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(54) ATTACHMENT OF A FITTINGS COMPONENT TO A PROFILE

(57) The invention relates to a tensile piece (1) that can be attached to a flat profile wall (12) of a hollow profile (11) of a window or door through an opening (15) provided to that end in the profile wall for attachment of a fittings component (16) to the profile.

The tensile piece comprises a body (2) with a base (3) and a protruding part (4) provided with a laterally outwardly protruding edge (5) configured such that the

base fits in the opening but the lateral protruding edge does not.

On the upsideside of the body the base comprises a stop (9) which when in use, the body being inserted in the opening, by turning in a screw (17) in a passage (6) provided to that end in the body, is pulled against an inside (13) of the profile wall.

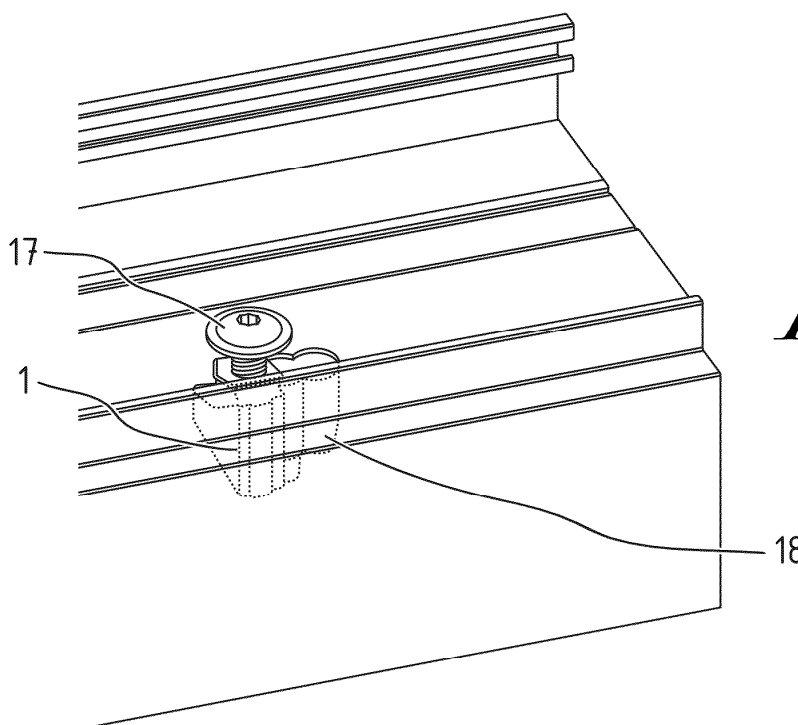


Fig. 2A

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Description

[0001] The present invention relates to a tensile piece that can be attached to a hollow profile of a window or door for attaching a fittings component, such as for example a hinge component, to the profile.

[0002] Windows and doors are often made from hollow profiles in metal or plastic to which fittings components such as for example a hinge are attached.

[0003] A known way of attaching uses telescopic tensile pieces. Usually such telescopic tensile pieces are inserted along an open end of the profile and slid to the desired location where an opening is already provided beforehand in the profile, for example, by drilling. Such telescopic tensile piece substantially consists of a solid element in which a threaded hole is provided for tightening by a bolt that is inserted in the threaded hole through the bore hole in the profile and is screwed tight in the tensile piece whereby the threaded hole in the tensile piece is positioned opposite the bore hole in the profile.

[0004] A disadvantage of this solution is that the tensile pieces already need to be inserted in the profile prior to mounting the hinge and the bore holes need to be provided in the profile beforehand. After assembly of the window or door said tensile pieces can no longer be replaced or reused without dismantling the relevant profiles of the window or door.

[0005] EP 2248975 A1 discloses a clip anchor for mounting fittings on a hollow profile of a window or door. The clip anchor contains a hook-shaped or L-shaped body with a first leg and a second leg. In mounted condition the first leg of the clip anchor hooks behind a first internal wall surface, which is located at a certain depth in the hollow profile, the flat part of the first leg being clamped against the first internal wall, and the clip anchor hooks behind a second internal wall in the hollow profile, a shoulder at the end of the second leg being clamped against the second internal wall. A disadvantage of this is that the use of two clamping surfaces adds to the complexity and complicates a stable attachment because the two clamping surfaces must be correctly positioned for a stable attachment. A further disadvantage is that a deeper lying internal wall must be available on the attachment location behind which the clip anchor can hook. This is not always the case and also depends on the type of profile such that the applicability is restricted.

[0006] An objective of the invention is to provide a solution which allows the attachment to be executed such that the openings in the profile wall for the attachment do not need to be made beforehand (during production) which allows more freedom in the placement of the tensile piece and the corresponding fittings component.

[0007] Another objective of the invention is to provide a solution which allows an efficient, reliable and stable assembly of a tensile piece and a corresponding fittings component by a person skilled in the art, preferably at a randomly chosen attachment location to the profile and is, preferably, applicable for each type of profile, including

more in particular also narrow profiles.

[0008] Yet a further objective of the invention is to provide a solution whereby the tensile piece can be removed after attachment and if relevant replaced without disassembling the profiles and whereby the removed tensile piece can be reused.

[0009] To at least partially provide a solution to one or more of the aforementioned or other known disadvantages and/or to at least partially meet one or more aforementioned objectives, the invention provides an alternative device comprising a hollow profile of a window or door with a flat profile wall, and an opening which extends from the outside to the inside, a fittings component provided with a screw opening and a tensile piece.

[0010] The flat profile wall has an inside facing the cavity in the profile, an opposite outside and an opening that extends from the outside to the inside. The tensile piece can be attached to the flat profile wall via the opening in the profile wall for attachment of a fittings component to the profile.

[0011] The tensile piece comprises a body with a length (dimension in X direction), a width (dimension in Y-direction) and a height (dimension in Z direction), and with a base and a protruding part which on an upperside of the body protrudes in a height direction (Z) relative to the base and laterally (X, Y) does not protrude relative to the base, whereby the protruding part on or near a free end is provided at least in transversal direction (Y) with a laterally outwardly protruding edge which protrudes in the transversal direction relative to the base and the protruding part. The dimensions of the body of the tensile piece and the opening in the flat profile wall are matched such that when the body (with the base first) is inserted through the opening in the profile wall in the cavity of the profile, the base fits in the opening but the laterally protruding edge of the protruding part does not. This prevents the tensile piece from falling through the opening in the cavity of the profile upon assembly and also allows the tensile piece to be removed easily from the profile upon disassembly. Optionally, the body of the tensile piece can be shaped such that the protruding part in the transversal direction (Y) is narrower than the base. This simplifies laterally moving the body when said body extends in the cavity of the profile via the opening.

[0012] A passage provided with a thread is provided in the body of the tensile piece which extends in an upward direction through the protruding part and through the base of the upperside to an underside of the body. A complementarily formed screw or bolt can be inserted in said passage for tightening or loosening the tensile piece.

[0013] The body of the tensile piece is shaped such that at the upperside of the body, the upperside of the base between a transverse side of the base and the protruding part is substantially flat and forms a stop. The fact that the relevant part of the base, or in other words the stop, is substantially flat means that the upper surface of the stop is at an angle with the height direction (Z) between 85° and 95°. In the upper surface of the stop,

a structure can be applied, such as for example a pattern of ribs and grooves.

[0014] In mounted condition the fittings component of the device is placed at the outside on the flat profile wall, the base of the tensile piece is located in the hollow profile with the stop facing the inside of, and overlapping with, the profile wall, and the protruding edge of the protruding part of the tensile piece is located at the outside of the profile wall. The fittings component of the device is attached to the profile by turning in a screw, inserted through the screw opening of the fittings component in the passage of the tensile piece, such that the stop is pulled against the inside of the flat profile wall, whereby the stop forms the only surface that supports or clamps the tensile piece on the profile.

[0015] This configuration of the device allows simple attachment (and if relevant removal) of the tensile piece directly behind the flat profile wall by inserting the tensile piece in the opening of the profile wall, extending in the cavity of the profile with the laterally extending edge of the upward directed protruding part at the outside of the profile wall, subsequently sliding the tensile piece in the direction of an edge which delimits the opening such that the stop overlaps with the profile wall at the inside until the protruding part touches said edge of the opening, and turning in the screw in the passage such that the stop is pulled against the underside of the profile wall. This ensures that the tensile piece is stably attached to the profile, solely by tightening it against one single flat profile wall. In other words only one single clamping or support surface is formed by the tensile piece with a profile wall whereby the relevant profile wall is the flat profile wall in which the opening is formed through which the tensile piece is inserted in the profile cavity. Furthermore, the tensile piece of the device according to the invention is also suitable for attachment in narrow profiles, as the tensile piece can also be attached longitudinally parallel with the longitudinal direction of the profile such that in transversal direction of the profile little mounting space is needed.

[0016] In an embodiment according to the invention the base of the body of the tensile piece is formed such that in the height direction from the upperside to the underside of the body, the shortest distance between the transverse side of the base adjacent to the stop and the passage gradually decreases at least over a section in the height direction. Optionally, the body can be shaped such that a longitudinal side of the section of the base, located between the transverse side of the base adjacent to the stop and the passage, has a substantially triangular shape at least over a section in height direction. A substantially triangular shape means that the appearance of the relevant section evokes the image of a triangle, one or more angles of which may or may not be rounded or bevelled.

[0017] The configuration of the tensile piece whereby in height direction the shortest distance between the transverse side of the base adjacent to the stop and the passage, or in other words the section of the base

located adjacent to the opening under the profile wall in mounted condition of the tensile piece, gradually decreases in height direction from the upperside of the body to the underside, ensures that upon attachment the screw force, exercised when turning in the screw in the passage, is effectively transferred to the profile wall resulting in a more reliable and stable attachment.

[0018] To simplify the attachment of the tensile piece to the profile wall, optionally the body of the tensile piece can be executed such that the laterally extending edge of the upward directed protruding part overlaps in a longitudinal direction with the stop.

[0019] In an embodiment of the device according to the invention, the opening in the profile wall is an oblong-shaped opening, whereby the stop of the tensile piece overlaps at one end of the oblong-shaped opening with the profile wall and the device comprises a locking piece detachably connected to the body whereby the locking piece extends in the oblong-shaped opening in a longitudinal direction between the body and the opposite end of the oblong-shaped opening, and in an upward direction overlaps with the oblong-shaped opening. Preferably, the locking piece does not protrude or barely protrudes in an upward direction through the opening at the outside of the profile wall. The detachable connection between the locking piece and the body is, for example, a snap connection and/or a tongue and groove connection.

[0020] The advantage of this configuration with the locking piece is that when the base of the body is inserted in the oblong-shaped opening and the stop is slid under the profile wall, the locking piece can be connected to the body such that the body cannot slide unintentionally, for example under the influence of gravity, in the longitudinal direction of the oblong-shaped opening which simplifies the further attachment of the fittings component to the profile.

[0021] Also in an embodiment of the device according to the invention, the profile wall is provided with two openings which lie in each other's extension, and for each of the openings the tensile piece is provided, whereby the tensile pieces are applied in the corresponding openings such that the stops of the respective tensile pieces on one of the facing ends of the openings overlap with the profile wall.

[0022] This allows a fittings component, such as for example a hinge component, which is provided with two screw openings, the relative position and distance of which are aligned with the openings in the profile wall such that, when in use, said openings overlap with the respective passages of the tensile pieces which are applied, to be attached to the profile using the tensile pieces with the respective stops facing each other. Directing the stops towards each other increases the load-bearing capacity of the attached fittings component because in case of any light deformation of the fittings component under load the tensile pieces are pulled towards each other fixedly in the profile wall. Furthermore, optionally the respective tensile pieces can be adjusted

such that the base of the body of the tensile piece is formed such that in the height direction from the upper-side to the underside of the body the shortest distance between the transverse side of the base adjacent to the stop and the passage gradually decreases at least over a section in the height direction and the decrease is such that a longitudinal side of the section of the base located between the transverse side of the base adjacent to the stop and the passage in height direction has a substantially triangular shape at least over a section. Consequently, the section of the bases of the respective tensile pieces with the stops facing each other which is located under the profile wall gradually decreases such that, for example, a tensile force exercised on the fittings component is optimally accommodated. Indeed, the reaction forces exercised by the respective tensile pieces as reaction to the exercised tensile forces are each parallel with the hypotenuse of the triangle of the relevant tensile piece (and thus facing away from each other) such that a balance of forces is obtained which benefits the stability and lifetime of the attachment.

[0023] The attachment of a fittings component provided with a screw opening on a flat profile wall of a hollow profile of a window or door, whereby the flat profile wall is provided with an inside facing the cavity, an opposite outside, and an opening which extends from the outside to the inside is simple. The method comprises the steps of:

- inserting the tensile piece, as described above, in the opening such that the base extends in the cavity, whereby the tensile piece and the opening are aligned such that upon inserting the body in the opening the base fits in the opening but the laterally protruding edge of the protruding part does not;
- sliding the tensile piece in the direction of an edge which delimits the opening such that the stop overlaps with the profile wall at the inside until the protruding part touches said edge of the opening;
- placing the fittings component on the profile wall at the outside and aligning the fittings component such that the screw opening and the passage overlap;
- turning in a screw extending through the screw opening in the passage whereby the stop is pulled against the underside of the profile wall.

[0024] Optionally, the step of sliding the body to the edge of the opening can be followed by sliding a locking piece in the cavity of the profile through the opening between the body and the edge of the opening opposite said edge whereby the locking piece is attached to the body, for example using a tongue and groove connection and/or a snap connection. In attached condition the locking piece extends in a longitudinal direction from the body to the opposite edge of the opening and the locking piece overlaps at or near an end in an upward direction with the opening in the profile wall. Thus, the slid tensile piece can practically no longer slide which simplifies the further

steps of attaching the fittings component.

[0025] The opening or oblong-shaped opening in the profile wall through which the tensile piece is inserted can be made using a simple tool, such as for example a drill, by using the drill in combination with a gauge. This can be done in advance, for example during production, but the (oblong-shaped) opening can also be applied on site in the profile before or after placing the window. Obviously, the (oblong-shaped) opening can also be made with a specialised CNC-machine, but typically this then needs to be done in the factory.

[0026] With the intention of better showing the characteristics of the invention, a preferred embodiment of a device according to the invention is described hereinafter, by way of an example without any limiting nature, with reference to the accompanying drawings wherein:

figure 1 schematically shows a perspective view of a hinge component attached with tensile pieces in an embodiment according to the invention;

figure 2 partially shows a section indicated with F2 in fig.1, whereby fig.2A and fig.2B respectively show a transparent view and a longitudinal section;

figure 3 shows the tensile piece indicated with F3 in fig.2B, whereby fig.3A and fig.3B respectively show a perspective view and a longitudinal view;

figure 4 shows the locking piece indicated with F4 in fig.2B, whereby fig.4A and fig.4B respectively show a perspective view and a bottom view;

figure 5 shows a magnified view of the opening indicated with F5 in fig.2B;

figure 6 schematically and partially shows an example for attaching the tensile pieces to a profile.

[0027] Figure 1 shows an example according to the invention of a fittings component 16 that is attached to a hollow profile 11 of a window using tensile pieces 1. Figures 2 to 5 show further details and/or components which may or may not be magnified.

[0028] The shown fittings component 16 is a hinge leaf provided with two threaded holes that is placed at the outside 14 on a flat profile wall 12 of the hollow profile, in this case a frame profile.

[0029] As shown in more detail in figures 2 and 3, each tensile piece 1 is formed by an oblong-shaped body 2. The body 2 comprises a base 3 and a protruding part 4 that vertically protrudes at an upperside 7 of the body (Z-direction) relative to the base and laterally does not protrude relative to the base. Typical maximum external dimensions of the body are: a height (Z-direction) of 19 mm, a length (X-direction) of 25 mm and a width (Y-direction) of 8 mm.

[0030] In the example shown, said protruding part 4, also referred to as the neck, is narrower than the base 3, in a transversal direction (Y-direction). At the free end the neck 4 is provided with a laterally outwardly protruding edge 5, also referred to as a collar. Said collar 5 protrudes transversally relative to the base 3 and the neck 4.

[0031] The shortest distance in upward direction between the upperside of the stop 9 and the underside of the collar 5 is 0.3 cm such that the shown tensile pieces 1 can be used on profile walls 12 with a thickness up to approximately 0.25 cm.

[0032] A passage 6 is provided in the body 2. Said passage is provided with a thread and extends through the neck 4 and the base 3 of the upperside 7 up to the underside 8 of the body. At the upperside 7 of the body the base 3 comprises a flat stop 9 between a transverse side of the base and the neck 4.

[0033] The profile wall 12 has an inside 13 facing the cavity in the profile 11, an opposite outside 14 and two openings 15 lying in each other's extension, said openings extending from the outside to the inside. The tensile pieces 1 are applied through said openings 15. In this example, as shown in more detail in fig.5, the oblong-shaped openings are formed by three bores overlapping in a longitudinal direction. Obviously the opening can also be formed in another way, such as for example by milling. In the latter case the openings typically have an oval shape. The invention is not limited to a specific opening shape. In principle every shape is possible as long as the body 2 and the opening 15 are aligned with each other such that the base 3 fits through the opening but the collar 5 does not.

[0034] The fact that the openings can also be formed by bores offers the possibility to provide the attachment location for a fittings component in the profile wall on site at the customer, for example if it is desirable to place an extra hinge.

[0035] In mounted condition of the tensile piece 1 the collar 5, which is wider in the transversal direction than the opening 15, is located at the outside 14 of the profile wall 12 and the base 3 is located in the cavity of the profile 11 with the stop 9 facing the inside 13 of, and overlapping with, the profile wall 12 at one end of the opening. A locking piece 18, as shown in fig.2 and fig.4, extends from the body 2 up to the opposite end of the opening 15. The locking piece is detachably connected to the body 2 using a tongue and groove connection whereby the tongue 10 is part of the body 2 and the groove 19 is provided in the locking piece 18. Obviously, the locking piece can also be connected to the body in other known ways. The mounted locking piece 18 overlaps with the opening 15 in upward direction without, however, protruding through the opening at the outside 14 of the profile wall 12.

[0036] In the example shown, the collar 5 overlaps in a longitudinal direction (X direction) with the stop 9 such that in mounted condition of the tensile piece 1 the collar overlaps with the profile wall 12 at the outside 14.

[0037] As shown in fig.1 and fig.2, the hinge leaf 16 is attached to the profile 11 using screws or bolts 17 which are inserted through the threaded holes in the passages 6 of the tensile pieces 1 which hook to the profile wall and are turned in such that the stops 9 are pulled against the inside 13 of the profile wall 12. Note that the shape of the base 3 is such that in an upward direction the shortest

distance (indicated with D1 in fig.3B) between the transverse side of the base adjacent to the stop 9 and the passage 6 gradually increases from the bottom in an upward direction at least over a section. In this example, the course of the increase is such that the longitudinal sides of the section of the base 3 which is located between the transverse side of the base adjacent to the stop 9 and the passage 6 has a substantially triangular shape in upward direction over said section. Said shape contributes to the screw force exercised upon turning in the screw being optimally transferred to the profile wall 12.

[0038] Also note that the tensile pieces 1 are mounted such that said pieces hook behind the profile wall 12 to the opposite ends of the openings 15. This ensures a stable and reliable attachment. Indeed, in case of load, as indicated with the arrow in fig.1, the tensile pieces 1 are pulled towards each other fixedly in the profile wall 12.

[0039] With reference to the characteristics of the configuration as shown in figures 1 to 5, an example of a method for attaching the hinge leaf 16 provided with two screw openings to a flat profile wall 12 with two openings 15 lying in each other's extension, as partially shown in fig.6, comprises the steps of:

- inserting the tensile pieces 1 in the corresponding openings 15 such that the base 3 extends in the cavity of the hollow profile 11 and the collar 5 of the neck 4 is located at the outside 14 of the profile wall 12;
- sliding the tensile pieces 1 in the openings 15 towards each other such that the respective stops 9 overlap with the profile wall 12 at the inside 13 until the respective necks 3 touch the edge of the corresponding openings 15;
- in every opening 15, sliding a locking piece 18 in the cavity of the profile 11 between the body 2 and the opposite edge of the opening whereby the groove 19 of the locking piece 18 slides over the tongue 10 and the locking piece is attached to body 2;
- placing the hinge leaf 16 on the profile wall 12 at the outside 14 and aligning the hinge leaf such that the screw openings and the passages 6 overlap;
- turning in screws 17 extending through the screw openings in the passages 6 of the corresponding bodies 2 whereby the stops 9 are pulled against the inside 13 of the profile wall 12.

[0040] The present invention is by no means limited to the embodiments described as an example and shown in the figures, but a device according to the invention can be realised in all kinds of forms and dimensions without departing from the scope of the invention, as is described in the following claims.

Claims

1. A device comprising a hollow profile (11) of a window or door with a flat profile wall (12) with an inside (13) facing the cavity, an opposite outside (14), and an opening (15) extending from the outside to the inside,

a fittings component (16) provided with a screw opening, and

a tensile piece (1) that can be attached to the flat profile wall via the opening, the tensile piece comprising a body (2) with a length, a width and a height, and with a base (3) and a protruding part (4) that protrudes on an upperside (7) of the body in a height direction (Z) relative to the base and laterally does not protrude relative to the base, whereby the protruding part is provided on or near a free end, at least breadthways (Y), with a laterally outwardly protruding edge (5) which protrudes breadthways relative to the base and the protruding part, whereby in the body a passage (6) provided with a thread is provided which extends in the height direction through the protruding part and through the base from the upperside to an underside (8) of the body, whereby at the upperside of the body, the upperside of the base between a transverse side of the base and the protruding part is substantially flat and forms a stop (9), whereby the dimensions of the body and the opening are aligned with each other such that when the body is inserted in the opening the base fits in the opening but the laterally protruding edge of the protruding part does not,

whereby, in mounted condition, the fittings component is placed at the outside on the profile wall, the base of the tensile piece is located in the hollow profile with the stop facing the inside of, and overlapping with, the flat profile wall, and the protruding edge of the protruding part of the tensile piece is located at the outside of the profile wall,

whereby the fittings component is attached to the profile by turning in a screw (17), inserted through the screw opening of the fittings component in the passage of the tensile piece, such that the stop is pulled against the inside of the flat profile wall, and whereby the stop forms the only surface with which the tensile piece supports or clamps on the profile.
2. The device according to claim 1, **characterised in that** the base (3) is formed such that in the height direction from the upperside to the underside of the body (2) a shortest distance (DI) between the transverse side of the base adjacent to the stop (9) and the passage (6) gradually decreases at least over a section in the height direction.
3. The device according to claim 2, **characterised in that** a longitudinal side of the section of the base located between the transverse side of the base (3) adjacent to the stop (9) and the passage (6) has a substantially triangular shape in the height direction at least over a section.
4. The device according to any one of the previous claims, **characterised in that** the protruding part (4) is narrower breadthways than the base (3).
5. The device according to any one of the previous claims, **characterised in that** the laterally extending edge (5) overlaps in a longitudinal direction (X) with the stop (9).
6. The device according to any one of the previous claims, **characterised in that** the opening (15) is an oblong-shaped opening whereby the stop (9) of the tensile piece (1) overlaps with the profile wall (12) at one end of the oblong-shaped opening and the device comprises a locking piece (18) that is detachably connected to the body (2) whereby the locking piece extends in the oblong-shaped opening in a longitudinal direction between the body and the opposite end of the oblong-shaped opening and in an upward direction overlaps with the oblong-shaped opening.
7. The device according to any one of the previous claims, **characterised in that** the profile wall (12) is provided with two openings (15) which lie in each other's extension, and for each of the openings the tensile piece (1) is provided, whereby the tensile pieces are applied in the corresponding openings such that the stops (9) of the respective tensile pieces overlap with the profile wall at one of the facing ends of the openings.

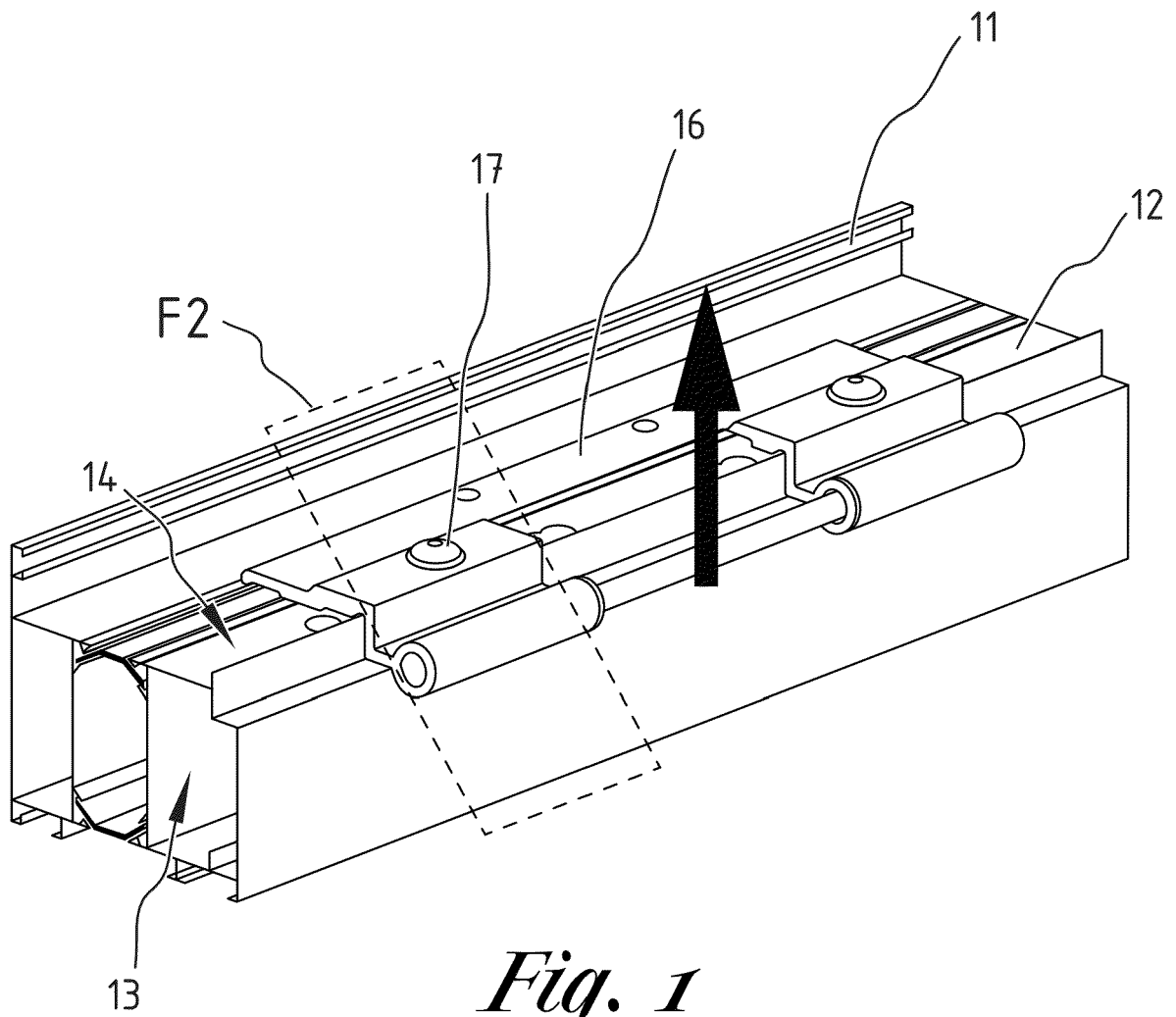


Fig. 1

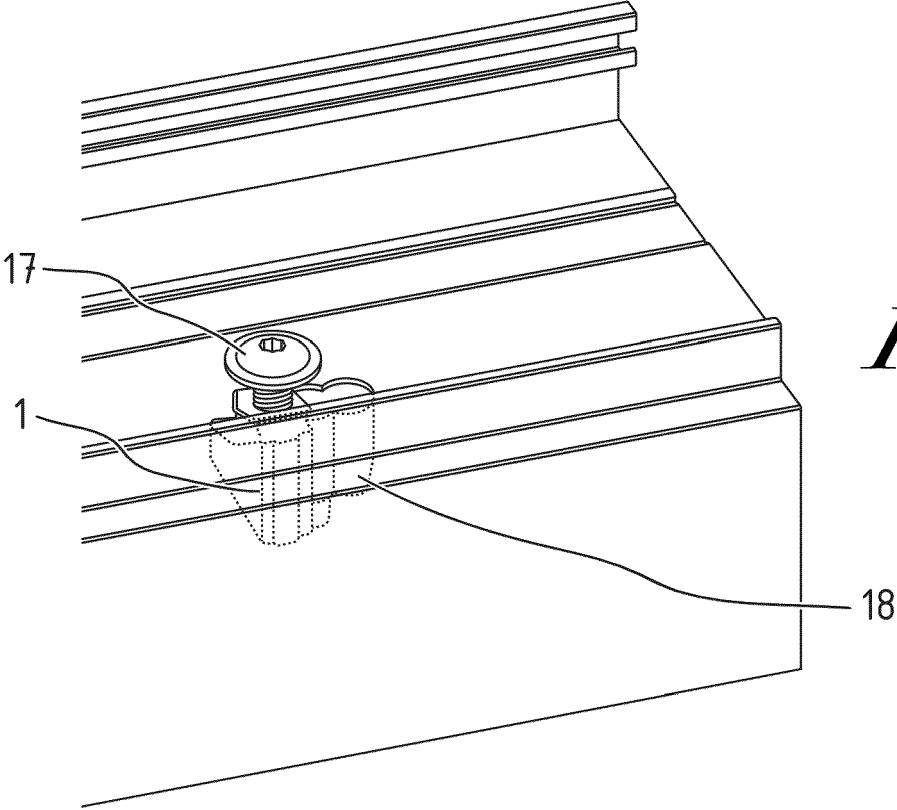


Fig. 2A

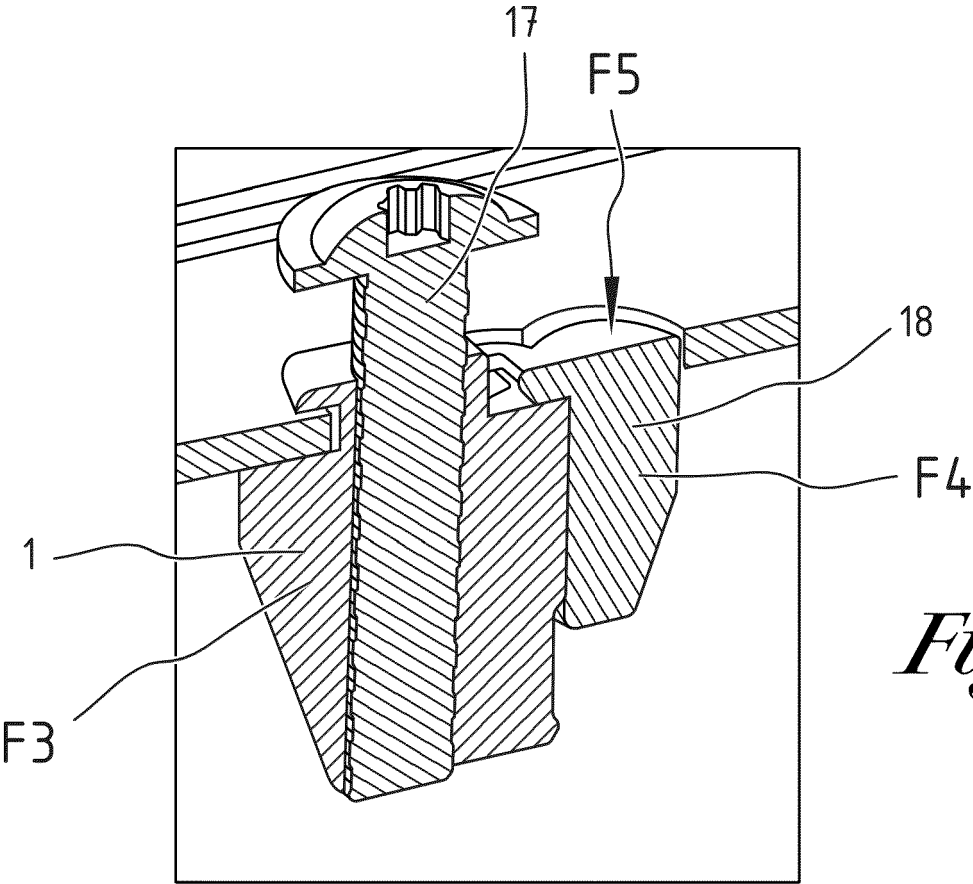
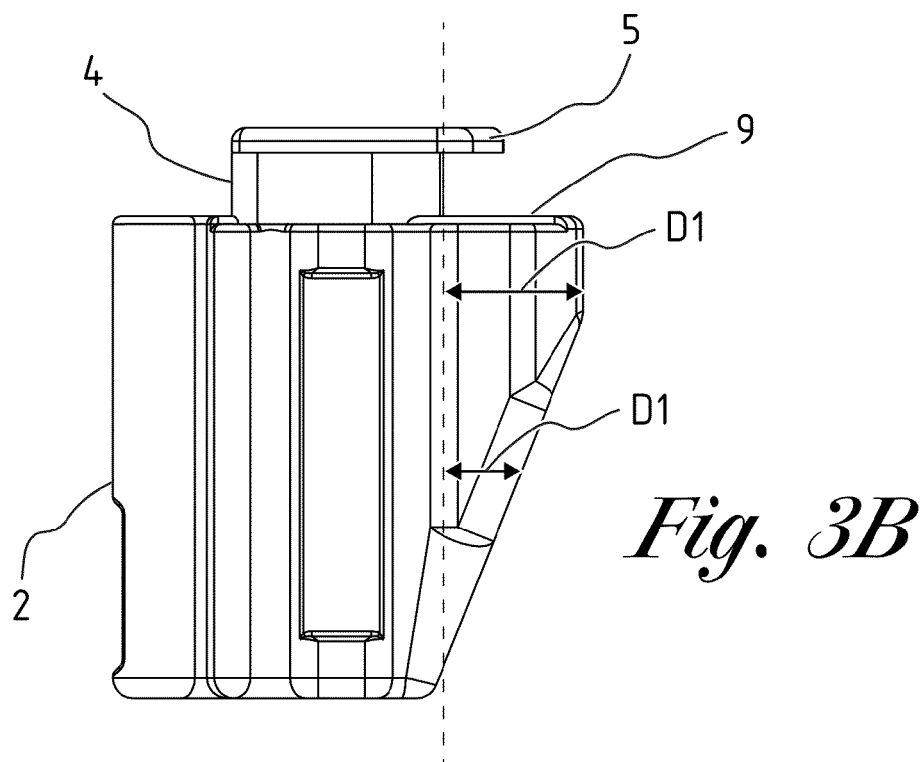
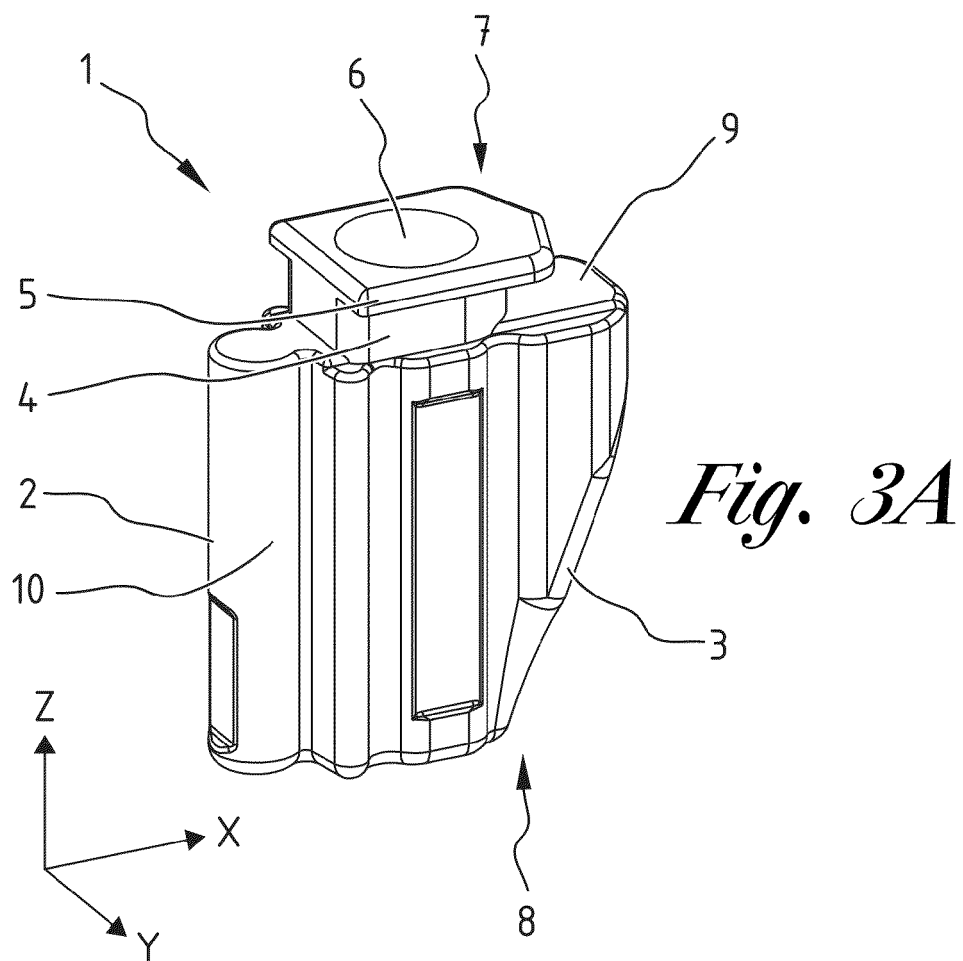


Fig. 2B



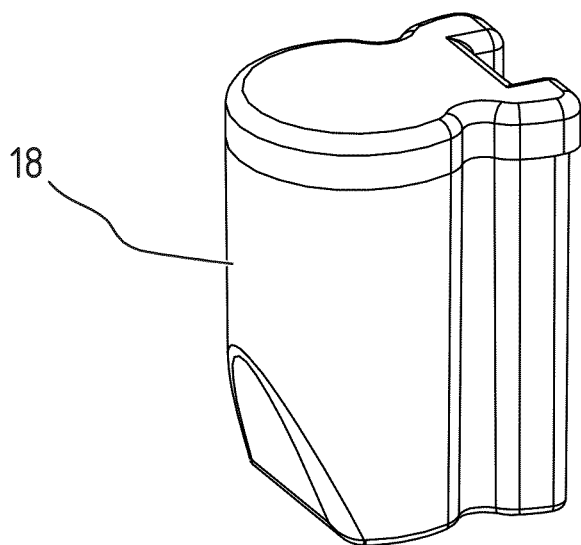


Fig. 4A

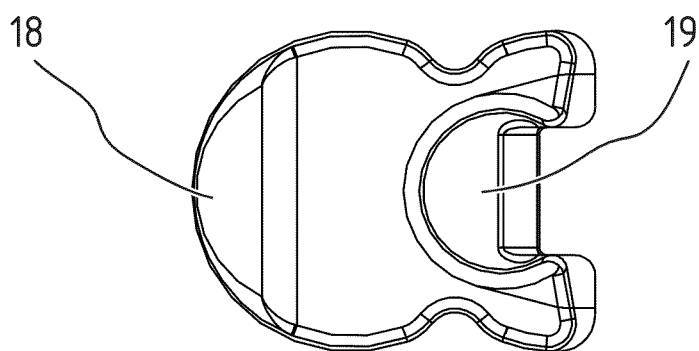


Fig. 4B

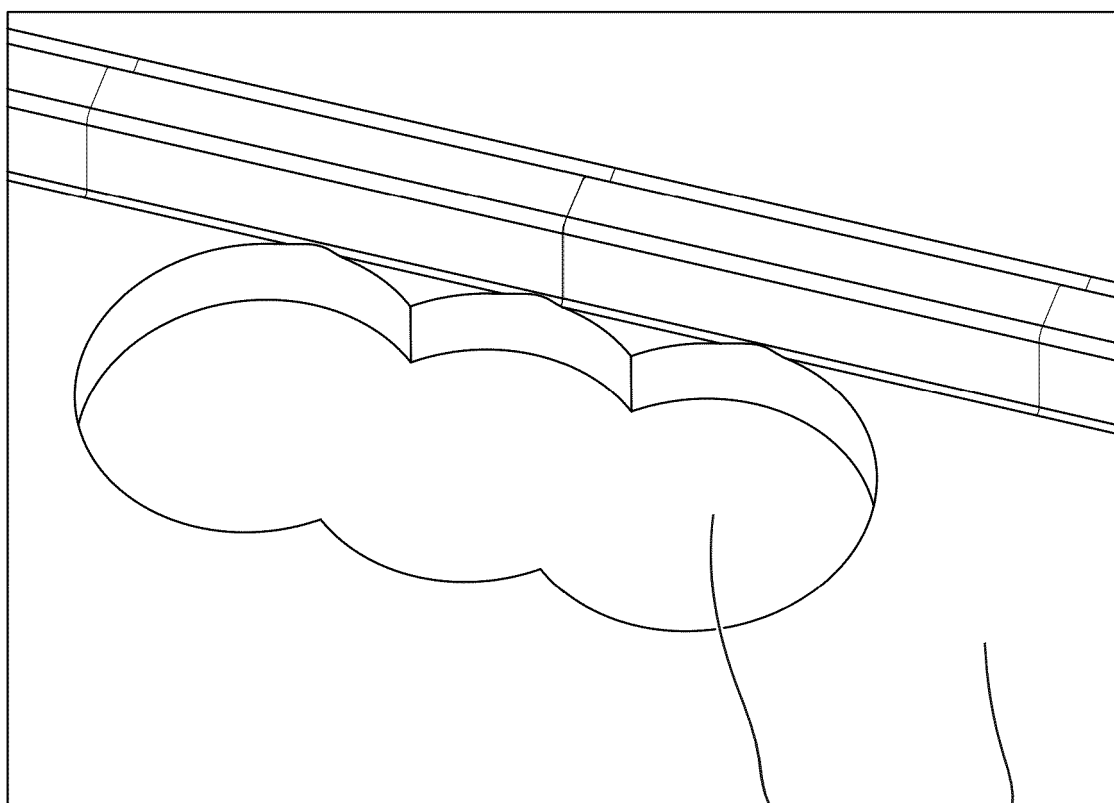


Fig. 5

15

12

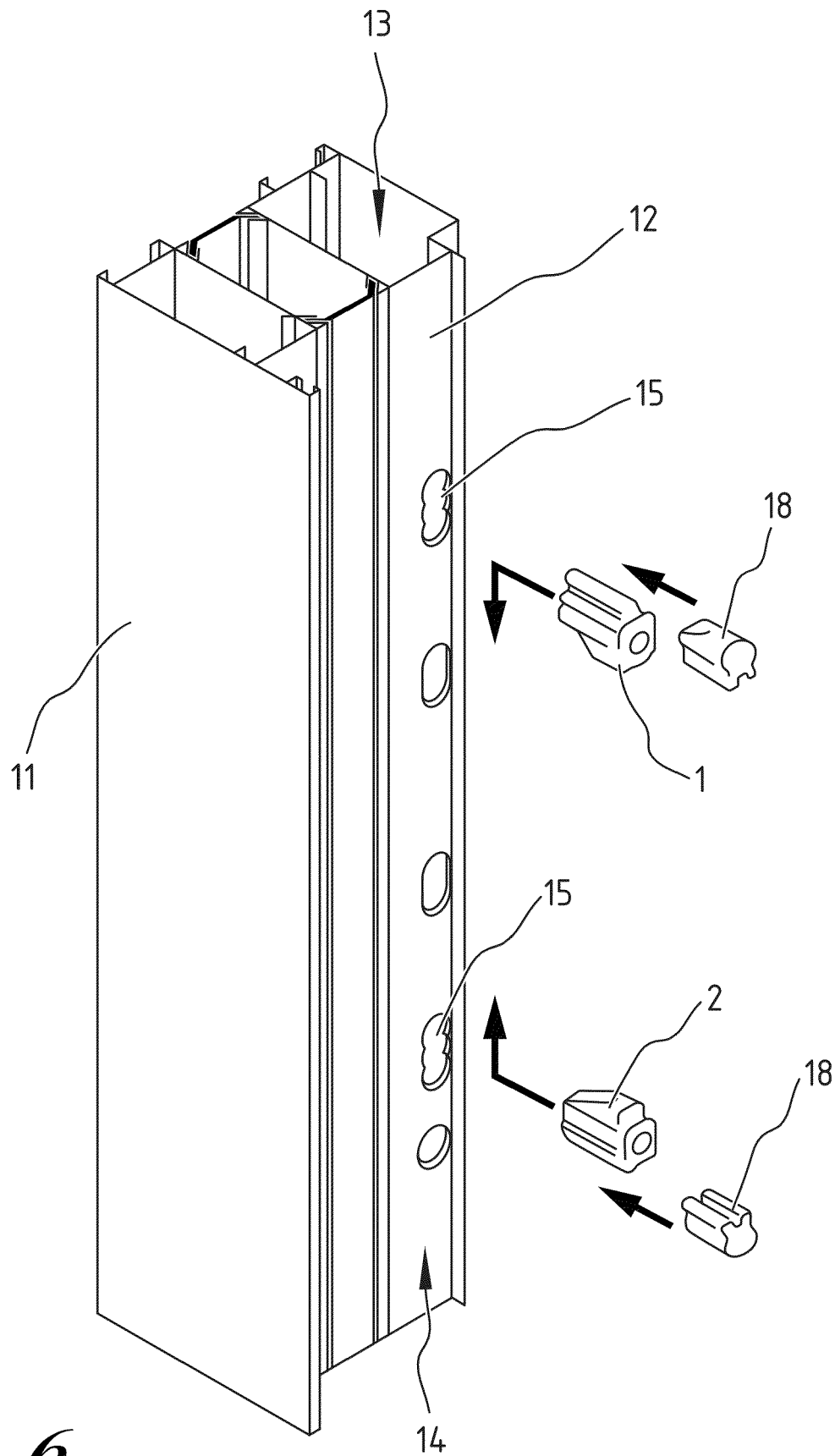


Fig. 6



EUROPEAN SEARCH REPORT

Application Number

EP 26 15 7739

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 248 975 A1 (VAN PARYS REMI EMIEL [BE]) 10 November 2010 (2010-11-10) * paragraphs [0035] - [0060], [0079] - [0092]; figures 1-8, 17-21 * -----	1-7	INV. E05D5/02
			TECHNICAL FIELDS SEARCHED (IPC)
			E05D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		14 July 2026	Klemke, Beate
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P24C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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14-07-2026

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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