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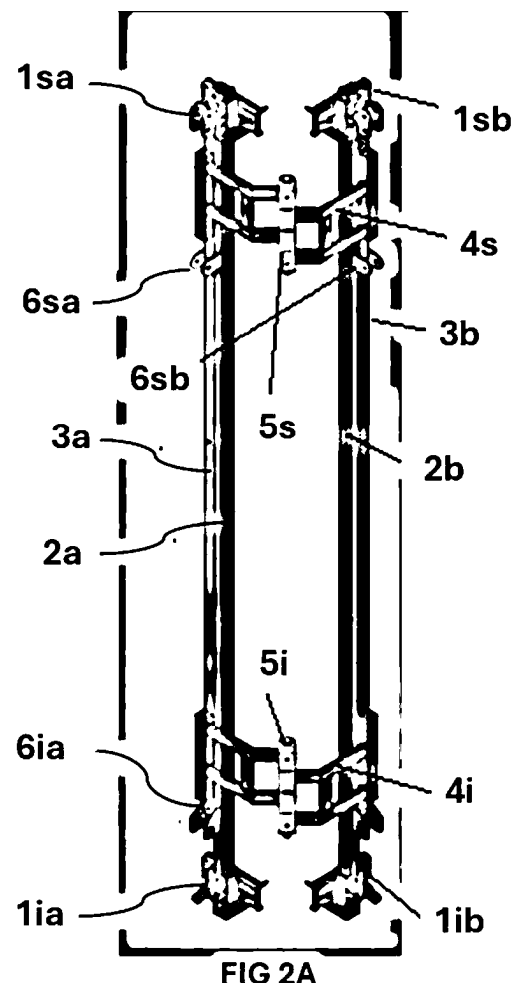
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(54) **VARIABLE-ANGLE SUPPORT SYSTEM FOR A CORNER REGION DEFINED BY CONVERGING VERTICAL WALL PORTIONS OF A BUILDING**

(57) A variable-angle support system for a corner region defined by converging vertical wall portions of a building is disclosed. The system comprises first and second lower anchoring elements (1ia, 1ib), first and second upper anchoring elements (1sa, 1sb), and a post assembly (PE) comprising first and second guide profiles (2a, 2b) and first and second telescopic profiles (3a, 3b) movable along the respective guide profiles (2a, 2b). The post assembly (PE) further comprises a lower articulated assembly (4i) having first and second arms (41i, 42i) connected to lower connection portions (6ia, 6ib) of the first and second telescopic profiles (3a, 3b) and pivotally connected by a lower pivoting connector (5i), and an upper articulated assembly (4s) having first and second arms (41s, 42s) connected to upper connection portions (6sa, 6sb) of the first and second telescopic profiles (3a, 3b) and pivotally connected by an upper pivoting connector (5s). The articulated arrangement allows accommodation of corner regions having different angles.



Description

TECHNICAL FIELD

[0001] The present invention relates to temporary support and access structures for use in building construction. More particularly, the invention relates to a system (or a variable-angle corner platform system) configured to be installed at junctions of converging vertical wall portions of a building, for connecting lateral perimeter platforms and providing a structurally supported corner working and transit platform. The invention is primarily, though not exclusively, directed to high-rise building construction.

PRIOR ART

[0002] In high-rise building construction, temporary perimeter structures such as working platforms, transit platforms, scaffolding systems, guardrail arrangements and collective fall-protection systems are commonly installed along the exterior of the vertical wall portions of a building. These systems are typically anchored or tied to the building structure by means of fixing elements such as anchor bolts with wire or steel cable, and are of critical importance for worker safety, given that such systems are subjected to external loads including point loads, distributed loads, compression, tension, buckling, wind and seismic forces, among others.

[0003] Such perimeter systems are generally installed along substantially planar facade regions and may provide suitable support, access and protection along the sides of a building. However, at corner regions - that is, at junctions where two or more vertical wall portions converge - conventional perimeter platform systems typically leave the corner uncovered, without a platform or dedicated structural solution. In practice, the corners or regions at the intersection of the vertical wall portions of the building remain unresolved.

[0004] Certain known arrangements attempt to bridge the gap at corner regions by connecting the bodies of adjacent perpendicular scaffolding sections using planks, trays, or similar auxiliary elements. However, such solutions are improvised, lack structural integration with the perimeter system, and do not constitute a purpose-designed corner platform system. They differ fundamentally from a dedicated, structurally integrated corner solution.

[0005] In addition, known climbing or self-climbing perimeter systems - commonly referred to in construction practice as climbing platforms or "trepas" - present specific shortcomings at corner regions. Such climbing systems typically require cranes for vertical relocation, do not provide an exit or access point at the corner zone of the building, and normally only provide a single point of access from the system to the building slab. Furthermore, the support of such climbing systems is

often combined with the formwork of the advancing slab by means of provisional supplementary elements of limited structural reliability, and the available platform width is restricted. When a climbing system needs to be raised to the next floor level, the platform must be removed, temporarily leaving workers without an exit or safe transit route through the corner region.

[0006] Known arrangements may also be limited to specific angular configurations, typically right-angle corners, and may not be readily adaptable to building geometries involving non-right-angle junctions between converging vertical wall portions. This limits their applicability to buildings of conventional rectangular plan.

[0007] Accordingly, there remains a need for a corner platform system specifically configured to be installed at junctions of converging vertical wall portions, capable of accommodating different corner angles - including both right-angle and non-right-angle configurations - connecting lateral perimeter platforms, and providing structurally supported continuity of working and transit surfaces through the corner region. There is a further need for such a system to be demountable and reusable, to be of simple construction, to not permanently affect the building structure, and to provide a safe, purpose-designed solution that avoids the risks of detachment, disengagement and falls associated with improvised corner arrangements.

SUMMARY OF THE INVENTION

[0008] The present invention relates to a variable-angle support system for a corner region defined by converging vertical wall portions of a building. The system is particularly suitable for use in construction, especially in high-rise construction, where safe support arrangements are required at corner regions between converging vertical wall portions. In some embodiments, the system may cooperate with one or more lateral structures configured to support respective lateral platforms extending along the converging vertical wall portions.

[0009] According to a first aspect of the invention, there is provided a variable-angle support system for a corner region defined by converging vertical wall portions of a building, the system comprising a first lower anchoring element and a second lower anchoring element respectively configured to be anchored to first and second vertical wall portions of the building, and a first upper anchoring element and a second upper anchoring element respectively configured to be anchored to the first and second vertical wall portions of the building. The system further comprises a post assembly (or composite post, or composed post) comprising a first guide profile configured to be connected to the first lower anchoring element and to the first upper anchoring element, and a second guide profile configured to be connected to the second lower anchoring element and to the second upper anchoring element.

[0010] The post assembly further comprises a first

telescopic profile configured to be movable along the first guide profile, and a second telescopic profile configured to be movable along the second guide profile. In other words, each telescopic profile may be slidably connected to the respective guide profile such that the telescopic profile is movable along the respective guide profile, wherein each telescopic profile may be configured to be attached in a predetermined position with respect to the respective guide profile.

[0011] The post assembly further comprises a lower articulated assembly (or lower articulation) comprising a first arm and a second arm, wherein the first arm is configured to be connected to a lower connection portion of the first telescopic profile and the second arm is configured to be connected to a lower connection portion of the second telescopic profile, and wherein the first and second arms are configured to be pivotally connected to each other by a lower pivoting connector (or lower pivot). The post assembly further comprises an upper articulated assembly (or upper articulation) comprising a first arm and a second arm, wherein the first arm is configured to be connected to an upper connection portion of the first telescopic profile and the second arm is configured to be connected to an upper connection portion of the second telescopic profile, and wherein the first and second arms are configured to be pivotally connected to each other by an upper pivoting connector (also referred to as upper pivot).

[0012] The articulated arrangement of the lower articulated assembly and the upper articulated assembly may allow the system to accommodate different angular relationships between converging vertical wall portions, thereby allowing use of the system at corner regions having different angles.

[0013] In some embodiments, the lower connection portions of the first and second telescopic profiles may comprise lower engagement ears, and the upper connection portions of the first and second telescopic profiles may comprise upper engagement ears. The engagement ears may provide connection locations for further structural members of the system. In some embodiments, one or more engagement ears may comprise plural ears, for example at least one pair of substantially parallel ears. In some embodiments, one or more upper connection portions may comprise two pairs of engagement ears spaced apart in a vertical direction.

[0014] In some embodiments, the first and second arms of the lower articulated assembly and/or the first and second arms of the upper articulated assembly may each be configured as a curved or angular bracket. In some embodiments, the arms of the lower articulated assembly and/or the arms of the upper articulated assembly may be articulately connected to the respective connection portions of the first and second telescopic profiles (e.g. by means of respective additional pivoting connectors).

[0015] In some embodiments, the system may further

comprise a first lower support member (also referred to as lower horizontal member) comprising a first end configured to be connected to the lower engagement ears of the lower connection portion of the first telescopic profile, and a second lower support member (also referred to as lower horizontal member) comprising a first end configured to be connected to the lower engagement ears of the lower connection portion of the second telescopic profile. The first and second lower support members may extend transversally from the respective telescopic profiles. In some embodiments, the first and second lower support members may be configured as horizontal lower support members (e.g. arranged perpendicularly to the respective telescopic profile).

[0016] In some embodiments, the system may further comprise a first upper support member (also referred to as upper triangular member when configured as a triangular structure) and a second upper support member (also referred to as upper triangular member when configured as a triangular structure). The first upper support member may comprise a first end portion configured to be connected to the upper connection portion (e.g. to the upper engagement ears) of the first telescopic profile and a distally arranged second end portion, and the second upper support member may comprise a first end portion configured to be connected to the upper connection portion (e.g. to the respective upper engagement ears) of the second telescopic profile and a distally arranged second end portion. The first and second upper support members may be configured to support a corner platform. In some embodiments, the corner platform may form part of the system. In other embodiments, the system according to the first aspect may be provided without the corner platform, while still comprising structural features configured (i.e. the first and second upper support members) to receive and support such a corner platform in use.

[0017] In some embodiments, each of the first and second upper support members may be configured as a triangular structure. In some embodiments, the first end portion of each upper support member may define (or may be arranged as) a side of the respective triangular structure. In some embodiments, the triangular structure may have the form of a right-angled triangle. Unless technically incompatible, structural and configurational features described herein in relation to the first upper support member and/or the second upper support member may likewise apply to a central upper support member, and vice versa. In some embodiments, for each of the first and second telescopic profiles, the respective upper engagement ears of the respective upper connection portions may comprise two pairs of engagement ears vertically spaced apart and configured for connecting thereto the first end portion of the respective upper support member.

[0018] In some embodiments, the system may further comprise a first lateral guide profile configured to be connected to a second end of the first lower support

member and to the second end portion of the first upper support member, and a second lateral guide profile configured to be connected to a second end of the second lower support member and to the second end portion of the second upper support member. In some embodiments, the system may further comprise a first lateral telescopic profile configured to be received in the first lateral guide profile and a second lateral telescopic profile configured to be received in the second lateral guide profile. One or both of the first and second lateral telescopic profiles may be configured for connecting thereto the corner platform and/or for attaching thereto a railing. In some embodiments, the system may further comprise connecting means provided on the first lower support member and the first upper support member, and/or on the second lower support member and the second upper support member, for attaching a lateral support structure configured to support a lateral platform such that, when the corner platform is present, a continuous walkable surface may be provided by the corner platform and the lateral platform.

[0019] In some embodiments, the post assembly may further comprise a central guide profile, wherein the lower pivoting connector and the upper pivoting connector may be connected to the central guide profile such that the central guide profile is articulately connected to the first and second telescopic profiles by means of the lower articulated assembly and the upper articulated assembly. In some embodiments, the central guide profile may comprise a lower connection portion and an upper connection portion. One or both of these connection portions may comprise engagement ears.

[0020] In some embodiments, the system may further comprise a central upper support member (also referred to as central upper triangular member when configured as a triangular structure) comprising a first end portion configured to be connected to the upper engagement ears of the upper connection portion of the central guide profile and a distally arranged second end portion. In some embodiments, the central upper support member may be configured as a triangular structure. In some embodiments, the first end portion of the central upper support member may define a side of the respective triangular structure. In some embodiments, the triangular structure of the central upper support member may have the form of a right-angled triangle. Unless technically incompatible, structural and configurational features described herein in relation to the first and second upper support members may also apply to the central upper support member. In some embodiments, the upper engagement ears of the upper connection portion of the central guide profile may comprise two pairs of engagement ears vertically spaced apart and configured for connecting thereto the first end portion of the central upper support member.

[0021] In some embodiments, the system may further comprise a central lower support member comprising a

first end configured to be connected to the lower connection portion of the central guide profile. In some embodiments, the lower connection portion of the central guide profile may comprise lower engagement ears, and the first end of the central lower support member may be configured to be connected to said lower engagement ears. In some embodiments, the system may further comprise a central lateral guide profile (also referred to as central external guide profile) configured to be connected to a second end of the central lower support member and to the second end portion of the central upper support member, and optionally a central telescopic profile configured to be received in the central lateral guide profile. The central telescopic profile may be configured for connecting thereto the corner platform and/or for attaching thereto a railing.

[0022] In some embodiments, any of the telescopic profiles described herein, including the first telescopic profile, the second telescopic profile and, where present, the central telescopic profile, may be selectively fixable in a plurality of predetermined positions along the respective guide profile with which it cooperates. For this purpose, one or more fixing elements may be provided, for example pins or similar locking elements, for fixing the respective telescopic profile in a selected predetermined position. In some embodiments, one or more lateral telescopic profiles may likewise comprise one or more fixing elements for selectively fixing the position thereof relative to the respective lateral guide profile.

[0023] In some embodiments, the system may further comprise an auxiliary platform supported by the first lower support member and the second lower support member and, when available, the central lower support member. The auxiliary platform may provide an additional support or working level below the corner platform.

[0024] In some embodiments, the system may further comprise at least one lateral structure connected to the system, wherein the lateral structure comprises at least one lateral lower support member and at least one lateral upper support member configured to support a lateral platform. In some embodiments, the lateral structure may further comprise at least one safety railing.

[0025] For the purposes of the present disclosure, the expression "variable-angle" means that the system is suitable for use at corner regions defined by converging vertical wall portions forming different angular relationships, including right-angle and non-right-angle configurations. The expression "corner region" is intended to encompass a curved region, junction region, meeting region, vertex region, or analogous region at which converging vertical wall portions meet, rather than a single geometric point. The term "post assembly" is intended to denote a support structure formed by a plurality of cooperating components and does not require a one-piece or monolithic construction. The ex-

pression "movable along" is intended to encompass slidable, translatable and/or telescopic movement relative to the respective guide profile. The expression "articulately connected" is intended to denote a connection provided through an articulated assembly and permitting relative angular movement between connected components. The term "triangular structure" is intended to denote a support structure having a triangulated configuration and may include, for example, a right-angled triangular configuration. The term "engagement ears" is intended to encompass one or more projecting connection portions configured to receive and/or connect further structural members of the system, and may include plural ears, such as one or more pairs of substantially parallel ears.

[0026] Unless technically incompatible, the optional features and embodiments described herein may be combined with one another in any suitable manner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027]

FIG. 1A is an exploded perspective view of a post assembly PE of a system according to an embodiment of the present disclosure, showing the first and second guide profiles 2a, 2b, the first and second telescopic profiles 3a, 3b, the lower and upper pivoting connectors 5i, 5s, the lower and upper articulated assemblies with their respective arms 41i, 42i, 41s, 42s, and the lower and upper anchoring elements 1ia, 1ib, 1sa, 1sb.

FIG. 1B is an enlarged exploded perspective view of an upper portion of the post assembly according to an embodiment of the invention, showing in detail the upper anchoring elements 1sa, 1sb, the upper connection portions 6sa, 6sb of the first and second telescopic profiles 3a, 3b, the arms 41s, 42s of the upper articulated assembly, and the upper pivoting connector 5s.

FIG. 1C is an enlarged exploded perspective view of the upper articulated assembly according to an embodiment of the invention, showing in detail the connection between the arms 41s, 42s, the upper connection portions 6sa, 6sb and the upper pivoting connector 5s.

FIG. 2A is a perspective view of an assembled post assembly PE according to an embodiment of the invention.

FIG. 2B is an enlarged perspective view of an upper portion of an assembled post assembly PE according to an embodiment of the invention, showing in detail the arms 41s, 42s of the upper articulated assembly 4s, the upper connection por-

tions 6sa, 6sb of the first and second telescopic profiles 3a, 3b, and the upper pivoting connector 5s.

FIG. 2C is an enlarged perspective view of an upper portion of an assembled post assembly PE according to an embodiment of the invention, showing the upper articulated assembly 4s, the upper pivoting connector 5s, and the central guide profile 8c connected to the upper pivoting connector 5s.

FIG. 3 is a perspective view of a system according to an embodiment of the invention.

FIG. 4 is a perspective view of a system according to an embodiment of the invention.

FIG. 5 is a perspective view of a system according to an embodiment of the invention shown in an installation context.

FIG. 6 is a perspective view of a multi-level installation according to an embodiment of the invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[0028] Reference will now be made to embodiments of the invention illustrated in the accompanying drawings. The same reference numerals designate the same or corresponding elements throughout the drawings. The embodiments are described by way of example and are not intended to limit the invention to the exact forms illustrated. Unless the context requires otherwise, terms such as lower, upper, central, lateral, inner and outer are used with reference to the orientation shown in the drawings and are not to be construed as limiting beyond the relationships expressly described.

[0029] The present invention relates to a variable-angle support system for a corner region defined by converging vertical wall portions of a building. The system is particularly suitable for use in construction, especially in high-rise construction, where safe support arrangements may be required at corner regions between converging vertical wall portions. In some embodiments, the system may cooperate with one or more lateral structures configured to support respective lateral platforms extending along the converging vertical wall portions.

[0030] With reference initially to FIGS. 1A to 2C, a variable-angle support system according to an embodiment of the invention comprises a first lower anchoring element 1ia and a second lower anchoring element 1ib, respectively configured to be anchored to first and second vertical wall portions of a building, and a first upper anchoring element 1sa and a second upper anchoring element 1sb, respectively configured to be anchored to

the first and second vertical wall portions of the building. The system further comprises a post assembly PE comprising a first guide profile 2a configured to be connected to the first lower anchoring element 1ia and to the first upper anchoring element 1sa, and a second guide profile 2b configured to be connected to the second lower anchoring element 1ib and to the second upper anchoring element 1sb.

[0031] The post assembly PE further comprises a first telescopic profile 3a configured to be movable along the first guide profile 2a, and a second telescopic profile 3b configured to be movable along the second guide profile 2b. In the illustrated embodiments, the first telescopic profile 3a and the second telescopic profile 3b are slidably connected to the respective guide profiles 2a, 2b such that they are movable along the respective guide profiles. In some embodiments, one or both of the first telescopic profile 3a and the second telescopic profile 3b may be selectively fixable in a plurality of predetermined positions with respect to the respective guide profile 2a, 2b, for example by one or more fixing elements not separately shown.

[0032] The post assembly PE further comprises a lower articulated assembly 4i comprising a first arm 41i and a second arm 42i, wherein the first arm 41i is configured to be connected to a lower connection portion 6ia of the first telescopic profile 3a and the second arm 42i is configured to be connected to a lower connection portion 6ib of the second telescopic profile 3b, and wherein the first and second arms 41i, 42i are configured to be pivotally connected to each other by a lower pivoting connector 5i. The post assembly PE further comprises an upper articulated assembly 4s comprising a first arm 41s and a second arm 42s, wherein the first arm 41s is configured to be connected to an upper connection portion 6sa of the first telescopic profile 3a and the second arm 42s is configured to be connected to an upper connection portion 6sb of the second telescopic profile 3b, and wherein the first and second arms 41s, 42s are configured to be pivotally connected to each other by an upper pivoting connector 5s.

[0033] As illustrated in FIGS. 1A to 1C, each of the first arm 41i and the second arm 42i of the lower articulated assembly 4i may be configured as a respective curved or angular bracket, and each of the first arm 41s and the second arm 42s of the upper articulated assembly 4s may be configured as a respective curved or angular bracket. In some embodiments, the first arm 41i and the second arm 42i may be articulately connected to the lower connection portions 6ia, 6ib of the first and second telescopic profiles 3a, 3b respectively, and the first arm 41s and the second arm 42s may be articulately connected to the upper connection portions 6sa, 6sb of the first and second telescopic profiles 3a, 3b respectively. Thus, in some embodiments, the lower articulated assembly 4i and the upper articulated assembly 4s may each permit relative angular movement both at the respective pivoting connector 5i, 5s and at

the respective connections to the connection portions 6ia, 6ib, 6sa, 6sb.

[0034] The articulated arrangement of the lower articulated assembly 4i and the upper articulated assembly 4s may allow the system to accommodate different angular relationships between converging vertical wall portions, thereby allowing use of the system at corner regions having different angles, including right-angle and non-right-angle configurations.

[0035] As shown, for example, in FIGS. 1B, the lower connection portion 6ia of the first telescopic profile 3a may comprise lower engagement ears 15a, the lower connection portion 6ib of the second telescopic profile 3b may comprise lower engagement ears 15b, the upper connection portion 6sa of the first telescopic profile 3a may comprise upper engagement ears 14a, and the upper connection portion 6sb of the second telescopic profile 3b may comprise upper engagement ears 14b. The engagement ears 15a, 15b, 14a, 14b (these elements are also visible in other figures but not identified) may provide connection locations for further structural members of the system. In some embodiments, one or more of the engagement ears 15a, 15b, 14a, 14b may comprise plural ears, for example one or more pairs of substantially parallel ears.

[0036] In the embodiment illustrated in FIG. 1C, the first arm 41s and the second arm 42s of the upper articulated assembly 4s may be fixedly connected to the respective upper connection portions 6sa, 6sb of the first and second telescopic profiles 3a, 3b. In such embodiments, the angular adaptability of the upper articulated assembly 4s may be provided by the upper pivoting connector 5s.

[0037] With reference now mainly to FIGS. 3 and 4, the system may further comprise a first lower support member 7a comprising a first end 71a configured to be connected to the lower engagement ears 15a of the lower connection portion 6ia of the first telescopic profile 3a, and a second lower support member 7b comprising a first end 71b configured to be connected to the lower engagement ears 15b of the lower connection portion 6ib of the second telescopic profile 3b. The first and second lower support members 7a, 7b may extend transversally from the respective telescopic profiles 3a, 3b. In some embodiments, the first and second lower support members 7a, 7b may be configured as horizontal lower support members.

[0038] The system may further comprise a first upper support member 9a and a second upper support member 9b for supporting a corner platform 11. The first upper support member 9a may comprise a first end portion 91a configured to be connected to the upper engagement ears 14a of the upper connection portion 6sa of the first telescopic profile 3a and a distally arranged second end portion 92a. The second upper support member 9b may comprise a first end portion 91b configured to be connected to the upper engagement ears 14b of the upper connection portion 6sb of

the second telescopic profile 3b and a distally arranged second end portion 92b.

[0039] In some embodiments, each of the first upper support member 9a and the second upper support member 9b may be configured as a triangular structure. In some embodiments, the first end portion 91a, 91b of each upper support member may define a side of the respective triangular structure. In some embodiments, the triangular structure may have the form of a right-angled triangle.

[0040] As shown, for example, in FIGS. 1B, 1C, 2B, 2C, 3 and 4, for each of the first and second telescopic profiles 3a, 3b, the respective upper engagement ears 14a, 14b of the respective upper connection portions 6sa, 6sb may comprise two pairs of engagement ears vertically spaced apart and configured for connecting thereto the first end portion 91a, 91b of the respective upper support member 9a, 9b.

[0041] The corner platform 11 may form part of the system. In other embodiments, the system may be provided without the corner platform 11 while still comprising structural features configured to receive and support such a corner platform in use. Thus, where the drawings illustrate a corner platform 11, this should not be interpreted as meaning that the corner platform 11 is necessarily present in all embodiments of the first aspect of the invention.

[0042] As further shown in FIGS. 3 and 4, the system may further comprise a first lateral guide profile 8a configured to be connected to a second end 72a of the first lower support member 7a and to the second end portion 92a of the first upper support member 9a, and a second lateral guide profile 8b configured to be connected to a second end 72b of the second lower support member 7b and to the second end portion 92b of the second upper support member 9b.

[0043] The system may further comprise a first lateral telescopic profile 10a configured to be received in the first lateral guide profile 8a and a second lateral telescopic profile 10b configured to be received in the second lateral guide profile 8b. In some embodiments, one or both of the first and second lateral telescopic profiles 10a, 10b may be configured for connecting thereto the corner platform 11 and/or for attaching thereto a railing 13. In some embodiments, one or more fixing elements 12, for example one or more pins, may selectively fix the position of the first lateral telescopic profile 10a and/or the second lateral telescopic profile 10b relative to the respective first and second lateral guide profiles 8a, 8b.

[0044] As represented in FIGS. 5 and 6, the first lower support member 7a and the first upper support member 9a may respectively comprise connecting means, not separately designated, for attaching a lateral support structure configured to support a lateral platform W such that, when the corner platform 11 is arranged onto the first and second upper support members 9a, 9b, a continuous walkable surface is provided by the corner

platform 11 and the lateral platform W. Additionally or alternatively, the second lower support member 7b and the second upper support member 9b may respectively comprise connecting means, likewise not separately designated, for attaching a lateral support structure configured to support a lateral platform W such that, when the corner platform 11 is arranged onto the first and second upper support members 9a, 9b, a continuous walkable surface is provided by the corner platform 11 and the lateral platform W.

[0045] With reference in particular to FIGS. 1B, 2C, 3 and 4, the post assembly PE may further comprise a central guide profile 8c, wherein the lower pivoting connector 5i and the upper pivoting connector 5s are configured to be connected to the central guide profile 8c such that the central guide profile 8c is articulately connected to the first and second telescopic profiles 3a, 3b by means of the lower articulated assembly 4i and the upper articulated assembly 4s.

[0046] In some embodiments, the central guide profile 8c may comprise an upper connection portion 6sc comprising upper engagement ears 16c. The system may further comprise a central upper support member 9c comprising a first end portion 91c configured to be connected to the upper engagement ears 16c of the upper connection portion 6sc of the central guide profile 8c and a distally arranged second end portion 92c.

[0047] In some embodiments, the central upper support member 9c may be configured as a triangular structure. In some embodiments, the first end portion 91c of the central upper support member 9c may define a side of the respective triangular structure. In some embodiments, the triangular structure of the central upper support member 9c may have the form of a right-angled triangle. Unless technically incompatible, structural and configurational features described herein in relation to the first and second upper support members 9a, 9b may also apply to the central upper support member 9c.

[0048] As shown, for example, in FIGS. 1B, 2C, 3 and 4, the upper engagement ears 16c of the upper connection portion 6sc of the central guide profile 8c may comprise two pairs of engagement ears vertically spaced apart and configured for connecting thereto the first end portion 91c of the central upper support member 9c.

[0049] In some embodiments, the central guide profile 8c may further comprise a lower connection portion 6ic comprising lower engagement ears 17c, and the system may further comprise a central lower support member 7c comprising a first end 71c configured to be connected to the lower connection portion 6ic of the central guide profile 8c. In some embodiments, the first end 71c of the central lower support member 7c may be connected to the lower engagement ears 17c of the lower connection portion 6ic, as illustrated in FIGS. 1B, 3 and 4.

[0050] As shown particularly in FIGS. 3 and 4, the

system may further comprise a central lateral guide profile 8d configured to be connected to a second end 72c of the central lower support member 7c and to the second end portion 92c of the central upper support member 9c.

[0051] The system may further comprise a central telescopic profile 10c configured to be received in the central lateral guide profile 8d. In some embodiments, the central telescopic profile 10c may be configured for connecting thereto the corner platform 11 and/or for attaching thereto a railing 13. In some embodiments, one or more fixing elements, not separately designated, may selectively fix the position of the central telescopic profile 10c relative to the central lateral guide profile 8d.

[0052] With reference now to FIG. 5, the system is shown in an installation context. The post assembly PE is installed at the corner between converging vertical wall portions of a building. The corner platform 11, when present, may be supported by the first and second upper support members 9a, 9b and positioned by the first and second lateral telescopic profiles 10a, 10b. FIG. 5 further shows that the system may be connected to lateral structures on one or both sides thereof. Each lateral structure may comprise at least one lateral lower support member 7' and at least one lateral upper support member 9' configured to support a lateral platform W. One or more safety railings 13 may extend along the lateral structure and, where present, along the corner platform 11.

[0053] With reference now to FIG. 4 and also to FIG. 5, where present, the central upper support member 9c may further support the corner platform 11 and the central telescopic profile 10c may further position the corner platform 11 in a central outer region thereof.

[0054] With reference finally to FIG. 6, the system is shown in a multi-level installation. In this embodiment, the system may further comprise an auxiliary platform 11' supported by the first lower support member 7a, the second lower support member 7b and, when present, the central lower support member 7c. The auxiliary platform 11' may provide an additional support or working level below the corner platform 11. FIG. 6 also illustrates an example in which the corner platform 11 may be integrated with adjacent lateral platforms W and associated safety railings 13.

[0055] Unless technically incompatible, the embodiments and optional features described herein may be combined with one another in any suitable manner.

EXAMPLES

[0056]

1. A composite variable-angle corner platform system for connecting lateral platforms at junctions of vertical wall portions of any angle in high-rise buildings in a safe manner, wherein the system com-

prises a composite post (post assembly) PE anchored between converging walls of a building by means of lower anchorings (lower anchoring elements) 1i (1ia, 1ib) and upper anchorings (upper anchoring elements) 1s (1sa, 1sb), to which guide profiles 2 (2a, 2b) are fixed, along which telescopic profiles 3 (3a, 3b) are displaced, said telescopic profiles comprising lower engagement ears (lower connection portions) 6i (6ia, 6ib) with a lower articulation (lower articulated assembly) 4i and upper engagement ears (upper connection portions) 6s (6sa, 6sb) with an upper articulation (upper articulated assembly) 4s; the lower articulation 4i is connected by a lower pivot (lower pivoting connector) 5i and the upper articulation 4s is connected by an upper pivot (upper pivoting connector) 5s; the lower and upper pivots 5i, 5s connect a central guide profile 8c to the post assembly PE; the lower engagement ears (lower connection portions) 6i (6ia, 6ib) fix lower horizontal members (lower support members) 7 (7a, 7b) and the upper engagement ears (upper connection portions) 6s (6sa, 6sb) fix upper triangular members (upper support members) 9 (9a, 9b) which support said corner platform 11; the lower horizontal members (lower support members) 7 (7a, 7b) connect lateral guide profiles 8 (8a, 8b) in which lateral telescopic members (lateral telescopic profiles) 10 (10a, 10b) are received, said lateral telescopic members comprising fixing means (fixing elements) 12 such as pins, for fixing or displacing the corner platform 11 at the outer regions thereof.

2. The composite variable-angle corner platform system according to Example 1, wherein the lower and upper articulations (lower and upper articulated assemblies) 4i and 4s, respectively, are each formed by two angular brackets which are connected by said lower pivot (lower pivoting connector) 5i and upper pivot (upper pivoting connector) 5s.

3. The composite variable-angle corner platform system according to Example 1, wherein the central guide profile 8c comprises a lower connection portion 6ic and an upper connection portion 6sc, to which a third lower horizontal member (third lower support member) 7c and a third upper triangular member (third upper support member) 9c are connected respectively, the third lower horizontal member 7c being connected to a third lateral guide profile 8d in which a third lateral telescopic member (third lateral telescopic profile) 10c is received, said third lateral telescopic member 10c and said third upper triangular member 9c being configured to support and fix the corner platform 11 at the outer central region thereof.

4. The composite variable-angle corner platform system according to Example 1, wherein the composite post (post assembly) PE and the whole composite structure thereof support the corner platform 11 and are connected to two structures 5 formed by two lower horizontal members (lower support members) 7 (7a, 7b) and two upper triangular members (upper support members) 9 (9a, 9b) which support trays or walking and working platforms (working platforms W) with guardrails 10 (safety railings) 13 on the sides of the walls of a high-rise building.

Claims

1. A variable-angle support system for a corner region defined by converging vertical wall portions of a building, the system comprising:

a first lower anchoring element (11a) and a second lower anchoring element (11b), respectively configured to be anchored to first and second vertical wall portions of the building;

a first upper anchoring element (11a) and a second upper anchoring element (11b), respectively configured to be anchored to the first and second vertical wall portions of the building;

a post assembly (PE) comprising:

a first guide profile (2a) configured to be connected to the first lower anchoring element (11a) and to the first upper anchoring element (11a);

a second guide profile (2b) configured to be connected to the second lower anchoring element (11b) and to the second upper anchoring element (11b);

a first telescopic profile (3a) configured to be movable along the first guide profile (2a);

a second telescopic profile (3b) configured to be movable along the second guide profile (2b);

a lower articulated assembly (4i) comprising a first arm (41i) and a second arm (42i), wherein the first arm (41i) is configured to be connected to a lower connection portion (6ia) of the first telescopic profile (3a) and the second arm (42i) is configured to be connected to a lower connection portion (6ib) of the second telescopic profile (3b), and wherein the first and second arms (41i, 42i) are configured to be pivotally connected to each other by a lower pivoting connector (5i); and an upper articulated assembly (4s) com-

prising a first arm (41s) and a second arm (42s), wherein the first arm (41s) is configured to be connected to an upper connection portion (6sa) of the first telescopic profile (3a) and the second arm (42s) is configured to be connected to an upper connection portion (6sb) of the second telescopic profile (3b), and wherein the first and second arms (41s, 42s) are configured to be pivotally connected to each other by an upper pivoting connector (5s).

2. The system according to claim 1, wherein each of the first arm (41i) and the second arm (42i) of the lower articulated assembly (4i) is configured as a respective curved or angular bracket; and wherein each of the first arm (41s) and the second arm (42s) of the upper articulated assembly (4s) is configured as a respective curved or angular bracket.

3. The system according to claim 2, wherein: the first arm (41i) of the lower articulated assembly (4i) is configured to be articulately connected to the lower connection portion (6ia) of the first telescopic profile (3a), and the second arm (42i) is configured to be articulately connected to the lower connection portion (6ib) of the second telescopic profile (3b); and the first arm (41s) of the upper articulated assembly (4s) is configured to be articulately connected to the upper connection portion (6sa) of the first telescopic profile (3a), and the second arm (42s) is configured to be articulately connected to an upper connection portion (6sb) of the second telescopic profile (3b).

4. The system according to any of the preceding claims, wherein the lower connection portion (6ia) of the first telescopic profile (3a) comprises lower engagement ears (15a), the lower connection portion (6ib) of the second telescopic profile (3b) comprises lower engagement ears (15b), the upper connection portion (6sa) of the first telescopic profile (3a) comprises upper engagement ears (14a), and the upper connection portion (6sb) of the second telescopic profile (3b) comprises upper engagement ears (14b).

5. The system according to claim 4, further comprising a first lower support member (7a) comprising a first end (71a) configured to be connected to the lower engagement ears (15a) of the lower connection portion (6ia) of the first telescopic profile (3a), and a second lower support member (7b) comprising a first end (71b) configured to be connected to the lower engagement ears (15b) of the lower connection portion (6ib) of the second telescopic profile (3b), wherein preferably: the first (7a) and second (7b) lower support members are configured to

extend transversally from the respective telescopic profile (3a, 3b), and/or the first (7a) and second (7b) lower support members are configured as horizontal lower support members.

6. The system according to claim 4 or 5, further comprising a first upper support member (9a) and a second upper support member (9b) for supporting a corner platform (11), the first upper support member (9a) comprising: a first end portion (91a), configured to be connected to the upper engagement ears (14a) of the upper connection portion (6sa) of the first telescopic profile (3a), and a distally arranged second end portion (92a); and the second upper support member (9b) comprising a first end portion (91b), configured to be connected to the upper engagement ears (14b) of the upper connection portion (6sb) of the second telescopic profile (3b), and a distally arranged second end portion (92b), wherein each of the first (9a) and second (9b) upper support members is configured as a triangular structure, wherein preferably the respective first end portion (91a, 91b) is configured as a side of the respective triangular structure.
7. The system according to claim 6, for each of the first (3a) and second (3b) telescopic profiles, the respective upper engagement ears (14a, 14b) of the respective upper connection portions (6sa, 6sb) comprise two pairs of engagement ears (14a, 14b) vertically spaced apart and configured for connecting thereto the first end portion (91a, 91b) of the respective upper support member (9a, 9b).
8. The system according to claim 5 and any of claims 6 or 7, further comprising: a first lateral guide profile (8a) configured to be connected to a second end (72a) of the first lower support member (7a) and to the second end portion (92a) of the first upper support member (9a); and a second lateral guide profile (8b) configured to be connected to a second end (72b) of the second lower support member (7b) and to the second end portion (92b) of the second upper support member (9b).
9. The system according to claim 8, further comprising a first lateral telescopic profile (10a) configured to be received in the first lateral guide profile (8a), and a second lateral telescopic profile (10b) configured to be received in the second lateral guide profile (8b), wherein preferably each of the first (10a) and second (10b) lateral telescopic profiles is configured to be connected to the corner platform (11) and/or for attaching thereto a railing (13).
10. The system according to claim 5 and any of claims 6 to 9, wherein:

the first lower support member (7a) and the first upper support member (9a) respectively comprise connecting means for attaching a lateral support structure configured to support a lateral platform (W) such that, when a corner platform (11) is arranged onto the first (9a) and second (9b) upper support members, a continuous walkable surface is provided by the corner platform (11) and the lateral platform (W); and/or

the second lower support member (7b) and the second upper support member (9b) respectively comprise connecting means for attaching a lateral support structure configured to support a lateral platform (W) such that, when a corner platform (11) is arranged onto the first (9a) and second (9b) upper support members, a continuous walkable surface is provided by the corner platform (11) and the lateral platform (W).

11. The system according to any of the preceding claims, wherein the post assembly (PE) further comprises a central guide profile (8c), wherein the lower pivoting connector (5i) and the upper pivoting connector (5s) are configured to be connected to the central guide profile (8c) such that the central guide profile (8c) is articulately connected to the first (3a) and second (3b) telescopic profiles by means of the lower articulated assembly (4i) and the upper articulated assembly (4s).

12. The system according to claim 11, wherein the central guide profile (8c) further comprises:

an upper connection portion (6sc) comprising upper engagement ears (16c); and
a central upper support member (9c) comprising a first end portion (91c) configured to be connected to the upper engagement ears (16c) of the upper connection portion (6sc) of the central guide profile (8c) and a distally arranged second end portion (92c), wherein the central upper support member (9c) is configured as a triangular structure;
wherein preferably: the first end portion (91c) of the central upper support member (9c) is configured as a side of the respective triangular structure; and/or the upper engagement ears (16c) comprise two pairs of engagement ears (16c) vertically spaced apart and configured for connecting thereto the first end portion (91c) of the central upper support member (9c).

13. The system according to claim 11 or 12, wherein the central guide profile (8c) further comprises:

a lower connection portion (6ic), comprising
lower engagement ears (17c); and
a central lower support member (7c) compris-
ing a first end (71c) configured to be con-
nected to the lower connection portion (6ic) of 5
the central guide profile (8c).

14. The system according to claims 12 and 13, further
comprising a central lateral guide profile (8d) con-
figured to be connected to a second end (72c) of 10
the central lower support member (7c) and to the
second end portion (92c) of the central upper sup-
port member (9c).

15. The system according to claim 14, further compris- 15
ing a central telescopic profile (10c) configured to
be received in the central lateral guide profile (8d),
wherein preferably the central telescopic profile
(10c) is configured for connecting thereto a corner 20
platform (11) and/or for attaching thereto a railing
(13).

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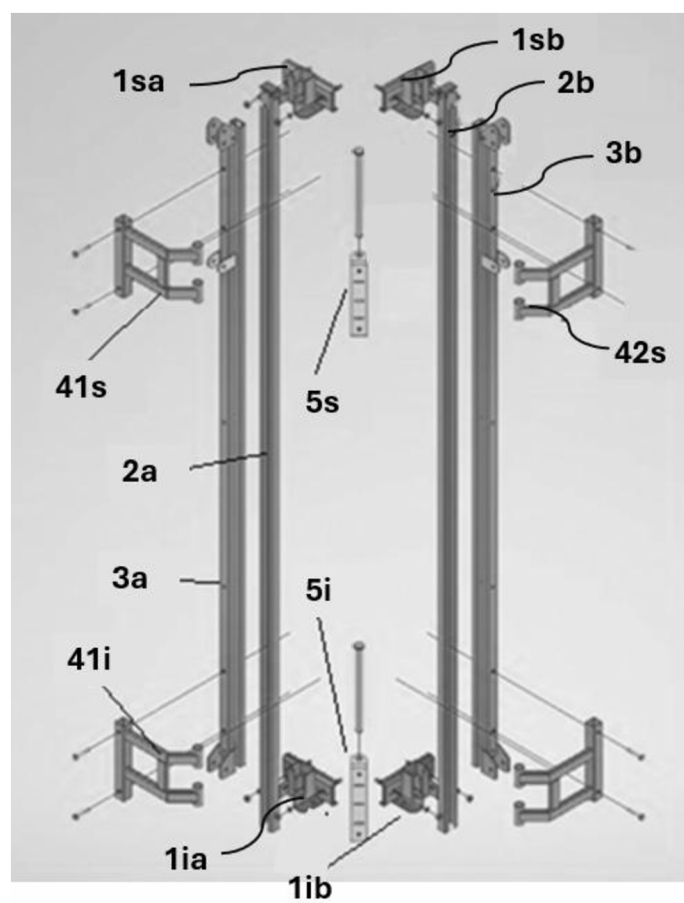
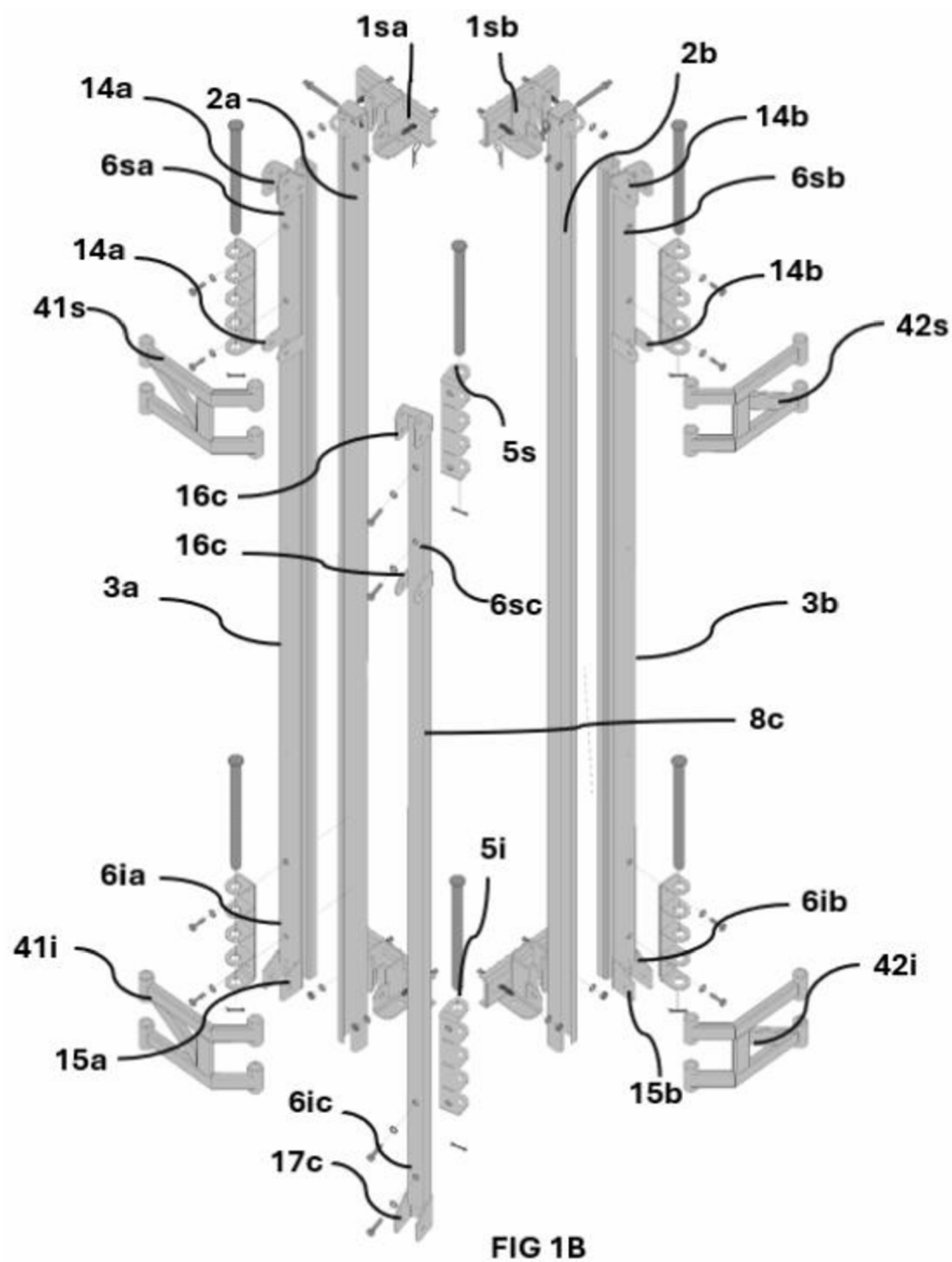


FIG 1A



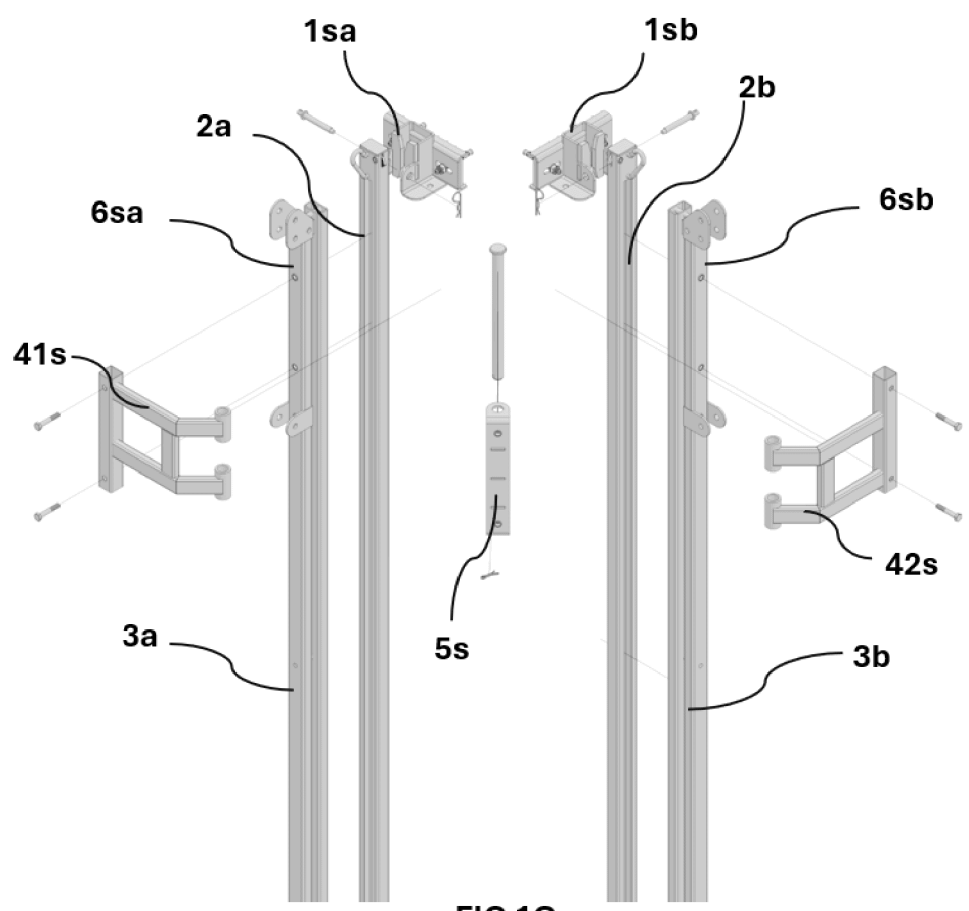
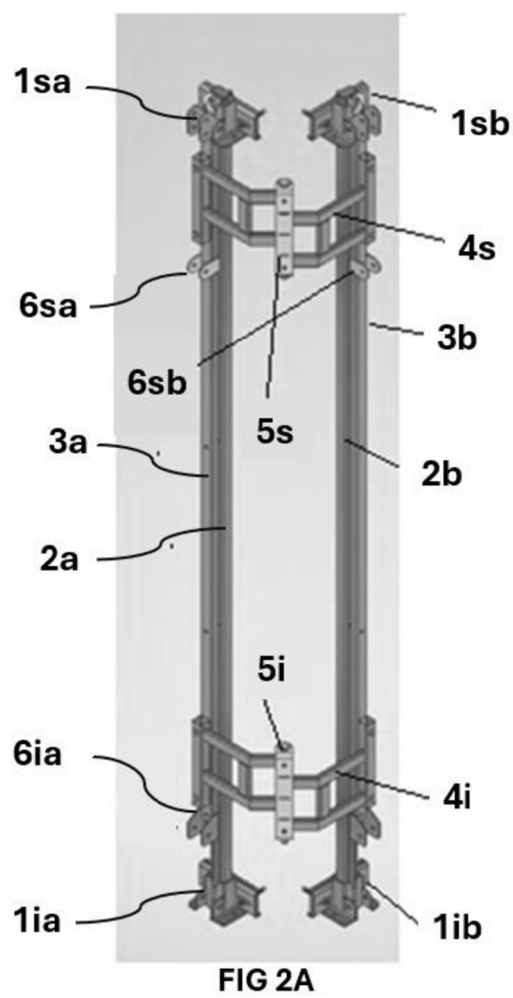


FIG 1C



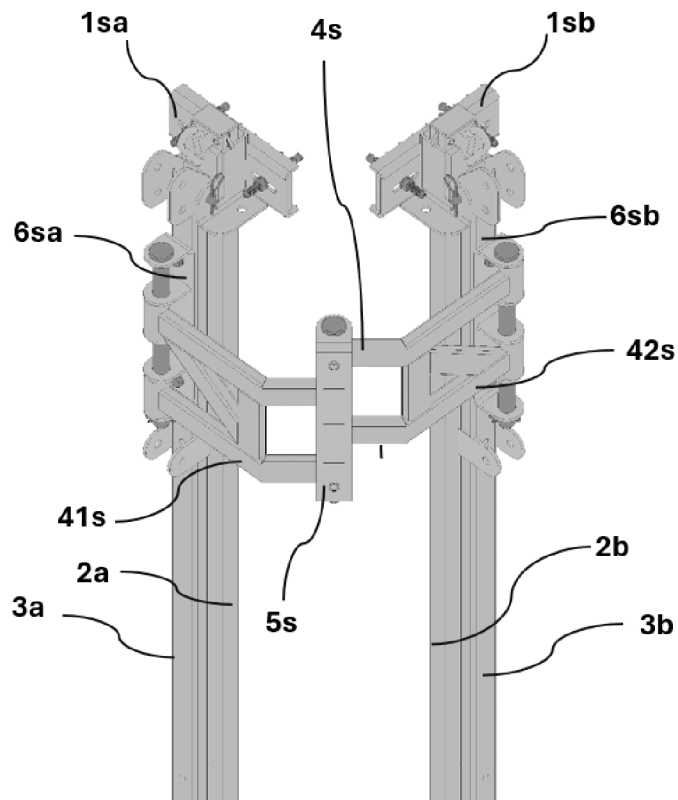


FIG 2B

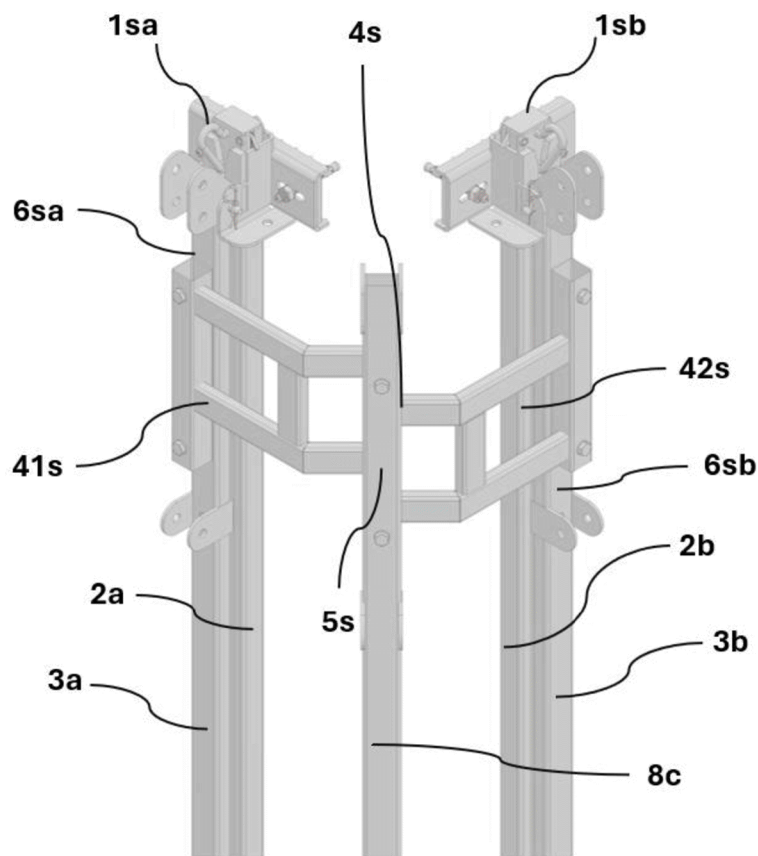


FIG 2C

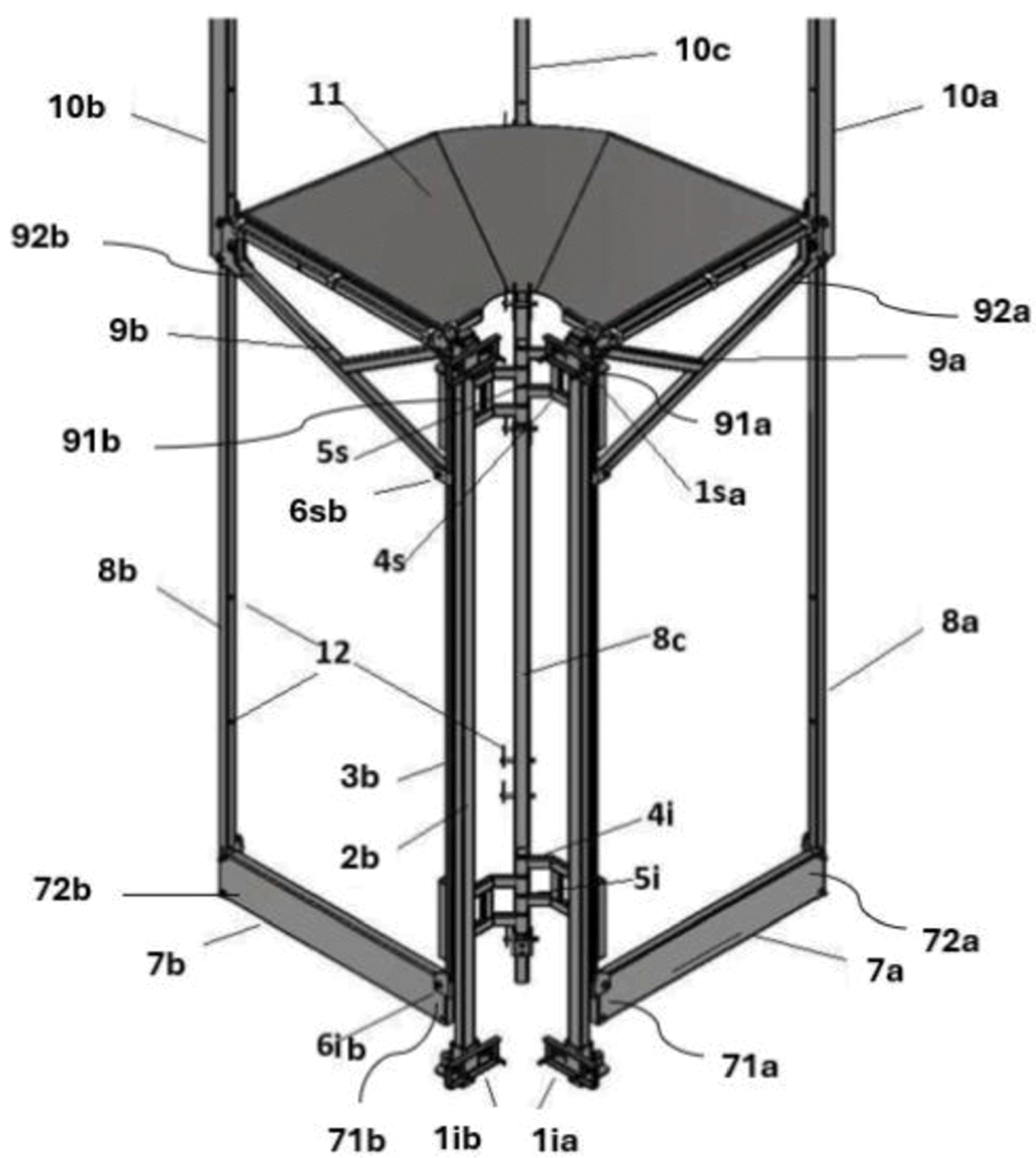


FIG 3

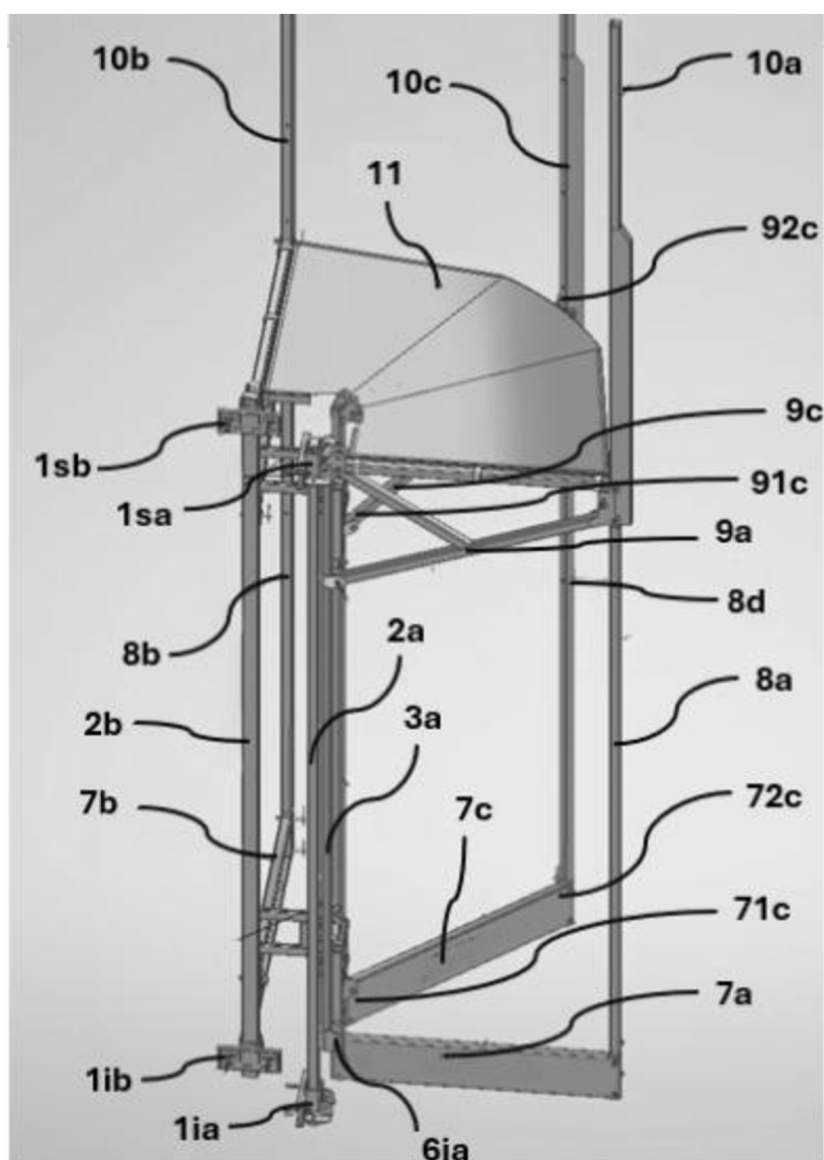
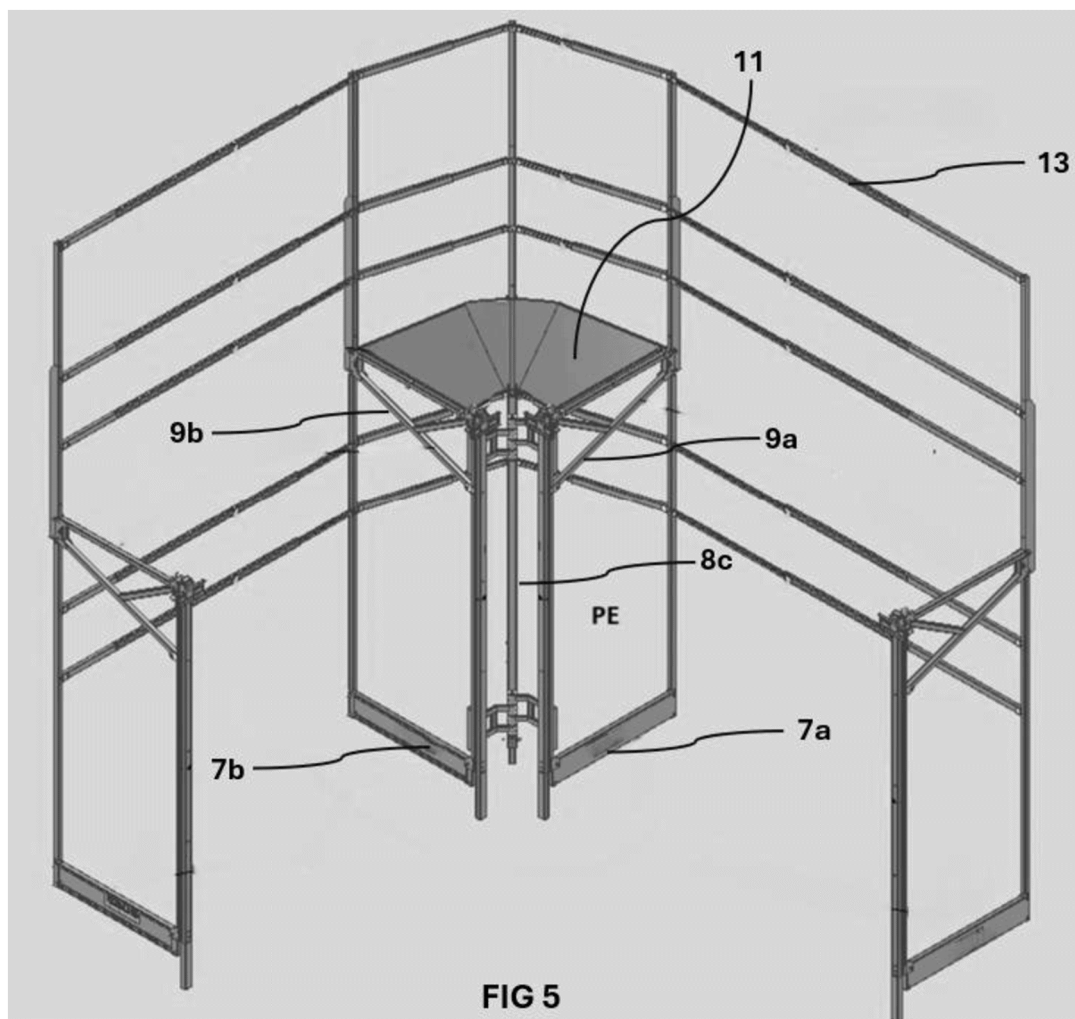
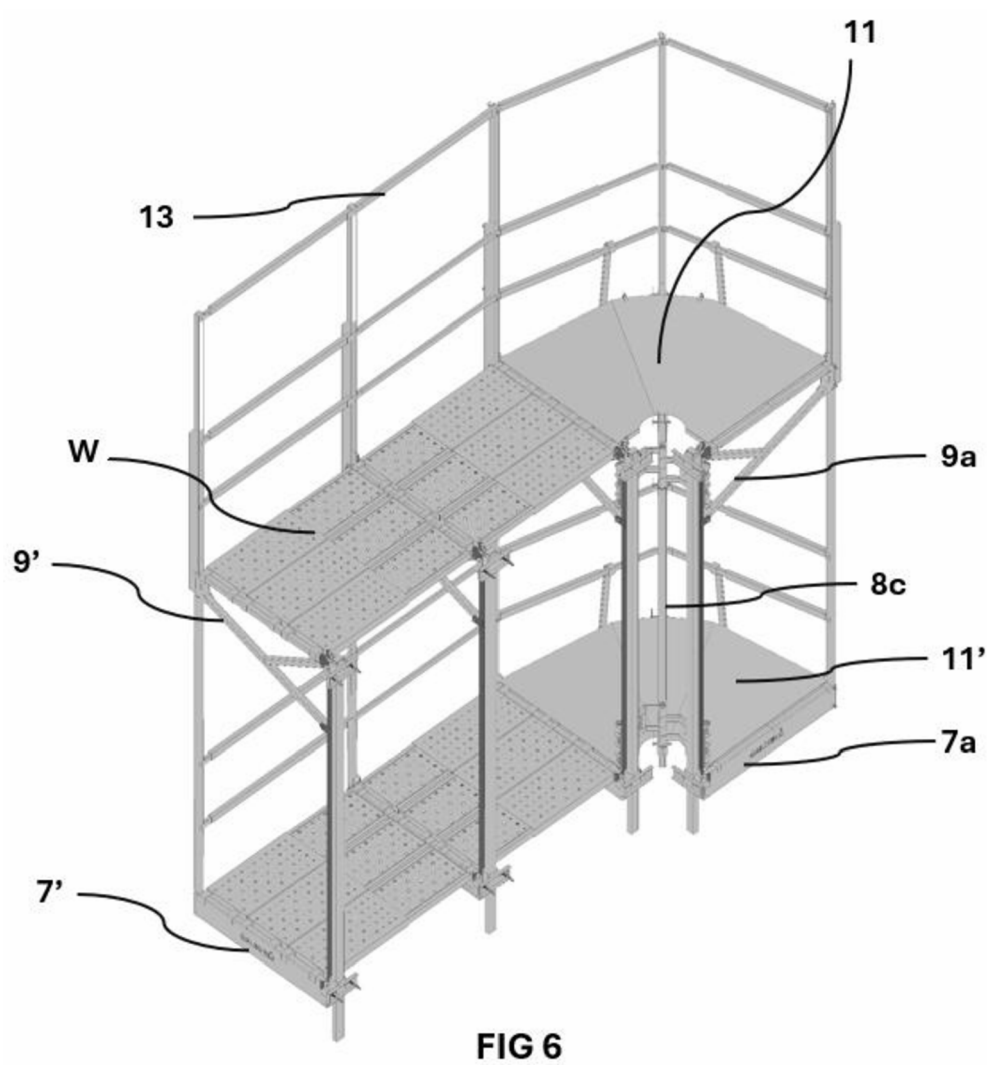


FIG 4







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Application Number

EP 26 17 2615

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Place of search		Date of completion of the search	Examiner
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