets and seams on pipe coils with suitable joint filler. The joint filler can thereby prevent passing of water, for instance, in such transition areas.

[0010] The two sheet pieces 1,2 are each mounted to a frame consisting of bearing strips 10, 11, 12, 13 or load bearing elements 14, 15, respectively, being situated between a pair of adjacent rafters 20 or uprights 24 and arranged in an area at outer edges of the respective sheet piece or between the outer edges and the at least one opening.

[0011] By mounting the lower collar 1 in an underroof 19 having a soft nature, in which sag is occurring between the rafters 20, a stiffening of the underroof has to be secured between the rafters as to achieve a rigid and stable surface extending along the front and rear edges and along sides of the lower collar 1 and is constituting an abutting surface for the lower collar. To achieve such stiffening, the frame of sheet piece 1 below the external ceiling lining is formed of four bearing strips 10, 11, 12, 13 extending in pairs transversal or longitudinal to the rafters 20. As shown in Fig. 8, the bearing strips can be formed in each corner area in a manner securing a tight abutting surface against the lower collar 1, e.g. by forming each end of the bearing strips 10, 11, 12, 13 like a recessed portion.

[0012] The frame for the sheet piece 2 below the internal roofing and/or the two support pieces 1, 2 below the external and internal wall lining are formed from at least to load bearing elements 14, 15 extending transversal to the rafters 20 or uprights 24. When needed the frame can be supplemented with two additional load bearing elements, not illustrated, extending transversal between the load bearing elements 14, 15 as to achieved the best possible sealing in the area between an internal moisture barrier 25 in the ceiling or wall and an external wind barrier 26 in the wall. Both the passage in the ceiling and in the wall can be filled with a suitable insulating material 27. It is understood that the internal ceiling or wall lining comprises an inner layer 28 made from a useful material, e.g. plaster boards, when needed being fastened to an extension in the form of laths 29.

[0013] The support plate 2 of the internal roofing and the two support plates 1, 2 of the external and internal wall lining, respectively, have in a favourable manner a width at least corresponding to a normal centre distance between the two adjacent rafters 20 or uprights 24, i.e. 600 mm. Of course, the width can be adapted such as by cutting the sheet pieces beyond the at least one opening, if the mounting is to occur in an end area of the ceiling or wall, unless the centre distance is as normal. The same sheet pieces 1, 2 can be from an appropriate material, e.g. metal. The support plate 1 below the external wall lining can of course be made without any raised portion such as on the lower collar 1.

[0014] To secure water-tight and air-tight mounting, at least the sheet piece 1 below the external ceiling lining in the area at the frame 10, 11, 12, 13 is provided with a bulb 16 filled with a joint filler and is sealing the mounted sheet piece and frame. This can be performed in any suitable manner and is within the competence of skilled persons and is not to further discussed here.

[0015] For the sake of clarity, it shall be mentioned that for mounting a vent pipe guard 17 over ends of the tubes 3, 4 the device is comprising in connection with the sheet piece 1 below the external ceiling lining a securing element 18 arranged in a lower area of the sheet piece transversal to the rafters 20 and is adapted to be situated in an end area of a roof covering, e.g. the roof tiles 21. As an example, the securing element 18 can be fastened to the distance laths 23 keeping the laths 22 in distance from the underroof 19, see Fig. 1 and 3. Moreover, the vent pipe guard 17 can be provided with a lower profiling adapted to the surface of the roof tiles 21, see Fig. 2 and 4a. In addition it is shown an example of a wall hood 30 being a so-called combibox, see Fig. 5. The wall hood comprises a covering 31, preferentially extending inwards below an overlapping panel board.

[0016] In the following a preferred way for mounting the present device is further described for the sealing of a channel passage through a ceiling comprising a lower ceiling 19 of foil, paper, plywood and various other "simplified underroofs" available in the market. The device is distinguishing itself inter alia in that the mounting of the lower collar 1 can be performed from the upper side of the roof without any actions from the lower side, whereby it is achieved a sealed ceiling passage through the modem underroofs of today.

[0017] To avoid sag of the underroof 19 between the rafters 20 at the lower collar 1, see Fig. 6, the underroof 19, see Fig. 7, is thus stiffened by arranging a frame along the four edges of the lower collar and thus around the at least one opening. The frame mounting occurs by means of fittings, see Fig. 8, in the form of four so-called support laths 10, 11, 12, 13 being lowered down below a hole 32 in the underroof 19, see Fig. 7, and the recessed portions on the support laths 10, 11 in between the rafters 20 and underroof on each side and then to be fastened from above into each rafter which are performed occurs at the upper and lower portion of the hole 32. The support laths 12, 13 are situated to the right and left hand side of the

hole 32 below the underroof 19 and screwed to the transversal support laths 10, 11, see Fig. 8. Thereby, the frame is provided around and below the hole 32 in the underroof 19, whereby the mounting of the lower collar 1 can be performed. As already mentioned above, it is a bulb 17 around the outer edges of the lower collar 1. The bulb 17 is filled with joint filler and is screwed against the frame for the support laths 10, 11, 12, 13, see Fig. 8. Thus, provided that the support plate 2 is mounted, see below, the actual tube passage is thereby made ready. A following connection towards a ceiling covered by roof tiles, for instance, occurs by using a ceiling hood of appropriate type, see Fig. 2a and 4 b.

[0018] In case the support plate 2 for the ceiling passage is to be part of a ceiling presupposing use of a moisture barrier 25, i.e. then facing a heated zone within the building. If so the support plate 2, which in that respect also are applicable to the support plates 1, 2 of the wall passage, usually having both a moisture and wind barrier is always situated at a pair adjacent rafters 20 and is therefore having the same need of structural support in the form of load bearing elements 14, 15, see Fig. 9, whereby the same sealing is achieved against the internal moisture barrier, see Fig. 11. This occurs by means of clamping laths 33 with joint filler on the moisture barrier 25 over the support platen 2 arranged against the load bearing elements 14, 15, see Fig. 11 and 12. Support plate configuration as to the passage and sealing between the tubes 3, 4 and the weatherproof rubber gaskets 6, 7 is identical to the lower collar 1, except for the raised portion consequently involving that the support platen therefore is completely flat.

Claims

1. A device for the passage of channels in ceilings or walls, **characterized in that** the device is comprising a pair of sheet pieces in the form of a lower collar (1) or a support plate for mounting below an external ceiling or wall lining and a support plate (2) for mounting below an internal ceiling or wall lining, **in that** the two sheet pieces for the passage of channels (3; 3, 4) are formed with at least one opening, and **in that** the respective opening is provided with a flexible gasket (5, 7; 5, 6, 7, 8) dimensioned for tight-fitting engagement with an external circumferential surface of the corresponding channel (3; 3, 4).

2. A device according to claim 1, **characterized in that** at least the sheet piece (1) below the external ceiling lining is formed with a raised portion (9) in an area in connection with the at least one opening having the gaskets (5, 7; 5, 6, 7,8).

3. A device according to any of the preceding claims , **characterized in that** the respective the sheet piece (1,2) is mounted to a frame (10, 11, 12, 13; 14, 15) arranged between a pair of adjacent rafters or uprights, preferentially situated in an area at the outer edges of the sheet piece.

4. A device according to the claim 3, **characterized in that** at least the frame of the sheet piece (1) below the external ceiling lining is formed from four bearing strips (10, 11, 12, 13) extending in pairs transversal or longitudinal to the rafters.

5. A device according to the claim 3, **characterized in that** the frame of the sheet piece (2) below the lower ceiling lining is formed from at least two load bearing elements (14, 15) extending transversal to the rafters.

6. A device according to the claim 3, **characterized in that** the frame of the support pieces (1, 2) below the external and internal wall lining are formed from at least two load bearing elements (14, 15) extending transversal to the uprights.

7. A device according to any of the preceding claims, **characterized in that** at least the sheet piece (1) below the external ceiling lining in an area at the frame (10, 11, 12, 13; 14, 15) is formed with a bulb (16) filled with a joint filler and to seal between the sheet piece being mounted and the frame.

8. A device according to any of the preceding claims , **characterized in that** the device below the external ceiling in connection with the sheet piece (1) lining is comprising for mounting a vent pipe guard (17) a fastening element (18) situated in a lower area of the sheet piece transversal to the rafters and adapted to be situated in an end area of the roofing.

9. A device according to any of the preceding claims , **characterized in that** at least the sheet piece below the external ceiling lining is formed from a corrosion resistant material.

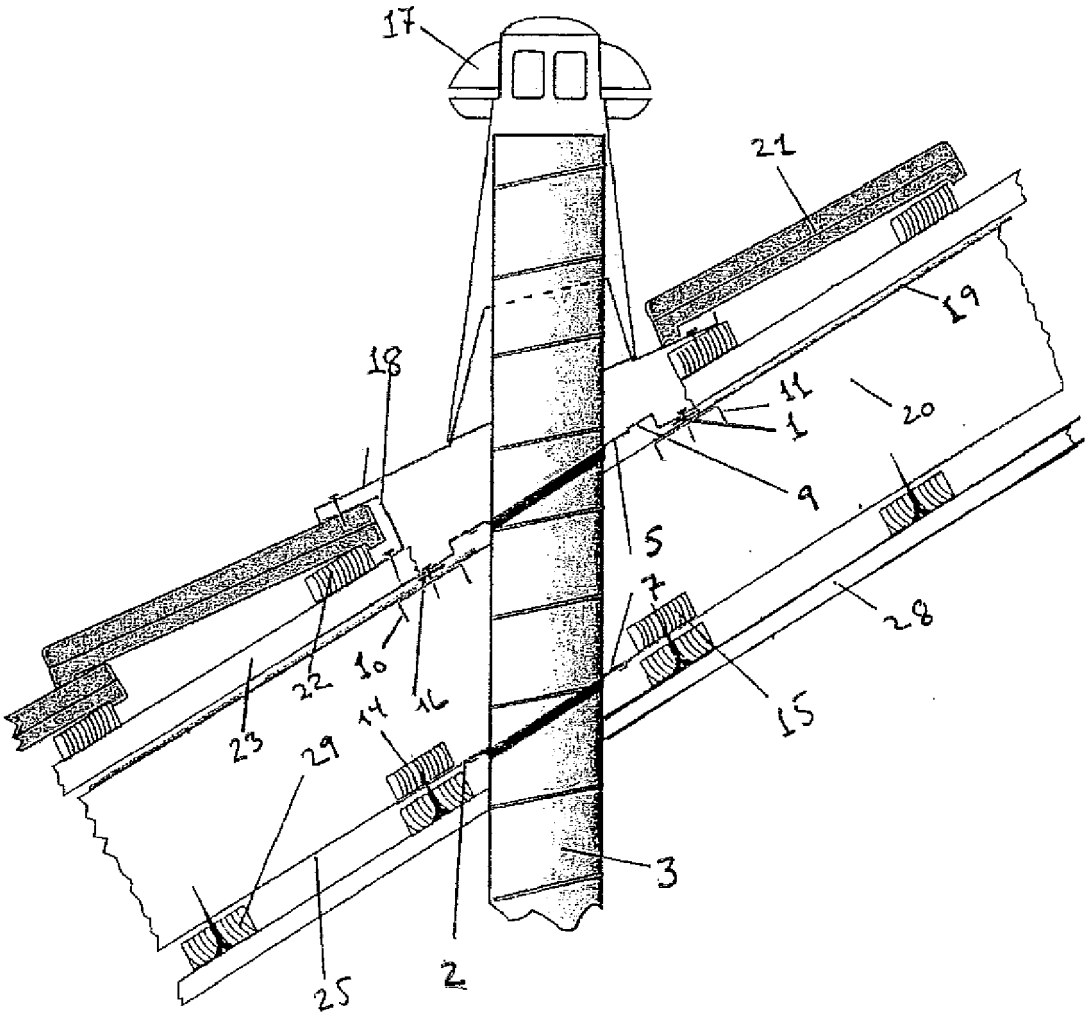

Fig. 1

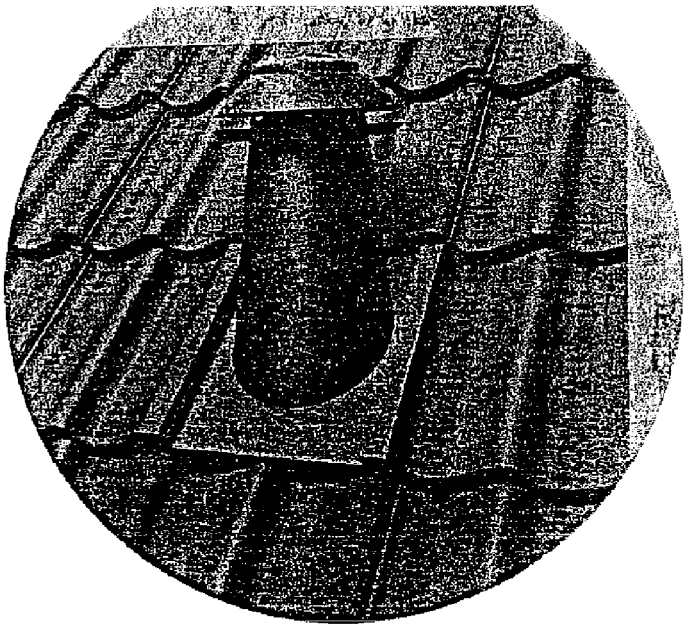

Fig. 2a

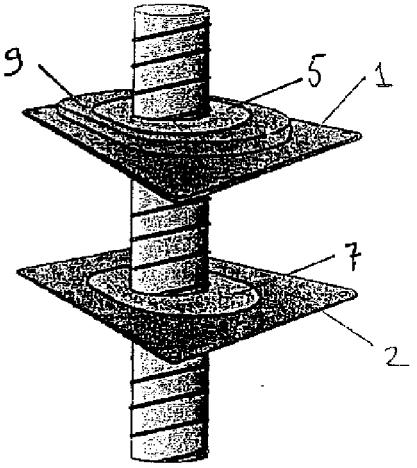

Fig. 2b

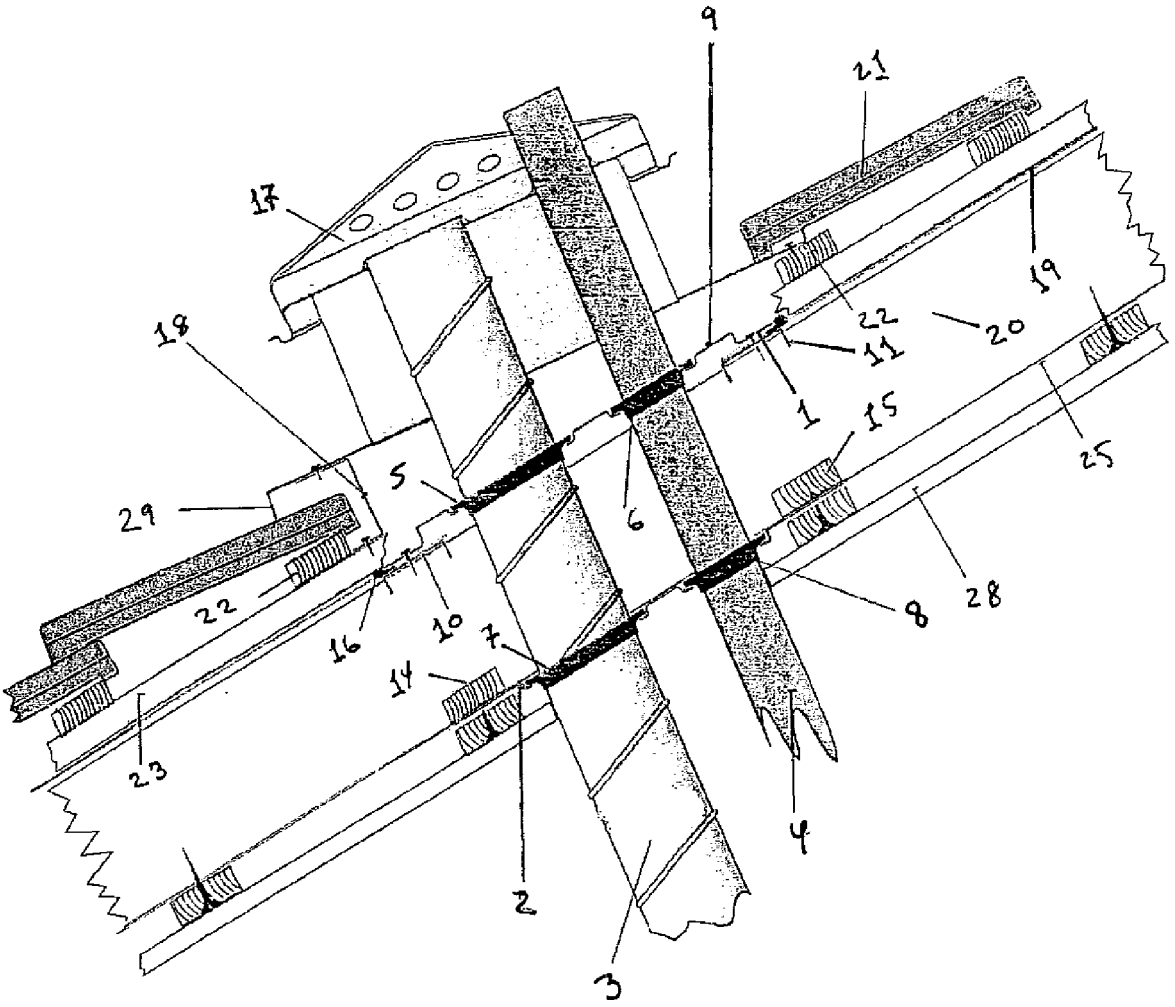

FIG. 3

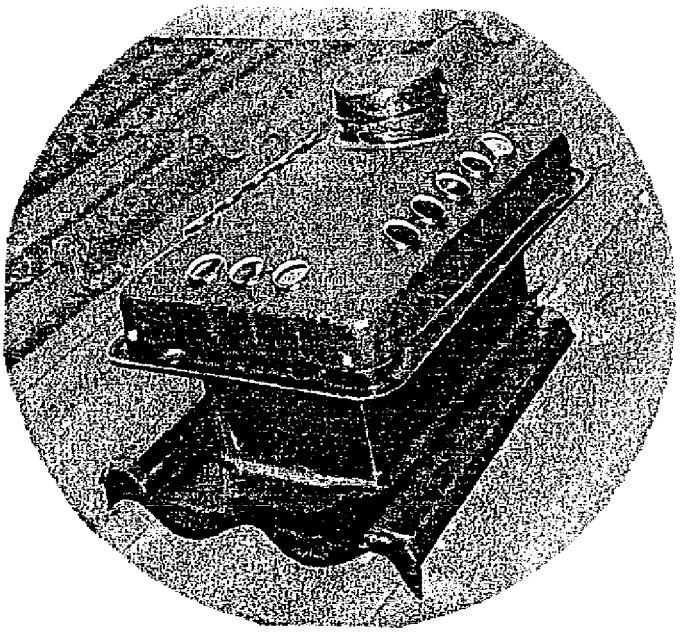

Fig. 4a

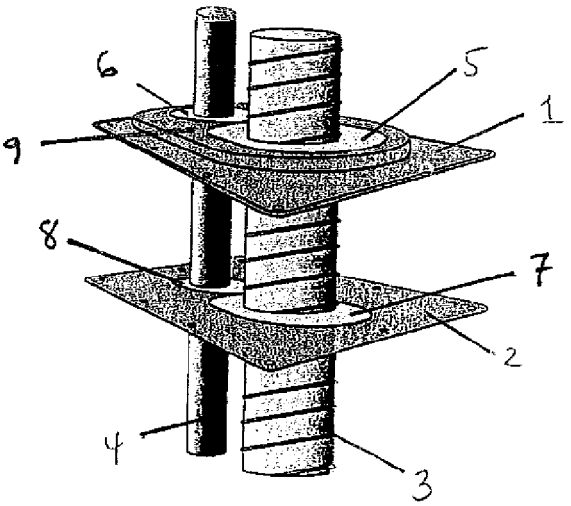

Fig. 4b

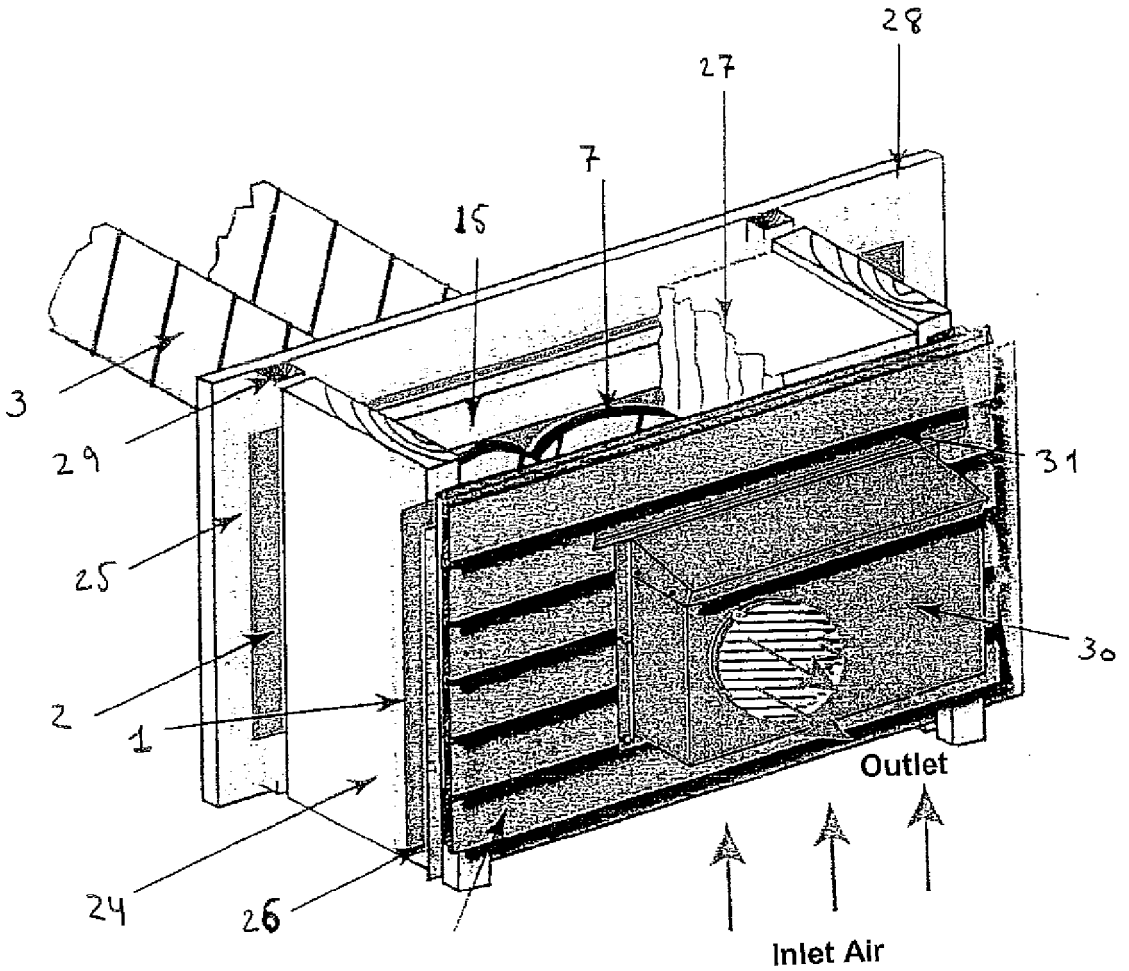

Fig. 5

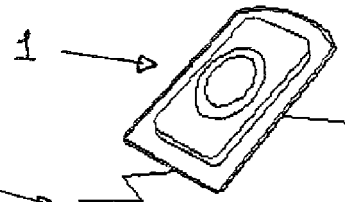

Fig. 6

Fig. 7

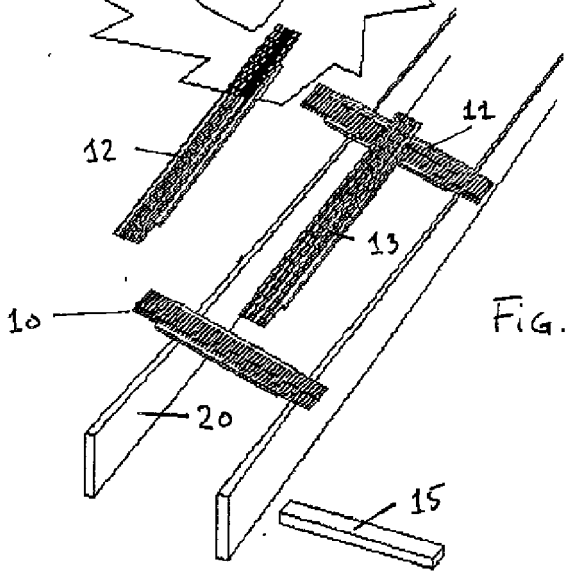

Fig. 8

Fig. 9

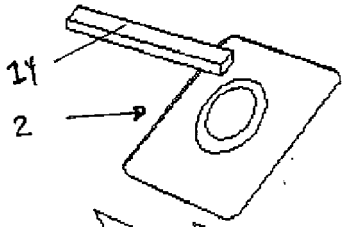

Fig. 10

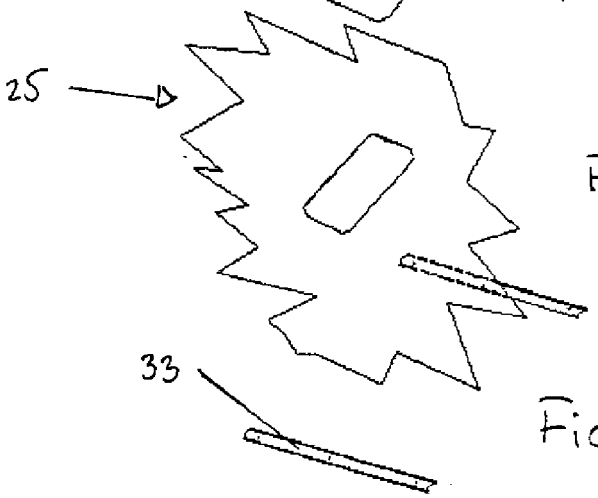

Fig 11

Fig. 12