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(54) **SOLAR HOUSE**

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(57) **ABSTRACT**

[Problem]

To provide a solar house capable of taking in a moderate amount of sunlight while obtaining a large amount of electric power generation.

[Solution]

A solar house **1** is provided with a first panel set **2** having a plurality of first solar panels **21**, a second panel set **3** having a plurality of second solar panels **31**, and a driving mechanism **6** for driving the first panel set **2** and the second panel set **3** to track sunlight. The first panel set **2** and the second panel set **3** are arranged so that a space S is opened therebetween when the first panel set **2** and the second panel set **3** are placed on a straight line. The space S is set to a substantially exact distance such that the first panel set **2** does not block reception of sunlight by the second panel set **3** and the second panel set **3** does not block reception of sunlight by the first panel set **2** even when the first panel set **2** and the second panel set **3** are tilted to a maximum to track sunlight. Below the first panel set **2**, the second panel set **3**, and the space S, a housing portion **8** made of materials capable of holding own shape is provided.

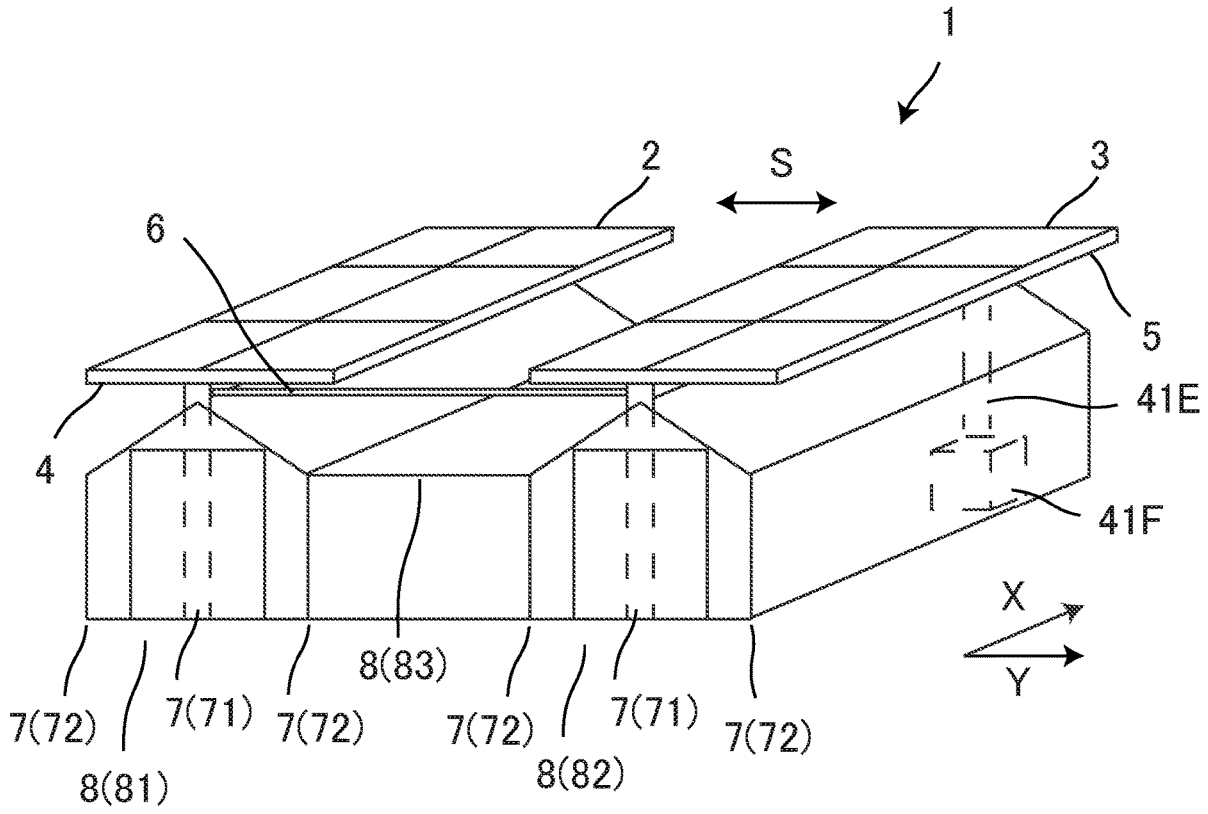


Fig. 1

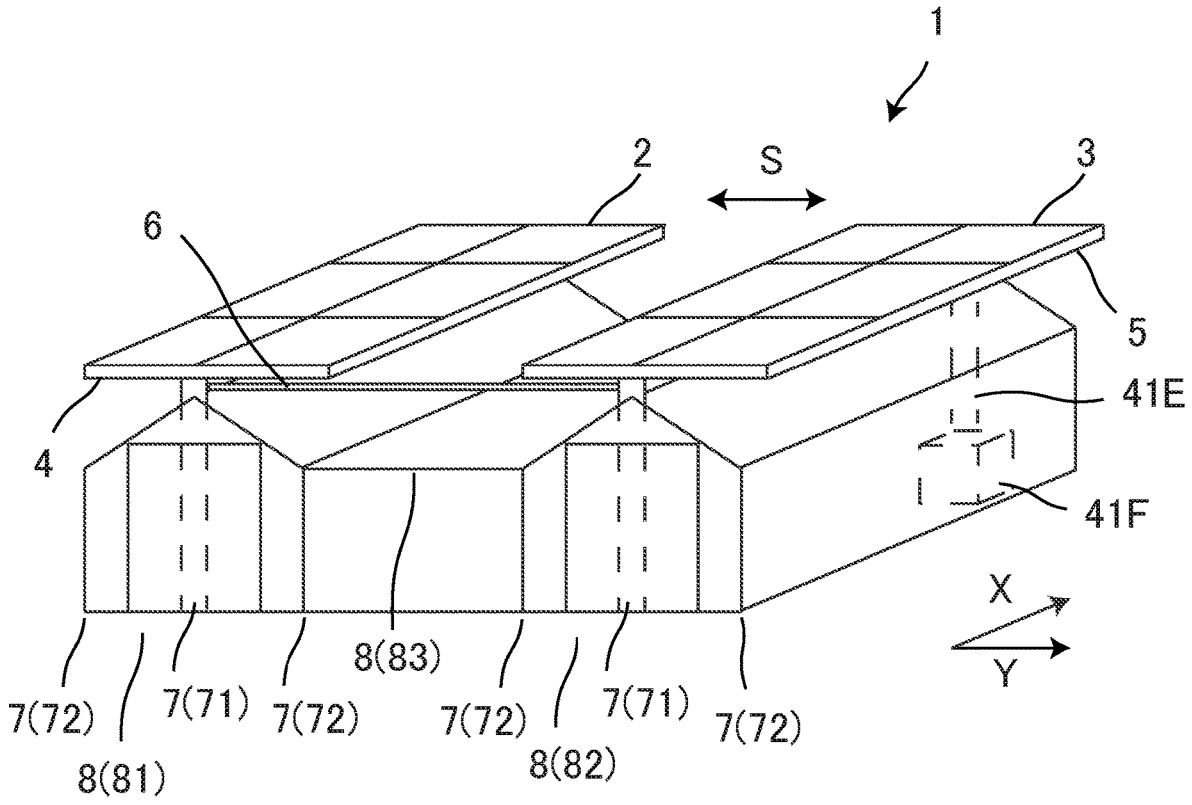


Fig. 2

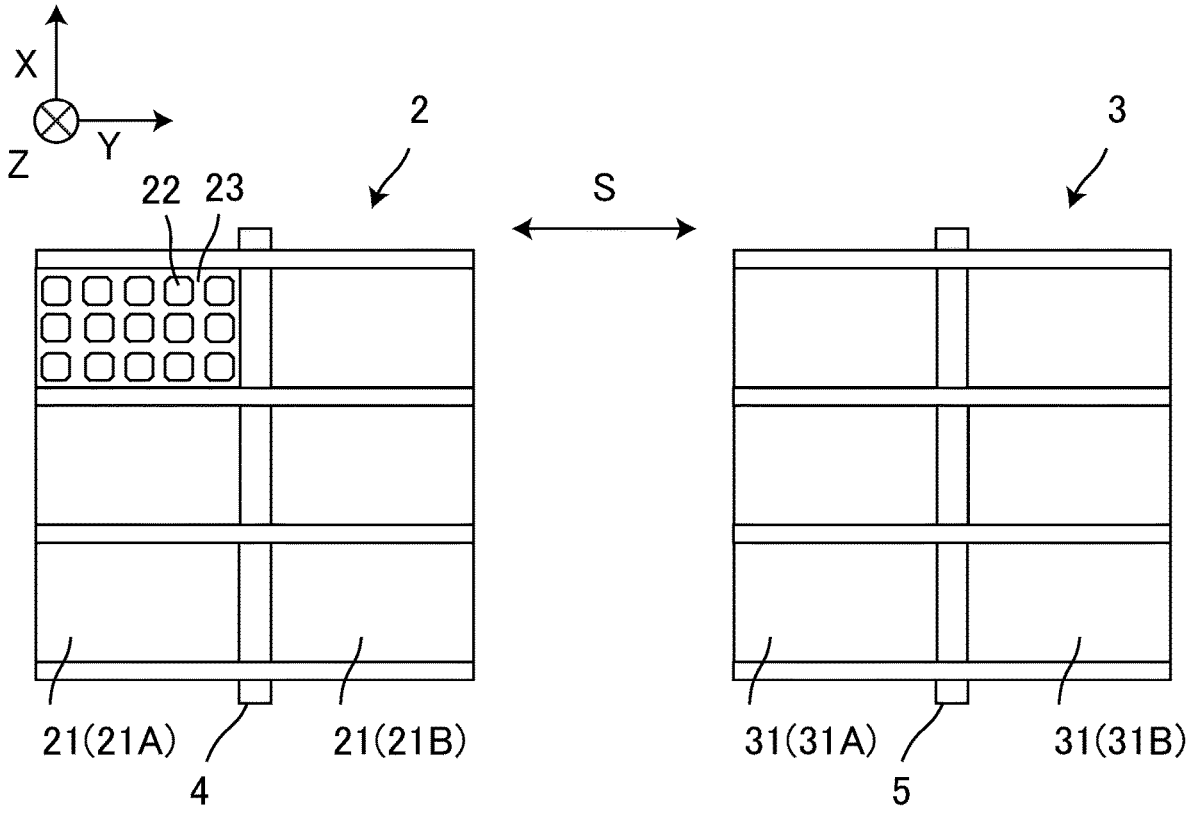


Fig. 3

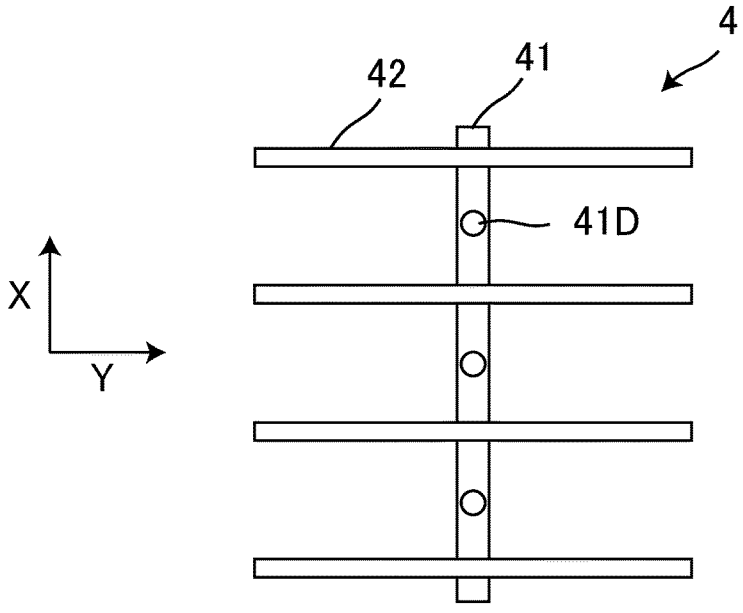


Fig. 4

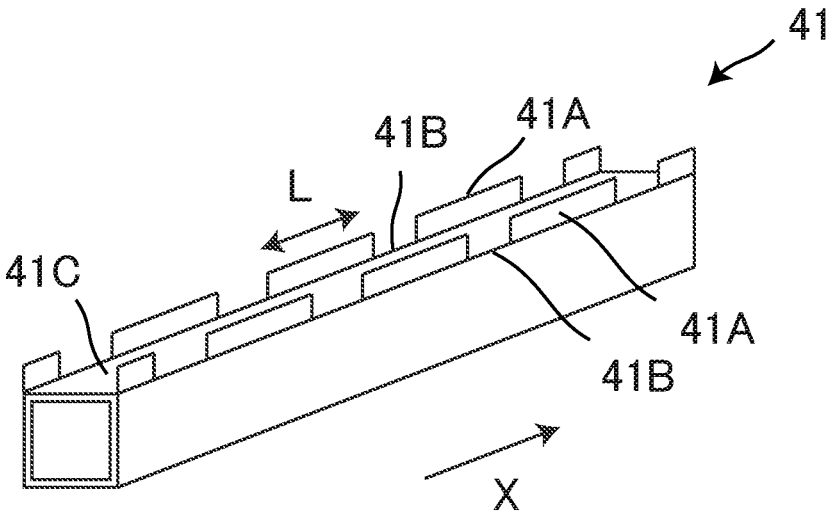


Fig. 5

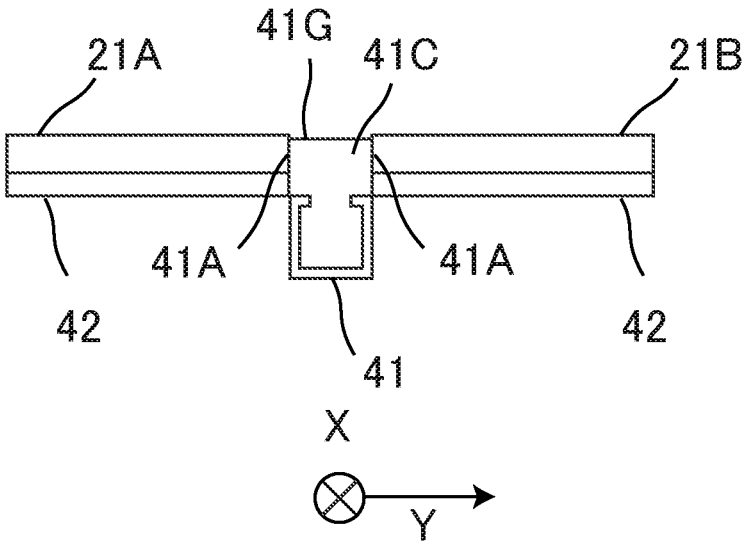


Fig. 6

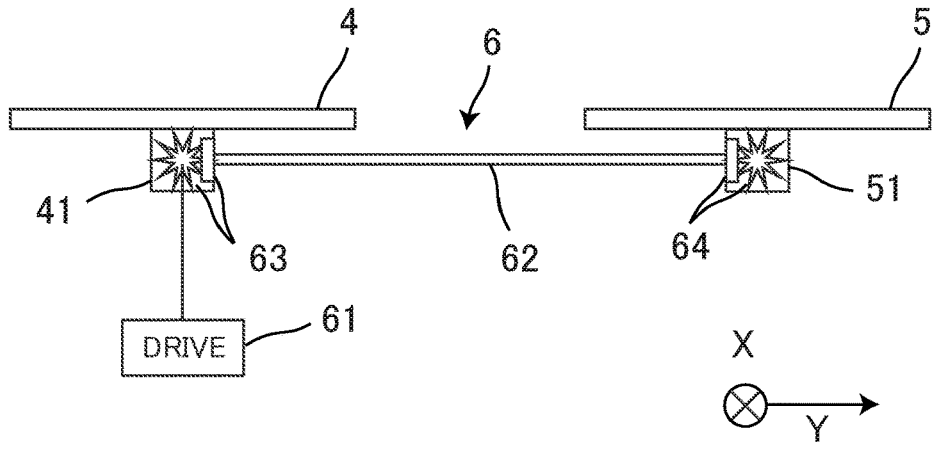


Fig. 7

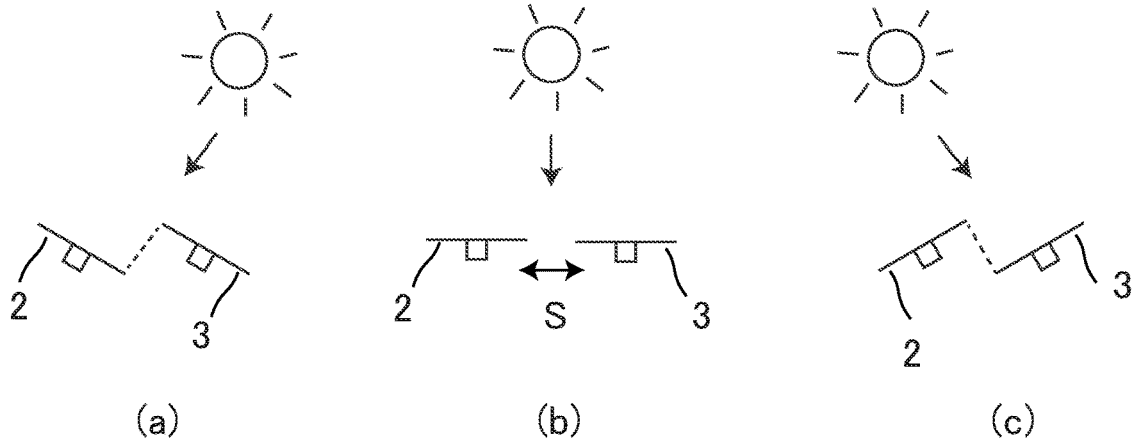


Fig. 8

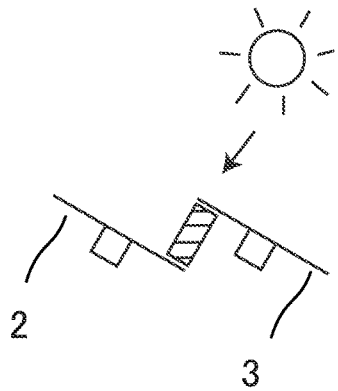


Fig. 9

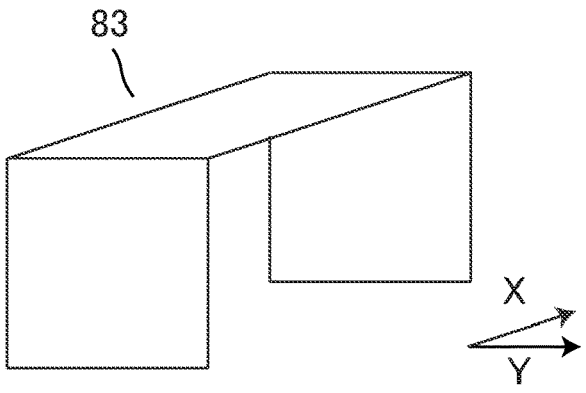


Fig. 10

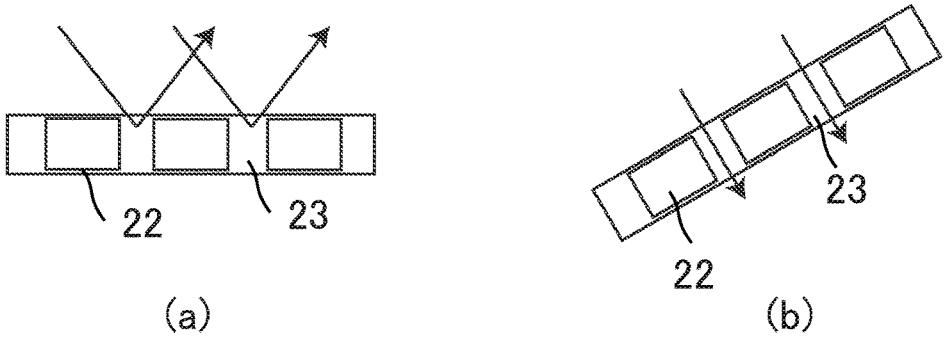


Fig. 11

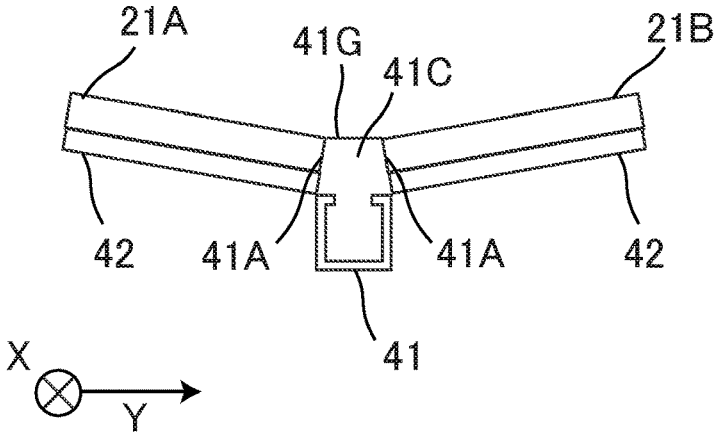
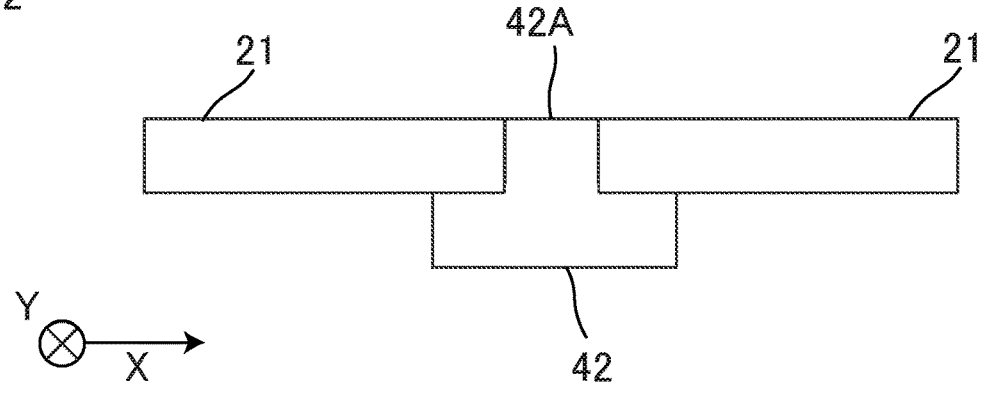


Fig. 12



SOLAR HOUSE

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a solar house using a solar panel.

BACKGROUND OF THE INVENTION

[0002] Conventionally, an agricultural house in which most of the roof and the south wall side are made by a transparent material (transparent glass), solar panels being installed on a part of the transparent material, is known. (for example, Patent Document 1).

PRIOR ART

[0003] Patent Document 1: Japanese Patent Application publication No. 2014-50369.

SUMMARY OF INVENTION

Problem to be Solved by the Invention

[0004] In the above-described technology, since the solar panels are simply arranged on a part of the roof, the amount of the electric power generation is proportional to the number of the solar panels.

[0005] In order to grow crops in an agricultural house, it is preferable to take in a moderate amount of sunlight evenly into the interior. However, with the above-described technology, direct sunlight enters only from the south wall side where the solar panels are not arranged. Therefore, it cannot be said that the environment is favorable for growing agricultural crops.

[0006] Further, if a large number of solar panels are laid out in the above-described technique in order to obtain a large amount of electric power generation, the cost of the solar panels is significantly increased, and also a moderate amount of sunlight cannot be taken in.

[0007] In view of the foregoing, it is an object of the invention to provide a solar house capable of taking in a moderate amount of sunlight while obtaining a large amount of electric power generation.

Means for Solving the Problem

Effects of the Invention

[0008] According to the solar house of the present invention, it becomes possible to take in moderate amount of sunlight, while obtaining a large amount of electric power generation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. **1** is a general view of a solar house according to an embodiment of the present invention.

[0010] FIG. **2** is a plan view of a first panel set according to the embodiment of the present invention.

[0011] FIG. **3** is a plan view of a first mount according to the embodiment of the present invention.

[0012] FIG. **4** is a perspective view of a main shaft according to the embodiment of the present invention.

[0013] FIG. **5** is a side cross-sectional view of the first panel set and the first mount according to the embodiment of the present invention.

[0014] FIG. **6** is an explanatory view of a driving mechanism according to the embodiment of the present invention.

[0015] FIG. **7** is an explanatory view of a solar light tracking by the driving mechanism according to the embodiment of the present invention.

[0016] FIG. **8** is an explanatory view of a positional relation between the first panel set and a second panel set according to the embodiment of the present invention.

[0017] FIG. **9** is a perspective view of an intermediate house member according to the embodiment of the present invention.

[0018] FIG. **10** is a side cross-sectional view of a first solar panel according to the embodiment of the present invention.

[0019] FIG. **11** is a side cross-sectional view of a first panel set and a first mount according to a modification of the present invention.

[0020] FIG. **12** is a side cross-sectional view of a partition portion according to the modification of the present invention.

PREFERRED EMBODIMENTS

[0021] A solar house **1** according to a preferred embodiment of the present invention will be described below, while referring to FIGS. **1** to **10**.

[0022] As shown in FIG. **1**, the solar house **1** includes a first panel set **2**, a second panel set **3**, a first mount **4**, a second mount **5**, a driving mechanism **6**, a plurality of support columns **7**, and a house portion **8**.

[0023] As shown in FIG. **2**, the first panel set **2** includes a plurality of first solar panels **21** and is supported by the first mount **4**. Similarly, the second panel set **3** includes a plurality of second solar panels **31** and is supported by the second mount **5**.

[0024] In the present embodiment, since a set of the first panel set **2** and the first mount **4** has the same configuration as a set of the second panel set **3** and the second mount **5**, the set of the first panel set **2** and the first mount **4** will be described below, and the description of the set of the second panel set **3** and the second mount **5** will be omitted.

[0025] As shown in FIG. **2**, the plurality of first solar panels **21** is provided with a plurality of first-row solar panels **21**A arranged in a first direction X and a plurality of second-row solar panels **21**B arranged in the first direction X. The plurality of first-row solar panels **21**A and the plurality of second-row solar panels **21**B are adjacent to each other in a second direction Y substantially orthogonal to the first direction X. In the present embodiment, the first direction X substantially coincides with the north-south direction, while the second direction substantially coincides with the east-west direction.

[0026] In the present embodiment, the plurality of first solar panels **21** is a transmissive and bifacial type. More specifically, as shown in FIG. **2**, the first solar panel **21** has a substantially rectangular shape, and a plurality of double-sided light receiving cells **22** are regularly arranged in the first solar panel **21**. A transmitting member **23** such as glass and the like is disposed between each double-sided light receiving cell **22**.

[0027] With this configuration, sunlight is received by the surface of the double-sided light receiving cell **22** and is transmitted through the transmitting member **23**. The sunlight transmitted through the transmitting member **23** and reflected by the ground or the like is received by the back surface of the double-sided light receiving cell **22**. In the

present embodiment, the thicknesses of the double-sided light receiving cell **22** and the transmitting member **23** extend in a third direction Z substantially orthogonal to both the first direction X and the second direction Y.

[0028] As shown in FIGS. **3** to **5**, the first mount **4**, for supporting the first panel set **2** put thereon, is provided with a main shaft **41** and a plurality of partition portions **42**.

[0029] As shown in FIG. **4**, when the main shaft **41** is arranged so as to extend in the first direction X, a pair of upright portions **41**A is respectively erected from both end portions in a direction intersecting the first direction X (in the present embodiment, the second direction Y). A plurality of fitting portions **41**B in which a plurality of partition portions **42** is respectively fitted is formed at predetermined intervals L in each upright portion **41**A. The predetermined interval L is set to a length (substantially the same or slightly shorter) corresponding to the length of the first solar panels **21** (the first-row solar panels **21**A and the second-row solar panels **21**B) in the first direction X.

[0030] The plurality of partition portions **42** is fitted to the plurality of fitting portions **41**B respectively to partition the plurality of first-row solar panels **21**A and the plurality of second-row solar panels **21**B. As shown in FIG. **3**, the partition portions **42** extend to both sides of the main shaft **41** so as to intersect the main shaft **41** (orthogonally in the present embodiment).

[0031] Under such configuration, as shown in FIG. **2**, the plurality of first-row solar panels **21**A and the plurality of second-row solar panels **21**B are put on the first mount **4** with the main shaft **41** as a boundary, in a state where the main shaft **41** extends in the first direction X and the plurality of partition portions **42** extends in the substantially second direction.

[0032] At this time, since the predetermined interval L between each fitting portion **41**B is set to the length corresponding to the length of the first solar panels **21** (the first-row solar panels **21**A and the second-row solar panels **21**B) in the first direction X, the plurality of first-row solar panels **21**A and the plurality of second-row solar panels **21**B are respectively partitioned by the plurality of partition portions **42**.

[0033] When the predetermined interval L is substantially equal to the length of the first solar panel **21** in the first direction X, the first solar panel **21** is preferably supported by another member in order to prevent the first solar panel **21** from falling off the first mount **4** (between the partition portions **42** adjacent each other in the first direction X).

[0034] As described above, in the present embodiment, since the partition portion **42** is fitted onto the fitting portion **41**B formed at intervals corresponding to the length of the first solar panel **21** in the first direction X, the positioning of the partition portion **42** becomes accurate and easy.

[0035] Further, since the position of the first solar panel in the first direction X is defined by the partition portions **42** and the position of the first solar panel **21** in the second direction Y is defined by the upright portion **41**A, it is possible to arrange each first solar panel **21** at an accurate position, and at the same time, it is possible to prevent each first solar panel **21** from moving in the first direction X.

[0036] The end portion of the first solar panel **21** on the opposite side of the main shaft **41** is preferably fixed to the first mount **4** by a stopper or the like so that the first solar panel **21** does not move in the second direction Y.

[0037] Incidentally, as shown in FIGS. **4** and **5**, since a groove **41**C is formed in the upper portion of the main shaft **41** by the upright portion **41**A, there is a possibility that rainwater or the like flowing into the groove **41**C is concentrated on and falls from the end portion of the main shaft **41** in the first direction X only to a part of the ground, resulting in an unintentional water reservoir.

[0038] However, in the present embodiment, as shown in FIGS. **4** and **5**, the main shaft **41** has a hollow shape, and as shown in FIG. **3**, a plurality of water entrance holes **41**D is formed in the upper portion of the main shaft **41** at positions not intersecting the plurality of partition portions **42**. As shown in FIG. **1**, a drain pipe **41**E is connected to at least one end of the main shaft **41** in the first direction X.

[0039] With this configuration, rainwater or the like flowing into the groove **41**C is discharged through the water entrance hole **41**D and the drain pipe **41**E. As the result, it is possible to prevent rain water or the like flowing into the groove **41**C from being concentrated only to a part of the ground and falling down, thereby forming an unintentional water reservoir at an unintended position.

[0040] As shown in FIG. **1**, it is preferable that the rainwater or the like discharged through the drain pipe **41**E is stored in a tank **41**F provided inside or outside of the house portion **8**.

[0041] As shown in FIG. **5**, a cover **41**G made of a wire mesh or the like is preferably attached to the upper portion of the main shaft **41** in order to prevent trash other than rainwater from entering the grooves **41**C.

[0042] As shown in FIG. **6**, the driving mechanism **6** includes a driving unit **61**, a transmitting unit **62**, a first converting unit **63**, and a second converting unit **64**.

[0043] The driving unit **61** rotates the first mount **4** (main shaft **41**) around the first direction X.

[0044] The transmitting unit **62** extends in the second direction Y and is disposed between the main shaft **41** of the first mount **4** and the main shaft **51** of the second mount **5**.

[0045] The first converting unit **63** is connected between the main shaft **41** of the first mount **4** and the transmitting unit **62** to convert the rotation of the main shaft **41** around the first direction X to a rotation of the transmitting unit **62** around the second direction Y.

[0046] In the present embodiment, as shown in FIG. **6**, the first converting unit **63** includes a gear which is mounted on the main shaft **41** to rotate around the first direction X, and a gear which is mounted on the main shaft **41** side of the transmitting unit **62** to rotate around the second direction Y. Therein, the rotation around the first direction X is converted into the rotation around the second direction Y by the two gears engaged with each other.

[0047] The second converting unit **64** is connected between the transmitting unit **62** and the main shaft **51** of the second mount **5** to convert the rotation of the transmitting unit **62** around the second direction Y to a rotation of the main shaft **51** around the first direction X.

[0048] In the present embodiment, as shown in FIG. **6**, the second converting unit **64** includes a gear which is mounted on the main shaft **51** side of the transmitting unit **62** to rotate around the second direction Y and a gear which is mounted on the main shaft **51** and rotates around the first direction X. Therein, the rotation around the second direction Y is converted into the rotation around the first direction X by the two gears engaged with each other.

[0049] With such configuration, a plurality of mounts (the first mount **4** and the second mount **5** in the present embodiment) can be rotated by one driving unit **61**.

[0050] Under such configuration, as shown in FIG. **7**, the driving unit **61** drives the first mount **4** and the second mount **5** so that the first panel set **2** mounted on the first mount **4** and the second panel set **3** mounted on the second mount **5** track sunlight, that is, the surfaces of the first panel set **2** and the second panel set **3** continue to face the sun. (a) of FIG. **7** shows the case where the sun is in the east side, (b) of FIG. **7** shows the case where the sun is near the top, and (c) of FIG. **7** shows the case where the sun is in the west side.

[0051] As shown in FIG. **1**, the plurality of support columns **7** is steel columns or the like erected from the ground to support the first panel set **2** and the second panel set **3**, respectively. The plurality of support columns **7** includes a plurality of first support columns **71** and a plurality of second support column **72**.

[0052] In the present embodiment, the plurality of first support columns **71** rotatably supports the main shaft **41** of the first mount **4** and the main shaft **51** of the second mount **5** near the both end portions of the main shaft **41** and the main shaft **51** in the first direction X. The plurality of second support columns **72** supports the house portion **8**. The support of the house portion **8** by the plurality of second support columns **7** will be described later.

[0053] Here, as shown in FIG. **8**, if the first panel set **2** and the second panel set **3** approach excessively with each other, one panel set becomes a shadow (hatched portion) of the other panel set when tracking the sun, and the electric power generation efficiency is lowered.

[0054] Therefore, in the present embodiment, in order to obtain electric power at maximum efficiency, the first panel set **2** and the second panel set **3** are supported by the plurality of support columns **7** so that a space S is opened therebetween when the first panel set **2** and the second panel set **3** are placed on a straight line as shown in (b) of FIG. **7**. As shown in (a) and (c) of FIG. **7**, the space S is a distance such the first panel set **2** does not block reception of sunlight by the second panel **3** and the second panel set **3** does not block reception of sunlight by the first panel set **2** even when the first panel set **2** and the second panel set **3** are tilted for tracking sunlight. In the present embodiment, the space S is set to a substantially exact distance such the first panel set **2** does not block reception of sunlight by the second panel set **3** and the second panel set **3** does not block reception of sunlight by the first panel set **2** even when the first panel set **2** and the second panel set **3** are tilted to a maximum for tracking sunlight. The substantially exact distance is set in accordance with the "sizes of the first panel set **2** and the second panel set **3**" and the "maximum tilt of the first panel set **2** and the second panel set **3**."

[0055] As shown in FIG. **1**, the house portion **8** includes a first house set **81**, a second house set **82**, and an intermediate house member **83**, each of them being made of a transparent material capable of holding own shape.

[0056] In the present embodiment, the first house set **81** is disposed below the first panel set **2**; the second house set **82** is disposed below the second panel set **3**; and the intermediate house member **83** is disposed below the space S.

[0057] The first house set **81** and the second house set **82** have the same size and have the same shape in which the upper part is inclined in a mountain shape in order to correspond to the rotation of the first panel set **2** and the second panel set **3**. On the other hand, as shown in FIG. **9**, the sides of the intermediate house member **83** adjacent to the first house set **81** and the second house set **82** are opened, and the upper surface thereof has a substantially flat plate shape. This configuration makes substantially U shape.

[0058] The first house set **81** is supported by the first support columns **71** at a substantially central portion in the second direction Y together with the first panel set **2** (the first mount **4**). Further, the first house set **81** is supported by the second support columns **72** at the both end portions in the second direction Y.

[0059] The second house set **82** is supported by the first support columns **71** at a substantially central portion in the second direction Y together with the second panel set **3** (the second mount **5**). Further, the second house set **82** is supported by the second support columns **72** at the both end portions in the second direction Y.

[0060] The intermediate house member **83** is supported by the second support columns **72** adjacent to the space S among the second support columns **72** together with the first panel set **2** and the second panel set **3**.

[0061] Since the intermediate house member **83** is disposed between the first house set **81** and the second house set **82**, the intermediate house member **83** is set to have substantially the same length as the distance between the first house set **81** and the second house set **82** in the second direction Y.

[0062] Of the side surfaces of the first house set **81** and the second house set **82**, at least the side surface adjacent to the intermediate house member **83** is opened. As the result, a large working space is secured below the first panel set **2**, the second panel set **3**, and the space S, that is, inside the connected house portion **8**.

[0063] According to the above-described configuration, most of the upper portion of the house portion **8** is covered with the first panel set **2** and the second panel set **3**. However, sunlight can enter in the interior of the house portion **8** from the space S.

[0064] More specifically, not only in the state shown in (b) of FIG. **7** but also in the states shown in (a) and (c) of FIG. **7**, sunlight enters the interior of the house portion **8** from the space between the first panel set **2** and the second panel set **3**.

[0065] Further, in the configuration where the first panel set **2** and the second panel set **3** do not track sunlight, sunlight obliquely incident on the transmitting member **23** is reflected on the side surface of the double-sided light receiving cell **22** as shown in (a) of FIG. **10**. Therefore, the amount of sunlight entering the interior of the house portion **8** is reduced.

[0066] However, in the present embodiment, since the first panel set **2** and the second panel set **3** are configured to track the sunlight as shown in (b) of FIG. **10**, the sunlight is incident substantially orthogonal to the transmitting member **23**, and a large amount of sunlight can be taken into the house portion **8**.

[0067] As described above, in the solar house **1** according to the present embodiment, since it is possible to take in a moderate amount of sunlight into the interior of the house portion **8** while suppressing the polarization of amount of sunlight, it is possible to grow crops and the like inside the house portion **8** in a favorable environment. If a production facility of plants or the like is provided inside the house

portion **8**, plants or the like can be automatically cultivated using the electric power obtained by the first panel set **2** and the second panel set **3**.

[0068] For example, if a plant LED lighting light guide plate is provided, the production of seasonal vegetables can be adjusted. Further, a moisture meter is provided on the ground, and when moisture is insufficient, rain water or the like stored in the tank **41**F can be automatically sprayed. Examples of automated work included in such production facilities include water sprinkling, air conditioning, lighting, and fertilizing (scattering fertilizer) and the like.

[0069] As described above, in the solar house **1** according to the present embodiment, the space S is opened between the first panel set **2** and the second panel set **3** at the substantially exact distance such that the first panel set **2** does not block reception of sunlight by the second panel set **3** and the second panel set **3** does not block reception of sunlight by the first panel set **2** even when the first panel set **2** and the second panel set **3** are tilted to the maximum to track sunlight, and the house portion **8** is provided below the first panel set **2**, the second panel set **3**, and the space S.

[0070] With this configuration, since the first panel set **2** and the second panel set **3** can be arranged closest to each other within a range that does not block the reception of sunlight, the solar house **1** that is compact and achieves maximum efficiency can be realized. In addition, it is possible to take in a moderate amount of sunlight into the interior of the house portion **8** while suppressing the polarization of amount of sunlight, making good use of the space S for obtaining the maximum efficiency with the tracking type. Thus, it is possible to grow crops and the like in a favorable environment.

[0071] Since most of the upper portion of the house portion **8** is covered with the first panel set **2** and the second panel set **3**, the first panel set **2** and the second panel set **3** suppress the incidence of direct sunlight into the house portion **8** in summer, while the first panel set **2** and the second panel set **3** function as a heat insulating material in winter. Therefore, the house portion **8** has an environment-friendly heat pump function.

[0072] In the solar house **1** according to the present embodiment, the first house set **81** is supported by the first support columns **71** together with the first panel **2**, and the second house set **82** is supported by the first support columns **71** together with the second panel set **3**.

[0073] With this configuration, the structure can be simplified, and material and space can be saved.

[0074] In the solar house **1** according to the present embodiment, the intermediate house portion **83** is supported by the second support columns **72** together with the first house set **81** and the second house set **82**.

[0075] With this configuration, the structure can be simplified, and material and space can be saved.

[0076] In the solar house **1** according to the present embodiment, the adjacent side surfaces of the first house set **81**, the second house set **82**, and the intermediate house member **83** with each other are opened.

[0077] With this configuration, it is possible to effectively use the space below the space S in which a vinyl house or the like is normally not installed. Therefore, a large working space is secured below the first panel set **2**, the second panel set **3**, and the space S due to the connected house portion **8**.

[0078] Further, in the solar house **1** according to the present embodiment, each of the first panel set **2** and the second panel set **3** is transmissive and bifacial type.

[0079] With this configuration, sunlight is projected onto the ground in the state of tree leakage to supply moderate amount of sunlight to crops and the like due to the transmissive characteristic. On the other hand, due to the bifacial characteristic, it is possible to generate electric power, even with light reflected from the ground.

[0080] In the solar house **1** according to the present embodiment, a production facility driven by the electric power obtained by the first solar panel **21** is provided inside the house portion **8**.

[0081] With this configuration, it is possible to grow plants and the like friendly to the environment, without requiring electric power from outside.

[0082] In the solar house **1** according to the present embodiment, the first converting unit **63** converts the rotation of the main shaft **41** around the first direction X to the rotation of the transmitting unit **62** around the second direction Y and the second converting unit **64** converts the rotation of the transmitting unit **62** around the second direction Y to the rotation of the main shaft **51** around the first direction X.

[0083] With this configuration, a plurality of mounts can be rotated by one driving unit **61**. Therefore, even when a large number of house sets and a large number of panel sets are provided to obtain a large working space, a plurality of mounts can be rotated by one driving unit **61**. Therefore, the cost and space for installing the driving unit **61** can be significantly reduced.

[0084] Further, in the solar house **1** according to the present embodiment, the pair of upright portions **41**A is respectively erecting from both end portions of the main shaft **41** in the second direction Y. The fitting portions **41**B to which the partition portions **42** are fitted are formed at the predetermined interval L in the pair of upright portions **41**A. The predetermined interval L is set to a length corresponding to the length of the first solar panel **21** in the first direction X.

[0085] With this configuration, since the partition portions are fitted on the fitting portions **41**B formed at the interval corresponding to the length of the first solar panel **21** in the first direction X, the positioning of the partition portion **42** becomes accurate and easy. Further, since the position of the first solar panel **21** in the first direction X is defined by the partition portions **42**, while the position of the first solar panel **21** in the second direction Y is defined by the upright portion **41**A, it is possible to arrange the first solar panels **21** at an accurate position, and at the same time, it is possible to prevent each first solar panel **21** from moving in the first direction X. Further, since rainwater or the like flowing into the groove **41**C on the main shaft **41** moves to either end of the main shaft **41**, rainwater can be guided to a predetermined position.

[0086] In the solar house **1** according to the present embodiment, the main shaft **41** has a hollow shape, and the water entrance hole **41**D is formed in the upper portion of the main shaft **41** at a position not intersecting with the partition portion **42**, and the drain pipe **41**E is further connected to the main shaft **41**.

[0087] With this configuration, since rain water or the like flowing into the groove **41**C on the main shaft **41** is discharged through the water entrance hole **41**D and the

drain pipe **41**E, rain water or the like flowing into the groove **41**C is prevented from being concentrated on only a part of the ground and falling down to form a water reservoir at an unintended position.

[0088] While the solar house of the invention has been described in detail with reference to the preferred embodiment thereof, it would be apparent to those skilled in the art that many modifications and variations may be made therein without departing from the spirit of the invention, the scope of which is defined by the attached claims.

(1) Structure of Mount

[0089] For example, in the above-described embodiment, since the first mount **4** is rotated around the main shaft **41**, rain water that has fallen onto the first solar panel **21** also can move and fall in accordance with the rotation of the solar panel **21**. This also may cause the rain water to concentrate to fall on a part of the ground.

[0090] Now, as shown in FIG. **11**, each partition portion **42** may have a V shape whose center is located on the main shaft **41**.

[0091] With this configuration, since rain water that has fallen onto the first solar panel **21** moves to the groove **41**C, rain water and the like is prevented from being concentrated to fall in an unintended place. In addition, since light is reflected and scattered near the center of the V shape, further power generation can be performed by the scattered light.

[0092] In this case, it is preferable that the pair of standing portions **41**A are also slightly inclined inward so as to be in contact with the side surfaces of each first solar panel **21**, in accordance with the V shape of the partition portions **42**.

[0093] Further, an anemometer may be provided to control the driving unit **61** to stop the first panel set **2** and the second panel set **3** in a horizontal state when the wind is strong. In the case where the partition portion **42** has a V shape as described above, it is preferable that the central portion of the V shape of the partition portion **42** is made to have a rotatable structure and the partition portion **42** is made horizontal to stop the tracking of sunlight.

[0094] Further, in order to position the partition portion **42** more accurately, a groove or the like corresponding to the fitting portion **41**B may be formed in the lower portion of the partition portion **42**.

[0095] In the above-described embodiment, the upright portion **41**A is formed integrally with the main shaft **41**, but may be formed separately from the main shaft **41**.

[0096] In the above embodiment, the first solar panel **21** is disposed between the plurality of partition portions **42**, but may be placed on the plurality of partition portions **42**. In this case, as shown in FIG. **12**, a configuration in which a convex portion **42**A is formed in the partition portion **42** and the first solar panels **21** are respectively placed on both sides of the convex portion **42**A can be considered. In this case, the predetermined interval L between the fitting portions **41**B is slightly shorter than the length of the first solar panel **21** in the first direction X, which is different from the embodiment described above (which is substantially the same as the length of the first solar panel **21** in the first direction X). This is included in the "length corresponding to the length of the first solar panel **21** in the first direction X" of the present invention.

(2) Connection in the First Direction X

[0097] In addition, a configuration in which a plurality of first panel sets **2** is connected in the first direction X can also be considered. In this case, it is possible to carry rain water or the like in the distance by connecting adjacent main shafts **41**. For example, when a pond or the like exists outside the site of the solar house **1**, it is possible to drain water directly into the pond or the like, and it is unnecessary to provide the tank **41**F. Also in this case, by connecting the adjacent main shafts **41**, the plurality of first mounts (the first panel sets **2**) connected in the first direction X can be rotated by one driving unit **61**.

(3) Connection in the Second Direction Y

[0098] In the above-described embodiment, three of the first house set **81**, the second house set **82**, and the intermediate house member **83** are connected, but more house sets and intermediate house members may be connected in the second direction Y. Even in this case, if the transmitting unit **62** is commonly used for a plurality of mounts, the plurality of mounts can be rotated by one driving unit **61**.

(4) Structure of the House Portion

[0099] In the above-described embodiment, the first house set **81** and the second house set **82** have the same size, but they do not necessarily have the same size. In the above-described embodiment, the intermediate house member **83** has a substantially U shape, but a substantially flat plate shape may be bridged between the first house set **81** and the second house set **82** as the intermediate house member **83**, if only a roof is required.

[0100] In the above-described embodiment, the side surfaces of the first house set **81**, the second house set **82**, and the intermediate house member **83** adjacent to each other are opened. However, the side surfaces may be openable depend on the necessity. This case is also included in "opened" of the present invention.

[0101] In the above-described embodiment, the first house set **81**, the second house set **82**, and the intermediate house member **83** are made of materials capable of holding own shape, but this does not necessarily mean that the first house set **81**, the second house set **82**, and the intermediate house member **83** can hold own shape independently. For example, the case where a vinyl sheet or the like is hold own shape by being supported by the support column **7** is also included.

[0102] Further, in the above-described embodiment, the first house set **81**, the second house set **82**, and the intermediate house member **83** are made of a transparent material, but it is sufficient that at least the upper portion is made of a transparent material. Even in this case, a moderate amount of sunlight can be taken into the interior of the house portion **8** by the space S and the transmitting member **23** of the first solar panel **21** while suppressing the polarization of amount of sunlight.

[0103] In the above-described embodiment, the first support columns **71** support the end portions of the first house set **81** and the second house set **82** in the first direction X. However, for example, if the first house set **81** and the second house set **82** are extended in the first direction X and the positions inside the end portions are supported by the first support columns **71**, the first support column **71** does not hinder the entry and exit of the first house set **81** and the second house set **82** into the interior.

[0104] Further, for example, when the height is required for the work in the house portion **8**, it is a matter of course that the support column **7** and the house portion **8** having a height corresponding to the requirement may be employed.

(5) Methods of Using Solar Houses

[0105] The solar house of the present invention is not limited to use for vegetation, and the interior of the house portion **8** can be used as a parking lot, a house, a temporary housing, a warehouse, or a combination thereof.

[0106] In addition, it is considered that the ground corresponding to the space S is likely to be warm because the sunlight easily enters the ground. Therefore, it is considerable to provide in this portion a pipe for distributing underground heat within the house portion **8**.

DESCRIPTION OF THE REFERENCE NUMBER

[0107] **1** Solar house
[0108] **2** First panel set
[0109] **3** Second panel set
[0110] **4** First mount
[0111] **5** Second mount
[0112] **6** Driving mechanism
[0113] **7** Support column
[0114] **8** House portion
[0115] **21** First solar panel
[0116] **21**A First-row solar panel
[0117] **21**B Second-row solar panel
[0118] **22** Double-sided light receiving cell
[0119] **23** Transmitting member
[0120] **31** Second solar panel
[0121] **41** Main shaft
[0122] **41**A Upright portion
[0123] **41**B Fitting portion
[0124] **41**C Groove
[0125] **41**D Water entrance hole
[0126] **41**E Drain pipe
[0127] **41**F Tank
[0128] **41**G Cover
[0129] **42** Partition portion
[0130] **42**A Convex portion
[0131] **51** Main shaft
[0132] **61** Driving unit
[0133] **62** Transmitting unit
[0134] **63** First converting unit
[0135] **64** Second converting unit
[0136] **71** First support column
[0137] **72** Second support column
[0138] **81** First house set
[0139] **82** Second house set
[0140] **83** Intermediate house member
[0141] S Space
[0142] X First direction
[0143] Y Second direction
[0144] Z Third direction

1. A solar house comprising:

a first panel set having a plurality of first solar panels;

a second panel set having a plurality of second solar panels;

a driving mechanism for driving the first panel set and the second panel set to track sunlight; and

a plurality of first support columns erected for supporting the first panel set and the second panel set,

wherein the first panel set and the second panel set are arranged so that a space is opened therebetween when the first panel set and the second panel set are placed on a straight line,

wherein the space is set to a substantially exact distance such that the first panel set does not block reception of sunlight by the second panel set and the second panel set does not block reception of sunlight by the first panel set even when the first panel set and the second panel set are tilted to a maximum to track sunlight,

wherein a house portion formed of a material capable of holding own shape is provided below the first panel set, the second panel set and the space,

wherein the house portion is provided with a first house set disposed below the first panel set, a second house set disposed below the second panel set and an intermediate house member disposed below the space,

wherein the first house set is supported by the first support column together with the first panel set, and the second house set is supported by the first support column together with the second panel set, and

wherein at least an upper portion of the intermediate house member is formed of a transparent member.

2. The solar house according to claim **1**, further comprising a plurality of second support columns for supporting the first house set and the second house set in addition to the first support column, wherein the intermediate house member is supported by the second support column together with the first house set and the second house set.

3. The solar house according to claim **1**, wherein adjacent side surfaces of the first house set, the second house set, and the intermediate house member with each other are opened.

4. The solar house according to claim **1**, wherein each of the first panel set and the second panel set is a transmissive and bifacial type.

5. The solar house according to claim **1**, wherein a production facility driven by electric power obtained by the plurality of first solar panels and the plurality of second solar panels is provided inside the house portion.

6. The solar house according to claim **1**, wherein the drive mechanism includes:

a driving unit for rotating a first mount for supporting the first panel set around a first direction;

a transmitting unit extending in a second direction substantially orthogonal to the first direction and disposed between the first mount and a second mount for supporting the second panel set;

a first converting unit connected between the first mount and the transmitting unit to convert the rotation of the first mount around the first direction into a rotation around the second direction and to transmit the converted rotation around the second direction to the transmitting unit; and

a second converting unit connected between the transmitting unit and the second mount to convert the rotation of the transmitting unit around the second direction into a rotation around the first direction and to transmit the converted rotation around the first direction to the second mount.

7. The solar house according to claim **2**, wherein each of the first panel set and the second panel set is a transmissive and bifacial type.

8. The solar house according to claim **3**, wherein each of the first panel set and the second panel set is a transmissive and bifacial type.

9. The solar house according to claim **2**, wherein a production facility driven by electric power obtained by the plurality of first solar panels and the plurality of second solar panels is provided inside the house portion.

10. The solar house according to claim **3**, wherein a production facility driven by electric power obtained by the plurality of first solar panels and the plurality of second solar panels is provided inside the house portion.

11. The solar house according to claim **4**, wherein a production facility driven by electric power obtained by the plurality of first solar panels and the plurality of second solar panels is provided inside the house portion.

12. The solar house according to claim **2**, wherein the drive mechanism includes:

a driving unit for rotating a first mount for supporting the first panel set around a first direction;

a transmitting unit extending in a second direction substantially orthogonal to the first direction and disposed between the first mount and a second mount for supporting the second panel set;

a first converting unit connected between the first mount and the transmitting unit to convert the rotation of the first mount around the first direction into a rotation around the second direction and to transmit the converted rotation around the second direction to the transmitting unit; and

a second converting unit connected between the transmitting unit and the second mount to convert the rotation of the transmitting unit around the second direction into a rotation around the first direction and to transmit the converted rotation around the first direction to the second mount.

13. The solar house according to claim **3**, wherein the drive mechanism includes:

a driving unit for rotating a first mount for supporting the first panel set around a first direction;

a transmitting unit extending in a second direction substantially orthogonal to the first direction and disposed between the first mount and a second mount for supporting the second panel set;

a first converting unit connected between the first mount and the transmitting unit to convert the rotation of the first mount around the first direction into a rotation around the second direction and to transmit the converted rotation around the second direction to the transmitting unit; and

a second converting unit connected between the transmitting unit and the second mount to convert the rotation of the transmitting unit around the second direction into a rotation around the first direction and to transmit the converted rotation around the first direction to the second mount.

14. The solar house according to claim **4**, wherein the drive mechanism includes:

a driving unit for rotating a first mount for supporting the first panel set around a first direction;

a transmitting unit extending in a second direction substantially orthogonal to the first direction and disposed between the first mount and a second mount for supporting the second panel set;

a first converting unit connected between the first mount and the transmitting unit to convert the rotation of the first mount around the first direction into a rotation around the second direction and to transmit the converted rotation around the second direction to the transmitting unit; and

a second converting unit connected between the transmitting unit and the second mount to convert the rotation of the transmitting unit around the second direction into a rotation around the first direction and to transmit the converted rotation around the first direction to the second mount.

15. The solar house according to claim **5**, wherein the drive mechanism includes:

a driving unit for rotating a first mount for supporting the first panel set around a first direction;

a transmitting unit extending in a second direction substantially orthogonal to the first direction and disposed between the first mount and a second mount for supporting the second panel set;

a first converting unit connected between the first mount and the transmitting unit to convert the rotation of the first mount around the first direction into a rotation around the second direction and to transmit the converted rotation around the second direction to the transmitting unit; and

a second converting unit connected between the transmitting unit and the second mount to convert the rotation of the transmitting unit around the second direction into a rotation around the first direction and to transmit the converted rotation around the first direction to the second mount.

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