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(54) ROOF PROFILE

(57) The present invention is in the field of renovation of substantially flat roofs with a bituminous coating. Bituminous coating or also referred to as waterproofing system is for protection of residential and commercial buildings from environmental influences, and in particular from rain water. In particular an improved roof profile for renovation and an improved method making use of said roof profile of renovating a roof with a bituminous coating are provided.

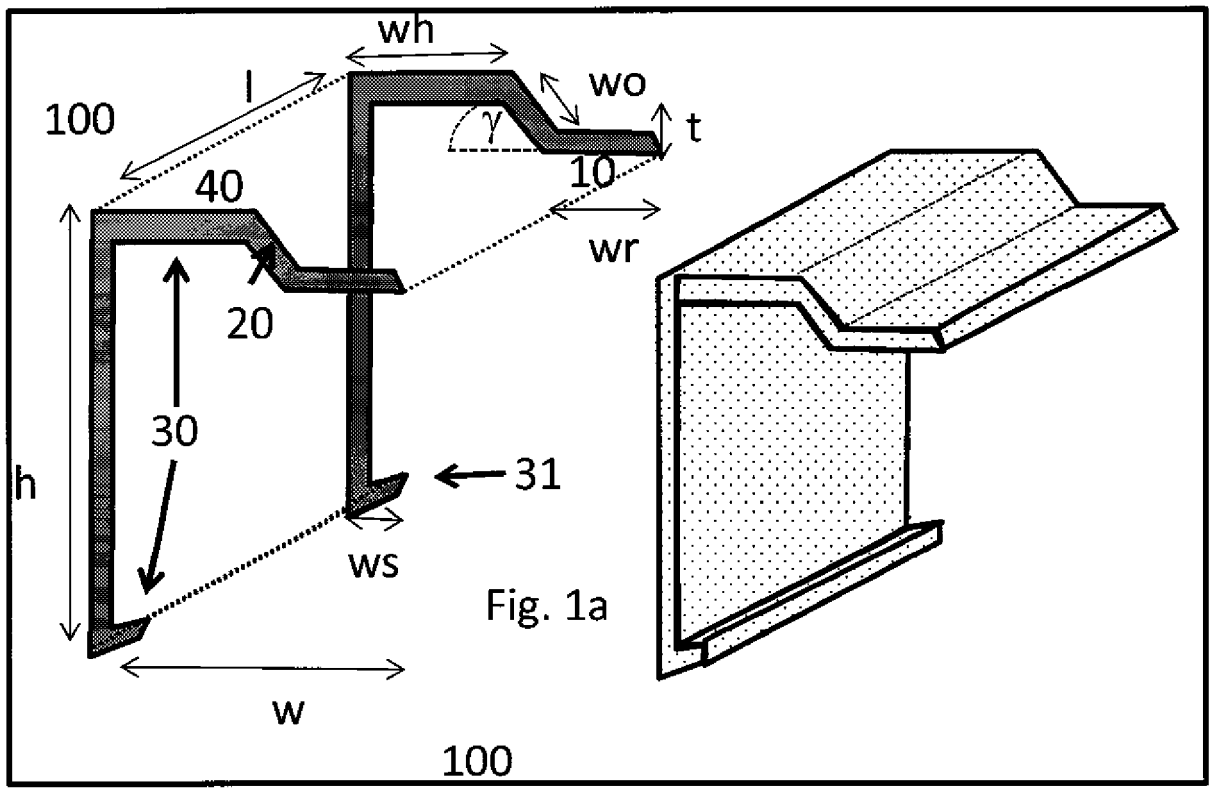

Fig. 1a

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Description

FIELD OF THE INVENTION

[0001] The present invention is in the field of renovation of substantially flat roofs with a bituminous coating.

BACKGROUND OF THE INVENTION

[0002] The present invention is in the field of renovation of substantially flat roofs with a bituminous coating. Bituminous coating or also referred to as waterproofing system is for protection of residential and commercial buildings from environmental influences, and in particular from rain water. Bitumen (asphalt) is typically a mixed substance made up of organic liquids that are highly sticky, viscous, and waterproof. The term "bitumen" typically refers to asphalt like materials, but also to more advanced materials, such as modified bitumen which is mixed with filler components such as polymers. These polymers improve characteristics of the bitumen. For instance atactic polypropylene (APP) gives rigidity and tear resistance whereas styrene-butadiene styrene (SBS), a rubber additive, gives more elastic benefits. Roll roofing is a bitumen product that is typically applied on roofs. To protect it from ultraviolet degradation typically mineral granules are added on top of a felt thereof, which also decreases the fire vulnerability. A thin, transparent film may be added to the base of the felt during manufacturing on all torch-on products. This stops the felt from sticking to itself when rolled up during the packaging process.

[0003] There are various reasons to use a bituminous coating. It protects the roof deck from rain before the roofing is installed; it provides an extra weather barrier in case of blowoffs or water penetration through the roofing or flashings; it protects the roofing from any resins that bleed out of the sheathing; etc. Nowadays the bituminous coating has a life time of about 10 years (low grade) to 20-40 years (high grade). At the end, preferably a bit before, the bituminous coating is removed and replaced.

[0004] For new buildings various profiles may be used. For instance JPH07233602 A recites a water resistant board in combination with upper and lower holders. For a person skilled in the art it is clear that the coping can only be used for new buildings. In addition the coping is not provided with a bituminous receiving section, as the bituminous material is provided underneath the coping (typically element 13 in fig. 27). The coping member extend over a roof edge, being present on both sides thereof; as such clamping action is largely provided by the total coping; it certainly is not provided by a side U-shape form alone, only in combination with a horizontal part. The coping is further no provided on an existing bituminous material, but on a dripping member. In addition a dripping member needs to be provided. The dripping member is attached to an even further element, namely an attaching member. Also a horizontal section of the coping extends fully over a raised edge of the roof. The construction is considered to be too complex and having limited use in practice.

[0005] In this respect US 2002/178671 A recites an integral, pre-formed edge closure, which has most of the disadvantages mentioned above, fabricated from a non-corrosive, durable material including an anchoring flange for installation to a roof structure, an upper flange, an intermediate panel spanning between the anchoring flange and the upper flange, a cant panel positioned at an acute angle relative to the upper flange to define a cant strip along a length of the edge closure, and a mounting strip above the cant panel for securing the edge closure to a concrete parapet or other adjoining vertical wall on a roof structure. The closure is for example encompassing isolation material of the roof in an open area of depth, which area does not comprise a receiving section for bituminous material. In addition an angle between the area of depth and the adjacent oblique part makes it impossible to apply this closure over a roof edge as the oblique parts extends in the wrong direction, namely away from the roof, thereby inherently leaving a whole; for this purpose also the anchoring flang would point upwards, making it impossible to attach a bituminous coating. It is therefore impossible to use this closure for renovation. As above it is considered to be a too complex structure and hence having limited use in practice.

[0006] So none of the documents above address the problem of renovation, let alone a solution thereto. The above coping and closure can only be used in new buildings, and under different circumstances, compared to renovation.

[0007] When removing the old bituminous coating it is difficult if not impossible to remove a part thereof close to the raised edge of the roof. In order to remove the bituminous coating often brute force is applied, leading to damage of the roof edge and sometimes also of the brick and roof construction. The removal is also time consuming and therefore costly. As renovation of a roof is typically performed under a time constraint, renovators may be inclined to go for a quick and dirty approach, possibly leading to even more damage.

[0008] A side issue, which is however often encountered when renovating, is that a roof edge is especially vulnerable for wear cause by water; such may be due to warping or settling of the roof construction and bituminous coating, wear of the bituminous coating, and of weather influences such as frost and heat, on the coating. As a result the roof edge and supporting construction may be affected and even be decayed, at least partially. Inherently such may occur due to the construction of the roof in combination with the bituminous coating. Hence, care should be taken to apply the coating properly.

[0009] The present invention therefore relates to an improved roof profile for renovation and an improved method making use of said roof profile of renovating a roof with a bituminous coating, which solves one or more of the above problems and drawbacks of the prior art,

providing reliable results, without jeopardizing functionality and advantages.

SUMMARY OF THE INVENTION

[0010] The present invention relates to a roof profile according to claim 1 and to a method of renovation of a bituminous coating on a roof according to claim 15.

[0011] The present roof profile is especially designed to be applied directly and without much effort to an existing roof, the roof still partly having an older bituminous coating or the like. For production reasons the roof profile may have a standard length, such as 250 cm, 200 cm, 100 cm, etc., a standard height, such as 75 mm and 95 mm, and a standard width. The roof profile is typically made of a readily available, not too expensive, and suitable material, typically of a single material. In view of appearance a metal profile is often considered.

[0012] An imported aspect of the present profile is the receiving section. The receiving section covers the bituminous coating that remains on the roof at least partially and further receives a freshly applied new bituminous coating. Thereto the receiving section extends at and towards one end of the profile (in a cross-sectional view, see e.g. figs. 1 and 3, it is extending to an end at the right). As these coating are typically applied using heat, such as by using a burner, the profile is typically of a heat resistant material, such as a metal. The receiving section should be large enough to ensure a waterproof sealing between the present profile and the bituminous coating after application thereof, which sealing should remain intact over the life time of the coating.

[0013] The present roof profile further has an oblique section for draining rain water and the like under gravitational force. The oblique section is preferably at an upwards angle γ relative to the receiving section (10).

[0014] For applying the present profile in a secure manner to the roof a U-shaped part is provided. The U-shaped part extends towards a second end of the profile (in a cross-sectional view, see e.g. figs. 1 and 3, it is extending to an end at the left). This U-shaped part is typically clamped on a side of the roof in a vertical direction. In addition it may be fastened to the roof and/or to a wall supporting the roof, although this option is less preferred and typically not required. The U-shaped profile provides at least some clamping action, due to its curved nature. In addition to securing the present profile by applying the bituminous coating a robust and durable final structure can be obtained.

[0015] In a second aspect the present invention relates to a method of renovation of a bituminous coating on a roof. In the method the present roof profile can be applied directly to a side of the roof, without a need for removing a bituminous coating (50) being present at said side of the roof, and thereafter applying a new bituminous coating (60) to the roof, the coating covering a receiving section (10) of the profile.

[0016] With the present method and profile a watertight sealing of the roof edge (and likewise of the roof) with a bituminous coating is provided, without a need for removing an existing old coating at in particular a roof edge section thereof. The present method and profile provide an easy and ready to use, and therefore quick, way of renovating a roof, without a risk of damage of a roof edge and the like, and still providing a durable sealing of the roof. There is no longer a need to demolish a roof edge, no loose stones or the like result from removing an old coating, less material is consumed, no edge section of bituminous material is required, no water can penetrate in the roof edge, less waste is produced, a risk of fire is diminished, no refurbishing and painting of a roof edge is required, and the profile levels the roof surface by itself.

[0017] Thereby the present invention provides a solution to one or more of the above mentioned problems and drawbacks, without jeopardizing beneficial effects.

[0018] Advantages of the present description are detailed throughout the description.

DETAILED DESCRIPTION OF THE INVENTION

[0019] The present invention relates in a first aspect to a roof profile according to claim 1.

[0020] In an example the present profile is formed from a plate, preferably a single plate. Such provides for an easy and cheap way of producing the profile, especially in view of standard plate material that can be used. The production can be simplified even further as only bending of the plate is required, in order to obtain the present profile. It is therefore preferred to use a single plate of adequate length and width, or first obtain adequate sections thereof, such as by cutting.

[0021] In an example the present profile has a thickness (t) from 1-5 mm, preferably 2-3 mm. Such a thickness is considered sufficient to provide rigidity, clamping action, and body, especially for the receiving section. The thickness may be in line with standard available plate material, which in view of production costs and simplicity is a further advantage.

[0022] In an example the present profile is formed from a metal, such as stainless steel, aluminum, steel, or from a thermoset plastic. These materials typically have suitable characteristics.

[0023] In an example the present profile the length (1) is from 20-300 cm, such as from 50-250 cm, e.g. 100 cm, 200 cm, etc. For a corner section a minimal length considered is 50 cm, from a practical point of view a length is not larger than that can be handled by a single individual.

[0024] In an example the present profile the height (h) is from 5-15 cm, such as 75 mm, 95 mm. The height is typically in line with standard roof edge profiles.

[0025] In an example the present profile the width (w) is from 2-20 cm. The width is typically in line with standard roof edge profiles.

[0026] In an example the present profile a width (w_s) of the support part (31) is from 0.5-2.5 cm, such as 1-2

cm, e.g. 1.5-1.7 cm. The support part can be relatively small. The support part may be at an angle relative to the longer side of the U-shaped part, such as at an angle of 30-60°, e.g. 45°.

[0027] In an example the present profile a width (w_o) of the oblique section (20) is from 10-30 mm, such as 15-25 mm. The oblique section typically has a width in line with standard roof edge profiles.

[0028] In an example the present profile the width (w_r) of the receiving section (10) is from 10-70 mm, such as 20-50 mm, such as 30-40 mm.

[0029] In an example the present profile the oblique section is at an angle γ of 20-80° relative to the receiving section (10), preferably at an angle γ of 30-60°, such as at an angle γ of 40-50°. The angle is preferably large enough to provide sufficient draining action of water under gravitational forces. It is also or in addition preferably such that it can be manufactured without much effort; in view thereof also an angle between the oblique section and an optional bridging section or the U-shaped profile may be taken into account: less bend profiles are preferred.

[0030] In an example the present profile further comprises a horizontal section (40) between the oblique section and U-shaped part, for bridging an raised roof edge, wherein a width (w_h) of the horizontal section (40) is from 0-60 mm, preferably 5-50mm, such as 10-40 mm, e.g. 20-30 mm. The bridging section may support ease of application of the present profile, provided further clamping action, and may be required in view of an existing roof edge profile.

[0031] If the horizontal element is absent, at least one reinforcing element may be provided between the U-shaped part and the oblique part, such as a plate structure.

[0032] In an example the present profile further comprises an extension element (70). The extension element protects an underlying bituminous coating from environmental influences, reduces risk of improper sealing, and provides a visual target for applying the coating up to said element. The element has a width of 1-20 mm, such as 5-10 mm. It preferably is not too small.

[0033] If the extension element and/or the horizontal section and/or the reinforcing element are present the present profile is typically manufactured by casting or the like.

[0034] In an example the present profile comprises a touch (80).

[0035] In an example the present profile comprises a reinforcing element 90.

[0036] In an example the present profile has a cutaway (11) providing an angle of 45° relative to a length 1 at one side of the receiving section. It is noted that the same angle results relative to a width of the receiving section. Said profile is intended for use in an inward corner section of the roof. At the other part of the corner section a symmetrical counter section can be applied. As such also corner sections of a rectangular roof can be covered with a bituminous coating in a simple and effective manner.

[0037] In an example of the present profile the oblique section (20) comprises a vertical portion (21) in connection with the horizontal section (40). The vertical portion can e.g. be used to form an uptake element for couple plates, the couple plates connecting adjacent profiles.

[0038] In an example of the present profile at least one of the receiving section and oblique section are profiled. As such a better adherence for e.g. a bituminous coating is provided.

[0039] The invention is further detailed by the accompanying figures, which are exemplary and explanatory of nature and are not limiting the scope of the invention. To the person skilled in the art it may be clear that many variants, being obvious or not, may be conceivable falling within the scope of protection, defined by the present claims.

FIGURES

[0040] The invention although described in detailed explanatory context may be best understood in conjunction with the accompanying figures. In the figures:

100	roof profile
200	roof
300	wall
10	receiving section
11	cutaway
20	oblique section
21	vertical section
30	U-shaped part
31	Support section
40	bridging section
50	old bituminous coating
60	new bituminous coating
70	extension element
80	touch
90	reinforcement
95	existing roof profile
di	distance i
h	height of the profile
w	width of the profile
1	length of the profile
o1	opening space
w_s	width of the support section
w_r	width of the receiving section
w_o	width of the oblique section
w_h	width of the horizontal bridging section
ti	thickness i of the profile
R	curvature

[0041] Figs. 1a-c shows details of the present profile and application thereof.

[0042] Fig. 2 shows the application of the present roof profile on a roof segment.

[0043] Fig. 3 shows an example of the present profile.

DETAILED DESCRIPTION OF THE FIGURES

[0044]

Fig. 1a shows a worked open version (left) of the present profile having a length 1, a width w, a height h, and a thickness t, and a perspective view thereof (right). The profile comprises a receiving section 10, an oblique section 20, a horizontal section 40, a U-shaped profile 30, and as part of the U-shaped profile a support section 31. The width of the support section is indicated with w_s, the width of the receiving section with w_r, the width of the oblique section with w_o, and the width of the horizontal bridging section with w_h.
Fig. 1b shows a schematic cross-section of a roof having the present profile 100 applied on a left side thereof. The old bituminous coating 50 is still partly present at an edge of the roof 200, and on top of the present profile, in particular the receiving section thereof, a new bituminous coating 60 is applied. Also an existing profile 95 is shown, which could have been applied during construction of the building and is now integrated in the building. Present element 30 provides clamping action around old profile 95. The present roof profile may further comprise an extension element 70. A new bituminous coating is typically applied towards this extension element. For better positioning of the present roof profile on the roof and against the wall a touch 80 may be provided. The touch preferably has an element perpendicular to a horizontal plane. A length of the touch is from 5-40 mm, preferably 10-20 mm. Further a reinforcing element 90 may be present. The reinforcing element may be a bridging part between the oblique section and the vertical part of the U-shape, or may be a solid part, filling a space between the oblique section and the U-shape.
Fig. 1c shows a top view of a receiving section 10, having length 1, and provided with a cutaway 11.
Fig. 2 shows the application of the present roof profile on a roof segment. Therein the profile 100 is applied on a wall segment 300 or upstanding part of the roof 200. The roof 200 typically has an oblique section extending towards the wall.
Figure 3 shows a further example of the present profile. A thickness of the profile may vary, e.g. when extruded. Thicknesses in this example are t1= 1.4 mm, t2 = 1.2 mm, t3 = 1.45 mm, and t4 = 0.5 mm. Further dimensions are ws = 17.1 mm, h = 78 mm, h' = 74.58 mm, d5 = 23.33 mm, w = 60 mm, d3 = 18.55 mm, d2 = 10 mm, d6 = 3.79 mm, and ol = 1.5 mm. γ = (90-66.69)°=32.31°. The receiving section and oblique section are largely profiled. The support part is at an angle relative to the longer side of the U-shaped part of 60°. In addition some curvatures R are given.

[0045] The figures have been further detailed throughout the description.

Claims

1. Roof profile (100) for bituminous coatings,
the roof profile having a thickness (t), a length (1), a width (w), and a height (h),
the roof profile comprising a receiving section (10), an oblique section (20) for draining next to the receiving section, the oblique section connected to a substantial U-shaped part (30) having a support part (31),
wherein the U-shaped part provides a clamping action when applied to a roof
characterized in that
the receiving section is for receiving bituminous material and for covering the existing bituminous coating that remains on the roof at least partially, and
the roof profile is for renovation of existing bituminous coatings.

2. Roof profile according to claim 1, wherein the oblique section is at an upwards angle γ relative to the receiving section (10).

3. Roof profile according to any of the preceding claims, wherein the profile is formed from a plate.

4. Roof profile according to any of the preceding claims, wherein the profile has a thickness (t) from 1-5 mm.

5. Roof profile according to any of the preceding claims, wherein the profile is formed from a metal, or from a thermoset plastic.

6. Roof profile according to any of the preceding claims, wherein the length (1) is from 20-300 cm, the height (h) from 5-15 cm, and the width (w) from 2-20 cm,
wherein a width (w_s) of the support part (31) is from 0.5-2.5 cm,
wherein a width (w_o) of the oblique section (20) is from 10-30 mm, and
the width (w_r) of the receiving section (10) is from 10-70 mm.

7. Roof profile according to any of the preceding claims, wherein the oblique section is at an angle γ of 20-80° relative to the receiving section (10).

8. Roof profile according to any of the preceding claims, further comprising a horizontal section (40) between the oblique section and U-shaped part, for bridging an raised roof edge,
wherein a width (w_h) of the horizontal section (40) is from 0-60 mm.

9. Roof profile according to any of the preceding claims,

further comprising an extension element (70).

10. Roof profile according to any of the preceding claims, further comprising a touch (80).

11. Roof profile according to any of the preceding claims, further comprising a reinforcing element (90).

12. Roof profile according to any of the claims 8-12, wherein the oblique section (20) comprises a vertical portion (21) in connection with the horizontal section (40).

13. Roof profile according to any of the preceding claims, wherein at least one of the receiving section and oblique section are profiled.

14. Roof profile according to any of the preceding claims for an inward corner section of the roof, having a cutaway (11) providing an angle of 45° relative to a length 1 at one side of the receiving section.

15. Method of renovation of a bituminous coating on a roof (200) comprising the steps of
applying the roof profile (100) of any of claims 1-14 to a side of the roof, without removing a bituminous coating (50) being present at the side of the roof,
applying a new bituminous coating (60) to the roof, the coating covering a receiving section (10) of the profile.

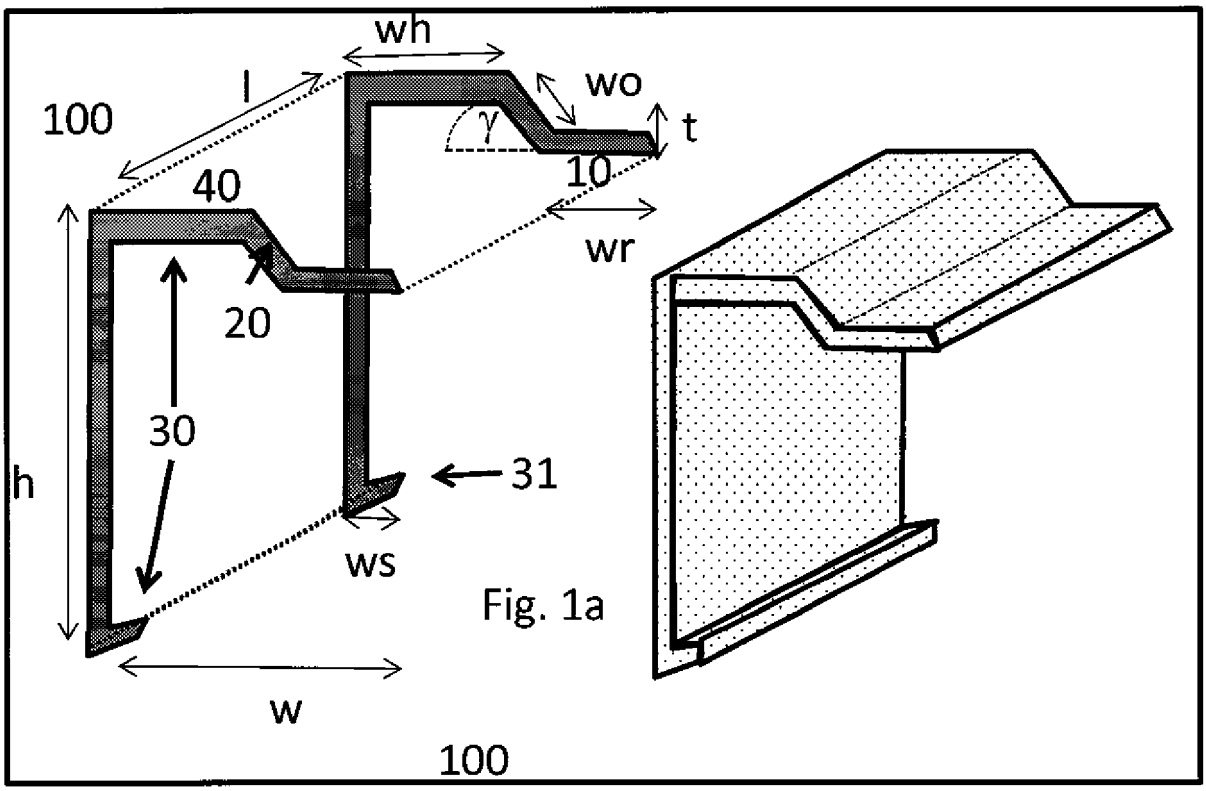

Fig. 1a

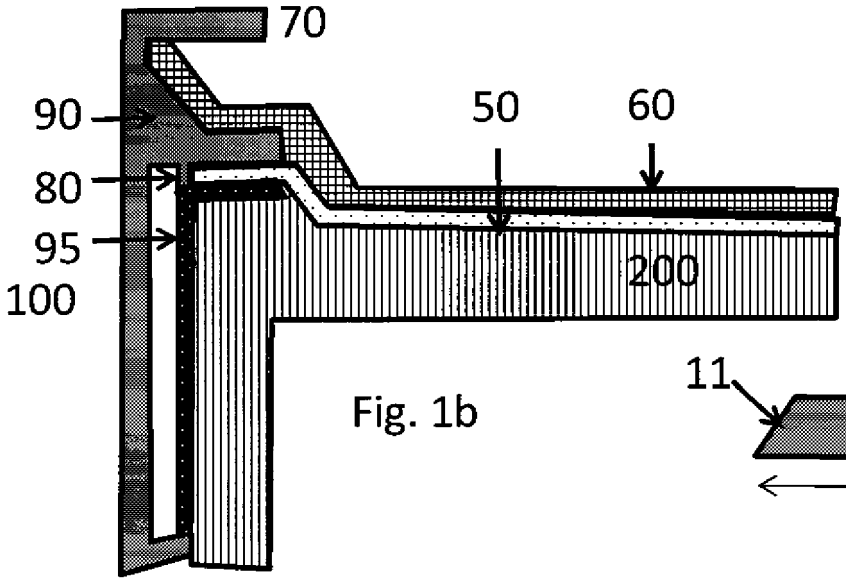

Fig. 1b

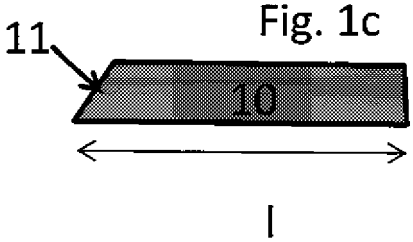

Fig. 1c

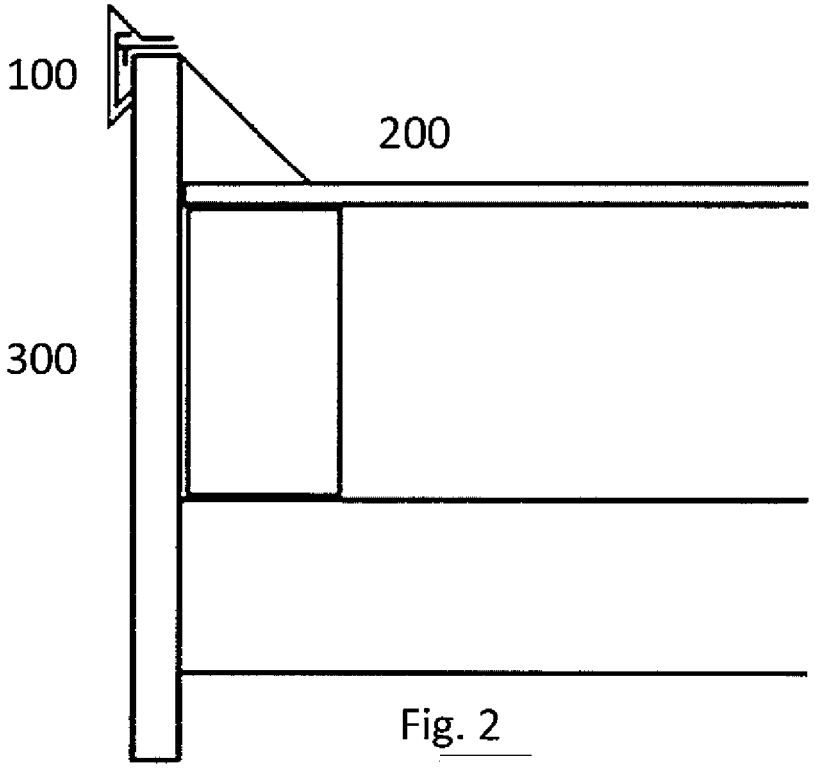
100
200
300

Fig. 2

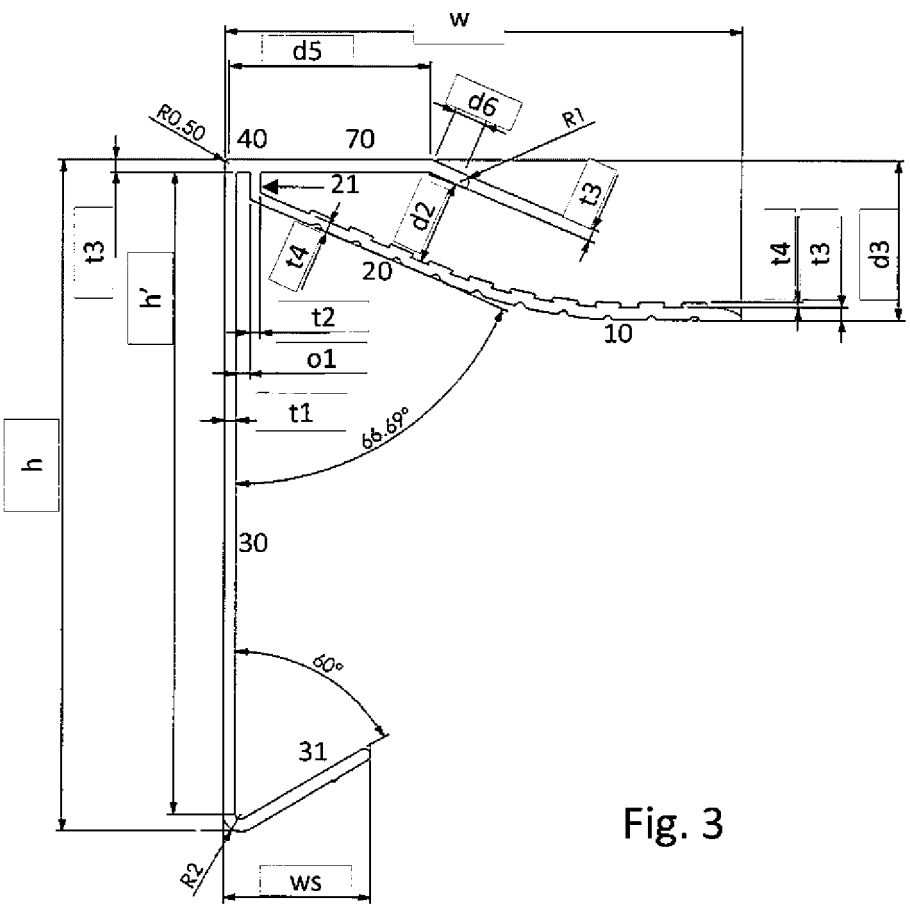
w
d5
d6
R1
R0,50
40
70
21
d2
t3
t4
20
t3
h'
t2
o1
t1
h
66,69°
10
t4
t3
d3
30
60°
31
R2
ws

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 16 16 0633

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	US 2002/178671 A1 (GEMBALA HENRY [US]) 5 December 2002 (2002-12-05) * figures 4,5 * * paragraphs [0032], [0034] *	1-7, 9-11, 13-15	INV. E04D3/40 E04D13/14 E04D13/155
X	WO 96/39565 A1 (GARLAND COMPANY INC [US]) 12 December 1996 (1996-12-12) * figure 3 * * second paragraph; page 8 *	1-15	
X	US 2 857 861 A (TROSTLE JOHN W) 28 October 1958 (1958-10-28) * figures 2, 6 *	1-13,15	
X	JP H07 233602 A (YAMADE KK) 5 September 1995 (1995-09-05) * figures 27,31,32 *	1-5, 8-11,14	

TECHNICAL FIELDS SEARCHED (IPC)

E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 June 2016	Tran, Kim Lien

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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& : member of the same patent family, corresponding document

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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28-06-2016

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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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