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(54) FLOODLIGHT AND MOUNTING SYSTEM FOR A FLOODLIGHT

(57) A mounting system 10 for mounting at least one lighting module 200, comprising; two carrier elements 300, 301, 302 being arranged parallel to each other and spaced apart from each other, two mounting elements 100, 101, 102 being arranged parallel to each other and spaced apart from each other. Each of the mounting elements 100, 101, 102 has at least one coupling point 110 for reversibly connecting the at least one lighting module 200 to the respective mounting element 100, 101, 102. The mounting system 10 further comprises joints 400 for coupling the mounting elements 100, 101, 102 to the carrier elements 300, 301, 302, whereby the joints 400 each comprise a mounting point 170 on each of the mounting elements 100, 101, 102 and a further mounting point 370 on each of the carrier elements 300, 301, 302, wherein each joint 400 is associated to an opposing joint 400 forming a pivot axis Px. The mounting elements 100, 101, 102 are hereby pivotable along the pivot axis Px with regard to the carrier elements 300, 301, 302 in a pivoting movement.

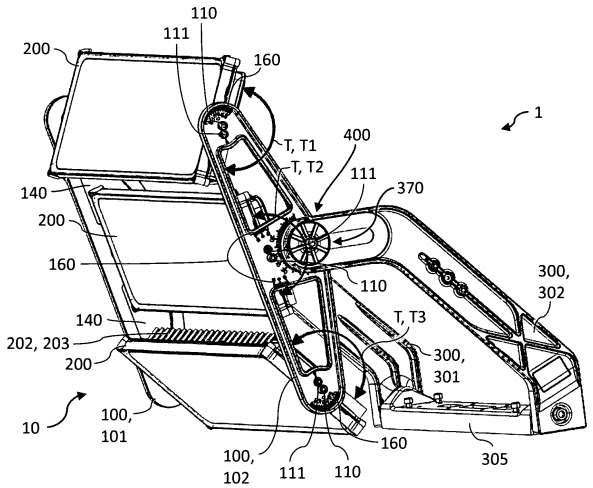

Fig. 4

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Description

[0001] The invention relates to a luminaire, in particular to a floodlight, and a mounting system for such a luminaire.

[0002] Currently known mounting systems for floodlight luminaires are mostly mounting frame systems which surround the luminaire, or the respective lighting modules of the luminaire on all sides in a frame-like manner in order to ensure rigid mounting. These are usually heavy and bulky, so that mounting in particular is difficult, and the luminaire together with the mounting frame system is also susceptible to wind. Particularly in exposed locations, large forces can be exerted on such luminaires by winds, which promotes wear and tear and premature material fatigue. Furthermore, these luminaires are usually placed in difficult to access locations, so that a high weight and/or an unwieldy design of the luminaire hampers installation and maintenance processes. Moreover, currently known mounting systems are not adjustable to individual user specific requirements.

[0003] It is thus an object of the present invention to provide a mounting system and a luminaire as mentioned, which facilitates installation and mounting thereof.

[0004] This object is solved by a mounting system according to independent claim 1. Particular embodiments of the invention are disclosed in the dependent claims.

[0005] According to the invention a mounting system for mounting at least one lighting module is provided. Hereby the mounting system comprises two carrier elements, which are arranged parallel to each other and spaced apart from each other, and further comprises two mounting elements, which are arranged parallel to each other and spaced apart from each other. Hereby each of the mounting elements has at least one coupling point for reversibly connecting the at least one lighting module to the respective mounting element. Furthermore, the mounting system comprises joints for coupling the mounting elements to the carrier elements, whereby the joints each comprise a mounting point on each of the mounting elements and a further mounting point on each of the carrier elements. Each joint is associated to an opposing joint forming a pivot axis, whereby the mounting elements are pivotable along the pivot axis with regard to the carrier elements in a pivoting movement. Moreover, at least one of each two opposing joints comprises indicator means, which are preferably formed by degree indicators.

[0006] The so formed mounting system eases installation of the at least one lighting module due to the parallel configuration of the mounting system. Hereby accessibility and operability is provided, and the coupling points facilitate the connection between the mounting system and the at least one lighting module of the luminaire. The installation process of the luminaire is further simplified with the parallel arrangement of the opposing coupling points of the mounting system. With the mounting system having joints the mounting system is further adjustable to individual user specific requirements, whereby with the adjustment of positioning of the lighting module coupled with the mounting elements with regard to the pivot axis, the lighting characteristics of the lighting module may be influenced. Furthermore the indicator means of at least one of each two opposing joints allow for a further facilitated installation and adjustment of the luminaire with the respective mounting system. Further these indicator means allow a precise and repeatable adjustment of the positioning of the lighting module being connected to the mounting elements towards the pivot axis, such that a certain desired lighting characteristic can be achieved. This reduces costs and time consumed by installation of the luminaire. Hereby, it would be sufficient if one joint of each opposing two joints has such indicator means, as a pivoting movement of the mounting elements with the connected lighting module leads to an identical delta of the pivot angle at both sides and thus at both opposing joints. Preferably each of two opposing joints have corresponding indicator elements, such that coupling and installation of the at least one lighting module is facilitated, as the pivot angle of a respective mounting element connected with the lighting module is then visible from both sides of the mounting system.

[0007] Optionally the indicator means are on an outer surface of the respective mounting element and/or of the respective carrier element facing away from the opposing joint, wherein preferably the indicator means are formed by degree indicators mapping a degree range of at least 180°. With this implementation, the indicator means are placed utmost visible for a user adjusting the mounting system and/or the luminaire. By having degree indicators as indicator means which further map a degree range of at least 180° adjustment of the mounting system and/or the luminaire is facilitated and further more flexible, as the pivot angle between the mounting elements and the thereto respectively connected carrier elements can be easily changed without the need of additional measurement tools.

[0008] According to a first embodiment of the mounting system, the mounting system is formed for mounting at least two lighting modules. Hereby the mounting elements each have at least two coupling points, for reversibly connecting the at least two lighting modules to the respective mounting element. Moreover the mounting system further has a receiving area between the two mounting elements, whereby the receiving area is formed to receive the at least two lighting modules. Furthermore, each coupling point of a first one of the mounting elements is associated to a corresponding coupling point of a second one of the mounting elements in an opposing manner, whereby the opposing coupling points form a tilt axis, whereby preferably these tilt axes run parallel to each other. Further preferably at least one of the mounting elements has indicator elements on a surface of the respective mounting element wherein the indicator elements are designed to indicate an angle of tilt of a re-

spective lighting module with respect to the mounting element. The so formed mounting system eases installation of the lighting modules due to the parallel orientation of the lighting modules arranged between the two mounting elements. The installation process of the luminaire is further simplified with the given receiving area and the parallel arrangement of the opposing coupling points of the mounting system. The indicator elements on at least one mounting element allow for a further facilitated installation of the luminaire with the respective mounting system. Further these indicator elements allow a precise and repeatable adjustment of the lighting modules towards the mounting system, such that a certain desired lighting characteristic can be achieved. This reduces costs and time consumed by installation of the respective lighting modules and thus the luminaire. Hereby, it would be sufficient if one mounting element of the mounting system has such indicator elements, as a tilt of a connected lighting module leads to an identical delta of the tilt angle at both sides and thus at both mounting elements. Preferably both mounting elements have corresponding indicator elements, such that coupling and installation of the lighting modules is facilitated, as the tilt angle of a respective lighting module is then visible from both sides of the mounting system.

[0009] Another aspect of the first embodiment includes that the at least one mounting element has indicator elements on an outer surface of the mounting element, whereby the outer surface is a surface facing away from the receiving area, wherein preferably each of the coupling points of the at least one mounting element have associated indicator elements. This implementation allows for an improved readability of the indicator elements, which further facilitates installation and readjustment of the luminaire with the respective mounting system. Preferably both mounting elements are provided with respective indicator elements positioned on the respective outer surfaces. This allows for particularly easy handling and flexible positioning of the mounting system and the luminaire.

[0010] Optionally in the first embodiment the indicator elements are each formed by degree markings which map a specific degree range, preferably a degree range of at least 30°, and particularly preferably a degree range of at least 120°. This features a precise and flexible installation process, which provides a variety of application possibilities of the mounting system.

[0011] Preferably in the first embodiment the at least one mounting element has sundry indicator elements and preferably at least two different indicator elements, in particular at least two different degree markings. The so formed mounting element provides different indicator elements for different coupling points and thus different to be connected lighting modules, reflecting usual setups of such luminaires, in particular floodlights, whereas for example the outer lighting modules are usually more tilted than the light modules positioned in the middle of the mounting system and thus the luminaire. Therefore, different indicator elements may be provided with regard to a usual angle of tilt at a respective coupling point.

[0012] Another aspect of the first embodiment includes that each mounting element has at least one through opening which forms a handle element of the respective mounting element. The so formed mounting system provides an easy mounting and carriage of the mounting system and/or the luminaire. With the one or more handle elements the carriage and handling of the luminaire is improved, whereby furthermore the handle elements allow for an easy adjustment of the positioning of the mounting system within a carrier system. The through openings further reduce the wind contact surface of the mounting system, whereby furthermore a ventilation channel is created by the through openings for passively cooling the mounted lighting modules. Thus, stability and usability of the mounting system and luminaire is improved.

[0013] Optionally in the first embodiment the at least one through opening is arranged between two coupling points of a mounting element. This configuration provides a stiff mounting system, such that even with a reduced material surface area of the mounting system, a stable mounting of lighting modules at the coupling points is accomplished. Furthermore, the through opening provides cooling air for the lighting modules, as the back sides of the lighting modules can now easily be surrounded by air flowing through the trough holes. Moreover, the handle element formed by the through opening is ergonomically built, such that carrying, mounting and/or adjusting the luminaire or the mounting system or a carrier system is facilitated.

[0014] Another aspect of the first embodiment includes that the indicator elements are arranged in an edge region of the respective mounting element. Hereby the mounting element may have different edge regions, whereas for example the outer edge regions are formed by the outer edges of the mounting element. Moreover, such edge regions may be formed by the through openings, which thus form different edges. With the indicator elements being placed in a region close to such an edge region of the mounting element, connected lighting modules are visible behind these edges, such that the angle of tilt is easily obtainable.

[0015] Preferably in the first embodiment the mounting elements are each arranged laterally on end faces of the lighting modules. With this arrangement of the mounting elements, the assembly of the mounting system and thus the luminaire is simplified. Moreover, with the mounting elements and thus the coupling points being arranged on end faces of the lighting modules the mounting system is designed for an utmost steady mounting.

[0016] Optionally in the first embodiment each mounting element is formed approximately symmetrically, wherein in particular the coupling points are arranged symmetrically with respect to a central axis of the mounting element. This configuration further improves stability of the mounting system, as impacting forces on the

mounting system and/or the carrier system and/or the luminaire can be distributed evenly across the components of the respective system. Moreover, assembly of the respective luminaire is facilitated. Adding to that, the parallelism of the mounting elements and thus the mounting system further improves aesthetics and functionality with regard to the lighting characteristic of the luminaire. Moreover, a symmetrical configuration of the mounting element 100 and/or the mounting system 10 allow for a symmetric setup of the luminaire which further improves weight balancing and aesthetics.

[0017] Preferably in the first embodiment each mounting element has three coupling points. With this configuration, the mounting system allows for three lighting modules to be mounted, such that assembly and carriage of the mounting system and the luminaire is facilitated. Optionally in the first embodiment each coupling point is accessible from both an outer surface and an inner surface of a respective mounting element. This characteristic facilitates the assembly of the luminaire, as the coupling between the mounting system and the individual lighting modules is also achievable from the outer surface, which is easier to reach, compared to the inner surface.

[0018] Preferably in the first embodiment the coupling points are configured for tiltable adjustment of a respective connected lighting module about the respective tilt axis. This provides an individual adjustment of the respective connected lighting modules, which improves flexibility and application possibilities of the mounting system, and thus the luminaire. Hereby the lighting characteristic of the luminaire is quickly and comfortably adjustable, whereby it is further preferably possible to adjust the luminaire after it has been installed. Therefore, the mounting system allows for an individual adjustment of each connected lighting module.

[0019] Optionally in the first embodiment at least one mounting element comprises fixing elements for fixing a tilted positioning of a respective lighting module, preferably each coupling point of the at least one mounting element has at least one fixing element associated therewith. With this configuration the positioning of the respective lighting modules is easily fixable, allowing for a further steady and stiff setup of the luminaire with the mounting system. Hereby the fixing elements preferably provide a reversible fixing, such that the positioning of the respective lighting module is flexibly adjustable.

[0020] Preferably in the first embodiment the two mounting elements each have a mounting point for mounting the mounting system on a carrier element. With this configuration, a coupling to a carrier element forming the carrier system is further facilitated. Moreover preferably the mounting point is arranged on the central axis of the mounting element, thus a symmetrical luminaire mounted on the carrier system is provided. Furthermore preferably, the two mounting points of the mounting system form a pivot axis, whereby the mounting system is pivotable along this pivot axis in a pivoting movement. This enables an easy and flexible positioning of the luminaire and the mounting system with respect to the carrier element. Additionally the mounting point preferably has further indicator elements which are preferably formed by degree markings, which preferably map a degree range of about 180°. Thus, as with the indicator elements of the coupling points the whole mounting system is pivotable in an easy and precise manner without the use of extra measurement tools. Moreover preferred at least one mounting element has further fixing elements for fixing a pivoted positioning of the mounting system. Hence a respective adjusted positioning of the mounting system towards the carrier element is easily and moreover preferred reversibly fixable, such that the adjusted positioning is durable.

[0021] According to a second embodiment of the mounting system, the mounting system further comprises additional carrier elements which are attached to the carrier elements and which are formed to couple with an additional lighting module. With this characteristics, the mounting system is easily extendable forming the possibility of attaching an additional lighting module.

[0022] Furthermore in the second embodiment the additional carrier elements are pivotable along the pivot axis with regard to the carrier elements in a further pivoting movement. Thus, the positioning of the additional carrier elements and thus the positioning of the additional lighting module which is connected to the additional carrier elements is adjustable with regard to the known pivot axis related to the carrier elements.

[0023] Preferably in the second embodiment this further pivoting movement is independent to the pivoting movement of the mounting elements with regard to the carrier elements. With this implementation, the additional carrier elements and thus the additional lighting module is independently positionable with regard to the other lighting module.

[0024] Moreover preferred in the second embodiment the additional lighting module is connected to mounting elements, which are coupled with the additional carrier elements via own joints, whereas these joints form an other pivot axis, which allows individual adjustment of the additional lighting module towards the additional carrier elements.

[0025] Further preferably in the second embodiment the further pivoting movement is supported and limited by guiding elements wherein preferably these guiding elements comprise a guiding rail. These guiding elements support the structure of such a mounting system, whereas furthermore installation and adjustment of the mounting system and thus of the luminaire is facilitated.

[0026] Preferably in the second embodiment an adjusted positioning of the additional carrier elements towards the carrier elements is reversibly fixed by a fastening element. With this implementation, the structure and stability of the mounting system is improved, whereas an adjusted positioning is easily fixable.

[0027] In a further preferred configuration of the sec-

ond embodiment the additional carrier elements are arranged parallel to each other and spaced apart from each other. Thus a certain space is formed between the additional carrier elements, simplifying installation and adjustment of the mounting system and thus the luminaire, whereas with the spaced positioning the stability of the mounting system is further improved.

[0028] Furthermore, a luminaire is provided, which comprises a respective mounting system according to any of the embodiments of the present invention and at least one lighting module, which is connected to the mounting system.

[0029] Preferably the luminaire may comprise at least one adjustable visor arrangement that is coupled with the at least one lighting module. With this implementation the light emission of the at least one lighting module and thus of the luminaire may be additionally adjusted by the respective adjustable visor arrangement, such that individual lighting scenarios are achievable due to the additional adjustment possibilities.

[0030] The adjustable visor arrangement is not necessarily used within a luminaire, but can be easily attached and used with a lighting module in a standalone matter. Thus an adjustable visor arrangement for a lighting module is provided as well. The visor arrangement comprises two lateral support elements being adapted to be coupled with a lighting module and a main visor being pivotally attached to the two lateral support elements, whereby on the main visor a telescopic visor panel is provided, which is transversely moveable in an extension plane of the main visor, whereby the main visor is pivotable along a visor pivot axis with regard to the lateral support elements in a pivoting movement. With such an adjustable visor arrangement the light emission characteristics of lighting modules in general are easily and flexibly adjustable, improving versatility of a lighting module, whereas such a lighting module with a thereto connected adjustable visor arrangement may also be connected to a mounting system forming a luminaire. Thus the light emission characteristics of the at least one lighting module and/or of a luminaire is utmost easily, flexible and precisely adjustable due to the thereto connected adjustable visor arrangement, such that such a lighting module and/or such a luminaire may be adapted to various different scenarios.

[0031] Preferably the adjustable visor arrangement comprises means of fixation for fixating an extended positioning of the telescopic visor panel with regard to the main visor, and/or that the adjustable visor arrangement comprises visor angle fixation means for fixating an adjusted visor angle of the main visor with regard to the lateral support elements. With such means of fixation and/or such visor angle fixation means an adjusted positioning of the adjustable visor arrangement is easily locked, resulting in a durable and fixed light emission orientation of the respective lighting module and/or of the luminaire.

[0032] Further preferred, the adjustable visor arrangement comprises at least one visor angle readout for displaying the adjusted visor angle of the main visor with regard to the lateral support elements. The implementation of visor angle readouts facilitates the adjustment and setup of the adjustable visor arrangement for easily setting a desired light emission of the respective lighting module and/or the respective luminaire. Furthermore, with such visor angle readouts reproducibility is improved resulting in an easy and uniform setup of multiple lighting modules and/or multiple luminaires.

[0033] The invention is explained in detail below with reference to examples of embodiments and with reference to the drawing. The figures show:

Figure 1 a perspective view of a luminaire and a mounting system according to a first embodiment of the present invention with one lighting module connected to the two mounting elements of the mounting system;

Figure 2 a perspective view of a luminaire and the mounting system according to a first embodiment of the present invention and known from Figure 1 with three lighting modules connected to the two mounting elements of the mounting system;

Figure 3 a perspective view of the luminaire and the mounting system according to a first embodiment of the present invention and known from Figure 2, with carrier elements connected to the mounting elements;

Figure 4 a perspective view of the luminaire and the mounting system according to a first embodiment of the present invention and known from Figure 3, with a tilted positioning of the lighting modules;

Figure 5A a side view of an outer surface of a mounting element according to a first embodiment of the invention;

Figure 5B a side view of an inner surface of a mounting element according to a first embodiment of the invention;

Figure 6 a cropped side view of a luminaire and a mounting system according to a first embodiment of the present invention, with at least two lighting modules connected to the mounting system;

Figure 7 a perspective view of a luminaire and a mounting system according to a first embodiment of the present invention with two

lighting modules connected to the mounting elements, and with carrier elements connected to the mounting elements;

Figure 8 a side view of a luminaire and a mounting system according to a second embodiment of the present invention with one lighting module;

Figure 9A a side view of a luminaire and a mounting system according to a second embodiment of the present invention with two lighting module;

Figure 9B a perspective view of the luminaire and the mounting system according to a second embodiment of the present invention and known from Figure 9A;

Figure 10A a perspective view of an embodiment of a lighting module with an adjustable visor arrangement;

Figure 10B a top view of an embodiment of an extension readout element of an adjustable visor arrangement;

Figure 10C a side view of an embodiment of a lighting module with an adjustable visor arrangement;

Figure 10D a perspective view of an embodiment of a lighting module with an adjustable visor arrangement with a pivoted main visor.

[0034] Figures 1 to 7 show different exemplary configurations of the mounting system 10 and the luminaire 1 according to a first embodiment of the present invention.

[0035] Figure 1 shows a perspective view of a luminaire 1 comprising a mounting system 10 with one lighting module 200 connected to the two mounting elements 100, 101, 102 of the mounting system 10. The mounting system 10 features a first mounting element 101 and a second mounting element 102, which are arranged parallel to each other and spaced apart from each other, such that the mounting system 10 has a receiving area 190 between the two mounting elements 100, 101, 102. Hereby each mounting element 100, 101, 102 comprises multiple coupling points 110 for coupling one or multiple lighting modules 200 with the mounting system 10 via a reversible mechanical connection, whereby each lighting module 200 is received within the receiving area 190. The receiving area 190 is formed to receive the at least two lighting modules 200, whereby in the shown embodiment each mounting element 100, 101, 102 comprises three coupling points 110 and therefore provides a coupling of up to three lighting modules 200 with the shown mounting system 10.

[0036] Furthermore, the mounting system 10 comprises mounting points 170 for connecting the mounting elements 100, 101, 102 with carrier elements 300, 301, 302. As shown especially in Figures 3, 4 and 7 the coupling of the carrier elements 300, 301, 302 and mounting elements 100, 101, 102 is formed by joints 400, which each link a respective mounting element 100, 101, 102 to a respective carrier element 300, 301, 302, whereby each joint 400 comprises the mounting point 170 on the respective mounting element 100, 101, 102 and the further mounting point 370 on the respective carrier element 300, 301, 302. Each joint 400 is associated to an opposing joint 400 - as indicated by the opposing mounting point 170 of the first mounting element 101 with regard to the mounting point 170 of the second mounting element 102 in Figure 1 - forming a pivot axis Px, whereby the mounting elements 100, 101, 102 are pivotable along the pivot axis Px with regard to the carrier elements 300, 301, 302 in a pivoting movement. The further mounting points 370 may be formed as through holes, and/or a marking and connecting element 310 and/or guide rails or the like.

[0037] Furthermore at least one of each two opposing joints 400 comprises indicator means 180, 310, whereas in the first embodiment these indicator means are formed by degree indicators comprising further indicator elements 180 as well as a marking and connecting element 310. Hereby the further indicator elements 180 are formed by indicator markings which map a degree range of 180°, whereas the marking and connecting element 310 shows the respective pivot degree of the mounting element 100, 101, 102 towards the carrier element 300, 301, 302, as can be seen in detail in the Figures of the first embodiment. The marking and connecting element 310 of each joint 400 is thus preferably formed to indicate the pivoting and is further preferably formed to interact with the mounting point 170 forming a steady connection of the respective mounting element 100, 101, 102 and the respective carrier element 300, 301, 302.

[0038] As shown in Figure 1 each coupling point 110 of the first mounting element 101 is associated to a corresponding coupling point 110 of the second mounting element 102 in an opposing manner, wherein the opposing coupling points 110 form a respective tilt axis Tx, Txl, Tx2, Tx3. Hereby the lighting modules 200 are arranged along a respective tilt axis Tx, Tx1, Tx2, Tx3 of the mounting system 10, such that a first lighting module 200 is aligned on a first tilt axis Tx1, a second lighting module is aligned on a second tilt axis Tx2 and a third lighting module is aligned on a third tilt axis Tx3, whereby these tilt axes Tx, Tx1, Tx2, Tx3 run parallel to each other. Moreover, the coupling points 110 are configured for a tiltable adjustment of a respective connected lighting module 200 about the respective tilt axis Tx, Tx1, Tx2, Tx3, whereby each lighting module 200 of the luminaire 1 is individually tiltable about its respective tilt axis Tx.

[0039] As shown in the figures at least one mounting element 100, 101, 102 may further comprise fixing ele-

ments 111 for fixing a tilted positioning T, T1, T2, T3 of a respective lighting module 200, whereby the first lighting module has a first tilted positioning T1, the second lighting module has a second tilted positioning T2 and the third lighting module has a third tilted positioning T3. Preferably each coupling point 110 of the at least one mounting element 100, 101, 102 has at least one fixing element 111 associated therewith. These fixing elements 111 allow for an easy adjustment and fixation of a respective tilt positioning T of a lighting module 200.

[0040] Figures 3 and 4 show different tilt positions T, T1, T2, T3 of the mounted lighting modules 200, whereas in Figure 3 the lighting modules 200 are not tilted at all in relation to the mounting system 10, and whereas in Figure 3 each of the lighting modules 200 is tilted in a different tilt angle α in relation to the mounting system 10. An other example of a tilted positioning T of respective lighting modules 200 is shown in Figure 6, which shows that one of the lighting modules 200 is tilted in an tilt angle α of approximately 20° towards the mounting element 100, 101, 102, and whereas an other lighting module 200 which is positioned in a central area is not tilted, which equals an tilt angle of 0°.

[0041] In Figure 1 the second mounting element 102 basically shows the inner surface 107 of a mounting element 100, whereby the first mounting element 101 shows the outer surface 105 of a mounting element 100. Hereby it is visible, that each coupling point 110 is accessible from both an outer surface 105 and an inner surface 107 of a respective mounting element 100, 101, 102.

[0042] Figures 5A and 5B illustrate that the coupling points 110 preferably are aligned along a horizontal axis Hx of the mounting element 100, which eases installation of the lighting modules 200 and further contributes with regard to the aesthetics of the luminaire 1. Moreover, preferably the fixing elements 111 associated to their respective coupling point 110 are centrally aligned on this horizontal axis Hx as well. Hereby the horizontal axis Hx is further preferred parallel to a lower edge of the mounting element 100.

[0043] As shown in Figures 1 and 2 the mounting elements 100, 101, 102 are each arranged laterally on end faces 205 of the lighting modules 200, such that the coupling points 110 are each connected with a respective end face 205 of a lighting module. This allows an easy installation of the lighting modules 200 inside the mounting system 10. In Figure 2 a luminaire 1 with a mounting system 10 - which comprises the two mounting elements 100 with three coupling points 110 each, whereby the carrier elements 300, 301, 302 are not shown in Figure 2 - and three lighting modules 200 is shown. Hereby the lighting modules 200 are not tilted, such that the lighting modules 200 are arranged parallel to the horizontal axis Hx.

[0044] Hereby each lighting module 200 provides a light emitting surface 201 and a lighting module housing 202, which preferably comprises a heat sink 203, which may be integrally formed with the housing 202. The lighting module 200 preferably is built to allow for a highperformance light output, which is necessary for floodlight luminaires. Behind the light emitting surface 201 and inside the housing 202 of each light module 200 at least one illumination element may be present, whereby the illumination element could be a lamp or an LED-array or the like. Moreover, different lighting modules 200 with regard to their light emission characteristics may be connected to the mounting system 10 to accomplish a customized luminaire 1 according to individual requirements of a user. Each lighting module 200 is preferably plate-shaped, whereby the heat sink 203 allows for a passive cooling of the lighting module 200, which relies on surrounding air flowing through its heatsink elements.

[0045] Further shown in the figures according to one embodiment at least one mounting element 100, 101, 102 has so called indicator elements 160 on a surface 105, 107 of the respective mounting element 100, 101, 102. In Figures 5A, 5B and 6 these indicator elements 160 are shown in more detail, wherein in the shown embodiment the indicator elements 160 are designed to indicate an angle of tilt α of a respective lighting module 200 with respect to the mounting element 100, 101, 102. With these indicator elements 160 the positioning of each lighting module 200 is simplified and easily repeatable, such that the setup of such a luminaire 1 is further facilitated, allowing for an improved lighting characteristic of the luminaire 1 according to the respective conditions. Thus, the user setting up the respective luminaire 1 is enabled to adjust the positioning of the individual lighting modules 200 of the luminaire 1 without the need for additional measurement tools, as the indicator elements 160 are integrated on the mounting element 100. In the shown embodiments the indicator elements 160 are placed on an outer surface 105 of the mounting element 100, whereby it is also possible to place these indicator elements 160 on an inner surface 107. Preferably both mounting elements 100 comprise such indicator elements 160.

[0046] Furthermore, each of the coupling points 110 of the at least one mounting element 100, 101, 102 may have associated indicator elements 160, and both mounting elements 100, 101, 102 preferably have corresponding indicator elements 160. As displayed in the embodiments of Figures 5A and 6 the indicator elements 160 are each formed by degree markings which map a specific degree range. This configuration allows for a quick and flexible tilted positioning of a lighting module 200 towards the mounting element 100 in a desired angle of tilt α. Hereby a mounting element 100 may have different variants of indicator elements 160, whereby for example an indicator element 160 placed in a central area of the mounting element 100 maps a different degree range than an indicator element 160 placed in an end area of the mounting element 100, as lighting modules 200 connected to a coupling point 110 in an end area of the mounting element 100 may be more tilted than lighting

modules 200 in a central area of a luminaire 1. Therefore, the shown mounting element 100 has sundry indicator elements 160 on its outer surface 105, whereas one variant has a degree range of 30° and an other variant has a degree range of 120°. Of course the configuration of the indicator elements 160 and in particular of these degree ranges may differ according to a respective area of application of the mounting system 10 and/or the luminaire 1.

[0047] Moreover, the indicator elements 160 of a respective mounting element 100 may also comprise additional markings 161 such as arrows or other symbols, which mark a provided default orientation of a connected lighting module 200. These additional markings 161 are further preferred aligned on the horizontal axis Hx such that a lighting device 200 oriented thereto is automatically untilted, which means tilted by 0° towards the mounting system 10. Hereby the lighting modules 200 may have a marking 210 which may interact with an additional marking 161 of a respective mounting element 100, facilitating the untilted positioning of a respective lighting module 200. These markings 210 may also be formed by distinctive structures of the lighting module 200, such as an edge forming a transition between the light emitting surface 201 and the housing 202 and/or the heat sink 203 of the lighting module 200.

[0048] The markings 210 of a lighting module 200 and/or the additional marking 161 and/or the indicator elements 160 of a mounting element 100 may be formed integrally with the respective element and/or may also be formed by an extra component connected to the said element, such as a decal for example. Hereby the indicator elements 160 which are integrally formed with the mounting element 100 may be laser cut, milled, and/or formed by injection moulding or punching during production of the mounting element 100. Same applies to the marking 210 of a respective lighting module 200.

[0049] As shown in Figures 1 to 6 the mounting system 10 according to the therein shown embodiment further comprises handle elements 120, which improve carriage and handling of the mounting system 10 and thus the assembled luminaire 1 and or the carrier system 15. Hereby preferably each mounting element 100, 101, 102 has at least one through opening 140 which forms such a handle element 120 of the respective mounting element 100, 101, 102. Hereby the handle elements 120 allow for an easy handling and especially a simplified carriage of the mounting system 10 and thus the luminaire 1. Moreover, the handle elements 120 ease an attachment of the mounting system 10 and/or the luminaire 1 to a respective carrier element 300 or the like.

[0050] With these through openings 140 the weight of the mounting elements 100 is reduced, while furthermore allowing a direct view onto the coupled lighting modules 200 which are arranged in the receiving area 190 of the mounting system 10. Additionally, these through openings 140 improve the air flow towards the lighting modules 200, which improves the cooling of the lighting modules 200. Furthermore, with the reduced material of the mounting element 100 and the through openings 140 the windage surface is reduced as well, so that the environmental impact through wind on the mounting system 10 and thus on the luminaire 1 and the carrier system 15 is decreased.

[0051] In the shown embodiments each mounting element 100 comprises two through openings 140, which are symmetrically arranged on the mounting element 100 with respect to a central axis Cx of the mounting element 100, as indicated in Figures 5A and 5B. The at least one through opening 140 is hereby arranged between two coupling points 110 of a respective mounting element 100, 101, 102, which further improves stability of the mounting element 100. Preferably the horizontal axis Hx and the central axis Cx intersect at a coupling point 110 located in a central area of the mounting element 100, whereas the central axis Cx and the horizontal axis Hx are further preferred orthogonal to each other. Furthermore, each tilt axis Tx, Tx1, Tx2, Tx3 of the coupling points 110 is orthogonal to the horizontal axis Hx. As further displayed in the Figures 5A and 5B each mounting element 100, 101, 102 is formed approximately symmetrically, wherein in particular the coupling points 110 are arranged symmetrically with respect to a central axis Cx of the mounting element 100, 101, 102.

[0052] The combination of the indicator elements 160 and the through openings 140 further facilitate the positioning of the lighting modules 200, as these through openings 140 form additional edge regions of the mounting element 100, such that the lighting modules 200, and in particular the end faces of the respective lighting modules 200, arranged in-between the two mounting elements 100, 101, 102 are visible, so that the tilt angle α of the respective lighting modules 200 can be read and adjusted quickly and precisely due to the indicator elements 160. Even the tilt angle α of a lighting module 200 which is positioned in a central area of the mounting system 10 can be precisely read and adjusted, as the through openings 140 and the respective indicator elements in these edge regions show the respective tilt angle α. Therefore, preferably the indicator elements 160 are arranged in an edge region of the respective mounting element 100, 101, 102.

[0053] In the shown embodiment each mounting element 100, 101, 102 has a mounting point 170 for mounting on the respective carrier element 300, 301, 302 whereas moreover preferably the mounting point 170 is arranged on the central axis Cx of the mounting element 100. The pivot axis Px, which is formed by the two joints 400 of the two mounting points 170 of the two mounting elements 100, 101, 102, enables the mounting elements 100, 101, 102 to be moved along the pivot axis Px in a pivoting movement, providing the possibility for an individual, precise and situation-related adjustment of the positioning of the mounting system 10 and thus the luminaire 1. At least one mounting element 100, 101, 102 preferably has further fixing elements 171 for fixing a piv-

oted positioning P of the mounting elements 100, 101, 102 towards the carrier elements 300, 301, 302, further increasing sturdiness of the mounting system 10 and thus the luminaire 1. These further fixing elements 171 are preferably arranged close to the respective mounting point 170, as shown especially in Figures 5A and 5B.

[0054] The marking and connecting element 310 of a carrier element 300, 301, 302 is hereby coupled with the respective mounting points 170 of the mounting elements 100, 101, 102. Hereby the marking and connecting element 310 could be designed as a screw or a snap-in connection or the like, building a stiff and durable mechanical connection between the marking and connecting element 310 and the respective mounting element 100, 101, 102 to ensure a sturdy setup of the mounting system 10 and thus a sturdy mounting of the luminaire 1. Hereby the further fixing elements 171 and the marking and connecting element 310 may interact with each other. Moreover the marking and connecting element 310 may also interact with a guiding rail being integrally formed with a respective carrier element 300, 301, 302, which allows for an flexible adjustment of the coupling between the mounting elements 100, 101, 102 and the carrier elements 300, 301, 302 of the mounting system 10.

[0055] The further indicator elements 180 are associated to a respective mounting point 170 of a mounting element 100, 101, 102, as shown especially in Figure 5A. Hereby when coupled to the carrier element 300, 301, 302 the pivoting angle can be easily read due to these further indicator elements 180. With these further indicator elements 180, which map a degree range of 180°, an easy, flexible and accurate positioning of the mounting elements 100, 101, 102 of the mounting system 10 and thus the luminaire 1 in relation to the carrier elements 300, 301, 302 is provided, such that a certain intended angle between the carrier elements 300, 301, 302 and the mounting elements 100, 101, 102 can be achieved.

[0056] Hereby as indicated in Figure 3 the pivoting movement for adjusting the pivoted positioning P is a movement of the mounting elements 100, 101, 102 relative to the carrier elements 300, 301, 302, whereas this positioning adjustment is facilitated by the handle elements 120 of the mounting elements 100, 101, 102, which allow a simple, targeted and defined pivoting of the mounting system 10 and thus the luminaire 1. The pivot angle of the pivoted positioning P is hereby directly shown via the further indicator elements 180, whereby preferably the carrier element 300 may comprise auxiliar markings to further improve reading accuracy of the further indicator elements 180. For example such an auxiliary marking could be formed by an arrow or a similar symbol formed at an edge of at least one carrier element 300, 301, 302 in the surrounding of the further indicator elements 180, or formed within a marking and connecting element 310.

[0057] The carrier elements 300, 301, 302 may coupled together via a strut 305, whereas the carrier elements 300 and the strut 305 may form a stirrup. Hereby the strut 305 may act as a base element, which is designed to be connected to a wall, a celling or other contact points, for mounting the luminaire 1 and thus the mounting system 10. Hereby the carrier elements 300 are formed as two side arms , which are connected laterally to the base element - i.e. the strut 305. These carrier elements 300 are then connected to the mounting elements 100 via the marking and connecting element 310.

[0058] Preferably the carrier elements 300, the strut 305, and/or the mounting elements 100 are built from metal or other sturdy, stiff and durablematerials. The mounting elements 100, the carrier elements 300, as well as the other components of the mounting system 10, e. g. the marking and connecting element 310 and/or the strut, may be formed by a stamping process, a casting process, in particular an injection moulding process, or a cutting process or the like.

[0059] Figure 4 shows a luminaire 1 comprising a mounting system 10, whereas the lighting modules 200 are each differently tilted in relation to the mounting elements 100 of the mounting system 10. This allows a situational adjustment to fit the luminaire 1 to certain requirements of the user, whereas different tilt positions T of the lighting modules 200 result in different lighting characteristics of the luminaire 1. In particular, depending on the configuration of the luminaire 1, different areas may be illuminated so that, especially when used in stadiums or large places, individual settings lead to an ideal illumination depending on the circumstances. With the possible adjustments of the lighting characteristics of the luminaire 1 by adjusting each of the lighting modules 200 in relation to the tilt axes Tx and by adjusting the mounting elements 100 in relation to the pivot axis Px the luminaire 1 is utmost versatile, especially as a floodlight.

[0060] As can be seen from Figures 1, 5A and 5B, the mounting element 100, 101, 102 in this embodiment is shaped essentially like a coat hanger, whereas the shape approximates a triangle with rounded corners and the aforementioned through openings 140.

[0061] The fixing elements 111 max be formed by snap-in elements, screws or other similar fixation elements which allow for a sturdy but reversible mechanical connection between each mounting element 100, 101, 102 and the respective lighting module 200.

[0062] Moreover, as shown especially in the embodiments of Figures 1 and 5B the mounting element may comprise at least one supporting structure 150, preferably located at each coupling point 110 and associated thereto. This supporting structure 150 may be designed to support the coupling of a lighting module 200 with the mounting element 100, preventing the mounting element 100 and the lighting module 200 from slipping in relation to each other during the assembly of these two components, further facilitating the assembly. Furthermore, the supporting structure 150 may be formed to limit the range of tilting of a respective lighting module 200, which may

be realized via interaction with a corresponding structure of the lighting module 200.

[0063] Of course embodiments of the luminaire 1 with more or less lighting modules 200 are also possible, whereas preferably the number of lighting modules 200 and/or the number of coupling points 110 per mounting element 100 is odd, such that the general setup with a central coupling point 110 placed in the intersection of the horizontal axis Hx and the central axis Cx can be continued.

[0064] Optionally an even number of coupling points 110 per mounting element 100 is also possible, as exemplary shown in the configuration of the first embodiment of the luminaire 1 and the mounting system 10 shown in Figure 7. Hereby the luminaire 1 comprises two lighting modules 200, which are coupled to two mounting elements 100, 101, 102 arranged at lateral faces of the luminaires 200. Hereby each mounting element 100 comprises two coupling points 110 at opposite ends of each mounting element 100. Thus in comparison with the former described version of the mounting elements 100 with three coupling points 110, the middle coupling point 110 is removed in the configuration with an even number of coupling points 110. However, each coupling point 110 is associated with its own indicator elements 160, which indicate the respective angle of tilt α of the lighting module 200 coupled to the respective coupling point 110. The mounting elements 100 are then each coupled - as before - with the carrier elements 300. In the shown possible configuration the coupling is realized via the mounting points 170 of the mounting elements 100. Hereby the mounting point 170 of a respective mounting element 100 is associated with further indicator elements 180 indicating a pivot angle of the mounting elements 100 around the pivot axis Px and thus a pivot angle of the mounting elements 100 in relation to the carrier elements 300 - just as in the previously discussed configuration with an odd number of coupling points 110.

[0065] Figures 8, 9A and 9B show different exemplary configurations of the mounting system 10 and the luminaire 1 according to a second embodiment of the present invention.

[0066] Hereby Figure 1 shows a luminaire 1 with one single lighting module 200 coupled to the mounting system 10 in a different way - compared to the first embodiment. Hereby the mounting elements 100, 101, 102 are implemented in a different way, whereas still two mounting elements 100 are arranged parallel to each other and spaced apart from each other. Each mounting element 100 has at least one coupling point 110 for reversibly connecting the at least one lighting module 200 to the respective mounting element 100, whereas these coupling points 110 may be formed as screws, bolts, snap in elements or similar structures for a stiff and sturdy connection between the mounting element 100, 101, 102 and the luminaire 1. In the shown exemplary configuration of the second embodiment the coupling points 110 are formed via screws which mount the mounting elements 100 to the back side of the respective lighting module 200. Hereby the coupling points 110 are connected to the heat sink 203 and/or the housing 202 of the lighting module 200.

[0067] The mounting system 10 further comprises joints 400 for coupling the mounting elements 100, 101, 102 to the carrier elements 300, 301, 302, whereby the joints 400 each comprise a mounting point 170 on each of the mounting elements 100, 101, 102 and a further mounting point 370 on each of the carrier elements 300, 301, 302. The mounting point 170 of the mounting element 100 is not shown in Figure 8, as the carrier element 301 overlaps, whereas the further mounting point 370, formed as a through hole and the marking and connecting element 310 is coupled to the mounting point 170 forming a steady connection of the mounting element 100 and the carrier element 300. Hereby the joint 400 with the marking and connecting element 310 further has indicator means 180, 310 to indicate a pivoted positioning of the mounting elements 100 towards the carrier elements 300 along the pivot axis Px, which is formed by the two opposing joints 400 of the mounting system 10. As exemplary displayed in Figure 8 these indicator means 310 are formed by degree indicators. Moreover the indicator means 180, 310 may comprise additional elements, to further facilitate the positioning and improve the readability. As exemplary shown in Figure 8 further indicators with an arrow may be included.

[0068] With the connecting points 110 being directly connected to the heat sink the heat dissipation and heat removal of the luminaire 1 is further improved, as the mechanical connection between the lighting module 200 and the mounting elements 100 is further a thermal connection using the mounting system 10 as an extended heat sink of the connected lighting modules. The mounting elements 100 of the second embodiment are preferably formed in a L-shape, with a low weight and improved aerodynamics thus reducing the wind drag of the mounting system 10 and thus the luminaire 1.

[0069] Figures 9A and 9B exemplary show an other configuration of the second embodiment, showing a luminaire 1 with two lighting modules 200. Hereby the known mounting system 10 shown in Figure 8 forms the basis for this configuration, whereas additional carrier elements 303, 304 are attached to the carrier elements 300, 301, 302. These additional carrier elements 300, 304 are formed to couple with an additional lighting module 200, preferably in the same manner as the carrier elements 300.

[0070] The additional carrier elements 303, 304 are preferably easily attachable to the known carrier elements 300 of Figure 8, whereas the additional carrier elements 303, 304 are coupled with the carrier elements 300 via the joints 400, such that the additional carrier elements 300, 304 are pivotable along the pivot axis Px with regard to the carrier elements 300, 301, 302 in a further pivoting movement, wherein preferably this further pivoting movement is independent to the pivoting

movement of the mounting elements 100, 101, 102 with regard to the carrier elements 300, 301, 302. Furthermore the additional carrier elements 303, 304 may be connected to the carrier elements 300 via guiding elements 321, 322, whereas the carrier elements 300 comprise at least one part of these guiding elements. Hereby the guiding elements 321, 322, are formed by a guiding rail 321 and fixation elements 322 interacting with the guiding rail 321. These fixation elements 322 are not only formed to guide the movement of the additional carrier element 303, 304 but also to fix the respective desired and adjusted positioning of the additional carrier element 303, 304, to improve stability of the mounting system 10. Hereby the fixation elements 322 are formed by a through hole 322a of the carrier element 300 and a bolt and/or screw 322b interacting with the through hole 322a. Thus the further pivoting movement of the additional carrier elements 303, 304 is supported and limited by the guiding elements 321, 322.

[0071] As shown in the exemplary configurations shown of Figures 9A and 9B the additional carrier elements 303, 304 are also arranged parallel to each other and spaced apart from each other, such that the connecting points 110 of the mounting elements 100, 101, 102 cupled with the additional carrier elements 303, 304 are preferably identically spaced from each other compared to the mounting elements 100 connected to the carrier elements 300. In the shown configuration each of the lighting modules 200 connected to the mounting system 10 are pivotable around their respective pivot axis Px, Pxl, Px2 formed by the respective opposing joints 400 of the mounting elements 100, 101, 102 and the carrier elements 300, 301, 302 or the additional carrier elements 303, 304.

[0072] Of course the second embodiment exemplary shown in Figures 8, 9A and 9B are not limited to the displayed configurations, as of course a configuration with second additional carrier elements coupled either to the carrier elements 300 or the additional carrier elements 303, 304 or other similar implementations are possible. Obviously similar or identical features of the two different embodiments are generally not mentioned separately herein and, in view of the figures and the technical understanding, these features are equally valid for all embodiments. Therefore, a mounting system 10 for facilitating transport, mounting and adjustment of the mounting system 10 and therewith connected lighting modules 200 is provided. The so formed mounting system 10 and luminaire 1, which preferably is a floodlight, is utmost flexibly adjustable to respective user specific requirements. A flexible, precise and repeatable configuration of the luminaire 1 and its lighting modules 200 is enabled by the respective mounting system 10.

[0073] To further enhance adjustability of the luminaire 1, in an other embodiment at least one of the lighting modules 200 may have an adjustable visor arrangement 500, which comprises a main visor 510 extending along a longitudinal side of the respective lighting module 200 and being pivotally attached to two lateral support elements 520, which are provided at opposite lateral sides of the lighting module 200, as exemplary shown in Figures 10A to 10D. The pivoting movement of the adjustable visor arrangement 500 is performed around a corresponding visor pivot axis Vx. The visor pivot axis Vx of the main visor 510 extends in front of the respective lighting module 200 and being parallel to the pivot axes Px and tilt axis Tx of the lighting modules 200 and the mounting system 10. On the main visor 510 there is provided a telescopic visor panel 512, which is transversely moveable in an extension plane of the main visor 510 and in a direction away from and towards the respective lighting module 200 so as to vary the extension of the visor arrangement 500 with respect to the lighting module 200.

[0074] In Figures 10A to 10D various characteristics of such an adjustable visor arrangement 500 are shown. Hereby the adjustable visor arrangement 500 comprises two lateral support elements 520 and a main visor 510 being pivotally attached to the two lateral support elements 520, whereby on the main visor 510 a telescopic visor panel 512 is provided, which is transversely moveable in an extension plane of the main visor 510. Moreover the main visor 510 is pivotable along a visor pivot axis Vx with regard to the lateral support elements 520 in a pivoting movement.

[0075] Figure 10A shows perspective view on a possible implementation of such a lighting module 200 with an adjustable visor arrangement 500 connected thereto. On a surface of the telescopic visor panel 512 at least one extension readout element 513 is provided, which enables a user to easily perceive a certain extension of the adjustable visor arrangement 500. A possible implementation of such an extension readout element 513 is shown in Figure 10B.

[0076] Preferably the adjustable visor arrangement 500 comprises means of fixation 513b for fixating an extended positioning of the telescopic visor panel 512 with regard to the main visor 510. The means of fixation 513b may be part of the extension readout element 513, as shown in Figure 10B. The extension readout element 513 may comprise a rail-like hole 513a which enables a certain means of fixation 513b to interact with the telescopic visor panel 512 and the thereto underlying main visor 510, such that a certain adjusted extension of the telescopic visor panel 512 is fastened preferably via a force fit. In addition, next to the rail-like hole 513a, a scale 513c may be present that indicates the span by which the telescopic visor panel 512 can be extended in relation to the main visor 510. The means of fixation 513b also preferably serve as an indicator, marking in cooperation with the adjacent scale 513c how much the telescopic visor panel 512 actually is extended.

[0077] In the shown embodiment of Figure 10B the telescopic visor panel 512 is not extended at all, as the means of fixation 513b is positioned at an edge of the rail-like hole 513a and next to the zero marking of the scale 513c, which means that the telescopic visor panel

512 is extended by zero millimetres in relation to the main visor 510. The shown scenario of Figure 10B of the extension readout element 513 corresponds to the position of the telescopic visor panel 512 shown in Figure 10A of the light module 200. Preferably the span by which the telescopic visor panel 512 can be extended in relation to the main visor 510 may be between 0 millimetres and 70 millimetres, as exemplary shown in Figure 10B. However other ranges of extension may also be possible.

[0078] Besides the possible adjustability of the visor arrangement 500 concerning the extension of the telescopic visor panel 512 the orientation of the main visor 510, together with thereon mounted parts as e.g. the telescopic visor panel 512, is adjustable, such that a visor angle δ between the normal of the light emitting surface 201 and the main visor 510 can be adjusted flexibly and easily by a pivoting movement. Hereby the main visor 510 preferably has two lateral visor elements 515, which may be formed integrally with the main visor 510. The lateral visor elements 515 are arranged laterally on the main visor 510 and are perpendicular to the main visor 510, so that each of the lateral visor elements 515 is dedicated to and runs parallel and close to one of the lateral support elements 520. The lateral visor elements 515 thereby prevent light from escaping from the visor arrangement 500 between the main visor 510 and the lateral support elements 520 in a pivoted state of the main visor 510.

[0079] Preferably the adjustable visor arrangement 500 comprises visor angle fixation means 516 for fixating an adjusted visor angle δ of the main visor 510 with regard to the lateral support elements 520. As exemplary shown in Figure 10C the adjusted visor angle δ is fixated via visor angle fixation means 516, which preferably are formed on at least one lateral visor element 515 and at least one thereto dedicated lateral support element 520. As shown in Figures 10A, 10C and 10D these visor angle fixation means 516 may be formed as through holes, thread holes 516b, screws 516a, bolts and/or the like.

[0080] Moreover, the adjustable visor arrangement 500 may comprise at least one visor angle readout 517 for displaying the adjusted visor angle δ of the main visor 510 with regard to the lateral support elements 520, and thus facilitating and improving readability of a pivoted position of the main visor 510.

[0081] As exemplary shown in Figures 10A, 10C and 10D the at least visor angle readout 517 may be formed via a through hole 517a on at least one of the two lateral support elements 520, and visor angle markings 517b on at least one of the two lateral visor elements 515. Depending on the set visor angle δ, the corresponding angle marking 517b on the corresponding lateral visor element 515 is visible in the through hole 517a of the lateral support element 520, so that the positioning of the main visor 510 of the visor arrangement 500 can be set precisely, easily and reproducibly.

[0082] Figure 10C shows an exemplary implementation of the adjustable visor arrangement 500 with a pivoted main visor 510, whereas the main visor 510 is pivoted at a visor angle δ of 70°, as visible through the visor angle readout 517. As shown the pivot range for the visor angle δ is between 0° and 70°, whereas other ranges are also thinkable.

[0083] The pivoted positioning of the main visor 510 is fixed via the angle fixation means 516. The elements of the visor angle fixation means 516 that are positioned on one of the lateral visor elements 515 are positioned adjacent to a dedicated visor angle marking 517b, such that locking a specific pivoted position is simplified. In the shown embodiment, the visor angle markings 517b intervals of the possible adjustable visor angle δ are in discrete 5° increments. However a continuous adjustability of the visor angle δ is also possible in an other implementation. As moreover shown in Figure 10C the telescopic visor panel 512 is extended, enlarging the visor surface of the visor arrangement 500.

[0084] Figure 10D provides a perspective view on a lighting module 200 with an embodiment of such an adjustable visor arrangement 500, whereas the main visor 510 is pivoted at a visor angle δ of 30°. The orientation and position of the main visor 510 towards the lateral support elements 520 is fixed via the visor angle fixation means 516. The telescopic visor panel 512 is not extended in the displayed state of the visor arrangement 500.

[0085] The surface of the main visor 510 opposite to the adjacent telescopic visor panel 512 is also called the inner surface of the main visor 510, whereas preferably this inner surface is a light reflective, diffusing or absorbing surface, to improve light emitting characteristics of the respective lighting module 200. Moreover preferably the inner surface of the telescopic visor panel 512, which is the surface being in contact with the main visor 510, may also be a light reflective, diffusing or absorbing for the same reason. Additionally the inwards pointing surfaces of the two lateral support elements 520 of a respective visor arrangement 500 and/or the inwards pointing surfaces of the two lateral visor elements 515 may also be light reflective, dispersive or absorbing.

[0086] As illustrated in Figure 10A an adjustable visor arrangement 500 may have multiple extension readout elements 513 for a durable and sturdy fixation and an easy setup of an adjusted telescopic visor panel 512, whereas possibly some readout elements 513 only function as fixation as they only contain the rail-like hole 513a and the means of fixation 513b.

[0087] To further ease varying the extension of the visor arrangement 500 the telescopic visor panel 512 may comprise a handle element 514 for easily pushing or pulling the telescopic visor panel 512 and thus increasing or decreasing the extension of the telescopic visor panel 512 relative to the main visor 510.

[0088] The adjustable visor arrangement 500 may be coupled with a respective lighting module 200 via a force fit or a form fit fixation, whereas the visor arrangement 500 may be clipped and/or screwed on the lighting module 200, for an easy and sturdy coupling. To allow for a

flexible and easy pivoting of the main visor 510, preferably the lateral support elements 520 are directly connected with the lighting module 200, whereas the main visor 510 is pivotable connected with the lateral support elements 520.

[0089] It is further stated that the embodiment of the lighting module 200 with an adjustable visor element 500 is compatible with any previously presented embodiments of the mounting system 10 and/or lighting modules 200, whereas the light emitting characteristics of such a mounting system 10 or luminaire 1 with a lighting module 200 with an adjustable visor 500 are more flexible and in general improved.

[0090] Furthermore, it is noted that the herein presented adjustable visor element 500 may also be used forming a luminaire 1 without a mounting system 10, such that the adjustable visor element is solely coupled to a lighting module 200, adjusting its light emission.

[0091] Thus, with the mounting system 10 and with a lighting module 200 with such an adjustable visor element 500 multiple means for a precise and repeatable adjustment concerning tilting or pivoting certain components of the mounting system 10, the lighting module 200 and/or the luminaire 1 are presented, resulting in an improved adaptability of the luminaire 1 to different scenarios.

[0092] The present invention is not limited by the embodiment as described herein as long as being covered by the appended claims.

Claims

1. A mounting system (10) for mounting at least one lighting module (200), comprising:

   two carrier elements (300, 301, 302) being arranged parallel to each other and spaced apart from each other,
   two mounting elements (100, 101, 102) being arranged parallel to each other and spaced apart from each other,
   wherein each of the mounting elements (100, 101, 102) has at least one coupling point (110) for reversibly connecting the at least one lighting module (200) to the respective mounting element (100, 101, 102),
   and whereby the mounting system (10) further comprises joints (400) for coupling the mounting elements (100, 101, 102) to the carrier elements (300, 301, 302), the joints (400) each comprising a mounting point (170) on each of the mounting elements (100, 101, 102) and a further mounting point (370) on each of the carrier elements (300, 301, 302), wherein each joint (400) is associated to an opposing joint (400) forming a pivot axis (Px), whereby the mounting elements (100, 101, 102) are pivotable along the pivot axis (Px) with regard to the carrier elements (300, 301, 302) in a pivoting movement,
   whereby at least one of each two opposing joints (400) comprises indicator means (180, 310), which are preferably formed by degree indicators.

2. Mounting system according to claim 1, **characterized in that**

   the indicator means (180, 310) are on an outer surface of the respective mounting element (100, 101, 102) and/or of the respective carrier element (300, 301, 302) facing away from the opposing joint (400),
   wherein preferably the indicator means (180, 310) being formed by degree indicators mapping a degree range of at least 180°.

3. Mounting system according to claim 1 or 2, **characterized in that**

   the mounting elements (100, 101, 102) each have at least two coupling points (110), for reversibly connecting at least two lighting modules (200) to the respective mounting element (100, 101, 102),
   wherein the mounting system (10) further has a receiving area (190) between the two mounting elements (100, 101, 102),
   whereby the receiving area (190) is formed to receive the at least two lighting modules (200),
   wherein each coupling point (110) of a first one of the mounting elements (101) is associated to a corresponding coupling point (110) of a second one of the mounting elements (102) in an opposing manner,
   whereby the opposing coupling points (110) form a tilt axis (*Tx, Tx1, Tx2, Tx3*),
   whereby preferably these tilt axes (*Tx, Tx1, Tx2, Tx3*) run parallel to each other,
   wherein preferably at least one of the mounting elements (100, 101, 102) has indicator elements (160) on a surface (105, 107) of the respective mounting element (100, 101, 102), wherein the indicator elements (160) are designed to indicate an angle of tilt (α) of a respective lighting module (200) with respect to the mounting element (100, 101, 102).

4. Mounting system according to claim 3, **characterized in that**

   the indicator elements (160) are on an outer surface (105) of the respective mounting element (100, 101, 102) facing away from the receiving area (190),
   wherein preferably each of the coupling points

(110) of the at least one mounting element (100, 101, 102) having associated indicator elements (160), and both mounting elements (100, 101, 102) particularly preferably having corresponding indicator elements (160),
wherein preferably the indicator elements (160) are each formed by degree markings which map a specific degree range, preferably a degree range of at least 30°, and particularly preferably a degree range of at least 120°.

5. Mounting system according to any one of the forgoing claims 3 or 4,
characterized in that
the at least one mounting element (100, 101, 102) has sundry indicator elements (160) and preferably at least two different indicator elements (160), in particular at least two different degree markings.

6. Mounting system according to any one of the forgoing claims 3 to 5,
characterized in that

each mounting element (100, 101, 102) has at least one through opening (140) which forms a handle element (120) of the respective mounting element (100, 101, 102),
wherein preferably the at least one through opening (140) is arranged between two coupling points (110) of a mounting element (100, 101, 102).

7. Mounting system according to any one of the forgoing claims 3 to 6,
characterized in that
the indicator elements (160) are arranged in an edge region of the respective mounting element (100, 101, 102).

8. Mounting system according to any one of the forgoing claims 3 to 7,
characterized in that
the mounting elements (100, 101, 102) are each arranged laterally on end faces (205) of the lighting modules (200).

9. Mounting system according to any one of the forgoing claims 3 to 8,
characterized in that
each mounting element (100, 101, 102) is formed approximately symmetrically, wherein in particular the coupling points (110) are arranged symmetrically with respect to a central axis (Cx) of the mounting element (100, 101, 102).

10. Mounting system according to any one of the forgoing claims 3 to 9,
characterized in that
each mounting element (100, 101, 102) has three coupling points (110) and/or
wherein each coupling point (110) is accessible from both an outer surface (105) and an inner surface (107) of a respective mounting element (100, 101, 102).

11. Mounting system according to any one of the forgoing claims 3 to 10, **characterized in that**
the coupling points (110) are configured for tiltable adjustment of a respective connected lighting module (200) about the respective tilt axis (*Tx, Tx1, Tx2, Tx3*).

12. Mounting system according to any one of the forgoing claims 3 to 11,
characterized in that
at least one mounting element (100, 101, 102) comprises fixing elements (111) for fixing a tilted positioning (*T, T1*, *T2, T3*) of a respective lighting module (200), preferably each coupling point (110) of the at least one mounting element (100, 101, 102) has at least one fixing element (111) associated therewith.

13. Mounting system according to any one of the forgoing claims 3 to 12,
characterized in that

at least one mounting element (100, 101, 102) has further fixing elements (171) for fixing a pivoted positioning (P) of the mounting elements (100, 101, 102) towards the carrier elements (300, 301, 302),
and/or preferably the mounting point (170) on each of the two mounting elements (100, 101, 102) is arranged on the central axis (Cx) of the mounting element (100, 101, 102),
and/or wherein the indicator means (180, 310) comprise further indicator elements (180) which are preferably formed by degree markings, which preferably map a degree range of 180°.

14. Mounting system according to any one of the forgoing claims 1 or 2,
characterized in that

the mounting system (10) further comprises additional carrier elements (303, 304) which are attached to the carrier elements (300, 301, 302) and which are formed to couple with an additional lighting module (200),
whereby the additional carrier elements (303, 304) are pivotable along the pivot axis (Px) with regard to the carrier elements (300, 301, 302) in a further pivoting movement,
wherein preferably this further pivoting movement is independent to the pivoting movement of the mounting elements (100, 101, 102) with

regard to the carrier elements (300, 301, 302), whereby preferably the further pivoting movement is supported and limited by guiding elements (321, 322),
wherein preferably these guiding elements (321, 322) comprise a guiding rail (321), whereby preferably an adjusted positioning of the additional carrier elements (303, 304) towards the carrier elements (300, 301, 302) is reversibly fixed by a fastening element (322), wherein preferably the additional carrier elements (303, 304) are arranged parallel to each other and spaced apart from each other.

15. A luminaire (1) comprising:

- a mounting system (10) according to any one of the preceding claims 1 to 14;
- at least one lighting module (200) connected to the mounting system (10).

16. Luminaire according to claim 15,
characterized in that
the luminaire (1) comprises at least one adjustable visor arrangement (500) that is coupled with the at least one lighting module (200).

17. Luminaire according to claim 16,
characterized in that
that the adjustable visor arrangement (500) comprises two lateral support elements (520) coupled with the lighting module (200) and a main visor (510) being pivotally attached to the two lateral support elements (520), whereby on the main visor (510) a telescopic visor panel (512) is provided, which is transversely moveable in an extension plane of the main visor (510), whereby the main visor (510) is pivotable along a visor pivot axis (Vx) with regard to the lateral support elements (520) in a pivoting movement.

18. An adjustable visor arrangement (500) for a lighting module (200), the visor arrangement (500) comprising two lateral support elements (520) being adapted to be coupled with a lighting module (200) and a main visor (510) being pivotally attached to the two lateral support elements (520), whereby on the main visor (510) a telescopic visor panel (512) is provided, which is transversely moveable in an extension plane of the main visor (510), whereby the main visor (510) is pivotable along a visor pivot axis (Vx) with regard to the lateral support elements (520) in a pivoting movement.

19. Luminaire or adjustable visor arrangement according to claim 17 or 18, **characterized in that**
the adjustable visor arrangement (500) comprises means of fixation (513b) for fixating an extended positioning of the telescopic visor panel (512) with regard to the main visor (510), and/or that the adjustable visor arrangement (500) comprises visor angle fixation means (516) for fixating an adjusted visor angle (δ) of the main visor (510) with regard to the lateral support elements (520).

20. Luminaire or adjustable visor arrangement according to claim 19,
characterized in that
the adjustable visor arrangement (500) comprises at least one visor angle readout (517) for displaying the adjusted visor angle (δ) of the main visor (510) with regard to the lateral support elements (520).

Amended claims in accordance with Rule 137(2) EPC.

1. An adjustable visor arrangement (500) for a lighting module (200), the visor arrangement (500) comprising two lateral support elements (520) being adapted to be coupled with a lighting module (200) and a main visor (510) being pivotally attached to the two lateral support elements (520), whereby on the main visor (510) a telescopic visor panel (512) is provided, which is transversely moveable in an extension plane of the main visor (510), whereby the main visor (510) is pivotable along a visor pivot axis (*Vx*) with regard to the lateral support elements (520) in a pivoting movement.

2. A luminaire (1) comprising:

- a mounting system (10) for mounting at least one lighting module (200), comprising:

  two carrier elements (300, 301, 302) being arranged parallel to each other and spaced apart from each other,
  two mounting elements (100, 101, 102) being arranged parallel to each other and spaced apart from each other,
  wherein each of the mounting elements (100, 101, 102) has at least one coupling point (110) for reversibly connecting the at least one lighting module (200) to the respective mounting element (100, 101, 102), and whereby the mounting system (10) further comprises joints (400) for coupling the mounting elements (100, 101, 102) to the carrier elements (300, 301, 302), the joints (400) each comprising a mounting point (170) on each of the mounting elements (100, 101, 102) and a further mounting point (370) on each of the carrier elements (300, 301, 302), wherein each joint (400) is associated to an opposing joint (400) forming a pivot axis (Px), whereby the mounting ele-

ments (100, 101, 102) are pivotable along the pivot axis (Px) with regard to the carrier elements (300, 301, 302) in a pivoting movement,
whereby at least one of each two opposing joints (400) comprises indicator means (180, 310), which are preferably formed by degree indicators;

- at least one lighting module (200) connected to the mounting system (10);

characterized in that
the luminaire (1) comprises at least one adjustable visor arrangement (500) according to claim 1, that is coupled with the at least one lighting module (200).

3. Luminaire according to claim 2,
characterized in that

the indicator means (180, 310) are on an outer surface of the respective mounting element (100, 101, 102) and/or of the respective carrier element (300, 301, 302) facing away from the opposing joint (400),
wherein preferably the indicator means (180, 310) being formed by degree indicators mapping a degree range of at least 180°.

4. Luminaire according to claim 2 or 3,
characterized in that

the mounting elements (100, 101, 102) each have at least two coupling points (110), for reversibly connecting at least two lighting modules (200) to the respective mounting element (100, 101, 102),
wherein the mounting system (10) further has a receiving area (190) between the two mounting elements (100, 101, 102),
whereby the receiving area (190) is formed to receive the at least two lighting modules (200),
wherein each coupling point (110) of a first one of the mounting elements (101) is associated to a corresponding coupling point (110) of a second one of the mounting elements (102) in an opposing manner,
whereby the opposing coupling points (110) form a tilt axis (*Tx, Tx1, Tx2, Tx3*),
whereby preferably these tilt axes (*Tx, Tx1, Tx2, Tx3*) run parallel to each other,
wherein preferably at least one of the mounting elements (100, 101, 102) has indicator elements (160) on a surface (105, 107) of the respective mounting element (100, 101, 102), wherein the indicator elements (160) are designed to indicate an angle of tilt (α) of a respective lighting module (200) with respect to the mounting element (100, 101, 102).

5. Luminaire according to claim 4,
characterized in that

the indicator elements (160) are on an outer surface (105) of the respective mounting element (100, 101, 102) facing away from the receiving area (190),
wherein preferably each of the coupling points (110) of the at least one mounting element (100, 101, 102) having associated indicator elements (160), and both mounting elements (100, 101, 102) particularly preferably having corresponding indicator elements (160),
wherein preferably the indicator elements (160) are each formed by degree markings which map a specific degree range, preferably a degree range of at least 30°, and particularly preferably a degree range of at least 120°.

6. Luminaire according to any one of the forgoing claims 4 or 5,
characterized in that
the at least one mounting element (100, 101, 102) has sundry indicator elements (160) and preferably at least two different indicator elements (160), in particular at least two different degree markings.

7. Luminaire according to any one of the forgoing claims 4 to 6,
characterized in that

each mounting element (100, 101, 102) has at least one through opening (140) which forms a handle element (120) of the respective mounting element (100, 101, 102),
wherein preferably the at least one through opening (140) is arranged between two coupling points (110) of a mounting element (100, 101, 102).

8. Luminaire according to any one of the forgoing claims 4 to 7,
characterized in that
the indicator elements (160) are arranged in an edge region of the respective mounting element (100, 101, 102).

9. Luminaire according to any one of the forgoing claims 4 to 8,
characterized in that
the mounting elements (100, 101, 102) are each arranged laterally on end faces (205) of the lighting modules (200).

10. Luminaire according to any one of the forgoing claims 4 to 9,

characterized in that
each mounting element (100, 101, 102) is formed approximately symmetrically, wherein in particular the coupling points (110) are arranged symmetrically with respect to a central axis *(Cx)* of the mounting element (100, 101, 102).

11. Luminaire according to any one of the forgoing claims 4 to 10,
characterized in that

each mounting element (100, 101, 102) has three coupling points (110) and/or
wherein each coupling point (110) is accessible from both an outer surface (105) and an inner surface (107) of a respective mounting element (100, 101, 102).

12. Luminaire according to any one of the forgoing claims 4 to 11,
characterized in that
the coupling points (110) are configured for tiltable adjustment of a respective connected lighting module (200) about the respective tilt axis (*Tx, Tx1, Tx2, Tx3*).

13. Luminaire according to any one of the forgoing claims 4 to 12,
characterized in that
at least one mounting element (100, 101, 102) comprises fixing elements (111) for fixing a tilted positioning (*T, T1, T2, T3*) of a respective lighting module (200), preferably each coupling point (110) of the at least one mounting element (100, 101, 102) has at least one fixing element (111) associated therewith.

14. Luminaire according to any one of the forgoing claims 4 to 13,
characterized in that

at least one mounting element (100, 101, 102) has further fixing elements (171) for fixing a pivoted positioning (P) of the mounting elements (100, 101, 102) towards the carrier elements (300, 301, 302),
and/or preferably the mounting point (170) on each of the two mounting elements (100, 101, 102) is arranged on the central axis (Cx) of the mounting element (100, 101, 102),
and/or wherein the indicator means (180, 310) comprise further indicator elements (180) which are preferably formed by degree markings, which preferably map a degree range of 180°.

15. Luminaire according to any one of the forgoing claims 2 or 3,
characterized in that
the mounting system (10) further comprises additional carrier elements (303, 304) which are attached to the carrier elements (300, 301, 302) and which are formed to couple with an additional lighting module (200),
whereby the additional carrier elements (303, 304) are pivotable along the pivot axis (Px) with regard to the carrier elements (300, 301, 302) in a further pivoting movement,
wherein preferably this further pivoting movement is independent to the pivoting movement of the mounting elements (100, 101, 102) with regard to the carrier elements (300, 301, 302),
whereby preferably the further pivoting movement is supported and limited by guiding elements (321, 322),
wherein preferably these guiding elements (321, 322) comprise a guiding rail (321), whereby preferably an adjusted positioning of the additional carrier elements (303, 304) towards the carrier elements (300, 301, 302) is reversibly fixed by a fastening element (322), wherein preferably the additional carrier elements (303, 304) are arranged parallel to each other and spaced apart from each other.

16. Luminaire or adjustable visor arrangement according to any one of the forgoing claims,
characterized in that
the adjustable visor arrangement (500) comprises means of fixation (513b) for fixating an extended positioning of the telescopic visor panel (512) with regard to the main visor (510), and/or that the adjustable visor arrangement (500) comprises visor angle fixation means (516) for fixating an adjusted visor angle (δ) of the main visor (510) with regard to the lateral support elements (520).

17. Luminaire or adjustable visor arrangement according to claim 16,
characterized in that
the adjustable visor arrangement (500) comprises at least one visor angle readout (517) for displaying the adjusted visor angle (δ) of the main visor (510) with regard to the lateral support elements (520).

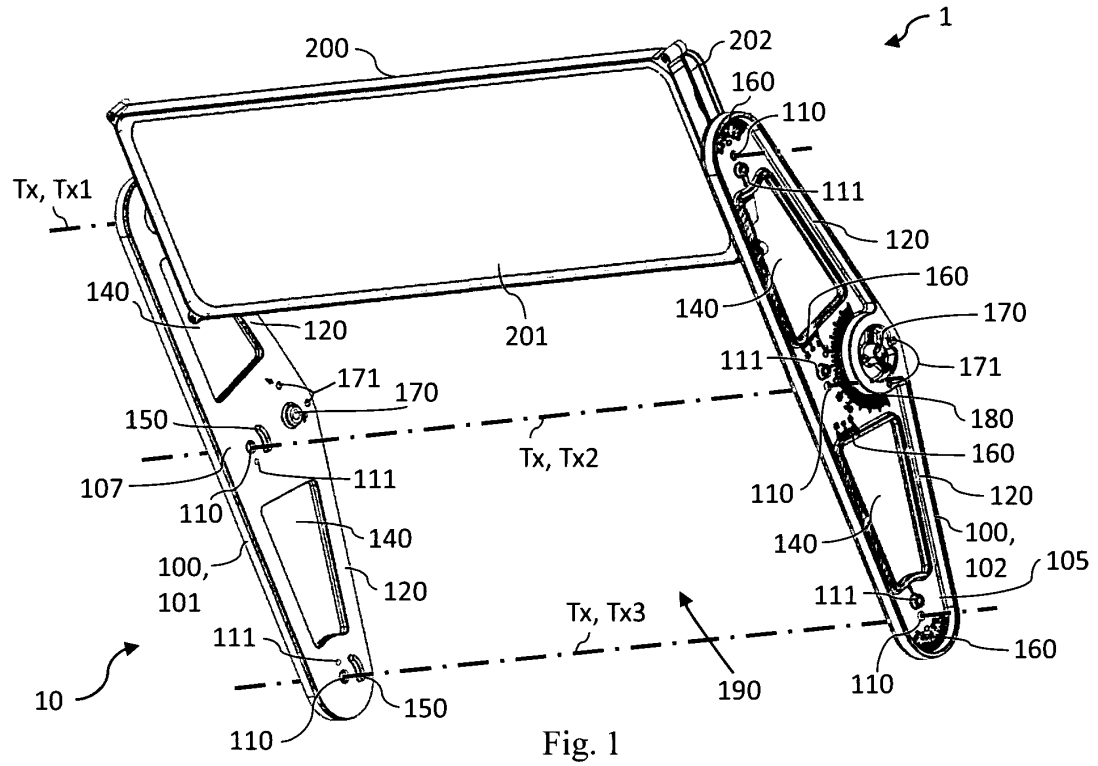
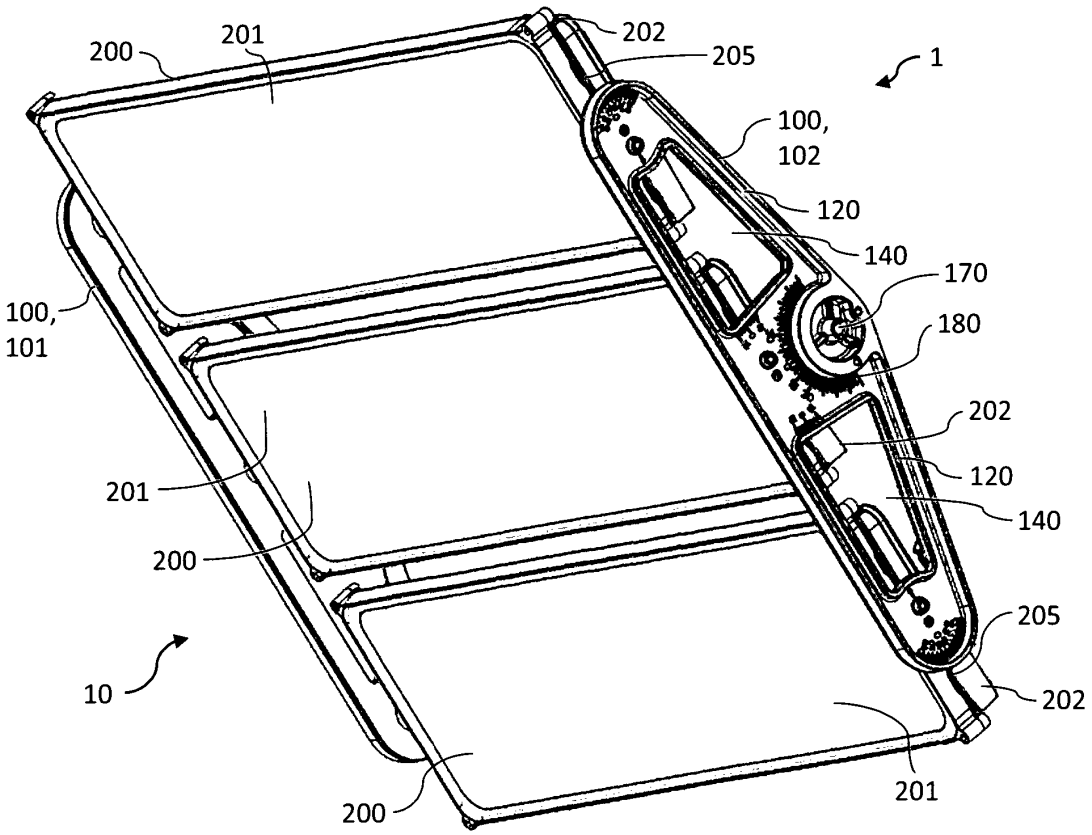

1
200
202
160
110
Tx, Tx1
111
120
140
160
201
140
170
111
171
171
150
180
Tx, Tx2
160
107
111
110
110
120
140
100,
102
100,
101
140
105
120
111
Tx, Tx3
111
160
10
190
110
150
110

Fig. 1


200
201
202
205
1
100,
102
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100,
101
170
180
202
201
120
140
200
205
10
202
200
201

Fig. 2

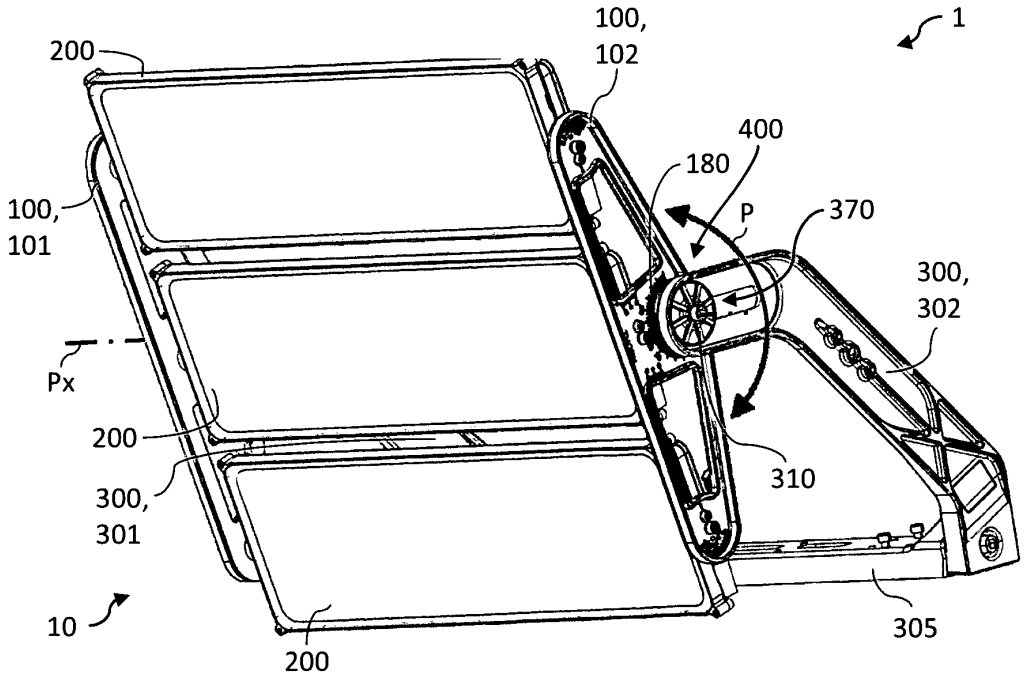

1
200
100,
102
400
180
P
370
100,
101
300,
302
Px
200
310
300,
301
10
305
200

Fig. 3

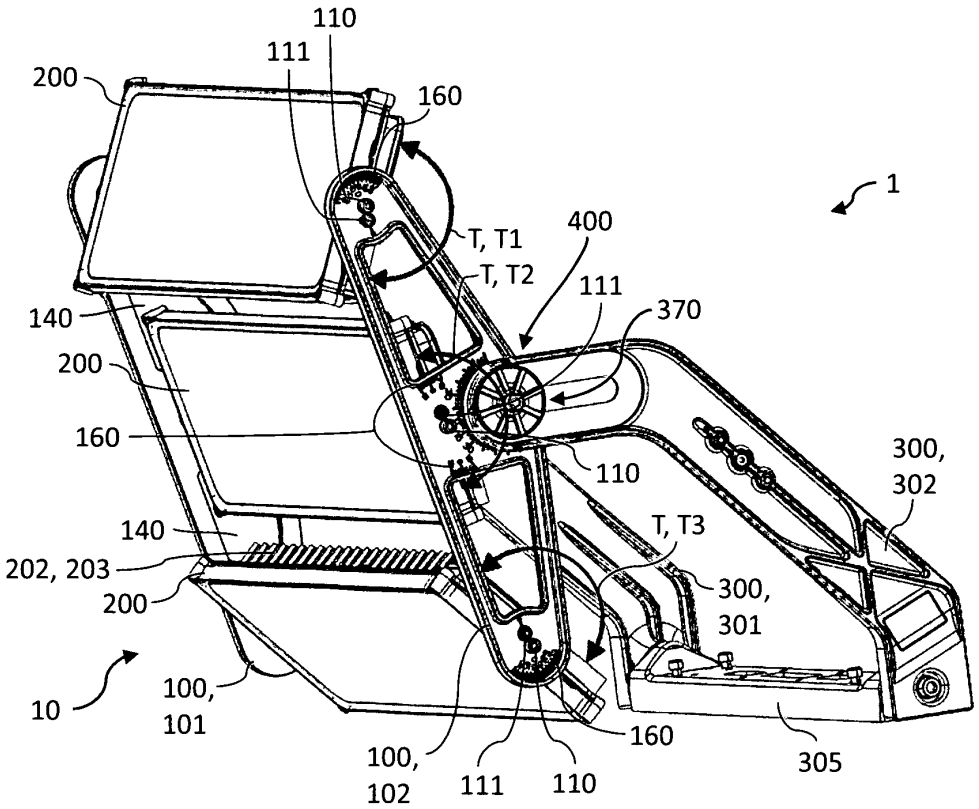

110
111
200
160
1
T, T1
400
T, T2
111
140
370
200
160
300,
302
110
140
T, T3
202, 203
300,
301
200
10
100,
101
160
305
100,
102
111
110

Fig. 4

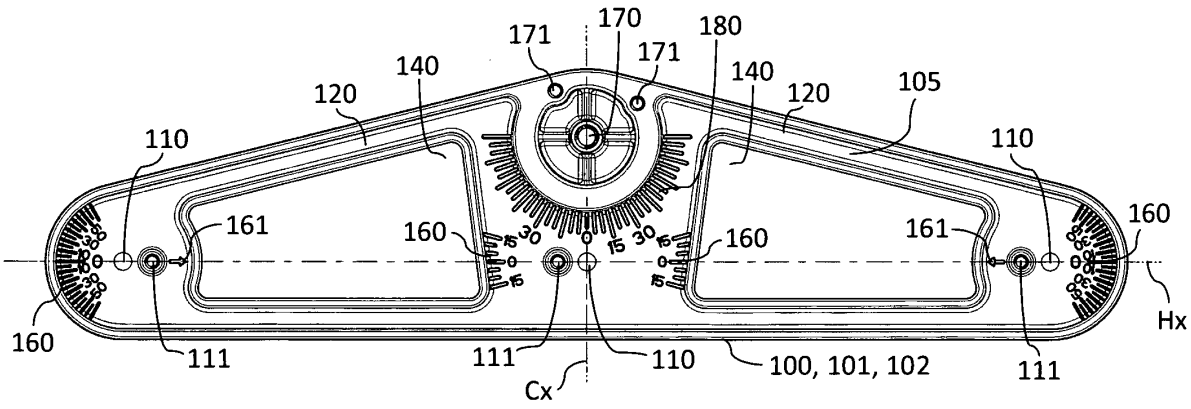


Fig. 5A

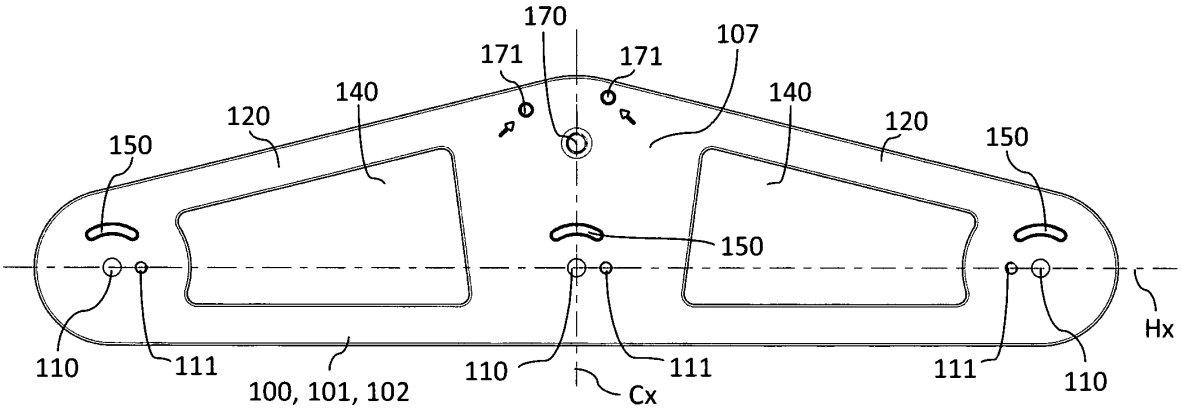


Fig. 5B

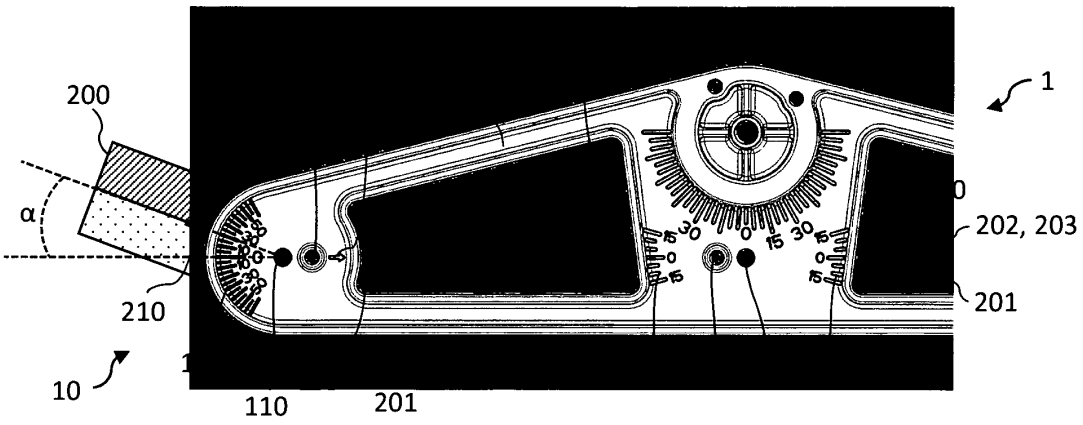
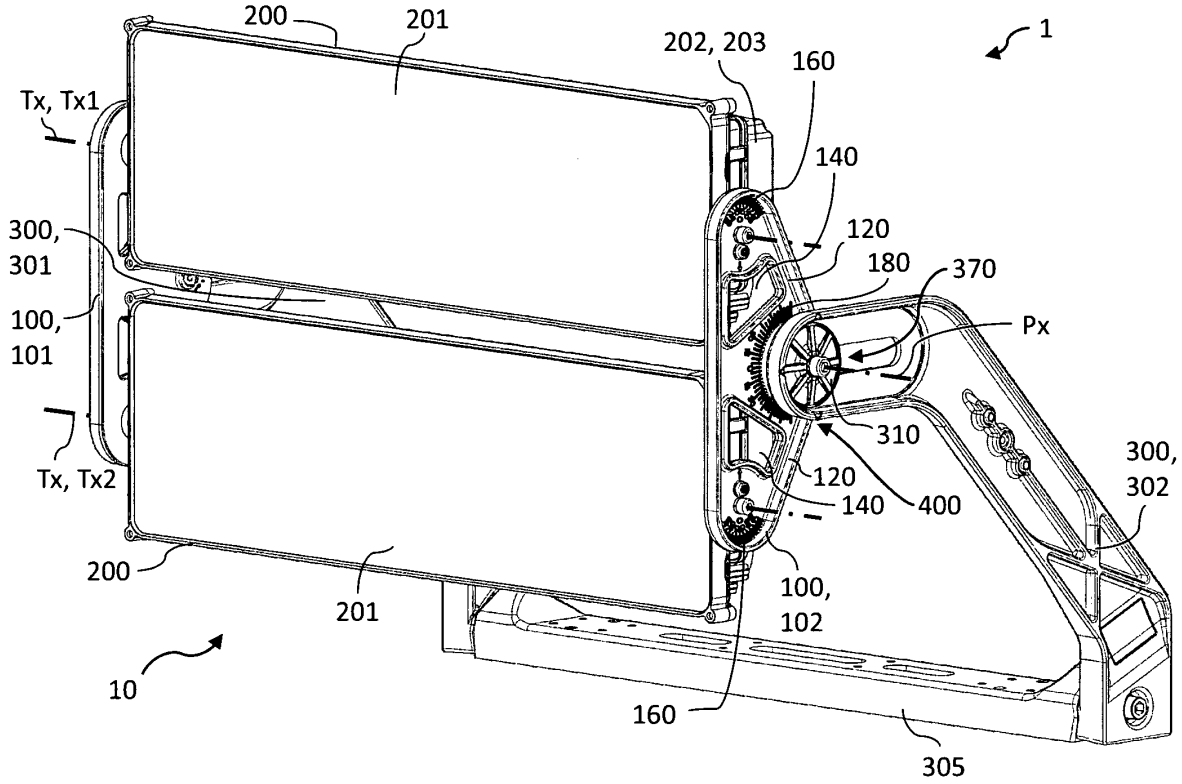


Fig. 6


200
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202, 203
160
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Tx, Tx1
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300,
301
120
180
370
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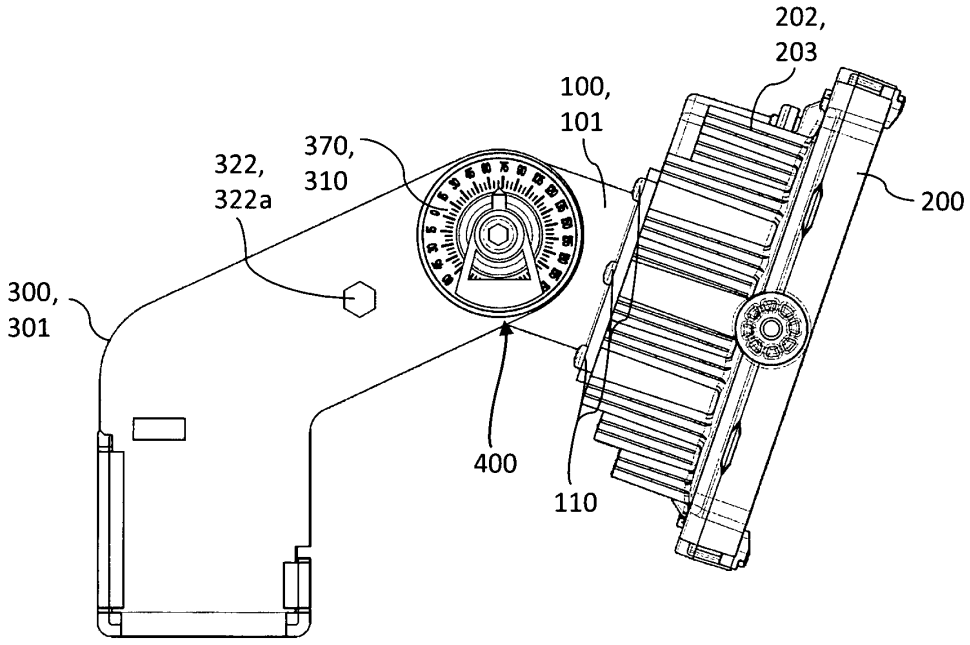
101
Px
310
300,
302
Tx, Tx2
120
140
400
200
201
100,
102
10
160
305

Fig. 7


202,
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370,
310
322,
322a
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300,
301
400
110

Fig. 8

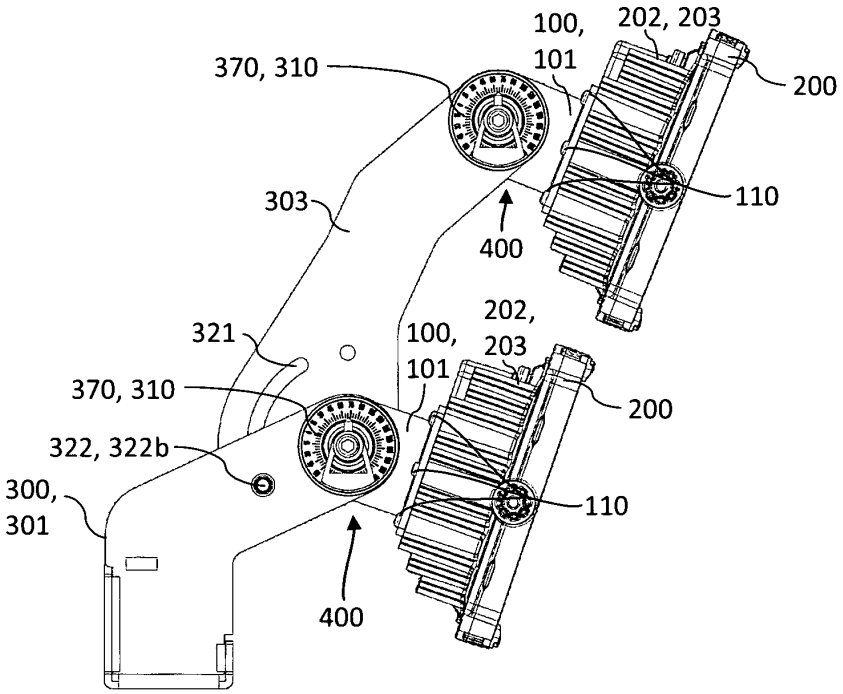
100,
101
202, 203
200
370, 310
303
110
400
321
100,
101
202,
203
370, 310
200
322, 322b
300,
301
110
400

Fig. 9A

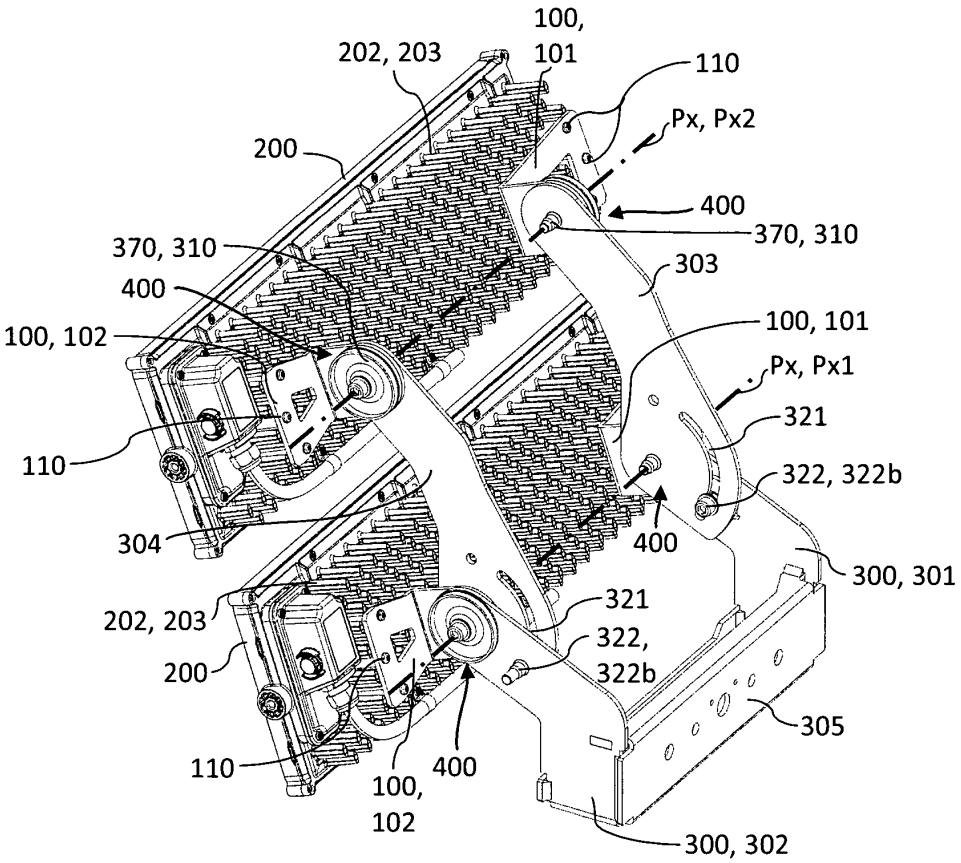
100,
101
202, 203
110
Px, Px2
200
400
370, 310
370, 310
303
400
100, 101
100, 102
Px, Px1
321
110
322, 322b
304
400
300, 301
321
202, 203
322,
322b
200
305
110
100,
102
400
300, 302

Fig. 9B

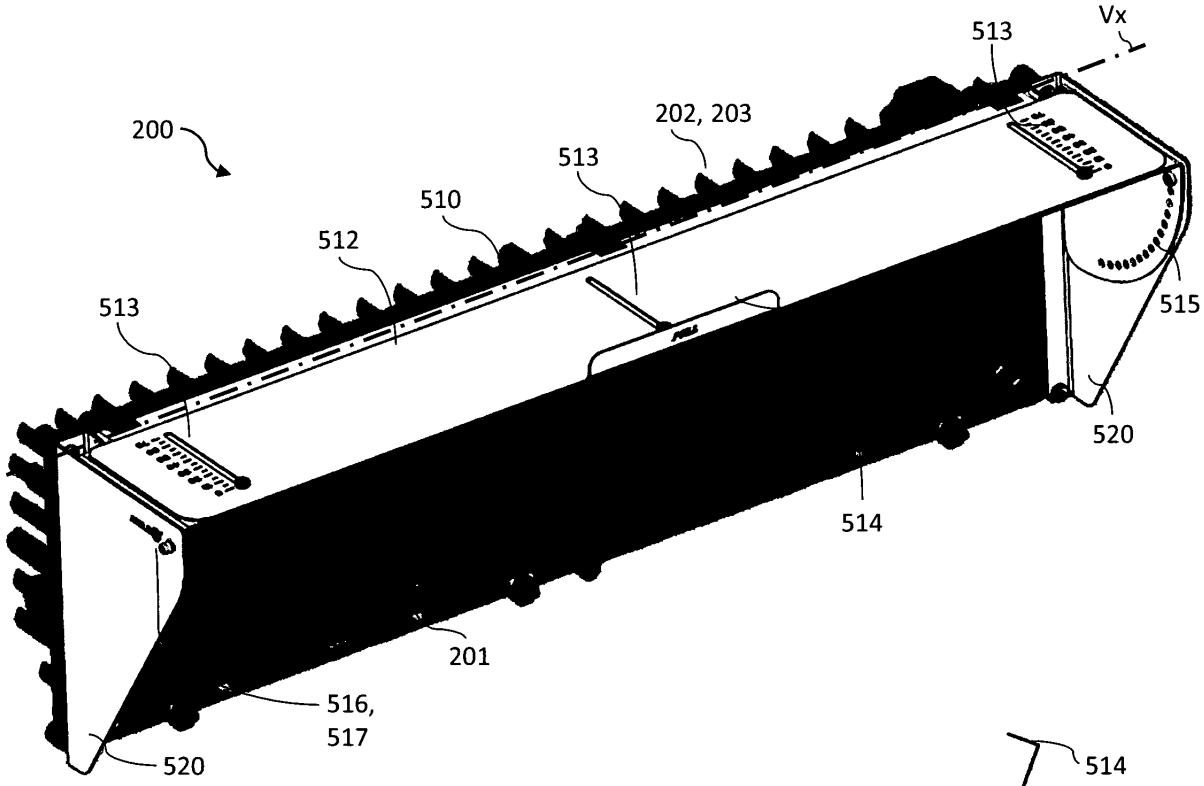

Fig. 10A

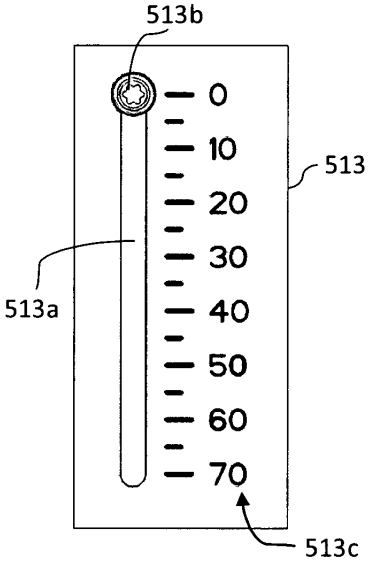

Fig. 10B

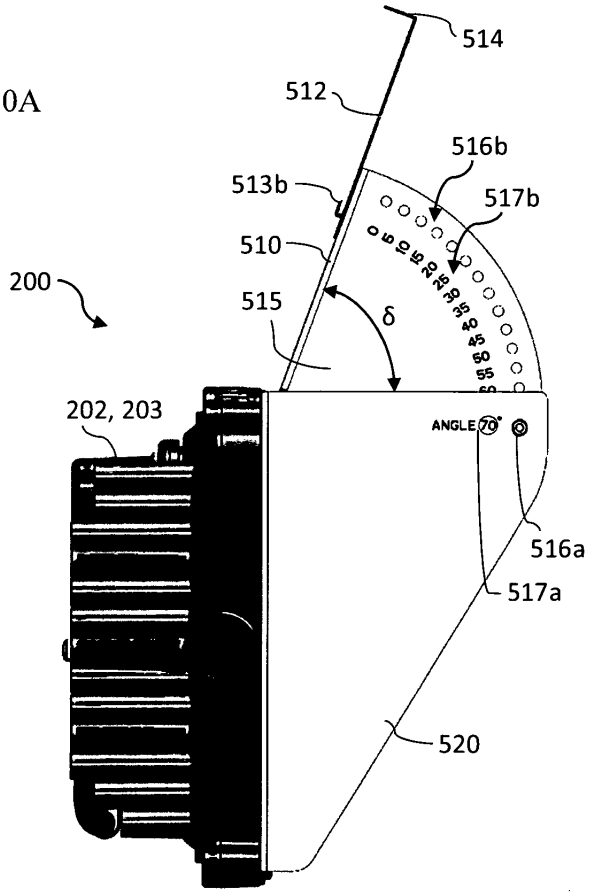

Fig. 10C

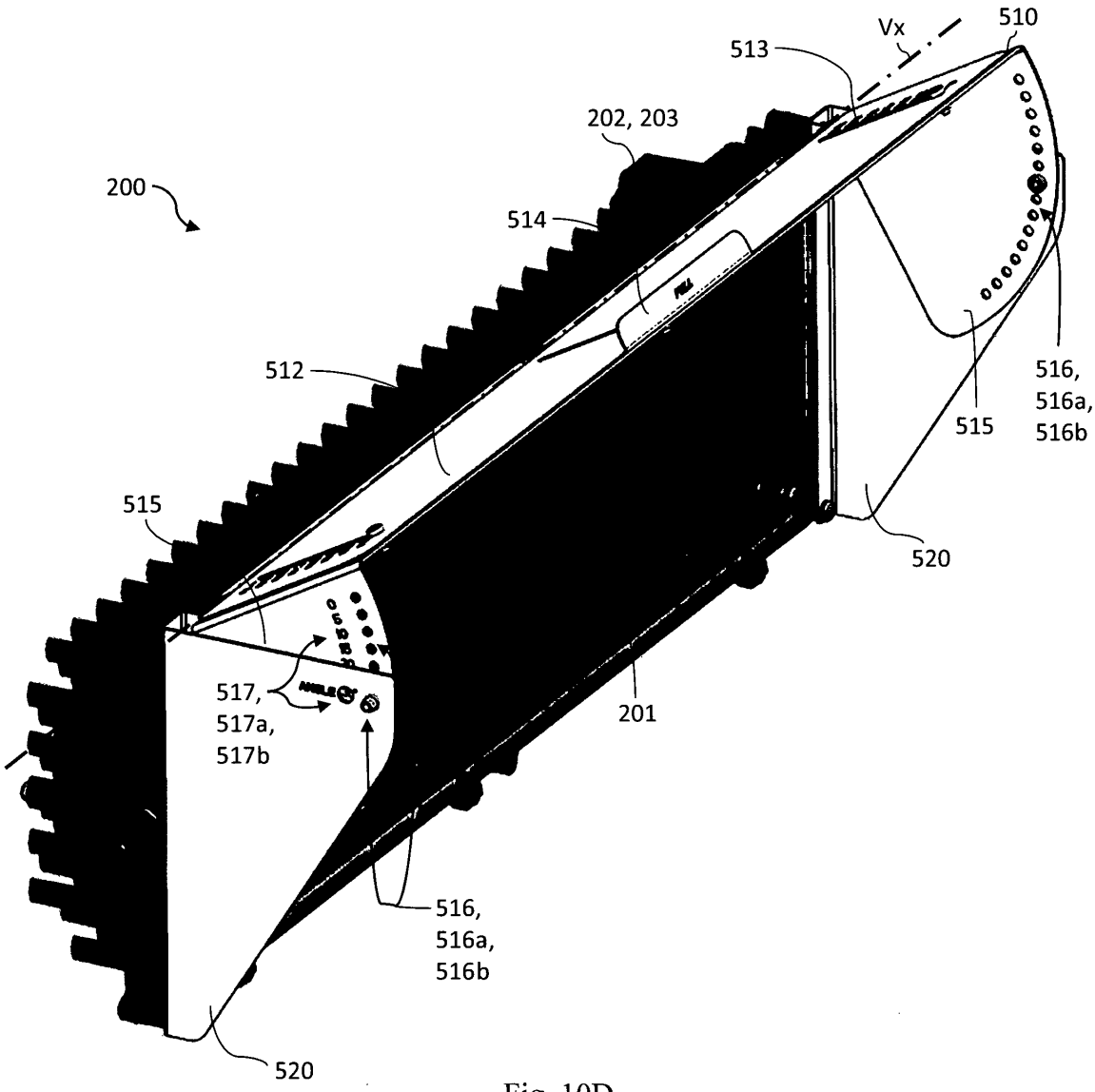
Vx
510
513
202, 203
200
514
512
516,
516a,
516b
515
515
520
517,
517a,
517b
201
516,
516a,
516b
520

Fig. 10D

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EUROPEAN SEARCH REPORT

Application Number
EP 21 29 0051

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	KR 102 029 959 B1 (POMELING CO LTD [KR]) 8 October 2019 (2019-10-08) * paragraph [0001] - paragraph [0078] * * figures 1-3 *	1,2,15	INV. F21V21/30 F21V11/18 ADD. F21Y115/10
X	WO 2013/090536 A1 (EPHESUS TECHNOLOGIES LLC [US]) 20 June 2013 (2013-06-20) * paragraph [0073] - paragraph [0149] * * figures 15,16,16a,17,20 *	1-5,7-15	
X	US 10 012 375 B1 (SALESSI NADER [US]) 3 July 2018 (2018-07-03)	1-15	
Y	* column 4, line 59 - column 19, line 50 * * figures 21a-e *	16	
Y	US 2018/347787 A1 (GORDIN MYRON [US] ET AL) 6 December 2018 (2018-12-06)	16	
A	* figure 16 * * paragraph [0063] *	1	
A	CN 211 040 593 U (UNIV SHANDONG SCIENCE & TECH) 17 July 2020 (2020-07-17) * paragraph [0012] - paragraph [0020] * * figures 1-4 *	1-20	TECHNICAL FIELDS SEARCHED (IPC) F21V F21Y

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 January 2022	Blokland, Russell

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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26-01-2022

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