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(54) Wall angle runner

(57) The present invention relates to a wall angle runner comprising a first upright wing which extends in longitudinal direction of the call angle runner and comprises connection means for connection of the wall angle runner to a wall in such a way that the first upright wing extends along the wall, the wall angle runner further comprising a first flange for supporting at least one ceiling member , the first flange being connected to the first upright wing and pointing away from the first upright wing, characterized in that the first upright wing comprises at least one perforation for forming a first part in the first upright wing which is displaceable with respect to a remaining second part in the first upright wing.

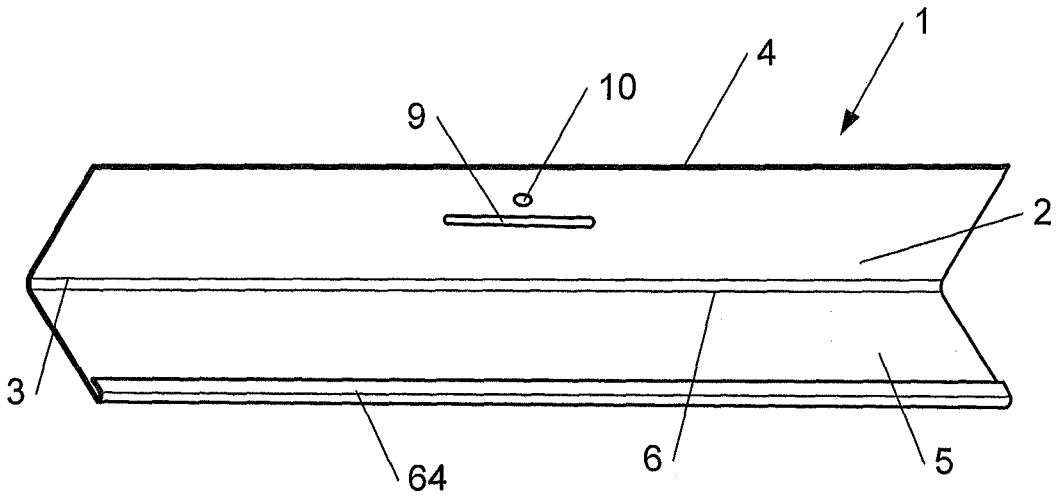

Fig. 1

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Description

[0001] The present invention relates to a wall angle runner comprising a first upright wing which extends in longitudinal direction of the wall angle runner and comprises connection means for connection of the wall angle runner to a wall in such a way that the first upright wing extends along the wall, the wall angle runner further comprising a first flange for supporting at least one ceiling member, the first flange being connected to the first upright wing and pointing away from the first upright wing, according to the preamble of the first claim.

[0002] A lowered ceiling usually comprises a grid comprising a plurality of parallel spaced frame members which are connected to each other by one or more cross runners. The grid is provided for supporting ceiling tiles. Along the walls, surrounding the lowered ceiling, usually a number of wall angle runners are mounted, which function to support the frame members and cross runners. Each wall angle runner comprises an upright wing, for connection to the surrounding wall, and a flange, for receiving the edges of the frame members and cross runners.

[0003] A common known problem in relation to the installation of lowered ceilings is the fact that the wings of the wall angle runners which run along the wall will follow the surface of the wall to which they are fixed. However, wall surfaces in buildings are rarely perfectly flat and certain tolerances are permitted. As a result, the walls in buildings often have a waving wall surface. The connection of the upright wing of the wall angle runner to such a waving wall surface results in a deformation of the wall angle runner. A waving wall surface can in particular cause a deformation of the flange of the wall angle runner that supports the edges of the frame members and cross runners. This deformation may result in gaps between the edges of the flange of the wall angle runner and the ceiling tiles which are placed on top of the flange. These gaps are unwanted because they adversely influence the esthetic view of the lowered ceiling.

[0004] The deformation of the horizontal flange of the wall angle runner is stronger for thin gauge steel wall angle runners, compared to extruded aluminum wall angle runners. However, those aluminum wall angle runners are not always accepted because they are often too heavy from an aesthetic point of view and not fire rated compared to the variant roll formed profile out of thin steel. The deformation of the horizontal flange of the wall angle runner as a result of a waving wall surface also depends on the shape of the wall angle runner. In W-shaped wall angle runners for example, the horizontal flange deforms fewer compared to L-shaped wall angle runner, because the second upright wing already compensates for the undulations to some extend.

[0005] A known solution to compensate for deviations of the wall surface is to first mount wooden slats to the wall surface and then fix the upright wing of the wall angle runner to the wooden slats. The bottom edge of the wooden slats is often painted in black to obtain a floating effect of the lowered ceiling. The use of wooden slats in order to compensate for undulations of the wall surface is very time consuming and is not fire rated. As a result this solution is not always accepted.

[0006] It is therefore an object of the present invention to provide a wall angle runner which compensates for tensions in the wall angle runner, as a result of undulations of the wall surface to which the wall angle runner is connected, in a simplified way.

[0007] This is achieved according to the present invention with a wall angle runner showing the technical features of the characterizing part of the first claim.

[0008] Thereto, the wall angle runner according to the present invention is characterized in that the first upright wing comprises at least one perforation for forming a first part in the first upright wing which is displaceable with respect to a remaining second part in the first upright wing.

[0009] The at least one perforation in the first upright wing creates a first part which can be displaced with respect to the remainder of the runner to compensate for undulations in the wall surface. In fact, because the at least one perforation creates an area in the first upright wing with less material, the material between the longitudinal edges of the upright wing and the at least one perforation will be displaced with respect to the remainder of the runner upon mounting of the wall angle runner to an undulating wall surface, for example by screwing. The presence of a displaceable part in the upright wing, reduces the risk and possibly eliminates the occurrence of tensions in the wall angle runner. In particular the risk to the occurrence of tensions in the flange of the wall angle runner which provide a supporting edge for the ceiling tiles, is reduced. Thus, the risk to deformation of the first flange is reduced, a better contact between and support by the first flange of the wall angle runner and the ceiling tile placed on top of the first flange is provided, and the risk to the occurrence of visible gaps between the first flange and the ceiling tile is minimised.

[0010] The use of a wall angle runner according to the present invention provides a number of additional advantages compared to the use of wooden slats. A first advantage is that the wall angle runner according to the present invention is suitable for use in clean room situations and hospital environments. Other advantages are that fire resistance can be guaranteed and that the assembling is less time consuming. In fact, the positioning of these wall angle runners can be done in one step only, whereas the use of wooden slats always requires minimum two steps, namely the connection of the wooden slat to the wall and the connection of the wall angle runner to the wooden slat. In most cases, even a third step is needed, namely the painting black of the wooden slat to create an improved lowered ceiling effect. Moreover, the application of this type of wall angle runner to the wall can be done by one professional only, whereas the application of the wooden slats in most cases requires two

professionals with different expertise.

[0011] The first flange points away from the first upright wing. As a result, because first upright wing extends in longitudinal direction of the wall after connection of the wall angle to the wall, the first flange points away from the wall after connection of the wall angle to the wall. The first flange may extend under any angle with respect to the first upright wing or with respect to the wall. Preferably, the first flange points away from the first upright wing in a direction perpendicular to the first upright wing or in a direction perpendicular to the wall.

[0012] The at least one perforation can have any shape considered suitable by the person skilled in the art. The at least one perforation may for example comprise a single line shaped perforation, a pair of oppositely positioned perforations, but it may also be a circular or rectangular perforation. Preferably, the at least one perforation is C-shaped. A C-shaped perforation has the advantage that a lip can be created in the first upright wing that is bendable with respect to the first upright wing. This bendable lip can be used for a number of different applications, besides its function as a displaceable member for mounting the wall angle runner to the wall. The bendable lip can for instance be used as a connecting tool for connection with a cross runner of a lowered ceiling or to connect a cross direction profile to the wall angle runner. Moreover, the bendable lip allows the connection between a cross runner or cross direction profile with a wall angle runner to be done by one person only. The connection can be done by, in a first step, positioning the cross runner or cross direction profile with its opposite end parts in cross direction on top of the first flanges of facing wall angle runners. In a second step, the cross runner or cross direction profile can be connected to the wall angle runner by bending the flexible lips of the first upright flanges of said facing wall angle runner over the upright web of the cross runner or cross direction profile and connecting it thereto.

[0013] The size, shape and number of perforations determine the capability of the wall angle runner to compensate for tensions in the wall angle runner. The larger the at least one perforation is, the larger is the first part which is displaceable with respect to a remaining part of the first upright wing and the more the wall angle runner is capable of compensating for undulations in the wall surface. The person skilled in the art will be capable of adjusting the number, position and size of the perforations to the profile of the wall to which the wall angle runner is to be mounted and the envisaged stability of the runner. Preferably, the wall angle runner comprises a plurality of perforations in longitudinal direction of the first upright wing. Such a wall angle runner allows compensating for tensions along the whole wall surface and provides and minimizes the risk to the occurrence of visible gaps between the first flange and the lowered ceiling which is mounted on the wall angle runner. However, when applying the at least one perforation in the first upright wing of the wall angle runner, one should take into account that the first upright wing maintains sufficient strength and bend resistance, to be able to hold the weight of the ceiling members which are placed on top of the first flange of the wall angle runner.

[0014] The invention is further elucidated in the appending figures and description of the figures.

Figure 1 shows a 3-dimensional view of a first preferred embodiment of the wall angle runner.

Figures 2a - 2k show a number of different shapes of the at least one perforation of the first upright wing of a wall angle runner according to the present invention.

Figures 3a and 3b show a 3-dimensional view of a wall angle runner with a C-shaped perforation.

Figure 4 shows a cross section of a second preferred embodiment of the wall angle runner according to the present invention.

Figure 5 shows a cross section of a third preferred embodiment of the wall angle runner according to the present invention.

Figure 6 shows a cross section of a fourth preferred embodiment of the wall angle runner according to the present invention wherein the fifth flange extends in a direction perpendicular to the first upright wing.

Figure 7 shows a cross section of a fourth preferred embodiment of the wall angle runner according to the present invention wherein the fifth flange extends in a slanted downward direction towards the first flange.

Figures 8A and 8B respectively show a cross section and 3-dimensional view of a fifth preferred embodiment of the wall angle runner according to the present invention wherein the sixth flange extends in a slanted downward direction away towards the first flange.

Figure 9 shows a cross section of a fifth preferred embodiment of the wall angle runner according to the present invention wherein the sixth flange extends in a direction perpendicular to the first upright wing.

[0015] The wall angle runners 1, 11, 21, 31, 41 shown in figures 1-9, extend in longitudinal direction of the wall and comprise a first upright wing 2 and a first flange 5, which are connected to each other in longitudinal direction of the runner. The connection may be direct, along mating longitudinal edges or indirect through one or more intervening flanges.

[0016] The first upright wing 2 is provided for connecting the wall angle runner 1, 11, 21, 31, 41 to the wall. Thereto, the first upright wing 2 comprises connection means 10. The connection means 10 can for instance take the form of a hole for receiving a screw as is shown in figure 1. However any other type of connection means 10 considered suitable by the person skilled in the art can be used. The first upright wing 2 comprises a top longitudinal edge 4 and a bottom longitudinal edge 3.

After connection of the wall angle runner to the wall, the first upright wing extends in longitudinal direction of the wall. The first upright wing can be a straight vertical wing, or may comprise bended part, as is shown for instance in figures 8a, 8b and 9.

[0017] Preferably, the first upright wing 2 comprises a first hemmed edge 63, formed by a part of its top longitudinal edge 4 which is folded downwards an inner face of the first upright wing 2. This is for instance shown in figures 3A, 3B and 6. This first hemmed edge 63 is mainly provided for aesthetic reasons. It is also provided for safety reasons because the first hemmed edge 63 minimizes the risk for cutting wounds resulting from the sharp edges of the wall angle runners during handling of the wall angle runners. The hemmed edge can be bent so as to run along the face of the first upright wing 2 which faces the wall, but preferably is bent to run along the opposite face of the first upright wing 2.

[0018] The first flange 5 is provided for supporting at least one ceiling member 8, such as for example a ceiling tile or a frame member or cross runner of a lowered ceiling. The first flange 5 is connected to the first upright wing 2 in such a way that, after connecting the first upright wing 2 to the wall, the first flange 5 points away from the wall. The first flange 5 may extend under any angle with respect to the first upright wing 2 considered suitable by the person skilled in the art, but preferably extends in a direction perpendicular to the first upright wing 2, and thus in a direction perpendicular to the wall. The first flange 5 comprises a first longitudinal edge 6, proximal to the wall, and a second longitudinal edge 7, remote from the wall.

[0019] Preferably, the first flange 5 comprises a second hemmed edge 64, formed by a part of the first flange 5 near its second longitudinal edge 7 which is folded upwards onto a top face of the first flange. This is for instance shown in figures 1, 3A, 3B, 4, 5, 6, 8A, 8B and 9. This second hemmed 64 edge is mainly provided for aesthetic reasons and assures that only a coated or painted part of the wall angle runner is visible from beneath the lowered ceiling.

[0020] The first upright wing 2 further comprises at least one perforation 9. The at least one perforation 9 forms a first part in the first upright wing 2 which is displaceable with respect to a remaining second part in the first upright wing 2. Upon fixing the runner to the wall, said first part in the first upright wing 2 will be displaced with respect to a remainder of the first upright wing 2 when encountering an undulation and will as such compensate for undulations in the wall surface to which it is attached. Because of this ability to deform, tensions caused by the occurrence of irregularities in the wall may be absorbed by deformation of the upright wing 2, in particular by displacement of the first part. As tensions are absorbed within the first upright wing 2, the risk to transferring of tension from the upright wing 2 to the first flange 5 and any ensuing deformation of flange 5, is strongly reduced. As a result, the risk to deforming the support surface for the ceiling tiles is minimal, the contact between the edge of the ceiling tiles mounted on top of the flange 5 is optimised and the risk to the occurrence of visible gaps between the ceiling tile and the first flange 5 is minimal.

[0021] The at least one perforation 9 can have any shape considered suitable by the person skilled in the art. The at least one perforation 9 can for instance have an elongated line shape or circular shape. The line shape can be straight, curved, waved or serrated or any other orientation considered suitable by the person skilled in the art. The at least one perforation may for example also comprise a pair of opposite line-shaped perforations, mounted at corresponding positions as is shown in figure 2b. The position of the at least one perforation 9 on the upright wing 2 can be any position considered suitable by the person skilled in the art. The at least one perforation 9 can be applied in a middle part of the first upright wing 2, or near the bottom 3 or top 4 longitudinal edge of the first upright wing 2. In case the at least one perforation 9 is applied near the top longitudinal edge 4 of the first upright wing 2, the first upright wing 2 preferably does not comprise a first hemmed edge 63 as this would reduce the ability of the wall angle runner 1 to compensate for undulations in the wall surface. Thereby, the person skilled in the art will seek the optimum compromise between optimal deformability of the upright wing and optimum strength, stability and support force of the runner.

[0022] Some examples of different shapes and positions of the at least one perforation 9 are given in figures 2a - 2k. The at least one perforation 9 shown in figure 2a takes the form of one elongated recess applied below the connection means 10. The at least one perforation 9 shown in figure 2b comprises two elongated recesses, one applied above the connection means 10 and one applied below the connection means 10. The at least one perforation 9 shown in figure 2c comprises two protruding bended parts, one at each side of the connection means 10. The at least one perforation 9 shown in figures 2d-2g comprises two C-shaped recesses. Each of the C-shaped recesses is located such that it encloses the connection means 10. The orientation of the C-shaped recesses with respect to the longitudinal edges 3, 4 of the first upright wing and the orientation of the C-shaped recesses with respect to each other may vary as is shown in figures 2d-2g. The at least one perforation 9 shown in figures 2h and 2i comprises a first and a second elongated recess which extend under an angle with respect to each other. The at least one perforation 9 shown in figure 2j comprises a circular shaped recess. The at least one perforation 9 shown in figure 2k comprises a star shaped recess.

[0023] Preferably, the at least one perforation 9 is C-shaped as is shown in figures 2d-2g. A C-shaped perforation comprises three elongated recesses which together form a letter C. A C-shaped perforation has the advantage that within the rectangle defined by said three elongated recesses a lip can be created that is bendable

with respect to the first upright wing 2 as is shown in figures 3a and 3b. The lip can be formed by the whole rectangle defined by said three elongated recesses as is shown in figure 3a or by only part of the rectangle as is shown in figure 3b. The orientation of said bendable lip may vary depending for instance on the orientation of said C-shaped perforation and on the amount of bending of the lip. The bendable lip may for instance point away from the first upright wing 2 to extend in a direction perpendicular to the first upright wing 2 as is shown in figure 3a. This orientation of the bendable lip is in particular suitable for mounting and connecting a cross runner of a lowered ceiling to the wall angle runner 1 as is shown in figure 3a. The cross runner of the lowered ceiling shown in figure 3a rests with its horizontal flange on the first flange 5 of the wall angle runner 1 and is connected with its upright web to the flexible lip of the first upright wing 2 of the wall angle runner 1, 11, 21, 31, 41. However, any other position of the bendable lip with respect to the first upright wing 2 is considered suitable by the person skilled in the art. In order to facilitate the connection of the flexible lip to a ceiling member 8, such as a cross runner, the flexible lip preferably comprises a mounting member. The mounting member of the bendable lip as shown in figure 3a may for instance comprise a hole for receiving a screw which can be screwed in the upright web of the cross runner. However, the mounting member can have any other form considered suitable by the person skilled in the art. In figure 3b the bendable lip of the wall angle runner is used as a hold down member to avoid deformation of thin ceiling tiles.

[0024] The connection means 10 for connecting the wall angle runner 1, 11, 21, 31, 41 to the wall can take any position considered suitable by the person skilled in the art with respect to the at least one perforation 9. Preferably, the position of the connection means 10 is such that it is located in the first part of the first upright wing 2 which is displaceable with respect to a remaining second part in the first upright wing 2.

[0025] The size, shape and number of perforations can be adjusted by the person skilled in the art taking into consideration the amount of unevenness of the wall. Preferably, the wall angle runner comprises a plurality of perforations in longitudinal direction of the first upright wing 2 as is shown in figures 2a-2k, allowing compensating for tensions along the whole length of the wall angle runner 1, 11, 21, 31, 41.

[0026] The perforations can be applied during or after production of the wall angle runner 1, 11, 21, 31, 41, for instance at the construction site itself. The position, size and number of the perforations 9 can be adjusted to the position of the undulations in the wall surface and to the amount of unevenness of the wall surface. Preferably, the distance between subsequent perforations 9 is fixed. This allows the perforations 9 to be applied during production of the wall angle runner 1, 11, 21, 31, 41. This can for instance be achieved with a rotating press roll which rotates at substantially the same rate as the rate at which the wall angle runner 1, 11, 21, 31, 41 is produced, such that the perforations 9 can be formed at the same time and same rate as the wall angle runner 1, 11, 21, 31, 41 itself.

[0027] The at least one perforation 9 can be applied in the first upright wing 2 of any type of wall angle runner 1, 11, 21, 31, 41 considered suitable by the person skilled in the art.

[0028] The simplest embodiment of the wall angle runner 1 according to the present invention is shown in figure 1. The first flange 5 is directly connected with its first longitudinal edge 6 to the bottom longitudinal edge 3 of the first upright wing 2 in such a way that an L-shaped wall angle runner is created. The first upright wing 2 of the wall angle runner 1 shown in figure 1 comprises at least one perforation 9 in the form of one elongated recess located beneath the connection means 10. The at least one perforation 9 may however have any other shape considered suitable by the person skilled in the art. Upon connection of the first upright wing 2 to the wall, the part between the elongated recess 9 and the bottom longitudinal edge 3 of the first upright wing 2 will be displaceable with respect to a remainder of the first upright wing 2 when encountering an undulated wall surface and will minimize the risk to creating tension at the first flange 5.

[0029] A second preferred embodiment of the wall angle runner 11 according to the present invention is shown in figure 4. The wall angle runner 11 comprises a first 5 and a second 15 flange and a first upright wing 2. The first 5 and the second flange 15 are connected with their first longitudinal edges 6, 16 to respectively the bottom 3 and top 4 longitudinal edge of the first upright wing 2 in such a way that a C-shaped wall angle runner is created. The first 5 and the second 15 flange may extend under any angle with respect to each other, but preferably run parallel. More preferably the first 5 and second 15 flanges both extend perpendicular with respect to the first upright wing 2. The first upright wing 2 of the wall angle runner comprises at least one perforation (not shown) 9 for forming a part in the first upright wing 2 which will be displaceable with respect to a remainder of the first upright wing 2 upon connection of the wall angle runner to an undulating wall surface to compensate to a certain extend for undulations in the wall surface. The at least one perforation 9 may have any shape considered suitable by the person skilled in the art, but preferably has a C-shape, allowing for instance the connection of cross profiles in wall-to-wall applications in a simplified way. Moreover, the C-shape of the wall angle runner allows the cross runner to be clamped between the first and the second flanges of the wall angle runner, which provides for an improved positioning of the cross profile with respect to the wall angle runner. Another advantage of the C-shaped wall angle runner is that it results in a further reduction of tensions in the first flange compared to the L-shaped wall angle runner of figure 1 because part of the tension is transferred to and absorbed by the second

flange of the wall angle runner. As a result, a C-shaped wall angle runner 11 provides for an improved resistance against deformation of the first flange 5 of the wall angle runner as a result of an undulated wall surface as compared to an L-shaped wall angle runner 1.

[0030] A third preferred embodiment of the wall angle runner 21 according to the present invention is shown in figure 5. The wall angle runner 21 comprises a first wall angle runner part 28 and a second wall angle runner part 29 which are removably connected to each other. The first wall angle runner part 28 comprises a first upright wing 2 and a third flange 25. The third flange 25 is with its first longitudinal edge 26 directly connected to the bottom longitudinal edge 3 of the first upright wing 2, in such a way that the first wall angle runner part 28 forms an L-shaped wall angle runner part. The first upright wing 2 and the third flange 25 may extend under any angle with respect to each other, but preferably extend perpendicular with respect to each other. The second wall angle runner part 29 comprises a first flange 5, a fourth flange 35 and a second upright wing 12 which are connected to each other in such a way that a C-shaped wall angle runner part is formed. Thereto, the first flange 5 is with its first longitudinal edge 6 directly connected to the bottom longitudinal edge 13 of the second upright wing 12 and the fourth flange 35 is with its first longitudinal edge 36 directly connected to the top longitudinal edge 14 of the second upright wing 12. The first 5 and the fourth flange 35 may extend under any angle with respect to each other, but preferably run parallel. More preferably the first 5 and fourth flanges 35 both extend perpendicular with respect to the first upright wing 2. The second longitudinal edge 37 of the fourth flange 35 is folded away from the first flange 5 onto an outer face of the fourth horizontal flange 35 in such a way that a third hemmed edge 65 is formed. The first wall angle runner part 28 and the second wall angle runner part 29 are connected such that the third flange 25 is being received between the third hemmed edge 65. This 2-part wall angle runner 21 has a number of advantages. First, the wall angle runner 21 shown in figure 5 results in a further reduction of tensions in the first flange 5 of the wall angle runner compared to the L-shaped wall angle 1 runner of figure 1 and compared to the C-shaped wall angle runner 11 of figure 4. This results from the fact that, because the first wall angle runner part 28 and the second wall angle runner part 29 are removably connected and do not form one single piece, a deformation of the first wall angle runner part 28 is not or only to a minor extend transferred to the second wall angle runner part 29, and thus to the first flange 5. The wall angle runner 21 thus comprises two places where tensions are compensated: 1) the first upright wing 2 of the first wall angle runner part 28 which comprises at least one perforation 9 and 2) the connection between the first 28 and the second 29 wall angle runner part which minimizes transfer of deformation of the third flange 25 to the first flange 5. A second advantage of the wall angle runner 21 shown in figure 5 is that it allows creating a floating effect of the lowered ceiling in a simplified way. Thereto, the width of the third flange 25 is preferably smaller than the width of the fourth flange 35, such that, after connection of the first wall angle runner part 28 to the second wall angle runner part 29, only part of the third flange 25 of the first wall angle runner part 28 is covered by the fourth flange 35 of the second wall angle runner part 29. This uncovered part of the third flange results in a shadow-effect, which gives a floating effect to the lowered ceiling when mounted to the wall angle runner 21. It also allows obtaining a similar effect as the one obtained by black wooden slats in a much more simplified way. In fact this effect can be obtained in a number of different ways. Because the wall angle runner comprises two separate wall angle runner parts, these parts can be produced separately and can be made in different colours suited for their use. By providing the first wall angle runner part 28 in a first dark colour, for instance in black, and the second wall angle runner part 29 in a similar colour of the ceiling, a similar effect as the one obtained with black wooden slats can be obtained. Another way to obtain a similar effect as the one obtained with black wooden slats, is to apply in the space between the wall and the second upright wing a dark sealing block. This sealing block can be made from an acoustic absorbing material or even from a material which expands during fire. Moreover, this sealing block can be applied during production of the wall angle runner in the form of a self adhesive strip onto the bottom of the first flange, such that the wall angle runner can be made by one manufacturer only. A third advantage of the wall angle runner shown in figure 5 is that the uncovered part of the third flange of the first wall angle runner part can be used for different purposes. The uncovered part can for instance comprise one or more recesses. These recesses can provide for ventilation through the wall angle runner and avoid super heating of the plenum above the lowered ceiling. The uncovered part can also be used to connect devices which are preferably invisible for the eye, for instance for connection of lighting.

[0031] A fourth preferred embodiment of the wall angle runner 31 is shown in figures 6 and 7. The wall angle runner 31 is a one-piece wall angle runner comprising a first upright wing 2, a fifth flange 45, a third upright wing 22 and a first flange 5. The wall angle runner 31 is with its first upright wing 2 connected to the wall. The first upright wing 2 comprises at least one perforation 9 for compensating for undulations in the wall surface. The fifth flange 45 is with its first longitudinal edge 46 connected to a bottom longitudinal edge 3 of the first upright wing 2 and with its second longitudinal edge 47 connected to a top longitudinal edge 24 of the third upright wing 22. The third upright wing 22 points downwardly away from the fifth flange 45. The third upright wing 22 may extend under any angle with respect to the first upright wing 2 but preferably extends parallel to the first upright wing 2. The first flange 5, which is provided for receiving the ceiling members, is with the first longitudinal edge 6

connected to the bottom longitudinal edge 26 of the third upright wing 22 and points away from the first upright wing 2. The fifth flange 45 points away from the first upright wing 2. Any orientation of the fifth flange 45 with respect to the first upright wing 2 considered suitable by the person skilled in the art is possible. Figure 6 shows a wall angle runner 31 in which the fifth flange 45 points away from the first upright wing 2 in a direction perpendicular to the first upright wing 2. Figure 7 shows a wall angle runner 31 in which the fifth flange 45 points away from the first upright wing 2 in a downward slanted direction towards the first flange 5.

[0032] The wall angle runner 31 shown in figure 6 has a similar W-shape as the one of figure 5, with the difference that the wall angle runner 31 as shown in figure 6 is a one-part wall angle runner, as compared to the 2-part wall angle runner 21 shown in figure 5. The wall angle runner 31 shown in figure 6 has similar advantages as the wall angle runner 21 shown in figure 5. First, the wall angle runner 31 shown in figure 6 results in a further reduction of tensions in the first flange 5 of the wall angle runner 31 compared to the L-shaped wall angle runner 1 of figure 1. This reduction is due to the fact of the 3-angle absorption of the tensions: the angle between the first upright wing 2 and the fifth flange 45, the angle between the fifth flange 45 and the third upright wing 22 and the angle between the first flange 5 and the third upright wing 22 each absorb part of the created tension and avoid transfer of the tension to the first flange 5 of the wall angle runner. Second, the fifth flange 45 also gives a shadow-effect to the wall angle runner 31, which gives a floating effect to the lowered ceiling when mounted to the wall. This floating effect can be enhanced by for instance applying a sealing block in the space between the wall and the third upright wing 22 as is shown in figure 6. A third advantage of the wall angle runner shown in figure 6 is that the fifth flange 45 can comprise ventilation holes or comprise lighting members.

[0033] Similar to the wall angle runner 31 shown in figure 6, the wall angle runner 31 shown in figure 7 provides in a reduction of tension in the first flange 5 of the wall angle runner compared to the L-shaped wall angle runner 1 of figure 1, allows the presence of ventilation holes or lighting members in the fifth flange 45 and gives a certain floating effect to the lowered ceiling.

[0034] A fifth preferred embodiment of the wall angle runner 41 according to the present invention is shown in figures 8 and 9. The wall angle runner 41 shown in figures 8 and 9 comprises a first upright wing 2 which is hidden behind and connected to a fourth upright wing 32 by an intervening sixth flange 55. The wall angle runner further comprises a first flange 5. The wall angle runner 41 is connected to the wall with its first upright wing 2. The first upright wing 2 comprises at least one perforation 9 for compensating for undulations in the wall surface. The sixth flange 55 is connected to a top longitudinal edge 4 of the first upright wing 2 with its first longitudinal edge 56 and to a top longitudinal edge 34 of the fourth upright wing 32 with its second longitudinal edge 7. The fourth upright wing 32 may extend under any angle with respect to the first upright wing 2 and with respect to the sixth flange 55, but preferably extends parallel to the first upright wing 2 and downward from the sixth flange 55. The first flange 5, which is provided for supporting the ceiling members, is with a first longitudinal edge 6 connected to the bottom longitudinal edge 33 of the fourth upright wing 32 and points away from the first upright wing 2, preferably in a direction perpendicular to the first upright wing 2. The sixth flange 55 points away from the first upright wing 2. Any orientation of the sixth flange 55 with respect to the first upright wing 2 considered suitable by the person skilled in the art is possible. Figure 8 shows a wall angle runner 41 in which the sixth flange 55 points away from the first upright wing 2 in a downward slanted direction towards from the first flange 5. Figure 9 shows a wall angle runner 41 in which the sixth flange 55 points away from the first upright wing 2 in a direction perpendicular to the first upright wing 2.

[0035] Similar to the wall angle runner 31 shown in figures 6 and 7, the wall angle runner 41 shown in figures 8 and 9 provides in a further improved reduction of tension in the first flange 5 of the wall angle runner compared to the L-shaped wall angle runner 1 because part of the tension is absorbed by the sixth flange 55 and not transferred to the first flange 5. This type of wall angle runners also allows the presence of ventilation holes or lighting members in the sixth flange 55 and gives a certain floating effect to the lowered ceiling. The ventilation holes in the sixth flange 55 form an additional part which is displaceable with respect to the rest of the wall angle runner and allows for additional compensation of tensions in the wall angle runner.

[0036] Preferably, the bottom longitudinal edge 3 of the first upright wing 2 of the wall angle runner 41 is folded in such a way that a first suspension hook 61 is formed. The first suspension hook 61 may point away from the wall as is shown in figure 8 or may point towards the wall as is shown in figure 9. The first suspension hook 61 may be used for any purpose considered suitable by the person skilled in the art. It can for instance by used as an invisible suspension member that can be used to hang on a painting or frame to the wall. This is achieved by folding a part of a bottom longitudinal edge 3 of the first upright wing 2 in a slanted upward direction, in a direction which points away from the first flange 5 or in other words towards the wall. In the example shown in figure 9 the suspension hook is achieved by folding an end part of the wing 2, however any other method for providing a suspension hook may be used as well.

[0037] Preferably, the first flange 5 of the wall angle runners 21, 31, 41 according to the present invention which comprise a space between the first upright wing 2 and another upright wing 12, 22, 32, i.e. a second, third or fourth upright wing, comprise a second suspension hook 62. The second suspension hook 62 comprising a part of the first longitudinal edge 6 of the first flange 5

which is folded in a slanted direction towards the wall, i.e. a direction pointing away from the first flange 5, and back towards the first flange 5, in such a way that a second suspension hook 62 is formed. Usually both parts of the suspension hook run along each other. Although in this embodiment the suspension hook is formed by folding of a part of the first flange, any other way of forming a suspension hook may be used as well. The above described suspension hook is for instance shown in figure 7. This second suspension hook 62 further reduces the risk to the occurrens of tensions in the first flange. This suspension hook 62 also has the advantage that it provides in an invisible suspension member that can for instance be used to hang on a painting or frame to the wall. This type of suspension hook may also be used for mounting a capping material to the visible bottom face of the first flange. The capping material may fore example take the shape of a C-shaped cap and can be applied by simply hooking the capping material behind the wall angle runner. This allows the wall angle runner to be produced in an uncoated material, and to provide only that part of the wall angle runner which is visible to the eye with coloured capping material.

Claims

1. A wall angle runner (1, 11, 21, 31, 41) comprising a first upright wing (2) which extends in longitudinal direction of the wall angle runner and comprises connection means (10) for connection of the wall angle runner (1, 11, 21, 31, 41) to a wall in such a way that the first upright wing (2) extends along the wall, the wall angle runner (1, 11, 21, 31, 41) further comprising a first flange (5) for supporting at least one ceiling member (8), the first flange (5) being connected to the first upright wing (2) and pointing away from the first upright wing (2), **characterized in that** the first upright wing (2) comprises at least one perforation (9) for forming a first part in the first upright wing (2) which is displaceable with respect to a remaining second part in the first upright wing (2).

2. A wall angle runner (1, 11, 21, 31, 41) according to claim 1, **characterized in that** the at least first one perforation (9) comprises a first and a second perforation provided on corresponding opposite positions in height direction of the first upright wing (2).

3. A wall angle runner (1, 11, 21, 31, 41) according to anyone of claims 1-2, **characterized in that** the at least one perforation (9) is mainly C-shaped.

4. A wall angle runner (1, 11, 21, 31, 41) according to anyone of claims 1-3, **characterized in that** the wall angle runner (1, 11, 21, 31, 41) comprises a plurality of perforations (9) in longitudinal direction of the first upright wing (2).

5. A wall angle runner (1, 11, 21, 31, 41) according to claim 4, **characterised in that** the distance between subsequent perforations (9) is fixed.

6. A wall angle runner according to anyone of claims 4-5, **characterized in that** the perforations (9) are alternately applied in a lower part of the first upright wing (2) and in an upper part of the first upright wing (2).

7. A wall angle runner (1) according to anyone of claims 1-6, **characterized in that** the wall angle runner (1) is mainly L-shaped and **in that** a longitudinal edge (6) of the first flange (5) is connected to a bottom longitudinal edge (3 of the first upright wing (2).

8. A wall angle runner (11) according to claim 7, **characterized in that** the wall angle runner (11) is mainly C-shaped and comprises a second flange (15), a longitudinal edge (16) of which is connected to a top longitudinal edge (4) of the first upright wing (2) and which points away from the first upright wing (2).

9. A wall angle runner (21) according to anyone of claims 1-6, **characterized in that** the wall angle runner (21) comprises a first wall angle runner part (28) and a second wall angle runner part (29) which are removably connected to each other, **in that** the first wall angle runner part (28) comprises the first upright wing (2) and a third flange (25), a longitudinal edge (26) of which is connected to a bottom longitudinal edge (3) of the first upright wing (2) and points away from the first upright wing (2), **in that** the second wall angle runner part (29) comprises a fourth flange (35), a second upright wing (12) and the first flange (5), the fourth flange (35) being connected with a first longitudinal edge (36) to a top longitudinal edge (14) of the second upright wing (12) and pointing away from the first upright wing, the first flange (5) being connected with a longitudinal edge (6) to a bottom longitudinal edge (13) of the second upright wing (12), the fourth horizontal flange (35) comprising a hemmed edge (65), the hemmed edge (65) comprising a part of a second longitudinal edge (37) of the fourth flange (35), opposite to the first longitudinal edge (36), which is folded away from the first flange (5) onto an outer face of the fourth flange (35), the first wall angle runner part (28 and the second wall angle runner part (29) being connected such that the third flange (25) is at least partly being received between the hemmed edge (65).

10. A wall angle runner (21) according to claim 9, **characterized in that** a bottom of the third flange (25) is divided in a part covered by the fourth flange (35) and an uncovered part.

11. A wall angle runner (21) according to claim 10, **char-**

acterized in that the uncovered part of the third flange (25) comprises at least one recess.

12. A wall angle runner (31) according to anyone of claims 1-6, **characterized in that** the wall angle runner (31) is mainly W-shaped and comprises a fifth flange (45) connected with a first longitudinal edge (46) to a bottom longitudinal edge (3) of the first upright wing (2) and pointing away from the first upright wing (2), **in that** the wall angle runner (31) further comprises a third upright wing (22) connected to a second longitudinal edge (47) of the fifth flange (45), opposite the first longitudinal edge (46), and pointing downwardly away from the fifth flange (45), and **in that** the first flange (5) is connected with a longitudinal edge (6) to a bottom longitudinal edge (23) of the third upright wing (22).

13. A wall angle runner (31) according to claim 12, **characterized in that** the fifth flange (45) extends perpendicular with respect to the first upright wing (2).

14. A wall angle runner (31) according to claim 12, **characterized in that** the fifth flange (45) slants downwardly with respect to the first upright wing (2).

15. A wall angle runner (31) according to anyone of claims 12-14, **characterized in that** the fifth flange (45) comprises at least one recess.

16. A wall angle runner (41) according to anyone of claims 1-6, **characterized in that** the wall angle runner (41) comprises between the first upright wing (2) and the first flange (5), a sixth flange (55) and a fourth upright wing (32), wherein the sixth flange is connected with a first longitudinal edge (56) to a top longitudinal edge (4) of the first upright wing (2) and points away from the first upright wing (2) in opposite direction of the first flange (5), and the fourth upright wing (32) is connected with a top longitudinal edge (34) to a second longitudinal edge (57) of the sixth flange (55) opposite the first longitudinal edge (56) and points downwardly away from the sixth flange (55), and **in that** the first flange (5) is connected with a longitudinal edge (6) to a bottom longitudinal edge (33) of the fourth upright wing (32).

17. A wall angle runner (41) according to claim 16, **characterized in that** the sixth flange (55) extends perpendicular with respect to the first upright wing (2).

18. A wall angle runner (41) according to claim 16, **characterized in that** the sixth flange (55) points away from the first upright wing (2) in a downward slanted direction towards the first flange (5).

19. A wall angle runner (41) according to anyone of claims 16-18, **characterized in that** the sixth flange (55) comprises at least one recess.

20. A wall angle runner (41) according to anyone of claims 16-19, **characterized in that** part of a bottom longitudinal edge (3) of the first upright wing (2) is folded in a slanted upward direction in a direction pointing away from the first flange (5) to provide a first suspension hook (61) suitable for use as a suspension member.

21. A wall angle runner (21, 31, 41) according to anyone of claims 9-20, **characterized in that** a first part of the first flange extends (5) in a slanted upward direction which points away from the first flange and towards the wall and a second part of the first flange extends from the first part towards the first flange (5), in such a way that a second suspension hook (62) is formed.

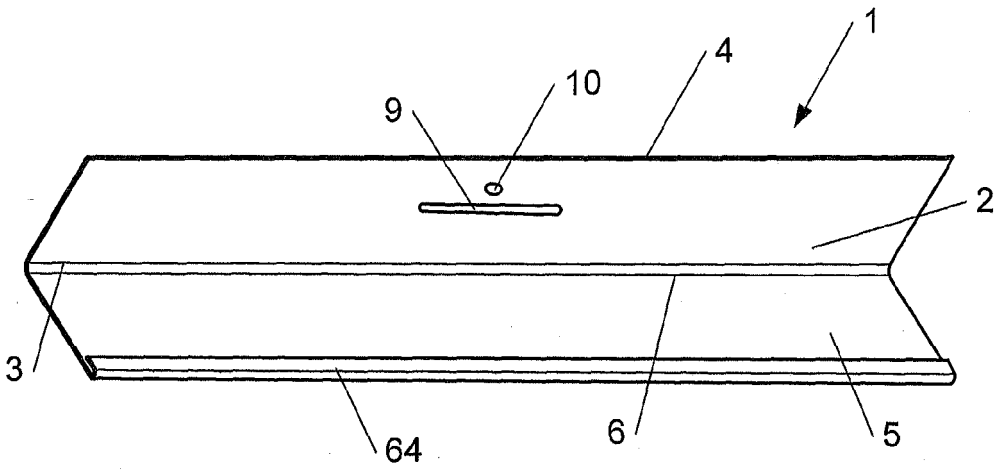

Fig. 1

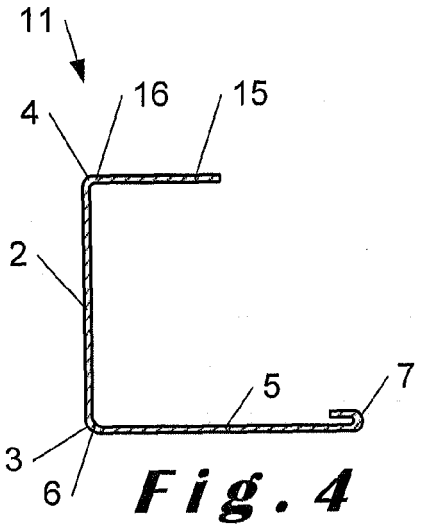

Fig. 4

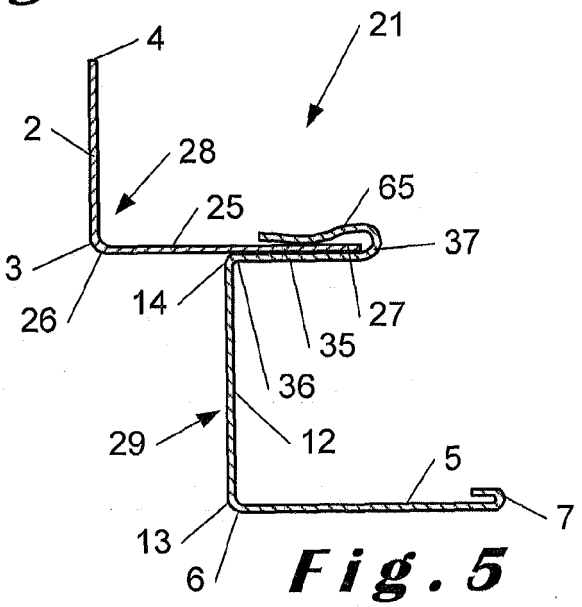

Fig. 5

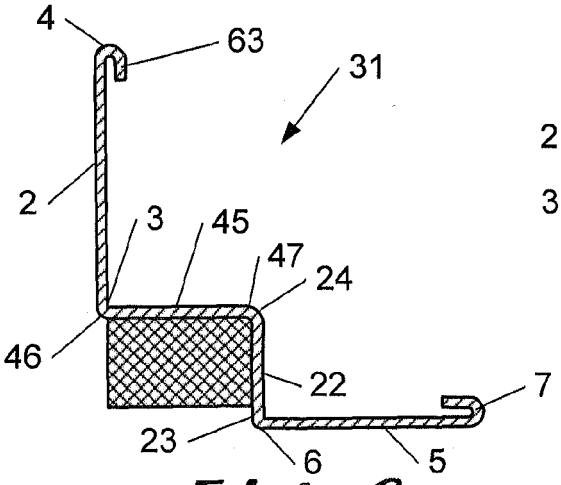

Fig. 6

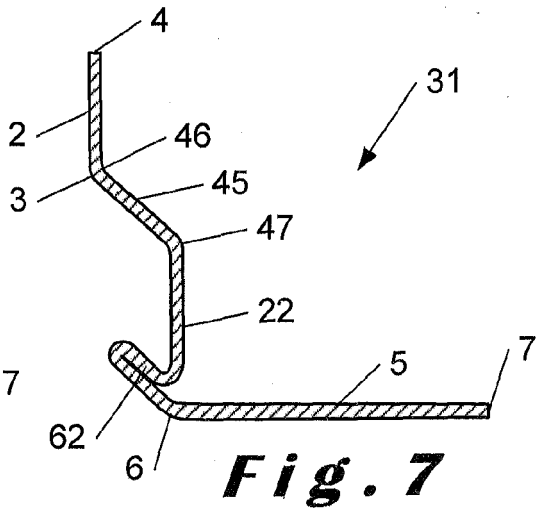

Fig. 7

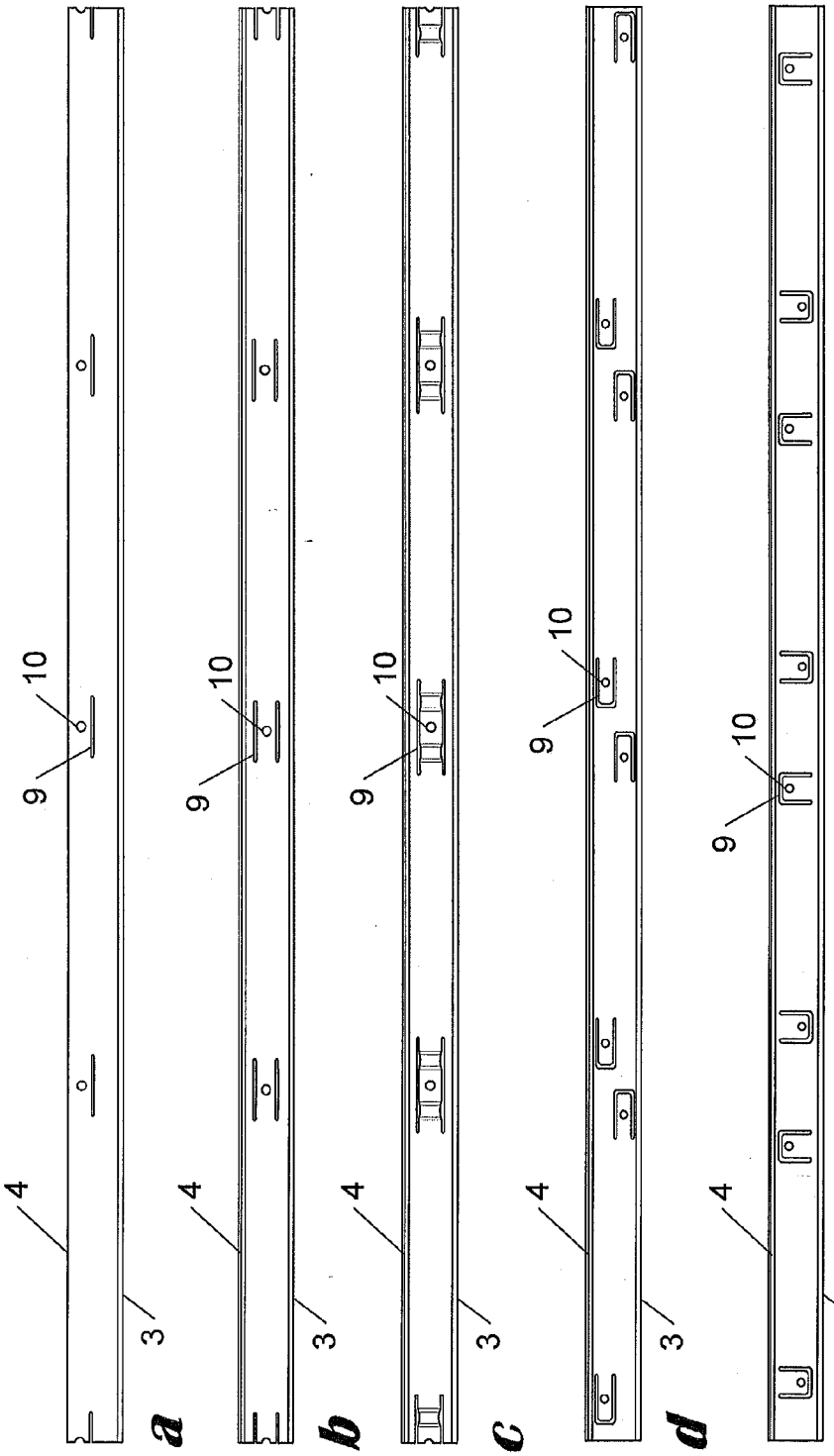

Fig. 2a

Fig. 2b

Fig. 2c

Fig. 2d

Fig. 2e

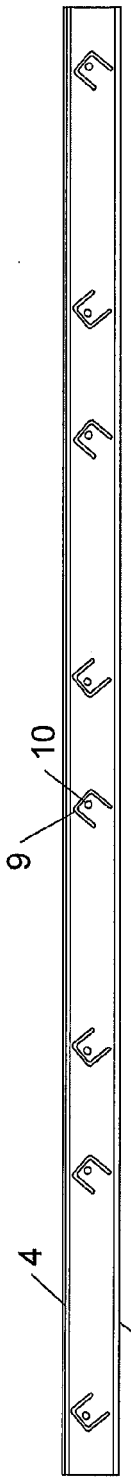

Fig. 2f

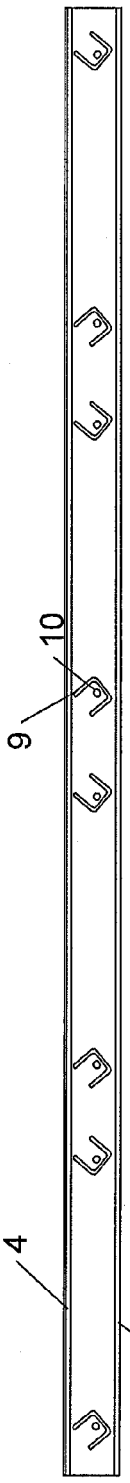

Fig. 2g

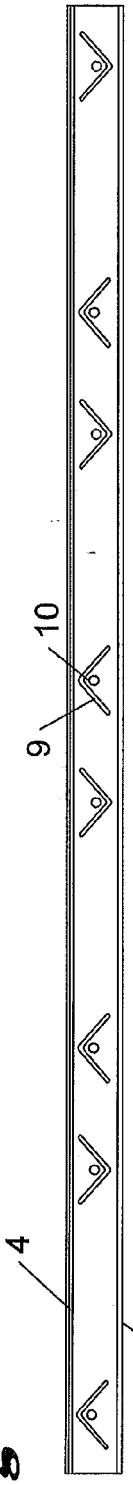

Fig. 2h

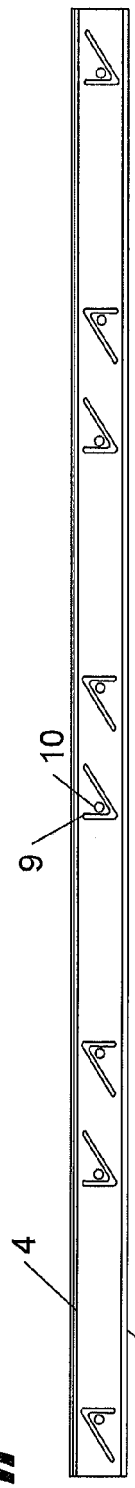

Fig. 2i

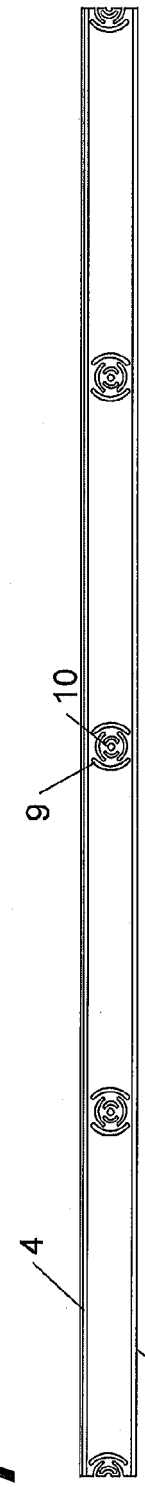

Fig. 2j

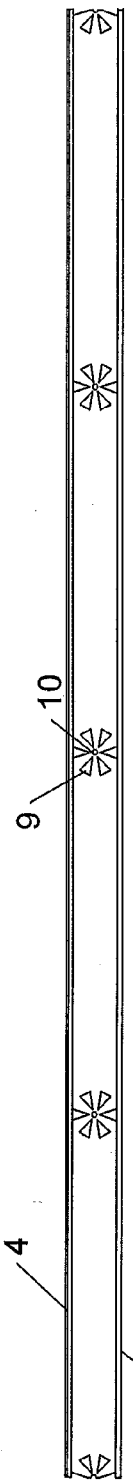

Fig. 2k

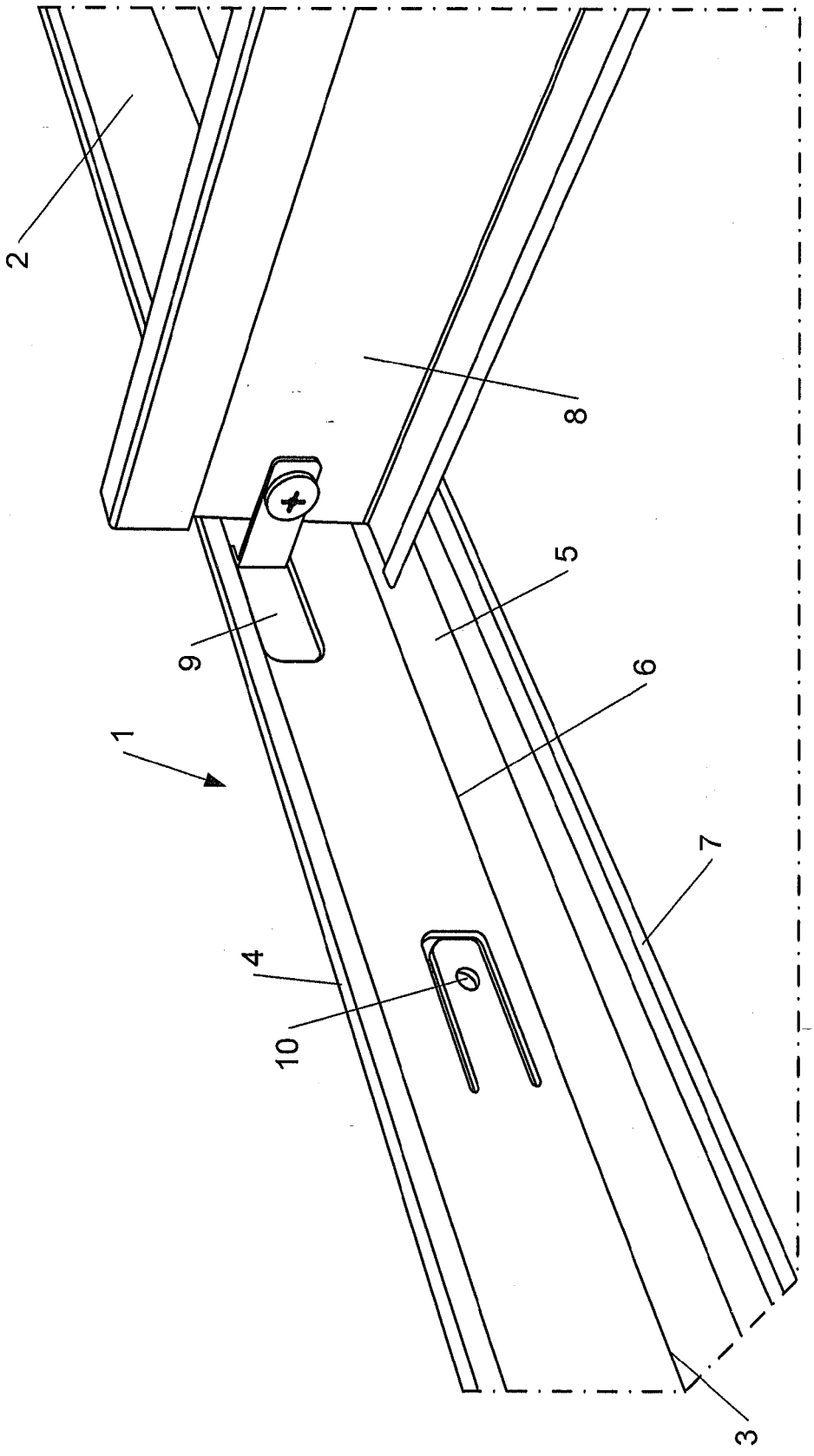

Fig. 3a

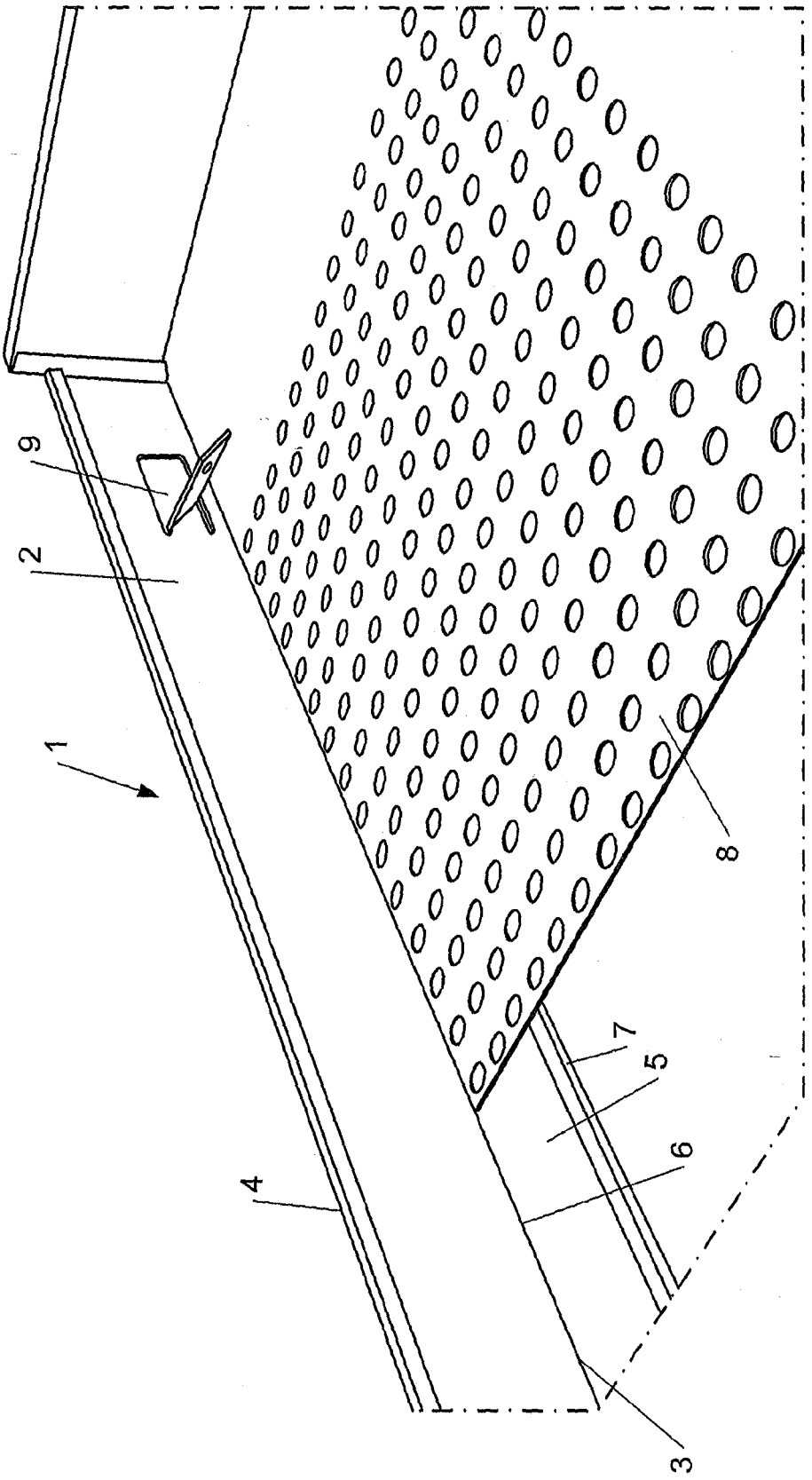

Fig. 3b

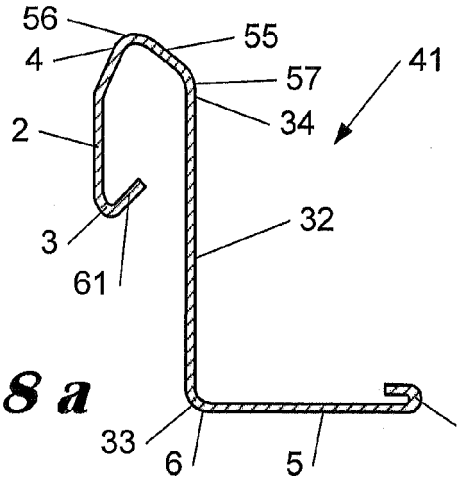

Fig. 8a

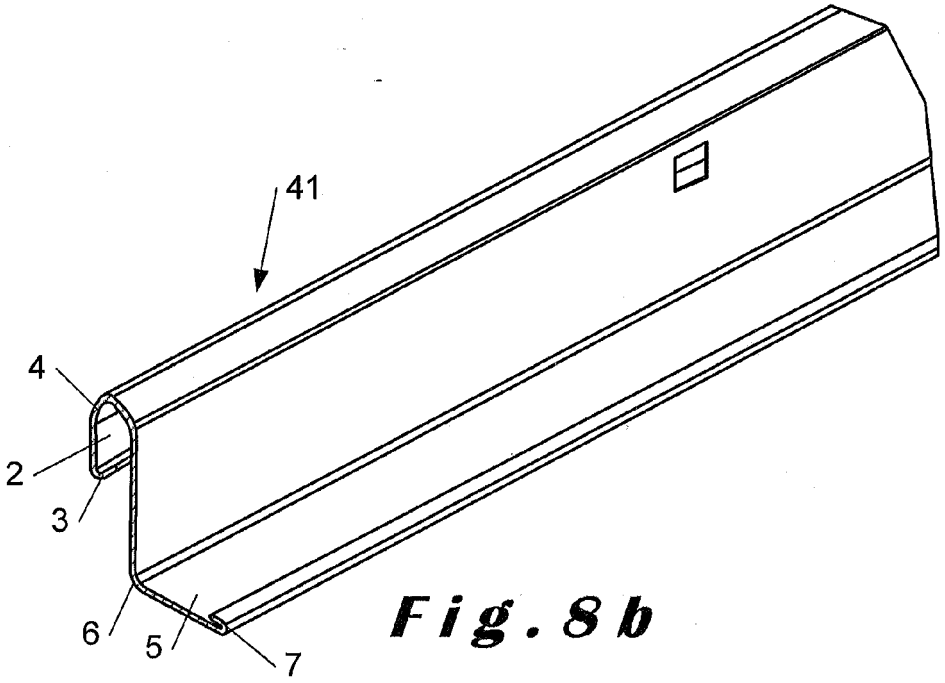

Fig. 8b

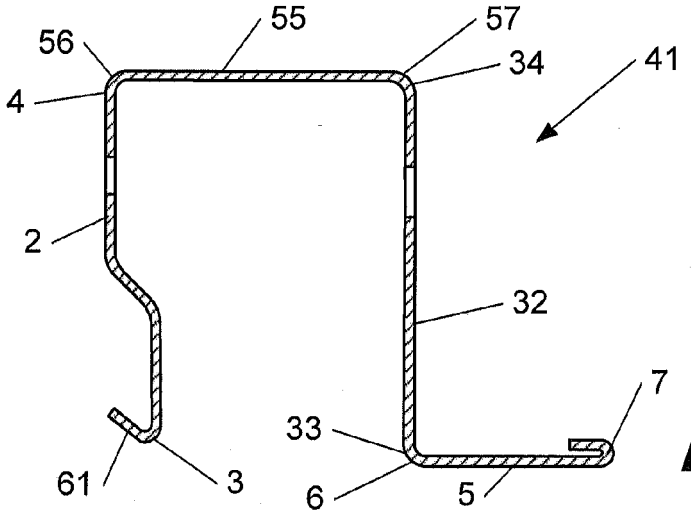

Fig. 9