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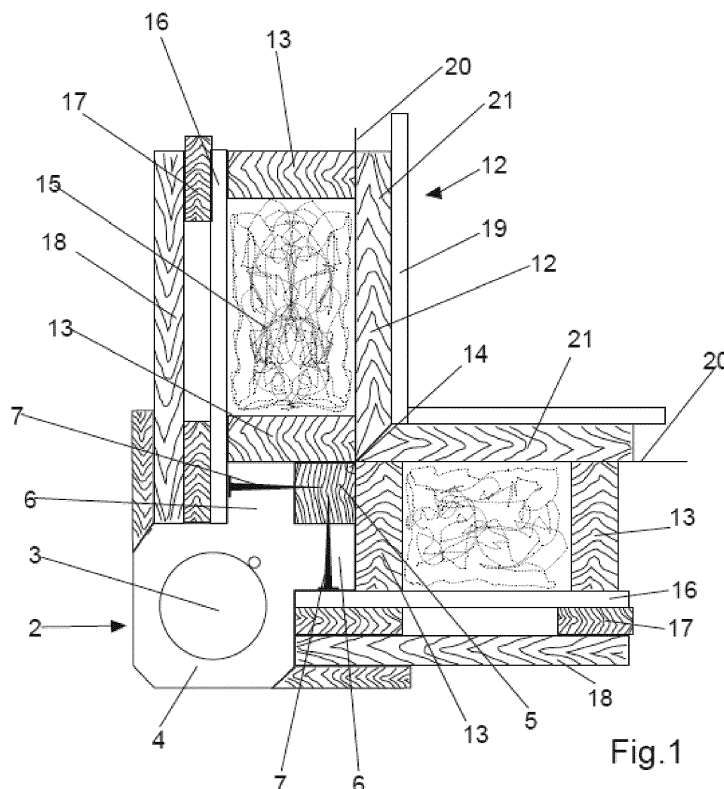
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(54) **ARRANGEMENT FOR DRAINING WATER FROM A ROOF OF A BUILDING AND A BUILDING**

(57) An arrangement (1) for draining water from the roof (10) of a building, the arrangement (19) comprising a downspout (2) with a flow channel (3) for the water.

The downspout (2) has an insulating layer (4) around the flow channel (3).



Description

[0001] This invention relates to an arrangement for draining water from the roof of a building as defined in the preamble of claim 1, the arrangement comprising a downspout with a flow channel for the water, the downspout having an insulating layer around the flow channel. The invention also relates to the building.

[0002] Rain- or meltwater is drained from the roof of a building into a gutter provided at an edge of the building, and, then, along a downspout connected to the gutter, to the ground or a rainwater system. The downspout is usually fixed to the exterior of building.

[0003] The traditional solutions suffer from the problem that the downspout freezes at sub-zero temperatures, although, to prevent this from happening, the downspout can be equipped with a heating cable. A drawback of this solution is that the heating requires electrical couplings, and, in addition, the heating increases the energy consumption of the building. Besides, being fixed to the wall, the downspout easily gets damaged.

[0004] US 2018228141 A1 discloses a filter provided at the top of a downspout to prevent debris from entering the downspout.

[0005] JP H0274421 U, in turn, discloses a cover provided underneath the roof of a building but it does not consist of an insulating material.

[0006] The following prior-art documents can also be stated: JP S5468414 U, JP S56105025 U, WO 2018146017 A1, DE 202015005519 U1, JP H0524756 U and JP S5051222 U.

[0007] This invention aims at providing an improved solution allowing the above-mentioned problems to be alleviated.

[0008] The objective of the invention is achieved by an arrangement as defined in claim 1 and a building as defined in claim 5.

[0009] The arrangement for draining water from the roof of a building according to the invention comprises, at the top of a downspout, a cover made of an insulating material and encasing at least one connecting channel to connect the flow channel of the downspout, by means of the cover, to a gutter of the building.

[0010] The building according to the invention, in turn, comprises a roof equipped with a gutter for collecting water running off the roof, the building having a downspout in a flow connection with the gutter and enclosed, partly or entirely, by a corner of the building. Besides, the building comprises an arrangement as defined in any of claims 1 to 4 and a cover fitted on top of the downspout and having its connecting channel connected to the gutter of the building, the cover being located underneath the roof of the building.

[0011] A number of advantages arise from the invention. Being insulated and enclosed by the corner of the building, the downspout does not freeze, thus eliminating the need of equipping the downspout with a heating cable. Besides, the corner-enclosed downspout is better

protected against damages. The downspout also enhances the appearance of the building because it is not fixed to the exterior of the building.

[0012] The walls of a wood-frame building comprise spaced studs. In a solution according to an embodiment of the invention, the studs of corner-defining walls that are located closest to the corner are positioned in a 90 degree angle in relation to each other, the angle being open towards the tip of the corner. Therefore, the downspout can be supported and/or fixed against the studs that define the corner. This makes the corner more rigid in structure. Further, the corner between the studs can be provided with a support post or some other support structure against which the downspout can be supported and/or fixed. This contributes to the rigidity of the walls as well.

[0013] In the following, the invention will be described in more detail, by means of examples, with reference to the accompanying drawings wherein

Figure 1 is a horizontal cross-sectional view of a corner of a building according to an embodiment of the invention, with an arrangement according to an embodiment of the invention fixed therein,

Figure 2 is a cross-sectional view of the downspout of the arrangement shown in Figure 1,

Figure 3 is a schematic view of a building, with an arrangement according to an embodiment of the invention provided in a corner thereof, and

Figure 4 is a top view of the arrangement shown in Figure 1. In the Figure, the cover of the arrangement is denoted by a dashed line.

[0014] The drawings show a building comprising an arrangement 1 for draining water from the roof 10 of the building. The arrangement 1 is connected to a gutter 11 of the building into which the water leaving the roof 10 runs. The gutter 11 can be provided at an edge of the roof 10 or on the roof. Typically, the building is a small house, i.e. a detached house, a duplex or a low-rise. The building can also be a townhouse, high-rise or an industrial building. The drawings show a wood-frame building whose walls 12 comprise spaced studs 13.

[0015] The arrangement 1 comprises a downspout 2 having a flow channel 3 for the water drained from the roof. The flow channel 3 is circular in cross-section. The downspout 1 has an insulating layer 4 surrounding the flow channel 3. The insulating layer 4 surrounds the flow channel 3 partly or entirely. The flow channel 3 is directly provided inside the insulating layer 4. The interior of the flow channel can be provided with a liner made of a resin mixture. Alternatively, the flow channel 3 can be a tube having the insulating layer 4 applied on its outer surface. The insulating layer 4 consists of expanded polypropylene (EPP). The insulating layer 4 is square or polygonal

in cross-section. The insulating layer 4 forms the exterior of the downspout 2. The insulating layer 4 extends, in the longitudinal direction of the downspout 2, over the above-ground portion thereof.

[0016] The downspout 2 may comprise interconnectable components shown in Figure 2. A necessary number of these components are interconnected to form a downspout 2 of a desired length.

[0017] The downspout 2 is partly or entirely enclosed by a corner of the building. The insulating layer 4 forms the exterior of the corner of the building, as shown in Figure 1. The surface of the insulating layer 4 can be flush with the exterior of the wall 12 of the building. Alternatively, the exterior cladding 18 of the building, such as paneling, may extend over the insulating layer 4, thus placing the insulating layer 4, partly or entirely, underneath the exterior cladding 18.

[0018] In the embodiment shown in the drawings, the corner-defining walls 12 of the building comprise spaced studs 13. At the ends of the corner-defining walls 12, the studs 13 that are located closest to the corner form an angle 14, such as a 90 degree angle, the angle 14 being open towards the tip of the corner. The insulating layer 4 of the downspout is supported and/or fixed against the studs 13 forming the angle 14. In addition, the angle 14 between the studs 13 encloses a support structure, such as a support post 5, against which the insulating layer 4 of the downspout 2 is supported and/or fixed. The support structure 5 abuts the studs 13 and is fixed to the studs 13, for example. The support post 5 can be a glulam post.

[0019] The insulating layer 4 of the downspout comprises two projections 6 enabling the downspout 2 to be fixed to the support structure 5 enclosed by the corner of the building. The projections 6 consist of the same material as the insulating layer 4. The projections 6 may extend over the entire length of the insulating layer 4. The projections 6 are square or rectangular in cross-section. The projections 6 are arranged in a 90 degree angle in relation to each other, thus placing the support post or other support structure 5 in the angle between the projections 6, against the projections 6. The projections 6 are supported and/or fixed against the support structure 5 by an appropriate fastener 7, such as a nail or screw. The fastener 7 penetrates, through the projection 6, into the support structure 5.

[0020] Alternatively or additionally, the projections 6 can be supported and/or fixed against the studs 13 located at the ends of the corner-defining walls 12, i.e. to the studs 13 that form the angle 14. Thus, the fasteners 7 penetrate, through the studs 13, into the projections 6.

[0021] The embodiment shown in the drawings includes heat-insulating material 15, such as insulating wool, between the studs 13 of the walls 12. The exterior of the walls 12 is provided with wind barrier boards 16, such as bitumen impregnated fiber boards, which are fixed to the outsides of the studs 13. Battens 17, to which the cladding panels are fixed, are fixed to the wind barrier boards 16. The wind barrier boards 16 extend over the

projections 6. Horizontal battens 21, to which the interior material 19 of the wall, such as gyproc boards, are fixed, are fixed to the insides of the studs 13. Plastic vapor barrier sheeting 20 is provided underneath the horizontal battens 21 of the interior material 19.

[0022] A cover 8 made of an insulating material and encasing at least one connecting channel 9 for connecting the flow channel 3 to the gutter 11 of the building is provided at the top of the downspout 2. The cover 8 comprises a lower part and an upper part on top of the lower part. The cover 8 encases the entire connecting channel 9. Two connecting channels 9 can be employed if gutters 11 extending to the same corner of the building are provided on adjacent sides of the roof 10. The cover 8 is fitted at the top of the downspout 2 in such a way that the connecting channel 9 is connected to the gutter 11 and is a flow connection with the gutter 11. The cover 8 is horizontally dimensioned larger than the downspout, the cover 8 thus covering the entire top end of the downspout 2. The roof 10 of the building lies on top of the cover 8. The cover 8 is sheet-like. The horizontal cross-section of the cover 8 is square or rectangular. The insulating material of the cover 8 is the same as the insulating material of the insulating layer 4, i.e. expanded polypropylene (EPP).

[0023] The lower end of the downspout 2 is connected to a rainwater drainage system, such as a rainwater pipe. Thus, the downspout extends, through the foundation of the building, below the soil surface. Alternatively, the water can be discharged into a rainwater gully provided below the downspout 2.

[0024] The downspout 2 comprises one or more openable and closeable inspection hatches. The inspection hatch allows for unclogging the downspout 2, for example.

Claims

1. An arrangement (1) for draining water from the roof (10) of a building, the arrangement (1) comprising a downspout (2) with a flow channel (3) for the water, the downspout (2) having an insulating layer (4) around the flow channel (3), **characterized in that** a cover (8) made of an insulating material and encasing at least one connecting channel (9) for connecting the flow channel (3), by means of the cover (8), to a gutter (11) of the building, is provided at the top of the downspout (2).
2. An arrangement (1) as defined in claim 1, **characterized in that** the insulating layer (4) and/or the cover (8) consist of expanded polypropylene (EPP)
3. An arrangement (1) as defined in claim 1 or 2, **characterized in that** the flow channel (3) is provided inside the insulating layer (4).

4. An arrangement (1) as defined in any of the preceding claims, **characterized in that** the insulating layer (4) comprises two projections (6) by means of which the downspout (2) can be fixed to a support structure (5) provided in a corner of the building. 5

5. A building comprising a roof (10) with a gutter (11) for collecting water running off from the roof (10), the building having a downspout (2) in a flow connection with the gutter (11) and enclosed, partly or entirely, by a corner of the building, **characterized in that** the building comprises an arrangement (1) as defined in any of the preceding claims 1 to 4, and **in that** the building comprises a cover (8) fitted on top of the downspout (2) and having a connecting channel (9) connected to the gutter (11) of the building, and **in that** the cover (8) is located underneath the roof (10) of the building. 10
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6. A building as defined in claim 5, **characterized in that** the walls (12) defining the corner comprise spaced studs (13), the studs (13) of the walls (12) that are located closest to the corner form an angle (14) opening towards the corner, and **in that** the insulating layer (4) of the downspout (2) is supported and/or fixed against the studs (13) that form the angle (14). 20
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7. A building as defined in claim 5 or 6, **characterized in that** the corner of the building encloses a support structure (5) against which the insulating layer (4) of the downspout (2) is supported and/or fixed. 30

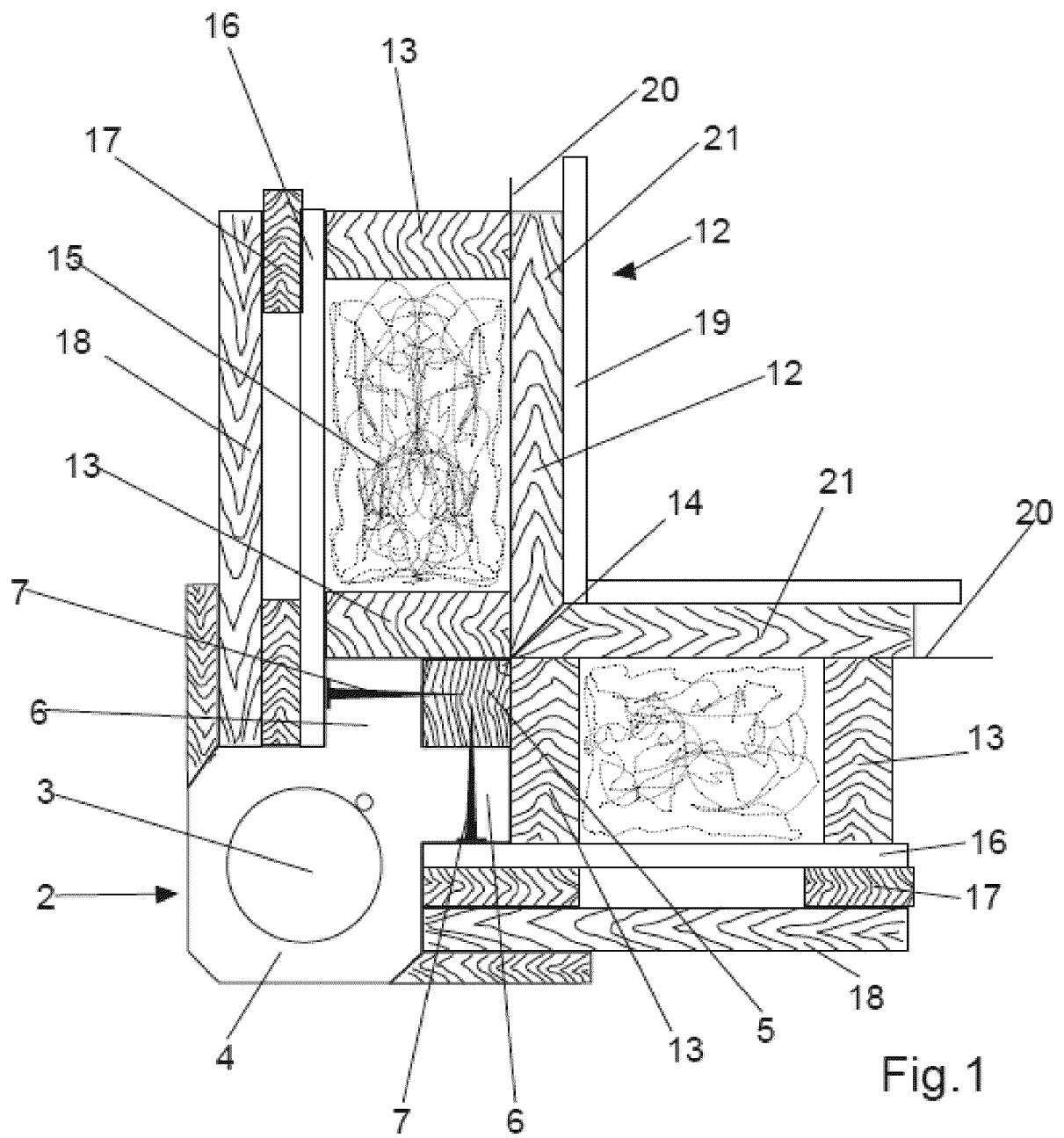
8. A building as defined in claim 7, **characterized in that** the support structure (5) is positioned in the angle (14) between the studs (13). 35

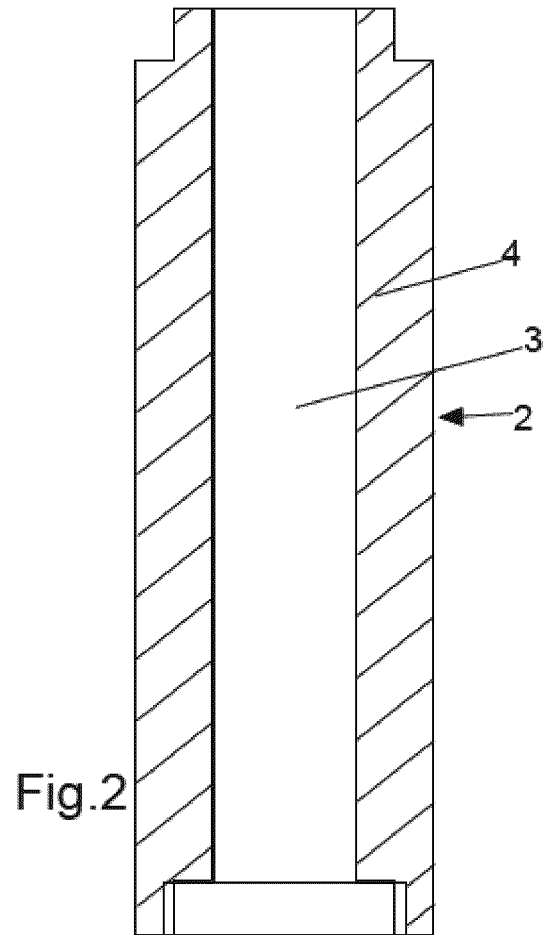
9. A building as defined in any of claims 5 to 8, **characterized in that** the insulating layer (4) of the downspout forms the exterior of the corner of the building or an exterior cladding (18) of the building extends over the insulating layer (4). 40

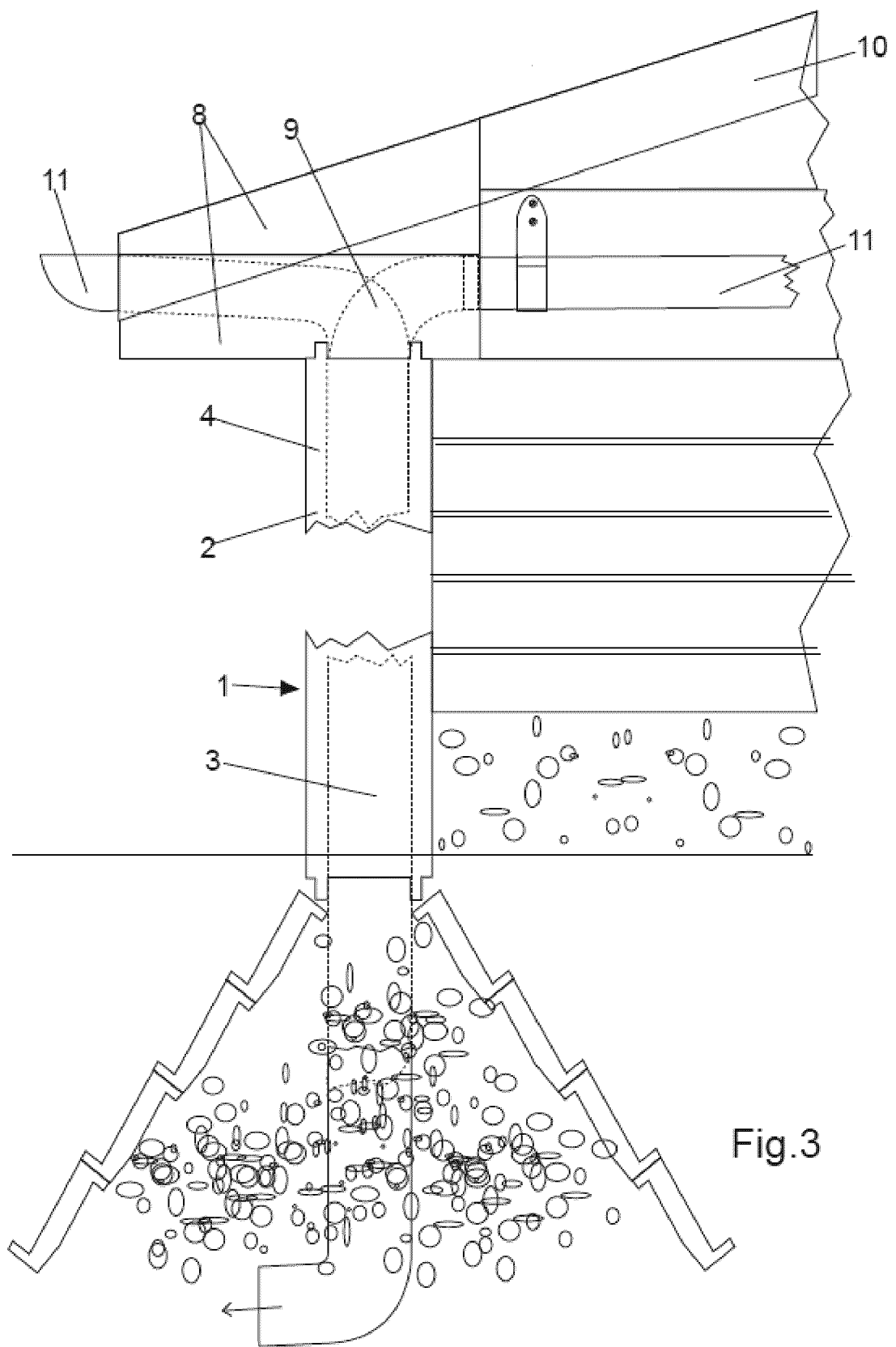
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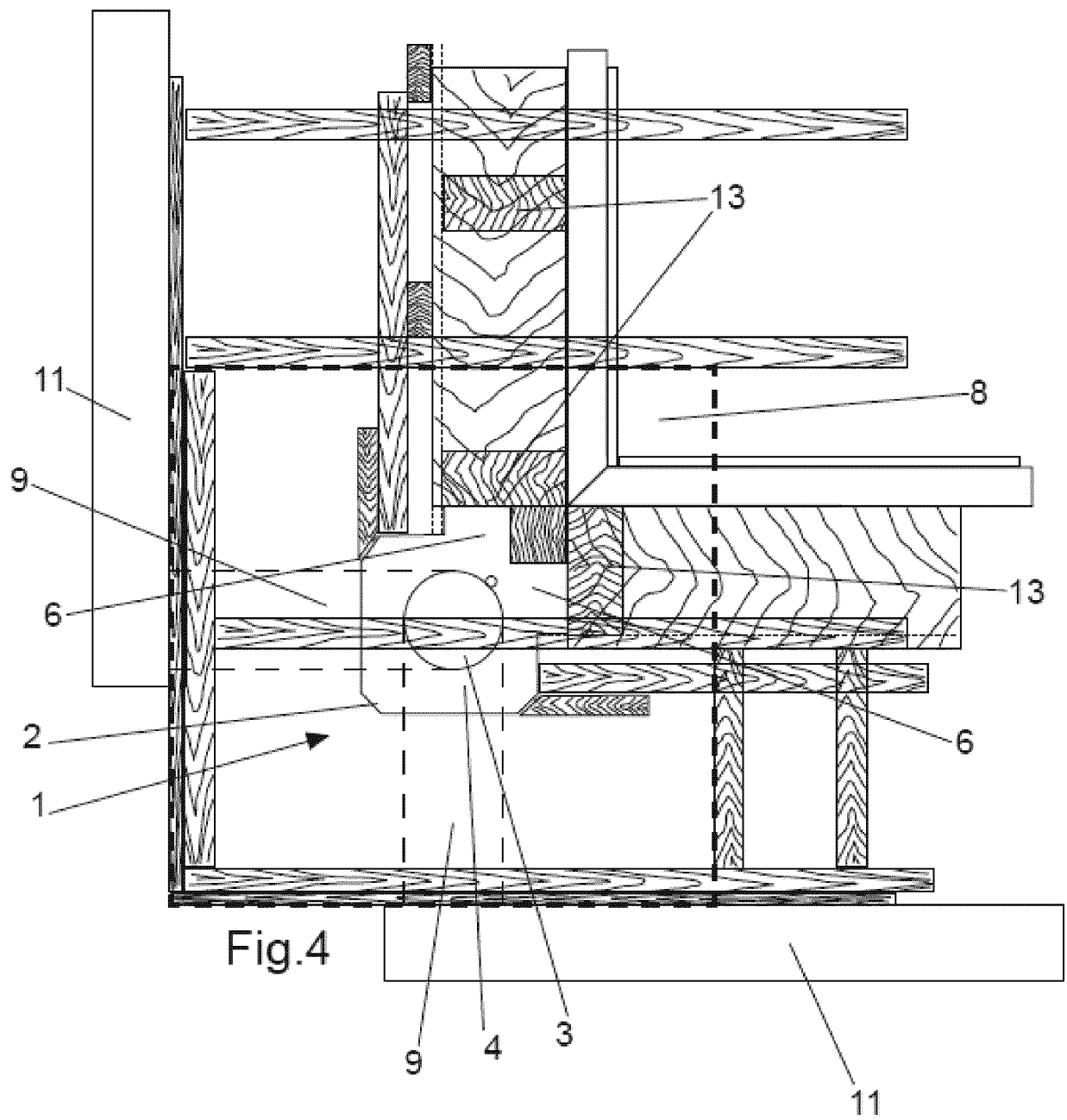
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The Hague		9 October 2020	Leroux, Corentine
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