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(54) CORNER JOINT MEMBER FOR JOINING PROFILED TUBULAR RODS

**ECKVERBINDUNGSELEMENT ZUM ZUSAMMENFÜGEN PROFILIERTER ROHRFÖRMIGER
STRÄNGE**

ÉLÉMENT DE RACCORD EN COIN POUR RELIER DES TIGES TUBULAIRES PROFILÉES

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Description

[0001] The invention relates to a corner joint member for joining profiled tubular rods under an angle with respect to each other. Such corner joint members and tubular rods in a connecting state result in a profiled tubular rod assembly for use in for example door frames, window frames and/or cupboard frames.

[0002] Such corner joint members are known in the state of art. When assembling a profiled tubular rod assembly profiled tubular rods are often joined to each other under an angle. This angle is often 90 degrees. Corner joint members comprise often a first element and a second element that are welded to each other under an angle that is equal to a desired angle of to be joined profiled tubular rods. The first element and the second element define a so called mitred corner joint. Welding such a mitred corner joint is well known in the state of art and is for example disclosed in US-2010/0071834. Here, two elements under an mitre angle of 45 degrees are welded to each other by means of vibration welding. The elements have mitre areas that contact each other when they are in a desired connecting state. By means of welding the mitre areas together a corner joint member is provided which is suitable to be connected with the profiled tubular rods. DE 197 48 613 shows a corner joint member according to the preamble of claim 1.

[0003] Drawback of corner joint members having a welded mitred joint is that after welding irregularities arise. These irregularities must be removed to acquire a smooth outer surface of the corner joint member. Another drawback is that the weld is a weak point when forces or moments are exerted on one of the joined profiled tubular rods.

[0004] It is an object of the present invention to eliminate the abovementioned problems or at least provide an alternative.

[0005] In particular it is an object of the present invention to provide a corner joint member that has little irregularities while providing sufficient strength.

[0006] This object is received by a corner joint member according to claim 1.

[0007] This corner joint member is suitable for joining a first profiled tubular rod under an angle with a second profiled tubular rod by connecting ends of the first rod and the second rod to the corner joint. Preferably, each tubular rod comprises a substantially rectangular profile. The profile is defined as a contour of the profiled tubular rod seen in a direction perpendicular to a longitudinal axis of the profiled tubular rod. Preferably, the profile is such that an outer contour is rectangular. Preferably, the profile has a square shape.

[0008] The corner joint member comprises a first profiled connector element having a first rod connecting end for connecting to the first rod. The first rod connecting end is open. The first profiled connector element is also a profiled tubular rod having two ends. The first profiled connector element is hollow and profiled. The first rod

connecting end being hollow results in the first connecting end being open.

[0009] Preferably, the first rod connecting end has a profile similar to the profile of the first rod. This is advantageous as when the first profiled tubular rod is connected to the first rod connecting end, a smooth connection with little irregularities may be acquired.

[0010] The first profiled connector element further comprises a first oblique end opposing the first rod connecting end. The first oblique end is open and has a profile. The first oblique end is open resulting from the first profiled connector element being hollow.

[0011] The first profiled connector element defines a first interior space limited by the first rod connecting end, the first oblique end and a first inner contour surface of the first element. As the first profiled connector element is hollow it defines the first interior space. The first inner contour surface extends circumferentially along a longitudinal axis of the first profiled connector element.

[0012] The corner joint member comprises a second profiled connector element having a second rod connecting end for connecting to the second rod. The second rod connecting end is open. The second profiled connector element is also a profiled tubular rod having two ends. The second profiled connector element is hollow and profiled.

[0013] Preferably, the second rod connecting end has a profile similar to the profile of the second rod. This is advantageous as when the second profiled tubular rod is connected to the second rod connecting end, a smooth connection with little irregularities may be acquired.

[0014] The second profiled connector element comprises a second oblique end opposing the second rod connecting end. The second oblique end is open and has a profile. The second oblique end is open resulting from the second profiled connector element being hollow.

[0015] The second profiled connector element defines a second interior space limited by the second rod connecting end, the second oblique end and a second inner contour surface of the second element. As the second profiled connector element is hollow it defines the interior space. The second inner contour surface extends circumferentially along a longitudinal axis of the second profiled connector element.

[0016] Oblique means that an oblique end lies in a plane that is under an angle with respect to a longitudinal axis of a profiled connector element. The angles of the oblique ends depend on a desired angle between a connected first rod and second rod. The first oblique end profile is similar to the second oblique end profile, such that in a connecting state, when the first oblique end profile adjoins to the second oblique end profile, a closing seam is defined between the oblique ends.

[0017] No weld is provided in the closing seam. As the first oblique end profile is similar to the second oblique end profile, and no weld is provided in the closing seam, a smooth outer contour surface of the profiled connector elements is acquired with little irregularities.

[0018] The corner joint member is arranged in the connecting state and further comprises an auxiliary insert arranged in the first- and second interior space. The auxiliary insert for example is box shaped. When the first- and second oblique end profiles are square shaped, the auxiliary insert preferably is a cube that fits within the profiled connector elements in the interior spaces.

[0019] An outer contour surface of the auxiliary insert contacts the first inner contour surface of the first profiled connector element as well as the second inner contour surface of the second profiled connector element. By contacting the inner contour surfaces of the first- and second profiled connector elements it fits within said first- and second profiled connector elements.

[0020] The first inner contour surface extends along the longitudinal axis of the first profiled connector element and the second inner contour surface extends along the longitudinal axis of the second profiled connector element.

[0021] The corner joint member further comprises at least one first element weld between the outer contour surface of the auxiliary insert and the first inner contour surface.

[0022] The first element weld connects the auxiliary insert to the first profiled connector element. Preferably, each corner of the first inner contour surface, seen in a transverse plane perpendicular to the longitudinal axis of the first profiled connector element, is welded to the outer contour surface of the auxiliary insert.

[0023] The corner joint member further comprises at least one second element weld between the outer contour surface of the auxiliary insert and the second inner contour surface.

[0024] The second element weld connects the auxiliary insert to the second profiled connector element. Preferably, each corner of the second inner contour surface, seen in a transverse plane perpendicular to the longitudinal axis of the second profiled connector element, is welded to the outer contour surface of the auxiliary insert.

[0025] Having no weld in the closing seam results in a smooth outer contour surface of the first- and second profiled connector element. The first- and second element weld instead is provided respectively on the inner contour surfaces. These welds cannot be seen by a person. The respective welds are provided by means of a welding head reaching the interior spaces through openings of respectively the first- and second rod connecting ends. The openings are suitably for receiving the welding head and result from the respective rod connecting ends being open, i.e. having an open profile.

[0026] The auxiliary surfaces are therefore arranged within both the first- and second profiled connector elements, more in particular in the respective first- and second interior spaces. As the auxiliary inserts are welded to the first- and second profiled connector elements, the auxiliary insert provides more support to the first- and second profiled connector elements. Moreover, as the first - and second profiled connector elements contact

the auxiliary surface, more support is provided such that forces exerted on the first profiled connector element is transferred more easily to the second profiled connector element and vice versa.

[0027] This results in a corner joint member that has little irregularities while providing sufficient strength.

[0028] Having no weld in the closing seam and providing the corner joint member with the auxiliary insert further has as advantage that a more accurate corner joint member may be provided.

[0029] The corner joint member connect the first profiled tubular rod and the second profiled tubular rod under a desired angle. It often is desired that the actual angle has a certain accuracy with respect to the desired angle. In particular, when the corner joint member and the first- and second profiled tubular rods are part of an assembly, it may be desired that this assembly comprises profiled tubular rods that are arranged under an angle, wherein the actual angle is within a fault margin, i.e. has a desired accuracy. The auxiliary insert allows a more accurate angle as during welding of the corner joint member to the first- and second profiled connector elements, said first- and second profiled connector elements are supported by said auxiliary insert. Less unwanted movement of the first profiled connector element with respect to the second profiled connector element may arise during welding.

[0030] In an embodiment of the corner joint member according to the invention, material of the auxiliary insert has a smaller mass than the mass of the first- and second profiled connector elements such that, near the first- and second weld, material of the auxiliary insert expand more during welding and cools faster after welding compared to material of the first- and second profiled connector elements.

[0031] During welding the auxiliary insert expands due to heating, while the auxiliary insert is connected to the first- and second profiled connector elements. After welding, the auxiliary insert as well as the first- and second profiled connector elements need to cool down. As the mass of the auxiliary insert is smaller, the auxiliary insert shall cool down faster than the first- and second profiled connector elements. The auxiliary insert shall, therefore shrink more.

[0032] This is advantageous as the first profiled connector element is pressed against the second profiled connector element as the auxiliary insert shrinks more than the profiled connector elements. Therefore, the first oblique end is pressed against the second oblique end upon cooling after welding. This results in a closing seam has even less irregularities as irregularities are removed due to the pressing of the first- and second oblique ends to each other.

[0033] In an embodiment of the corner joint member according to the invention, the auxiliary insert is sized such that, near the first- and second weld, material of the auxiliary insert expand more during welding and cools faster after welding compared to material of the first- and

second profiled connector element.

[0034] In a preferred embodiment, the auxiliary insert is hollow. This is advantageous as it reduces mass, such that the auxiliary inserts cools down faster after welding. The auxiliary insert comprises a hollow shape such that the mass is as little as possible, however providing sufficient stiffness for providing support to the first- and second profiled connector elements.

[0035] Further preferably, the auxiliary insert comprises a reinforcement means arranged inside the auxiliary insert, wherein the reinforcement means is arranged perpendicular with respect to the closing seam.

[0036] This allows a hollow auxiliary insert with little mass while still providing sufficient stiffness such that the auxiliary insert is able to distribute forces exerted on the corner joint member.

[0037] In an embodiment of the corner joint member according to the invention, an edge of the auxiliary insert comprises a bevel.

[0038] The edge is defined by at least two sides of the auxiliary insert. The bevel creates an additional side, in other words, it defines an additional outer contour surface of the auxiliary insert. When the auxiliary insert is arranged in the first- and second interior space, the auxiliary insert fills the first- and second interior space. The bevel allows the first- and second interior space to be filled less compared with an absence of the bevel. The bevel therefore defines an auxiliary interior space limited by the bevel of the auxiliary insert and part of the inner contour surface of the first- and second profiled connector elements.

[0039] The part of the inner contour surface of the first- and second profiled connector elements is preferably near corners, seen in a plane perpendicular to a longitudinal axis of the respective profiled connector element, wherein said corners are the corners defined by a longest side of the respective profiled connector elements.

[0040] This has as advantage that it allows the auxiliary insert to fit snugly in the first- and second interior space. Moreover, near said corners defined by the longest side of the respective profiled connector elements, burs may occur that may result in an irregular fitting of the auxiliary insert. As a result of the bevel and defining of the auxiliary interior space, the burs may be located in the auxiliary interior space, such that the burs do not result in contacting the auxiliary insert and thus avoiding inaccuracies and irregularities.

[0041] In an embodiment of the corner joint member according to the invention, at least one of the first- and second profiled connector elements comprises in its corners, seen in a plane perpendicular to a longitudinal axis of the respective profiled connector element, a recess extending away from the inner contour surface of the respective profiled connector element.

[0042] This is advantageous as it allows the auxiliary insert to fit snugly in the first- and second interior space.

[0043] In an embodiment of the corner joint member according to the invention, the auxiliary insert is box shaped.

[0044] This is advantageous as the outer contour surface of the auxiliary insert contacts the first profiled connector element in three planes of the first inner contour surface and it contacts the second profiled connector element in three planes of the second inner contour surface. This may provide even more support, resulting in a more strong corner joint member.

[0045] In an embodiment of the corner joint member according to the invention, wherein the first- and second oblique end profiles are square shaped and the auxiliary insert is cube shaped.

[0046] This is advantageous as the outer contour surface of the auxiliary insert contacts the first profiled connector element in three planes of the first inner contour surface and it contacts the second profiled connector element in three planes of the second inner contour surface. This may provide even more support, resulting in a more strong corner joint member.

[0047] In an embodiment of the corner joint member according to the invention, the corner further comprises a third profiled connector element. The third profiled connector element has a third rod connecting end for connecting to a third profiled tubular rod. Preferably, the profile of the third rod connecting end is similar to the profile of the third profiled tubular rod. The third profiled connector element has a third end opposing the third rod connecting end. The third end adjoins an outer contour surface of both the first- and second profiled connector element. The third end partly overlaps the outer contour surfaces of the first- and second profiled connector elements. A longitudinal axis of the third profiled connector element is perpendicular to a plane comprising longitudinal axes of respectively the first- and second profiled connector elements. This means that the third profiled connector element is perpendicularly arranged with respect to the first- and second profiled connector elements. This is advantageous as the third profiled tubular rod can be arranged perpendicular to the first- and second profiled tubular rods. The third profiled connector element defines a third interior space limited by the third rod connecting end, the third, end and a third inner contour surface of the third element. At least one third element weld is provided between the outer contour surface of the first- and second profiled connector element and the third inner contour surface.

[0048] The third element weld is provided by a welding head that is received in the third interior space through the third rod connecting end. The third rod connecting end therefore comprises an opening. The opening is suitable for receiving the welding head and the opening results from the third rod connecting end being open, i.e. having an open profile.

[0049] This is advantageous as a closing seam between on the one hand the first- and second profiled connector elements and on the other hand the third profiled connector elements is free from a weld. The closing seam is defined between on the one hand the outer contour surface of the first- and second profiled connector ele-

ments and on the other hand the profile of the third end. Instead of a weld in the closing seam, the connection is provided internal of the third profiled connector element, namely on the third inner contour surface. As the weld is internal, little irregularities arise in the closing seam.

[0050] Preferably, the profile of the third profiled connector element is rectangular and the third element welds are provided at least in the corners seen in a transverse plane perpendicular to the longitudinal axis of the third profiled connector element.

[0051] The invention further relates to a method for manufacturing a corner joint member according to claim 9.

[0052] The method comprises the step of adjoining a first oblique end of a first profiled tubular element to a second oblique end of a second profiled tubular element, wherein a first oblique end profile is similar to a second oblique end profile.

[0053] The method further comprises the step of inserting an auxiliary insert at least partly into a first interior space and a second interior space. The first interior space is limited by the first oblique end and a first inner contour surface of the first profiled tubular element. The second interior space is limited by the second oblique end and a second inner contour surface of the second profiled tubular element.

[0054] The step of adjoining and inserting may be performed in random order. For example, firstly the first oblique end is adjoined to the second oblique end and subsequently the auxiliary insert is inserted into the first- and second interior spaces. The auxiliary insert may pass through an opposing end that is open. In an alternative example, the auxiliary insert is firstly inserted into the first interior space and secondly the second profiled connector element is slid over the auxiliary insert, such that the second interior space receives the auxiliary insert. The auxiliary insert is received into the second interior space by passing through an open end opposing the second oblique end.

[0055] The method further comprises the step of receiving a welding head respectively in the first- and second interior space through respectively the first- and second rod connecting end. The first rod connecting end of the first profiled connector element opposes the first oblique end and has an open profile. The second rod connecting end of the second profiled connector element opposes the second oblique end and has an open profile. Therefore, after the auxiliary insert is received into the interior spaces, also the welding head is subsequently received in the interior spaces.

[0056] Preferably, only one welding head is subsequently received in respectively the first- and second interior space or vice versa. Alternatively, more than one welding head is available which allows simultaneously receiving a respective welding head in the first- and second interior spaces.

[0057] The method further comprises the step of welding the auxiliary insert to the first- and second profiled

tubular element by respectively providing at least one first element weld between an outer contour surface of the auxiliary insert and the first inner contour surface and by providing at least one second element weld between the outer contour surface of the auxiliary insert and the second inner contour surface.

[0058] The at least one element weld are provided by the welding head that are received in the interior spaces. While the welding head is received in the interior spaces the respective inner contour surfaces of the profiled connector elements can be reached such that they can be welded to the outer contour surface of the auxiliary insert.

[0059] The at least one first element weld is provided by the welding head when received in the first interior space. The at least second element weld is provided by the welding head when received in the second interior space.

[0060] This method is particularly advantageous while a closing seam between the first- and second oblique end is free from a weld. Instead, the weld is provided internal of the first- and second profiled connector elements. This results in less irregularities.

[0061] Moreover, the auxiliary insert provides support to the first- and second profiled connector elements. This results in a more strong corner joint member.

[0062] In an embodiment of the method according to the invention, each corner of the first inner contour surface, seen in a transverse plane perpendicular to a longitudinal axis of the first profiled connector element, is welded to the outer contour surface of the auxiliary insert.

[0063] This is advantageous as it provides an optimal connection as these corners provide a relatively large inner contour surface of the first profiled connector element as the surface extends in two planes.

[0064] In an embodiment of the method according to the invention, each corner of the second inner contour surface, seen in a transverse plane perpendicular to a longitudinal axis of the second profiled connector element, is welded to the outer contour surface of the auxiliary insert.

[0065] This is advantageous as it provides an optimal connection as these corners provide a relatively large inner contour surface of the second profiled connector element as the surface extends in two planes.

[0066] In an embodiment of the method according to the invention, a continuous weld is applied along the total profile of the first inner contour surface, seen in a transverse plane perpendicular to a longitudinal axis of the first profiled connector element.

[0067] This is advantageous as the first element weld is relatively large compared to multiple smaller first element welds, therefore providing more strength.

[0068] In an embodiment of the method according to the invention, wherein a continuous weld is applied along the total profile of the second inner contour surface, seen in a transverse plane perpendicular to a longitudinal axis of the second profiled connector element.

[0069] This is advantageous as the second element

weld is relatively large compared to multiple smaller second element welds, therefore providing more strength.

[0070] The invention further relates to a profiled tubular rod assembly according to claim 14, comprising a first corner joint member; according to one of the above embodiments.

[0071] The profiled tubular assembly further comprises a first profiled tubular rod connected to a first rod connecting end of the first corner joint member. The first profiled tubular rod has a profile similar to the first rod connecting end.

[0072] The connection of the first rod connecting end to the first profiled tubular rod may be provided by a conventional connection means, such as a pin-hole connection. The pin may be sunken in the first profiled connector element or the first profiled tubular rod.

[0073] This results in an assembly with a corner joint member having little irregularities near a closing seam and an increased strength compared to the state of art.

[0074] In an embodiment of the profiled tubular rod assembly according to the invention, the profiled tubular assembly further comprises a longitudinal profiled receiving element for receiving a plate like element.

[0075] The plate like element may for example be a glass plate or a wooden plate. The plate like element is fixed with respect to the profiled tubular rods, or in other words, the profiled tubular rods keep the plate like element in place.

[0076] The longitudinal profiled receiving element is form fitted parallel to the first profiled tubular rod. For this reason, the longitudinal profiled receiving element comprises a form fitting recess for receiving complementary form fitting protrusions.

[0077] The first profiled tubular rod comprises complementary form fitting protrusions extending outwards from an outer contour surface.

[0078] The recess as well as the complementary protrusion extend longitudinally along the longitudinal profiled receiving element and the first profiled tubular rod.

[0079] Preferably, multiple form fitting recesses are provided in the longitudinal profiled receiving element and multiple corresponding complementary form fitting protrusions are provided on the first profiled tubular rods. Alternatively, a single recess and a single complementary protrusion are provided.

[0080] The longitudinal profiled receiving element extends over an outer contour surface of the first corner joint member.

[0081] This is advantageous as the longitudinal profiled receiving element can abut with less irregularities to the closing seam of the corner joint member as the closing seam is free from a weld.

[0082] In an embodiment of the profiled tubular rod assembly according to the invention, the profiled tubular rod assembly comprises multiple corner joint members. Particularly, the multiple corner joint members are corner joint members according to one of the above embodiments.

[0083] The profiled tubular assembly comprises a first corner joint member for connecting a first profiled tubular rod with a second profiled tubular rod under a first angle.

[0084] The profiled tubular assembly further comprises a second corner joint member for connecting the second profiled tubular rod with a third profiled tubular rod under a second angle.

[0085] The profiled tubular assembly further comprises a third corner joint member for connecting the third profiled tubular rod with a fourth profiled tubular rod under a third angle;

The profiled tubular assembly further comprises a fourth corner joint member for connecting the fourth profiled tubular rod with a first profiled tubular rod under a fourth angle;

The profiled tubular assembly further comprises the first profiled tubular rod connected with its ends to respectively the first corner joint member and the second corner joint member;

The profiled tubular assembly further comprises the second profiled tubular rod connected with its ends to respectively the second corner joint member and the third corner joint member.

[0086] The profiled tubular assembly further comprises the third profiled tubular rod connected with its ends to respectively the third corner joint member and the fourth corner joint member.

[0087] The profiled tubular assembly further comprises the fourth profiled tubular rod connected with its ends to respectively the fourth corner joint member and the first corner joint member.

[0088] This is advantageous as it results in a profiled tubular rod assembly having corner joint members with little irregularities near the closing seam and an increased strength compared to the state of art.

[0089] In a further embodiment of the profiled tubular rod assembly according to the invention, the first-, second-, third-, and fourth angles are 90 degrees such that the profiled tubular rod assembly has a rectangular frame profile.

[0090] This is advantageous as it results in a profiled tubular rod assembly having corner joint members with little irregularities near the closing seam and an increased strength compared to the state of art.

[0091] These and other aspect of the invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description and considered in connection with the accompanying drawings in which like reference symbols designate like parts.

Figure 1 shows a side view of an embodiment of the corner joint member;

figure 2 shows a top view of the embodiment of the corner joint member;

figure 3 shows a perspective view of the embodiment of the corner joint member;

figure 4a shows a first embodiment of a profiled tu-

bular rod;
 figure 4b shows a second embodiment of a profiled tubular rod;
 figure 4c shows a third embodiment of a profiled tubular rod;
 figure 5 shows a first embodiment of a profiled tubular rod assembly; and
 figure 6 shows a second embodiment of a profiled tubular rod assembly;
 figure 7 shows an embodiment of a auxiliary insert;
 figure 8 shows another embodiment of an auxiliary insert;
 figure 9 shows an embodiment of a profiled connector element

[0092] Figure 1 shows a corner joint member 1 for joining a first profiled tubular rod 10 under an angle with a second profiled tubular rod 20 by connecting ends of the first rod 10 and the second rod 20 to the corner joint member 1. Preferably, each tubular rod 10, 20 comprises a rectangular profile. Here said profile is square.

[0093] The corner joint member 1 comprises a first profiled connector element 11 having a first rod connecting end 12 for connecting to the first rod 10, wherein the first rod connecting end 12 is open and has a profile similar to the profile of the first rod 10. The first profiled connector element 11 further comprises a first oblique end 13 opposing the first rod connecting end 12. The first oblique end 13 is open and has a profile, wherein the first profiled connector element 11 defines a first interior space A. The first interior space A is limited by the first rod connecting end 12, the first oblique end 13 and a first inner contour surface 14 of the first element 11.

[0094] The corner joint member also comprises a second profiled connector element 21 having a second rod connecting end 22 for connecting to the second rod 20. The second rod connecting end 22 is open and has a profile similar to the profile of the second rod 20. The second profiled connector element 21 comprises a second oblique end 23 opposing the second rod connecting end 22. The second oblique end 23 is open and has a profile, wherein the second profiled connector element 21 defines a second interior space B. The second interior space B is limited by the second rod connecting end 22, the second oblique end 23 and a second inner contour surface 24 of the second element 11.

[0095] The first oblique end profile is similar to the second oblique end profile, such that in a connecting state, when the first oblique end 13 profile adjoins to the second oblique end 23 profile, a closing seam 3 is defined between the oblique ends 13, 23.

[0096] The corner joint member 1 in the connecting state further comprises an auxiliary insert 5 arranged in the first- and second interior space A, B, wherein an outer contour surface 6 of the auxiliary insert 5 contacts the first inner contour surface 14 of the first profiled connector element 11 as well as the second inner contour surface 24 of the second profiled connector element 21.

[0097] As can be seen in figure 2, the corner joint member 1 further comprises at least one first element weld 15a, 15b, 15c, 15d between the outer contour surface of the auxiliary insert 6 and the first inner contour surface 14.

[0098] Here the first element welds 15a, 15b, 15c, 15d are provided in four corners of the first inner contour surface 14, seen in a transverse plane perpendicular to a longitudinal axis X1 of the first profiled connector element 11. The first element welds 15a, 15b, 15c, 15d weld the first profiled connector element 11 to the outer contour surface 6 of the auxiliary insert 5.

[0099] As can be seen in the perspective view of figure 3, the corner joint member 1 further comprises at least one second element weld 25a, 25b, 25c, 25d between the outer contour surface 6 of the auxiliary insert 5 and the second inner contour surface 24.

[0100] Figure 3, shows a perspective view of the embodiment of the corner joint member. For convenience, the first profiled tubular rod 10 and the second profiled tubular rod 20 are not shown.

[0101] Here the second element welds 15a, 15b, 15c, 15d are provided in four corners of the second inner contour surface 24, seen in a transverse plane perpendicular to a longitudinal axis X2 of the second profiled connector element 21. The second element welds 25a, 25b, 25c, 25d weld the first profiled connector element 11 to the outer, contour surface 6 of the auxiliary insert 5.

[0102] Note that the longitudinal axis X1 of the first profiled connector element 11 is perpendicularly arranged, i.e. 90 degrees, with respect to the longitudinal axis X2 of the second profiled connector element 21. Therefore, the connected first profiled tubular rod 10 is arranged with an angle of 90 degrees with respect to the connected second profiled tubular rod 20.

[0103] Material of the auxiliary insert 5 has a smaller mass than the mass of the first profiled connector 11. Also the material of the auxiliary insert 5 has a smaller mass than the mass of the second profiled connector elements 21. This results in that, near the first- and second weld 15, 25, the material of the auxiliary insert 5 expands more during welding and cools faster after welding compared to material of the first- and second profiled connector elements 11, 21.

[0104] The auxiliary insert 5 is hollow. The first- and second oblique end profiles are square shaped and the corresponding auxiliary insert 5 is cube shaped.

[0105] The corner joint member 1 shown in figures 1-3 is manufactured by means of a method for manufacturing the corner joint member 1. This method comprises the step of adjoining the first oblique end 13 of the first profiled tubular element 11 to the second oblique end 23 of the second profiled tubular element 23.

[0106] The method further comprises the step of inserting the auxiliary insert 5 at least partly into the first interior space A and the second interior space B.

[0107] The method further comprises the step of receiving a welding head respectively in the first- and second interior space A, B through respectively a first- and

second rod connecting end 12, 22.

[0108] The first rod connecting end 12 of the first profiled connector element 11 opposes the first oblique end 13. The first rod connecting end 12 has an open profile. The second rod connecting end 22 of the second profiled connector element 21 opposes the second oblique end 23. The second rod connecting end 22 has an open profile.

[0109] The method further comprises the step of welding the auxiliary insert 5 to the first- and second profiled tubular element 11, 21 by respectively providing at least one first element weld 15 between an outer contour surface 6 of the auxiliary insert 5 and the first inner contour surface 14 and providing at least one second element weld 25 between the outer contour surface 6 of the auxiliary insert 5 and the second inner contour surface 24.

[0110] Figure 5 shows a profiled tubular rod assembly, comprising a first corner joint member 101 according to another embodiment. The first corner joint members comprises a first profiled connector element 111 and a second profiled connector element 121. Each profiled connector element 111, 121 comprises a pin-hole connecting means 151, 152 for connecting the respective profiled connector element 111, 121 to a respective first- and second profiled tubular rod 110, 210.

[0111] Figure 5 shows that a second profiled tubular rod 210 is connected to a second rod connecting end of the first corner joint member 101. The second profiled tubular rod 210 has a profile similar to the first rod connecting end.

[0112] The second profiled tubular rod 210 is suitable for longitudinally connecting to a longitudinal profiled receiving element 42 as also shown in figure 4a.

[0113] The longitudinal profiled receiving element 42 is suitable for receiving a plate like element in a plate recess 62. The longitudinal profiled receiving element 42 is form fitted parallel to the second profiled tubular rod 210. The longitudinal profiled receiving element 42 comprising a form fitting recess 72a, 72b for receiving complementary form fitting protrusions 82a, 82b.

[0114] The second profiled tubular rod 210 comprises the complementary form fitting protrusions 82a, 82b extending outwards from an outer contour surface C of the second profiled tubular rod 210. The longitudinal profiled receiving element 42 extends over an outer contour surface D of the first corner joint member 101.

[0115] Figure 4b and figure 4c disclose alternative profiled tubular rods 230, 240. Wherein more parallel arranged form fitting protrusions are arranged on their respective outer contour surfaces of the profiled tubular rods.

[0116] Figure 6 shows the profiled tubular rod assembly further assembled with multiple corner joint members 101, 201, 301, 401 and profiled tubular rods 110, 210, 310, 410. The corner joint members 101, 201, 301, 401 are embodied according to the first corner joint - member 101.

[0117] Shown is the first corner joint member 101 for

connecting a first profiled tubular rod 110 with a second profiled tubular rod 210 under an 90 degrees angle.

[0118] Shown is a second corner joint member 201 for connecting the second profiled tubular rod 210 with a third profiled tubular rod 310 under a 90 degrees angle.

[0119] Shown is a third corner joint member 301 for connecting a third profiled tubular rod 310 with a fourth profiled tubular rod 410 under a 90 degrees angle.

[0120] Shown is a fourth corner joint member 401 for connecting the fourth profiled tubular rod 410 with the first profiled tubular rod 110 under a 90 degrees angle.

[0121] The first profiled tubular rod 110 is connected with its ends to respectively the first corner joint member 101 and the second corner joint member 201.

[0122] The second profiled tubular rod 210 is connected with its ends to respectively the second corner joint member 201 and the third corner joint member 301.

[0123] The third profiled tubular rod 310 is connected with its ends to respectively the third corner joint member 301 and the fourth corner joint member 401.

[0124] The fourth profiled tubular rod 401 is connected with its ends to respectively the fourth corner joint member 401 and the first corner joint member 301.

[0125] The profiled tubular rod assembly has a rectangular frame profile.

[0126] Figure 7 shows a top view of a corner joint 201 according to another embodiment of the invention. In particular it shows an auxiliary insert 205 which is hollow. This reduces the mass of the auxiliary insert such that the mass is lower than the mass of first- and second profiled connector elements 11, 21 in which the auxiliary insert 205 is inserted.

[0127] This is advantageous as it reduces mass, such that the auxiliary insert 205 cools down faster after welding. The auxiliary insert 205 comprises a hollow shape such that the mass is as little as possible, however providing sufficient stiffness for providing support to the first- and second profiled connector elements 11, 21.

[0128] Further preferably, the auxiliary insert comprises a reinforcement means 60 arranged inside the auxiliary insert 205, wherein the reinforcement means 60 is arranged perpendicular with respect to the closing seam 3.

[0129] This allows a hollow auxiliary insert 205 with little mass while still providing sufficient stiffness such that the auxiliary insert 205 is able to distribute forces exerted on the corner joint member 201.

[0130] Figure 8 shows a top view of a corner joint member 301 further comprising an auxiliary insert 305 of which an edge 66 comprises a bevel 65.

[0131] The edge 66 is defined between two sides 67a, 67b of the auxiliary insert 305. The bevel 65 creates an additional side, being actually the edge 66. In other words, it defines a different shape of the additional outer contour surface 6 of the auxiliary insert 305. When the auxiliary insert 305 is arranged in the first- and second interior space A, B, the auxiliary insert 305 fills the first- and second interior space A, B. The bevel 65 allows the

first- and second interior space A, B to be filled less compared with an absence of the bevel 65. The bevel 65 therefore defines an auxiliary interior space C limited by the bevel 65 of the auxiliary insert 305 and part of the inner contour surfaces 14, 24 of the first- and second

profiled connector elements 11, 21. **[0132]** The part of the inner contour surfaces 14, 24 of the first- and second profiled connector elements 11, 21 is preferably near corners, seen in a plane perpendicular to a longitudinal axis X1, X2 of the respective profiled connector element 14, 24, wherein said corners are the corners defined by a longest side of the respective profiled connector elements 14, 24.

[0133] This has as advantage that it allows the auxiliary insert 305 to fit snugly in the first- and second interior space A, B. Moreover, near said corners defined by the longest side of the respective profiled connector elements 11, 21, burs may occur that may result in an irregular fitting of the auxiliary insert 305. As a result of the bevel 65 and defining of the auxiliary interior space C, the burs may be located in the auxiliary interior space C, such that the burs do not result in contacting the auxiliary insert 305 and thus avoiding inaccuracies and irregularities.

[0134] In an embodiment of the corner joint member 401 according to the invention, at least one of first- and second profiled connector elements 411, 421 comprises in its corners, seen in a plane perpendicular to a longitudinal axis X1, X2 of the respective profiled connector element 411, 421, a recess 67a, 67b, 67c, 67d extending away from the inner contour surface 14, 24 of the respective profiled connector element 411, 421.

[0135] This is advantageous as it allows an auxiliary insert 5 to fit snugly in the first- and second interior space A, B.

[0136] In figures 7-9, a space is indicated between the auxiliary insert 205, 305, 5 and the respective profiled connector elements 11, 21, 411, 421. However, this space is to more clearly indicate where the profiled connector elements 11, 21, 411, 421 limit the respective auxiliary insert 205, 305, 5. When the corner joint member 201, 301, 401 is assembled the auxiliary insert 205, 305, 5 snugly fits in the respective profiled connector elements 11, 21, 411, 421. Or in other words, the outer contour surface of the auxiliary insert 205, 305, 5 contact the inner contour surface of the respective profiled connector-elements 11, 21, 411, 421.

Claims

1. Corner joint member (1, 101, 201, 301, 401) for joining a first profiled tubular rod (10, 110) under an angle with a second profiled tubular rod (20, 210, 230, 240) by connecting ends of the first rod and the second rod to the corner joint member, the corner joint member (1, 101, 201, 301, 401) comprising

- a first profiled connector element (11, 111, 211, 311, 411) having a first rod connecting end (12) for connecting to the first rod (10, 110), wherein The first rod connecting end (12) is open, wherein the first profiled connector element (11, 111, 211, 311, 411) further comprises a first oblique end (13) opposing the first rod connecting end (12), wherein the first oblique end (13) is open and has a profile, wherein the first profiled connector element (11, 111, 211, 311, 411) defines a first interior space (A) limited by the first rod connecting end (12), the first oblique end (15) and a first inner contour surface (14) of the first element;

- a second profiled connector element (21, 121, 221, 321, 421) having a second rod connecting end (22) for connecting to the second rod, wherein the second rod connecting end (22) is open, wherein the second profiled connector element (21, 121, 221, 321, 421) comprises a second oblique end (23) opposing the second rod connecting end (22), wherein the second oblique end (23) is open and has a profile, wherein the second profiled connector element (21, 121, 221, 321, 421) defines a second interior space (13) limited by the second rod connecting end (22), the second oblique end (23) and a second inner contour surface (24) of the second element;

wherein the first oblique end profile is similar to the second oblique end profile, such that in a connecting state, when the first oblique end profile adjoins to the second oblique end profile, a closing seam (3) is defined between the oblique ends (13, 23), wherein the corner joint member (1, 101, 201, 301, 401) is in the connecting state and further comprises:

- an auxiliary insert (5, 205, 305) arranged in the first- and second interior space (A, B), wherein an outer contour surface of the auxiliary insert (5, 205, 305) contacts the first inner contour surface (14) of the first profiled connector element (11, 111, 211, 311, 411) as well as the second inner contour surface (24) of the second profiled connector element (21, 121, 221, 321, 421);

characterized in that

the corner joint member (1, 101, 201, 301, 401) further comprises

- at least one first element weld (15a, 15b, 15c, 15d) between the outer contour surface of the auxiliary insert (5, 205, 305) and the first inner contour surface (14) ;
- at least one second element weld (25a, 25b, 25c, 25d) between the outer contour surface of the auxiliary insert (5, 205, 305) and the second inner contour surface (24).

2. Corner joint member according to claim 1, wherein material of the auxiliary insert (5, 205, 305) has a smaller mass than the mass of the first- and second profiled connector elements (11, 111, 211, 311, 411, 21, 121, 221, 321, 421) such that, near the first- and second weld (15, 25), material of the auxiliary insert (5, 205, 305) expand more during welding and cools faster after welding compared to material of the first- and second profiled connector elements. 5
3. Corner joint member according to one of the preceding claims, wherein the auxiliary insert (5, 205, 305) is hollow, wherein preferably the auxiliary insert (205) comprises a reinforcement means (60) arranged inside the auxiliary insert, wherein the reinforcement means (60) is arranged perpendicular with respect to the closing seam (3). 10
4. Corner joint member according to one of the preceding claims, wherein an edge of the auxiliary insert (305) comprises a bevel (65). 15
5. Corner joint member according to one of the preceding claims, wherein at least one of the first- and second profiled connector elements (411, 421) comprises in its corners seen in a plane perpendicular to a longitudinal axis of the respective profiled connector element a recess (67a, 67b, 67c, 67d) extending away from the inner contour surface (14, 24) of the respective profiled connector element. 20
6. Corner joint member according to one of the preceding claims, wherein the auxiliary insert (5, 205, 305) is box shaped. 25
7. Corner joint member according to one of the preceding claims, wherein the first- and second oblique end (13, 23) profiles are square shaped and the auxiliary insert (5, 205, 305) is cube shaped. 30
8. Corner joint member according to one of the preceding claims, further comprising: 35
 - a third profiled connector element having a third rod connecting end for connecting to a third profiled tubular rod and having an opposing third end that adjoins an outer contour surface of both the first- and second profiled connector element, wherein a longitudinal axis of the third profiled connector element is perpendicular to a plane comprising longitudinal axes of respectively the first- and second profiled connector elements, wherein the third profiled connector element defines a third interior space limited by the third rod connecting end, the third end and a third inner contour surface of the third element, wherein at least one third element weld between the outer contour surface of the first- and second40
9. Method for manufacturing a corner joint member according to one of the preceding claims, comprising the steps of: 45
 - adjoining a first oblique end (13) of a first profiled connector element (11, 111, 211, 311, 411) to a second oblique end (23) of a second profiled connector element (21, 121, 221, 321, 421), wherein a first oblique end profile is similar to a second oblique end profile;
 - inserting an auxiliary insert (5, 205, 305) at least partly into a first interior space (A) and a second interior space (B), wherein the first interior space (A) is limited by the first oblique end (13) and a first inner contour surface (14) of the first profiled connector element (11, 111, 211, 311, 411) and the second interior space (B) is limited by the second oblique end (23) and a second inner contour surface (24) of the second profiled connector element (21, 121, 221, 321, 421)
 - receiving a welding head respectively in the first- and second interior space (A, B) through respectively a first- and second rod connecting end (12, 22), wherein the first rod connecting end (12) of the first profiled connector element opposes the first oblique end (13), the first rod connecting end (12) having an open profile, and the second rod connecting end (22) of the second profiled connector element opposes the second oblique end (23), the second rod connecting end (22) having an open profile;
 - welding the auxiliary insert (5, 205, 305) to the first- and second profiled connector element by respectively providing at least one first element weld (15) between an outer contour surface of the auxiliary insert (5, 205, 305) and the first inner contour surface (14) and providing at least one second element weld (25) between the outer contour surface of the auxiliary insert (5, 205, 305) and the second inner contour surface (24).50
10. Method for manufacturing a corner joint member according to claim 9, wherein each corner of the first inner contour surface (14), seen in a transverse plane perpendicular to a longitudinal axis of the first profiled connector element (1, 111, 211, 311, 411) is welded to the outer contour surface of the auxiliary insert (5, 205, 305). 55
11. Method for manufacturing a corner joint member according to one of the claims 9-10, wherein each corner of the second inner contour surface (24), in a transverse plane perpendicular to a longitudinal axis of the second profiled connector element (21, 121, 221, 321, 421), is welded to the outer contour surface

of the auxiliary insert (5, 205, 305).

12. Method for manufacturing a corner joint member according to one of the claims 9-10, wherein a continuous weld is applied along the total profile of the first inner contour surface (14), seen in a transverse plane perpendicular to a longitudinal axis of the first profiled connector element (11, 111, 211, 311, 411). 5
13. Method for manufacturing a corner joint member according to one of the claims 9-12, wherein a continuous weld is applied along the total profile of the second inner contour surface (24), seen in a transverse plane perpendicular to a longitudinal axis of the second profiled connector element (21, 121, 221, 321, 421). 10 15
14. Profiled tubular rod assembly, comprising:

- a first corner joint member according to one of the claims 1-8; 20
- a first profiled tubular rod (10, 110) connected to a first rod connecting end (12) of the first corner joint member (1, 101, 201, 301, 401), wherein the first profiled tubular rod (10, 110) has a profile similar to the first rod connecting end (12). 25

preferably further comprising:

- a longitudinal profiled receiving element (42) for receiving a plate like element, the longitudinal profiled receiving element (42) being formed fitted parallel to the first profiled tubular rod, the longitudinal profiled receiving element (42) comprising a form fitting recess (72a, 72b) for receiving complementary form fitting protrusions (82a, 82b), the first profiled tubular rod (10, 110) comprising complementary form fitting protrusions (82a, 82b) extending outwards from an outer contour surface, wherein the longitudinal profiled receiving element (42) extends over an outer contour surface of the first corner joint member. 30 35 40

15. Profiled tubular rod assembly according to claim 14, comprising multiple corner joint members according to one of the claims 1-8, comprising: 45

- a first corner joint member for connecting a first profiled tubular rod with a second profiled tubular rod under a first angle; 50
- a second corner joint member for connecting the second profiled tubular rod with a third profiled tubular rod under a second angle;
- a third corner joint member for connecting the third profiled tubular rod with a fourth profiled tubular rod under a third angle; 55
- a fourth corner joint member for connecting the

fourth profiled tubular rod with the first profiled tubular rod under a fourth angle;

- the first profiled tubular rod connected with its ends to respectively the first corner joint member and the second corner joint member;
- the second profiled tubular rod connected with its ends to respectively the second corner joint member and the third corner joint member;
- the third profiled tubular rod connected with its ends to respectively the third corner joint member and the fourth corner joint member;
- the fourth profiled tubular rod connected with its ends to respectively the fourth corner joint member and the first corner joint member,

wherein preferably the first-, second-, third-, and fourth angles are 90 degrees such that the profiled tubular rod assembly has a rectangular frame profile.

Patentansprüche

1. Eckverbinder (1, 101, 201, 301, 401) zum Verbinden einer ersten profilierten rohrförmigen Stange (10, 110) unter einem Winkel mit einer zweiten profilierten rohrförmigen Stange (20, 210, 230, 240) durch Verbinden von Enden der ersten Stange und der zweiten Stange mit dem Eckverbinder, wobei der Eckverbinder (1, 101, 201, 301, 401) umfasst:

- ein erstes profiliertes Anschlusselement (11, 111, 211, 311, 411) mit einem ersten Stangenverbindungsende (12) zum Verbinden mit der ersten Stange (10, 110), wobei das erste Stangenverbindungsende (12) offen ist, wobei das erste profilierte Anschlusselement (11, 111, 211, 311, 411) ferner ein erstes schräges Ende (13) entgegengesetzt zu dem ersten Stangenverbindungsende (12) umfasst, wobei das erste schräge Ende (13) offen ist und ein Profil hat, wobei das erste profilierte Anschlusselement (11, 111, 211, 311, 411) einen ersten Innenraum (A) bildet, der durch das erste Stangenverbindungsende (12), das erste schräge Ende (13) und eine erste innere Umfangsfläche (14) des ersten Elements begrenzt ist;
- ein zweites profiliertes Anschlusselement (21, 121, 221, 321, 421) mit einem zweiten Stangenverbindungsende (22) zum Verbinden mit der zweiten Stange, wobei das zweite Stangenverbindungsende (22) offen ist, wobei das zweite profilierte Anschlusselement (21, 121, 221, 321, 421) ein zweites schräges Ende (23) umfasst, das dem zweiten Stangenanschlussende (22) entgegengesetzt ist, wobei das zweite schräge Ende (23) offen ist und ein Profil hat, wobei das zweite profilierte Anschlusselement (21, 121, 221, 321, 421) einen zweiten Innenraum (B) bil-

det, der durch das zweite Stangenverbindungs-
ende (22), das zweite schräge Ende (23) und
eine zweite innere Umfangsfläche (24) des
zweiten Elements begrenzt ist;

wobei das erste schräge Endprofil ähnlich dem zwei-
ten schrägen Endprofil ist, derart, dass in einem Ver-
bindungszustand, wenn das erste schräge Endprofil
an das zweite schräge Endprofil angrenzt, eine
Schweißnaht (3) zwischen den schrägen Enden (13,
23) gebildet wird,
wobei der Eckverbinder (1, 101, 201, 301, 401) im
Verbindungszustand ist, und ferner umfasst:

- einen Hilfseinsatz (5, 205, 305), der in dem
ersten und zweiten Innenraum (A, B) angeord-
net ist, wobei eine äußere Umfangsfläche des
Hilfseinsatzes (5, 205, 305) die erste innere Um-
fangsfläche (14) des ersten profilierten An-
schlusselements (11, 111, 211, 311, 411) sowie
die zweite innere Umfangsfläche (24) des zwei-
ten profilierten Anschlusselements (21, 121,
221, 321, 421) berührt;

dadurch gekennzeichnet, dass der Eckver-
binder (1, 101, 201, 301, 401) ferner umfasst;

- wenigstens eine Schweißstelle (15a, 15b,
15c, 15d) für das erste Element zwischen
der äußeren Umfangsfläche des Hilfsein-
satzes (5, 205, 305) und der ersten inneren
Umfangsfläche (14);

- wenigstens eine Schweißstelle (25a, 25b,
25c, 25d) für das zweite Element zwischen
der äußeren Umfangsfläche des Hilfsein-
satzes (5, 205, 305) und der zweiten inne-
ren Umfangsfläche (24).

2. Eckverbinder nach Anspruch 1, in welchem Material
des Hilfseinsatzes (5, 205, 305) eine kleinere Masse
als die Masse des ersten und zweiten profilierten
Anschlusselements (11, 111, 211, 311, 411, 21, 121,
221, 321, 421) hat, derart, dass sich nahe der ers-
ten und zweiten Schweißnaht (15, 25) Material des
Hilfseinsatzes ((5, 205, 305) während eines
Schweißvorgangs mehr ausdehnt und nach einem
Schweißvorgang schneller abkühlt im Vergleich zum
Material des ersten und zweiten profilierten An-
schlusselements.

3. Eckverbinder nach einem der vorhergehenden An-
sprüche, in welchem der Hilfseinsatz (5, 205, 305)
hohl ist, wobei vorzugsweise der Hilfseinsatz (205)
ein Verstärkungselement (60) umfasst, das innerhalb
des Hilfseinsatzes angeordnet ist, wobei das Ver-
stärkungselement (60) senkrecht in Bezug zur
Schweißnaht (3) angeordnet ist.

4. Eckverbinder nach einem der vorhergehenden An-

sprüche, in welchem eine Kante des Hilfseinsatzes
(305) eine Abschrägung (65) aufweist.

5. Eckverbinder nach einem der vorhergehenden An-
sprüche, in welchem wenigstens eines der ersten
und zweiten profilierten Anschlusselemente (411,
421) aus Sicht in einer Ebene senkrecht des jewei-
ligen profilierten Anschlusselements in seinen
Ecken eine Aussparung (67a, 67b, 67c, 67d) um-
fasst, die sich von der inneren Umfangsfläche (14,
24) des jeweiligen profilierten Abschlusselements
weg erstreckt.

6. Eckverbinder nach einem der vorhergehenden An-
sprüche, in welchem der Hilfseinsatz (5, 205, 305)
kastenförmig ist.

7. Eckverbinder nach einem der vorhergehenden An-
sprüche, in welchem die Profile der ersten und zwei-
ten schrägen Endes (13, 23) quadratisch gestaltet
sind und der Hilfseinsatz (5, 205 305) würfelförmig
gestaltet ist.

8. Eckverbinder nach einem der vorhergehenden An-
sprüche, ferner mit:

- einem dritten profilierten Anschlusselement,
das ein drittes Stangenverbindungs-
ende zum Verbinden mit einer dritten profilierten rohrfö-
rmigen Stange aufweist und ein entgegenge-
setztes drittes Ende hat, das an eine äußere
Umfangsfläche sowohl des ersten als auch des
zweiten profilierten Anschlusselements an-
grenzt, wobei eine Längsachse des dritten pro-
filierten Anschlusselements senkrecht zu einer
Ebene ist, welche Längsachsen jeweils des ers-
ten und zweiten profilierten Anschlusselements
umfasst, wobei das dritte profilierte Anschlus-
element einen dritten Innenraum bildet, der
durch das dritte Stangenverbindungs-
ende, das dritte Ende und eine dritte innere Umfangsfläche
des dritten Elements begrenzt ist, wobei wenig-
stens eine Schweißstelle für das dritte Element
zwischen der äußeren Umfangsfläche des ers-
ten und zweiten profilierten Anschlusselements
und der dritten inneren Umfangsfläche vorgese-
hen ist.

9. Verfahren zum Herstellen eines Eckverbinders nach
einem der vorhergehenden Ansprüche, mit den
Schritten:

- Aneinanderfügen eines ersten schrägen En-
des (13) eines ersten profilierten Anschlussele-
ments (11, 111, 211, 311, 411) mit einem zwei-
ten schrägen Ende (23) eines zweiten profilier-
ten Anschlusselements (21, 121, 221, 321, 421)
wobei ein Profil des ersten schrägen Endes ähn-

lich einem Profil des zweiten schrägen Endes ist;

- Einführen eines Hilfseinsatzes (5, 205, 305) wenigstens teilweise in einen ersten Innenraum (A) und einen zweiten Innenraum (B), wobei der erste Innenraum (A) durch das erste schräge Ende (13) und eine erste innere Umfangsfläche (14) des ersten profilierten Anschlusselements (11, 111, 211, 311, 411) begrenzt ist und der zweite Innenraum (B) durch das zweite schräge Ende (23) und eine zweite innere Umfangsfläche (24) des zweiten profilierten Anschlusselements (21, 121, 221, 321, 421) begrenzt ist;

- Aufnehmen eines Schweißkopfes jeweils in den ersten und zweiten Innenraum (A, B) durch jeweils ein erstes und zweites Stangenverbindungsende (12, 22) hindurch, wobei das erste Stangenverbindungsende (12) des ersten profilierten Anschlusselements dem ersten schrägen Ende (13) entgegengesetzt ist, wobei das erste Stangenverbindungsende (12) ein offenes Profil hat und wobei das zweite Stangenverbindungsende (22) des zweiten profilierten Anschlusselements dem zweiten schrägen Ende (23) entgegengesetzt ist, wobei das zweite Stangenverbindungsende (22) ein offenes Profil hat;

- Schweißen des Hilfseinsatzes (5, 205, 305) an das erste und zweite profilierte Anschlusselement durch jeweiliges Vorsehen wenigstens einer Schweißstelle (15) für das erste Element zwischen einer äußeren Umfangsfläche des Hilfseinsatzes (5, 205, 305) und der ersten inneren Umfangsfläche (14), und Vorsehen wenigstens einer Schweißstelle (25) für das zweite Element (25) zwischen der äußeren Umfangsfläche des Hilfseinsatzes (5, 205, 305) und der zweiten inneren Umfangsfläche (24).

10. Verfahren zum Herstellen eines Eckverbinders nach Anspruch 9, in welchem jede Ecke der ersten inneren Umfangsfläche (14), aus Sicht in einer Querebene senkrecht zur Längsachse des ersten profilierten Anschlusselements (11, 111, 211, 311, 411), an die äußere Umfangsfläche des Hilfseinsatzes (5, 205, 305) geschweißt wird.

11. Verfahren zum Herstellen eines Eckverbinders nach einem der Ansprüche 9 bis 10, in welchem jede Ecke der zweiten inneren Umfangsfläche (24), aus Sicht in einer Querebene senkrecht zu einer Längsachse des zweiten profilierten Anschlusselements (21, 121, 221, 321, 421), an die äußere Umfangsfläche des Hilfseinsatzes (5, 205, 305) geschweißt wird.

12. Verfahren zum Herstellen eines Eckverbinders nach einem der Ansprüche 9 bis 10, in welchem eine durchgehende Schweißnaht entlang des gesamten

Profils der zweiten inneren Umfangsfläche (24) aufgebracht wird, aus Sicht in einer Querebene, senkrecht zu einer Längsachse des ersten profilierten Anschlusselements (11, 111, 211, 311, 411).

13. Verfahren zum Herstellen eines Eckverbinders nach einem der Ansprüche 9 bis 12, in welchem eine durchgehende Schweißnaht entlang des gesamten Profils der zweiten inneren Umfangsfläche (24) aufgebracht wird, aus Sicht in einer Querebene, senkrecht zu einer Längsachse des zweiten profilierten Anschlusselements (21, 121, 221, 321, 421).

14. Anordnung profilierter rohrförmiger Stangen, mit:

- einem ersten Eckverbinder nach einem der Ansprüche 1 bis 8;

- einer ersten profilierten rohrförmigen Stange (10, 110), die mit einem ersten Rohrverbindungsende (12) des ersten Eckverbinders (1, 101, 201, 301, 401) verbunden ist, wobei die erste profilierte rohrförmige Stange (10, 110) ein Profil hat, dass ähnlich dem ersten Stangenverbindungsende (12) ist,

vorzugsweise ferner mit:

- einem in Längsrichtung profilierten Aufnahmeelement (42) zum Aufnehmen eines plattenförmigen Elements, wobei das in Längsrichtung profilierte Aufnahmeelement (42) eine formschlüssige Aussparung (72a, 72b) zum Aufnehmen komplementärer formschließender Vorsprünge (82a, 82b) umfasst, wobei die erste profilierte rohrförmige Stange (10, 110) komplementäre formschließende Vorsprünge (82a, 82b) umfasst, die sich von einer äußeren Umfangsfläche nach außen erstrecken, wobei sich das in Längsrichtung profilierte Aufnahmeelement (42) über eine äußere Umfangsfläche des ersten Eckverbinders erstreckt.

15. Anordnung profilierter rohrförmiger Stangen nach Anspruch 14, mit mehreren Eckverbindern nach einem der Ansprüche 1 bis 8, umfassend:

- einen ersten Eckverbinder zum Verbinden einer ersten profilierten rohrförmigen Stange mit einer zweiten profilierten rohrförmigen Stange unter einem ersten Winkel;

- einem zweiten Eckverbinder zum Verbinden der zweiten profilierten rohrförmigen Stange mit einer dritten profilierten rohrförmigen Stange unter einem zweiten Winkel;

- einem dritten Eckverbinder zum Verbinden der dritten profilierten rohrförmigen Stange mit einer vierten profilierten rohrförmigen Stange unter einem dritten Winkel;

- einem vierten Eckverbinder zum Verbinden der vierten profilierten rohrförmigen Stange mit der ersten profilierten rohrförmigen Stange unter einem vierten Winkel;

- wobei die erste profilierte rohrförmige Stange mit ihren Enden mit jeweils dem ersten Eckverbinder und dem zweiten Eckverbinder verbunden ist;

- wobei die zweite profilierte rohrförmige Stange mit ihren Enden jeweils mit dem zweiten Eckverbinder und dem dritten Eckverbinder verbunden ist;

- wobei die dritte profilierte rohrförmige Stange mit ihren Enden jeweils mit dem dritten Eckverbinder und dem vierten Eckverbinder verbunden ist;

- wobei die vierte profilierte rohrförmige Stange mit ihren Enden jeweils mit dem vierten Eckverbinder und dem ersten Eckverbinder verbunden ist,

- wobei vorzugsweise der erste, zweite, dritte und vierte Winkel 90° betragen, derart, dass die Einheit aus profilierten rohrförmigen Stangen ein rechtwinkliges Rahmenprofil hat.

Revendications

1. Élément de joint d'angle (1, 101, 201, 301, 401) pour assembler une première tige tubulaire profilée (10, 100) sous un angle avec une deuxième tige tubulaire profilée (20, 210, 230, 240) en raccordant les extrémités de la première tige et de la deuxième tige à l'élément de joint d'angle, l'élément de joint d'angle (1, 101, 201, 301, 401) comprenant :
 - un premier élément de connecteur profilé (11, 111, 211, 311, 411) ayant une première extrémité de raccordement de tige (12) pour le raccordement à la première tige (10, 110), dans lequel la première extrémité de raccordement de tige (12) est ouverte, dans lequel le premier élément de connecteur profilé (11, 111, 211, 311, 411) comprend en outre une première extrémité oblique (13) opposée à la première extrémité de raccordement de tige (12), dans lequel la première extrémité oblique (13) est ouverte et a un profil, dans lequel le premier élément de connecteur profilé (11, 111, 211, 311, 411) définit un premier espace intérieur (A) limité par la première extrémité de raccordement de tige (12), la première extrémité oblique (15) et une première surface de contour interne (14) du premier élément ;
 - un deuxième élément de connecteur profilé (21, 121, 221, 321, 421) ayant une deuxième extrémité de raccordement de tige (22) pour le raccordement à la deuxième tige, dans lequel la

deuxième extrémité de raccordement de tige (22) est ouverte, dans lequel le deuxième élément de connecteur profilé (21, 121, 221, 321, 421) comprend une deuxième extrémité oblique (23) opposée à la deuxième extrémité de raccordement de tige (22), dans lequel la deuxième extrémité oblique (23) est ouverte et a un profil, dans lequel le deuxième élément de connecteur profilé (21, 121, 221, 321, 421) définit un deuxième espace intérieur (B) limité par la deuxième extrémité de raccordement de tige (22), la deuxième extrémité oblique (23) est la deuxième surface de contour interne (24) du second élément ;

dans lequel le premier profilé d'extrémité oblique est similaire au second profilé d'extrémité oblique, de sorte que, dans un état de raccordement, lorsque le premier profilé d'extrémité oblique est attaché au second profilé d'extrémité oblique, une soudure de fermeture (3) est définie entre les extrémités obliques (13, 23), dans lequel l'élément de joint d'angle (1, 101, 201, 301, 401) est à l'état de raccordement et comprend en outre :

un insert auxiliaire (5, 205, 305) agencé dans les premier et deuxième espaces intérieurs (A, B), dans lequel une surface de contour externe de l'insert auxiliaire (5, 205, 305) est en contact avec la première surface de contour interne (14) du premier élément de connecteur profilé (11, 111, 211, 311, 411) ainsi que la deuxième surface de contour interne (24) du deuxième élément de connecteur de profilé (21, 121, 221, 321, 421),

caractérisé en ce que l'élément de joint d'angle (1, 101, 201, 301, 401) comprend en outre :

au moins une première soudure d'élément (15a, 15b, 15c, 15d) entre la surface de contour externe de l'insert auxiliaire (5, 205, 305) et la première surface de contour interne (14) ;

au moins une deuxième soudure d'élément (25a, 25b, 25c, 25d) entre la surface de contour externe de l'insert auxiliaire (5, 205, 305) et la deuxième surface de contour interne (24).

2. Élément de joint d'angle selon la revendication 1, dans lequel le matériau de l'insert auxiliaire (5, 205, 305) a une masse inférieure à la masse des premier et deuxième éléments de connecteur profilés (11, 111, 211, 311, 411, 21, 121, 221, 321, 421) de sorte que, à proximité des première et deuxième soudures (15, 25), le matériau de l'insert auxiliaire (5, 205, 305)

se dilate davantage pendant la soudure et refroidit plus vite après la soudure par rapport au matériau des premier et deuxième éléments de connecteur profilés.

3. Élément de joint d'angle selon l'une des revendications précédentes, dans lequel l'insert auxiliaire (5, 205, 305) est creux, dans lequel de préférence l'insert auxiliaire (205) comprend un moyen de renforcement (60) agencé à l'intérieur de l'insert auxiliaire, dans lequel le moyen de renforcement (60) est agencé perpendiculairement par rapport à la soudure de fermeture (3).

4. Élément de joint d'angle selon l'une des revendications précédentes, dans lequel un bord de l'insert auxiliaire (305) comprend un biseau (65).

5. Élément de joint d'angle selon l'une des revendications précédentes, dans lequel au moins l'un des premier et deuxième éléments de connecteur profilés (411, 421) comprend, dans ses angles observés dans un plan perpendiculaire à un axe longitudinal de l'élément de connecteur profilé (67a, 67b, 67c, 67d) respectif s'étendant à distance de la surface de contour interne (14, 24) de l'élément de connecteur profilé respectif.

6. Élément de joint d'angle selon l'une des revendications précédentes, dans lequel l'insert auxiliaire (5, 205, 305) est en forme de boîte.

7. Élément de joint d'angle selon l'une des revendications précédentes, dans lequel les premier et second profilés d'extrémité obliques (13, 23) sont de forme carrée et l'insert auxiliaire (5, 205, 305) est en forme de cube.

8. Élément de joint d'angle selon l'une des revendications précédentes, comprenant en outre :

un troisième élément de connecteur profilé ayant une troisième extrémité de raccordement de tige pour raccorder une troisième tige tubulaire profilée et ayant une troisième extrémité opposée qui est attenante à une surface de contour externe à la fois des premier et deuxième éléments de connecteur profilés, dans lequel un axe longitudinal du troisième élément de connecteur profilé est perpendiculaire à un plan comprenant les axes longitudinaux respectivement des premier et deuxième éléments de connecteur profilés, dans lequel le troisième élément de connecteur profilé comprend un troisième espace intérieur limité par la troisième extrémité de raccordement de tige, la troisième extrémité et une troisième surface de contour interne du troisième élément, dans lequel au

moins une troisième soudure d'élément entre la surface de contour externe des premier et deuxième éléments de connecteur profilés et la troisième surface de contour interne est prévue.

9. Procédé pour fabriquer un élément de joint d'angle selon l'une des revendications précédentes, comprenant les étapes consistant à :

assembler une première extrémité oblique (13) d'un premier élément de connecteur profilé (11, 111, 211, 311, 411) à une deuxième extrémité oblique (23) d'un deuxième élément de connecteur profilé (21, 121, 221, 321, 421), dans lequel un premier profil d'extrémité oblique est similaire à un second profil d'extrémité oblique ; insérer un insert auxiliaire (5, 205, 305) au moins partiellement dans un premier espace intérieur (A) et un deuxième espace intérieur (B), dans lequel le premier espace intérieur (A) est limité par la première extrémité oblique (13) et une première surface de contour interne (14) du premier élément de connecteur profilé (11, 111, 211, 311, 411) et le deuxième espace intérieur (B) est limité par la deuxième extrémité oblique (23) et une deuxième surface de contour interne (24) du deuxième élément de connecteur profilé (21, 121, 221, 321, 421),

recevoir une tête de soudage respectivement dans les premier et deuxième espaces intérieurs (A, B) respectivement par le biais d'une première et d'une deuxième extrémité de raccordement de tige (12, 22), dans lequel la première extrémité de raccordement de tige (12) du premier élément de connecteur profilé s'oppose à la première extrémité oblique (13), la première extrémité de raccordement de tige (12) ayant un profil ouvert, et la deuxième extrémité de raccordement de tige (22) du deuxième élément de connecteur profilé et opposée à la deuxième extrémité oblique (23), la deuxième de raccordement de tige (22) ayant un profil ouvert ;

souder l'insert auxiliaire (5, 205, 305) aux premier et deuxième éléments de connecteur profilés en prévoyant respectivement au moins une première soudure d'élément (15) entre une surface de contour externe de l'insert auxiliaire (5, 205, 305) et la première surface de contour interne (14) et en prévoyant au moins une deuxième soudure d'élément (25) entre la surface de contour externe de l'insert auxiliaire (5, 205, 305) et la deuxième surface de contour interne (24).

10. Procédé pour fabriquer un élément de joint d'angle selon la revendication 9, dans lequel chaque angle de la première surface de contour interne (14), observé dans un plan transversal perpendiculaire à un

axe longitudinal du premier élément de connecteur profilé (11, 111, 211, 311, 411) est soudé à la surface de contour externe de l'insert auxiliaire (5, 205, 305).

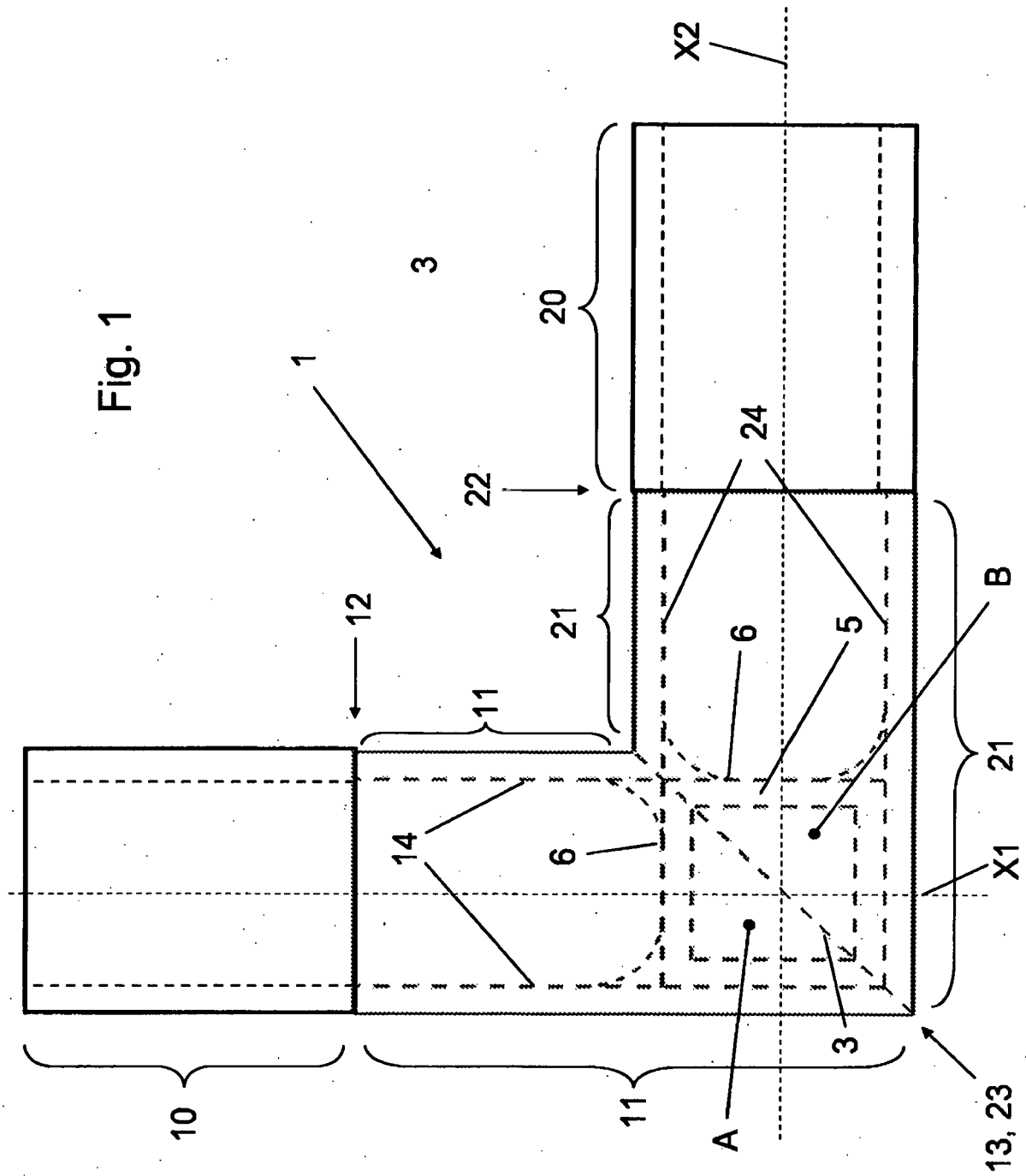
11. Procédé pour fabriquer un élément de joint d'angle selon l'une des revendications 9 à 10, dans lequel chaque angle de la deuxième surface de contour interne (24), observé dans un plan transversal perpendiculaire à un axe longitudinal du deuxième élément de connecteur profilé (21, 121, 221, 321, 421) est soudé à la surface de contour externe de l'insert auxiliaire (5, 205, 305). 5 10
 12. Procédé pour fabriquer un élément de joint d'angle selon l'une des revendications 9 à 10, dans lequel une soudure continue est appliquée le long du profil total de la première surface de contour interne (14), observé dans un plan transversal perpendiculaire à un axe longitudinal du premier élément de connecteur profilé (11, 111, 211, 311, 411). 15 20
 13. Procédé pour fabriquer un élément de joint d'angle selon l'une des revendications 9 à 12, dans lequel une soudure continue est appliquée le long du profil total de la deuxième surface de contour interne (24), observée dans un plan transversal perpendiculaire à un axe longitudinal du deuxième élément de connecteur profilé (21, 121, 221, 321, 421). 25
 14. Ensemble de tiges tubulaires profilées, comprenant : 30
 - un premier élément de joint d'angle selon l'un des revendications 1 à 8 ;
 - une première tige tubulaire profilée (10, 110) raccordée à une première extrémité de raccordement de tige (12) du premier élément de joint d'angle (1, 101, 201, 301, 401), dans lequel la première tige tubulaire profilée (10, 110) a un profil similaire à la première extrémité de raccordement de tige (12), 35 40
- comprenant en outre de préférence :
- un élément de réception profilé longitudinal (42) pour recevoir un élément en forme de plaque, l'élément de réception profilé longitudinal (42) étant monté par forme, parallèlement à la première tige tubulaire profilée, l'élément de réception profilé longitudinal (42) comprenant un évidement de montage par forme (72a, 72b) pour recevoir des saillies de montage par forme complémentaires (82a, 82b), la première tige tubulaire profilée (10, 110) comprenant des saillies de montage par forme complémentaires (82a, 82b) s'étendant vers l'extérieur à partir d'une surface de contour externe, dans lequel l'élément de réception profilé longitudinal (42) s'étend sur une 45 50 55

surface de contour externe du premier élément de joint d'angle.

15. Ensemble de tiges tubulaires profilées selon la revendication 14, comprenant plusieurs éléments de joint d'angle selon l'une des revendications 1 à 8, comprenant :

- un premier élément de joint d'angle pour raccorder une première tige tubulaire profilée avec une deuxième tige tubulaire profilée sous un premier angle ;
- un deuxième élément de joint d'angle pour raccorder la deuxième tige tubulaire profilée avec une troisième tige tubulaire profilée sous un deuxième angle ;
- un troisième élément de joint d'angle pour raccorder la troisième tige tubulaire profilée avec une quatrième tige tubulaire profilée sous un troisième angle ;
- un quatrième élément de joint d'angle pour raccorder la quatrième tige tubulaire profilée avec la première tige tubulaire profilée sous un quatrième angle ;
- la première tige tubulaire profilée raccordée avec ses extrémités respectivement au premier élément de joint d'angle et au deuxième élément de joint d'angle ;
- la deuxième tige tubulaire profilée raccordée avec ses extrémités respectivement au deuxième élément de joint d'angle et au troisième élément de joint d'angle ;
- la troisième tige tubulaire profilée raccordée avec ses extrémités respectivement au troisième élément de joint d'angle et au quatrième élément de joint d'angle ;
- la quatrième tige tubulaire profilée raccordée avec ses extrémités respectivement au quatrième élément de joint d'angle et au premier élément de joint d'angle,

dans lequel de préférence les premier, deuxième, troisième et quatrième angles sont à 90 degrés de sorte que l'ensemble de tiges tubulaires profilées a un profil de bâti rectangulaire.



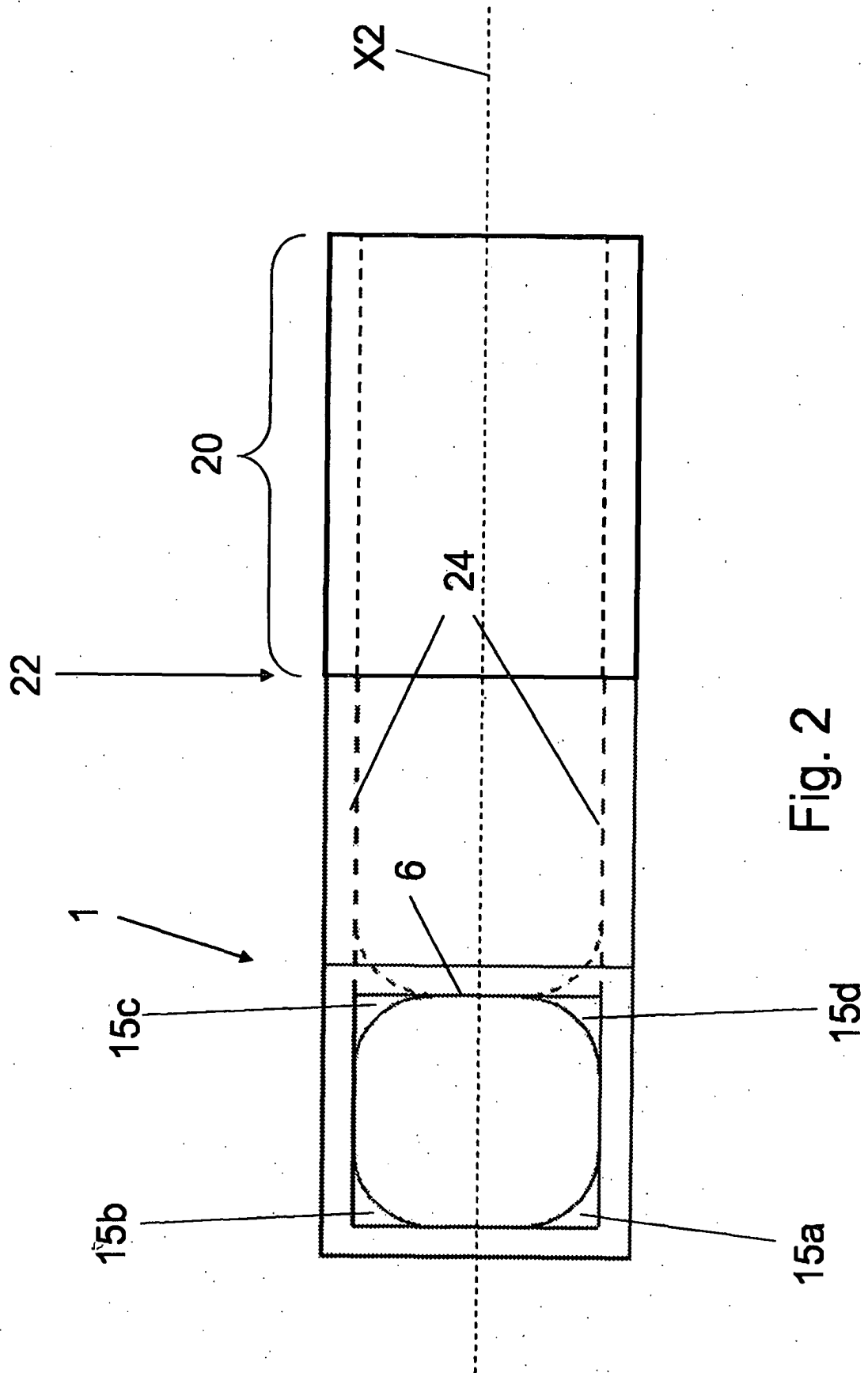
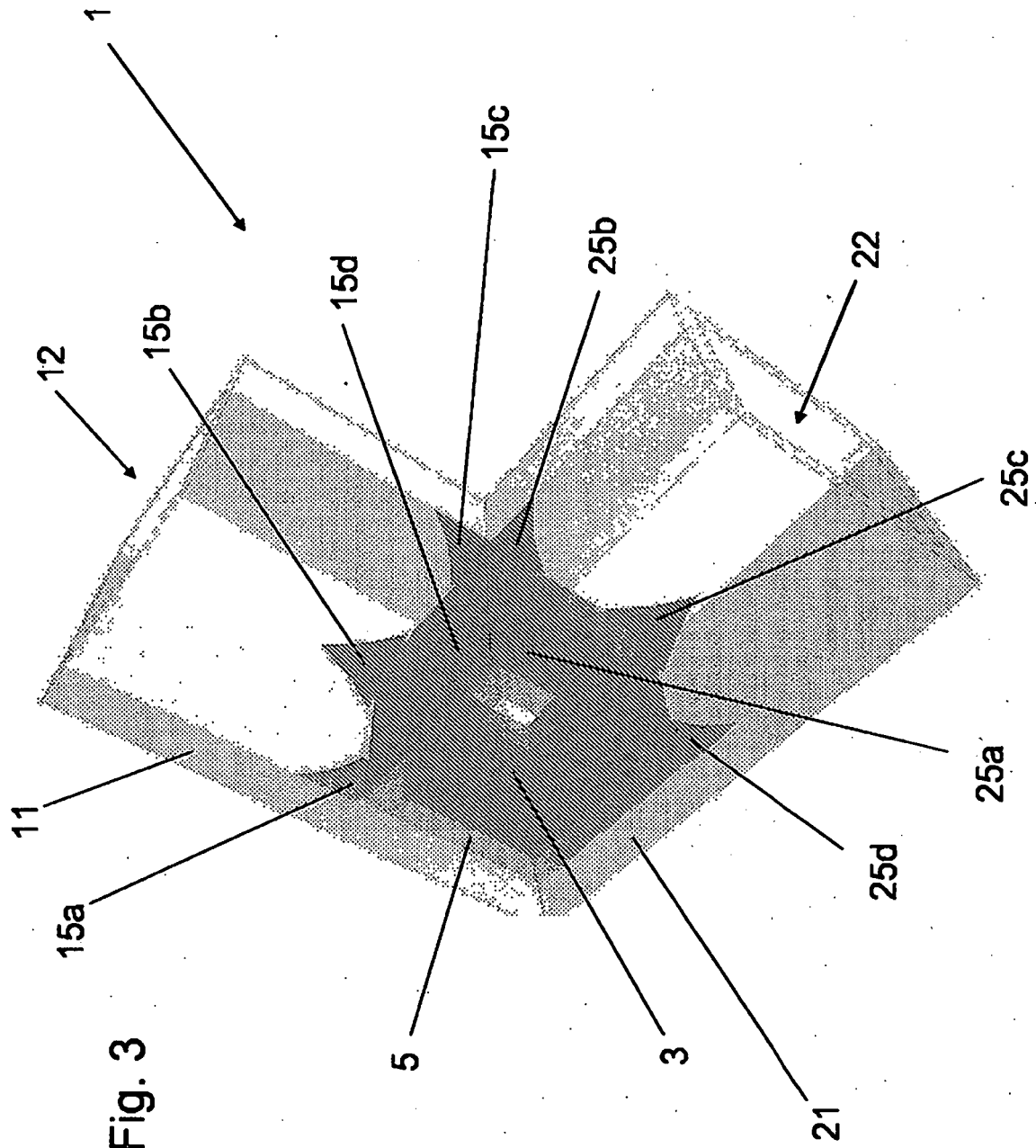


Fig. 2



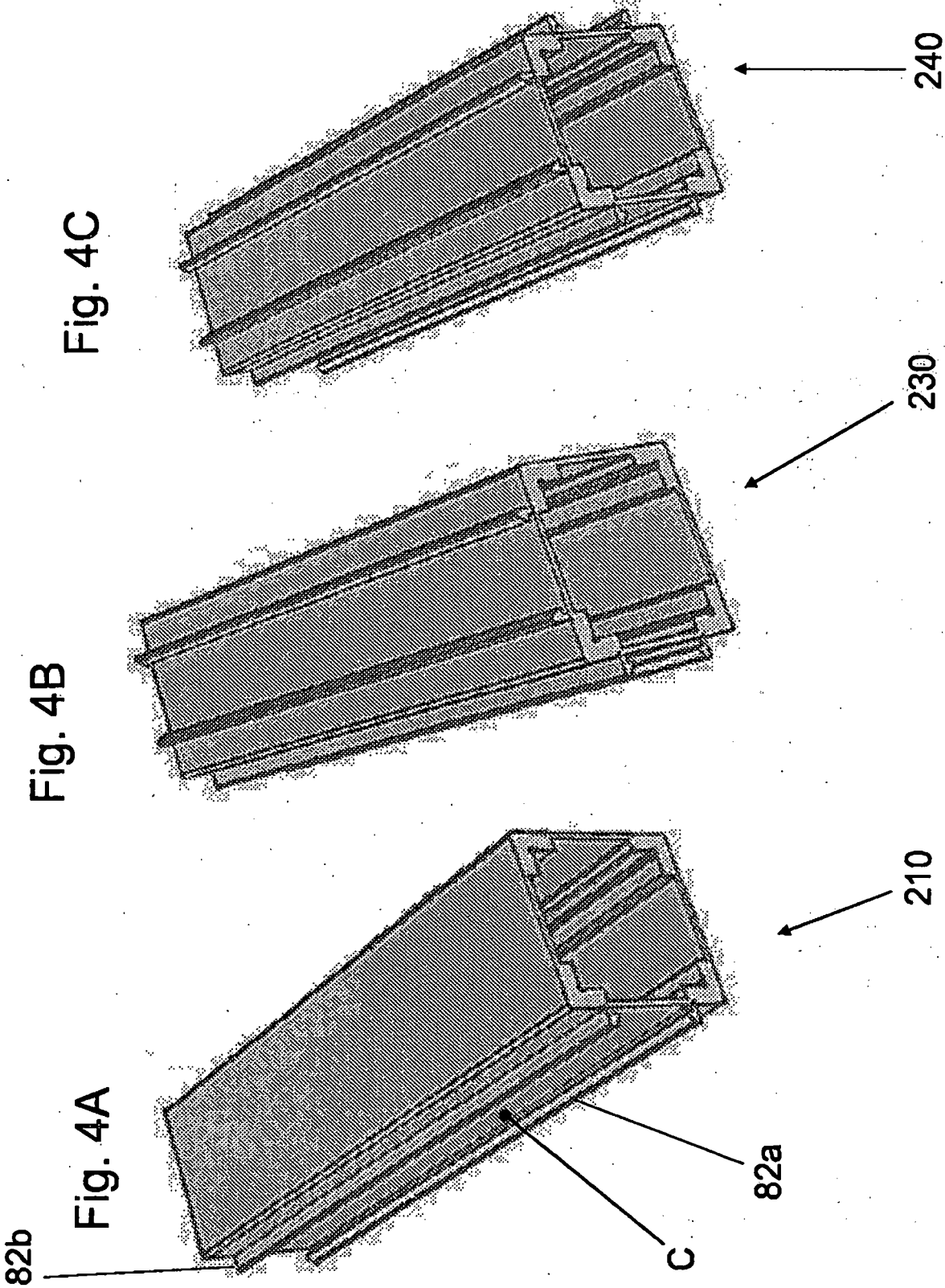
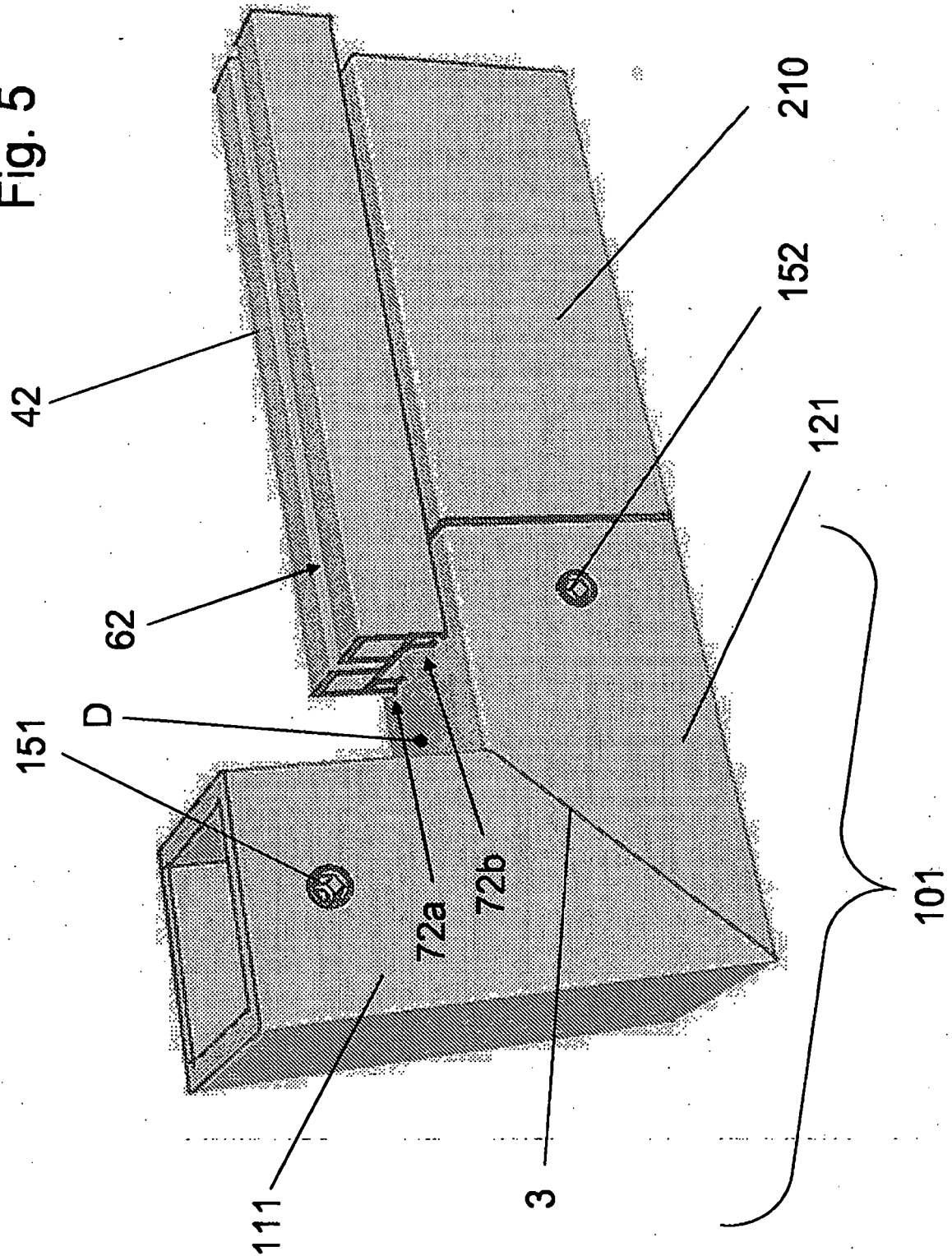
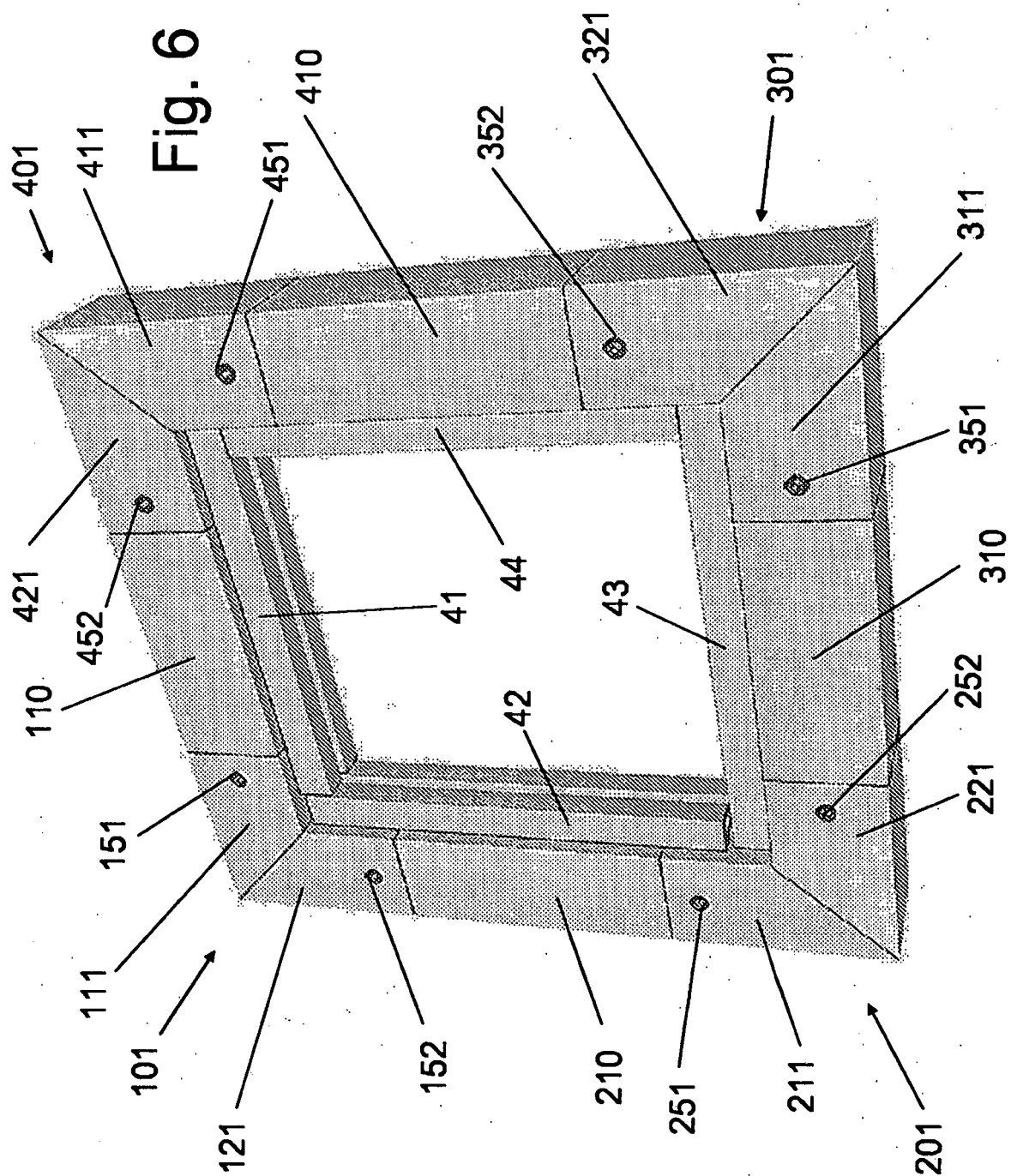
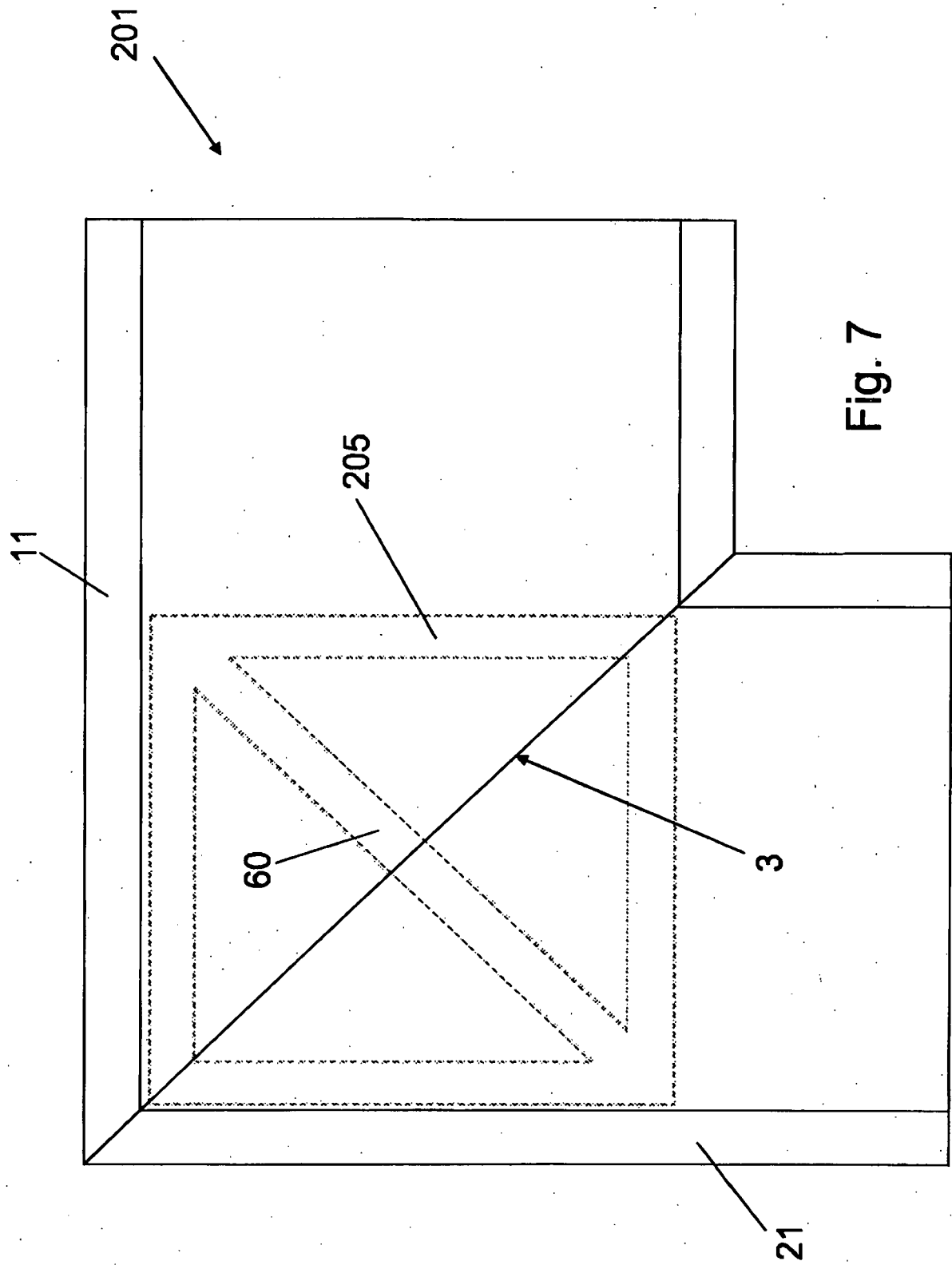


Fig. 5







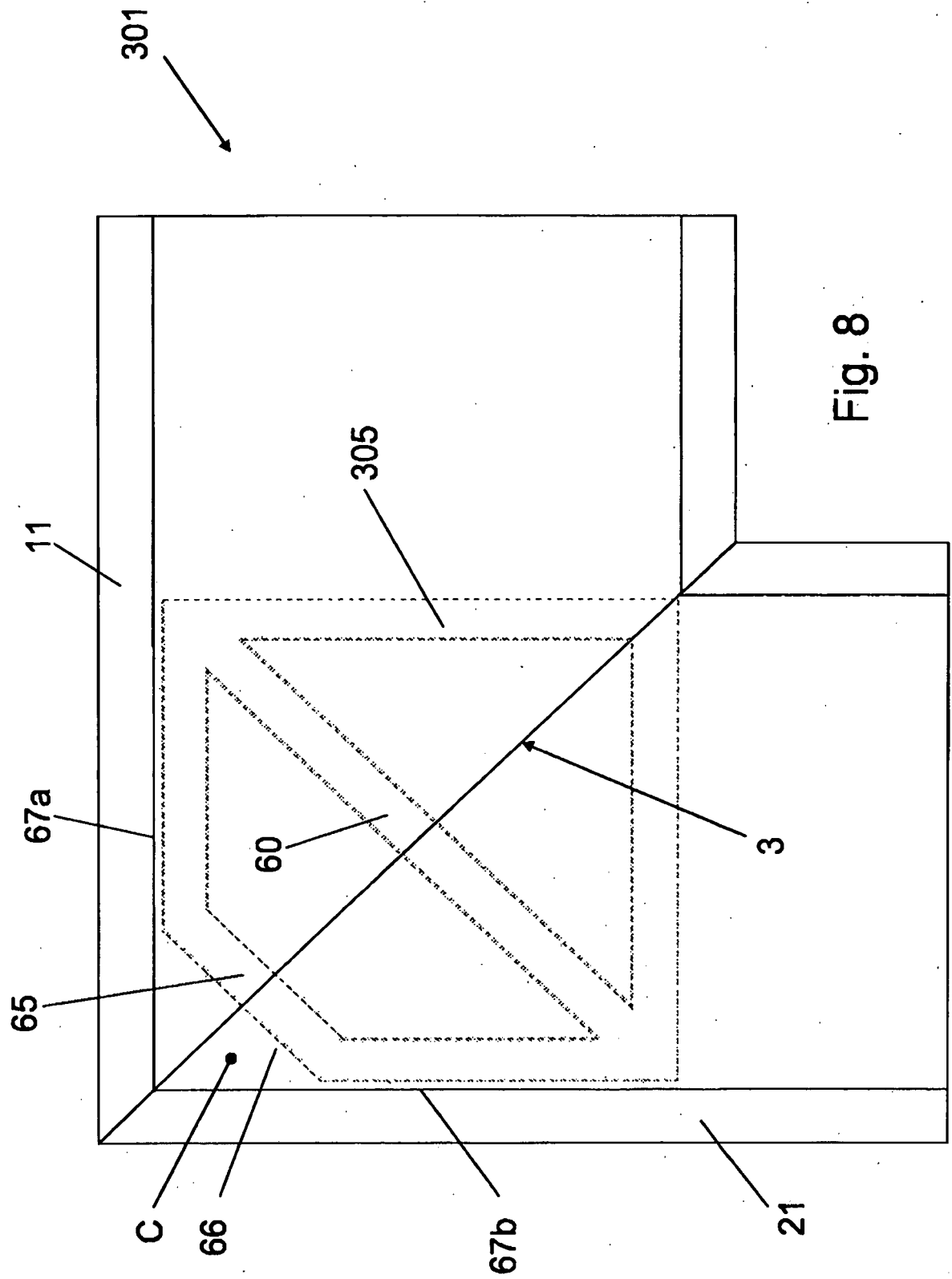


Fig. 8

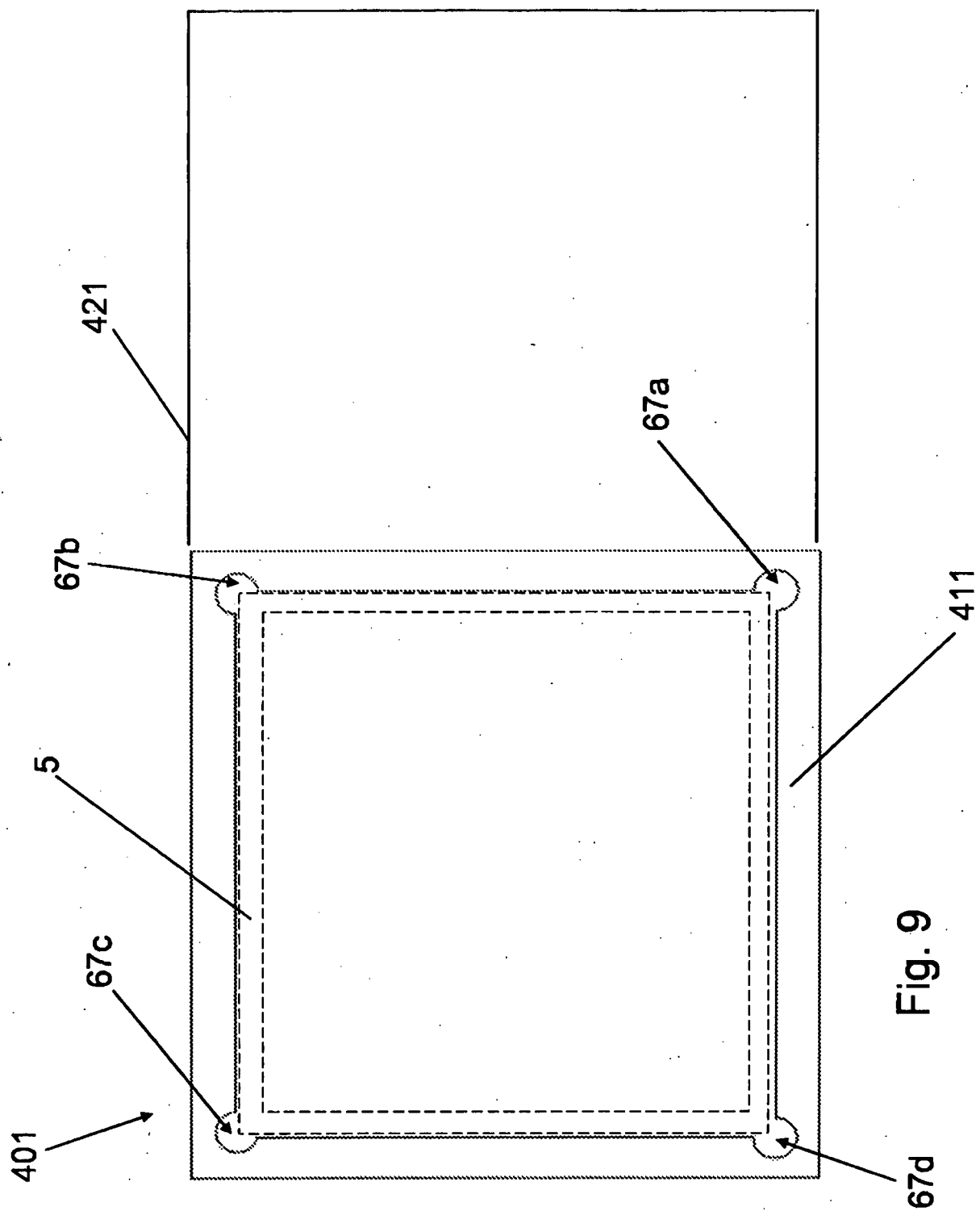


Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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