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Description

Prior art

5 The invention relates to a solar module holding device according to the preamble of Claim 1, to a solar park according to Claim 24 and to a method for producing a solar module holding device according to Claim 25.

10 In US 2017/359017 A1, a solar module holding device has already been proposed which is provided to make possible an assembly of at least one solar module with a shaft, having a base body, which forms at least one support surface, which is provided for supporting at least a part of the solar module, wherein the base
15 body is formed as a sheet part with solar module holding elements moulded integrally on the base body.

The object of the invention consists in particular in providing a generic device with advantageous characteristics in terms of
20 efficiency, in particular in terms of a fixed holding with a reduced material requirement. According to the invention, the object is achieved through the features of Patent Claims 1, 24 and 25, while advantageous configurations and further developments of the invention can be taken from the subclaims.

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Advantages of the invention

The invention is based on a solar module holding device which is provided to make possible an assembly of at least one, in
30 particular solar-position-tracking solar module with a shaft, in particular a rotatable shaft with a base body that forms at least one support surface configured for supporting at least a section of the solar module, wherein the base body is embodied as a sheet part preferably implemented as one piece, with at
35 least one solar module holding element which is moulded on the base body integrally and is configured for fixing a solar module and with at least one further solar module holding element which is moulded on the base body integrally and is configured for a

fixing of a further solar module, wherein the solar module holding element is realized in a hook shape and protrudes from the support surface of the base body, wherein the solar module holding elements are in each case configured to create a form-fit connection to respectively one solar module, wherein the base body comprises a side wall and a further side wall.

It is proposed that the solar module holding element and the further solar module holding element is arranged in each case offset from a central line of the support surface towards the outside in the direction of the respective side walls. Advantageously, a particularly simple and/or particularly efficient production, of the solar module holding device, for example in a simple punch-bending method, can be made possible. Advantageously, particularly short production times can thus be achieved as a result of which in particular unit costs can be reduced. In addition, a material offcut can be kept particularly low in particular through a production from a single rectangular metal sheet. The solar module holding device is configured in particular as an intermediate piece between the shaft generating a rotation and the solar modules assigned to the shaft, which is to preferentially transmit on the one hand a movement of the shaft to the solar module and on the other hand ensure a fastening of the solar module on the shaft. Preferentially, multiple solar modules are assigned to a shaft within a solar park wherein each solar module is connected to at least one, preferentially to at least two solar module holding device(s). A "solar module" is to mean in particular a module which is provided for generating power from sunlight. Preferentially, the solar module is configured as a photovoltaic module. In particular, the shaft is configured as a rod, as a bar, as a spar or the like. In particular, the shaft is connected to a rotation-generating motor which is preferentially provided for adjusting a rotation position of the shaft as a function of a solar position. In particular, the solar modules lie in each case in a peripheral region of the solar modules, in particular with a frame part of the solar modules, on the support surface of the solar module holding device. The sheet part is in

particular configured as a metal sheet part, for example as an aluminium sheet part or as a steel sheet part. "In one piece" is to mean in particular materially connected, such as for example through a welding process and/or gluing process, etc.

5 and particularly advantageously moulded on, as through the production from one cast and/or through the production in a single or multi-component injection moulding method. Advantageously, "in one piece" is to mean also integrally. "Integrally" is to mean in particular moulded in one piece.
10 Preferentially, this one piece is produced from a single blank, a compound and/or a cast, particularly preferably in an injection moulding method. "Provided" is to mean in particular especially programmed, configured and/or equipped. That an object is provided for a certain function is to mean in
15 particular that the object fulfils and/or carries out this defined function in at least one application and/or operating state.

Further it is proposed that a height of the base body and a
20 width of the support surface of the base body are at least section-wise anti-correlated. Thus, a high efficiency can be advantageously achieved in particular in that a metal sheet which in a flat, unpressed state is substantially rectangular can be used as starting material and in that an offcut can be
25 preferably kept low. In particular, the height of the base body is compensated by the width of the base body or vice versa. Advantageously, a particularly good force distribution within the base body can be achieved in particular in that the base body is divided into regions which are particularly suited for
30 absorbing forces and into regions which are particularly suited to form as large as possible a support surface. "At least section-wise" in this connection is to mean in particular a section which, seen along a longitudinal direction of the base body, lies between a centre of the base body and an end region
35 of the base body. In particular, the height of the base body and the width of the support surface of the base body anti-correlate at least in a region of the base body in which the support surface of the base body tapers along the longitudinal direction.

A "longitudinal direction" of an object, in particular of the base body or of the support surface, is to mean in particular a direction which runs parallel to a main extension direction of the same object, in particular of the base body or the support surface, wherein the "main extension direction" of an object is to mean in particular as a direction which runs parallel to a longest edge of a smallest geometrical cuboid which just completely encloses the object. In particular, the longitudinal direction of the base body and the longitudinal direction of the support surface are parallel to one another, preferentially identical to one another. A height of the base body is to mean in particular an extent of the base body in a direction perpendicularly to a support plane formed by the support surface. A width of the support surface is to mean in particular an extent of the support surface in a direction perpendicularly to the longitudinal direction. That two parameters anti-correlate to one another is to mean in particular that an enlargement of one of the parameters results in a reduction of the other parameter or vice versa.

When the base body comprises at least one tapering region, within which the support surface tapers towards a centre of the base body, a particularly good force distribution can be advantageously achieved within the base body and/or a particularly good force absorption capacity of the base body can be achieved, in particular in that in a central region of the base body a particularly high stiffness of the base body against a load in particular in a direction perpendicularly to the support surface can be achieved and/or in that a region of the base body located in a longitudinal direction of the support surface on the outside as large as possible a support surface can be made possible. A centre of the base body is to mean in particular a centre of the support surface in the longitudinal direction of the support surface. Preferentially, the support surface tapers from both end regions of the base body located outside in the longitudinal direction in the direction towards the centre of the support surface. In particular, the support surface has a maximum width at the end regions of the base body

seen in the longitudinal direction. In particular, the support surface has a minimal width in the, seen in the longitudinal direction, central region of the base body. Preferentially, the tapering in the tapering region takes place continuously and/or linearly. Alternatively, the tapering can also follow a course deviating from a linear course. In particular, the width of the support surface decreases within the tapering region by at least 40%, preferentially by at least 65%, preferably by at least 100% and particularly preferably by maximally 150%.

A particularly advantageous force distribution over the base body and/or a particularly advantageous force absorption capacity of the base body can be additionally achieved when the height of the base body in the tapering region increases towards the centre of the base body, in particular towards the centre of the support surface. Thus, a particularly high stiffness of the base body can be advantageously achieved in a near region of the centre of the base body or in a near region of a shaft support element preferentially arranged centrally in the base body, which is provided for connecting the base body with the shaft. In particular, a ratio of the height of the base body and width of the support surface in one of the end regions of the base body located outside in the longitudinal direction is at least 1:3, preferentially at least 1:2 and preferably maximally 1:1. In particular, a ratio of height of the base body and width of the support surface in the centre of the support surface is maximally 2:1, preferentially maximally 3:2 and preferably at least 1:1. In particular, the height of the base body within the tapering region increases by at least 30%, preferentially by at least 50% and preferably by at least 70% and particularly preferably by at least 100%.

For a further improvement of the advantageous force distribution and/or the advantageous force absorption capacity it is proposed that the base body comprises at least one side wall, preferentially two side walls which is/are at least substantially bent off perpendicularly to the support surface. In particular, the side wall is formed in one piece with the

sheet part. In particular, the side wall is formed by a piece of the sheet part bent off at an angle of approximately 90° relative to the support surface. In particular, the base body includes two side walls arranged on opposite ends of the base body. In particular, the side walls are arranged at least on long edges of the base body.

In particular, the side walls are arranged at least at the ends of the base body which delimit the base body perpendicularly to the longitudinal direction. In particular, the side walls are at least substantially formed identically to one another. "Substantially identical" is to mean in particular identical except for production tolerances. The expression "substantially perpendicular" here is to define in particular an orientation of a direction relative to a reference direction, wherein the direction and the reference direction, in particular viewed in a plane, include an angle of 90° and the angle has a maximum deviation of in particular less than 8° , advantageously less than 5° and particularly advantageously less than 2° .

Apart from this, it is proposed for a further improvement of the advantageous force distribution and/or of the advantageous force absorption capacity that the side wall delimits the base body sidewise at least along a large part of a longitudinal extension of the base body. A "sidewise delimitation" of the base body is to mean in particular a delimiting of the base body in a direction perpendicularly to the longitudinal direction of the base body. A "longitudinal extent" is to mean in particular a maximum extent of the base body in a direction running parallel to the main extension direction and/or the longitudinal direction. A "large part of the longitudinal extent" in this connection is to mean in particular at least 51%, preferentially at least 55% and preferably at least 60% of a total longitudinal extent of the base body. Particularly preferably, the side walls delimit the base body along the entire longitudinal extent of the base body except for a region of the base body, in which the base body forms shaft support elements.

In addition it is proposed that total lengths of developments offcuts produced perpendicularly to a longitudinal direction of the base body are at least substantially constant over a large part of the base body, in particular in the tapering region.

5 Thus, a high efficiency with respect to the material consumption can advantageously be achieved. In particular, an offcut can thus be kept particularly low. Advantageously, a development of the entire base body corresponds at least substantially to a rectangular plate. A "large part of the base body" in this
10 connection is to mean at least 51%, preferentially at least 60%, preferably at least 66% and particularly preferably at least 75% of the entire base body. In particular, at least 70%, preferentially at least 80% of all total lengths offcuts produced perpendicularly to a main extension direction of the
15 base body are at least substantially constant in the tapering region. A "development" is to mean in particular a sheet metal development and/or a blank. Preferentially, development is to mean an imaginary flat, in particular unbent metal sheet which is required for producing the base body for example by folding
20 or by punching-bending. "Substantially constant" total lengths is to mean in this connection in particular lengths which have a maximum deviation from one another that is less than 5%, preferentially less than 3% and preferably less than 1%.

25 When at least a large part of the base body has an at least substantially constant material thickness, in particular wall thickness, a particularly high stability of the solar module holding device can be advantageously achieved. In addition, a particularly high efficiency with respect to a material
30 consumption can be advantageously achieved. In particular in that upon a selection of a desired end wall thickness no wall thickness reductions through a tensile stressing of a starting metal sheet have to be taken into account, as a result of which in particular unmoulded parts of the base body can have an
35 unnecessarily high material thickness. In particular, the base body is produced at least substantially free of a production method changing a material thickness such as for example a deep-drawing. Thus, deviations of wall thicknesses of different solar

module holding devices can be advantageously kept low. A "large part of the base body" in this connection is to mean in particular at least 90%, preferentially at least 95%, advantageously at least 97% and preferably at least 99%.

5 Particularly preferably, the entire base body has a constant material thickness, in particular wall thickness, in particular except of partial regions of the shaft support elements. A "substantially constant material thickness" is to mean in particular a material thickness which in a range of production
10 tolerances is constant. Preferentially, a deviation of the material thicknesses distributed over the base body is less than 8%, advantageously less than 5%, preferably less than 3% and particularly preferably less than 1%. In particular, the constant material thickness is approximately 2.5 mm.

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Apart from this it is proposed that the base body, in particular the side wall, forms at least the shaft support element which is provided for supporting the base body on the shaft. Thus, a stable support of the base body on the shaft can be achieved.

20 Advantageously, a high stability, in particular of a mounted state, in which the base body is fastened on the shaft, can be achieved. The shaft support element is formed in one piece with the base body. The shaft support element is bent off from the side wall at least substantially perpendicularly to the side
25 wall. The shaft support element is bent off from the side wall towards the outside facing away from the support surface. Alternatively, the shaft support element could also be designed bent off towards the inside pointing towards the support surface, which is configured in particular free of a bend and provided
30 for being directly supported with the edge on the shaft. In particular, the shaft support element forms a shaft support surface which in the mounted state is supported on a surface of the shaft.

35 Further it is proposed that the shaft support element has an extension perpendicularly to a longitudinal direction of the support surface of the base body, which corresponds at least to three times, preferentially four times a material thickness of

the base body. Thus, a particularly high stability, in particular of the mounted state, in which the base body is fastened on the shaft, can be advantageously achieved. In addition, a canting of the base body with the shaft can be advantageously prevented as far as possible. In particular, the extent of the shaft support element perpendicularly to the longitudinal direction of the support surface of the base body is 10 mm.

When the shaft support surface formed by the shaft support element, in a sidewise view of the base body, forms an at least substantially polygonal, in particular an at least substantially semi-hexagonal contour, a particularly high stability in particular of the mounted state in which the base body is fastened on the shaft can be advantageously achieved. In addition, a rotationally fixed holding of the base body and thus also of the solar body on the shaft can thus be additionally achieved. Advantageously, it can thus be achieved that the base body follows a rotation of the shaft about a shaft of rotation of the shaft running parallel to a longitudinal direction of the shaft. In particular, the contour is polygonal, preferentially semi-hexagonal, except for an individual side of the polygon, preferentially of the semi-hexagon, which has an additional, in particular semi-circular recess and/or protrusion.

In addition it is proposed that the shaft support element comprises at least one partial region which is provided, upon a support of the base body on the shaft, to remain free of a contact with the shaft and thus provides in a longitudinal direction of the shaft an, in particular enlarged, interspace between the shaft and the base body. Thus, space for routing cables or similar along the shaft can thus be advantageously achieved in the mounted state, in which the base body is fastened on the shaft. In particular, a connector, in particular a standardized solar module connector, can be advantageously routed through the interspace between the shaft and the base body. Advantageously, a high fixing and/or maintenance efficiency can thus be achieved.

Furthermore it is proposed that, in particular for making possible an advantageous fastening of the base body on the shaft, the side wall comprises at least one recess, which is provided for fastening a shaft mounting clamp. In particular, the recess is configured as a rectangular elongated hole which extends along the side wall in particular in a direction running parallel to the support surface of the base body. Preferentially, each side wall comprises at least two recesses which are provided for fastening a shaft mounting clamp each. In particular, the recesses of different side walls are arranged in a direction perpendicularly to the longitudinal direction of the base body, located opposite one another. In particular, the two recesses of a side wall are arranged relative to the shaft support element of the side wall, on opposite sides. In particular, the recesses of a side wall are arranged mirrored relative to one another. In particular, an extension in a direction perpendicular to the support surface of the base body of each recess is enlarged on a side of the recess facing the shaft support element. Thus, a slipping of the shaft mounting clamp in the mounted state can be advantageously prevented. The shaft mounting clamp is provided in particular to engage, in the mounted state, partially in at least two recesses arranged on opposite side walls and be thus hooked into the recess.

When the recess for receiving the shaft mounting clamp is at least partially, preferentially at least to a large part, arranged in a tapering region of the base body, a high fixing efficiency can be advantageously achieved. In particular, a particularly simple fixing of the shaft mounting clamp to the base body can be advantageously made possible. In particular, a part of the shaft mounting clamp provided for engagement in the recess of the side wall can thus be pushed in between opposite side walls in a region of the base body, in which the side walls through the tapering of the support surface have a larger distance from one another, and can thus be easily positioned in the recesses. Following this, the part of the shaft mounting clamp provided for engagement in the recess of the side wall can

be advantageously moved further in the direction of the centre of the base body until it preferentially projects from the recesses and protrudes over the side walls and is thus fixed relative to the base body in a direction perpendicularly to the support surface. "A large part" in this connection is to mean
5 in particular 80%, preferentially 90% and preferably 95%.

The solar module holding device comprises at least one solar module holding element moulded in one piece, preferentially
10 integrally, to the base body, which is provided for fastening and/or positioning a solar module. Thus, a high mounting efficiency can be advantageously achieved. In particular, a simple mounting of the solar module on the base body can be advantageously made possible.

15 The solar module holding device comprises at least one further solar module holding element moulded in one piece, preferentially integrally, to the base body, which is provided for fastening and/or positioning a further solar module that is
20 distinct from the solar module. Thus, a high mounting efficiency can be advantageously achieved. In particular, a simple mounting of the further solar module on the base body can be advantageously achieved. Advantageously, at least two solar modules can be mounted on the solar module holding device. In
25 particular, seen in the longitudinal direction of the base body, the solar module holding element and/or the further solar module holding element is arranged in an end region of the base body. An "end region" is to mean in particular a region of the base body which is formed of points which are maximally 30 mm,
30 preferentially maximally 40 mm and preferably maximally 50 mm distant from an end of the base body lying in the longitudinal direction. Particularly preferably, the end region is configured as at least one region of the base body which is formed by points the distance of which from an end of the base body lying in the
35 longitudinal direction corresponds to maximally 10% of a maximum longitudinal extent of the base body. In particular, the solar module holding element and/or the further solar module holding element are arranged on the support surface of the base body.

The solar module holding element and the further solar module holding element project out of the support surface of the base body. The solar module holding element and the further solar module holding element are each arranged offset from the central line of the support surface towards the outside in the direction of the respective side walls, wherein in particular one of the solar module holding elements is arranged nearer to a side wall and the other of the solar module holding elements is arranged nearer to the opposite side wall. In particular, the solar module holding element and/or the further solar module holding element is arranged in a region of the support surface in which the support surface has a maximum width. In particular, the solar module holding element and/or the further solar module holding element are arranged outside the tapering region. The solar module holding elements are each provided to establish a form-fit connection with a solar module each. In particular, the solar module holding elements are provided to engage in a recess of the solar modules corresponding to the solar module holding elements in a form-fit manner. In particular, the solar module holding elements are spaced apart from one another in a plane of the support surface in a direction perpendicularly to a longitudinal direction of the support surface, by at least 40 mm, preferentially at least 49 mm, advantageously at least 55 mm, preferably at least 61 mm and particularly preferably maximally 70 mm. A "fastening" is to mean in particular a suspension and/or a preassembly in particular a prepositioning for a final assembly. A positioning is to mean in particular an orientation and/or the prepositioning.

The solar module holding elements are configured hook-shaped. Thus, a high mounting efficiency can be advantageously achieved, in particular in that a simple mounting, preferentially without tools, in particular pre-assembling and/or positioning of the solar modules on the base body can be made possible. Advantageously, a form-fit connection between the base body and the solar module can thus be established. In particular, the hook-shaped solar module holding element projects, at least substantially, perpendicularly from the support surface of the

base body. Preferentially, the hook-shaped solar module holding element forms a stop surface for a solar module, which is at least substantially arranged perpendicularly to the support surface. In particular, the solar module holding element protrudes at least 4 mm, preferentially at least 6 mm and preferably at least 8 mm over the support surface. A "hook-shaped" solar holding element is to mean in particular a solar holding element which is curved or angularly curved in such a manner that in at least one orientation of the solar holding element a load can be hooked into the solar holding element. In particular, the ends of the hook-shaped solar holding elements face in the longitudinal direction of the support surface. In particular, the ends of the hook-shaped solar holding elements face in a direction facing away from the centre of the support surface.

Additionally it is proposed that the solar module holding element comprises at least one potential compensation element, in particular grounding element, moulded onto the base body in one piece, preferentially integrally, which is provided for electrically contacting, in particular grounding a solar module. Thus, a high efficiency, in particular with respect to a fixing and/or a material consumption can be advantageously achieved.

On the one hand, a necessary grounding of a mounted solar module can be advantageously achieved in a particularly simple manner. Thus, costs can be advantageously reduced. On the other hand, a necessary grounding of the mounted solar module without a need for additional components can be advantageously accomplished. Advantageously, a high operational safety can be ensured. A "potential compensation element" is to mean in particular an element which is provided for establishing a potential compensation between the solar module, in particular a frame of the solar module, and the base body, in particular the ground. In particular, the base body is grounded at least in the mounted state. In particular, the base body in the mounted state is located on a ground potential.

Further it is proposed that the solar module holding device a further potential compensation element moulded on the base body in one piece, in particular integrally, in particular a further grounding element which is provided for electrically contacting, in particular grounding a further solar module that is distinct from the solar module. Thus, a simple and material-saving grounding of a further solar module can be advantageously made possible through the solar module holding device. In particular, seen in the longitudinal direction of the base body, the potential compensation element and/or the further potential compensation element are arranged in the end region of the base body. Particularly preferably, the potential compensation elements are arranged on an edge of the base body which in the longitudinal direction is located outside. In particular, the potential compensation element and/or the further potential compensation element are/is arranged on the support surface of the base body. In particular, the potential compensation element and/or the further potential compensation element projects out of the support surface of the base body. In particular, the potential compensation element and/or the further potential compensation element are each arranged offset from a central line of the support surface towards the outside in the direction of the respective side walls, wherein in particular one of the potential compensation elements is arranged nearer to a side wall and the other of the potential compensation elements is arranged nearer to the opposite side wall. In particular, the potential compensation element and/or the further potential compensation element are arranged in a region of the support surface in which the support surface has a maximum width. In particular, the potential compensation element and/or the further potential compensation element are arranged outside the tapering region. In particular, the potential compensation elements are spaced apart from one another in a plane of the support surface in a direction perpendicularly to the longitudinal direction of the support surface by at least 40 mm, preferentially at least 49 mm, advantageously at least 55 mm, preferably at least 61 mm and particular preferably maximally 70 mm. In particular, the potential compensation elements and

the solar module holding elements are arranged on ends of the base body located opposite in the longitudinal direction. In particular, it is conceivable that the base body comprises more than two solar module holding elements and/or potential compensation elements that are formed in particular in one piece with the base body.

When the potential compensation element/s, preferentially the grounding element/s form/s a tip projecting out of the support surface, in particular at least substantially perpendicularly, which is provided in particular to penetrate a surface layer of the solar module supported on the support surface, for example an anodized layer of the solar module, a potential compensation that is particularly easy to fix and/or particularly material-saving can be advantageously achieved between the base body and one or two solar modules in the fixed state. In particular, the tip protrudes at least 1 mm over the support surface upwards.

When the base body, in particular on the support surface, comprises at least one threaded hole, a high mounting efficiency can be advantageously achieved. In particular, a simple final assembly of solar modules, which were in particular hooked into the solar module holding elements in a pre-assembly step, can be advantageously achieved on the base body. Advantageously, no counterparts such as for example nuts are thus necessary for an assembly, as a result of which an assembly, in particular final assembly, of the solar modules on the solar module holding devices can be advantageously carried out from only one side of the solar module, in particular from a top side of the solar modules. In particular, seen in the longitudinal direction of the base body, the threaded hole is arranged in the end region of the base body. In particular, the threaded hole is arranged on a central line of the support surface preferentially halving the support surface. In particular, the threaded hole is arranged in a region of the support surface in which the support surface has a maximum width. In particular, the threaded hole is arranged outside the tapering region. In particular, the threaded hole has an internal thread. In particular, the

threaded hole forms an M6, an M7, an M8, an M9 or an M10 thread. In particular, the threaded holes are arranged, seen along the longitudinal direction, on opposite ends of the base body. In particular, the threaded holes are configured at least
5 substantially identically to one another. In particular, it is conceivable that the base body has more than two threaded holes.

Further it is proposed that the base body comprises in particular a stiffening element formed in one piece, preferentially
10 integrally with the base body, which is arranged in a near region of the threaded hole and provided to stiffen the base body at least in the near region of the threaded hole. Thus, a particularly high stability can be achieved. In particular, the stiffening element is configured as at least one bead,
15 preferentially as at least two beads, which, at least partially, engage about the threaded hole in the plane of the support surface. In particular, the stiffening element is at least 2 mm deep. In particular, each threaded whole comprises a separate stiffening element. A "near region" is to mean in particular a
20 region which is formed of points having a distance from the threaded hole that is smaller than four times, preferentially three times the opening diameter of the threaded hole.

When, in addition, the support surface comprises at least one
25 bead arranged centrally in the base body for stiffening the base body, a particularly high stability with a minimized material consumption can be advantageously achieved at the same time. In particular, the bead is at least 2.5 mm deep. In particular, the bead is at least 200 mm long. In particular, the bead is
30 configured so as to terminate flat in the end regions of the bead. In particular, a slope of the bead in the end regions terminating flat is less than 45° , preferentially less than 35° . Thus it can be advantageously achieved that with a 45° slope of the base body relative to a level ground surface, rainwater
35 collected in the bead drains completely. In particular, it is conceivable that the base body comprises more than one bead for stiffening the base body.

In addition it is proposed that the base body comprises at least one recess for receiving a blind rivet, which is arranged offset sidewise relative to a central axis of the base body running parallel to a longitudinal direction of the base body. Thus, a particularly simple and stable assembly of the solar modules on the base body can be advantageously made possible. In particular, the assembly by means of the blind rivet can take place alternatively or additionally to the assembly by means of the threaded hole. The recess for receiving the blind rivet is configured in particular as a hole in the support surface. In particular, the base body comprises a further recess for receiving a further blind rivet which is arranged conversely offset sidewise relative to a central axis of the sheet part running parallel to a main extension direction of the base body like the in particular previously described recess for receiving the blind rivet. In particular, the recesses for receiving the blind rivets are arranged in the tapering region of the base body. In particular, the recesses for receiving the blind rivets are arranged in the longitudinal direction on opposite sides of the centre of the base body. In particular, a blind rivet for an assembly advantageously requires only one access from one side, as a result of which, furthermore, an assembly of the solar modules on the base body advantageously remains exclusively possible from a top side of the solar modules.

In addition it is proposed that the base body is formed mirror-symmetrically at least substantially, in particular except for recesses for receiving blind rivets. Thus, a high assembly efficiency can be advantageously achieved, in particular in that during an assembly the solar module holding device can be rotated by 180° as desired. Thus, assembly errors can be advantageously avoided and an assembly can be altogether accelerated. In particular, the base body is configured mirror-symmetrically to at least two mirror planes. In particular a first mirror plane is defined by a central line halving the support surface in the longitudinal direction and by a perpendicular on the support surface. In particular, a second mirror plane is defined by a further central line halving the support surface perpendicularly

to the longitudinal direction and by the perpendicular on the support surface.

When, additionally, the base body comprises an anti-corrosion protection coating, a long lifespan can be advantageously achieved. In particular, the base body comprises a dip-galvanising and/or a Zn-Al-Mg coating, for example a Magnelis® coating.

Further it is proposed that the solar module holding device comprises the shaft mounting clamp which is provided for a rotationally fixed mounting of the base body on the shaft. Thus, an efficient and simple assembly of the solar module holding device on the shaft can be advantageously made possible. In addition it can be advantageously ensured that the solar modules mounted by means of the solar module holding device can track a rotational movement of the shaft. The shaft mounting clamp includes at least two clamp elements which are provided to be joined during an assembly in order to engage about the shaft at least over half a circumference of the shaft.

Apart from this, a solar park having a plurality of solar module holding devices with at least one shaft and with a plurality of solar modules and a method for producing the base body of the solar module holding device is proposed, wherein at least one solar module holding element and at least one further solar module holding element are each moulded on the base body offset in one piece from a central line of a support surface of the base body towards the outside in the direction of side walls of the base body.

In that during a production of the base body a sheet metal offcut of less than 15%, preferentially less than 10%, preferably less than 7% and particularly preferably less than 5% of an in particular flat starting metal sheet free of recesses is produced, a high efficiency with respect to a material consumption and/or with respect to an energy consumption can be advantageously achieved. In particular, unit costs can thus be

advantageously kept low. In particular, a sheet metal offcut is restricted to the threaded holes, to the recesses for receiving a blind rivet, for maximally two ejection holes for ejecting the base body out of a bending device and/or to the region of the shaft support elements.

Further it is proposed that the base body is produced by means of a pressing method, wherein maximally 10%, preferentially maximally 5% and preferably maximally 3% of a total surface of a metal sheet, from which the base body is produced, is exposed to a substantial tensile stress during a pressing process of the pressing method and/or wherein maximally 10%, preferentially maximally 5% and preferably maximally 3% of a total surface of the metal sheet, from which the base body is produced, a material thickness of the metal sheet is substantially changed during the pressing process of the pressing method. Thus, a particularly high stability of the solar module holding device can be advantageously achieved. In particular, a particularly high efficiency in terms of material consumption can be advantageously achieved. In particular, in that during a selection of a desired end wall thickness no wall thickness reductions through a tensile stressing of a starting metal sheet have to be taken into account. Thus, deviations from wall thicknesses of different solar module holding devices can be advantageously kept low. A "substantial tensile stress" is to mean in particular a tensile stress which causes a substantial change of a material thickness of a processed metal sheet. A "substantial change" of a material thickness of the metal sheet is to mean in particular a change, in particular a reduction of the material thickness of the metal sheet by more than 10%, preferentially by more than 7%, preferably by more than 5% and particularly preferably by more than 3%.

The solar module holding device according to the invention, the solar park according to the invention and the method according to the invention shall not be restricted to the application and embodiment described above. In particular, the solar module holding device, the solar park according to the invention and

the method according to the invention can comprise a number of individual elements, components and units deviating from the number mentioned herein for fulfilling a function described herein.

5

Drawings

Further advantages are obtained from the following drawing description. In the drawings, an exemplary embodiment of the invention is shown. The drawings, the description and the claims contain numerous features in combination. The person skilled in the art will practically consider the features also individually and combine these into practical further combinations.

15 There:

Fig. 1 shows an extract of a schematic representation of a solar park with a plurality of solar modules and with a plurality of solar module holding devices;

20

Fig. 2 shows a schematic perspective view of the solar module holding device, which is connected to a solar module and to a shaft;

25 Fig. 3 shows a schematic sidewise view of a base body of the solar module holding device mounted to the shaft by means of a shaft mounting clamp;

Fig. 4a shows a schematic plan view of the base body;

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Fig. 4b shows a schematic front view of the base body; and

Fig. 5 shows a flow diagram of a method for producing the base body.

35

Description of the exemplary embodiment

Fig. 1 shows a part of a solar park 78 having a plurality of solar modules 12, 60. The solar modules 12, 60 are moveable in such a manner that they can at least substantially track a solar position. The solar modules 12, 60 are of solar-position-tracking configuration. The solar park 78 includes at least one shaft 14. The solar modules 12, 60 are coupled to a shaft 14. The solar park 78 includes a drive unit 80. The shaft 14 is rotationally rotatable by means of the drive unit 80 in two rotation directions about a longitudinal shaft of the shaft 14 that is parallel to a longitudinal direction 44 of the shaft 14. The shaft 14 is provided to transmit a rotation of the drive unit 80 to the solar modules 12, 60.

The solar park 78 includes a plurality of solar module holding devices 10. The solar modules 12, 60 are fastened to the solar module holding devices 10 by means of a plurality of fastening platelets 82 and fastening screws 84. The solar module holding devices 10 are provided to make possible mounting the solar-position-tracking solar modules 12, 16 to the rotatable shaft 14. The shaft 14 is configured as a spar with a substantially hexagonal cross-section. Thus, a transmission of a rotational movement by means of the shaft 14 can be advantageously simplified. The shaft 14 is hollow in its interior.

Fig. 2 shows a perspective view of the solar module holding device 10 coupled to a solar module 12 and to the shaft 14. The solar module holding device 10 comprises a base body 16. The base body 16 forms a support surface 18. The support surface 18 is provided for a support of at least one part of the solar module 12 on the base body 16. The base body 16 is formed as a sheet part. The base body 16 is formed as a one-piece sheet part. The base body 16 comprises an anti-corrosion protection coating. In a mounted state, the solar module 12 is supported on the support surface 18 in such a manner that an edge 86 of the solar module 12 runs parallel to a central axis 76 of the support surface 18 running in the longitudinal direction 34 of the support surface 18. In the drawing of Fig. 2, the solar module 12 covers approximately half of the support surface 18. For

example, it is shown on the left side of Fig. 2 how the solar module 12 is clamped to the base body 16 by means of the fastening platelet 82 and the fastening screw 84. The fastening platelet 82 is additionally provided to simultaneously clamp a further adjacent solar module 60 (not shown in Fig. 2) supported on the other half of the support surface 18.

The base body 16 comprises a threaded hole 64. The base body 16 comprises a further threaded hole 66. The threaded holes 64, 66 are arranged on the support surface 18. The threaded holes 64, 66 comprise an internal thread each. The internal thread exemplary shown in the figures is provided for receiving an M8 screw. The threaded holes 64, 66 are provided for receiving a fastening screw 84 each. The threaded holes 64, 66 are arranged centrally in the support surface 18 in end regions 102, 104 of the base body 16. The threaded holes 64, 66 have a distance from one another of 400 mm along the longitudinal direction 34. By screwing the fastening screws 84 into the threaded holes 64, 66 from a top side of the solar modules 12, 60, the solar modules 12, 60 are clamped to the base body 16. The base body 16 comprises stiffening elements 70. The stiffening elements 70 are configured as beads. The stiffening elements 70 are each arranged in near regions of the threaded holes 64, 66. The stiffening elements 70 are provided to stiffen the base body 16 at least in the near regions of the threaded holes 64, 66.

The base body 16 has a height 20 (see Fig. 4b). The height 20 of the base body 16 corresponds to an extent of the base body 16 perpendicularly to the support surface 18. The height 20 of the base body 16 varies along the longitudinal direction 34 of the base body 16. In the case shown in the figures, a maximum height 20 is approximately 55 mm. The base body 16 has a width. The support surface 18 has a width 22 (see Fig. 4a). The width of the base body corresponds to the widths 22 of the support surface. The width 22 of the support surface 18 varies along the longitudinal direction 34 of the base body 16. In the case shown in the figures, a maximum width 22 of the support surface 18 is approximately 70 mm. The height 20 of the base body 16 and the

width 22 of the support surface 18 of the base body 16 along the longitudinal direction 34 of the base body 16 are section-wise anti-correlated.

5 The base body 16 comprises a tapering region 24. The base body 16 comprises a further tapering region 96. Within the tapering region 24, 96, the support surface 18 tapers towards a centre 26 of the base body 16. Within the tapering region 24, 96, the widths 22 of the support surface 18 decreases towards the centre
10 26 of the base body 16. In the example shown in the figures, the widths 22 of the support surface 18 decreases within the tapering region 24, 96 from 70 mm to 35 mm. Within the tapering region 24, 96, the height 20 of the base body 16 increases towards the centre 26 of the base body 16. In the example shown in the
15 figures, the height 20 of the base body 16 increases within the tapering region 24, 96 from 35 mm to 55 mm. Overall lengths offcuts produced from developments perpendicularly to the longitudinal direction 34 of the base body 16 are at least substantially constant in the tapering region 24. The support
20 surface 18 comprises a bead 68. The bead 68 is provided for stiffening the base body 16. The bead 68 is arranged centrally in the base body 16. The bead 68 is arranged centrally in the support surface 18. The bead 68 extends between the tapering regions 24, 96. The bead 68 extends parallel to the longitudinal
25 direction 34. The bead 68 is arranged in a central region 100 of the base body 16. The bead 68 exemplarily shown in the figures has a length parallel to the longitudinal direction 34 of 200 mm, a width, perpendicularly to the longitudinal direction 34, of 8 mm and a depth, perpendicularly to the support surface 18,
30 of 2 mm.

The solar module holding device 10 comprises a solar module holding element 52. The solar module holding element 52 is provided for fastening and/or for positioning the solar module
35 12. The solar module holding device 10 comprises a further solar module holding element 54. The further solar module holding element 54 is provided for fastening and/or positioning the further solar module 60 that is distinct from the solar module

12. The solar module holding element 52 and/or the further solar module holding element 54 is/are moulded onto the base body 16 in one piece. The solar module holding element 52 and/or the further solar module holding element 54 is/are formed integrally with the base body 16. During an assembly of the solar park 78, the solar module holding elements 52, 54 serve for hooking-in one of the solar modules 12, 16 each. The solar module holding element 52, 54 is bent out of the support surface 18 at least substantially perpendicularly. The solar module holding element 52, 54 is arranged in the first end region 102 of the base body 16. The solar module holding elements 52, 54 each have a tip 106. The tips 106 of the solar module holding elements 52, 54 are again bent off by approximately 90° relative to the regions of the solar module holding elements 52, 54 that are bent out perpendicularly from the support surface 18. Each of the tips 106 point in a direction which runs parallel to the longitudinal direction 45. The tips 106 each face away from the centre 26 of the base body 16. The solar module holding elements 52, 54 exemplarily shown in the figures protrude upwards over the support surface 18 by 6 mm. The tips 106 of the solar module holding elements 52, 54 exemplarily shown in the figures extend over 3.5 mm parallel to the support surface 18. The solar module holding elements 52, 54 exemplarily shown in the figures have a width perpendicularly to the longitudinal direction 34 of 5 mm. The solar module holding elements 52, 54 exemplarily shown in the figures are spaced apart from one another in a direction perpendicularly to the longitudinal direction 34 by 49 mm. One each of the solar module holding elements 52, 54 exemplarily shown in the figures is spaced apart in a direction perpendicularly to the longitudinal direction 34 by approximately 8 mm from a respective side wall 28, 30 located nearer.

The solar module holding device 10 comprises a potential compensation element 56. The potential compensation element 56 is provided for electrically contacting the solar module 12 mounted by means of the solar module holding device 10, so that the solar module 12 and the base body 16 have an identical base

potential. The potential compensation element 56 is provided for grounding the solar module 12. The solar module holding device 10 comprises a further potential compensation element 58. The further potential compensation element 58 is provided for electrically contacting the further solar module 60 mounted by means of the solar module holding device 10, so that the further solar module 60 that is distinct from the solar module 12 and the base body 16 have an identical base potential. Thus, both solar modules 12, 60 also have identical base potentials. The further potential compensation element 58 is provided for grounding the further solar module 16 that is distinct from the solar module 12. The potential compensation elements 56, 58 are moulded onto the base body 16 in one piece. The potential compensation elements 56, 58 are configured integrally with the base body 16. The potential compensation elements 56, 58 are arranged in the second end region 104 of the base body 16. The potential compensation elements 56, 58 each form a tip 62. The tips 62 of the potential compensation elements 56, 58 project from the support surface 18. The tips 62 of the potential compensation elements 56, 58 exemplarily shown in the figures protrude 1 mm over the support surface 18. The tips 62 of the potential compensation elements 56, 58 exemplarily shown in the figures, are spaced apart from one another in the direction perpendicularly to the longitudinal direction 34 by approximately 40 mm. The potential compensation elements 56, 58 are provided to penetrate a surface layer of the respective solar module 12, 60 supported on the support surface 18 in a region of the respective potential compensation element 56, 58. The surface layer of the solar modules 12, 60 to be penetrated by the potential compensation elements 56, 58 can be formed for example as an anodized layer.

The base body 16 comprises at least two recesses 72, 74 for receiving blind rivets. The recesses 72, 74 for receiving the blind rivets are arranged on the support surface 18. One recess 72, 74 each for receiving a blind rivet is arranged in one of the tapering regions 24, 96 each. The recesses 72, 74 for receiving blind rivets are arranged offset sidewise relative to

the central axis 76 of the base body 16 running parallel to the longitudinal direction 34 of the base body 16 (see also Fig. 4a). In the base body 16 exemplarily shown in the figures, the recesses 72, 74 for receiving blind rivets are offset sidewise from the central axis 76 by 15 mm. The recesses 72, 74 for receiving blind rivets shown there are spaced apart in the longitudinal direction 34 by 320 mm.

The base body 16 comprises a side wall 28. The base body 16 comprises a further side wall 30. The side walls 38 [28??], 30 of the base body 16 are bent off perpendicularly to the support surface 18. The side walls 28, 30 are arranged on opposite sides of the base body 16. The side walls 28, 30 are arranged on the sides of the base body 16 lying perpendicularly to the longitudinal direction 34 of the base body 16. The side walls 28, 30 delimit the base body 16 sidewise along a large part of a longitudinal extension 32 (see also Fig. 4a) of the base body 16. In edge regions, the base body 16 comprises edge surfaces 98. In the regions in which the side walls 28, 30 delimit the base body 16 sidewise the edge surfaces 98 of the base body 16 are not oriented perpendicularly to the support surface 18 (see also Fig. 4b). A large part of the base body 16 has a constant material thickness 36 (see also Fig. 4b). The material thicknesses 36 of the side walls 28, 30 are substantially identical to the material thickness 36 of the support surface 18. The material thicknesses 36 in the tapering region 24, 96 are substantially identical to the material thickness 36 in the central region 100 of the base body 16 or to the material thicknesses 36 in the end regions 102, 104 of the base body 16. A maximum longitudinal extension 32 of the solar module holding device 10 in particular of the base body 16 is preferentially at least 350 mm, preferentially at least 420 mm and preferably at least 430 mm. Particularly preferably, in particular in an alternative configuration of the solar module holding device 10, the maximum longitudinal extension 32 of the solar module holding device 10, in particular of the base body 16, is more than 500 mm, preferentially more than 650 mm and particularly preferably more than 800 mm.

The base body 16 forms a shaft support element 38. The shaft support element 38 is provided for a support of the base body 16 on a surface 92 of the shaft 14. The shaft support element 38 forms a shaft support surface 40 which is provided to be supported, in the mounted state, on the surface 92 of the shaft 14 (see also Fig. 3). The base body 16 forms on two opposite sides and shaft support element 38 each. The side walls 28, 30 each form a shaft support element 38. One shaft support element 38 each is moulded onto a side wall 28, 30 each. The shaft support elements 38 are formed integrally with the base body 16. The shaft support elements 38 are bent off substantially perpendicularly to the side walls 28, 30. The shaft support elements 38 protrude substantially perpendicularly over the side walls 28, 30. The shaft support element 38, in particular each of the shaft support elements 38, has an extent perpendicularly to the longitudinal direction 34 of the support surface 18 of the base body 16 which corresponds to four times the material thickness 36 of the base body 16. The extent of the shaft support element 38 perpendicularly to the longitudinal direction 34 of the support surface 18 of the base body 16 in the example shown in the figures is 10 mm. The extent of the shaft support element 38 perpendicularly to the longitudinal direction 34 of the support surface 18 is constant. Alternatively, the support surface 18 could be enlarged or reduced variably, for example in a contact region of the shaft support element 38 with the shaft 14. The shaft support surface 40 formed by the shaft support element 38 forms in a sidewise view of the base body 16 (see also Fig. 3), a polygonal in particular a semi-hexagonal contour. The bead 68 is arranged in a region of the support surface 18 which lies between the two shaft support elements 38.

The solar module holding device 10 comprises a shaft mounting clamp 50. The shaft mounting clamp 50 is provided for making possible a rotationally fixed mounting of the base body 16 on the shaft 14. Fig. 3 shows a sidewise view of the base body 16 and of the shaft mounting clamp 50. The shaft mounting clamp 50 includes two clamp elements 88, 90. The clamp elements 88, 90

are formed separately from one another. The clamp elements 88, 90 are formed at least substantially identically to one another. In the mounted state shown in Fig. 3, the clamp elements 88, 90 are arranged mirrored relative to one another. The shaft mounting clamp 50 is provided to at least partially engage about the shaft 14. The shaft mounting clamp 50 is provided for engaging about a side of the shaft 14 facing away from the base body 16 in the mounted state. The shaft mounting clamp 50 is provided to press the base body 16 against a part of the surface 92 of the shaft 14. The clamp elements 88, 90 can be connected by means of a screw connection 94. The screw connection 94 is provided to clamp the base body 16 and the shaft 14 to one another.

The side walls 28, 30 each have two recesses 48, 112 which are provided for fastening the shaft mounting clamp 50. The recesses 48, 112 are configured as rectangular elongated holes which, at their ends each facing the centre 26 of the base body 16, form a shoulder 114 enlarging a width of the respective recess 48, 112 in a direction perpendicularly to the support surface 18. The clamp elements 88, 90 of the shaft mounting clamp 50 are provided to perpendicularly engage in the recesses 48, 112 of the side walls 28, 30. The shoulder 114 is provided to fix the clamp elements 88, 90 of the shaft mounting clamp 50 after the shaft 14 has been pressed against the base body 16, by tightening the screw connection 94 in a mounting position. The clamp elements 88, 90 exemplarily shown in Fig. 2 have a hook shape in the regions engaging into the recesses 48, 112 of the side walls 28, 30, as a result of which fixing the mounting position can be further improved. The recess 48 for receiving the shaft mounting clamp 50 is partially arranged in the tapering region 24, 96 of the base body 16. The recess 48 for receiving the shaft mounting clamp 50 is arranged for the major part in the tapering region 24, 96 of the base body 16. Except for the part of the recess 48 comprising the shoulder 114, the recess 48 for receiving the shaft mounting clamp 50 is arranged for receiving the shaft mounting clamp 50 in the tapering region 24, 96 of the base body 16. The part of the recess 48 comprising the shoulder

114 for receiving the shaft mounting clamp 50 is arranged between a central part of the base body 16 lying between the two tapering regions 24, 96, in particular the central region 100 of the base body 16.

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In Fig. 3 it is additionally shown that the shaft support element 38 comprises a partial region 42 which is provided, upon a support of the base body 16 on the shaft 14, to remain free of contact with the shaft 14 and thus provides an, in particular enlarged, interspace 46 in the longitudinal direction 44 of the shaft 14 between the shaft 14 and the base body 16. In the partial region 42 of the shaft support element 38, the shaft support element 38 is configured curved. In the partial region 42 of the shaft support element 38, the shaft support element 38 is configured arched in the direction of the support surface 18.

The Figures 4a and 4b show different views of the base body 16. The base body 16, except for the recesses 72, 74 for receiving blind rivets, is configured mirror-symmetrically to the mirror planes 108, 110 indicated in Fig. 4a.

Fig. 5 shows a flow diagram of a method for producing the base body 16 of the solar module holding device 10. In at least one method step 116, an at least substantially rectangular and flat starting metal sheet is provided. In at least one further method step 118, the starting metal sheet is punched and bent. In the method step 118, the material thickness 36 of the metal sheet is retained at least in a large part of the metal sheet. In the method step 118, the base body 16 is produced in its final form. In the method step 118, a metal sheet offcut during the production of the base body 16 of less than 10% of the starting metal sheet is produced. In the method step 118, the base body 16 is produced by means of a pressing method. In the method step 118, maximally 5% of a total surface of the starting metal sheet, from which the base body 16 is produced, is exposed to a substantial tensile stress. In the method step 118, a material thickness 36 of the metal sheet from which the base body 16 is

produced is changed over maximally 5% of a total surface of the metal sheet during the pressing process of the pressing method.

Reference signs

	10	Solar module holding device
	12	Solar module
5	14	Shaft
	16	Base body
	18	Support surface
	20	Height
	22	Width
10	24	Tapering region
	26	Centre
	28	Side wall
	30	Side wall
	32	Longitudinal extent
15	34	Longitudinal direction
	36	Material thickness
	38	Shaft support element
	40	Shaft support surface
	42	Partial region
20	44	Longitudinal direction
	46	Interspace
	48	Recess
	50	Shaft mounting clamp
	52	Solar module holding element
25	54	Further solar module holding element
	56	Potential compensation element
	58	Further potential compensation element
	60	Further solar module
	62	Tip
30	64	Threaded hole
	66	Threaded hole
	68	Bead
	70	Stiffening element
	72	Recess
35	74	Recess
	76	Central axis
	78	Solar park
	80	Drive unit

	82	Fastening platelet
	84	Fastening screws
	86	Edge
	88	Clamp unit
5	90	Clamp element
	92	Surface
	94	Screw connection
	96	Tapering region
	98	Edge surface
10	100	Central region
	102	End region
	104	End region
	106	Tip
	108	Mirror plane
15	110	Mirror plane
	112	Recess
	114	Shoulder
	116	Method step
	118	Method step

Patentkrav

1. Solcellemodulholdeanordning (10), der er indrettet til at muliggøre en montage af i det mindste et solcellemodul (12), som især følger solens position, med en især roterbar aksel (14), med et grundlegeme (16), som udformer i det mindste en understøtningsflade (18), der er indrettet til en understøtning af i det mindste en del af solcellemodulet (12), hvor grundlegemet (16) er udformet som en metalpladedel, fortrinsvis i ét stykke, med i det mindste et på grundlegemet (16) i ét stykke tildannet solcellemodulholdeelement (52, 54), som er indrettet til en fastgørelse af et solcellemodul (12), og med i det mindste et yderligere på grundlegemet (16) i ét stykke tildannet solcellemodulholdeelement (52, 54), som er indrettet til en fastgørelse af et fra solcellemodulet (12) forskelligt yderligere solcellemodul (12), hvor solcellemodulholdeelementerne (52, 54) er udformet krogformet og rager frem fra grundlegemets (16) understøtningsflade (18), hvor solcellemodulholdeelementerne (52, 54) hver især er indrettet til at oprette en formluttende forbindelse med hver især et solcellemodul (12), hvor grundlegemet (16) har en sidevæg (28, 30) og en yderligere sidevæg (28, 30), hvilke sidevægge (28, 30) er afbøjet i det mindste i det væsentlige vinkelret på understøtningsfladen (18), kendetegnet ved, at solcellemodulholdeelementet (52, 54) og det yderligere solcellemodulholdeelement (52, 54) hver især er anbragt forskudt fra en midterlinje for understøtningsfladen (18) udadtil i retning af de respektive sidevægge (28, 30).
2. Solcellemodulholdeanordning (10) ifølge krav 1, kendetegnet ved, at en højde (20) af grundlegemet (16) og en bredde (22) af grundlegemets (16) understøtningsflade (18) i det mindste afsnitvist antikorrelerer.
3. Solcellemodulholdeanordning (10) ifølge krav 1 eller 2, kendetegnet ved, at grundlegemet (16) har i det mindste et indsnævringsområde (24, 96), inden for hvilket understøtningsfladen (18) indsnævres hen mod en midte (26) af

grundlegemet (16).

4. Solcellemodulholdeanordning (10) ifølge krav
3, kendetegnet ved, at en højde (20) af grundlegemet (16) i
5 indsnævringsområdet (24, 96) tiltager hen mod grundlegemets (16)
midte (26).

5. Solcellemodulholdeanordning (10) ifølge krav
1, kendetegnet ved, at sidevæggen (28, 30) i det mindste langs
10 størstedelen af en længdeudstrækning (32) af grundlegemet (16)
begrænser grundlegemet (16) sideværts.

6. Solcellemodulholdeanordning (10) ifølge et af de foregående
krav, kendetegnet ved, at samlede længder af forløb af snit, der
15 er udfærdiget vinkelret på en længderetning (34) af grundlegemet
(16), er i det mindste i det væsentlige konstante hen over
størstedelen af grundlegemet (16), især i indsnævringsområdet
(24, 96).

20 7. Solcellemodulholdeanordning (10) ifølge et af de foregående
krav, kendetegnet ved, at i det mindste størstedelen af
grundlegemet (16) har en i det mindste i det væsentlige konstant
materialetykkelse (36).

25 8. Solcellemodulholdeanordning (10) ifølge et af de foregående
krav, kendetegnet ved, at grundlegemet (16), især sidevæggen
(28, 30), udformer i det mindste et akselstøtteelement (38), som
er indrettet til en understøtning af grundlegemet (16) på akslen
(14).

30 9. Solcellemodulholdeanordning (10) ifølge krav
8, kendetegnet ved, at akselstøtteelementet (38) har en
udstrækning vinkelret på en længderetning (34) af grundlegemets
(16) understøtningsflade (18), hvilken udstrækning svarer til i
35 det mindste tre gange, fortrinsvis fire gange en
materialetykkelse (36) af grundlegemet (16).

10. Solcellemodulholdeanordning (10) ifølge krav 8 eller

9, kendetegnet ved, at en af akselstøtteelementet (38) udformet akselstøtteflade (40) i en afbildning set fra siden på grundlegemet (16) udformer en i det mindste i det væsentlige polygonal, især en i det mindste i det væsentlige semi-hexagonal kontur.

11. Solcellemodulholdeanordning (10) ifølge et af kravene 8 til 10, kendetegnet ved, at akselstøtteelementet (38) har i det mindste et delområde (42), der er indrettet til ved en understøtning af grundlegemet (16) på akslen (14) at forblive fri for en kontakt med akslen (14) og derved i en længderetning (44) af akslen (14) tilvejebringer et, især forstørret, mellemrum (46) mellem akslen (14) og grundlegemet (16).

12. Solcellemodulholdeanordning (10) i det mindste ifølge krav 1, kendetegnet ved, at sidevæggen (28, 30) har i det mindste en udtagning (48, 112), der er indrettet til en fastgørelse af en akselmontageklemme (50).

13. Solcellemodulholdeanordning (10) ifølge krav 12, kendetegnet ved, at udtagningen (48, 112) til optagelse af akselmontageklemmen (50) er anbragt i det mindste delvist i et indsnævringsområde (24, 96) af grundlegemet (16).

14. Solcellemodulholdeanordning (10) ifølge et af de foregående krav, kendetegnet ved i det mindste et på grundlegemet (16) i ét stykke tildannet potentialudligningselement (56), som er indrettet til elektrisk kontaktering, især jording, af et solcellemodul (12).

15. Solcellemodulholdeanordning (10) ifølge krav 14, kendetegnet ved i det mindste et yderligere, på grundlegemet (16) i ét stykke tildannet potentialudligningselement (58), som er indrettet til en elektrisk kontaktering, især jording, af et fra solcellemodulet (12) forskelligt yderligere solcellemodul (60).

16. Solcellemodulholdeanordning (10) ifølge krav 14 eller

15, kendetegnet ved, at
potentialudligningselementet/-elementerne (56, 58) udformer i
det mindste en spids (62), der rager frem fra
understøtningsfladen (18), og som især er indrettet til at
5 gennemtrænge et overfladelag af det på understøtningsfladen (18)
liggende solcellemodul (12, 60), eksempelvis et eloxallag af
solcellemodulet (12, 60).

17. Solcellemodulholdeanordning (10) ifølge et af de foregående
10 krav, kendetegnet ved, at grundlegemet (16), især på
understøtningsfladen (18), har i det mindste et gevindhul (64,
66).

18. Solcellemodulholdeanordning (10) ifølge krav
15 17, kendetegnet ved, at grundlegemet (16) har et
afstivningselement (70), der er anbragt i et nærområde til
gevindhullet (64, 66) og er indrettet til at afstive
grundlegemet (16) i det mindste i gevindhullets (64, 66)
nærområde.

20 19. Solcellemodulholdeanordning (10) ifølge et af de foregående
krav, kendetegnet ved, at understøtningsfladen (18) har i det
mindste en centralt i grundlegemet (16) anbragt sik (68) til en
afstivning af grundlegemet (16).

25 20. Solcellemodulholdeanordning (10) ifølge et af de foregående
krav, kendetegnet ved, at grundlegemet (16) har i det mindste
en udtagning (72, 74) til en optagelse af en blindnitte, der er
anbragt sideværts forskudt i forhold til en parallelt med en
30 længderetning (34) af grundlegemet (16) forløbende midterakse
(76) af grundlegemet (16).

21. Solcellemodulholdeanordning (10) ifølge et af de foregående
krav, kendetegnet ved, at grundlegemet (16) i det mindste i det
35 væsentlige, især med undtagelse af udtagninger (72, 74) til
optagelse af blindnitter, er udformet spejlsymmetrisk.

22. Solcellemodulholdeanordning (10) ifølge et af de foregående

krav, kendetegnet ved, at grundlegemet (16) har en antikorrosionsbeskyttende belægning.

23. Solcellemodulholdeanordning (10) ifølge et af de foregående krav, kendetegnet ved en akselmontageklemme (50), der er indrettet til en drejesikker montage af grundlegemet (16) på akslen (14).

24. Solcellepark (78) med et multiplum af solcellemodulholdeanordninger (10) ifølge et af de foregående krav, med i det mindste en aksel (14) og med et multiplum af solcellemoduler (12, 60).

25. Fremgangsmåde til en fremstilling af et grundlegeme (16) til en solcellemodulholdeanordning (10) ifølge et af kravene 1 til 23, hvor i det mindste et solcellemodulholdeelement (52, 54) og i det mindste et yderligere solcellemodulholdeelement (52, 54) hver især tildannes i ét stykke på grundlegemet (16) forskudt fra en midterlinje af en understøtningsflade (18) på grundlegemet (16) udadtil i retning af sidevægge (28, 30) til grundlegemet (16).

26. Fremgangsmåde ifølge krav 25, kendetegnet ved, at der ved en fremstilling af grundlegemet (16) fremstilles en pladetilskæring på mindre end 10 % af en udgangsplade.

27. Fremgangsmåde ifølge krav 25 eller 26, kendetegnet ved, at grundlegemet (16) fremstilles ved hjælp af en pressefremgangsmåde, hvor højst 5 % af et samlet areal af en metalplade, af hvilken grundlegemet (16) fremstilles, ved en presseproces i pressefremgangsmåden udsættes for en væsentlig trækspænding, og/eller hvor der på højst 5 % af et samlet areal af den metalplade, af hvilken grundlegemet (16) fremstilles, ved presseprocessen i pressefremgangsmåden væsentligt ændres en materialetykkelse (36) af metalpladen.

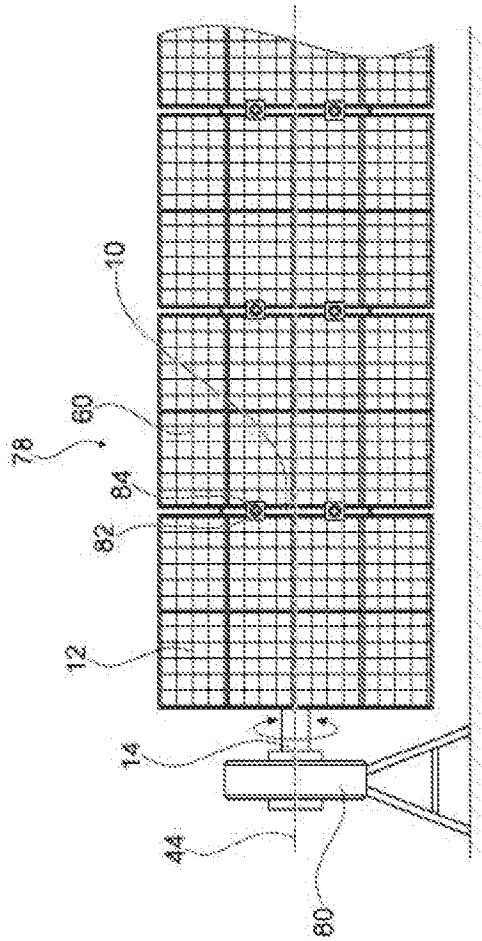
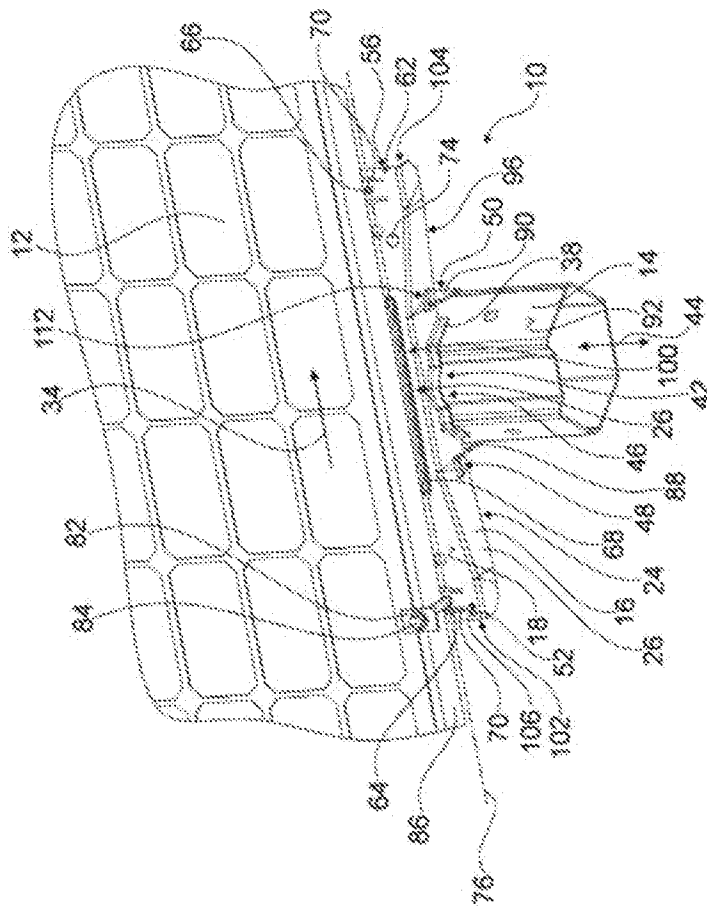


Fig. 1



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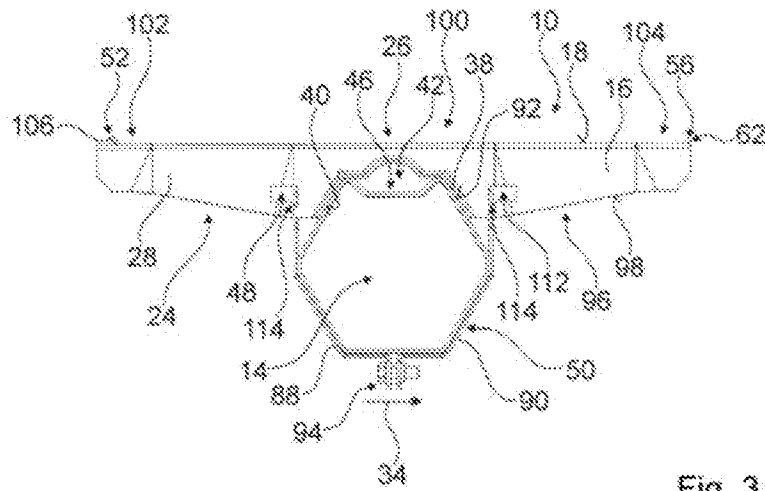


Fig. 3

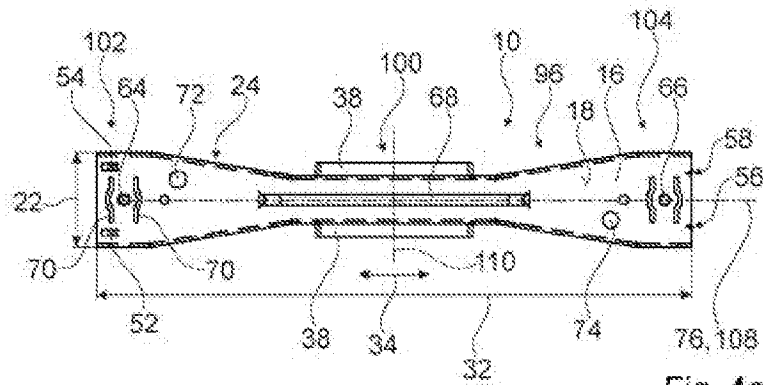


Fig. 4a

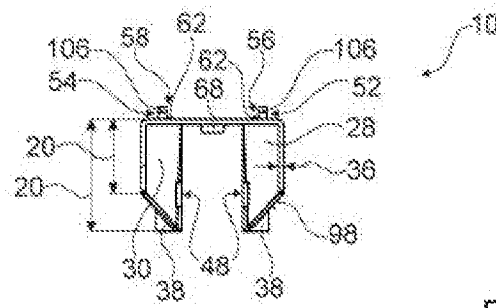


Fig. 4b

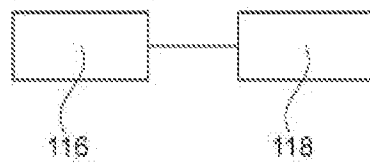


Fig. 5