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(54) A ROOF WINDOW WITH IMPROVED INSULATION PROPERTIES AND INCLUDING A SET OF HINGES

(57) In the roof window (1), each of a sash (3) and a frame (4) has two side members, a top member and a bottom member. The sash (3) carries a pane (5) and is connected to the frame (4) via a hinge device (2) including a pair of hinges (6) defining a hinge axis (α). The frame (4) is adapted to be connected to a load-bearing structure of a roof of a building. The frame (4) comprises a frame recess (44) facing the sash (3) and in which at least part of each hinge (6) is arranged. The frame recess (44) has a frame recess depth (df) and a frame recess width (wf) and is configured such that at least 60% of the width of each hinge (6) is arranged in the frame recess.

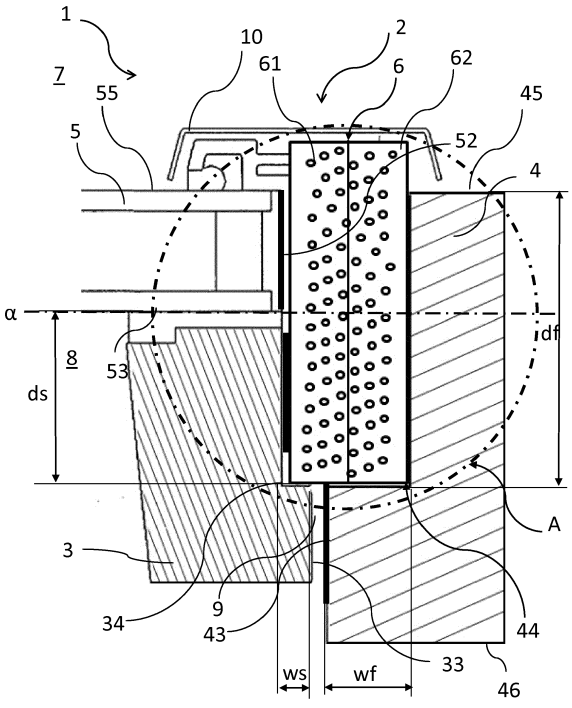


Fig. 2

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Description

Technical Field

[0001] The present invention relates to a roof window comprising a sash and a frame, each of the sash and the frame having two side members, a top member and a bottom member, and delimiting a frame opening and a sash opening, respectively, said sash carrying a pane and being connected to the frame via a hinge device including a pair of hinges defining a hinge axis, said frame being adapted to be connected to a load-bearing structure of a roof of a building, in which the pane has an exterior surface and an interior surface, and the sash and frame each has an interior side adapted to face the interior of the building in the mounted condition and an exterior side adapted to face the exterior of the building in the mounted condition, wherein the pair of hinges are arranged on either side of the pane between the frame and the sash, and in which the frame comprises a frame recess facing the sash and in which at least part of each hinge is arranged, the frame recess having a frame recess depth and a frame recess width.

Background Art

[0002] Roof windows may be provided in a number of varieties and include more or less complicated structures in order to allow opening of the sash and to fulfil other functions, and yet provide an airtight structure with satisfactory thermal properties. A common issue with windows in general is how to keep them sufficiently tight and insulating from the ambient. Therefore, a number of factors have been identified in order to improve the thermal properties. Depending on the climate zone, one factor that has proven challenging is that certain elements used in a window installation serve as a cooling bridge, and thus transfer the heat from one side of the window to the other, i.e. allows a heat transfer between the ambience and the interior of a building. An attempt at overcoming this issue can be found in for example Applicant's European patent No. EP 1922466 B1, wherein the hinges have been arranged on the outer side of the window. Although this solution provides for positive thermal properties since cooling bridges from the hinge are isolated from the interior of the room, the position of the hinges is not compatible with all window types. Also with regard to thermal properties, there is still room for improvement.

[0003] Other attempts at improving the thermal properties of a roof window include moving the level of installation of the entire window deeper into the roof structure, i.e. from the exterior into a more interior installation position. This, too, presents challenges and is dependent on the suitability of the roof structure to allow such a position.

[0004] In recent years, the development in improvement of the thermal properties of such a window has focussed on increasing the insulating capacity of the parts of the frame and/or sash of the roof window itself. A roof window of the kind mentioned in the introduction is found in Applicant's European patent No. EP 2748391 B1.

Summary of Invention

[0005] With this background it is an object of the present invention to provide a roof window in which the thermal properties are improved and which contributes to good insulation and avoids cooling bridges between the ambience and the interior, while providing for a wider applicability.

[0006] In a first aspect, this and further objects are met by the provision of a roof window of the kind mentioned in the introduction which is furthermore characterised in that the frame recess is provided with such a frame recess width that at least 60% of the width of each hinge is arranged in the frame recess.

[0007] By simply moving the hinge device outwards in the structure of the roof window itself, that is, to a more peripheral position, the effect of the cooling bridges is reduced while still retaining the advantages of a hinge positioned in close proximity to the frame-sash interface. By providing the hinge in a relatively wide recess in the frame it allows the hinge to be located as much as possible within the frame, but yet isolated from the interior. Such a recess may for instance extend partially through the frame and house the hinge, seen from the exterior. In that way, it is ensured that the hinge does not come in direct contact with any of the interior, and thus not transfer any of the ambient temperature to the interior. The remainder of the material of the frame serves as insulation between the hinge and the interior. This structure contributes to a better insulation since a majority part of the hinge is arranged inside the frame, and thus away from the ambient.

[0008] In one embodiment, at least 80% of the width of each hinge is arranged in the frame recess. This improves the thermal properties even further.

[0009] In a further embodiment, the remaining part of the width of the hinge is arranged within a sash recess of the sash and/or in a gap formed between the frame and the sash. In this way, the hinge may be hidden as much as possible within the frame and sash. The recess in the sash may be formed to allow connection of the hinge to the sash.

[0010] In an alternative embodiment, substantially the entire hinge is arranged in said frame recess. In this way, the hinge intrudes as little as possible in the sash, allowing the sash to be configured as narrow as possible. By the wording substantially entire hinge, it is meant as much as allowable. The sash may however include a connection to the hinge which, for evident reasons, may not be enclosed within the recess of the frame.

[0011] In a presently preferred embodiment, the frame recess is provided with such a depth that at least 60% of the depth of the hinge is arranged therein such that the hinge extends at least partially to the interior of the exte-

rior surface of the pane, as seen from a plane perpendicular to the pane.

[0012] In an advantageous further development, the frame recess is provided with such a frame recess depth that substantially the entire hinge is arranged in said frame recess.

[0013] In another embodiment, the pane is arranged relative to the frame such that an outward edge of the pane facing the frame is arranged at a distance from an inner edge of the frame facing the sash of not more than 50% of the width of the hinge, preferably less than 25%, and most preferably between 0-15%. In this way a slim sash is provided, and it is possible to configure the sash and the frame such that the frame edge and the pane edge almost coincide. In other words, a width of the gap between the sash and the frame is as small as possible.

[0014] In another embodiment, the exterior surface of the pane is substantially flush with an exterior surface of the frame. This is an advantage since the exterior of the window may become as flat as possible. A low profile altogether helps the window to stay cleaner and drained since there may be fewer protrusions that may catch dirt and water.

[0015] Regarding the orientation of the frame recess in the frame, it is preferred that the frame recess is provided in an exterior surface of the frame. In this way, the frame recess faces the exterior, in addition to facing the sash, which in turn provides for the least restrictions on the configuration of other parts of the roof window in order to allow unimpeded movement of the sash relative to the frame during opening and closing of the roof window. However, it is alternatively conceivable to provide the frame recess in an interior surface of the frame.

[0016] In a presently preferred embodiment, the pair of hinges is located such that the hinge axis is positioned to the interior of the interior surface of the pane. This is an advantage in that the hinge axis is positioned close to, or even coinciding with the centre of gravity of the sash including the pane.

[0017] In principle, the configuration of the hinge device of the roof window according to the invention may be chosen in any suitable way, as the formation of the roof window allows for an increased overall flexibility.

[0018] In one embodiment, the hinge is a pivot hinge including a hinge pin defining an axis of rotation substantially coinciding with hinge axis of the roof window.

[0019] In an alternative embodiment, the hinge is a pivot hinge including a guidance and a slide rail defining an axis of rotation offset from the hinge centre. This particular type of pivot hinge is very well-known and is considered as constituting more or less "industry standard" within the field of roof windows. In a further development of this alternative embodiment, the pivot hinge has a set of predefined dimensions, of which at least two dimensions are smaller than the corresponding dimensions of a standard pivot hinge.

[0020] In a still further embodiment, each hinge of said pair of hinges comprises a sash hinge part and a frame hinge part, preferably of substantially equal width. This is advantageous in particular from the point of mounting.

[0021] Other presently preferred embodiments and further advantages will be apparent from the following detailed description and the dependent claims.

Brief Description of Drawings

[0022] The invention will be described in more detail below by means of nonlimiting examples of embodiments and with reference to the schematic drawing, in which

Fig. 1 is a perspective view of a general pivot type roof window;
Fig. 2 is a schematic cross-sectional view of a roof window in an embodiment of the invention;
Fig. 3 is a break-out view of Fig. 2, along the circle A in Fig. 2;
Fig. 4 is a view corresponding to Fig. 2, of another embodiment of the invention;
Fig. 5 is a view corresponding to Fig. 2, of further embodiment of the invention; and
Fig. 6 is a view corresponding to Fig. 3 showing a break-out view A' of an alternative embodiment of the roof window according to the invention.

Description of Embodiments

[0023] The present invention will be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the claims to those skilled in the art. In the drawings, like numbers refer to like elements throughout the description of embodiments of the invention.

[0024] In a manner known *perse,* a window generally designated 1 comprises a sash 3 carrying a glazing in the form of a pane 5 and a frame 4. The window is intended to be built into a surface, which is inclined with respect to the horizontal, typically a roof, and the window will in the following be referred to as a roof window 1. At a position between the top and centre of the window, there is a hinge device 2 to provide connection between the frame 4 and the sash 3. The hinge device 2 of the prior art roof window shown in Fig. 1 comprises a set of two traditional pivot hinges.

[0025] The frame 4 and sash 3 each has two side members, a top member and a bottom member, and delimiting a frame opening and a sash opening, respectively. The sash 3 is openable with respect to the frame 4, as the sash 3 may be moved from a closed position, in which the sash side members are substantially parallel with the frame side members, to an open position, in which the sash side members form an angle with the frame side

members. During this movement the sash 3 rotates about a hinge axis α situated at or near the hinge device 2. As indicated in Fig. 1, the hinge axis α is located between a centre axis and the top of the roof window, but other locations are conceivable for instance at the centre of the roof window.

[0026] As will be described in further detail, the operation as described above and from here on is applicable to include pivot hinges such as they are for instance disclosed in Applicant's EP 1 038 083 B1 and EP 1 781 883 B1, which are very versatile as regards operational areas and adaptation of components. Examples of roof windows incorporating such adapted hinges are shown in Applicant's published European patent applications EP 2 770 146 A1 and EP 2 770 149 A1. From a closed position, the user operates the operating device of the window. The operating device typically comprises a handle (not shown) connected with the sash bottom member and/or an operating and locking assembly including a ventilation flap at the sash top member with a lock mechanism to interact with a striking plate on the frame top member.

[0027] To protect the interior and the components of the window itself and to ascertain weather-proof transition to the surrounding roofing, the roof window comprises a covering, including flashing members (not shown), cladding and covering elements of which a frame side covering element and sash side covering element are indicated by reference numeral 10. The parts of the covering of the prior art roof window are connected to the frame and the sash, and to the hinge in a hinge and covering assembly as described in detail in the above-mentioned embodiment of EP 2 751 354 B1.

[0028] Referring now to Figs 2 and 3, a first embodiment of the roof window 1 according to the invention will be described in detail.

[0029] When referring to the Figures, the terms up, down, upwards, downwards, top and bottom are taken relative to how the figures are displayed, that is having the frame arranged in a lying position with the covering elements facing upwards. A front view is taken from the hinge and viewing towards the frame. A view from behind is therefore taken as viewed from the frame towards the hinge. A longitudinal direction is, if nothing else is mentioned, longitudinal along the length of the frame. It is to be understood that the arrangement shown in a horizontal orientation is not the normal orientation as the roof window is installed in an inclined roof.

[0030] It is noted that the terms "exterior" and "interior" denote opposite directions substantially perpendicular to the roof surface in the mounted condition of the roof window. Terms such as "inner" and "outer" also denote opposite directions substantially parallel to the plane of the roof surface in the mounted condition.

[0031] In Fig. 2, a schematic cross-sectional view of a hinge device 2 is illustrated. The cross section is taken in a plane perpendicular to the pane 5, as seen in a direction along the pane 5, from the bottom of the roof window 1 and viewed upwards when the roof window 1 is in a closed state. A break-out view along the circle A is shown in Fig. 3.

[0032] In the embodiment shown in Figs 2 and 3, the hinge device 2 comprises a pair of hinges of which the right-hand hinge 6 is shown in Fig. 2 and which are arranged on either side of the pane 5 between the frame 4 and the sash 3. The left-hand hinge of the hinge device 2 is typically identical but mirror-inverted or of similar configuration, and only the right-hand hinge 6 will be described. The pane 5 has an exterior surface 55 and an interior surface 53, and the sash 3 and frame 4 each has an interior side adapted to face the interior 8 of the building in the mounted condition and an exterior side adapted to face the exterior 7 of the building in the mounted condition of the roof window 1.

[0033] The frame 4 comprises a frame recess 44 facing the sash 3 and in which at least part of each hinge of the hinge device 2 is arranged in that a major part of the hinge 6 is accommodated within the frame recess 44. The frame recess 44 has a frame recess depth df and a frame recess width wf. In the embodiment shown, the frame recess depth df of the frame recess 44 is defined from an exterior surface 45 and toward the interior, ending in a first recess surface 44a. The frame recess width wf is defined from inward frame surface 43 and outward, ending in a second recess surface 44b. In most cases, the frame recess 44 does not break through the frame 4, i.e. for instance all the way to the outer side. This is due to the need of insulation of the window 1. However, it may be possible that the frame hinge recess 44 breaks through, if sufficient additional insulation is provided so that it fulfils the current needs.

[0034] In the embodiment shown in Figs 2 and 3, the hinge 6 comprises a sash hinge part 61 and a frame hinge part 62, here of substantially equal width. The sash hinge part 61 is connected to the sash 3 and the frame hinge part 62 is connected to the frame 4. The sash hinge part 61 and the frame hinge part 62 are coupled to each other such that relative movement is allowed. The relative movement is such that the sash 3 pivots in the frame 4 so that the window can be opened and closed. The hinge 6 is defined by a hinge height hh extending between an exterior edge 64 and an interior edge 65, and a hinge width wh extending between an outward side edge 66 and an inward side edge 67.

[0035] According to the invention, the hinge 6 is arranged within the frame recess 44 such that a major part, constituted by at least 60% of the hinge width wh, is located within the frame recess width wf. In the embodiment shown in Figs 2 and 3, approximately 70% of the width of the hinge is accommodated in the frame recess 44. In principle, larger portions of the hinge 6 may be accommodated, for instance more than 80% or, as will be described below, the entire hinge 6.

[0036] In the same way, the sash 3 comprises a sash hinge recess 34 in the embodiment shown in Figs 2 and 4. The sash hinge recess 34 may be arranged to house

a remaining part of the hinge 6 as shown in Fig. 2. The sash hinge recess 34 has a depth ds and a width ws. The hinge 6 may thus be arranged in the frame 4 and in the sash 3, such that most of the hinge is arranged within the frame 4. In this manner, the hinge 6 is protected within the frame 4. Also, a narrow sash 3 may be provided, and thus a narrower structure of the hinge device 2 altogether may be obtained.

[0037] The inward frame surface 43 may be brought as close to an outward edge 52 of the pane 5 as possible. In that way, the sash 3 may become narrower as the sash hinge recess 34 becomes narrower and subsequently the frame hinge recess width wf becomes wider. In that way, the hinge 6 may be brought further into the frame 4. Thus, the most part of the insulation of the hinge 6 may be provided by the frame 4. To summarize, by the hinge 6 being located within the frame hinge recess as much as possible, a sleek low profile may be obtained. Further, a narrow sash may be provided by allowing the outward edge 52 of the pane 5 to be brought as close as possible to the inward frame surface 43.

[0038] Fig. 4 shows a second embodiment. Only differences relative to the first embodiment will be described in detail. Reference numerals having the same or analogous function are denoted by the same reference numeral as in the first embodiment, to which 100 has been added. In this embodiment, the frame recess 144 is located towards an interior surface 46 of the frame and thus extends between interior surface 46 to first recess surface 144a. In that way, a low profile may be provided since the hinge 106 is completely located away from the exterior 8. In Fig. 4, the hinge 106 is completely located within the frame hinge recess 144. In other words, the sash 3 does not enclose any of the hinge 106. In Fig. 3, the hinge location relative to the frame and the sash respectively can be viewed. Any of these parameters are general and can be adjusted to suit any particular installation. The sash 3 can however be provided with a sash hinge recess 34 to partially house the hinge 6. The hinge 6 is located so that an interior edge 67 is located at a distance d3 from the exterior surface 45 of the frame. A sash side edge 68 of the hinge is the edge that is directed towards the sash 3 and a frame side edge 69 is the side that is directed towards the frame. The location of the hinge can be described with the parameters w1, w2, d1, d2, d and d4. d1 is the distance between the exterior surface 55 of the pane 5 and the interior edge 67 of the hinge. Further, the hinge 6 may be arranged at a distance d2 from an interior surface 35 of the sash. The location of the hinge relative to the sash and frame can be described with the parameters first width w1 and second width w2. First width w1 is the location of the frame side edge 69 of the hinge 6 relative to the inward frame surface 43. Second width w2 is the location of the frame side edge 69 relative to the outward edge 52 of the pane. In Fig. 4, there is no sash recess, and the hinge is completely enclosed in the frame 3.

[0039] Fig. 5 schematically illustrates a third embodiment in which the hinge 6 corresponds to that of the first embodiment, but the frame recess 244 is made deeper and wider, such that substantially the entire hinge 206 is arranged in the frame recess 244.

[0040] In all of the embodiments, the frame recess 44; 144; 244; 344 is provided with such a depth df that at least 60% of the depth of the hinge 6; 106; 306 is arranged therein such that the hinge extends at least partially to the interior of the exterior surface 55 of the pane 5, as seen from a plane perpendicular to the pane 5.

[0041] The relation between the pane and the frame may also be varied, such that in certain embodiments, the pane 5 is arranged relative to the frame 4 such that an outward edge 52 of the pane 5 facing the frame 4 is arranged at a distance from an inward frame surface 43 of the frame 4 facing the sash (3) of not more than 50% of the width of the hinge, preferably less than 25%, and most preferably between 0-15%.

[0042] In the height direction, i.e. from the interior towards the exterior, the exterior surface 55 of the pane 5 may be substantially flush with the exterior surface 45 of the frame 4.

[0043] By the term "low" etc. regarding the hinge axis, it is noted that a suitable definition is found in that the pair of hinges of the hinge device is located such that the hinge axis α is positioned to the interior of the interior surface 53 of the pane 5.

[0044] The hinge itself may in principle be of any suitable kind, however since the hinge axis is located relatively low in the roof window, the hinge axis is located near the centre of gravity of the window. Hence, the need for compensating for the offsetting of the centre of gravity during opening and closing of the window is reduced or even substantially eliminated.

[0045] A pivot hinge having a hinge pin defining an axis of rotation substantially coinciding with the hinge axis α of the roof window pin is shown in the embodiment of Fig. 2g of WO 2010/088904 A1. In the context of the present invention, such a hinge could be the hinge 6 of the first and third embodiments.

[0046] In alternative embodiments, a traditional pivot hinge including a guidance and a slide rail defining an axis of rotation offset from the hinge centre could be used for the second embodiment shown in Fig. 4. One example of a traditional pivot hinge is shown in EP 1038083 B1, and is commercially available standard on many roof windows.

[0047] In the fourth embodiment shown in Fig. 6, the pivot hinge 306 has a set of predefined dimensions, of which at least two dimensions are smaller than the corresponding dimensions of a pivot hinge which come as standard on many roof windows. This applies both to the length, width and/or thickness dimensions and any combination thereof, including the components of the pivot hinge.

[0048] It should be noted that the above description of preferred embodiments serves only as an example, and that a person skilled in the art will know that numerous

variations are possible without deviating from the scope of the claims.

List of reference numerals

[0049]

1 roof window
2 hinge device
3 sash

33 outward sash surface
34 sash recess

4 frame

43 inward frame surface
44 frame recess

44a first recess surface
44b second recess surface

45 exterior surface of frame
46 interior surface of frame

5 pane

52 outward edge
53 interior surface of pane
55 exterior surface of pane

6 hinge

61 sash hinge part
62 frame hinge part
64 exterior edge of hinge
65 interior edge of hinge
66 outward side edge of hinge
67 inward side edge of hinge

7 exterior
8 interior
9 gap
10 covering

wf frame recess width
df frame recess depth

ws sash recess width
ds sash recess depth

wh hinge width
hh hinge height

w1-w3: first, second, third width
d1-d5: first, second, third, fourth, fifth distance/depth

Claims

1. A roof window (1) comprising a sash (3) and a frame (4), each of the sash and the frame having two side members, a top member and a bottom member, and delimiting a frame opening and a sash opening, respectively, said sash (3) carrying a pane (5) and being connected to the frame (4) via a hinge device (2) including a pair of hinges (6) defining a hinge axis (α), said frame (4) being adapted to be connected to a load-bearing structure of a roof of a building, in which the pane (5) has an exterior surface (55) and an interior surface (53), and the sash (3) and frame (4) each has an interior side adapted to face the interior (8) of the building in the mounted condition and an exterior side adapted to face the exterior (7) of the building in the mounted condition, wherein the pair of hinges (6) are arranged on either side of the pane (5) between the frame (4) and the sash (3), and in which the frame (4) comprises a frame recess (44) facing the sash (3) and in which at least part of each hinge (6) is arranged, the frame recess (44) having a frame recess depth (df) and a frame recess width (wf),
characterised in that
the frame recess (44; 144; 244; 344) is provided with such a frame recess width (wf) that at least 60% of the width of each hinge (6) is arranged in the frame recess.

2. A roof window according to claim 1, wherein at least 80% of the width of each hinge (6; 306) is arranged in the frame recess (144; 244; 344).

3. A roof window according to claim 1 or 2, wherein the remaining part of the width of each hinge (6) is arranged within a sash recess (34) of the sash (3) and/or in a gap (9) formed between the frame (4) and the sash (3).

4. A roof window according to claim 1 or 2, wherein substantially the entire hinge (6) is arranged in said frame recess (144; 244).

5. A roof window according to any one of the preceding claims, wherein the frame recess (44; 144; 244; 344) is provided with such a depth (df) that at least 60% of the depth of the hinge (6) is arranged therein such that the hinge (6) extends at least partially to the interior of the exterior surface (55) of the pane (5), as seen from a plane perpendicular to the pane (5).

6. A roof window (1) according to claim 5, wherein the frame recess (244; 344) is provided with such a frame recess depth (df) that substantially the entire hinge (6) is arranged in said frame recess (244; 344).

7. A roof window (1) according to any of the preceding

claims, wherein the pane (5) is arranged relative to the frame (4) such that an outward edge (52) of the pane (5) facing the frame (4) is arranged at a distance from an inward frame surface (43) of the frame (4) facing the sash (3) of not more than 50% of the width of the hinge, preferably less than 25%, and most preferably between 0-15%.

8. A roof window (1) according to any one of the preceding claims, wherein the exterior surface (55) of the pane (5) is substantially flush with an exterior surface (45) of the frame (4).

9. A roof window according to any one of the preceding claims, wherein the frame recess (44; 244; 344) is provided in an exterior surface (45) of the frame (4).

10. A roof window according to any one of claims 1 to 8, wheren the frame recess (144) is provided in an interior surface of the frame.

11. A roof window according to any one of the preceding claims, wherein the pair of hinges (6) is located such that the hinge axis (α) is positioned to the interior of the interior surface (53) of the pane (5).

12. A roof window according to any one of the preceding claims, wherein the hinge (6) is a pivot hinge including a hinge pin defining an axis of rotation substantially coinciding with hinge axis (α) of the roof window.

13. A roof window according to any of claims 1 to 11, wherein the hinge (306) is a pivot hinge including a guidance and a slide rail defining an axis of rotation offset from the hinge centre.

14. A roof window according to claim 13, wherein the pivot hinge (306) has a set of predefined dimensions, of which at least two dimensions are smaller than the corresponding dimensions of a traditional pivot hinge.

15. A roof window according to any one of the preceding claims, wherein each hinge (6; 306) of said pair of hinges comprises a sash hinge part (61) and a frame hinge part (62), preferably of substantially equal width.

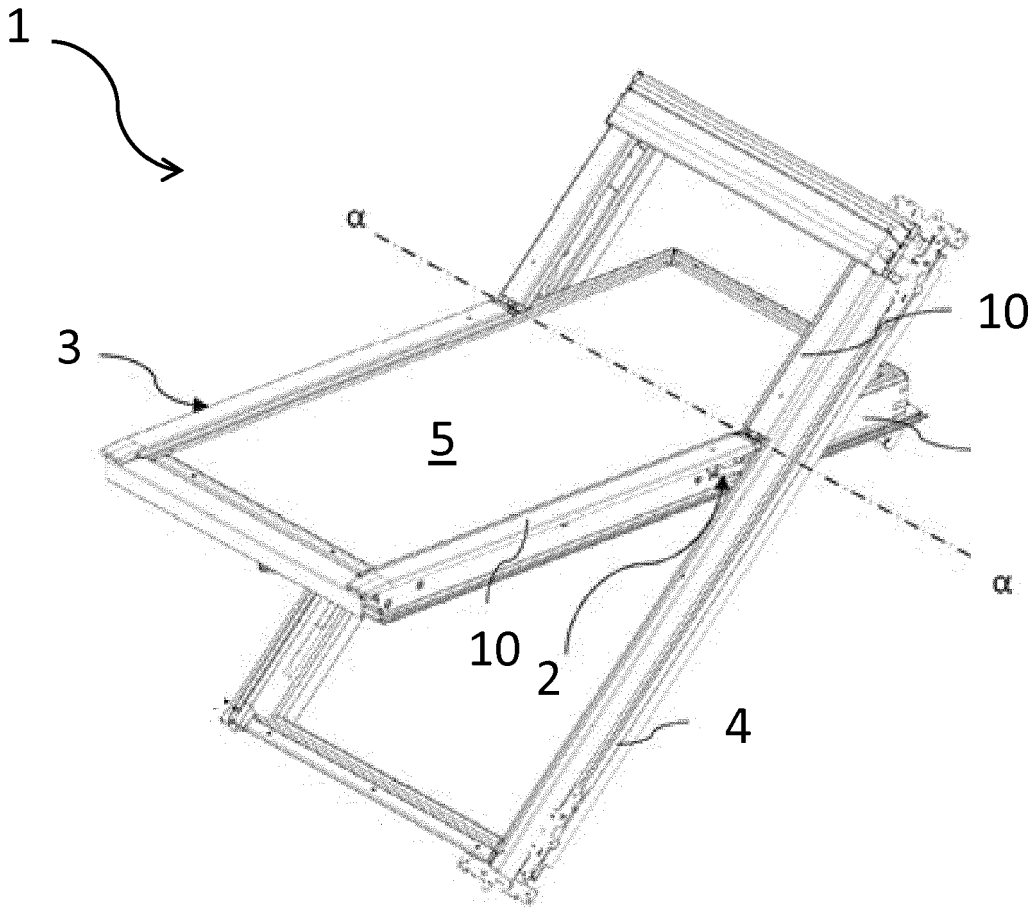


Fig. 1

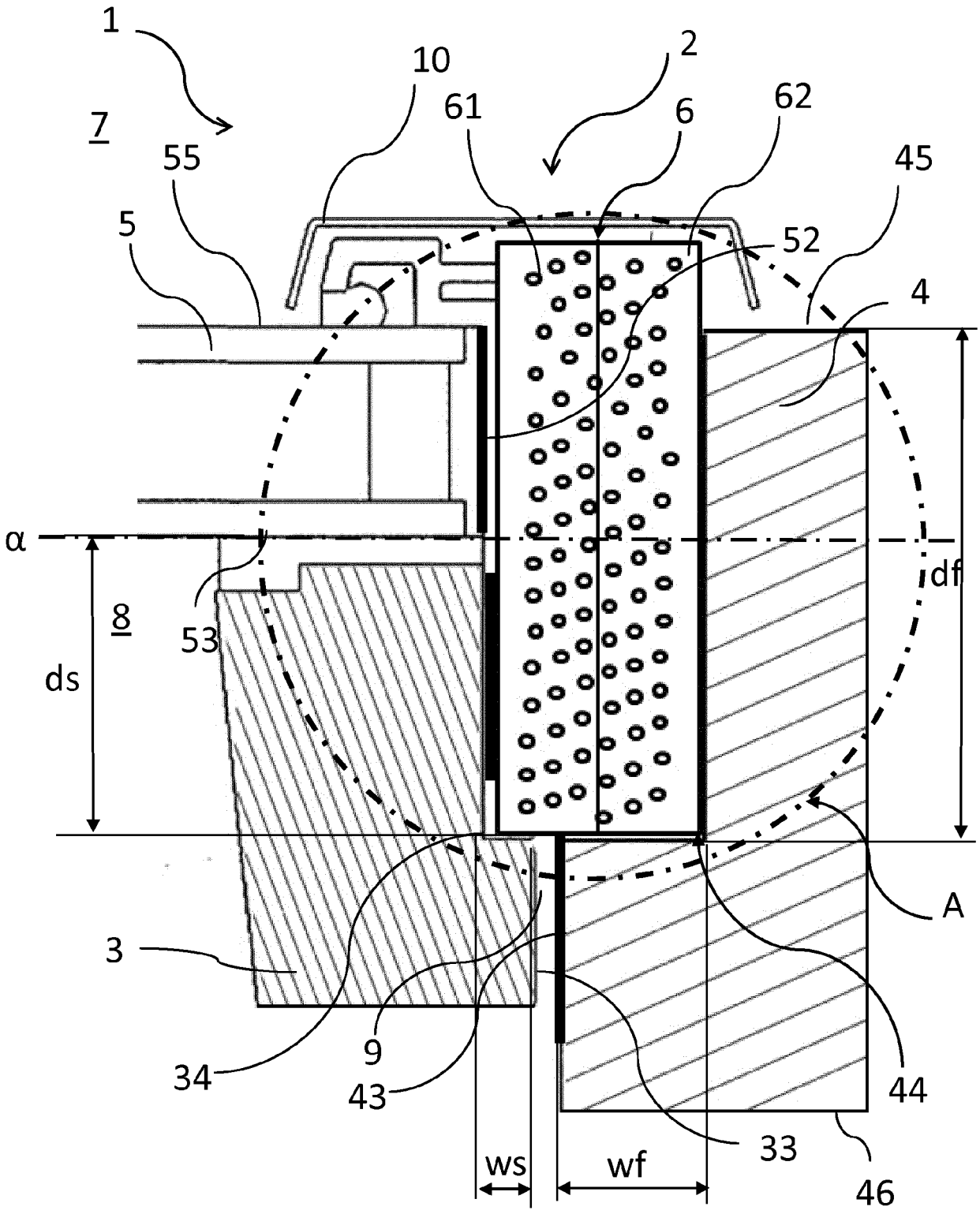


Fig. 2

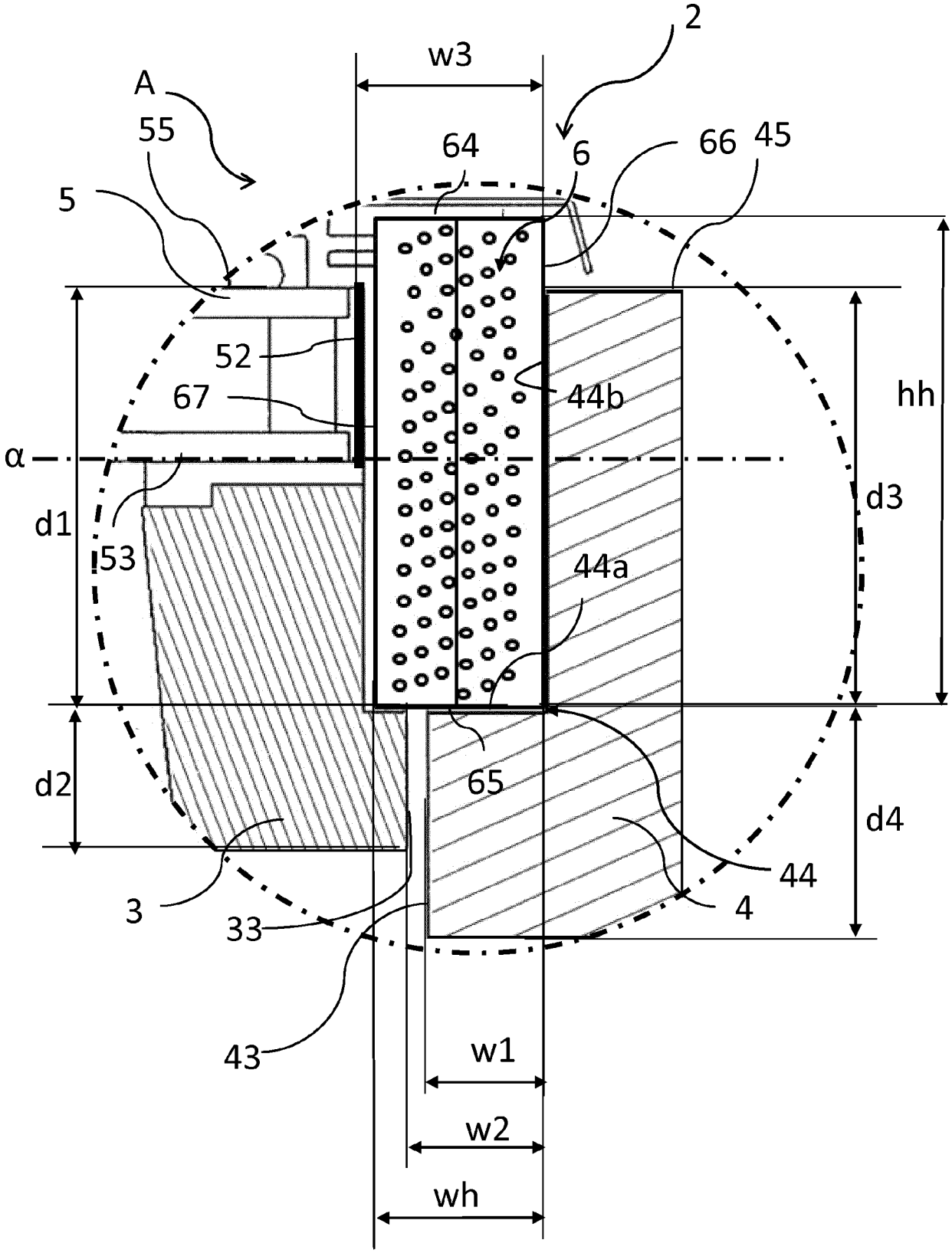

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w3
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Fig. 3

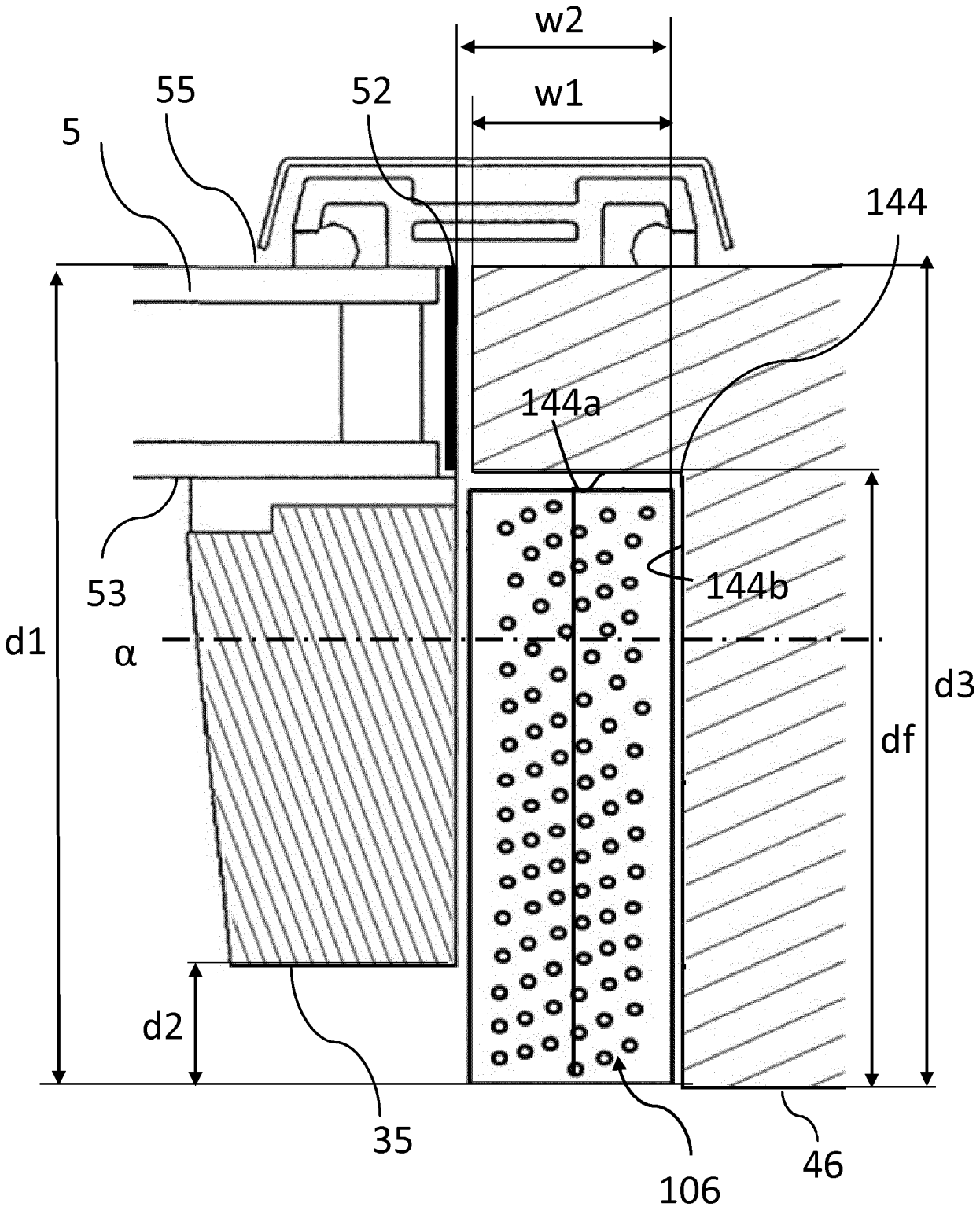


Fig. 4

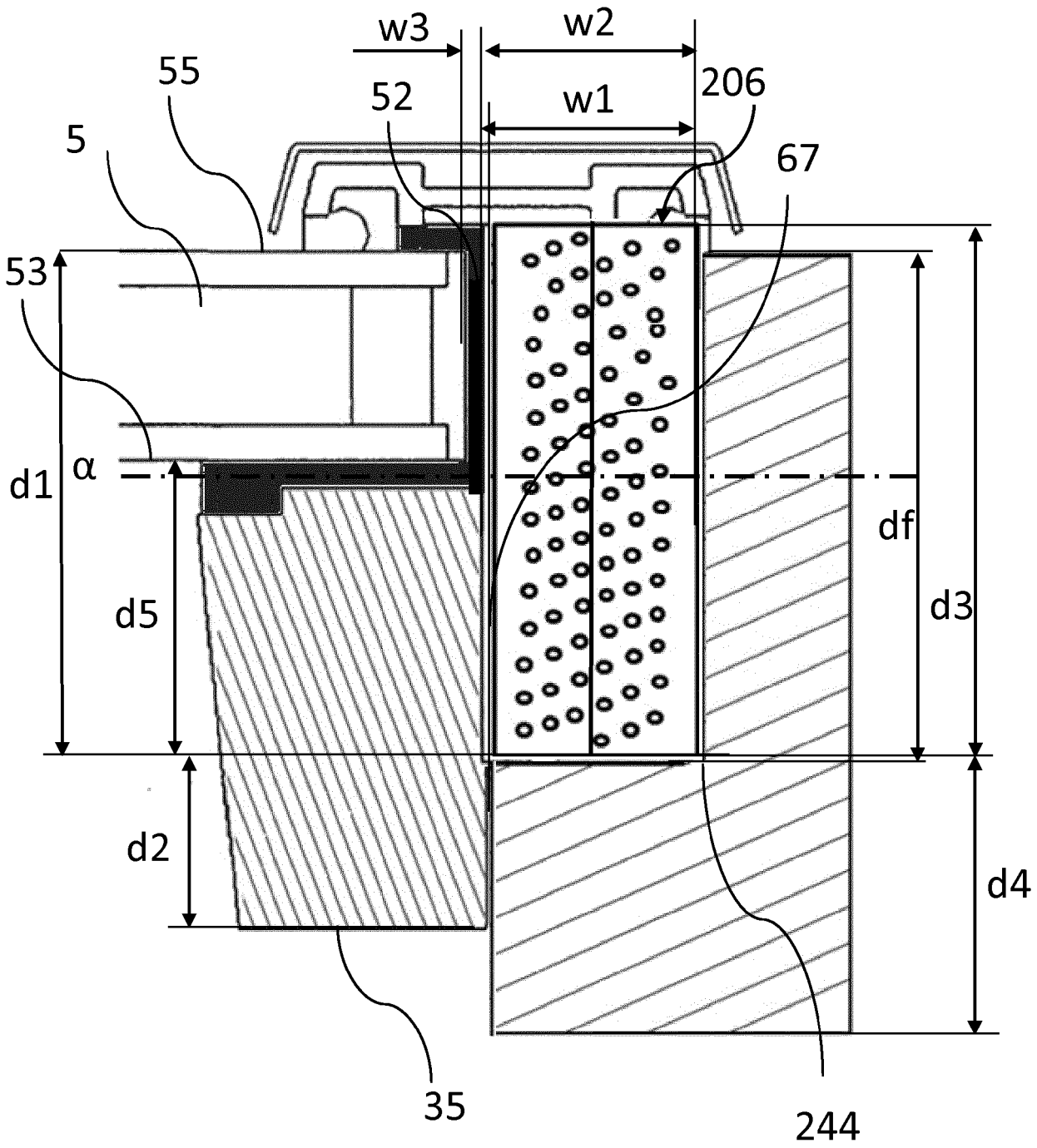


Fig. 5

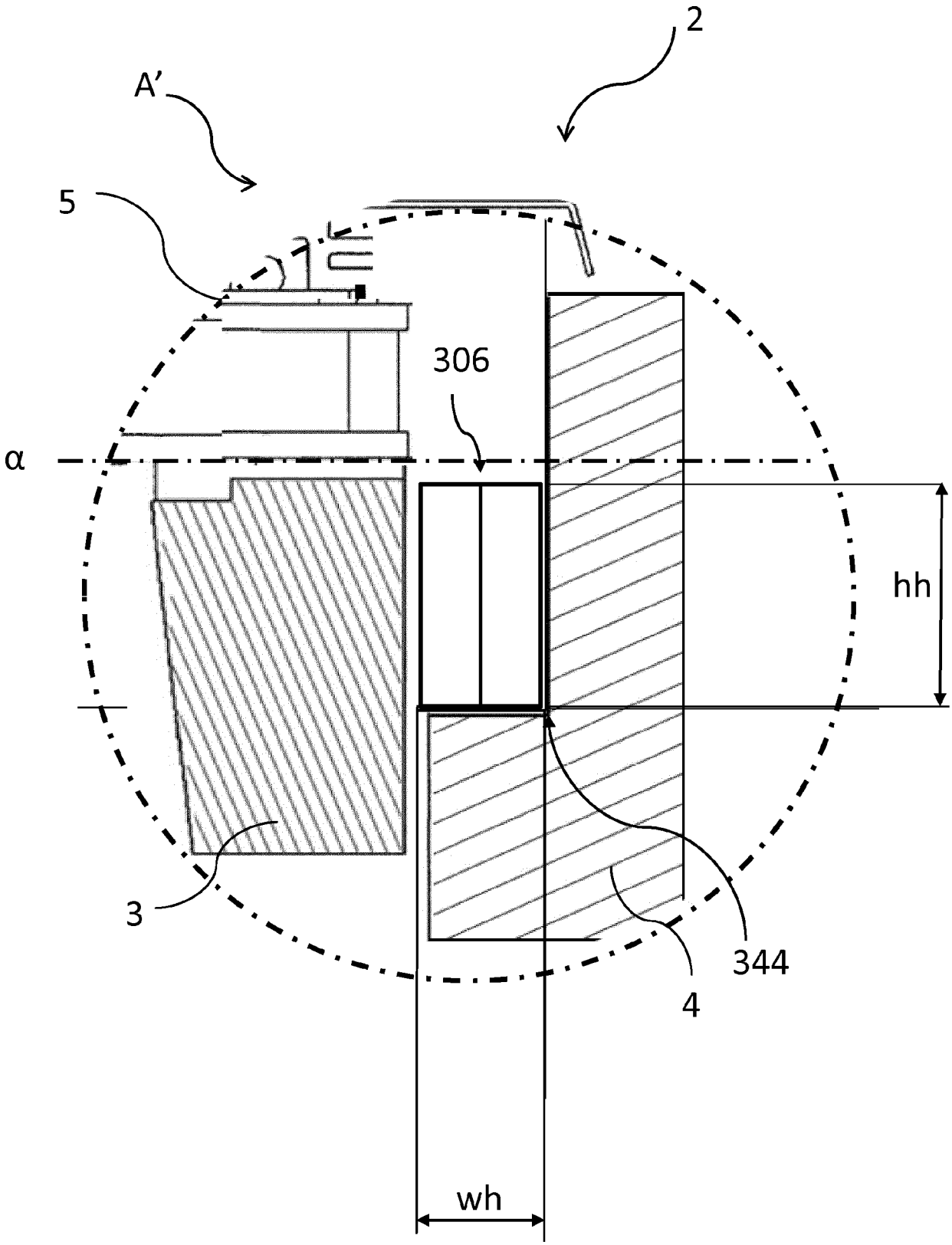


Fig. 6

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 17 18 9065

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	WO 2009/058039 A1 (FAKRO PP SPOLKA ZOO [PL]; ZWYRTEK BRONISLAW [CZ]; MUSIAL HENRYK [PL]) 7 May 2009 (2009-05-07) * figures 1,4,5,6 *	1-7,9, 10,13,14	INV. E04D13/035
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E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 November 2017	Leroux, Corentine

CATEGORY OF CITED DOCUMENTS

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