(19) DANMARK

(10) **DK/EP 3690177 T3**

Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

(51) Int.Cl.: ***E 06 B 9/52 (2006.01)***

(45) Oversættelsen bekendtgjort den: **2021-06-07**

(80) Dato for Den Europæiske Patentmyndigheds
bekendtgørelse om meddelelse af patentet: **2021-04-28**

(86) Europæisk ansøgning nr.: **19171028.4**

(86) Europæisk indleveringsdag: **2019-04-25**

(87) Den europæiske ansøgnings publiceringsdag: **2020-08-05**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

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(54) Benævnelse: **Profilforbindelse med drejeled**

(56) Fremdragne publikationer:
BE-A- 763 611
GB-A- 2 329 930
JP-A- 2011 010 825
US-A1- 2010 238 544

Profile connector comprising rotational joint

Description

The present invention relates to a profile connector comprising at least one first connecting arm which may be inserted into a profile and one second connecting arm which may be inserted into a profile. The invention further relates to a frame of a protection device, such as an insect protection device or light shaft cover, for use with a building opening such as a window or door, comprising such a profile connector and at least two vertical frame struts which in each case have at least one outer profile and at least one inner profile inserted in a telescopic manner to an insertion depth into the outer profile, as well as at least two horizontal frame struts which in each case have at least one outer profile and at least one inner profile inserted in a telescopic manner to an insertion depth into the outer profile, wherein the first connecting arm is at least partially inserted into a profile of a vertical frame strut and the second connecting arm is at least partially inserted into a profile of a horizontal frame strut. Such a frame may be easily adapted to the size of a building opening due to the telescopability of the inner profiles and outer profiles of the frame struts.

A frame having the aforementioned features is disclosed, for example, in EP 3 138 990 B1. The components of such a frame are generally provided to the end user as a construction kit so that the end user firstly has to assemble the components before an insect protection net may be fixed to the frame. To this end, the end user has to insert, in particular, the profile connectors into the respective profiles of the frame struts, optionally with the assistance of a tool. In order to reduce the assembly effort associated therewith it is disclosed, for example in DE 10 2015 116 588 A1, to preassemble profile pairs of two frame struts via the corner connector. However, in this case a relatively large package is required since the profile pairs which are arranged at right-angles to one another and connected together via a corner connector span a large surface. Moreover, even with this solution the end user still has to insert the preassembled profiles into the profiles of other preassembled profile pairs. BE 763 611 A and GB 2 329 930 A disclose further profile connectors.

It is the object of the present invention, therefore, to remedy the drawbacks set forth relative to the prior art and, in particular, to specify a profile connector by which the frame may be assembled in a more user-friendly manner and with reduced effort.

The object is achieved by a profile connector having the features of the independent claim. Advantageous developments of the profile connector are specified in the dependent claims and in the description, wherein individual features of the advantageous developments may be combined together in a technically expedient manner.

The object is achieved, in particular, by a profile connector having the features mentioned in the introduction, in which a rotational joint having at least one axis of rotation is configured between the first connecting arm and the

second connecting arm, such that the first connecting arm and the second connecting arm are able to be transferred by a relative pivoting movement about the at least one axis of rotation of the rotational joint from a starting position into an assembly position in which the first connecting arm and the second connecting arm are arranged in one plane at a right angle to one another, and the first connecting arm has a first receiving channel and the second connecting arm has a second receiving channel, wherein the first receiving channel and the second receiving channel are arranged so as to be aligned with one another in the assembly position, and in which a separate fixing element is provided, wherein the fixing element in the assembly position may be inserted into the first receiving channel and into the second receiving channel, such that the first connecting arm and the second connecting arm are secured against a relative movement.

Thus the basic idea of the invention provides that the at least two connecting arms of the profile connector are connected together in the manner of a hinge indirectly or directly via the rotational joint, so that the connecting arms may be transferred from a compact starting position into an assembly position in which the two connecting arms are arranged in one plane at a right angle to one another, wherein at least the two connecting arms are secured in the assembly position by inserting the fixing element into the two receiving channels, so that the connecting arms are prevented from being pivoted back out of the assembly position.

The connecting arms of the profile connectors in each case have, in particular, an insertion portion which may be inserted into the profile and which is fixed and/or fixable non-positively and/or positively in the profile.

To this end, the outer peripheral design of the insertion portion may coincide with the inner cross-sectional shape of a profile, so that the insertion portion may be inserted into the corresponding profile. Moreover, each connecting arm may protrude, in particular, over the profile and thus have a corner portion which is arranged outside the profile and, in particular, configured in one piece with the insertion portion, the at least one axis of rotation of the rotational joint being configured thereon or therein. The corner portion may have a bearing surface against which the profile comes to bear when the insertion portion is inserted. Each profile connector is thus configured in multiple parts and comprises at least the first connecting arm, the second connecting arm and optionally elements configured as separate components for forming the axis (axes) of rotation.

The assembly position is predetermined by the arrangement of the connecting arms at a 90° angle to one another, wherein the connecting arms are arranged in the assembly position in a plane which is spanned by the connecting arms arranged at right angles to one another.

In each case a receiving channel of identical configuration, in particular in its cross-sectional shape, is configured in the two connecting arms, wherein the receiving channels are configured and arranged such that they are arranged relative to one another in the assembly position such that the separate fixing element may be inserted by a linear movement into both receiving channels. The profile connector is fixed by the fixing element in its assembly position.

The receiving channels are configured, in particular, such that they fully enclose the fixing element in the inserted state in the peripheral direction of the fixing element, wherein the fixing element preferably bears without a gap against one or all of the walls of the receiving channels, so that

the fixing element is held by a non-positive connection in the receiving channels.

It may be provided, in particular, that the fixing element is able to be introduced via an edge of the first connecting arm into the first receiving channel. In this case, a recess which guides the fixing element during the introduction into the first receiving channel is configured in the edge of the first connecting arm.

Preferably, the receiving channels are configured in each case in a portion of the respective connecting arm which is not able to be inserted into a profile, for example in the corner portion. However, it may well be provided that for increasing the stability the fixing element in the assembly position extends beyond at least one receiving channel into an insertion portion of the connecting arm.

The fixing element is formed, in particular, from a rod-shaped, preferably planar, element, wherein the outer cross-sectional shape of the fixing element inserted into the receiving channels corresponds to the inner cross-sectional shape of the receiving channels.

Preferably, the fixing element is configured as a one-piece suspension element, which has a fixing portion which may be inserted into the receiving channels, a connecting portion protruding approximately at right angles from the plane spanned by the connecting arms, as well as an end portion oriented approximately parallel to the plane. With the use of the profile connector with a frame for a window insect protection device, the end portion engages behind a window frame of the window.

It is provided, in particular, that a latching element is configured in one piece on the first connecting arm and a latching element which is complementary to the first latching element is configured in one piece on the second connecting arm, so that the connecting arms are latched together in the assembly position. The latching element may have, for example, a hook-shaped projection, in particular, which in the assembly position engages behind a corresponding complementary undercut on the second connecting arm. In this manner, a further security may be provided, the connecting arms in the assembly position being secured thereby against being inadvertently pivoted back.

So that the profile connectors in the assembly position provide the frame with a high degree of stability, it may be provided that the first connecting arm of a profile connector has a stabilising element which protrudes, in particular, from its corner portion in the starting position in the direction of the second connecting arm, and which in the assembly position overlaps the second connecting arm of the profile connector. The stabilising element which, in particular, protrudes in one piece from the profile connector, is received, in particular, in a corresponding recess of the second connecting arm. In this case, it may be provided, in particular, that at least one latching element is configured on the stabilising element.

The rotational joint between two connecting arms of one respective profile connector has, in particular, exactly two axes of rotation, the one axis of rotation thereof being configured in or on the first connecting arm and the second axis of rotation thereof being configured in or on the second connecting arm. In this case the axes of rotation of each rotational joint oriented parallel to one another are connected together via at least one connecting element.

In one embodiment, the axes of rotation of the rotational joints are oriented at right angles to the plane.

Alternatively, the at least one axis of rotation of the profile connector may be oriented parallel to the plane or arranged in the plane. The axes of rotation of these rotational joints in this case are oriented, in particular, at an angle of 45 degrees to the direction of extension of the connecting arms.

In order to fix the profile connectors additionally in their assembly position and to secure the profile connectors from being inadvertently pivoted back, it may be provided that in the assembly position a cover cap may be inserted in each case into the profile connectors, said cover caps securing the connecting arms of the respective profile connector against pivoting. These cover caps are thus configured, in particular, in a planar manner and connected to both connecting arms of the profile connector. To this end, the cover caps may be fixable, for example, positively to the profile connector by means of a latching connection. The cover cap may also be fastenable non-positively to the profile connector. By means of the cover cap, therefore, the respective profile connector is additionally statically fixed and thus forms a stable unit.

The profile connector is provided, in particular, for a frame, preferably for a protection device for use with a building opening, wherein the frame comprises the following:

- at least four profile connectors according to the invention,
- at least two vertical frame struts which in each case have at least one outer profile and at least one inner profile which is inserted in a telescopic manner into the outer profile(s) to an insertion depth,
- at least two horizontal frame struts which in each case have at least one outer profile and at least one

inner profile which is inserted in a telescopic manner into the outer profile(s) to an insertion depth,

wherein the first connecting arm is at least partially inserted into a profile of a vertical frame strut and the second connecting arm is at least partially inserted into a profile of a horizontal frame strut and wherein the profile connectors are arranged such that in a starting position the vertical frame struts and the horizontal frame struts are oriented parallel to one another and such that, by pivoting the frame struts relative to one another about the axes of rotation of the rotational joints of the profile connectors connecting together the two respective frame struts, the frame is able to be transferred into an assembly position in which the horizontal frame struts and the vertical frame struts are arranged in a frame plane at a right angle to one another.

It is also provided that the frame struts preassembled via the profile connectors may be provided to the end user in a compact starting position. The end user then simply has to fold the frame out of its starting position into the assembly position, wherein in the assembly position the frame may be adapted in a simple manner to different sizes of building opening by telescoping the inner profiles and outer profiles relative to one another. Subsequently, the end user then simply has to fix the frame adapted to the building opening to the corresponding insertion depth of the inner profile and outer profile and to attach the insect protection net to the frame.

It should be mentioned that the terms "horizontal" and "vertical" refer to an orientation of the frame in a vertical plane for use with a door or a window. In the case of the use of the frame with a light shaft cover, all of the frame struts

are arranged in a substantially horizontal plane so that the frame struts denoted in the application as vertical frame struts are also arranged in the horizontal plane, but also at a right angle to the frame struts denoted as horizontal frame struts.

At least two frame struts which oppose one another and which are thus parallel in the assembly position have in each case at least one outer profile and one inner profile which is telescopable relative to the outer profile. However, the frame struts in each case may also have, for example, two outer profiles and one inner profile which is telescopable into the two outer profiles or in each case two inner profiles and one outer profile which is telescopable relative to the two inner profiles. The inner profile in each case is inserted into the outer profile over a length denoted as the insertion depth, wherein the insertion depth may be changed until the final fixing of the insertion depth by the end user. For the telescopability, the inner contour of the outer profile is complementary, in particular, to the outer contour of the inner profile.

Such a right-angled frame (portion) thus has four frame struts, in each case two thereof being connected to a profile connector, wherein the diagonally opposing, i.e. the profile connectors not connected to the same frame strut, have an axis of rotation oriented at right angles to the frame plane spanned by the frame struts in the assembly position. In this context, it is provided that in each case the other two, also diagonally opposing, profile connectors have axes of rotation which in the assembly position are oriented parallel to the frame plane or are arranged in the frame plane. The axes of rotation of these rotational joints in this case are oriented, in particular, at an angle of 45 degrees to the direction of extension of the frame struts connected to the profile connector.

By such an arrangement it is possible that two respective pairs of frame struts arranged parallel to one another in the starting position are firstly able to be transferred into an intermediate position by pivoting about the axes of rotation of two profile connectors oriented at right angles to the frame plane, in which the two pairs of parallel frame struts are arranged at a right angle relative to one another in said intermediate position, wherein the frame struts are secondly able to be transferred from the intermediate position into the assembly position by pivoting two pairs of frame struts arranged at right angles to one another in the intermediate position about the axes of rotation of two profile connectors arranged parallel to or in the frame plane.

In other words, therefore, the frame struts arranged parallel to one another in the starting position are firstly moved by a pivoting movement into a right-angled arrangement, by the frame struts being pivoted about the axes of rotation arranged at right angles to the frame plane. Subsequently, the frame is then unfolded further by the frame struts being pivoted about the axes of rotation arranged in the frame plane, wherein the profile connectors which are already arranged at right angles to one another (and having the axes of rotation oriented at right angles to the frame plane) and which in the intermediate position were still arranged adjacent to one another, are moved onto the diagonally opposing sides of the unfolded frame. One of the profile connectors, already arranged in the intermediate position at right angles to one another, thus describes a type of circular arc movement from the intermediate position into the assembly position.

Frames for insect protection devices generally have a sealing element such as a brush seal on the side facing the building and on a portion oriented toward the frame exterior.

So that such a seal is also implemented in the region of the corners and thus in the region of the profile connectors, in particular, the corner regions of the connecting arms of a profile connector in each case may have a receiving groove extending along the connecting arm for receiving sealing elements. So that the sealing element may be inserted easily into the receiving groove even in the assembly position, it is provided that the receiving groove of the first connecting arm in the assembly position is open on its front face toward a frame exterior and the receiving groove of the second connecting arm in the assembly position is closed on the front face by the first connecting arm. Thus the sealing element may be inserted in each case into the frame strut only from one side into the respective frame strut via the receiving groove which is open toward the frame exterior, whilst on the opposing side the insertion of a sealing element is restricted by the receiving groove which is closed by means of the second connecting arm.

Different means may be provided by which the inner profile and the outer profile of a frame strut may be fixed to one another to an insertion depth predetermined by the size of the building opening.

The frame, however, may not only be used for spanning a planar insect protection net but also as a frame for a pleated fabric insect protection net. To this end, at least the inner profile and the outer profile of the vertical frame struts have an opening which is continuous in its direction of extension and which faces a frame interior for receiving a pleated fabric. Thus, an edge of the pleated fabric may be arranged inside the vertical frame struts, wherein the pleated fabric extends as far as the opposing vertical frame strut and into said opposing vertical frame strut.

In one embodiment, the frame is provided for use as an insect protection device for a window, in which case the frame consists, in particular, of two lateral vertical frame struts and a lower and an upper horizontal frame strut, wherein the profile connectors are configured as corner connectors with in each case just two connecting arms which are pivotable relative to one another. Such a frame may be fastened to a window frame by means of the suspension elements already described above.

The proposed frame, however, may also be provided for a door opening, in which case the frame is able to be fastened, for example, by means of hinges to a door frame. In this case, the frame consists, in particular, of four lateral frame struts and a lower, a central and an upper horizontal frame strut, wherein the central frame strut is connected in each case at both ends to two vertical frame struts by means of a profile connector which is configured as a central connector, wherein the central connector has in each case three connecting arms which are pivotable relative to one another.

Also proposed is an insect protection device which comprises a frame according to the invention and an insect protection net which is movably fastened on or in the frame in the case of a pleated fabric.

The invention and the technical background are described by way of example hereinafter with reference to the figures, in which schematically

Figure 1: shows a profile connector with an axis of rotation oriented at right angles to the plane and a fixing element in the starting position,

Figure 2: shows the profile connector according to Figure 1 in an assembly position,

Figure 3: shows the profile connector according to Figure 2 in the assembly position with the inserted fixing element,

Figure 4: shows a profile connector with an axis of rotation oriented parallel to the plane and a fixing element in a starting position,

Figure 5: shows the profile connector according to Figure 4 in an assembly position,

Figure 6: shows the profile connector according to Figure 5 with the inserted fixing element,

Figure 7: shows a frame in the assembly position with the partially extended profiles,

Figure 8: shows the frame in a starting position,

Figure 9: shows the frame in an intermediate position,

Figure 10: shows the frame when transferred from the intermediate position into an assembly position,

Figure 11: shows the frame in the assembly position,

Figure 12: shows a profile connector with axes of rotation oriented at right angles to the frame plane in the starting position,

Figure 13: shows the profile connector according to Figure 12 in the assembly position,

Figure 14: shows a profile connector with axes of rotation oriented parallel to the frame plane in the starting position,

Figure 15: shows the profile connector according to Figure 14 when transferred from the intermediate position into the assembly position and

Figure 16: shows the profile connector according to Figure 14 in the assembly position.

A first profile connector is shown in Figures 1 to 3. The profile connector comprises a first connecting arm 7 and a second connecting arm 8. The connecting arms 7, 8 have in each case an insertion portion 18 and a corner portion 19. The connecting arms 7, 8 in each case may be inserted by the insertion portion 18 into a profile.

A rotational joint 11 which has an axis of rotation 9 is configured between the corner portions 19. The axis of rotation 9 is oriented at right angles to a plane spanned by the connecting arms 7 and 8.

A first receiving channel 21 which is aligned with a recess on the lower edge of the first connecting arm 7 is configured in the first connecting arm 7.

The second connecting arm 8 has a second receiving channel 22.

A fixing element 23 which forms a suspension element is additionally shown in Figures 1 to 3.

From the starting position shown in Figure 1, the connecting arms 7 and 8 may be pivoted relative to one another about the axis of rotation 11 and transferred into the assembly position shown in Figure 2. In the assembly position shown in Figure 2 the first connecting channel 21 of the first connecting arm 7 and the second connecting channel 22 of the second connecting arm 8 are arranged aligned with one another so that the fixing element 23 may be inserted by a linear movement into both receiving channels 21, 22. In the position shown in Figure 3, therefore, the fixing element 23 fixes the connecting arms 7 and 8 in their assembly position since a relative movement of the connecting arms 7 and 8 is no longer possible due to the fixing element 23 inserted into the receiving channels 21, 22. In the assembly position shown in Figure 3 the connecting arms 7, 8 span a plane, wherein the connecting arms 7, 8 are arranged in this plane.

A further profile connector is shown in Figures 4 to 6, wherein the axis of rotation 10 of the rotational joint 11 is oriented within and/or parallel to the plane spanned by the connecting arms 7 and 8 in the assembly position. The relative pivoting movement of the connecting arms 7, 8 from the starting position shown in Figure 4 into the assembly position shown in Figures 5 and 6 is thus not carried out within the plane in which the connecting arms 7 and 8 are arranged in the assembly position. Instead a pivoting movement is carried out about an axis which is arranged parallel to and/or in the plane.

Moreover, the connecting arms 7 and 8 also have a first receiving channel 21 and/or a second receiving channel 22 which in the assembly position shown in Figures 5 and 6 are arranged aligned with one another.

The frame shown in the following Figures 7 to 11 has profile connectors which differ in the detail thereof from the profile connectors of Figures 1 to 6. However, the profile connectors of the frame shown in Figures 7 to 11 also have axes of rotation which are arranged either at right-angles to the plane spanned by the profile connectors in the assembly position or in and/or parallel to this plane. In this regard, the profile connectors shown in Figures 1 to 6 may easily replace the profile connectors shown in Figures 7 to 11.

The frame shown in Figures 7 to 11 comprises a first vertical frame strut 1.1 and a second vertical frame strut 1.2 as well as a first horizontal frame strut 2.1 and a second horizontal frame strut 2.2 The frame shown in Figures 7 and 11 in its assembly position in perspective spans a frame plane.

The frame struts 1.1, 1.2, 2.1 and 2.2 consist in each case of an outer profile 3 and an inner profile 4. The inner profiles 4 and the outer profiles 3 in each case are telescopable relative to one another so that the size of the frame (length of the frame struts) may be easily adapted to windows of different size, wherein an insect protection net, not shown, may be fastened to the frame which is fixed in terms of size.

The outer profile 3 of the first vertical frame strut 1.1 is connected, via a first profile connector 6.1 with rotational axes 10 oriented parallel to the frame plane, to the inner profile 4 of the first horizontal frame strut 2.1, wherein a first connecting arm 7 of the profile connector 6.1 is inserted into the outer profile 3 of the first vertical frame strut 1.1 and a second connecting arm 8 of the first profile connector 6.1 is inserted into the inner profile 4 of the first horizontal frame strut

2.1. A second profile connector 6.2, with a joint 11 having two axes of rotation 10 oriented parallel to the frame plane, connects the inner profile 4 of the second horizontal frame strut 2.2 to the outer profile 3 of the second frame strut 1.2.

A first profile connector 5.1, with a rotational joint 11 having two axes of rotation 9 arranged at right-angles to the frame plane, connects with its first connecting arm 7 and its second connecting arm 8 the inner profile 4 of the first vertical frame strut 1.1 to the outer profile 3 of the second horizontal frame strut 2.2. A second profile connector 5.2, with a rotational joint 11 also having two axes of rotation 9 arranged at right angles to the frame plane, also connects the outer profile 3 of the first horizontal frame strut 2.1 to the inner profile 4 of the second vertical frame strut 1.2.

A profile connector with axes of rotation 9 arranged at right-angles to the frame plane, as is used as the first profile connector 5.1 and second profile connector 5.2, is shown in detail in Figures 12 and 13. The profile connector comprises a first connecting arm 7 and a second connecting arm 8. The connecting arms 7 and 8 have in each case an insertion portion 18 which is inserted into a profile of the frame strut. The connecting arms 7 and 8 additionally have in each case a corner portion 19 which protrudes over the profiles. In each case an axis of rotation 9 is configured on the corner portions 19, said axes of rotation being oriented at right angles to the frame plane and being connected together via a connecting element 20. Additionally, a hook-shaped latching element 12 and a stabilising element 14 are configured on the first connecting arm 7 of the profile connector shown in Figure 12, whilst a complementary latching element 13 in the form of an

undercut and a complementary stabilising element 15 in the form of a recess are configured on the second connecting arm 8.

In the starting position shown in Figure 12 the insertion portions 18 of the first connecting arm 7 and of the second connecting arm 8 are oriented parallel to one another. The profile connector may be transferred by pivoting the first connecting arm 7 and the second connecting arm 8 about the joint 11 configured with the two right-angled axes of rotation 9 into the position shown in Figure 13, in which the insertion portions 18 and thus the connecting arms 7 and 8 are arranged at a right angle to one another. In this position, the hook-shaped latching element 12 engages in the complementary latching element 13 formed by an undercut, whilst the stabilising element 14 of the first connecting arm 7 configured as a projection engages in the complementary stabilising element 15 configured as a recess. Thus, the profile connector is firstly secured by means of the latching element 12 and the complementary latching element 13 against being inadvertently pivoted back, and is secondly oriented in a stable manner by means of the stabilising element 14 and the complementary stabilising element 15.

The profile connector shown in Figures 14 to 16 also has a first connecting arm 7 and a second connecting arm 8 with in each case an insertion portion 18 and a corner portion 19. The first connecting arm 7 and the second connecting arm 8 are connected together via a rotational joint 11, wherein an axis of rotation 10 oriented parallel to the frame plane is configured in the first connecting arm 7 and a second rotational axis 10 oriented parallel to the frame plane is configured in the second connecting arm 8. The axes of rotation 10 are connected together via a connecting element 20. Additionally, a stabilising element 14

is configured on the first connecting arm 7, with a hook-shaped latching element 12 configured thereon, whilst a complementary stabilising element in the form of a recess and a complementary latching element 13 in the form of an undercut are configured on the second connecting arm 8.

In the starting position shown in Figure 14, the insertion portions 18 of the connecting arms 7 and 8 are oriented parallel to one another. The connecting arms 7 and 8 may be moved by pivoting about the two axes of rotation 10 (see Figure 9) into the position shown in Figure 16, in which the insertion portions 18 and thus also the connecting arms 7 and 8 are arranged at a right angle to one another. In the position shown in Figure 16 the hook-shaped latching element 12 engages behind the undercut as a complementary latching element 13 so that this profile connector is also secured against being inadvertently pivoted back. Additionally, the stabilising element 14 of the first connecting arm 7 overlaps the complementary stabilising element 15 of the second connecting arm 8 so that a high degree of stability is provided in the position shown in Figure 16.

It may also be identified in Figures 12 to 16 that the respective first connecting arm 7 has a receiver 16 into which a suspension element (not shown) may be inserted, wherein due to the resilient configurations of a latching hook the suspension element may be easily fixed in different insertion positions to the profile connector so that it is possible in a simple manner to adapt the suspension element to the depth of a window frame to which the frame is to be fastened. Since the profile connectors shown in Figures 12 to 16 have no receiving channels,

they are not encompassed by the invention with this feature. The profile connectors, however, have features which may be easily transferred to a profile connector according to the invention.

It is now possible to arrange the frame struts 1.1, 1.2, 2.1, 2.2 parallel to one another in the starting position shown in Figure 8, whilst each profile connector 5.1, 5.2, 6.1 6.2 with its two connecting arms 7, 8 is already inserted in each case into a profile of two frame struts. The frame may thus be delivered preassembled in a very compact state.

Thus in order to unfold the frame from the starting position into an assembly position, firstly the first vertical frame strut 1.1 and the first horizontal frame strut 2.1 together with the second vertical frame strut 1.2 and the second horizontal frame strut 2.2 are pivoted about the axes of rotation 9 of the profile connectors 5.1 and 5.2 oriented at right angles to the frame plane into the intermediate position shown in Figure 9. In the intermediate position shown in Figure 9 the pair of frame struts consisting of the first vertical frame strut 1.1 and the first horizontal frame strut 2.1 are arranged at a right angle to the pair of frame struts consisting of the second vertical frame strut 1.2 and the second horizontal frame strut 2.2, wherein the profile connectors 5.1 and 5.2 are located in the state shown in Figure 13.

Subsequently, therefore, (see Figure 10) the second vertical frame strut 1.2 together with the first horizontal frame strut 2.1 are pivoted relative to the first vertical frame strut 1.1 and the second horizontal frame strut 2.2 about the axes of rotation 10 of the profile connectors 6.1 and 6.2 arranged parallel to the frame plane, until all of the frame struts 1.1, 1.2, 2.1 and 2.2 are arranged in one plane in which the vertical frame struts

1.1 and 1.2 are arranged parallel to one another and at a right angle to the horizontal frame struts 2.1 and 2.2. This position which is also denoted as the assembly position is shown in Figure 11. From the assembly position shown in Figure 11 the frame may be adapted to the size of a window frame by simply being pulled apart, wherein the outer profiles 3 and the inner profiles 4 may be telescoped relative to one another.

By means of the present invention it is possible to provide the end user with a preassembled frame in a compact manner, wherein the end user then simply has to unfold the frame. The size may then be adapted in a simple manner due to the telescopable profiles.

It may be further identified in Figure 8 that the corner portions 19 of the connecting arms 7 and 8 in each case have a receiving groove 17.1 and/or 17.2, wherein the first receiving groove 17.1 is also accessible in the assembly position from a frame exterior so that sealing elements may be directly inserted into the first receiving groove 17.1 and subsequently may be inserted into corresponding grooves in the profiles. The second receiving grooves 17.2, however, are closed on the front face by the other connecting arm in the assembly position so that a definitive end stop is predetermined during insertion.

List of reference numerals

1.1, 1.2	Vertical frame strut
2.1, 2.2	Horizontal frame strut
3	Outer profile
4	Inner profile
5.1, 5.2	Profile connector with right-angled axis of rotation
6.1, 6.2	Profile connector with parallel axis of rotation
7	First connecting arm
8	Second connecting arm
9	Right-angled axis of rotation
10	Parallel axis of rotation
11	Rotational joint
12	Latching element
13	Complementary latching element
14	Stabilising element
15	Complementary stabilising element
16	Receiver
17.1, 17.2	Receiving groove
18	Insertion portion
19	Corner portion
20	Connecting element
21	First receiving channel
22	Second receiving channel
23	Fixing element

Patentkrav

1. Profilforbindelse (5.1, 5.2, 6.1, 6.2), der mindst omfatter
- en første forbindelsesarm (7), som kan indsættes i en profilliste (3, 4)
og
- en anden forbindelsesarm (8), som kan indsættes i en profilliste (3, 4),
hvor
- et drejeled (11) med mindst en rotationsakse (9, 10) er konfigureret mellem den første forbindelsesarm (7) og den anden forbindelsesarm (8), således at den første forbindelsesarm (7) og den anden forbindelsesarm (8) er i stand til at blive overført ved en relativ drejebevægelse omkring den mindst ene rotationsakse (9, 10) af rotationsleddet (11) fra en startposition til en samleposition, hvor den første forbindelsesarm (7) og den anden forbindelsesarm (8) er anbragt i et plan i en ret vinkel i forhold til hinanden, **kendetegnet ved, at**
- den første forbindelsesarm (7) har en første modtagekanal (21), og den anden forbindelsesarm (8) har en anden modtagekanal (22), hvor den første modtagekanal (21) og den anden modtagekanal (22) er anbragt således, at de flugter med hinanden i samlepositionen, og
- et separat fastgørelseselement (23) er tilvejebragt, hvor fastgørelseselementet (23) kan indsættes i den første modtagekanal (21) og i den anden modtagekanal (22) i samlepositionen, således at den første forbindelsesarm (7) og den anden forbindelsesarm (8) er sikret mod en relativ bevægelse.

2. Profilforbindelse ifølge krav 1, hvor den første modtagekanal (21) og den anden modtagekanal (22) i hvert tilfælde helt omslutter mindst en del af fastgørelseselementet (23) i fastgørelseselementets (23) perifere retning i den indsatte tilstand.

3. Profilforbindelse ifølge krav 1 eller 2, hvor fastgørelseselementet (23) er i stand til at blive indført via en kant af den første forbindelsesarm (7) i den første modtagekanal (21), hvor en fordybning til styring af fastgørelseselementet (23) er konfigureret i kanten af den første forbindelsesarm (21).

4. Profilforbindelse (5.1, 5.2, 6.1, 6.2) ifølge et af de foregående krav, hvor forbindelsesarmene (7, 8) på mindst en profilforbindelse (5.1, 5.2, 6.1, 6.2) har låseelementer (12, 13), som er komplementære til hinanden, og som låser forbindelsesarmene (7, 8) sammen i samlepositionen.

5. Profilforbindelse (5.1, 5.2, 6.1, 6.2) ifølge et af de foregående krav, hvor den første forbindelsesarm (7) af en profilforbindelse (5.1, 5.2, 6.1, 6.2) har et udragende stabiliserende element (14), som i samleposition overlapper profilforbindelsens (5.1, 5.2, 6.1, 6.2) anden forbindelsesarm (8).

6. Profilforbindelse (5.1, 5.2, 6.1, 6.2) ifølge et af de foregående krav, hvor en respektiv rotationsakse (9, 10) for drejeledet (11) er konfigureret på hver forbindelsesarm (7, 8) af en profilforbindelse (5.1, 5.2, 6.1, 6.2).

7. Profilforbindelse (5.1, 5.2, 6.1, 6.2) ifølge et af de foregående krav, hvor den mindst ene rotationsakse (9) af drejeledet (11) er orienteret vinkelret på planet.

8. Profilforbindelse (5.1, 5.2, 6.1, 6.2) ifølge et af kravene 1 til 6, hvor den mindst ene rotationsakse (10) af drejeledet (11) er orienteret parallelt med planet eller er anbragt i planet.

9. Profilforbindelse (5.1, 5.2, 6.1, 6.2) ifølge et af de foregående krav, hvor fastgørelseselementet (23) er konfigureret som et

ophængningselement.

10. En ramme, især til en beskyttelsesindretning til anvendelse med en bygningsåbning, omfattende
- mindst fire profilforbindelser (5.1, 5.2, 6.1, 6.2) ifølge et af de foregående krav,
- mindst to lodrette rammestivere (1.1, 1.2), som i hvert tilfælde har mindst en ydre profilliste (3) og mindst en indre profilliste (4), der indsættes på en teleskopisk måde i den / de ydre profil(er) til en indsættelsesdybde,
- mindst to vandrette rammestivere (2.1, 2.2), som i hvert tilfælde har mindst en ydre profilliste (3) og mindst en indre profilliste (4), som indsættes på en teleskopisk måde i den / de ydre profillist(er) til en indsættelsesdybde,

hvor den første forbindelsesarm (7) i det mindste delvist er indsat i en profilliste (3, 4) af en lodret rammestiver (1.1, 1.2), og den anden forbindelsesarm (8) i det mindste delvist er indsat i en profilliste (3, 4) af en vandret rammestiver (2.1, 2.2),
og hvor profilforbindelserne er arrangeret således, at de lodrette rammestivere (1.1, 1.2) og de vandrette rammestivere (2.1, 2.2) i en startposition er orienteret parallelt med hinanden og således, at ved at dreje rammestiverne (1.1, 1.2, 2.1, 2.2) i forhold til hinanden omkring rotationsakserne (9, 10) for profilforbindelsernes (5.1, 5.2, 6.1, 6.2) drejeled (11, 12), der forbinder to respektive rammestænger, kan rammen overføres til en samleposition, hvor de vandrette rammestivere (2.1, 2.2) og de lodrette rammestivere (1.1, 1.2) er anbragt i et rammeplan i en ret vinkel i forhold til hinanden.

11. Ramme ifølge krav 10, hvor to respektive par (1.1 og 2.1, 1.2 og 2.2) af parallelle rammestivere først er i stand til at overføres fra startpositionen til en mellemposition ved at dreje omkring rotationsakserne (9) på mindst to profilforbindelser (5.1, 5.2) orienteret

vinkelret på rammeplanet, hvor de to par (1.1 og 2.1, 1.2 og 2.2) af parallelle rammestænger er anbragt i en ret vinkel i forhold til hinanden i den nævnte mellemposition, hvor rammestiverne for det andet er i stand til at overføres fra mellempositionen til samleposition ved at dreje to par (1.1 og 2.2, 1.2 og 2.1) af rammestiverne anbragt vinkelret på hinanden i mellempositionen omkring rotationsakserne (10) af to profilforbindelser (6.1, 6.2) anbragt parallelt med eller i rammeplanet.

12. Ramme ifølge et af de foregående krav til indsættelse i en vinduesåbning, der består af to laterale lodrette rammestivere (1.1, 1.2) og en nedre og en øvre vandret rammestiver (2.1, 2.2), hvor profilforbindelserne (5.1, 5.2 , 6.1, 6.2) er konfigureret som hjørneforbindelser med i begge tilfælde kun to forbindelsesarme (7, 8), der er drejelige i forhold til hinanden.

13. Ramme ifølge et af de foregående krav til en døråbning, der består af fire lodrette rammestivere (1.1, 1.2) og en nedre, en central og en øvre vandret rammestiver (2.1, 2.2), hvor den centrale rammestiver er forbundet i begge tilfælde i begge ender til to lodrette rammestivere (1.1, 1.2) ved hjælp af en profilforbindelse, der er konfigureret som et central forbindelse, hvor det centrale forbindelse i hvert tilfælde har tre forbindelsesarme, der er drejelige i forhold til hinanden.

14. Insektbeskyttelsesindretning omfattende en ramme ifølge et af de foregående krav 8 til 13 og et insektbeskyttelsesnet, der er fastgjort i eller på rammen.

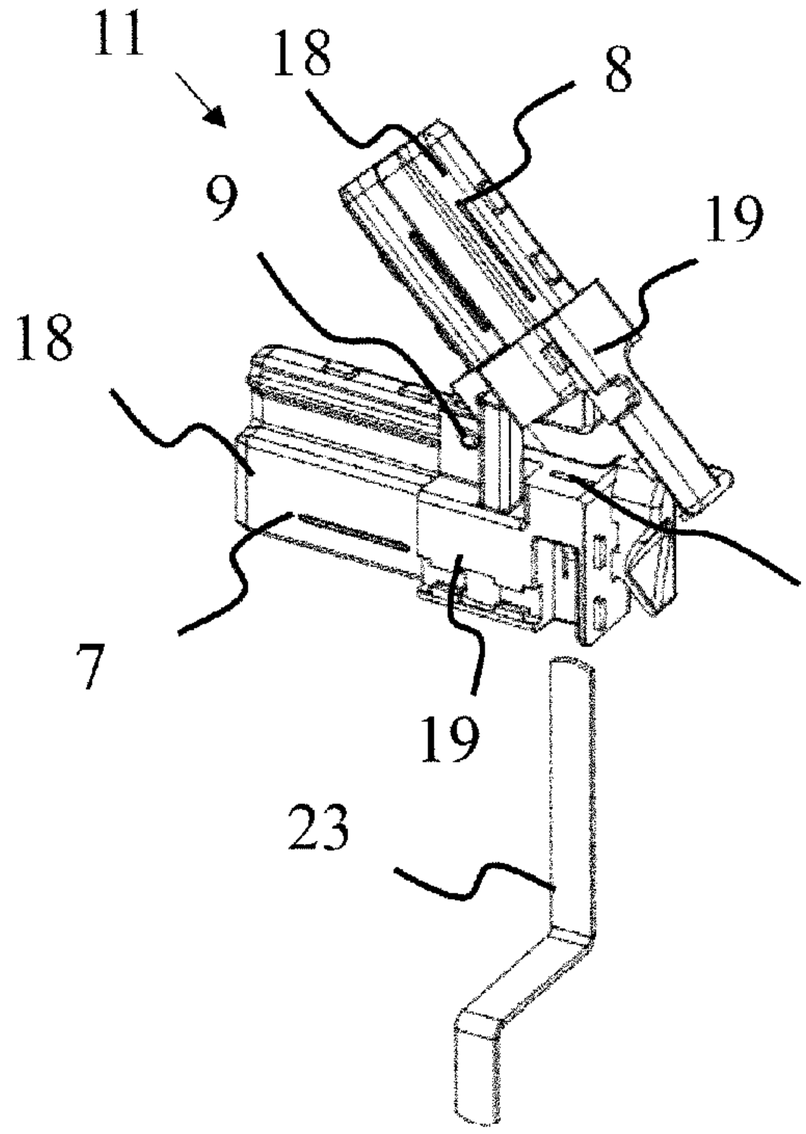

Fig. 1

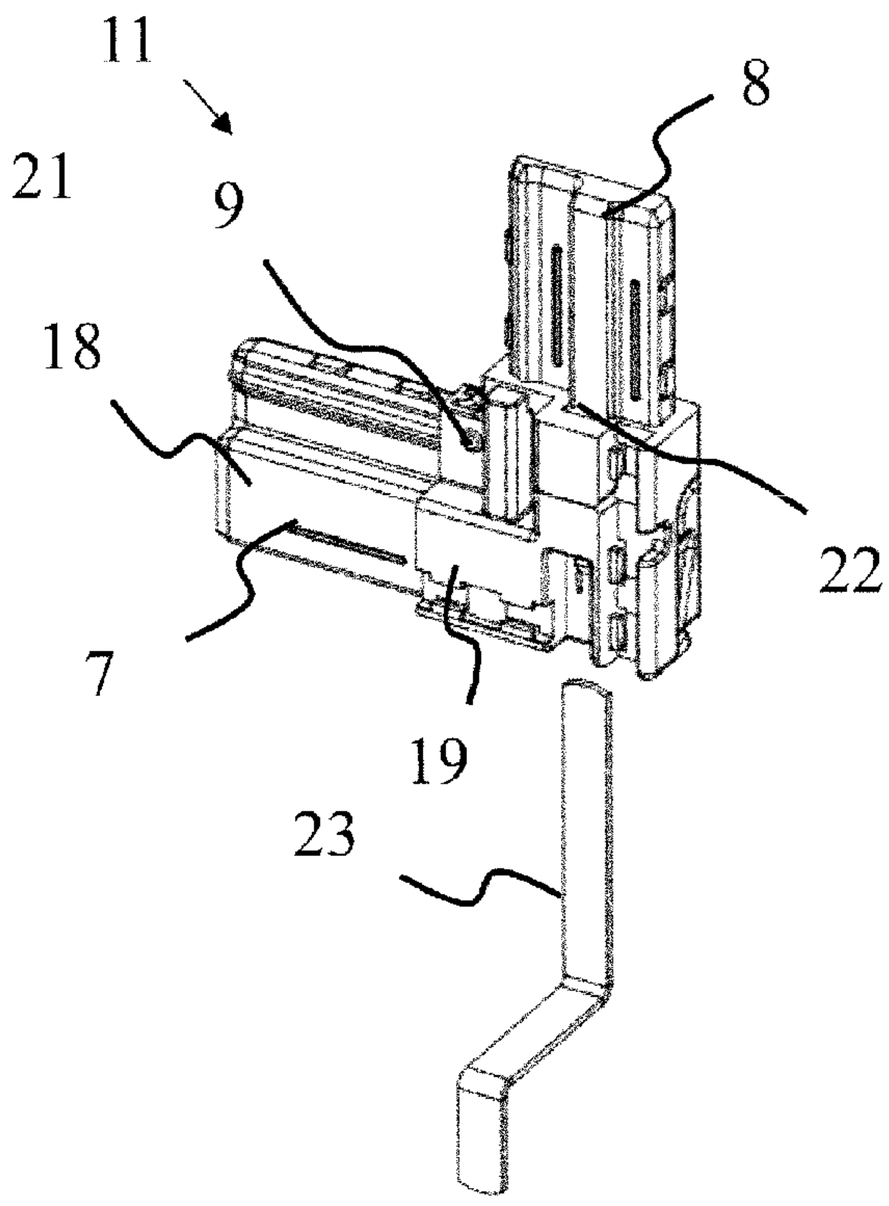

Fig. 2

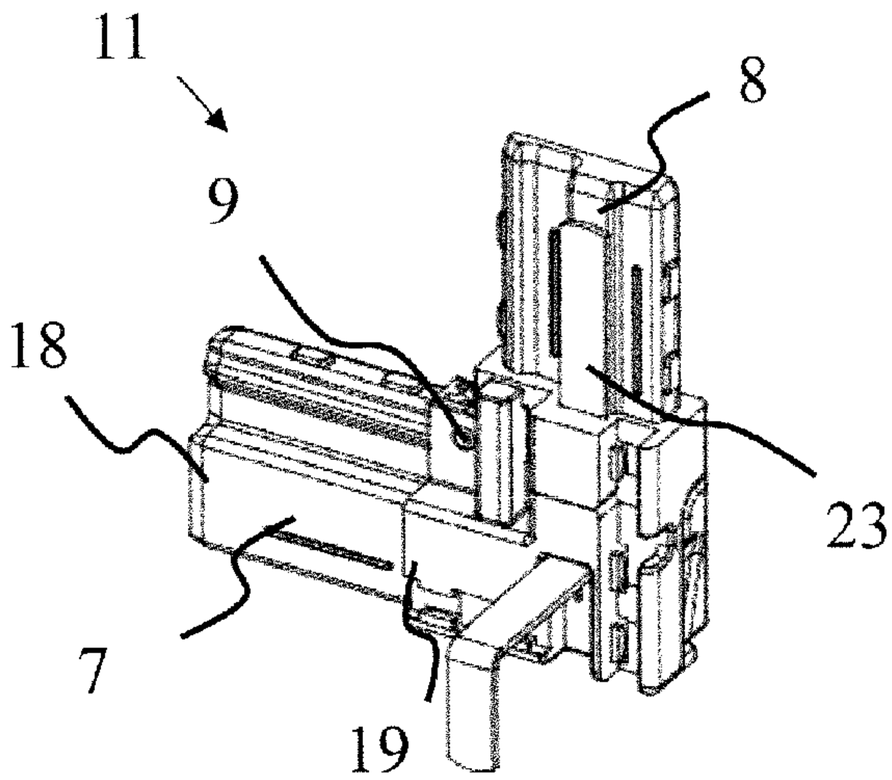

Fig. 3

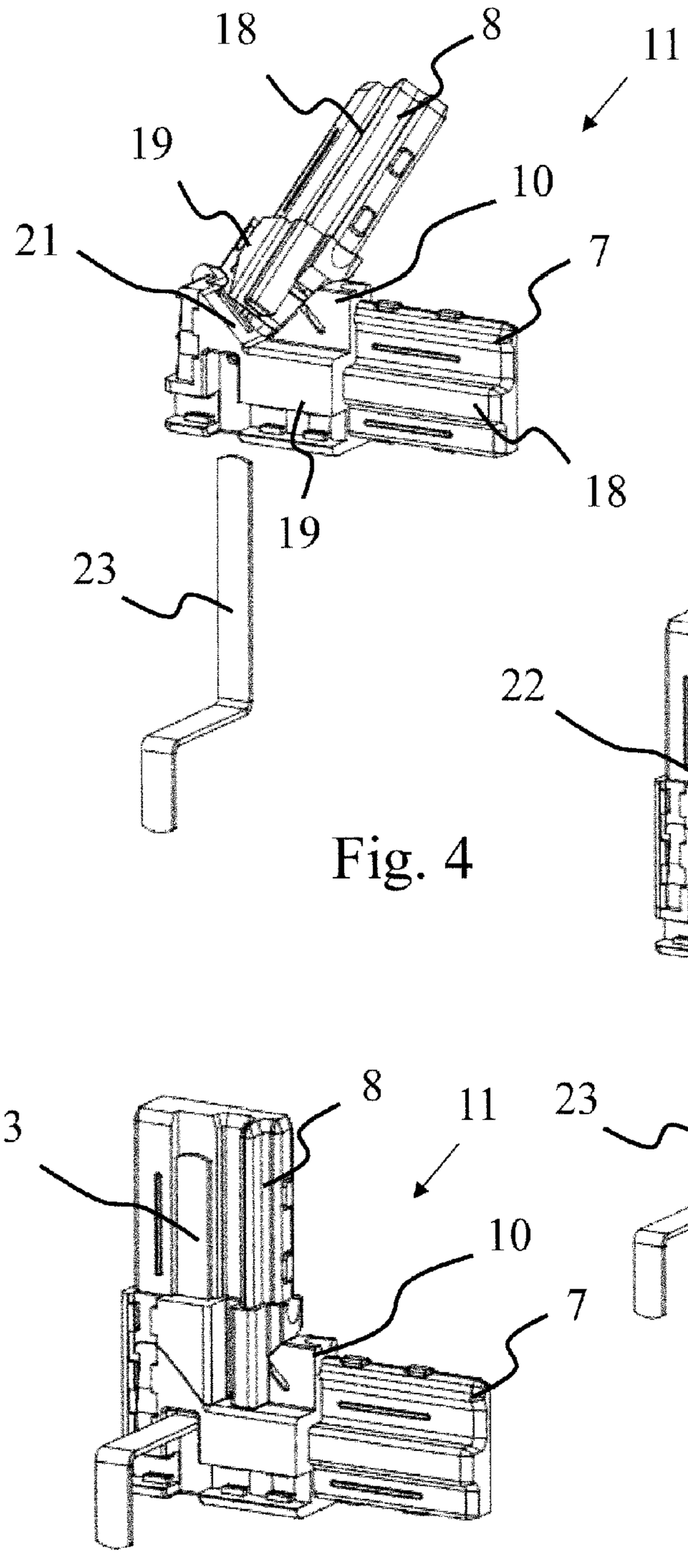

Fig. 4

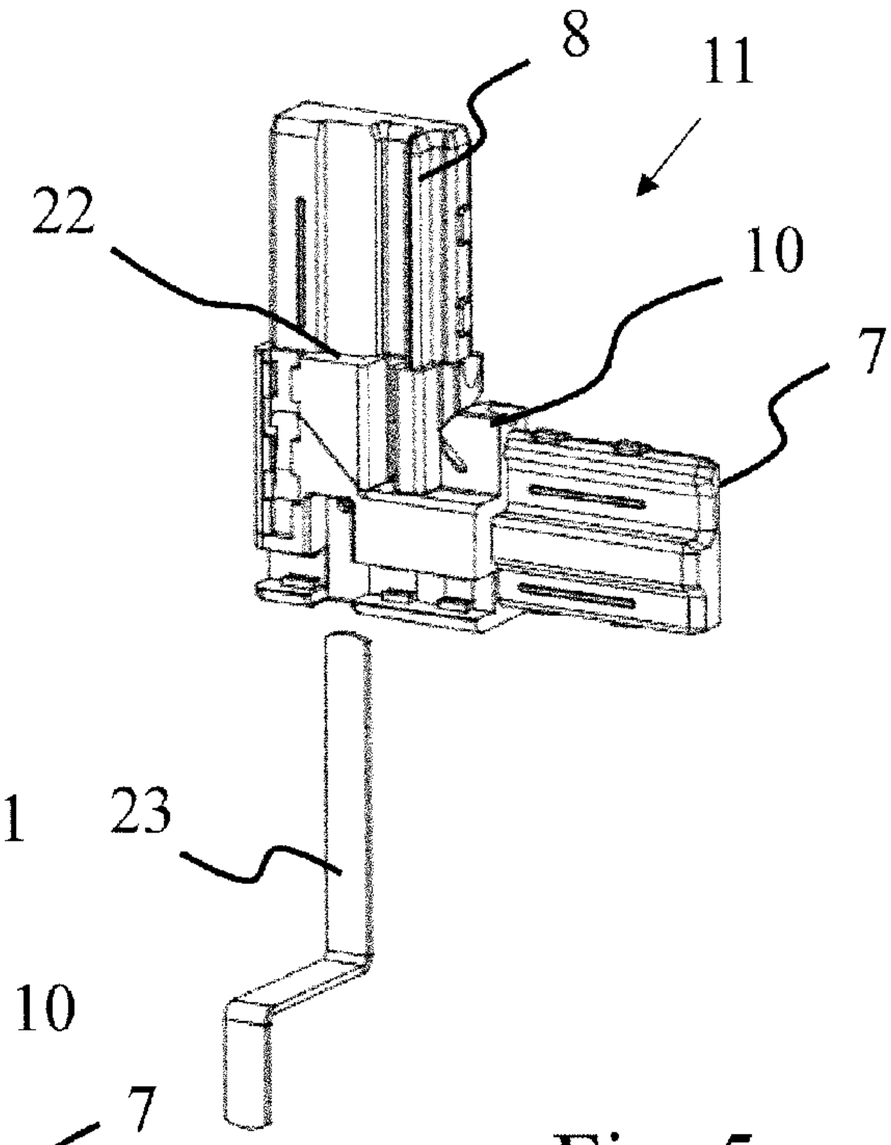

Fig. 5

Fig. 6

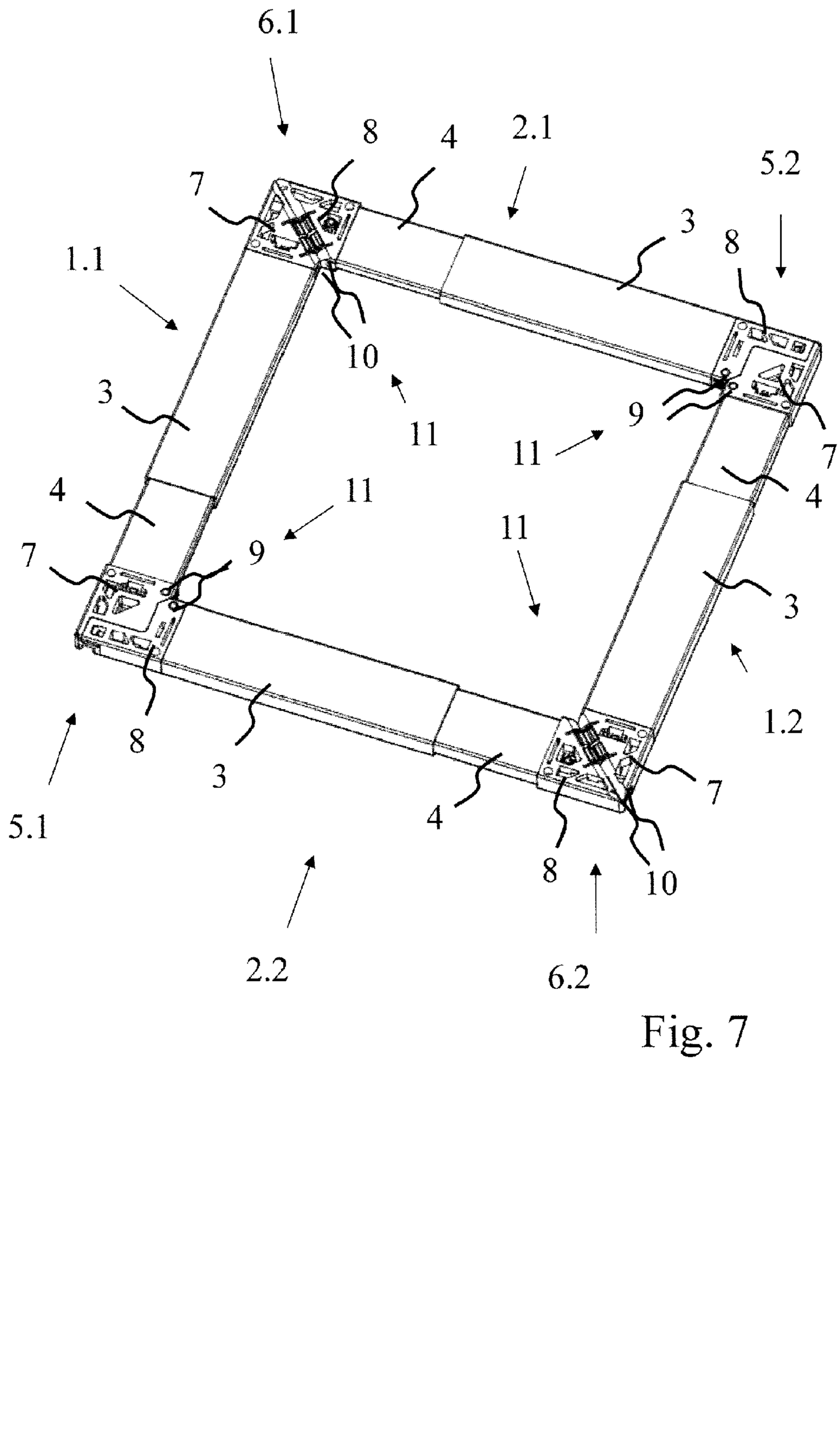

Fig. 7

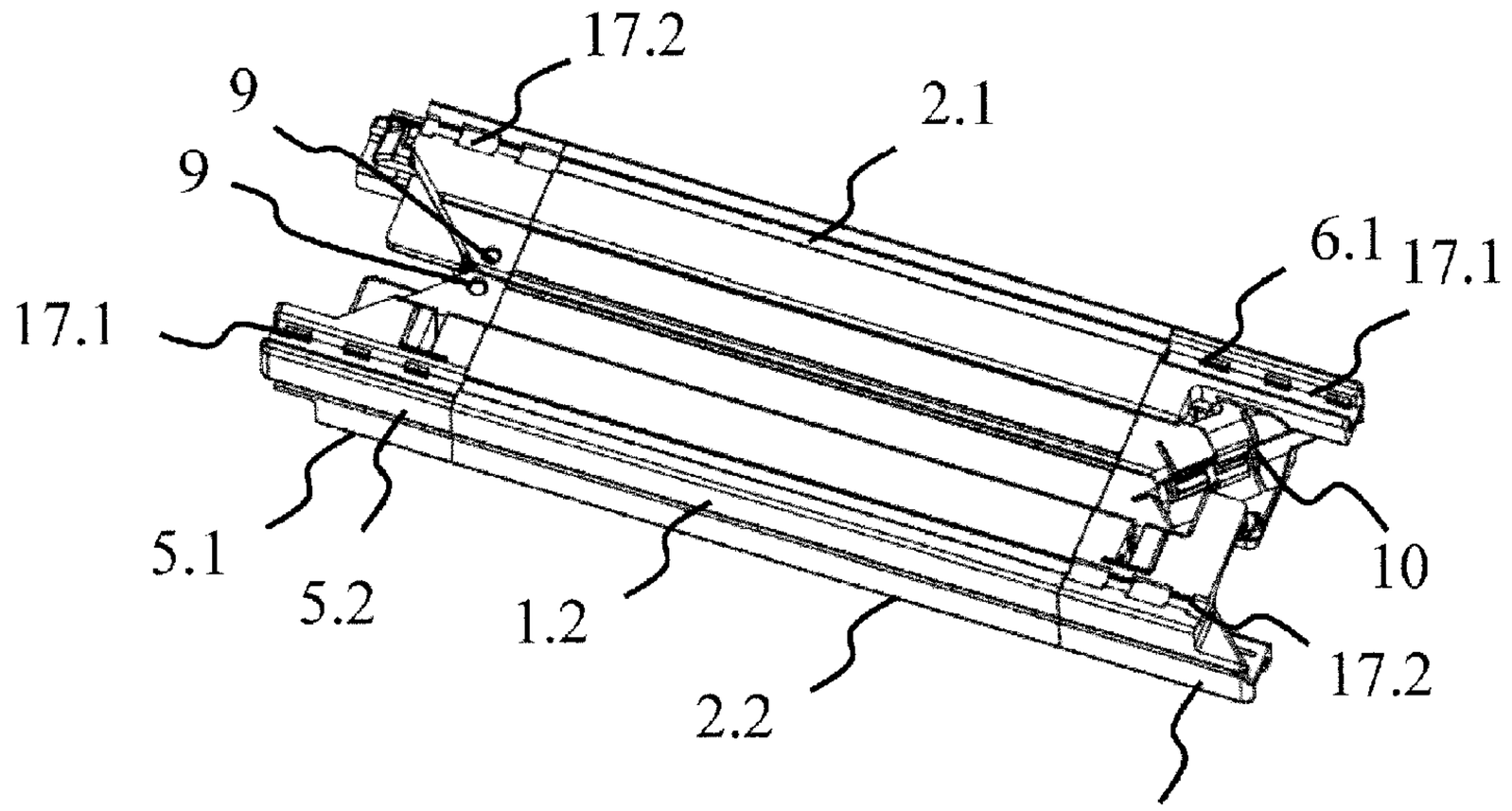

Fig. 8

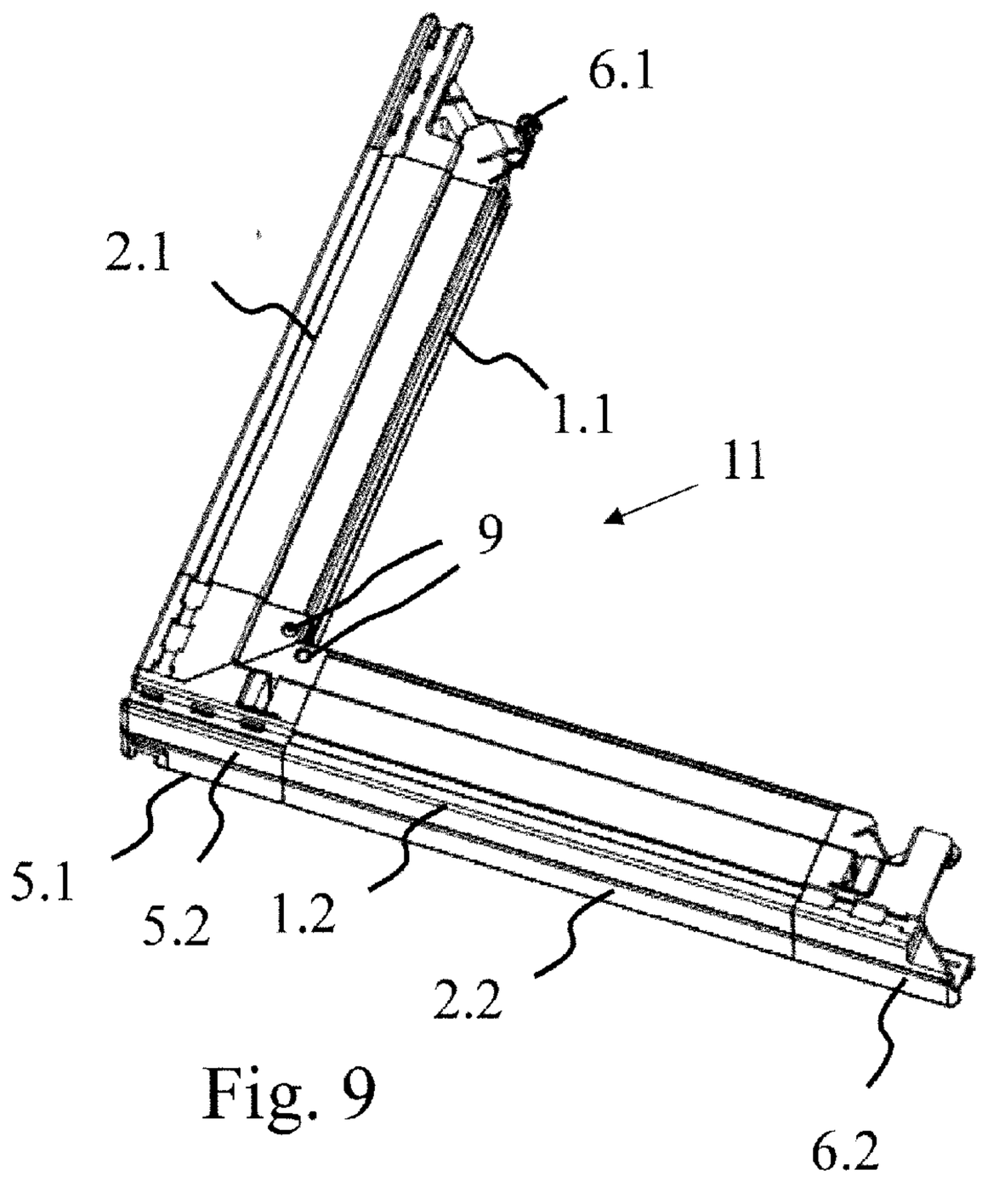

Fig. 9

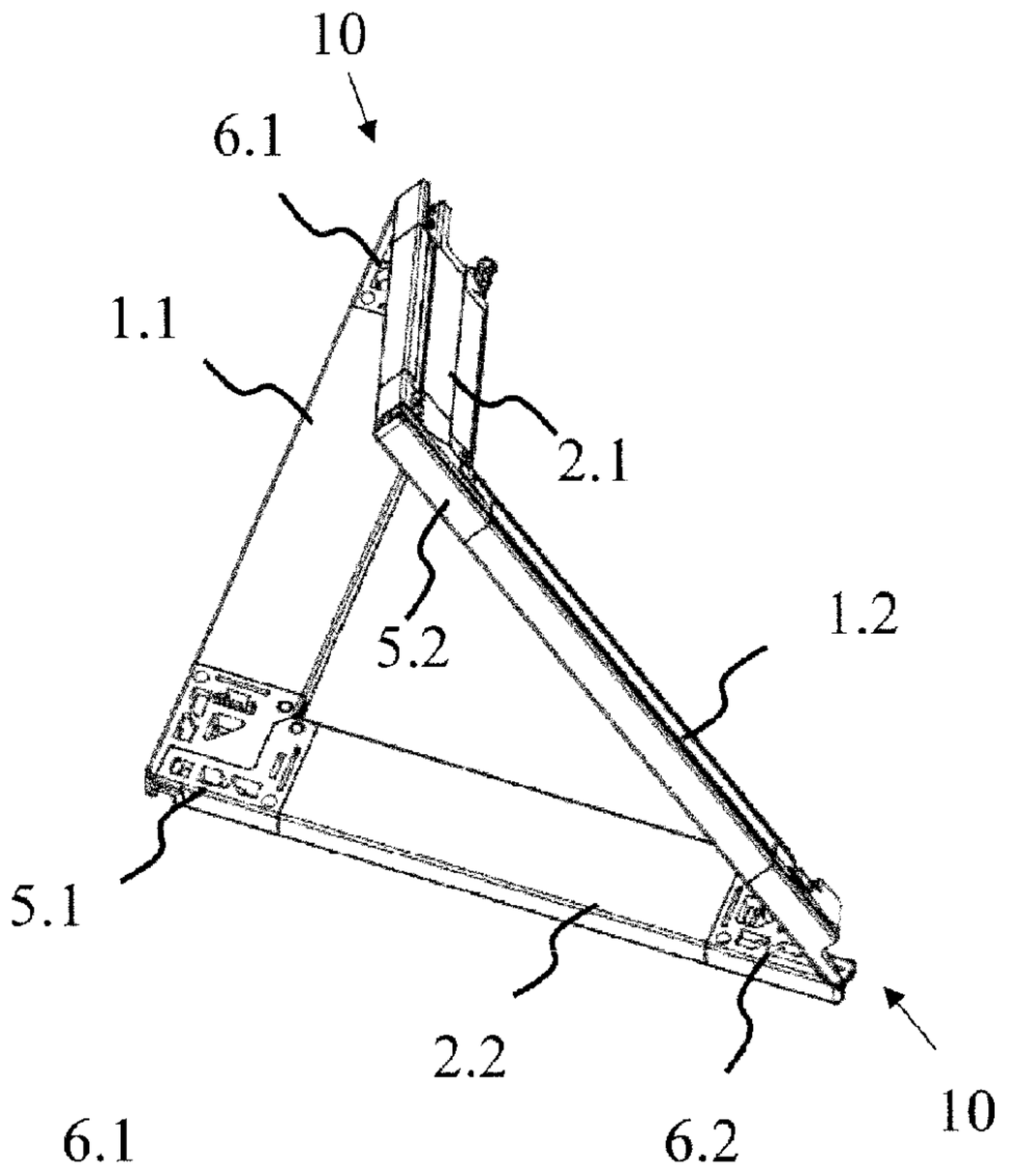

Fig. 10

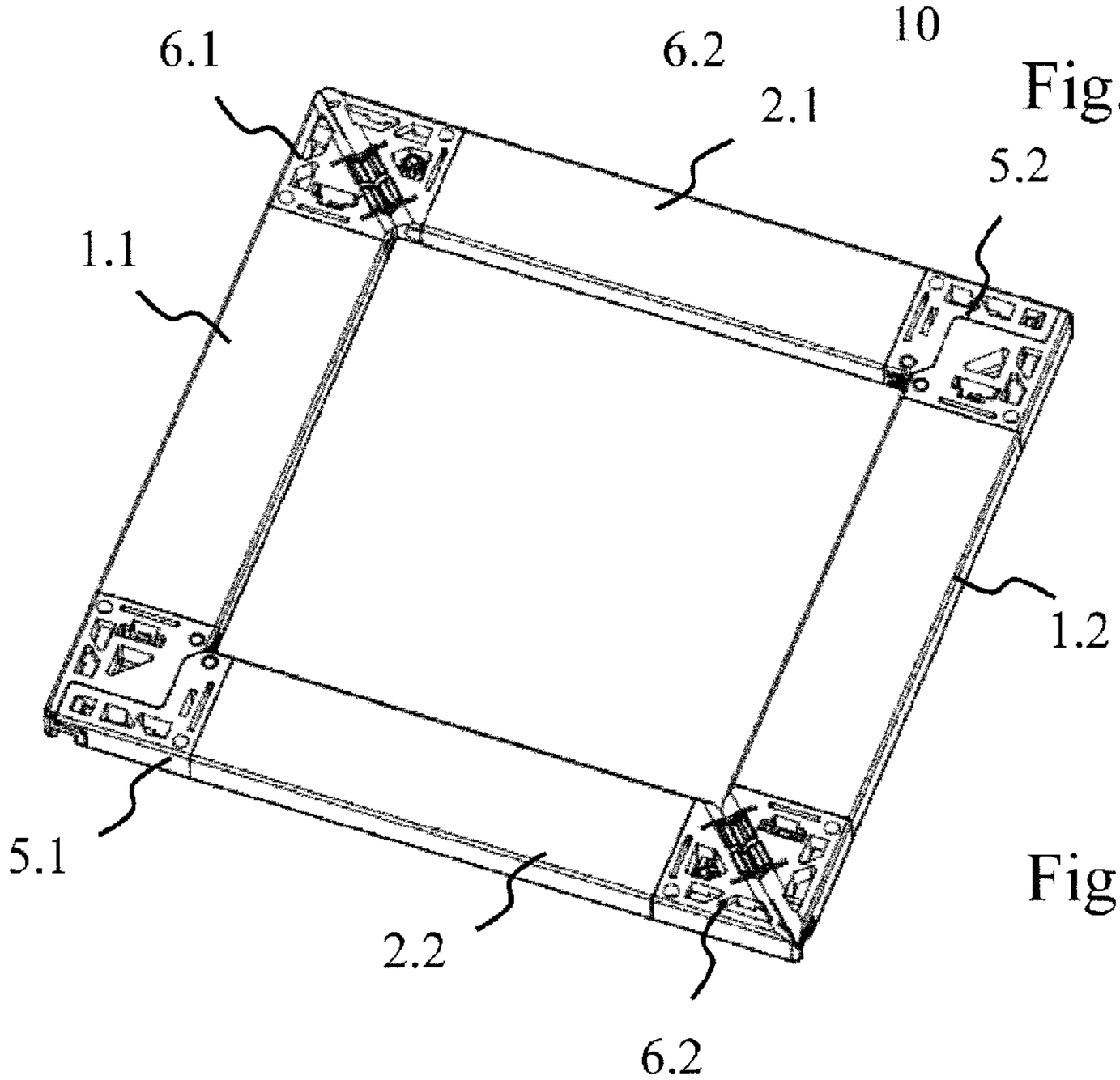

Fig. 11

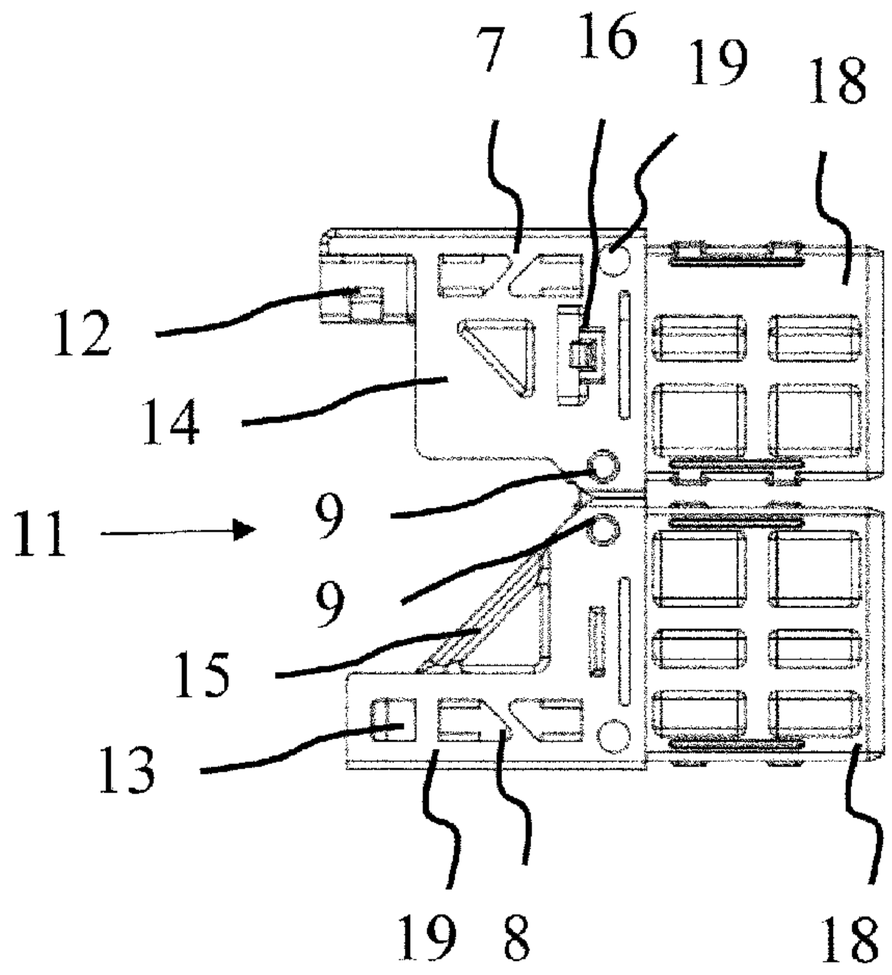

Fig. 12

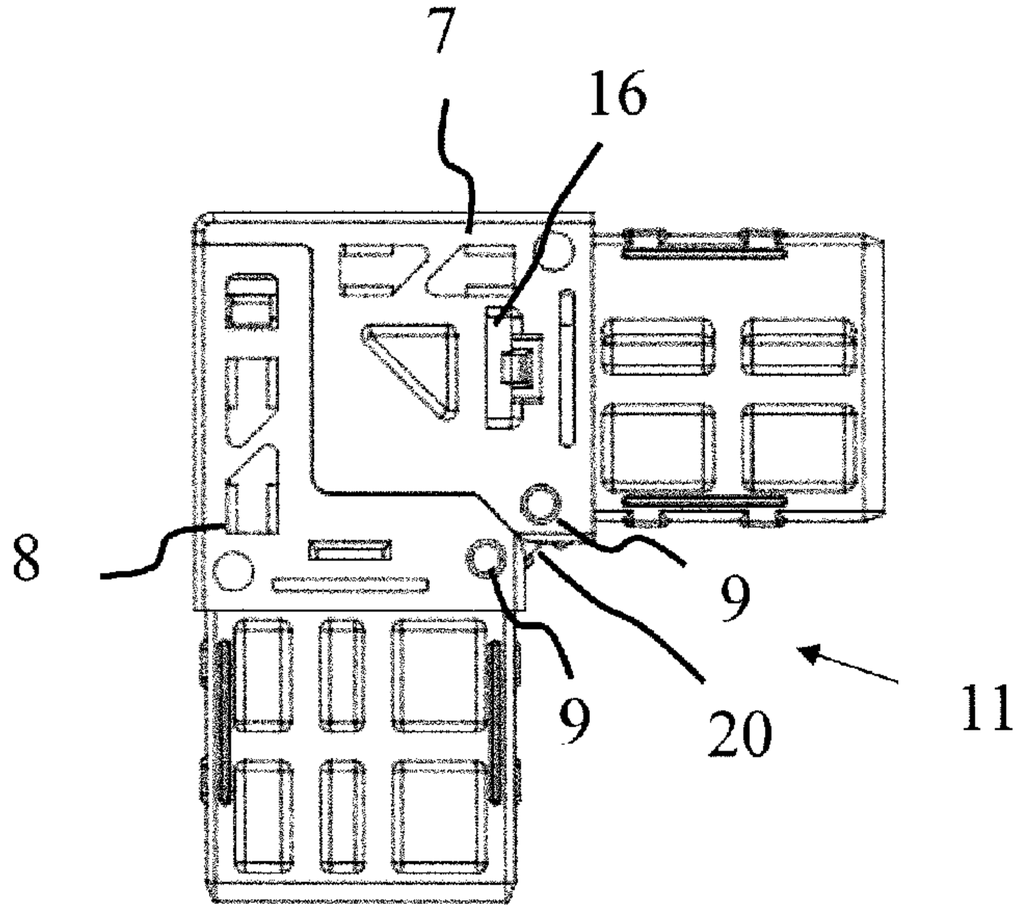

Fig. 13

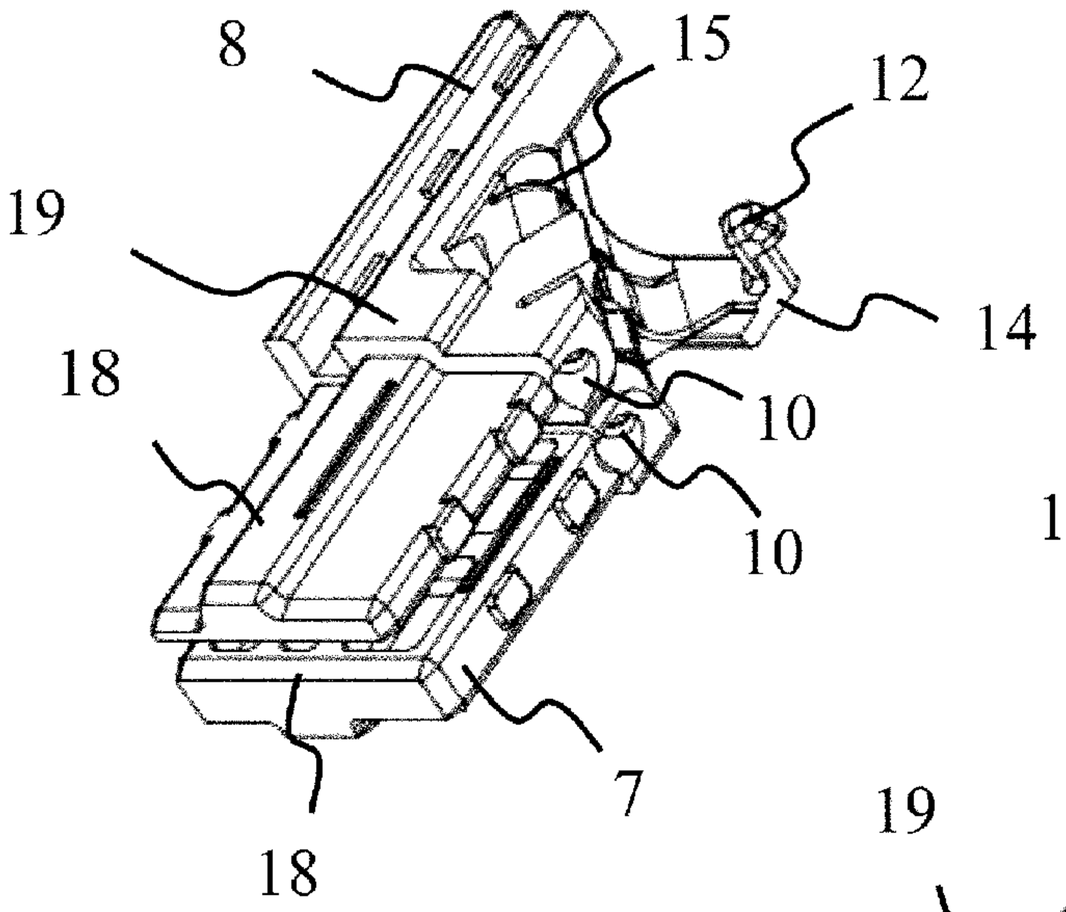

Fig. 14

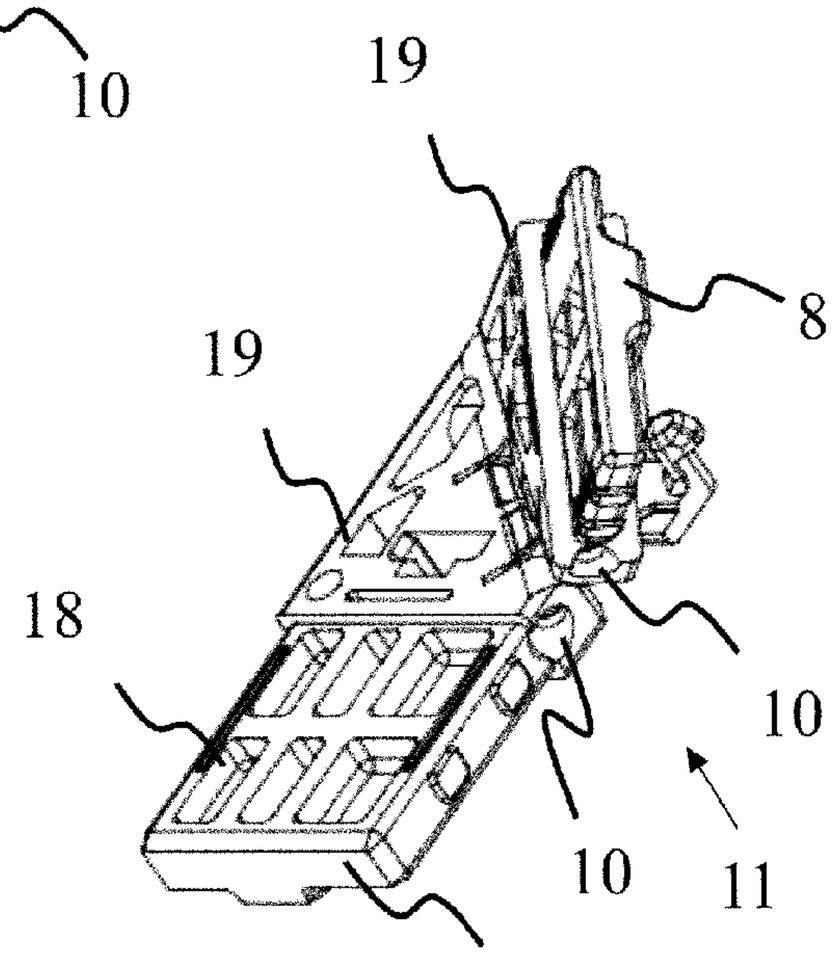

Fig. 15

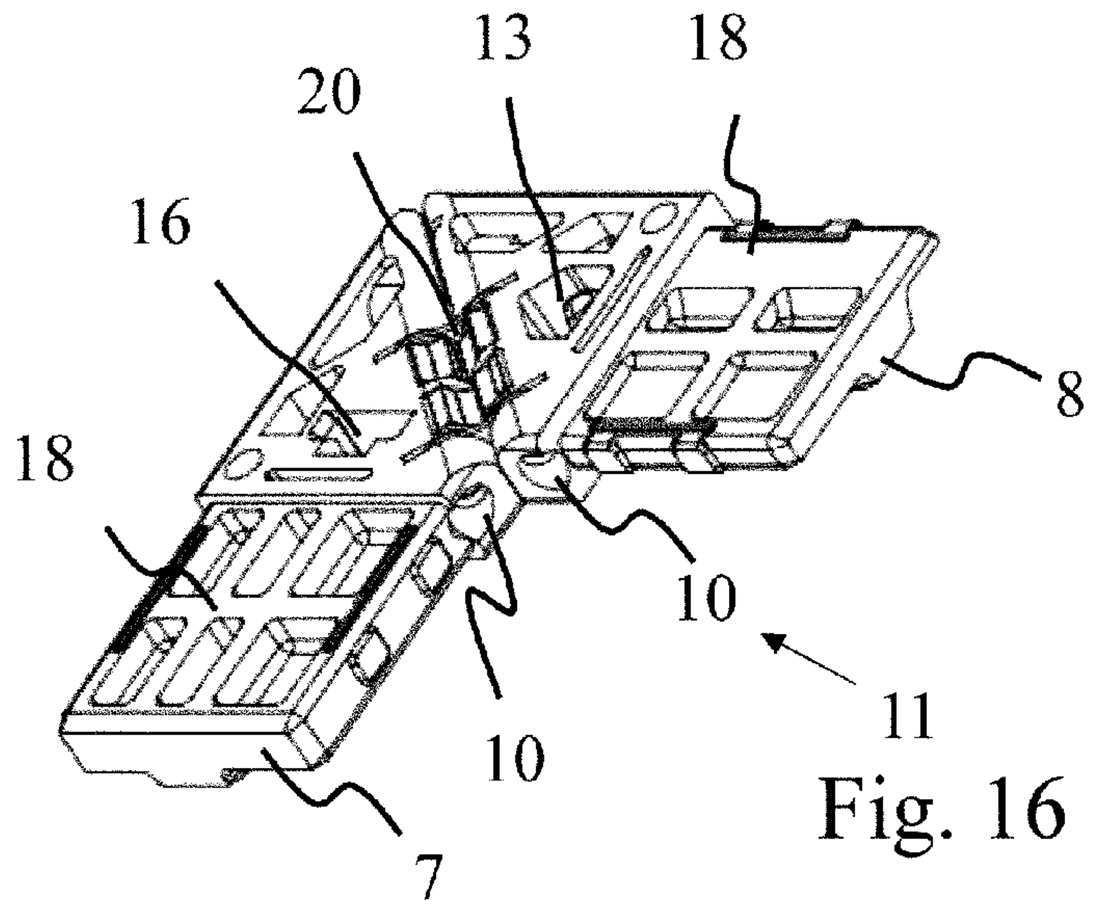

Fig. 16