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(54) DEVICE FOR COLLECTING CONDENSATION

(57) The present invention relates to a device (8) for collecting condensation on an inner surface of a window (18), comprising an elongated gutter (10), the gutter having a bottom (12), side walls, hereafter named inner (14) and outer (16) side walls, and end walls (40), wherein an upper edge (24) of the inner side wall (14) is arranged to be in contact with the surface of the window, for collecting water running along the window, the gutter (10) further comprising at least one passage (38), wherein the device comprises an elongated water conducting element (44) arranged in said passage (38), and wherein an end of said water conducting element (44) is positioned below said gutter and being arranged to a water collector (48).

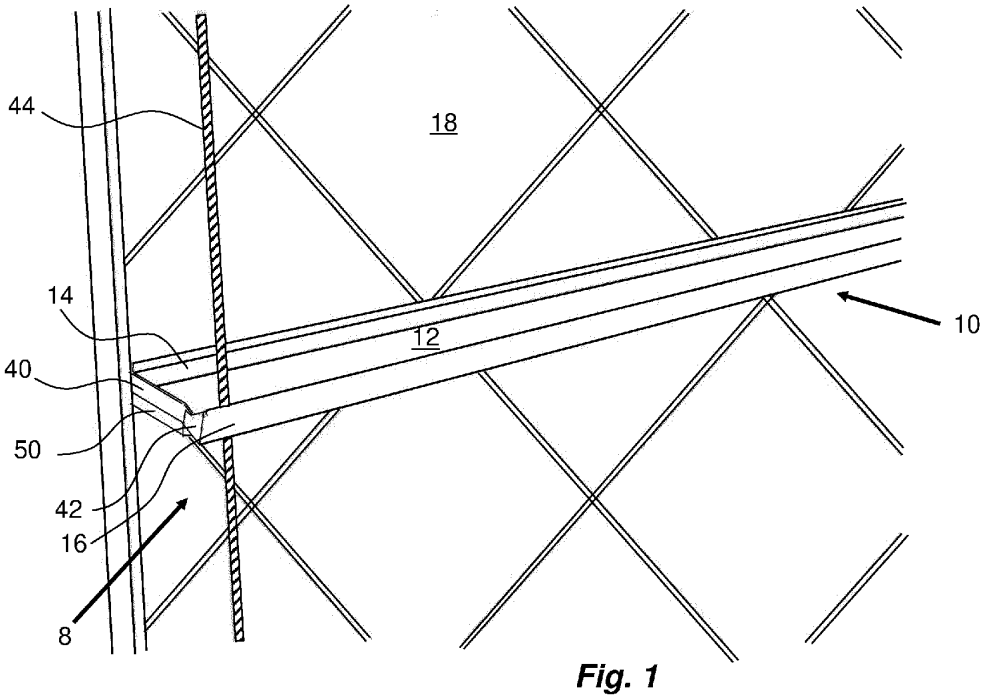


Fig. 1

EP 4 257 793 A1

Description

TECHNICAL AREA

[0001] The present invention relates to a device for collecting condensation that forms on inner surfaces of windows.

BACKGROUND OF INVENTION

[0002] Many old and historic buildings like churches, cathedrals and larger mansions such as castles are provided with often very elaborate stained glass windows. These windows can be rather large and are very seldomly arranged with a second, insulating glass, i.e. double glazing. This fact, in combination with poor or intermittent heating of these buildings, often lead to condensation building up on the inner surfaces of the glasses to such extent that water will run down the windows.

[0003] The water is unwanted since it causes damage to the window as such but also to window frames and attachments and reinforcements such as steel braces that are used to stabilize and reinforce the windows, because these windows are made of glass panels that are joined together by lead joints and lead is a soft metal which is very pliable and flexible. The water may then cause corrosion, rotting of wood and damage of the lead joints.

[0004] Some attempts have been made to protect the above mentioned types of windows. Document US 7,607,267 discloses an outer window design with a frame arranged with ventilation openings. The idea is to protect an inner ornamental window from exterior causes and creating a thermal barrier. In order to prevent moisture between the outer window and the inner ornamental window, venting means is arranged in the frame. The design might function for the intended use, but for buildings with very intermittent heating and during damp weather, there is still a risk that condensation builds up on the inner surface of the ornamental window. Further, the solution requires extensive work and cost for the manufacture and attachment of the outer window.

[0005] There is thus room for improvement in this technical area.

BRIEF DESCRIPTION OF INVENTION

[0006] The aim of the present invention is to improve how condensation on an inner surface of a window is handled and removed. This aim is solved with a device with the features according to the independent patent claim. Preferable embodiments of the invention form the subject of the dependent patent claims.

[0007] According to one aspect, a device for collecting condensation on an inner surface of a window is provided, comprising an elongated gutter, the gutter having a bottom, side walls, hereafter named inner and outer side walls, and end walls, wherein an upper edge of the inner side wall is arranged to be in contact with the surface of the window, for collecting water running along the window, the gutter further comprising at least one passage, wherein the device comprises an elongated water conducting element arranged in said passage, and wherein an end of said water conducting element is positioned below said gutter and being arranged to a water collector.

[0008] With this solution, condensation water running along the window is effectively collected by the gutter and led via the water conducting element to a water collector. The water cannot reach a lower frame portion or lower area of the window, whereby damage of the window and its attachments from the water is greatly reduced without disturbing the appearance or visibility of the window in any major way.

[0009] Preferably, the edge of the inner side wall may be provided with a sealing element for contact with the window. This ensures a good and flexible bearing against the window, preventing water from slipping past the edge of the gutter and at the same time reducing the risk of damaging the window because of the elastic properties of the element. The sealing element could be a type of window putty that has elastic properties and that can be painted to blend in with the colours of the window. As an alternative, an elastic elongated element, for instance made of rubber, may be used as sealing element.

[0010] According to a further aspect, the passage may be generally circular and wherein the water conducting element may have a generally circular cross-section and wherein the dimensions of the passage and the water conducting element may be chosen such that a narrow gap is formed between them in the passage. In this regard, the water conducting element may be a braided wire. This solution will ensure that water in the gutter is distributed downwards along the wire in controlled amounts without any splashing and trickling noise of the water.

[0011] Further, the water collector may be a water drain or a container. Moreover, the gutter may be provided with fastening and support elements providing an inclination of the bottom towards the passage.

[0012] In order to concentrate the collected water, the bottom may be formed with a narrow gutter section extending along the outer side wall, and wherein the passage may be arranged in the narrow gutter section. Preferably, the passage is positioned in the bottom in a corner where the outer side wall and one end wall meet.

[0013] This design is especially suitable when the gutter is arranged to be attached to generally horizontal braces supporting a window. These braces often have a certain width and when a gutter is placed on top of such a brace, the narrow gutter section will be positioned outside the brace as seen from the window, wherein the water conducting element can run downwards without any interference from the braces since the water conducting element will be positioned on the side of the braces.

[0014] These and other aspects of, and advantages with, the present invention will become apparent from

the following detailed description of the invention and from the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0015] In the following detailed description of the invention, reference will be made to the accompanying drawings, of which

Fig. 1 is a detailed perspective view of a window provided with the device according to the invention,

Fig. 2 is a cross-sectional view of the device of Fig. 1,

Fig. 3 is a detailed view showing a water collecting solution comprised in the device of Fig. 1, and

Fig. 4 is a perspective view showing several gutters to be connected to one window.

DETAILED DESCRIPTION OF THE INVENTION

[0016] An embodiment of a device 8 according to the invention is shown in the drawings. It comprises an elongated trough, chute or gutter 10. The gutter 10 is formed with a bottom 12 and two side walls 14, 16. Preferably the bottom 12 and the side walls 14, 16 are formed by bending a sheet-metal plate into the desired form. One of the side walls 14 is intended to face an inner surface of a window 18, hereafter named inner wall 14, while the other side wall 16, hereafter named outer wall 16, is facing an interior of a room in a building. The inner wall 14 may have a first section 20 generally perpendicular to the bottom, Fig. 2, and a second section 22 angled towards the window 18 such that its edge 24 will be in contact with the surface of the window. An elastic sealing element 26 may be provided as interface between the edge 24 of the first wall and the surface of the window 18. It could either be a type of flexible window putty or an elastic member such as a rubber strip. The idea behind this design is to collect any condensation and water drops formed on the window in the gutter.

[0017] The outer wall 16 may be angled outwards in relation to the bottom, and may have an upper section 28 thereof that is folded with the plate edge 30 inside the gutter for providing a smooth edge 32 of the outer wall 16. A section 34 of the bottom 12 adjacent the outer wall may further be inclined somewhat downwards as seen in Fig. 2, forming a narrow gutter section 36, for collecting water in the gutter in a defined area thereof. In at least one end of this narrow gutter section 36, a generally circular passage 38 is provided. The gutter is further provided with end walls 40 at each end, Fig. 1, also preferably made of the same sheet and folded upwards to form the end walls. In order to provide the end wall for the gutter section, a piece 42 may be folded inwards from the outer wall as seen in Fig. 1. A suitable sealant or a weld may be needed in the junction between the gutter section 36 of the bottom and the end wall piece 42. The gutter is preferably made of a non-corrosive material such as aluminium, stainless steel or plastic.

[0018] A water conducting element 44 is further arranged in the passage 38. The water conducting element 44 is preferably elongated and with a circular cross-section. Most preferably, the water conducting element 44 comprises a braided wire or rope. The diameters of the wire and of the passage are chosen such that there is a rather narrow annular gap 46 between the wire 44 and the passage 38. The size of the gap 46 and the braided structure of the wire 44 will then ensure that water in the gutter is distributed downwards along the wire 44 in controlled amounts without any splashing and trickling noise of the water. The lower end of the wire 44 is further preferably placed either in a water drain or in a water collecting container 48, as seen in Fig. 3.

[0019] The gutter 10 is as mentioned placed with its inner wall 14 in contact with a window 18, on which condensation may form. The gutter 10 is attached so that the bottom 12 is somewhat inclined outwards so that water is collected in the narrow gutter section 36. The narrow gutter section 36 is further somewhat inclined so that water in the narrow gutter section 36 flows towards the passage 38 and the water conducting element 44. If the window 18 is provided with generally horizontally directed steel braces 50, Fig. 1, for reinforcement of the window, which is very common for leaded windows, then the gutter 10 may be attached to an upper surface of the steel braces 50. Depending on the orientation and extension of the braces, suitable supports may be needed between the gutter and the brace for obtaining the desired inclination of the gutter so that water in the gutter flows to the passage.

[0020] As seen in Fig. 4, several gutters 10 may be arranged to a window 18 under each other as seen in a vertical direction, for instance a large window, on which quite large amounts of condensation water may be formed. The water conducting element 44 then preferably runs through the passages of several gutters 10 under each other. In order to keep the water conducting element tensioned, fastening elements 52 may be provided, such as loops through which the wire runs, wherein the loops may be squeezed by an appropriate tool for gripping the wire. The loops may further be provided with a threaded shank for attachment to a wall in which the window is placed. Fastening members may be provided at least at the upper end of the water conducting element as well as close to its lower end.

[0021] Even though the gutter described above has a certain shape and dimensions, it is to be understood that the shape, width, length etc. may be altered for instance depending on the actual window to which it is to be mounted. In this regard, if the window for instance is very wide, the gutter may be provided with water conducting elements in both ends, and wherein the gutter and/or the narrow gutter section has inclinations from the middle of the gutter and towards the ends.

[0022] It is to be understood that the embodiment described above and shown in the drawings is to be regarded only as a non-limiting example of the invention and that it may be modified in many ways within the scope of the patent claims.

Claims

1. Device (8) for collecting condensation on an inner surface of a window (18), comprising an elongated gutter (10), the gutter having a bottom (12), side walls, hereafter named inner (14) and outer (16) side walls, and end walls (40), wherein an upper edge (24) of the inner side wall (14) is arranged to be in contact with the surface of the window, for collecting water running along the window, the gutter (10) further comprising at least one passage (38), wherein the device comprises an elongated water conducting element (44) arranged in said passage (38), and wherein an end of said water conducting element (44) is positioned below said gutter and being arranged to a water collector (48).

2. Device according to claim1, wherein the upper edge (24) of the inner side wall (14) is provided with an elastic sealing element (26) for contact with the window.

3. Device according to claim 2, wherein the elastic sealing element (26) comprises a flexible window putty or an elastic member such as a rubber strip.

4. Device according to any of the claims 1 to 3, wherein the passage (38) is generally circular and wherein the water conducting element (44) has a generally circular cross-section and wherein the dimensions of the passage and the water conducting element are chosen such that a narrow gap (46) is formed between them in the passage.

5. Device according to claim 4, wherein the water conducting element (44) is a braided wire.

6. Device according to any of the preceding claims, further comprising fastening elements (52) for attachment of the water conducting element (44) to a fixed structure and for tensioning the water conducting element (44).

7. Device according to any of the preceding claims, wherein the water collector is a water drain or a water collector (48).

8. Device according to any of the preceding claims, wherein the gutter is provided with fastening and support elements providing an inclination of the bottom towards the passage.

9. Device according to claim 8, wherein the bottom is formed with a narrow gutter section (36) extending along the outer side wall (16), and wherein the passage (38) is arranged in the narrow gutter section (36).

10. Device according to any of the claims 8-9, wherein the passage (38) is positioned in the bottom in a corner where the outer side wall (16) and one end wall (40) meet.

11. Device according to claim 8, wherein the gutter is arranged to be attached to generally horizontal braces (50) supporting a window.

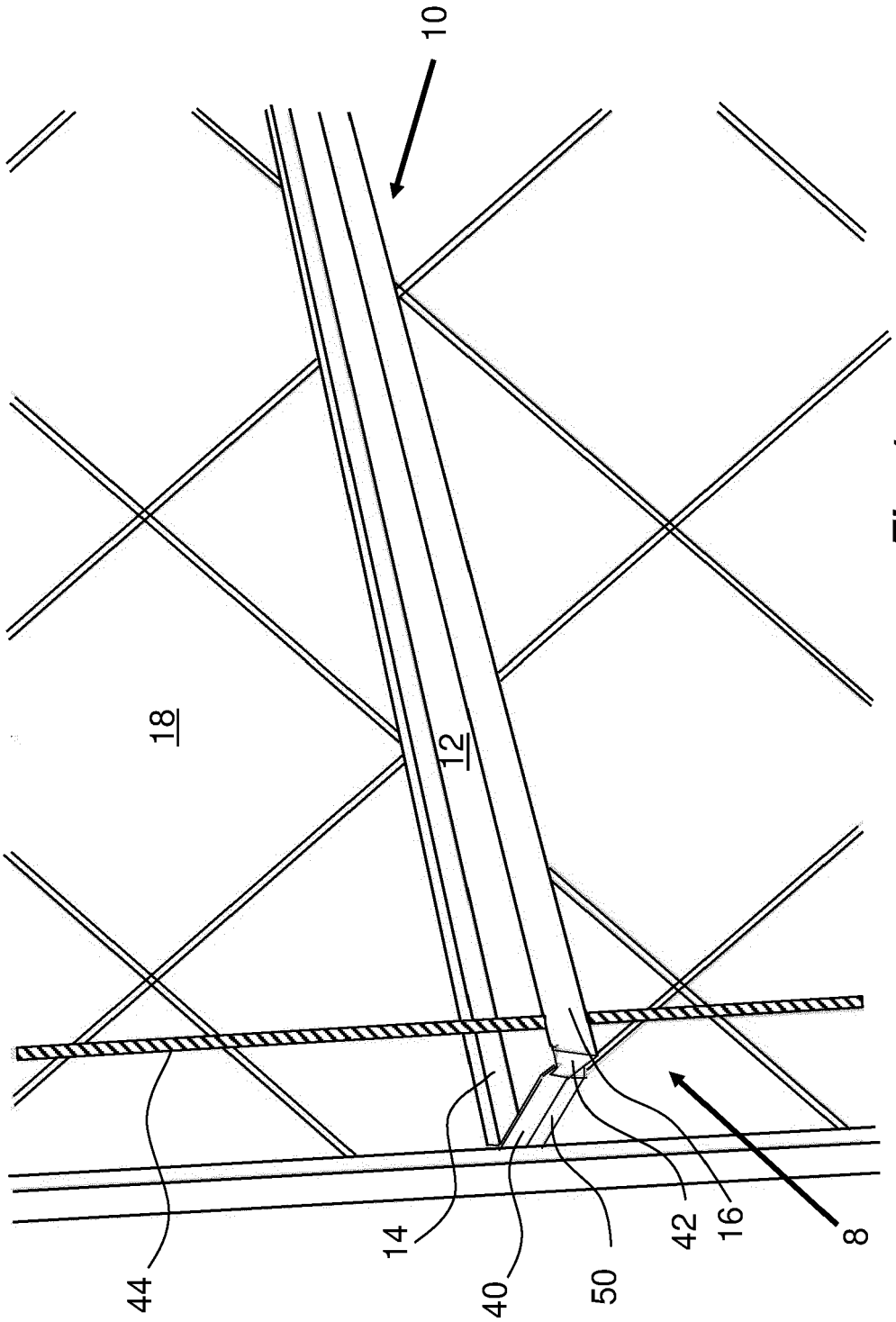


Fig. 1

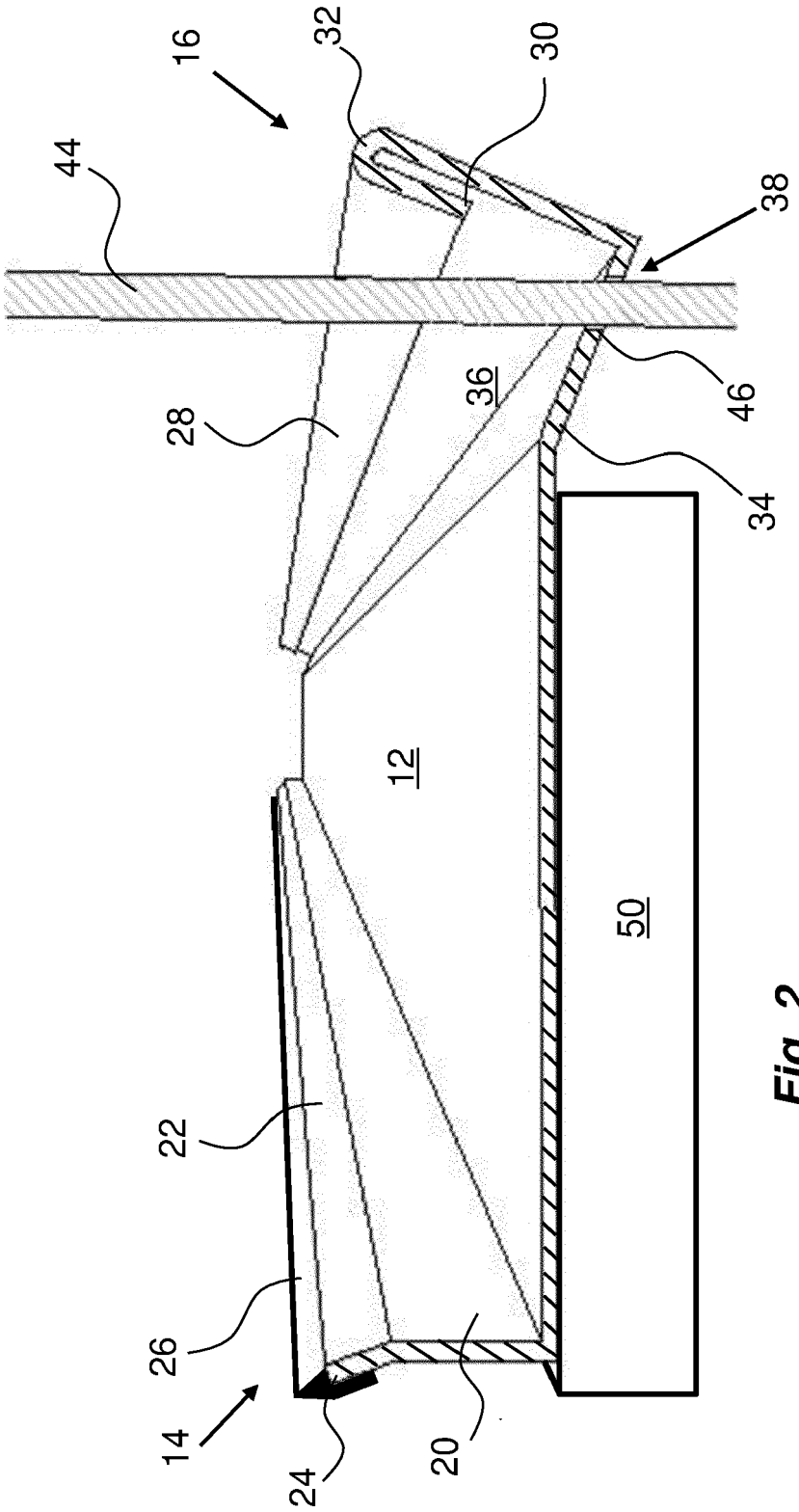


Fig. 2

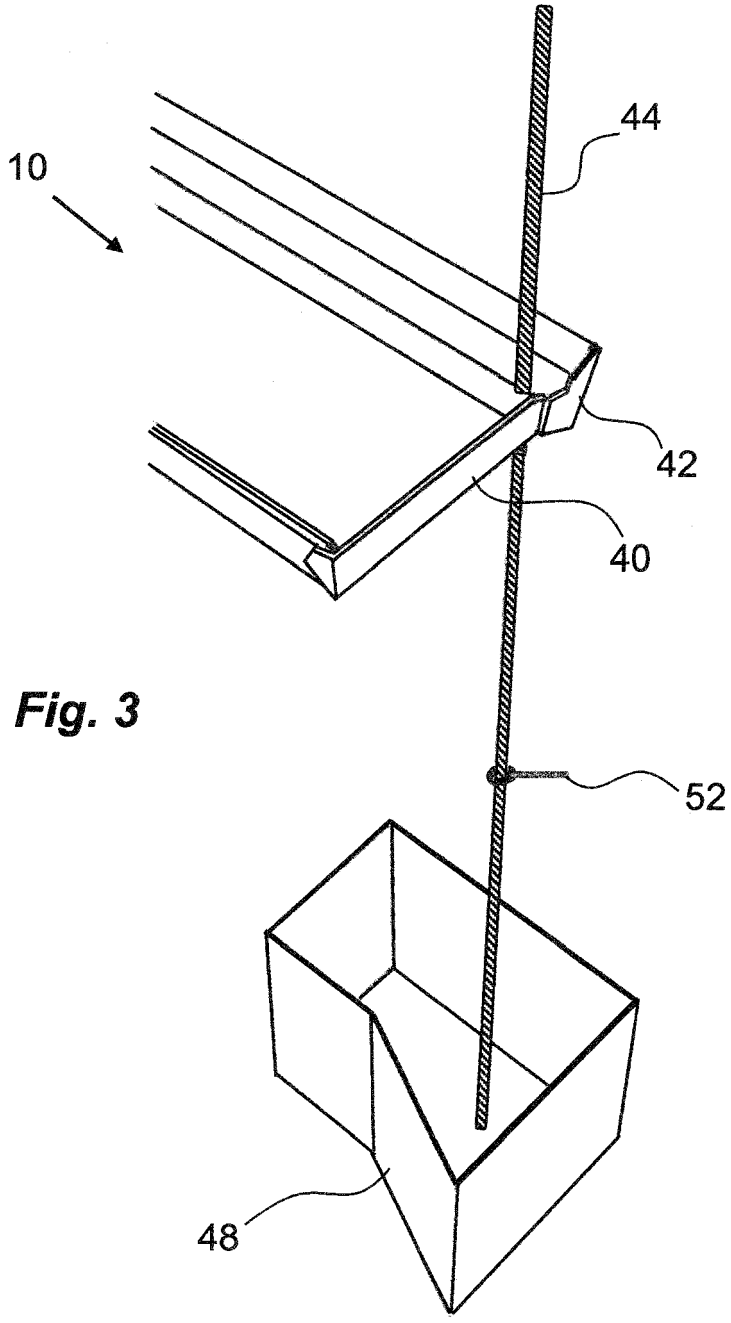
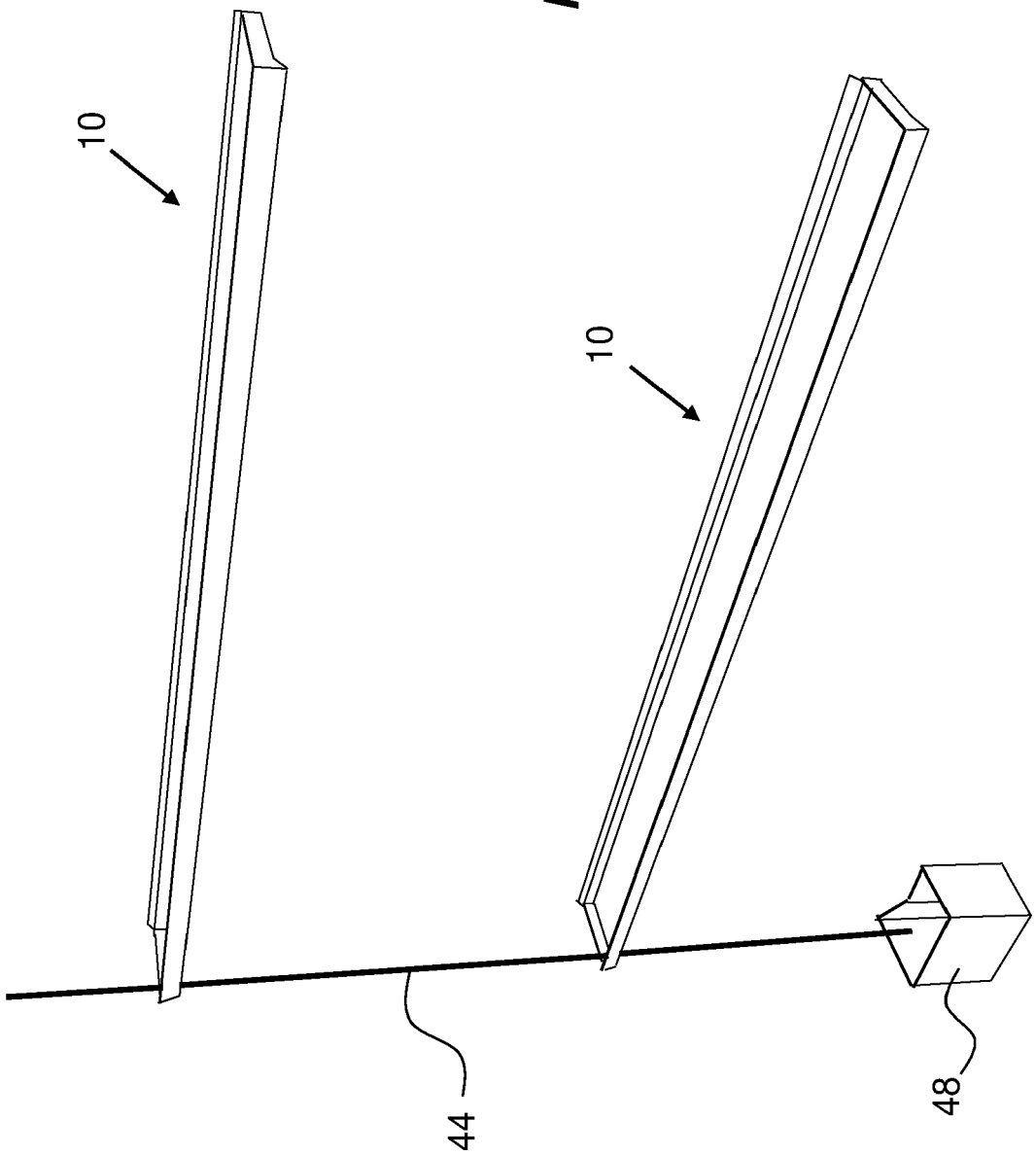


Fig. 3

Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 23 16 7054

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 228 284 A (RICHARDSON ALEXANDER RENTON) 22 August 1990 (1990-08-22) * figures 1-3 * * page 2 - page 4 *	1-11	INV. E06B7/14
A	GB 2 264 971 A (KELLY JAMES CRICHTON [GB]; HANNIGAN MARION [GB]) 15 September 1993 (1993-09-15) * figures 1-3 * * page 1 - page 4 *	1-11	
A	CA 1 052 184 A (PAQUETTE ROLLAND) 10 April 1979 (1979-04-10) * figures 1-3 * * page 3, line 4 - line 24 *	1-11	
			TECHNICAL FIELDS SEARCHED (IPC) E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	28 August 2023	Tänzler, Ansgar

CATEGORY OF CITED DOCUMENTS

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28-08-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2228284 A	22-08-1990	NONE	
GB 2264971 A	15-09-1993	NONE	
CA 1052184 A	10-04-1979	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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