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(54) **Windshield of a fire gas vent**

(57) The present invention refers to a device to increase the discharge of smoke through a fire gas vent (1), which is arranged through the roof of a building, comprising an essentially rectangular frame (2) with two at the frame pivoting doors (4, 5), which by means of at least one opening device (6) which can bring the doors (4, 5), at smoke emission in the building, from an essentially horizontal closed position to an essentially vertically open position, wherein the doors (4, 5) in open position forms side walls (7, 8), which extends along the long sides (9, 10) of the rectangular frame (2), and at the short sides (11, 12) of the frame (2) arranged upright foldable wind-

shield (13, 14).

The essential for the invention is that at least one windshield (13, 14) is arranged at each short side (11, 12) of the frame (2) and is pivotable attached at the frame (2) and at respectively door (4, 5), wherein said windshield (13, 14) folds up at opening of the doors (4, 5) and in upright unfolded position extends to a height which essentially correspond to the height of the doors (4, 5) along essentially the entire short sides (10, 11) of the frame, wherein the doors (4, 5) and the windshields (13, 14) form an extension of the side walls (9, 10, 11, 12) of the frame in upright unfolded position.

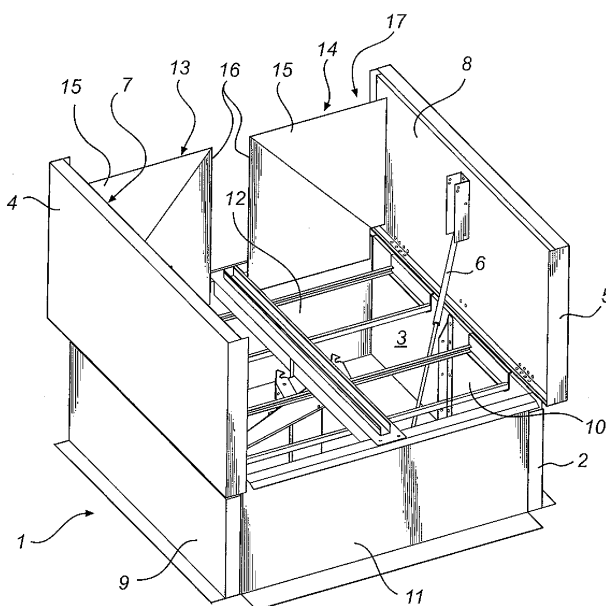


Fig. 1

Description

Technical field

[0001] The present invention refers to a device to increase the discharge of smoke through a fire gas vent, which is arranged through the roof of a building, comprising an essentially rectangular frame with two at the frame pivoting doors, which doors at smoke emission in the building can be brought from an essentially horizontal closed position to an essentially vertically open position, by means of at least one opening device, wherein the doors in open position form side walls, which extend along the long sides of the rectangular frame, and at least one at the short sides of the frame arranged upright foldable windshield, wherein said windshield comprising at least one first triangular plate flexible attached to a second plate, which plates in folded position abut towards each other and in upright unfolded position, together with the doors, forming an extension of the side walls of the frame.

Technical background

[0002] It is commonly known to arrange a fire gas vent with an openable door on the roof of a building to ventilate smoke at a possible fire in the building. Usually the fire gas vent consists of an essentially rectangular frame, which is intended to extend through the roof, and one or several doors, which is intended to automatically open at a possible fire, to uncover an opening through the frame to ventilate out smoke within the building. The amount of smoke, which can be ventilated, is dependant of the size of the opening and the wind conditions existing around the opening. By prolonging the frame with a border which extends above the roof it is possible to reduce the effect of said wind conditions owing to a certain chimney effect, in which an increased height on the border give an increased flow through the opening. However, such border result in considerable increased cost, in that the border must be insulated and made of material, which resists high temperature, and in addition such border reduces a possible light inlet through the fire gas vent. A further disadvantage is that a higher border has negative influence to the exterior of the building.

[0003] Another method to reduce the effect of said wind conditions is to shield the area around the opening. Such fire ventilator is previously known through DE 2 543 979 and disclose an openable door with windshields arranged at two sides of the door, which folds up at opening of the door. The fire gas vent shown has an opening angle which is less than 90°, wherein the opening becomes essentially vertical and at unfavourable conditions the opening may become orientated in the direction of the wind, which essentially worsens the flow through the opening.

Summary of the invention

[0004] The purpose with the present invention is therefore to provide a device which increases the effective area of the fire gas vent to increase the outflow of smoke compared with known technique.

[0005] This purpose is achieved, according to the invention, by that the device of the introductory described kind being characterised in that at least one windshield is pivotable attached at the frame and at respectively door, wherein said windshield folds up at opening of the doors and in upright unfolded position extends to a height which essentially corresponds to the height of the doors along essentially the entire short sides of the frame.

[0006] The device consists of a triangular first plate, which is foldable attached to a second plate and to one of the doors.

[0007] In one embodiment said windshield may consists of two essentially uniform triangular first plates, which are foldable attached to a second plate, which being formed of a common part of sheet metal, and to the respectively door.

[0008] In another preferred embodiment each said windshield can consists of two essentially uniform triangular plates, which are foldable attached to each other and in unfolded position forms a square.

Brief description of the drawings

[0009] A device according to the present invention will hereafter be described closer with reference to the appended drawings, in which:

figure 1 is a schematic perspective view of a fire gas vent, which being shown with open doors, according to the present invention and

figure 2 is a schematic side view of an alternately designed fire gas vent, which being shown with one door open and the second door partly open, according to the present invention.

Detailed description of preferred embodiments

[0010] In figure 1 a fire gas vent 1 being shown, which is intended to be arranged through a roof (not shown) of a building (not shown), comprising an essentially rectangular frame 2, which extends through the roof and forms an opening 3 for ventilation of smoke. Two pivoting doors 4 and 5 are arranged at the frame 2.

[0011] Preferably the doors 4 and 5 are fastened with hinges or similar and provided with at least one opening device 6, which at smoke emission in the building can bring the doors 4 and 5 from an essentially horizontal closed position to an essentially vertically open position. The opening means 6 can consist of a gas spring of known kind or other known devices for opening of the doors 4 and 5.

[0012] In open position the doors 4 and 5 form side walls 7 and 8, which extend along the long sides 9 and 10 of the rectangular frame 2. To increase the discharge of smoke through the fire gas vent 1 the present device comprising at the short sides 11 and 12 of the frame 2 arranged upright foldable windshields 13 and 14. In figure 1 has the windshields at the frontal short side 11 being excluded to clearly show the inside of the fire gas vent 1. The upright foldable windshields 13 and 14 comprising at least a first triangular plate 15 attached flexible to a second plate 16, in which said first and second plates in unfolded position forms said windshield and in retracted position abut towards each other. In one embodiment said windshield may consist of only one triangular first plate 15, which is foldable attached to a second plate, which extends along the entire short side 11 and 12, respectively, and to one of the doors 4 or 5. In another embodiment said windshield may consist of two essentially uniform triangular first plates 15, which are foldable attached to a second plate, which being formed of a common part of sheet metal, and to the doors 4 and 5, respectively. In one further preferred embodiment each of said windshields may consist of two essentially uniform triangular plates 15 and 16, which are foldable attached to each other. The second plate is foldable attached at the short side 11 or 12, respectively, by means of a hinge or similar.

[0013] Thus, each windshield 13 and 14 consists of two essentially uniform triangular plates 15 and 16, which are foldable attached to each other, e.g. by means of one or several hinges, wherein the plates in unfolded position forms a square and in retracted position abut towards each other. Naturally, as mention above, adjacent second triangular plates 16 of the windshield at respectively short side 11 or 12 could be formed of a common part of sheet metal, such that only one windshield extends along the short sides 11 and 12, respectively, but to facilitate assembly and stock-keeping preferably two windshields 13 and 14 are arranged at each short side 11 and 12 of the frame 2 and being pivotable attached, e.g. by hinges, at the frame 2 and at the door 4 and 5, respectively, wherein said windshields 13 and 14 fold up at opening of the doors 4 and 5, and in upright unfolded position forming end walls 17, which extends to a height which essentially correspond to the height of the doors 4 and 5 along essentially the entire short sides 11 and 12 of the frame 2. At closing of the doors 4 and 5 the windshields 13 and 14 are folded together below respective door. Through the present invention the doors and the windshields form an extension of the side walls 9 and 10, and, 11 and 12, respectively, of the frame 2 in upright unfolded position and a pressure difference being hereby established over the fire gas vent, owing to a certain chimney effect, in which an increased height of the side walls give an increased flow through the opening 6 and an increased effective area of the fire gas vent compared with a fire gas vent without end walls.

[0014] In figure 2 an alternately device is shown for

increasing the discharge of smoke through the fire gas vent 1, comprising a cone-shaped sheet metal 20 with an upper fastening plate (not shown), which is intended to be attached to the frame 2 at the inside of the building.

[0015] Preferably the doors and also the windshields are made of steel plates, but also other material is possible, e.g. when the doors should be transparent to light plastic or glass material may be used.

[0016] The fire gas vent 1, shown in the figures, having by example, the dimensions of the rectangular frame 2 being 2.4 m long, 1.2 m broad and 0.25 m high, the two rectangular doors 4 and 5, pivotable arranged at the frame, being 2.4 m long and 0.6 m broad and the sides of the upright foldable squared windshield 13 and 14 being 0.5 m. Thus, the side walls extend 0.6 m and the end walls 0.5 m over the frame 2 in upright unfolded position. Through the present invention the doors and the windshields forming an extension of the side walls of the frame 2 from 0.25 m to at least 0.75 m.

[0017] At testing of a fire gas vent with the above dimensions it has shown that the aerodynamic coefficient at blowing 90°, i.e. perpendicular towards one of the short sides 11 or 12, increased from 0,459 to 0,470 with use of an inner cone-shaped plate and from 0,459 to 1,00 at use of the above described windshields 13 and 14. The effective area, defined as real area multiplied by the aerodynamic coefficient, has increased from 1.32 m² to 1.35 m² at use of the inner cone-shaped plate and from 1.32 m² to 2.88 m² at use of the windshields 13 and 14. On same way the effective area become 2.48 m² at blowing 60° with the windshields 13 and 14 and 2.53 m² with the windshields 13 and 14 and the inner cone-shaped plate.

Claims

1. Device to increase the discharge of smoke through a fire gas vent (1), which is arranged through the roof of a building, comprising an essentially rectangular frame (2) with two at the frame pivoting doors (4, 5), which doors at smoke emission in the building can be brought from an essentially horizontal closed position to an essentially vertical open position, by means at least one opening device (6), wherein the doors (4, 5) in open position form side walls (7, 8), which extend along the long sides (9, 10) of the rectangular frame (2), and at least one at the short sides (11, 12) of the frame (2) arranged upright foldable windshield (13, 14), wherein said windshield (13, 14) comprising at least one first triangular plate (15) flexible attached to a second plate (16), which plates in folded position abut towards each other and in upright unfolded position, together with the doors (4, 5), forming an extension of the side walls (9, 10, 11, 12) of the frame, **characterised in that** at least one windshield (13, 14) is pivotable attached at the frame (2) and at respectively door (4, 5), wherein said windshield (13, 14) folds up at opening of the doors (4,

5) and in upright unfolded position extends to a height which essentially corresponds to the height of the doors (4, 5) along essentially the entire short sides (11, 12) of the frame.

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2. Device according to claim 1, **characterised in that** said windshield (13, 14) consists of two essentially uniform triangular first plates (15), which are foldable attached to a second plate (16), which being formed of a common part of sheet metal.

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3. Device according to claim 1, **characterised in that** each said windshield (13, 14) consists of two essentially uniform triangular plates (15, 16), which are foldable attached to each other and in unfolded position forms a square.

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4. Device according to claim 3, **characterised in that** two windshields (13, 14) are arranged at each of the short sides (11, 12) of the frame (2) and are pivotable attached, e.g. by hinges, at the frame (2) and at respectively door (4, 5).

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5. Device according to any of the claims 1 to 4, **characterised in that** a cone-shaped plate (20) is attached at the frame (2) on the inside of the building.

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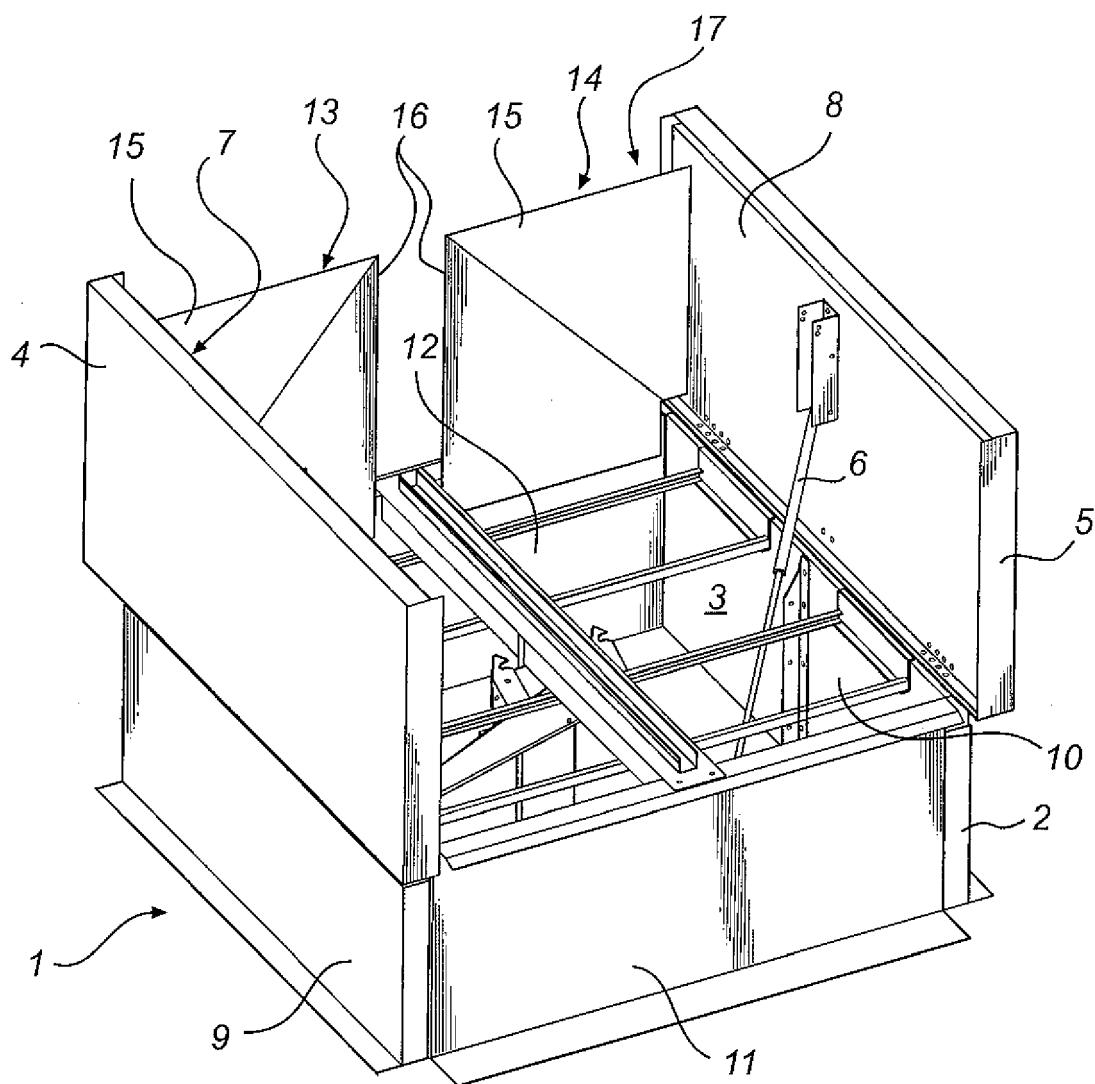
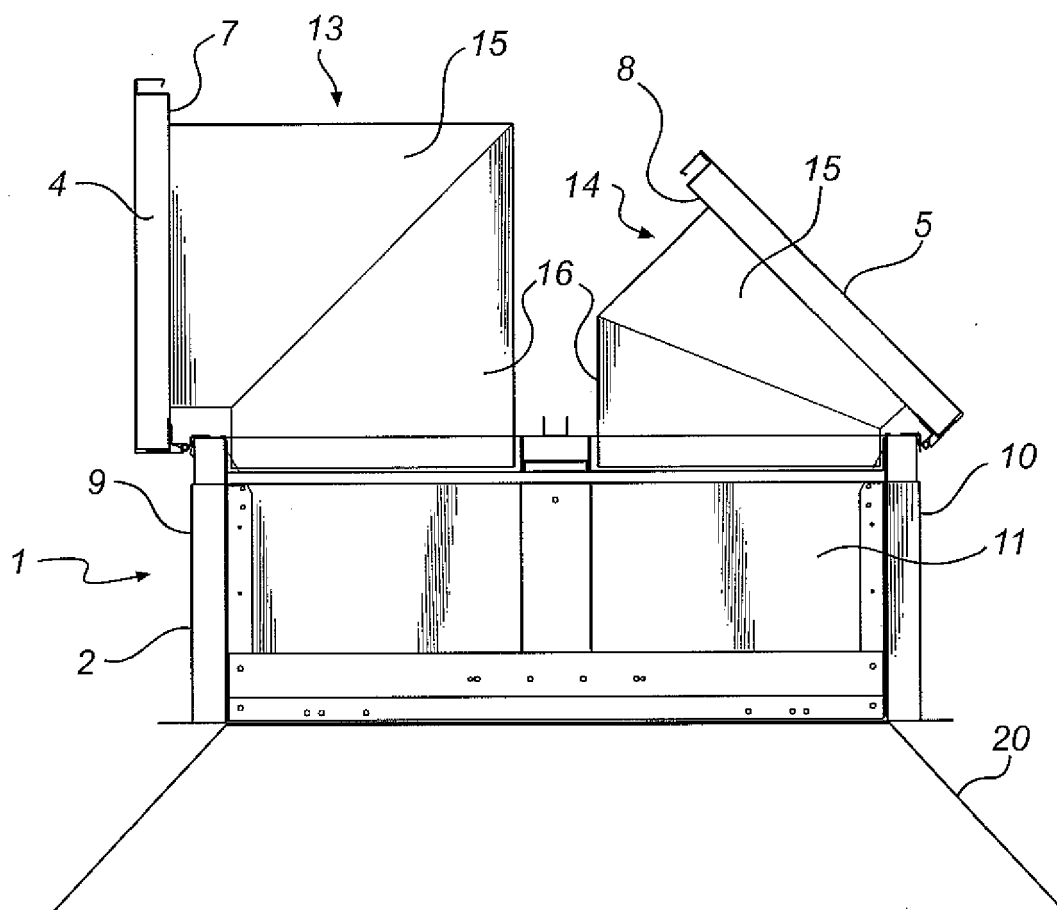


Fig. 1



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 2543979 [0003]