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(54) A GUTTER PROFILE FOR A TELESCOPIC DRAINAGE GUTTER, A TELESCOPIC DRAINAGE GUTTER, AND SYSTEM COMPRISING SUCH A GUTTER PROFILE, AND METHODS FOR ASSEMBLING SUCH A SYSTEM AND PRODUCING SUCH A GUTTER PROFILE

(57) The present invention relates to an elongate gutter profile for a telescopic drainage gutter for guiding water away from an aperture in an underroof, which allows for water-tight connection to a further gutter profile with similar geometry of further telescopic drainage gutter. Said gutter profile comprising a first leg and a second leg extending in a longitudinal direction and spaced apart in a transverse direction providing an interior space of the gutter profile, wherein the second leg of the gutter profile comprises an inwardly projecting portion extending into interior space from a top of the second leg, wherein the second leg of the gutter profile comprises a first end section at a first longitudinal end of the gutter profile and a main section next to the first end section, and the height of the first end section is less than the height of the adjoining main section of the second leg. The inventions also relates to telescopic drainage gutters and systems comprising such a gutter profile and to methods for assemblying such systems and method for producing such gutter profiles.

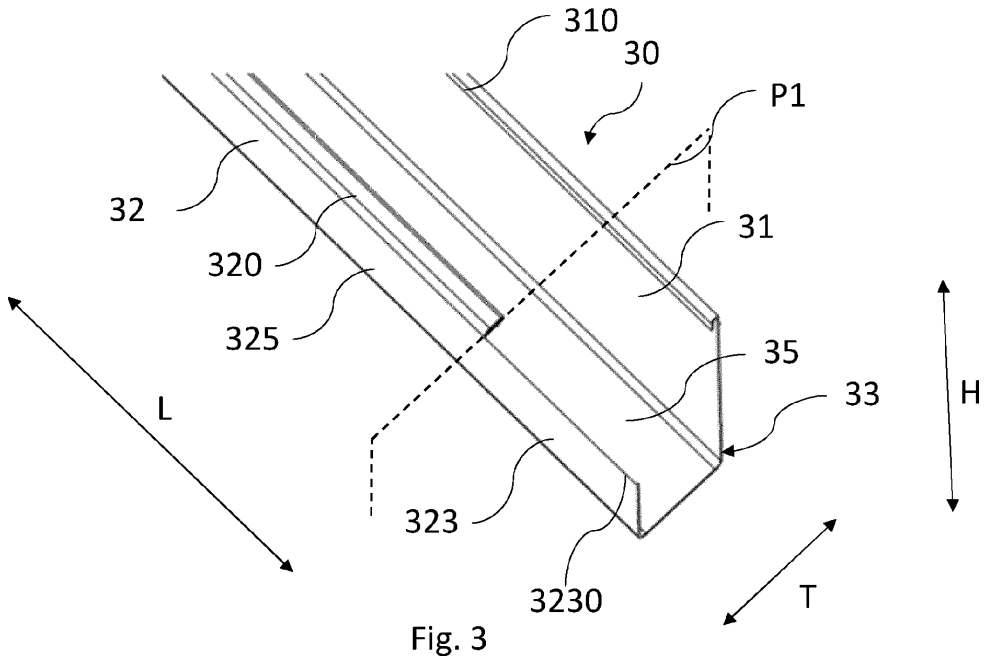

Fig. 3

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Description

Technical Field

[0001] The present invention relates to a gutter profile for a telescopic drainage gutter for guiding water away from an aperture in an underroof, said gutter profile being an elongate gutter profile extending in a longitudinal direction and comprising a first longitudinal end, a second longitudinal end, a bottom extending in the longitudinal direction for guiding away water, a first leg, and a second leg, which first and second legs extend in the longitudinal direction and are spaced apart in a transverse direction providing an interior space between the first and second legs, which transverse direction is perpendicular to the longitudinal direction, wherein the second leg of the gutter profile comprises an inwardly projecting portion extending into the interior space at a top of the second leg which top is opposite to the bottom of the gutter profile in a height direction being perpendicular to the longitudinal and transverse directions.

Background art

[0002] Installation of a roof window often entails the mounting of a number of additional components, such as flashing and insulation components, which are typically supplied alongside the roof window. One such component is a drainage gutter for guiding water away from an aperture in an underroof made to make room for the roof window in an inclined roof. The drainage gutter is mounted along the top of the roof window and used to drain off water along the top of the roof window in a direction of inclination of the telescopic drainage gutter and onto an intact part of the underroof extending along the side(s) of the roof window.

[0003] Various drainage gutter designs are known, one of which is the telescopic type disclosed in EP1131513B1. Telescopic type drainage gutters comprise at least two gutter profiles, one of which has a smaller cross-section so that it can slide longitudinally into the other profile having a larger cross-section. One of the gutter profiles may be denoted as the external gutter profile and the other the internal gutter profile, referring to their respective positions when assembled. Prior to installation, the internal gutter profile can be fully inserted in the external gutter profile, allowing the telescopic drainage gutter to be packed with other roof window related components, rather than needing its own longer packaging. During installation, the relative position of the two gutter profiles can be adjusted to provide a drainage gutter with a desired length. This further allows the same drainage gutter to be used for different size windows and different installation scenarios. In use, the telescopic drainage gutter is installed with an inclination relative to horizontal and with the internal gutter profile being positioned upstream of the external gutter profile creating a downwards overlap. This ensures that water flows down off the longitudinal end of the internal gutter profile and onto the external gutter profile, and with a very low risk of water entering between the gutter profiles as might happen if the external gutter profile was positioned upstream of the internal gutter profile, which would provide an upwards overlap in the direction of water flow where water can flow in between the gutter profile.

[0004] The adjustable length of the telescopic drainage gutter allows a manufacturer to make one drainage gutter product, which can be used for a range of roof window sizes, the length being adjustable according to the width of the roof window in question. The telescopic drainage gutter also provides the flexibility to adjust the drainage gutter length to the specific installation scenario to reach the intact part of the underroof. The length required may for example depend on rafter spacing. This solution has worked well, but when installing multiple roof windows side-by-side, such as 3, 4, or 5 roof windows side-by-side, the length of one telescopic drainage gutter may not be sufficient to provide drainage for all the roof windows. In these situations, multiple drainage gutters can be mounted separately and inclined such that they are draining to the left and right side of the roof window installation respectively, complicating the installation and adding risk of installation errors. Making special drainage gutters to be used only for specific installation scenarios is not economically desirable.

[0005] At present each roof window is typically supplied with one telescopic drain gutter, typically in a package of additional components separate from the roof window. Hence when installing multiple roof windows side-by-side multiple telescopic drainage gutter drains are available. Multiple telescopic drainage gutters, however, cannot simply be assembled telescopically, as water draining in a downstream direction would then encounter an external-to-internal gutter profile connection having upwards overlap, where water could enter in between the gutter profiles and into the roof structure.

[0006] EP3231956A1 discloses another roof window drainage gutter system, where each gutter profile has identical cross-sectional dimensions and where the gutter profiles are thin-walled and pliable, allowing them to be connected by deforming the gutter profiles to fit over/into each other. Having identical profiles to be connected by deformation requires a particular geometry, which limits the options in the design of the drainage gutter, and may result in expensive gutter profiles. In addition, deforming gutter profiles while on a roof may be troublesome for the installer. Having all gutter profiles be identical also increases the risk of the installer fitting them together incorrectly and creating an upwards overlap where water can enter between two gutter profiles.

[0007] Hence, there is a desire for providing an improved or alternative telescopic drainage gutter assembly which is easy for an installer to use and which may provide for cost and space efficient drainage for a wide range of roof window installations.

Summary of the invention

[0008] These and further objects are achieved by a first aspect of the invention providing a gutter profile according to the introduction, wherein the second leg of the gutter profile comprises a first end section at the first longitudinal end and a main section adjoining the first end section, which first end section and main section are arranged sequentially in the longitudinal direction, and wherein a height of the first end section in the height direction is less than a height of the adjoining main section in the height direction.

[0009] Providing the first end section with a reduced height compared to the main section allows the first longitudinal end of the gutter profile to be positioned in an interior space of a further gutter profile of a further telescopic drainage gutter, providing the desired downwards overlap in the direction of water flow, and at the same time allows the gutter profile slide longitudinally with the other profile of the further telescopic drainage gutter. In this way, the gutter profile according to the invention can be used as one of two gutter profiles of a telescopic drainage gutter in the typical telescopic manner (internal gutter profile sliding in an external gutter profile), but is also capable of connecting to a further telescopic drainage gutter with the desired downwards overlap. Hence, the gutter profile according to the invention is versatile and the manner in which it is used depends on the need for a specific roof window installation. In addition, the gutter profile according to the invention can be produced by modifying an existing telescopic drainage gutter profile, whereby the same production line can be used. For example, the first end section may be a section of the second leg wherein a portion of the second leg at the first longitudinal end has been removed or has been folded down toward the bottom of the gutter profile, thereby reducing the height of the second leg in said portion.

[0010] The gutter profile according to invention may be considered to comprise a plurality of portions, at least a first end portion and a main portion. The first end portion of the gutter profile is the longitudinal portion of the gutter profile in which the first end section of the second leg extends. The main portion of the gutter profile is the longitudinal portion of the gutter profile in which the adjoining main section of the second leg extends. The main portion extends in longitudinal continuation of the first end portion and the first end portion extends from the first longitudinal end of the gutter profile. The first end portion thus comprises the first end section of the second leg, and the longitudinal portions of the first leg and bottom of the gutter profile corresponding t. Similarly, The main portion of the gutter profile comprises the main section of the second leg, and the longitudinal portions of the first leg and bottom of the gutter profile corresponding to the main section of the second leg.

[0011] The gutter profile according to the invention can be configured as an internal gutter profile or an external gutter profile of a telescopic drainage gutter, which has the functionality of being connectable to a further telescopic drainage gutter. This may be illustrated by an example where there is provided a telescopic drainage gutter having an internal and external gutter profile and an additional telescopic drainage gutter having an additional internal and an additional external gutter profile. The external gutter profile and the additional external gutter profile are identical and the internal gutter profile and the additional internal gutter profile are identical, but at the first longitudinal end of the additional internal gutter profile the height of the second leg has been reduced, providing the first end section of the second leg of the additional internal gutter profile. The additional internal gutter profile is thus a gutter profile according to the invention. Hence, a cross-section of the internal gutter profile in a plane defined by the transverse and height directions (TH-plane), is identical to a cross-section in the main portion of the first gutter profile. Each of the telescopic drainage gutter and additional telescopic drainage gutter may be used as independent drainage gutters, but the additional internal gutter profile can also connect to the internal gutter profile by positioning the first end portion, comprising the first end section, of the additional internal gutter profile in the interior space of the internal gutter profile. This provides a drainage gutter assembly comprising, in the direction of water flow, the additional internal gutter profile, the internal gutter profile, and the external gutter profile, where each connection comprises a downwards overlap in the direction of water flow. If the drainage gutter assembly having three gutter profiles is sufficient for the roof window installation in question, the additional external gutter profile may be discarded, preferably recycled. A drainage gutter assembly which also uses the additional external gutter profile, and further examples of the gutter profile according to the invention and its use, are described in the detailed description of the invention.

[0012] It will be understood that one intended use of the gutter profile according to the invention, is to connect it to a further telescopic drainage gutter which already is available for a roof window. Hence, it will be appreciated that the dimensions and cross-sectional shape of the gutter profile according to the invention is made to correspond to one of the gutter profiles of the further telescopic drainage gutter. In particular, the main portion of the gutter profile according to the invention will have the same cross-section in the TH-plane as one of the gutter profiles of said further telescopic drainage gutter. Hence, the first end section of the second leg of the gutter profile is configured to allow the gutter profile to be connected to a further gutter profile which further gutter profile has the same cross-section as the main portion of the gutter profile according to the invention. In view of this it will be appreciated that that features of the first end section, or first end portion, of the second leg are suitably described in relation to the main section, or main portion, of the second leg of the gutter profile, as the main section and main portion corresponds to the further gutter profile with which it can connect.

[0013] A further intended use of the gutter profile according to the invention, is connect to a second, identical gutter profile according to the invention. As described above, the first end section allows the gutter profile to connect to the further gutter profile which has the same cross-section as the main portion of the gutter profile, and correspondingly the first end section also allows for the gutter profile to connect to the main portion of a second, identical gutter profile according to the invention.

[0014] In the description of the invention, the gutter profile with which the gutter profile according to invention is configured to be connected, is referred to as the "further gutter profile" unless otherwise noted. The term "additional gutter profile" is also sometimes used for economy of language and refers to gutter profiles according to the invention.

[0015] The gutter profiles according to the invention are described with reference to the longitudinal direction, height direction and transverse direction which are mutually perpendicular. Gutter profiles have a gutter-shaped cross-section which provides a channel for draining water along the bottom of the gutter profile. The longitudinal direction is the direction in which water flows along the bottom of the gutter profile when the gutter profile is in use. Referring to the channel of the gutter profile, the transverse direction as used herein is the direction in which a width of the channel extends and the height direction is the direction in which a depth of the channel extends. The first and second longitudinal ends are the ends of the gutter profile in the longitudinal direction, and the terms are not used to identify a specific end, e.g. left or right end, but to distinguish one longitudinal end from the other longitudinal end. The bottom of the gutter profile extends in the longitudinal direction and is the part of the gutter profile where water collects and flows when the gutter profile is in use. In some embodiments, the bottom of the gutter profile is formed by a bottom leg of the gutter profile which extends between the first and second leg in the transverse direction. In other embodiments, the bottom of the gutter profile is formed by the first and second legs of the gutter profile being joined directly, such as in V-shaped gutter profile. Parts identified herein as being a "top" part of an element, such as the top of the second leg, are the part opposite to the bottom of the gutter profile in the height direction. Hence, the top part is generally at a free edge of an element.

[0016] The inwardly projecting portion of the second leg may be configured to slide in a corresponding inwardly projecting portion of another profile of a telescopic drainage gutter. For example, when the gutter profile is configured to be an internal gutter profile, the corresponding external gutter profile may have inwardly projecting portion configured to receive the inwardly projecting portion of the internal gutter profile, thereby guiding and locking the telescopic connection of the two gutter profiles in the height and/or transverse directions. The first leg of the gutter profile may also comprise an inwardly projecting portion, extending from a top of the first leg and into the interior space of the gutter profile. The inwardly projecting portion may be provided by folding the top of the second leg or first leg into the interior space of the gutter profile. The inwardly projecting portion may for example be an open hem or a closed hem.

[0017] Heights, widths, lengths, and distances as used herein are understood as the size of a projection (geometrical) of a part in question onto the relevant direction. Hence, the height of first end section of the second leg is the size of a projection of the first end section onto the height direction and the height of the main section of the second leg is the size of a projection of the main section onto the height direction.

[0018] The first end section of the second leg has a reduced height compared to the main section of the second leg, which allows it to connect another gutter profile having substantially the same cross-section and dimensions as the main portion of the gutter profile. It will thus be understood that the first end section is the portion of the second leg which has a reduced height compared to the main section.

[0019] The reduced height may be constant, i.e. uniform, in the first end section. A first end section having a non-uniform height is also conceivable, for example an embodiment where at least part of the top of the second leg slopes downwards toward the first leg. In embodiments with non-uniform height in the first end section, the height of the first end section is the largest height in the first end section.

[0020] Minor indents or the like in the second leg are not relevant in the context of the invention are not considered as a first end section with reduced height in the context of the invention as such minor indents will not allow for the intended connection to a further gutter profile.

[0021] The first end section of the second leg extends from the first longitudinal end of the gutter profile to the adjoining main section of the gutter profile. Correspondingly, the first end portion of the gutter profile, in which the first end section extends, also extends from the first longitudinal end to the main portion of the gutter profile.

[0022] In some embodiments, the inwardly projecting portion extends from the main section of the second leg of the gutter profile. In this way, the main section provides the guiding-and-locking function previously described, where the inwardly projecting portion receives or is received by a corresponding inwardly projecting portion of another gutter profile. The inwardly projecting portion may extend along the entire main section of the second leg in the longitudinal direction. The inwardly projecting portion extending from the main section of the second leg may be an open hem or a closed hem. The first end section may not have an inwardly projecting portion.

[0023] In some embodiments, the height of the first end section is substantially equal to a free distance in the height direction between the bottom of the gutter profile and a downwardly facing surface of the inwardly projecting portion of the main section which downwardly facing

surface faces the bottom of the gutter profile and is adjacent to the second leg. This may provide for more secure connection to the further gutter profile as the first end section can abut the downwardly facing surface of the inwardly projecting portion of the further gutter profile and thereby be constrained in the further gutter profile, which further gutter profile has the same cross-section in the TH-plane as the main portion of the gutter profile according to the invention. The free distance from an interior surface of the bottom, which interior surface face the interior space of the gutter profile. The free distance is measured in the main section of the gutter profile to the downwardly facing surface of the inwardly projecting portion which surface is adjacent to the second leg of the gutter profile, as the first or second end section will be positioned adjacent to the second leg of the further gutter profile when connected thereto, and may thus engage the downwardly facing surface of the further gutter profile. The downwardly facing surface being adjacent to the second leg may be adjacent in the sense that is positioned within a distance of 5 times, 4 times, 3 times, or 2 times a material thickness of the second leg from the second leg. When comparing the height of the free distance and the first end section, the height of the first end section is suitably measured from between exterior surfaces first end section, as the exterior surfaces will be the surfaces abutting the further gutter profile in the connected state.

[0024] In some embodiments, a distance between an outwardly facing surface of the first leg and an outwardly facing surface of the second leg, a transverse distance between the first and second leg, and a thickness of the bottom extending in the height direction are constant along the entire length of the gutter profile in the longitudinal direction, i.e. the material thickness is substantially the same over the entire length. This may be advantageous as it allows substantially the entire length of the internal gutter profile to be accommodated in the external gutter profile. Further, this may enable easy production of the gutter profiles, as several gutter profile can be produced from one standard profile by cutting.

[0025] In some embodiments, the second leg of the gutter profile comprises a second end section at the second longitudinal end, which second end section is adjoining the main section and arranged sequentially in the longitudinal direction with the main section, and wherein a height of the second end section is less than the height of the adjoining main section. In this way, the gutter profile can connect to further gutter profiles at either longitudinal end thereby allowing the gutter profile to be used regardless of whether the water flow direction is towards the first longitudinal end or toward the second longitudinal end of the gutter profile. In such an embodiment, the gutter profile is also said to have a second end portion, which is the longitudinal portion of the gutter profile in which the second end sections extends. Details and embodiments of the first end section described herein may equally apply to the second end section, hence the height of the second section may for example also be substantially equal to the free distance between the downwardly facing surface of the inwardly projecting portion and the bottom of the gutter profile. Preferably the first and second end section are symmetrical. Preferably, the height of the second end section is equal to the height of the first end section.

[0026] At least a part of the gutter profile may be elastic, which allows the gutter profile to be deformed. As the dimensions of gutter profile in some respects are identical to those of the further gutter profile, the elasticity of the gutter profile or the elasticity of the further gutter profile, allows for deformation when the gutter profile connected to the further gutter profile.

[0027] In some embodiments, the gutter profile is made from sheet metal, preferably steel or aluminium. Such a gutter profile is elastic in the context of the invention.

[0028] In some embodiments, the first end section, and/or the second end section if present, has a length in the longitudinal direction of at least 5 cm, preferably in the range of 5 to 15 cm. More preferably the length is 8 to 12 cm and most preferably about 10 cm. These lengths may provide both an overlap with the further gutter profile of sufficient length to reduce the risk of water entering in between the gutter profiles, and a secure connection between the gutter profile and the further gutter profile.

[0029] It will be appreciated that the embodiment of the gutter profile having both the first end section and the second end section, may also be connected at the same time to the further gutter and to a second, identical gutter profile according to the invention. For example, the gutter profile may be an internal gutter profile which connects to a further internal gutter profile by way of the first end section, which provides an overlap equal to the length of the first end section, which could be 10 cm. A second, identical, internal gutter profile according to the invention may then be connected to the internal gutter profile by arranging the first end section of the second, identical, internal gutter profile in the main portion of the internal gutter profile at the second longitudinal end of the internal gutter profile. The second, identical, internal gutter profile will thus extend through the second end portion of the internal gutter profile and into the main portion of the internal gutter profile, providing an overlap equal to the sum of the lengths of the first end section of the second, identical, internal gutter profile and the second section of the internal gutter profile, which could then be about 20 cm. Hence, it will be appreciated that a plurality of gutter profiles according to the invention can be connected in sequence, such as 2, 3, 4, 5, or more connected in sequence. For use in this manner, it is preferable that the first and second end sections, if present, does/do not comprise portions projecting therefrom, such as an inwardly projecting portion. Hence, the first and second end sections are preferably planar. Such end sections may advantageously be formed by removing a portion of the second leg.

[0030] The elasticity of gutter profiles will typically allow for the height of the first and/or second end section to

exceed the transverse distance between the first and second leg to some extent and still allow for the previously mentioned rotation, as the legs of further gutter profile can yield temporarily during the rotation. In some embodiments, the height of the first end section, and the height of the second section if present, constitutes 110 % of the transverse distance between the first and second leg or less. Said heights may be 109 % of the transverse distance or less, 108 % or less, 107 % or less, 106 % or less, 105 % or less, 104 % or less, 103 % or less, 102 % or less, 101 % or less, 100 % or less, 95 % or less, 90 % or less, of the transverse distance. This facilitates connecting the gutter profile to the further gutter profile as it allows for inserting the first end section, or second section, in the interior space of the further gutter profile at angle to the first and second legs of the further gutter profile and thereafter rotating the gutter profile to connect it to the further gutter profile. This is especially advantageous when the height of the first end section corresponds substantially to the free distance between the downwardly facing surface of the inwardly projecting portion of the main section and the bottom, as previously described, in which case the first end section can snap into place between the bottom and inwardly projecting portion the further gutter profile when rotated into place. This may be referred to as a "snap-lock" connection. It will be appreciated that height of the second leg does not need to 110 % or less of all transverse distances between the first and second leg to provide the advantages mentioned. For example the height of the first end section may not 110 % or less of the transverse distance measured at the inwardly projecting portion of the second leg, but still be 110 % or less of the transverse distance measured elsewhere, for example below the inwardly projecting portion, and thereby still capable of being rotated in to place as previously described.

[0031] In some embodiments, the height of the main section of the second leg is less than a height of the first leg of the gutter profile. The height of the main section is also the overall height of the second leg and the second leg is preferably the shorter of the two legs. This first leg is thus preferably the leg of the gutter profile which is configured to rest on the roof structure.

[0032] In some embodiments, the first and second legs are parallel. In these embodiments, the bottom of the gutter profile is formed by a bottom leg extending between the first and second leg in the transverse direction.

[0033] In some embodiments, the gutter profile further comprises a bottom leg extending between the first and second leg and forming the bottom of the gutter profile, wherein the bottom leg has width in the transverse direction, and the height of the first end section is less than the width of the bottom leg. In this way the gutter profile is easily connected to the further gutter profile by positioning the gutter profile at an angle and rotating it in relation to the further gutter profile as previously described.

[0034] In some embodiments, the first leg of the gutter profile comprises a first end section of the first leg at the first longitudinal end and a main section of the first leg of the gutter profile, wherein a height of the first end section is less than a height of the main section of the first leg. The first end section of the first leg extend the same length as the first end section of the second leg. The first end section and main section of the first leg are arranged sequentially in the longitudinal direction. Similarly, a second end section of the first leg having reduced height compared to the main section of the first leg may be provided at the second longitudinal end.

[0035] In a preferred embodiment of the gutter profile, the first and second legs of the gutter profile are parallel, and a bottom leg extends between the first and second leg perpendicularly to the first and second leg, wherein the height of the main section of the second leg is less than the height of the first leg. The first end section preferably has a length of at least 5 cm and the second leg of the gutter profile further comprises a second end section at the second longitudinal end which second section also has a length of at least 5 cm. Still more preferred the height of the first and second end sections is substantially equal to the free distance between the bottom leg and the downwardly facing surface of the inwardly projecting portion of the main section of the second leg. Still more preferred, the height of the first and second end sections is also 110 % of a transverse distance between the first and second legs of the gutter profile or less, such as 105 % or less or 100 % of the transverse distance or less.

[0036] In a second aspect of the invention, there is provided a telescopic drainage gutter for guiding water away from an aperture in an underroof, which telescopic drainage gutter comprises an internal gutter profile and an external gutter profile, which internal gutter profile is configured for sliding within an interior space of the external gutter profile along a longitudinal direction, wherein the internal gutter profile and/or the external gutter profile is a gutter profile according to first aspect the invention. The telescopic drainage gutter according to the first aspect of the invention may be used by itself as a typical telescopic drainage gutter or to connect to a further gutter profile of a further telescopic drainage gutter. The telescopic drainage gutter according to the invention may advantageously be provided as part of a component collection for a roof window comprising installation or flashing assemblies for roof window installations, which component collection is provided for roof window installations comprising multiple roof windows.

[0037] In a third aspect of the invention there is provided a system comprising a telescopic drainage gutter for guiding water away from an aperture in an underroof and an additional gutter profile according to the first aspect of the invention, which telescopic drainage gutter comprises an internal gutter profile and an external gutter profile, wherein each of the internal and external gutter profiles is elongate and extends in the longitudinal direction and comprises a bottom extending in the longitudinal

direction for guiding away water, a first leg and a second leg, which first and second legs are spaced apart in the transverse direction providing an interior space between the first and second legs, and the second leg of each of the internal and external gutter profiles comprises an inwardly projecting portion extending into interior space at a top of the second leg, which top is opposite to the bottom in the height direction, which internal gutter profile is configured for sliding within the interior space of the external gutter profile along the longitudinal direction, and wherein the additional gutter profile is configured for sliding within the interior space of the external gutter profile along the longitudinal direction, or wherein the additional gutter profile is configured to allow the internal gutter profile to slide within the interior space of the additional gutter profile.

[0038] The additional gutter profile has the first end portion, the main portion and possible second end portion as described in relation to the gutter profile according to first aspect. In the system according to the invention, the additional gutter profile being configured for sliding within the interior space of the external gutter profile along the longitudinal direction, refers to the cross-section of the main portion of the additional gutter profile being substantially equal to the cross-section of the internal gutter profile of the telescopic drainage gutter, which cross-sections refer to the TH-plane. Similarly, when the additional gutter profile is configured to allow the internal gutter profile to slide within the interior space of the additional gutter profile, the cross-section of the main portion of additional gutter profile is substantially equal to the cross section of the external gutter profile.

[0039] The additional gutter profile of the system according to the invention may be provided as part of an additional gutter profile according to the second aspect of the invention.

[0040] The external and internal gutter profiles of the telescopic drainage gutter of the system, may be elastic as previously described in relation to the first aspect of the invention.

[0041] In a fourth aspect of the invention, there is provided method for assembling a system according to third aspect of the invention, comprising the steps of

(a) retracting the internal gutter profile at least partly from the external gutter profile, and
(b) connecting the additional gutter profile to the telescopic drainage gutter by either

(b1) arranging the first longitudinal end of the additional gutter profile in the interior space of the internal gutter profile, in the case where the additional gutter profile is configured for sliding within the interior space of the external gutter profile along the longitudinal direction, or
(b2) arranging the first longitudinal end of the additional gutter profile in the interior space of the external gutter profile in the case where the additional gutter profile is configured to allow the internal gutter profile to slide within the interior space of the additional gutter profile.

[0042] This provides an assembled drainage having at least three gutter profiles connected. Conceivably, step (b) may comprise both (b1) and (b2) with separate additional gutter profiles. Step (b) may additionally or alternatively comprise repeating (b1) or (b2) with separate additional gutter profiles.

[0043] In some embodiments, the method comprises providing a second additional gutter profile according to the first aspect of the invention and connecting the second additional gutter profile to the additional gutter profile as in steps (b1) or (b2). In this way, the assembled drainage gutter can comprise four or more gutter profiles, for example, in the order of the direction of water flow, a second additional internal gutter profile connected to an additional internal gutter profile, connected to the internal gutter profile connected to the external gutter profile.

[0044] In some embodiments of the method for assembling the system, step (b1) or (b2) comprises respectively positioning the additional gutter profile with at least part of the first end section extending in the interior space of the internal gutter profile at an angle to the second leg of internal gutter profile, or in the interior space of the external gutter profile at an angle to the second leg of external gutter profile, and rotating the additional gutter profile in relation to the internal gutter profile or in relation to the external gutter profile about the longitudinal direction. This provides an easy way to connect the gutter profiles, especially when the height of the first end section is substantially equal to the free distance in the height direction between the bottom of the gutter profile and the downwardly facing surface of the inwardly projecting portion of the main section, as the rotation snaps the first end section in between the inwardly projecting portion and bottom of the further gutter profile and thereby snaps the additional gutter profile into the gutter profile.

[0045] In a fifth aspect of the invention, there is provided a method for producing a gutter profile according to the first aspect of the invention, comprising the steps of

- providing a blank,
- shaping the blank to an elongate gutter profile extending in a longitudinal direction and comprising a first longitudinal end, a second longitudinal end, a bottom extending in the longitudinal direction for guiding away water,a first leg, and a second leg, which first and second legs extend in the longitudinal direction and are spaced apart in a transverse direction providing an interior space between the first and second legs, which transverse direction is perpendicular to the longitudinal direction,
- shaping a top of the second leg to provide an inwardly projecting portion extending into interior space from the second leg, which top is opposite to the bottom of the gutter profile in a height direction being per-

pendicular to the longitudinal and transverse directions,

- reducing a height of the second leg in a first end section at the first longitudinal end.

[0046] The blank may be a piece of sheet metal. Shaping the blank and shaping the top portion of the second leg may each comprising folding the blank.

[0047] In some embodiments of the method for producing a gutter profile, the step of reducing the height of the second leg comprises removing part of the second leg. This may for example be cutting away a portion of the second leg to provide the first end section.

[0048] In some embodiments of the method for producing a gutter profile, the step of reducing the height of the second leg comprises folding part of the second leg into the interior space of the gutter profile. This may for example be done making a cut in the top portion the second leg, including the inwardly projecting portion, and folding the portion extending from the cut to the first longitudinal end of the gutter profile towards the bottom of the gutter profile.

[0049] The method for producing the gutter profile may comprise further steps to provide the further features of the embodiments gutter profile described above. Hence, the method may for example comprise reducing a height of the second leg to provide a first end section having a length of at least 5 cm or other lengths disclosed herein. Similarly, the height may be reduced in the method to provide a height of the first end section, which is substantially equal to the free distance between the bottom of the gutter profile and the downwardly facing surface of the inwardly projecting portion of the second leg in the height direction, or to provide a height, which is 110 % of the transverse distance between the first and second legs or less. The method may also comprises steps for providing the second end section of the second leg as described in relation to the first aspect off the invention.

[0050] Further embodiment and advantages of the invention will be apparent from the following detailed description.

Brief description of the drawings

[0051] In the following the invention will be described with references to the enclosed schematic drawings in which

Fig. 1 shows a gutter profile according to the invention in the process of being installed together with a telescopic drainage gutter above three roof windows,

Fig. 2 shows a second longitudinal end of a gutter profile according to the invention,

Fig. 3 shows the first longitudinal end of the gutter profile of Fig. 2,

Fig. 4 shows an internal gutter profile according to the invention having a second end section as seen along a longitudinal direction from the second longitudinal end toward the first longitudinal end,

Fig. 5 shows a cross-section of the internal gutter profile of Fig. 4 in the process of being connected to a further internal gutter profile,

Fig. 6 shows an external gutter profile according to the invention having a second end section as seen along a longitudinal direction from the second end to the first longitudinal end,

Fig. 7 shows a cross-section of the external gutter profile of Fig. 6 in the process of being connected to a further external gutter profile,

Fig. 8 show the first longitudinal end of a gutter profile according to the invention next to a longitudinal end of a further internal gutter profile,

Fig. 9 to 11 show an internal gutter profile according to the invention in the process of being connected to a further internal gutter profile,

Figs. 12 and 13 show systems according the invention comprising a telescopic drainage gutter and additional gutter profiles, and

Figs. 14 and 15 show embodiments of gutter profiles having alternative cross-sections.

Detailed Description of the invention

[0052] Referring initially to Fig. 1 which shows three roof windows 1 installed side-by-side next to each other in a roof structure. A prior art telescopic drainage gutter 2' is shown above two of the roof windows with an internal gutter profile 30' on the left and an external gutter profile 20' on the right. The internal and external gutter profiles 30', 20' are configured to slide lengthwise along longitudinal direction L with respect to each other providing a telescopic connection. The direction of water flow in the telescopic drainage gutter 2' is indicated by an arrow above the telescopic connection. With the internal gutter profile 30' positioned upstream, water will flow down of a shoulder formed at the telescopic connection. The length of the telescopic drainage gutter 2' is seen to be sufficient to span two of the roof windows 1, but not the third. A further, identical telescopic drainage gutter cannot simply be connect to the telescopic drainage gutter 2' as it would provide an external-to-internal profile connection in the direction of water flow which would result in an upwards overlap in the direction of water flow, where water could enter in between the gutter profiles.

[0053] However, an elongate gutter profile 30 according to invention can connect to the telescopic drainage gutter 2' with a downwards overlap in the water flow direction. In Fig. 1 the gutter profile 30 is configured as an internal gutter profile 30, i.e. it has the same dimensions as the internal gutter profile 30' and slide lengthwise in the external profile 20', except at a first longitudinal end 33 of the gutter profile 30 where a height of a second leg of the gutter profile is reduced (see Fig. 3). The gutter profile 30 can be connected to the internal gutter profile 30' upstream thereof, providing a downwards shoulder

in the direction of the water flow. Fig. 1 thus shows an embodiment of the system according to the invention in a non-assembled state. For illustrative purposes the gutter profile 30 in Fig. 1 is configured to connect in a situation where the direction of water flow is towards the right in Fig. 1, but a height of a second leg of the gutter profile 30 could also be reduced at a second longitudinal end 34 of the gutter profile, which allows it to connect in a situation where the telescopic drainage gutter is installed with an inclination where water flows to the left in Fig. 1. Preferably the heights of the second leg are reduced at both the first 33 and second longitudinal ends 34, allowing the gutter profile to be used in both situations. In Fig. 1 and in the following, the first longitudinal end 33 is the right-hand end while the second longitudinal end 34 is the left-hand longitudinal end in the view of Fig. 1, but it is understood that the terms "first longitudinal end" and "second longitudinal end" serve only to distinguish one end from the other. Hence, the first longitudinal end 33 could just as well be the left-hand longitudinal end in the view of Fig. 1. Reference numerals followed by a prime (') are used herein for further gutter profiles to which the gutter profile according to the invention can connect, whereas reference numerals without a prime (') are used for the gutter profile according to the invention. The same reference numeral is used for the same or equal elements in the gutter profile and the further gutter profile.

[0054] Turning now to Fig. 2 and 3 showing details of the second longitudinal end 34 and first longitudinal end 33 of the gutter profile 30 of Fig. 1 respectively. The gutter profile of Fig. 2 and 3 is configured as an internal gutter profile. The gutter profile 30 extends in the longitudinal direction L from the first longitudinal end 33 to the second longitudinal end 34. The gutter profile 30 has a first leg 31 and a second leg 32 spaced apart in a transverse direction T and extending in a height direction H . The first and second legs 31, 32 extend in parallel along the longitudinal direction L from the first to the second longitudinal end 33, 34. The first leg 31 has a greater height than the second leg 32, with the second leg being about 1/3 of the height of the first leg 31. The first leg is configured to rest against the roof structure (not shown) and to be fastened thereto. In this embodiment, a bottom of the gutter profile is formed by a bottom leg 35 extending perpendicularly between the first and second legs 31, 32 providing a rectangular cross-section of the gutter profile 30 in the transverse-height plane (TH-plane). An interior space 300 is provided between the first and second legs 31, 32 forming a channel extending along the longitudinal direction L. Each of the first and second legs 31, 32 are provided with an inwardly projecting portion 310, 320 at their respective tops, and in this embodiment the inwardly projecting portions are configured to be received by and slide lengthwise in corresponding inwardly projecting portions of an external gutter profile (not shown). At the second longitudinal end 34 shown in Fig. 2, the inwardly projecting portion 320 of the second leg extends to the second longitudinal end 34 and the height of the second leg is not reduced at the second longitudinal end 34. However, at the first longitudinal end 33 a portion of the second leg 32 has been removed, thereby providing a section of the second leg having a reduced height compared to the remaining section of second leg 32. The section having reduced height constitutes the first end section 323 and the remaining section of the second leg constitutes the main section 325. In this embodiment, the first end section 323 does not have an inwardly projecting portion at the top. The demarcation of the first end section 323 and main section 325 is indicated by plane P1, where the portion of the gutter profile 30 to the right of plane P1 in Fig. 3 is identified as the first end portion of the gutter profile 30 and the portion to the left of the plane P1 is identified as a main portion of the gutter profile 30. In this embodiment, the main section 325 of the second leg and the main portion of the gutter profile extends to the second longitudinal end 325. The first end section 323 has a free edge 3230 at a top of the first end section 323. The first end section 323 allows the gutter profile 30 to be inserted in an interior space of further internal gutter profile (not shown), which further gutter profile has a cross-section in the TH-plane equal to the cross-section of the main portion of gutter profile 30 (hence the further gutter profile (not shown) would look like the gutter profile shown in Fig. 2).

[0055] Turning now to Fig. 4 showing another gutter profile 30 according to the invention as seen from the second longitudinal end toward the first longitudinal end. The embodiment of Fig. 4 has a second end section 324 of the second leg 32 having reduced height compared to the main section 325 of the second leg. A portion 321 of the inwardly projecting portion which extends in to the interior space 300 of the second leg 32 has been folded down toward the bottom 35 to reduce the height of the second leg and thereby provide a second end section 324 of the second leg at the second longitudinal end. In the second end section 324 there is a free edge 3240 at the top of the second leg and a height He1 of the second end section 324 extends between the free edge 3240 and bottom 35 (measured to an exterior surface of the bottom 35). A height of the main section Hm of the second leg, extending between the bottom 35 and the inwardly projecting portion 320 of the main section, is also shown and is seen to be greater than height He1. In this embodiment He1 is about 90 % of Hm. A transverse distance Dt between the first and second legs 31, 32 is also shown along with a free distance Dm between an inwardly facing surface of the inwardly projecting portion 320 of the main section of the second leg and an interior surface of the bottom 35. The free distance Dm is measured internally in the gutter profile to the downwardly facing surface of the inwardly projecting surface 320, which downwardly facing surface is adjacent to the second leg 32. In the embodiment of Fig. 4, the downwardly facing surface adjacent to the second leg is the surface of the closed hem which makes up the inwardly projecting portion 320. The height He1 is substantially equal to the free distance Dm

which allows the second end section 324 to be positioned and snap in place between the bottom and inwardly projecting portion of a further gutter profile which corresponds to the main portion of the gutter profile. Similarly, height He1 is slightly less than transverse distance Dt allowing the second end section 324 to be arranged at an angle, e.g. perpendicularly, between the first and second legs of said further gutter profile. Fig. 4 shows the second longitudinal end of the gutter profile 30, but the first longitudinal end may have the same configuration, which would then be a mirror of the view in Fig. 4.

[0056] Fig. 5 which shows a cross-section of gutter profile 30 in the process of being connected to a further gutter profile 30' having as first leg 31' and a second leg 32'. The cross-sectional plane of Fig. 5 is a TH-plane with a longitudinal position near the first longitudinal end of the gutter profile 30 as seen in a direction toward the first longitudinal end. The gutter profile 30 is configured as the one in Fig. 4, although Fig. 5 shows the first longitudinal end and the first end section 323 of the gutter profile 30. The further gutter profile 30' is configured as the main portion of the gutter profile shown in Fig. 4, hence height Hm' is equal to height Hm, free distance Dm' is equal to free distance Dm, and distance Dt' is equal to distance Dt. As can be seen the height He1 of first end section 323 is such that the first end section 323 can be positioned in the interior space 300' of the further gutter profile 30' at an angle to the first and second legs 31', 32' of the further gutter profile 30'.- When the gutter profiles are arranged as in Fig. 5, the gutter profile 30 can be rotated about the longitudinal direction as indicated by the curved arrow to connect the two profiles, whereby the first end section 323 will snap in between the bottom 35' and inwardly projecting portion 320' of the further gutter profile 30'. In this connected state (not shown) the legs of the gutter profile 30 and further gutter profile 30' will not extend in parallel. For example, bottom 35 and bottom 35' will be slightly inclined in relation to each other and similarly for the first leg 31 and first leg 31'. The material of the gutter profiles, such as metal, is elastic and or deformable, allowing the legs to deform when the gutter profiles are connected.

[0057] Turning now to Figs. 6 and 7 showing the same views as Figs. 4 and 5 but of an embodiment where the gutter profile 20 and further gutter profile 20' are configured to be external gutter profiles. The first end section 223 and second end section 224 have obtained by removing a portion of the second leg 22 including part of the inwardly projecting portion 220. The free edge 2240 of the second leg 32 in the second section 224 is not visible in the cross-section of Fig. 6 but is indicated by the reference number 2240 and height He1 of the second end section 224. The corresponding free edge 2230 at the first end section 223 is visible in Fig. 7. As in Figs. 4 and 5, height He1 of the first 223 and second end section 224 in Figs. 6 and 7 is less than the height Hm of the main section of the second leg 32, is substantially equal to free distance Dm and free distance Dm' between the bottom 25 and inwardly projecting portion 220, is less than distance Dt between the first leg 21 and second leg 22 of the gutter profile 20 and is less than distance Dt' between the first leg 21' and second leg 22' further gutter profile 20'. The inwardly projecting portions 220, 220' of the external gutter profiles in Figs. 6 and 7 are open hems whereas the inwardly projecting portions 320, 320' of the internal gutter profiles shown in Figs. 4 and 5 are closed hems. Hence, the downwardly facing surface of the inwardly projecting portion 220, 220' which is adjacent to the second leg 22, 22' and to which the free distance Dm is evaluated, is inside the open hem which makes up the inwardly projecting portion 220, 220' as indicated in Figs. 5 and 6. Figs. 4-7 shows how the gutter profiles 20, 30 according to the invention can be used to establish an internal-to-internal connection or external-to-external connection in a manner suitable for water drainage. In addition, the interior gutter profiles 30, 30' of Fig. 4 and 5 are configured to slide lengthwise in the interior space of the external profiles 20, 20' of Figs. 6 and 7 in the typical telescopic manner (not shown). The gutter profile 20 has a distance De between an outwardly facing surface of the first leg and an outwardly facing surface of the second leg. The distances De and Dm are constant along the entire length of the gutter profile.

[0058] Turning now to Fig. 8 which shows part of internal gutter profile 30 according to the invention at the first longitudinal end 33 thereof next to a longitudinal end of a further internal gutter profile 30'. Plane P1 divides the gutter profile 30 into a first end portion to the right of plane P1 in which the first end section 323 of the second leg 32 extends, and into the main portion to the left of the plane P1 in which the main section 325 of the second leg 32 extends. In this embodiment, the height He1 of the first end section 323 has been reduced by cutting part of the second leg including the inwardly projecting portion away from the second leg. The remaining inwardly projecting portion 320 extends in the main section 325 of the second leg. The height He1 of the first end section 323 is measured to the free edge 3230 at the top of the second leg and is less than the height of the main section Hm which is measured to the free edge 3250 at the top of the main section 325. The first end section 323 extends to the first longitudinal end 33 and has a length Le in the longitudinal direction which is here about 10 cm. The first leg 31 of the gutter profile is provided with a plurality of openings 37, of which only one is shown in Fig. 8, which openings are provided to receive fasteners for attaching the gutter profile 30 to the roof structure (not shown). A further opening 36 is provided in the first leg 31, the purpose of which is described below. The further gutter profile 30' has the same dimensions as the main portion of the gutter profile 30, hence first leg 31' is equal to first leg 31 and second leg 32' is equal to the main section 325 of the second leg 32 whereby height Hm' is equivalent to height Hm.

[0059] The sequence of Figs. 9 to 11 shows the process of connecting an internal gutter profile 30 according

to the invention to a further internal gutter profile 30'. In Fig. 9 the second longitudinal end 34 of the gutter profile 30 is arranged in the interior space of the further gutter profile 30', with the second end section 324 of the second leg 32 extending perpendicularly to the first and second legs 31', 32' of the further gutter profile 30'. The second section 324 and thus also the second end portion of the gutter profile) is to the left of plane P2 while the main section 325 of the second leg (and thus also the main portion of the gutter profile 30) is to the right of plane P2. The second section 324 corresponds to the first end section 323 shown in Fig. 8. Positioning the gutter profiles as in Fig. 9 at an angle to each other facilitates the first step of connecting the gutter profiles where sliding the gutter are arranged to overlap. In the next step, the profiles 30, 30' are rotated in relation to each other about the longitudinal direction L whereby part of the second section 325 snaps in between the inwardly projecting portion 320' and bottom (not visible) of the further gutter profile 30' as shown in Fig. 10. Subsequently, the gutter profile 30 is slid lengthwise into the further gutter profile 30' to arrive at an assembled state which is shown in Fig. 11. As can be seen in Fig. 11 both gutter profiles have a plurality of openings 37, 37' in their first legs 31, 31', but the gutter profile 30 according to the invention is also provided with the further opening 36, which is positioned to align with an opening 37 of the further gutter profile 30', which opening 37 is proximal to the longitudinal end when the gutter profiles are mounted with the correct overlap and allowing fastener to extend through both gutter profiles through opening 36. In the assembled state shown in Fig. 11 the entirety of the second end section (not visible) overlaps with the further gutter profile 30', hence the overlap has length Le. As can be seen, the first leg 31 is not parallel with first leg 31' in the assembled state shown, nor is the two bottom legs (not visible) parallel but are inclined in relation to each other. Hence, there is a gap between the gutter profiles 30, 30' in the height direction in the overlap of the gutter profiles. The gutter profiles are in this embodiment made from sheet metal, aluminium, and the gutter profiles are elastic, allowing them to be slightly deformed in the assembled state. If fastener (not shown) is inserted through openings 36, 37', the first legs 31, and 31' will be forced more closely together. Water drains from the gutter profile 30 to the further gutter profile 30' in Fig. 11, water does not flow directly into the gap between the gutter profiles. In addition, the length Le is sufficient to minimize the risk of water "backwards" below the gutter profile 30. In this embodiment, the length Le is about 10 cm.

[0060] Turning now to Fig. 12 which shows system according to the invention with a telescopic drainage gutter 2' having an internal gutter profile 30' and an external gutter profile 20', which are telescopically connected, and an additional gutter profile 30, which is equivalent in dimensions to the internal gutter profile 30' except for the reduced height of the second leg 32 at the fist longitudinal end 33 and second longitudinal end 34 providing first end section 323 to the of right plane P1 and the second end section 324 to the left of plane P2, with the main section 325, adjoining both end sections and extending between planes P1 and P2. The first end section 323, main section 325 and second end section 324 are arranged sequentially in the longitudinal direction L. The additional gutter profile 30 is shown apart from the telescopic drainage gutter in a non-assembled state of the system. When the system is in the assembled state the gutter profile 30 will be connected to the internal gutter profile 30', which will provide three gutter profiles in sequence with suitable overlaps in the direction of water flow (to the right). Further additional gutter profiles (not shown) may be connected to the additional gutter profile 30 to provide more than three profiles in sequence. In this case a second gutter profile (not shown) identical to the additional gutter profile 30 will be connected by positioning the first end section of the second additional gutter profile (not shown) in the main portion of the internal gutter profile 30 from the second longitudinal end 34. In this case the overlap between the second additional gutter profile (not shown) and additional gutter profile 30, will be twice the length Le.

[0061] Fig. 13 shows another embodiment similar to Fig. 12 but where the additional gutter profile 30 is provided as part of an additional telescopic drainage gutter which also comprises an additional external gutter profile 20 with the first end section 223 to the right of plane P1, the second end section 224 to the left of plane P2, and main section 225 extending in between planes P1 and P2. The order in which the four gutter profiles are to be connected is shown, with the additional internal gutter profile 30 to be connected to internal gutter profile 30' by means of first end section 323, the internal gutter profile 30' in turn connected telescopically with the additional external gutter profile 20, which then is to connect by means of the first end section 223 to the external gutter profile 20'. In both Figs. 12 and 13 the flow of water is to the right, but it will be understood that the flow of water could be toward the left, in which case the systems would be assembled in a mirrored fashion, using the second end sections 224, 324 of the further gutter profiles.

[0062] Figs. 14 and 15 show cross-sectional views of embodiments of gutter profiles according to the invention having alternative cross-sections. Fig. 14 shows a V-shaped gutter profile while Fig. 13 shows an embodiment having a round bottom. Both figures show heights He1 of the first end section 325 which are less than the heights Hm of the main sections 325 which is indicated with dashed lines. A distance Dt which is greater than heights He1 is indicated along with free distance Dm between the bottom 35 and inwardly projecting portion 320 of the main section 325.

List of reference numerals

[0063]

1	Roof windows

2’	Telescopic drainage gutter
20’	Further internal gutter profile
30’	Further external gutter profile
21’, 31’	First leg of further gutter profile
22’, 32’	Second leg of further gutter profile
37’	Opening
220’, 320’	Inwardly projecting portion of further gutter profile
200’, 300’	Interior space of further gutter profile
Hm’	Height of second leg of further gutter profile
Dm’	Distance in height direction
Dt’	Transverse distance
20	Internal gutter profile
30	External gutter profile
21, 31	First leg of gutter profile
22, 32	Second leg of gutter profile
23, 33	First longitudinal end of gutter profile
24, 34	Second longitudinal end of gutter profile
25, 35	Bottom, Bottom leg
200, 300	Interior space of gutter profile
310	Inwardly projecting portion of first leg
220, 320	Inwardly projecting portion of second leg
321	Folded part of inwardly projecting portion
223, 323	First end setion of second leg
224, 324	Second end setion of second leg
225, 325	Main section of second leg
2230, 3230	Free edge at top of first end section
2240, 3240	Free edge at top of second end section
3250	Free edge at top of main section
36	Opening
37	Opening
L	Longitudinal direction
T	Transverse direction
H	Height direction
He1	Height of first end section and second end section
Hm	Height of main section of second leg
Dm	Free distance in height direction
Dt	Transverse distance
Le	Length of first end section
P1	Plane
P2	Plane

Claims

1. A gutter profile (20, 30) for a telescopic drainage gutter (2) for guiding water away from an aperture in an underroof,

said gutter profile (20, 30) being an elongate gutter profile (20, 30) extending in a longitudinal direction (L) and comprising a first longitudinal end (23, 33), a second longitudinal end (24, 34), a bottom (25, 35) extending in the longitudinal direction for guiding away water, a first leg (21, 31), and a second leg (22, 32), which first and second legs extend in the longitudinal direction (L) and are spaced apart in a transverse direction (T) providing an interior space (200, 300) between the first (21, 31) and second legs (22, 32),which transverse direction (T) is perpendicular to the longitudinal direction (L),

wherein the second leg (22, 32) of the gutter profile (20, 30) comprises an inwardly projecting portion (220, 320) extending into the interior space (200, 300) at a top of the second leg which top is opposite to the bottom of the gutter profile in a height direction (H) being perpendicular to the longitudinal and transverse directions,

characterized in that

the second leg (22, 32) of the gutter profile comprises a first end section (223, 323) at the first longitudinal end (23, 33) and a main section (225, 325) adjoining the first end section (223, 323), which first end section and main section are arranged sequentially in the longitudinal direction,

and **in that** a height (He1) of the first end section (223, 323) in the height direction is less than a height (Hm) of the adjoining main section (225, 325) in the height direction.

2. A gutter profile (20, 30) according to claim 1, wherein the inwardly projecting portion extends from the main section (225, 325) of the second leg (22, 32) of the gutter profile.

3. A gutter profile (20, 30) according claim 2, wherein the height (He1) of the first end section is substantially equal to a free distance (Dm) in the height direction between the bottom (25, 35) of the gutter profile and a downwardly facing surface of the inwardly projecting portion (220, 320) of the main section (225, 325), which downwardly facing surface faces the bottom (25, 35) of the gutter profile and is adjacent to the second leg (22, 32).

4. A gutter profile (20, 30) according to any one of the preceding claims, wherein second leg (22, 32) of the gutter profile comprises a second end section (224, 324) at the second longitudinal end (24, 34), which second end section (224, 324) is adjoining the main section (325) and arranged sequentially in the longitudinal direction with the main section (325), and wherein a height of the second end section is less than the height (Hm) of the adjoining main section.

5. A gutter profile (20, 30) according to any one of the preceding claims, wherein the first end section (223, 323), and/or the second end section (224, 324) if present, has a length (Le) in the longitudinal direction of at least 5 cm, preferably in the range of 5 to 15 cm.

6. A gutter profile (20, 30) according to any one of the

preceding claims, wherein the height (He1) of the first end section, and/or the height of the second end section (224, 324) if present, constitutes 110 % of a transverse distance (Dt) between the first (21, 31) and second leg (22, 32) or less, such as 105 % or less or 100 % of the transverse distance or less.

7. A gutter profile (20, 30) according to any one of the preceding claims, wherein the height (Hm) of the main section of the second leg (225, 325) is less than a height of the first leg (21, 31) of the gutter profile.

8. A gutter profile (20, 30) according to any one of the preceding claims, wherein the first (21, 31) and second legs (22, 32) are parallel.

9. A gutter profile (20, 30) according to any one of the preceding claims, further comprising a bottom leg (25, 35) extending between the first and second leg and forming the bottom of the gutter profile (20, 30), wherein the bottom leg has width in the transverse direction (T), and the height of the first end section is less than the width of the bottom leg.

10. A gutter profile (20. 30) according to any one of the preceding claims, wherein at least a part of the gutter profile is elastic, allowing the gutter profile to be deformed, preferably wherein the gutter profile is made from sheet metal, more preferably steel or aluminium.

11. A telescopic drainage gutter (2) for guiding water away from an aperture in an underroof, which telescopic drainage gutter (2) comprises an internal gutter profile (30) and an external gutter profile (20), which internal gutter profile (30) is configured for sliding within an interior space of the external gutter profile along a longitudinal direction (L),
wherein the internal gutter profile (20) and/or the external gutter profile (30) is a gutter profile according to any one of claims 1 to 10.

12. A system comprising a telescopic drainage gutter for guiding water away from an aperture in an underroof and an additional gutter profile (20, 30) according to any one of claims 1 to 10,

which telescopic drainage gutter (2') comprises an internal gutter profile (30') and an external gutter profile (20'),
wherein each of the internal and external gutter profiles (20', 30') is elongate and extends in the longitudinal direction and comprises a bottom extending in the longitudinal direction for guiding away water, a first leg (21', 31') and a second leg (22', 32'), which first and second legs are spaced apart in the transverse direction providing an interior space (200', 300') between the first and second legs, and the second leg of each of the internal and external gutter profiles (22', 32') comprises an inwardly projecting portion (220', 320') extending into interior space at a top of the second leg (22', 32'), which top is opposite to the bottom in the height direction,
which internal gutter profile (30') is configured for sliding within the interior space (200') of the external gutter profile (20') along the longitudinal direction,
and

wherein the additional gutter profile (30) is configured for sliding within the interior space (200') of the external gutter profile (20') along the longitudinal direction, or
wherein the additional gutter profile (20) is configured to allow the internal gutter profile (30') to slide within the interior space (200) of the additional gutter profile (20).

13. A method for assembling a system according to claim 12, comprising the steps of

(a) retracting the internal gutter profile (30') at least partly from the external gutter profile (20'), and
(b) connecting the additional gutter profile (20, 30) to the telescopic drainage gutter by either

(b1) arranging the first longitudinal end (33) of the additional gutter profile (30) in the interior space (300') of the internal gutter profile (30'), in the case where the additional gutter profile (30) is configured for sliding within the interior space (200') of the external gutter profile (20') along the longitudinal direction, or
(b2) arranging the first longitudinal end (23) of the additional gutter profile (20) in the interior space (200') of the external gutter profile (20') in the case where the additional gutter profile (20) is configured to allow the internal gutter profile (30') to slide within the interior space (200) of the additional gutter profile (20).

14. A method for assembling according to claim 13, wherein step (b1) or (b2) comprises respectively positioning the additional gutter profile (20, 30) with at least part of the first end section (223, 323) extending in the interior space (300') of the internal gutter profile (30') at an angle to the second leg (32') of internal gutter profile (30'), or in the interior space (200') of the external gutter profile (20') at an angle to the second leg (22') of external gutter profile (20'), and rotating the additional gutter profile (20, 30) in relation to the internal gutter profile (30') or in relation to

the external gutter profile (20') about the longitudinal direction.

15. A method for producing a gutter profile according to any one of claims 1 to 10, comprising the steps of

- providing a blank,
- shaping the blank to an elongate gutter profile (20, 30) extending in a longitudinal direction (L) and comprising a first longitudinal end (23, 33) and a second longitudinal end (24, 34), a bottom extending in the longitudinal direction for guiding away water, a first leg (21, 31), and a second leg (22, 32), which first and second legs extend in the longitudinal direction (L) and are spaced apart in a transverse direction (T) providing an interior space (200, 300) between the first (21, 31) and second legs (22, 32), which transverse direction (T) is perpendicular to the longitudinal direction (L),
- shaping a top of the second leg (22, 32) to provide an inwardly projecting portion (220, 320) extending into interior space (200, 300) from the second leg, which top is opposite to the bottom of the gutter profile in a height direction (H) being perpendicular to the longitudinal and transverse directions,

characterized in that the method further comprises

- reducing a height of the second leg (22, 32) in a first end section at the first longitudinal end.

16. A method for producing according to claim 15, wherein reducing the height of the second leg comprises removing part of the second leg (22, 23).

17. A method for producing according to claim 15, wherein reducing the height of the second leg comprises folding part of the second leg (22, 23) into the interior space of the gutter profile.

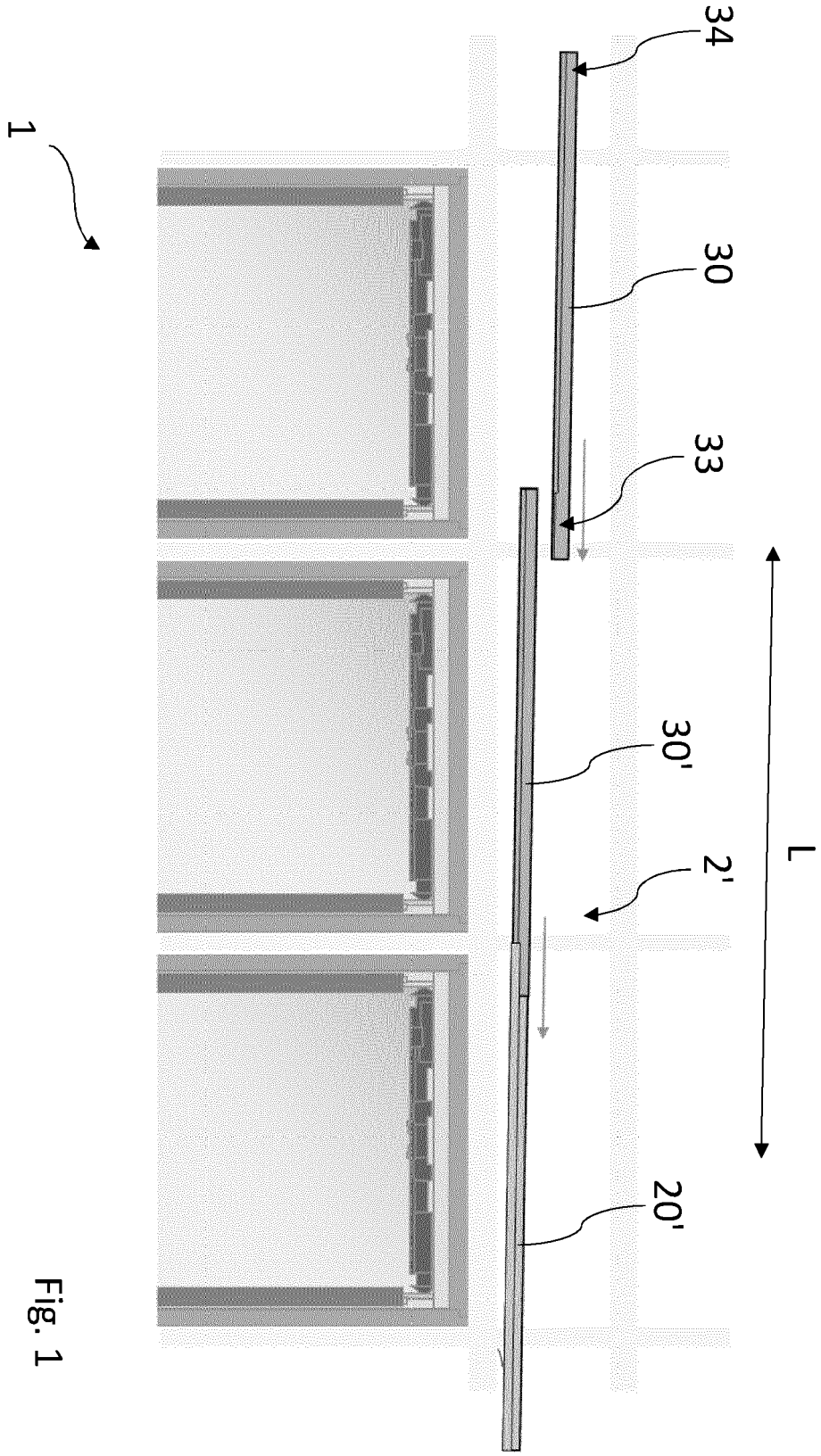

Fig. 1

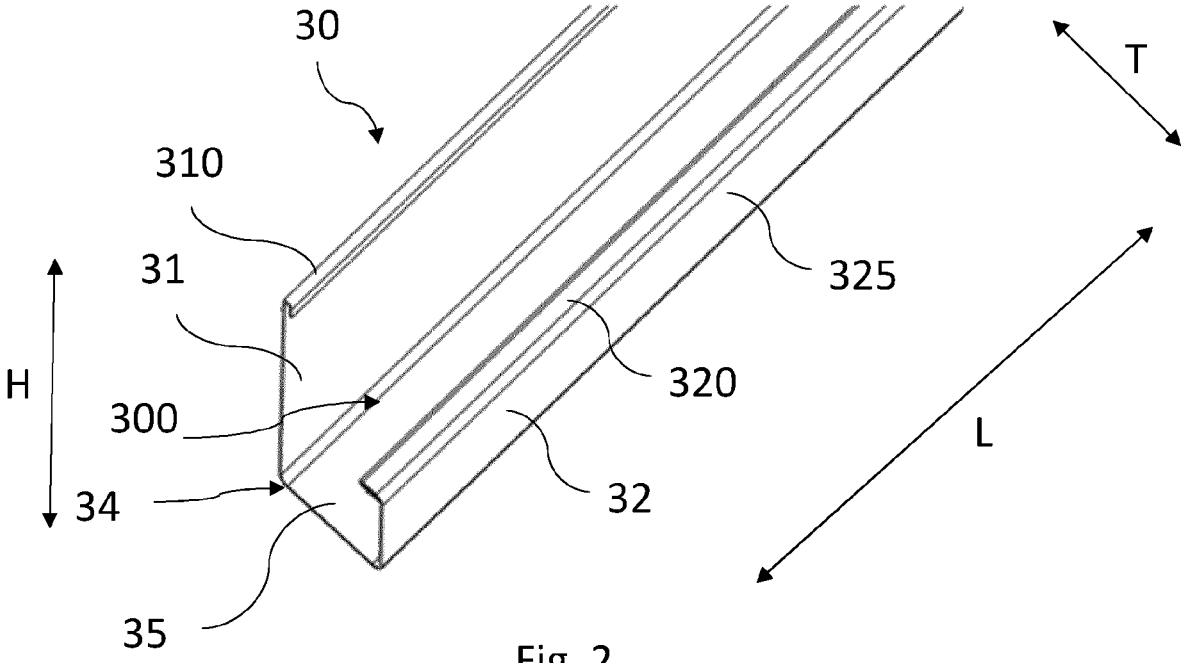
30
T
310
31
325
H
320
300
L
32
34
35

Fig. 2

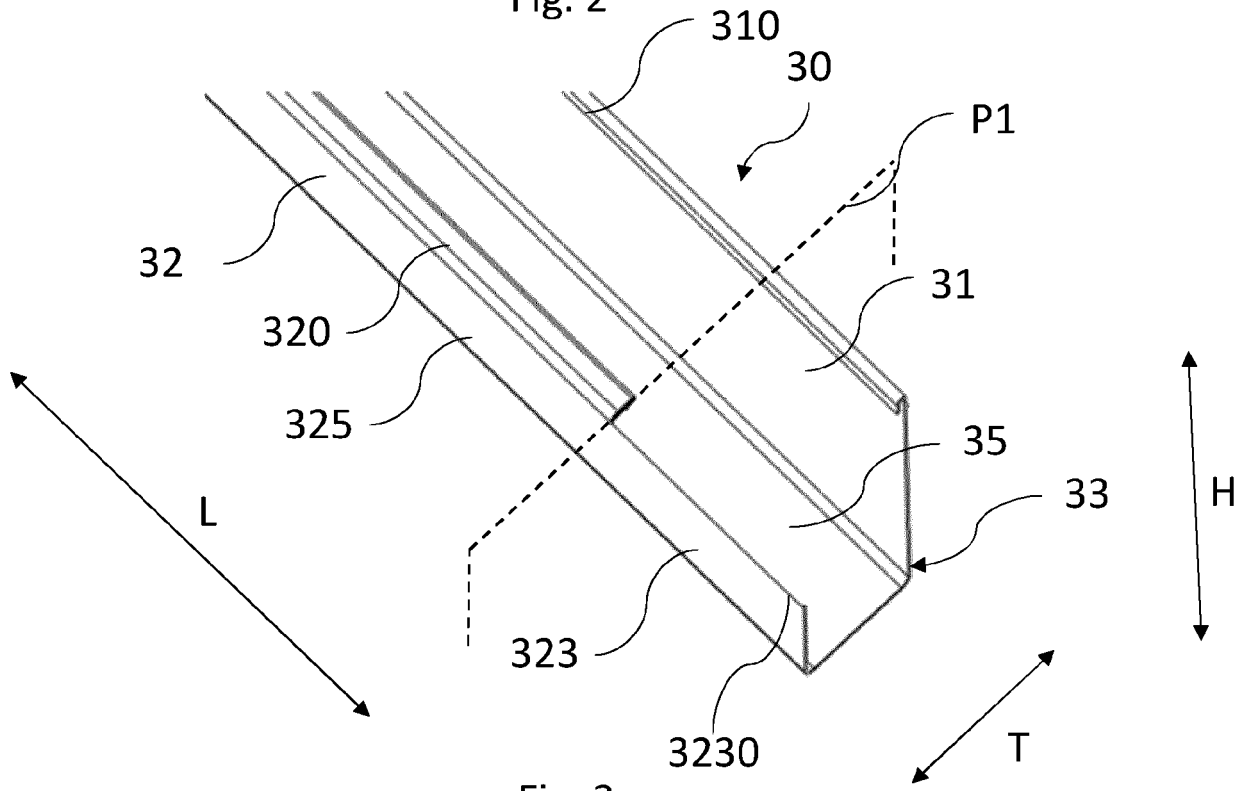
310
30
P1
32
31
320
325
35
H
33
L
323
3230
T

Fig. 3

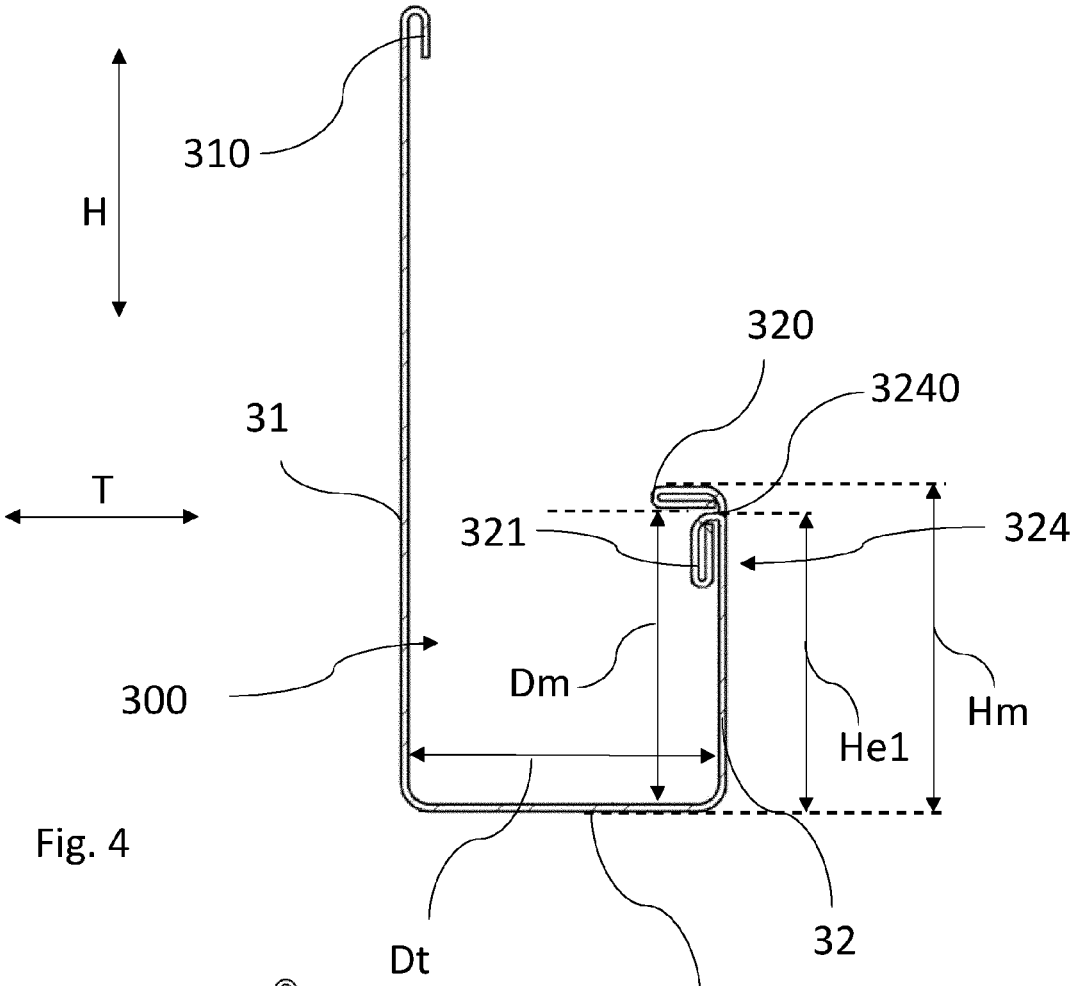
310
H
320
3240
31
T
321
324
300
Dm
Hm
He1
Dt
35
32

Fig. 4

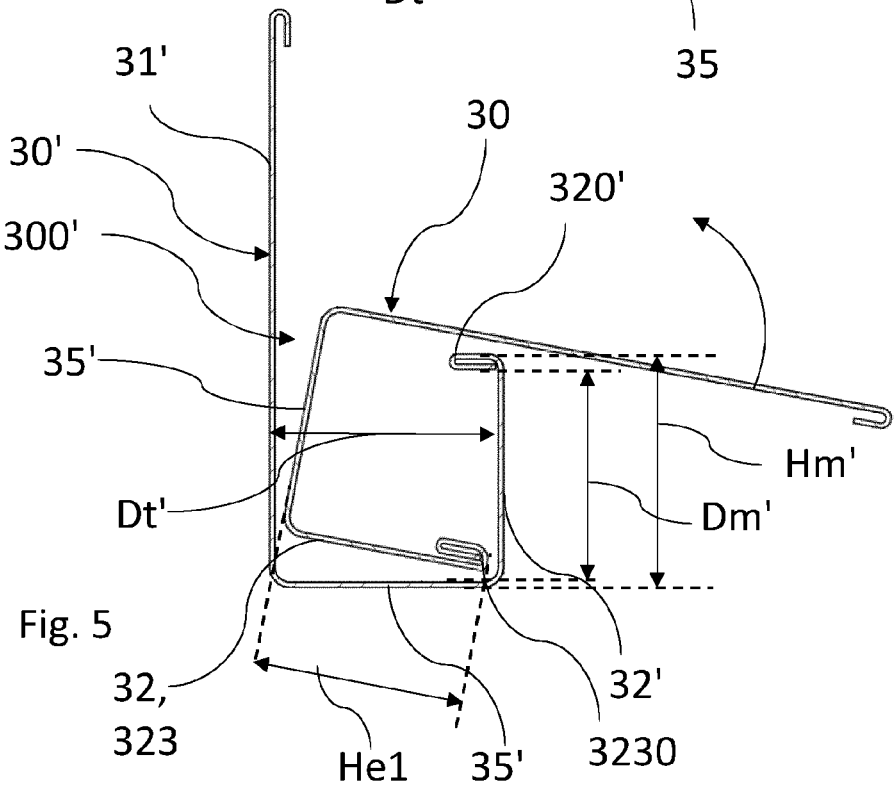
31'
30
30'
320'
300'
35'
Hm'
Dt'
Dm'
32,
323
He1
35'
32'
3230

Fig. 5

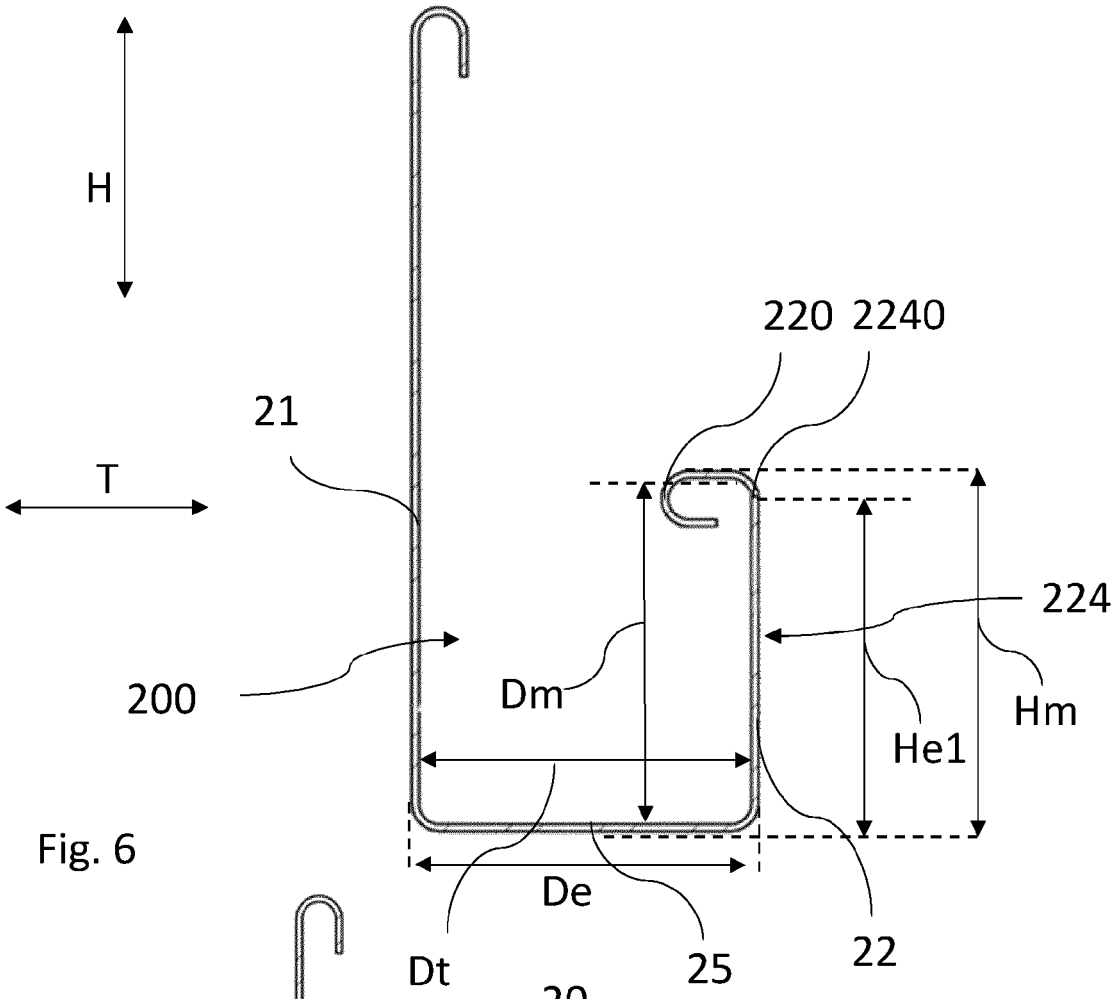
H
T
21
220
2240
224
200
Dm
Hm
He1
De
Dt
25
22

Fig. 6

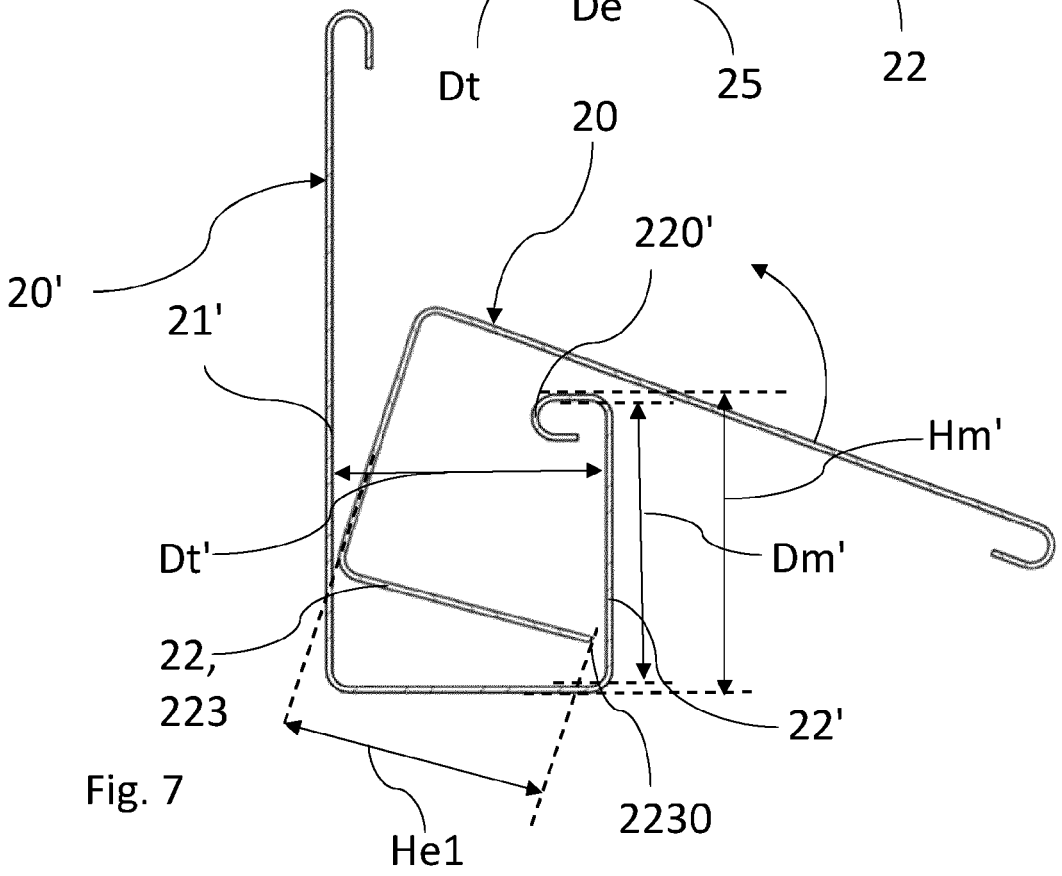
20'
21'
20
220'
Hm'
Dt'
Dm'
22,
223
22'
2230
He1

Fig. 7

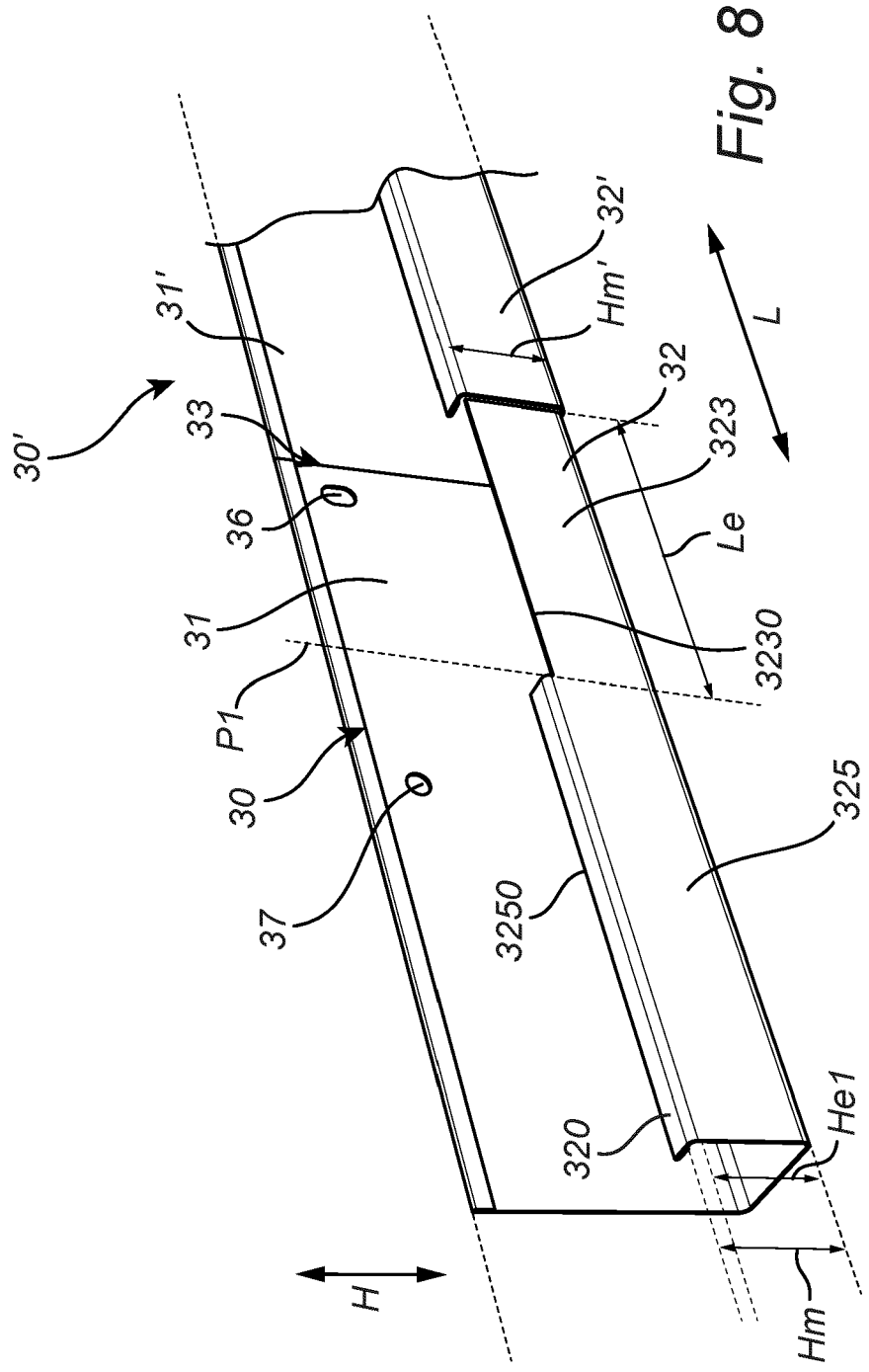
30'
31'
33
36
θ
31
P1
30
37
θ
32'
Hm'
32
323
L
Le
3230
325
3250
320
He1
H
Hm

Fig. 8

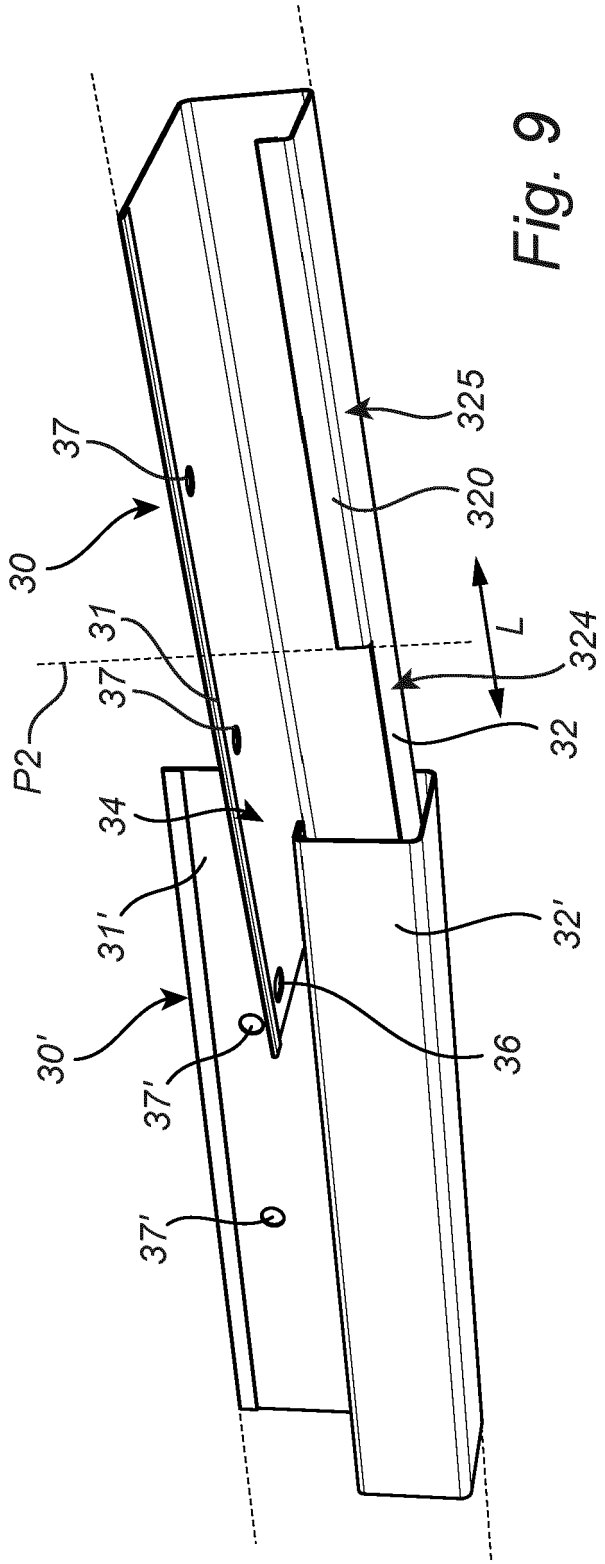

Fig. 9

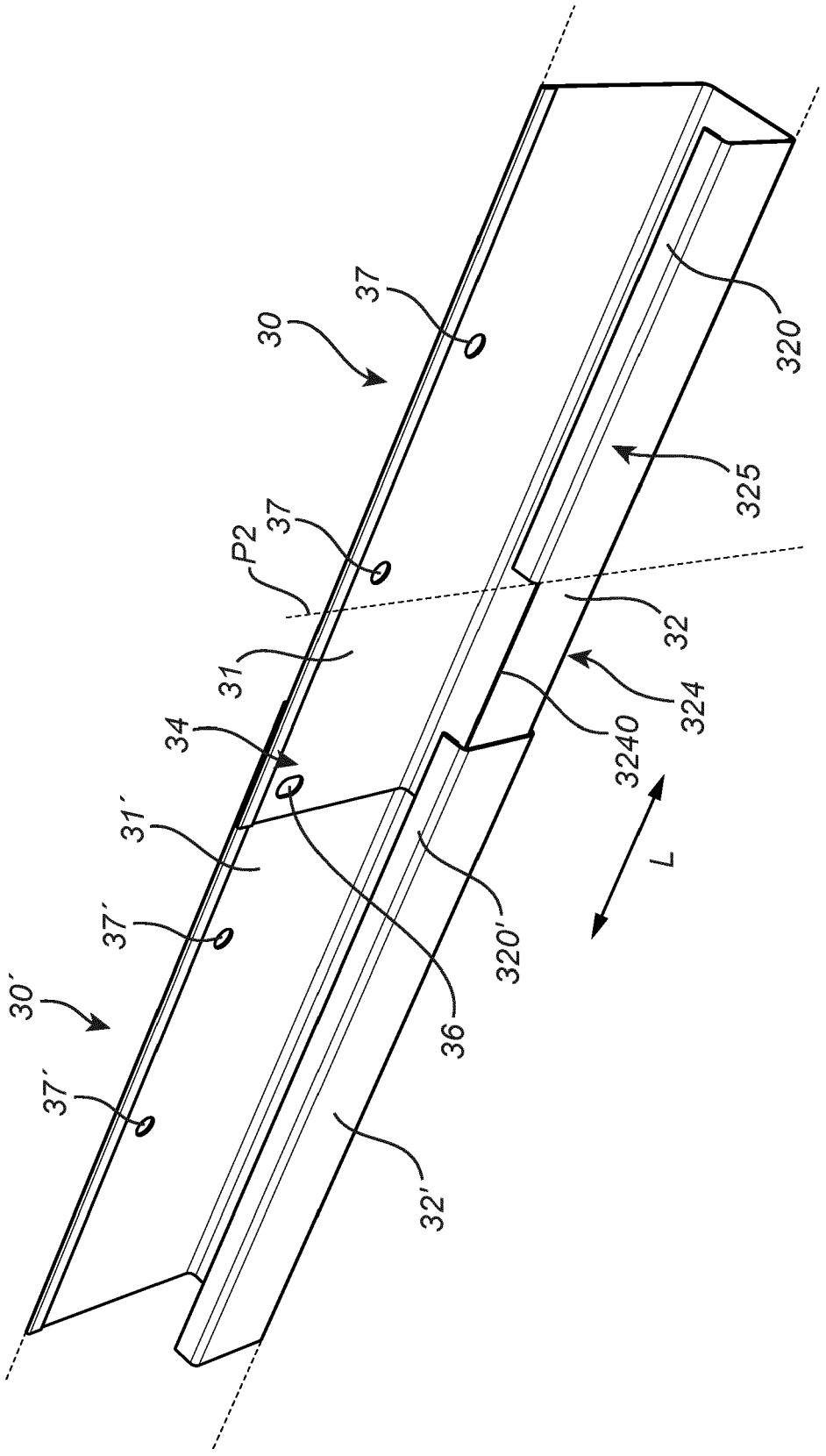

Fig. 10

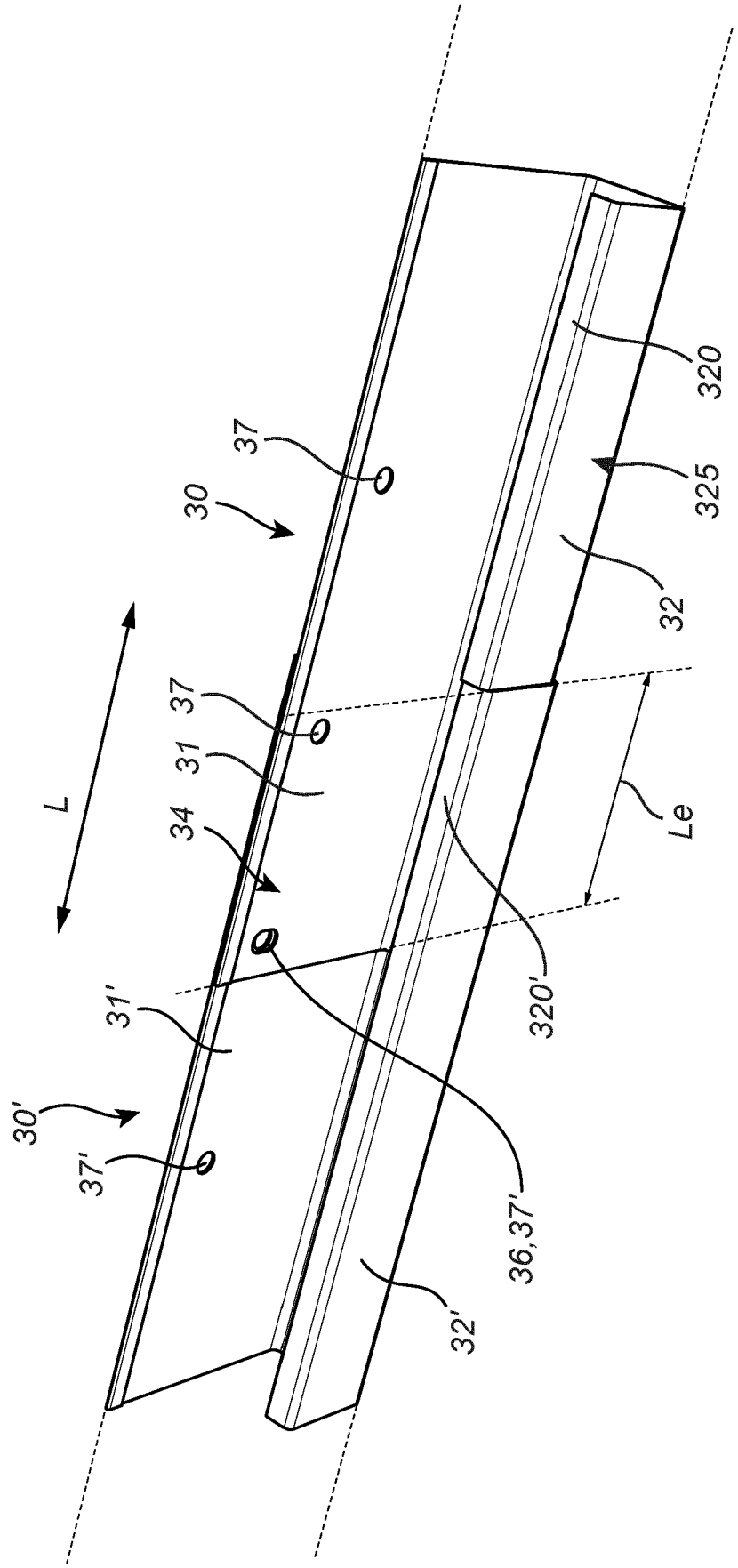

Fig. 11

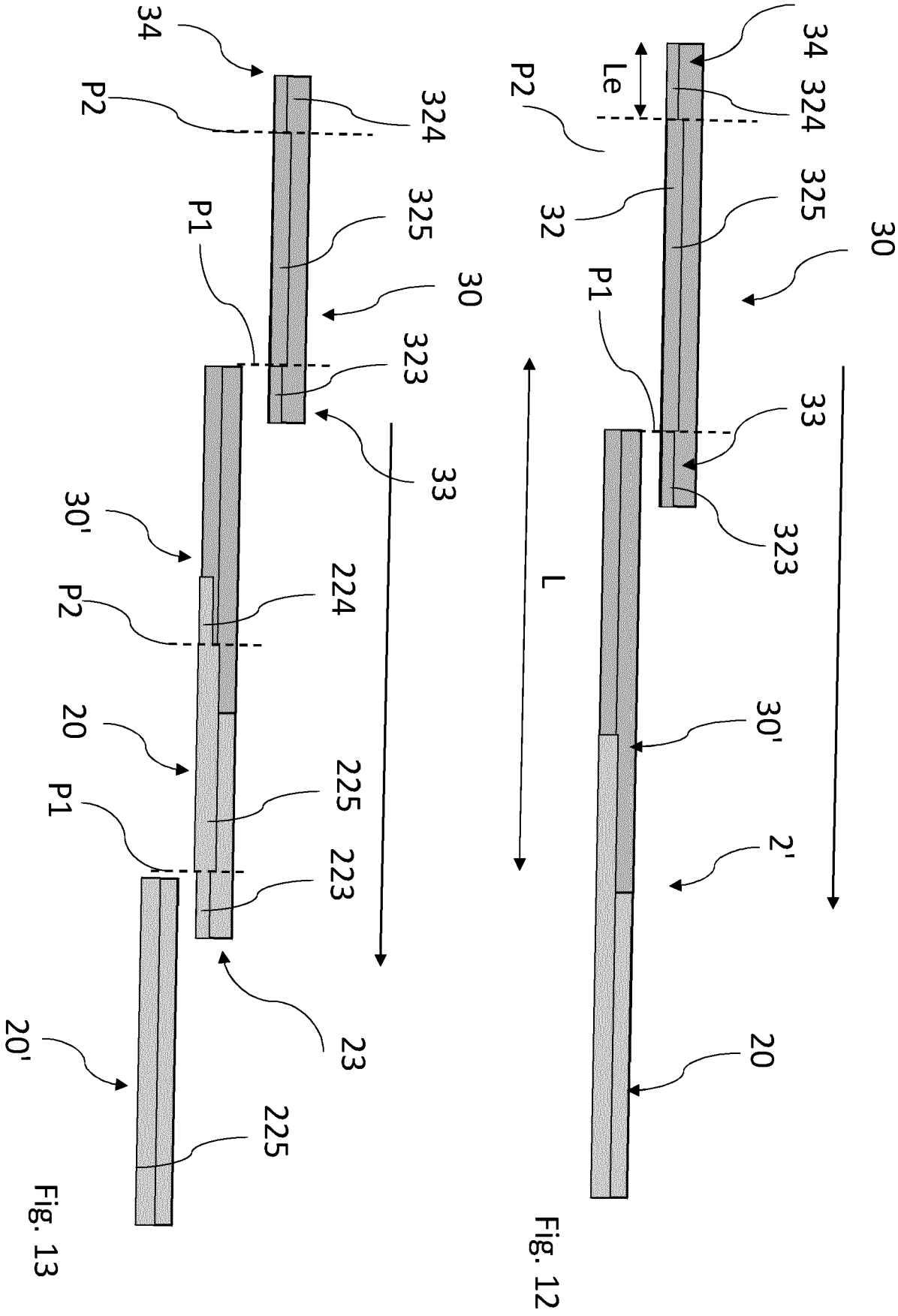
34
324
Le
P2
32
325
30
P1
33
323
L
30'
2'
20

Fig. 12

34
P2
324
325
P1
30
323
33
30'
P2
224
20
225
P1
223
23
20'
225

Fig. 13

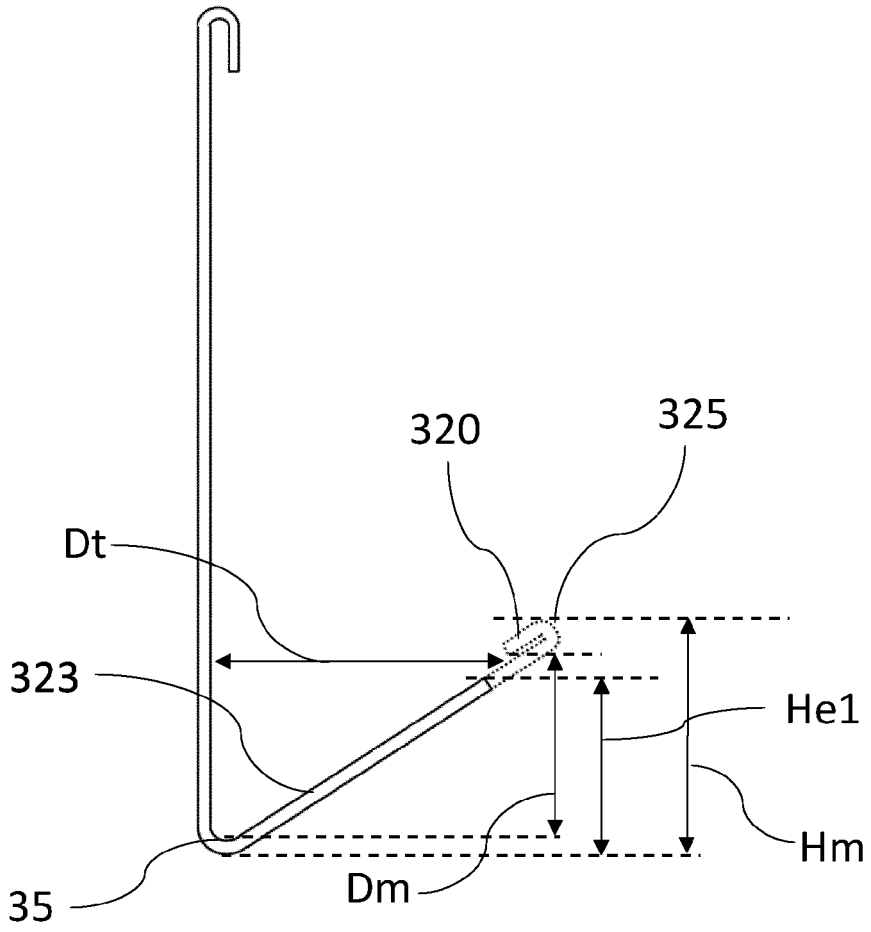

Fig. 14

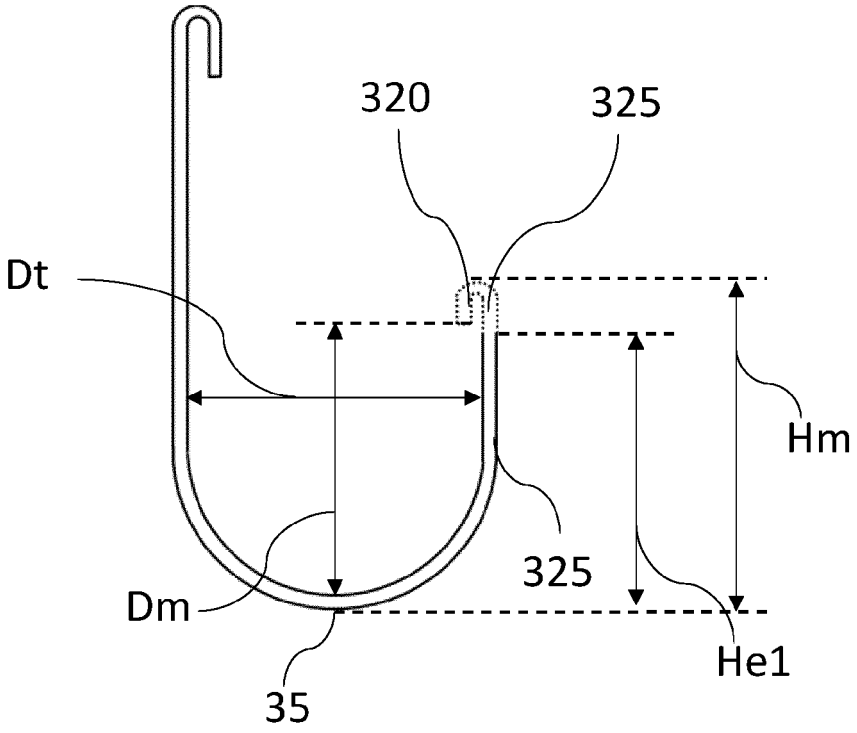

Fig. 15

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EUROPEAN SEARCH REPORT

Application Number
EP 24 15 0524

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 3 213 627 A (BLAYDEN JAMES H) 26 October 1965 (1965-10-26) * figures 5-7 * * column 2, line 70 - column 3, line 9 * * column 1, lines 62-72 *	1-17	INV. E04D13/064 E04D13/068
X	US 3 670 505 A (WEAVER LEONARD WHEELOCK) 20 June 1972 (1972-06-20) * figure 1 *	1-5, 8-10,13, 15	

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	21 March 2024	Tran, Kim Lien

CATEGORY OF CITED DOCUMENTS

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21-03-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3213627 A	26-10-1965	NONE	
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		US 3670505 A	20-06-1972

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- EP 1131513 B1 **[0003]**
- EP 3231956 A1 **[0006]**