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(54) **COLUMN AND BEAM UNIT FOR HUT CONSTRUCTION AND HUT STRUCTURE USING SAME**

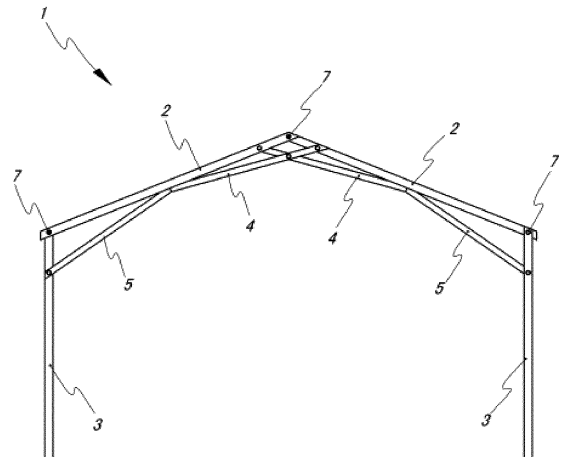
(57) [Problem to be solved]

To provide a column and beam unit for hut construction and a hut structure using same that are durable, can retain the shape, and can ensure a spacious interior.

[Solution]

A column and beam unit (1) comprises: a pair of ascending beam members (2) that form a ridge and roof pitch by being disposed so that the ends of two rod-shaped members are coupled to each other and have a fixed open angle; a column member (3) that is erected and held by coupling the top end thereof to near an end of the ascending beam member on the side of a pole plate; a pair of ridge-side beam support member (4) that couple a position down from the ridge toward the pole plate side of one ascending beam member to a position near the approximate center of the other ascending beam member; and an eaves-side beam support member (5) that is disposed between and couples the ascending beam member and the column member coupled to the ascending beam member. The ridge-side beam support member and the eaves-side beam support member abut each other and are joined on the ends at the connection point. The hut structure is constructed by disposing a plurality of column and beam units at fixed intervals in the longitudinal direction, and coupling and retaining of the shape of each unit with a girder member, a main building member, and a pole plate member (81).

Fig.1



Description

Field of the Invention

[0001] The present invention relates to the column and beam unit for hut construction and a hut structure using the same.

Background of the Invention

[0002] Due to the diversification of demand in recent years, the demand for a small-scale temporary hut with a roof installed outdoors and having a certain degree of durability is increased in general households, construction sites, small farmers and work place.

[0003] For the demand of such a small-scale temporary hut, for example, "roof unit for wooden building" (Patent Document 1) and "roof truss" in consideration of ease of assembly (Patent Document 2) are disclosed.

[0004] At first, the "roof unit for a wooden building" of patent document 1 is provided, and a connection fitting for connecting one end of the two ceiling joist to each other is provided, and the vicinity of the lower end part of each rafter is rotatably connected to the eye plate in the vicinity of the other end part of each of the ceiling joist, and the upper ends of the rafters connected in the vicinity of the other end of each of the ceiling joist are rotatably connected to each other by a connection metal fitting, and is constituted so as to be freely foldable.

[0005] Also, the roof truss of the patent literature 2, rotatably fitted to the upper end part of each of the diagonal members and diagonal members each other on one end side and another end side of an upper end part of a flux material mounted rotatably at the center of the diagonal member, and the folded position and a falling-down in any of horizontal and diagonal members and the other one diagonal member and strut material is laid down to the horizontal lower chord material. The other diagonal member and a diagonal member of one strut is vertically erected with respect to the horizontal lower chord material to provide a truss assembling attitude is positioned at one end and the other end of the lower chord member and lower end parts of each.

[0006] However, since The present units and the like disclosed in each of the above-mentioned patent documents are fixedly installed high-durability buildings, it takes only a reasonable time and cost (such as purchase and maintenance cost) to construct The present unit Its construction and disassembly are also complicated, so it is unsuitable for quick disassembly and movement, and there is a problem that the installation place is limited.

[0007] Then In order to solve the above problem, the present inventor has filed and disclosed "A Column and Beam Unit for Hut Construction and A Hut Structure Using It / JP. Pat. No. 4886078", and has a patent on it. In this patented invention, a column member is connected to each of the lower end side of a pair of climbing beam members forming a roof gradient, and the vicinity of the

middle of the ascending beam member opposed to the column member is connected by a pair of beam support members. In addition, the hut structure is arranged at a predetermined interval a plurality of sets in ridge direction of the column and beam unit, the constructed by combining the girder member

Prior Art Document

10 Patent document

[0008]

Patent Document 1: Japanese Laid-Open Patent Publication No.H09-228531

Patent Document 2: Japanese Laid-Open Patent Publication No.2002-38645

Patent Document 3: Japanese Patent Publication No.4886078

Disclosure of the Invention

Problems to be solved by the Invention

[0009] The present unit is obtained by the patent, has a shape-retaining property and durability of a certain degree and to provide a problem solving time of application, flexibility of changing dimension of outer shape and the internal space, and further to provide a quick assembling property at an installation site.

[0010] However, as a result of using this unit, there was a request to broaden the internal space in the hut structure using the present unit in addition to the technical effect mentioned above.

[0011] Accordingly, the applicants of the present invention, in addition to further improve the present unit, to provide a long-term maintenance of shape-retaining property and durability of conventional level in spite of a simple structure, to provide a hut structure using the same, and the column and beam unit for hut construction and can be widely used from an internal space of a hut after construction.

Means for Solving the Problems

[0012] In order to solve the above problem, the ascending beam unit for constructing a hut of the present invention of the present invention adopts the following constitution.

[0013] That is, a pair of ascending beam members which connect end parts of two rod-like members to each other and are arranged with a constant opening angle to form a ridge part and a roof gradient, and a column member erected and held by being connected to an upper end part in the vicinity of an end part on the pole plate side of the ascending beam member, and position falling from ridge part of one ascending beam member to pole plate side, and a pair of ridge-side beam support members

connected to the intermediate part of the other side of the ascending beam member.

[0014] It is preferable that the ascending beam member, the column member, and the ridge-side beam support member have wood members having the same cross-sectional shape and different length dimensions, for example, thinned wood of the same cross-sectional shape. Such thinned timber is easy to obtain, and is also excellent in terms of cost reduction and effective utilization of resources. As the other material of each member, a material such as a metal material, a metal pipe, a resin material, a resin pipe, a bamboo material, etc. may be selected, and a combination of a plurality of materials such as a combination of wood and a metal material It may be selected.

[0015] Also, in the column and beam unit for the hut construction of the above-described structure, and an eaves-side beam support member which is installed and connected to the ascending beam member and the column member connected thereto is provided. According to this constitution, the ascending beam member is provided with a ridge-side beam support member linked with the other ascending beam member facing the other, and the support is obtained from two directions by an eaves-side beam support member installed on a column member to which the ascending beam member is connected.

[0016] Further, the end portions of the ridge-side beam support member and the eaves-side beam support member are joined together at the Connection portion between the ridge-side beam support member and the eaves-side beam support member of the ascending beam member. Here, as a connection form of both members, they may be connected via a specific coupling member. As the coupling member, for example, a metal plate may be used, after the Connection portion of each member is covered with a metal plate, the member may be screwed together with this.

[0017] In addition, in joining the end portions between the members, it is characterized in that it is particularly a butt joint of the end surfaces of the each members. In other words, while the ridge-side beam support member and the eaves-side beam support member about each other, the opposing end surfaces are brought into contact with each other, while the upper surface side of the end surface is also joined to the beam member so that the ridge-side beam support member and the eaves-side beam support member supports the ascending beam member and supports each other mutually.

[0018] Further, in joining the ends, a bending reinforcing member is interposed between opposed end faces of both the ridge-side beam support member and the eaves-side beam support member, and the end face of the bending reinforcement member butt joints of end faces of both members may be used.

[0019] The intersecting portion of the pair of the ridge-side beam support members is also in the same connecting manner as the connecting of the other member and the connecting position between the eaves-side beam

support member and the column member in the connection of the eaves-side beam support member and the column member is a connection means selectable along the ridge direction of the column member.

[0020] As to the connection of each of the above members, at least one of fastening-loose coupling, pin coupling, rigid coupling, fitting coupling, and engagement coupling, or a combination thereof is adopted. As the fastening-loose coupling, for example, there are a mode of fastening a bolt and a nut, and a mode of fastening a thumb screw or a wing nut.

[0021] Here, as a pin coupling, there is a mode in which a pin formed on one side is fitted (press-fitted) into a bush arranged on the other. As for the rigid coupling, as described above, in addition to a mode in which each member is screwed and screwed after covering the Connection portion of each member with a coupling member such as a metal plate, when each member is a wooden material, There is also a mode of nailing.

[0022] Further, when the resin material and resin pipe, and the each members are good even when adopting a form adhesive material is used. As the fitting and coupling, and a cylindrical formed on one side, and the mode is fitted to the recessed part and the other is formed of the same shape as the predetermined shape projecting part is of square column. As the engagement bond, there is a form reference with each other a protrusion formed on the both.

[0023] In this case, In joining each member except the connecting portion between the ascending beam member, the ridge-side beam support member and the eaves-side beam support member, a connection mode to be rotatable by, for example, it is preferable that a mode which can be fastening/loosening universal joint by adopting a joining apparatus for fastening underwater bolt and nut. The connection mode is adopted, and ascending beam member and column member is appropriately loosening the bolt and nut to form a link structure by an outer frame part of the column and beam unit and the connection part becomes rotatable. As a result, it is possible to appropriately change the dimension between the standing members between the column members and the tilt angle of the ascending beam member, and it is also possible to fold the column members close to each other.

[0024] The hut structure using the column and beam unit having the above-described configuration is characterized by having the following constitution. That is, the pair of ascending beam members are held at a predetermined bending angle, and the column member is erected and held at an installation position, and the column and beam unit for hut construction the shape retention by the rigid coupling for connecting or an end part side of the eaves-side beam support member and the ridge-side beam support member, the column and beam unit group and a proper number of arranged at a proper interval in the ridge direction at a position opposite to and in parallel with the end face position of two or more of the column

and beam unit, respective column members to each other ascending beam member, and each of the column and beam unit group, a girder member, and ridge beam member, and a pole plate member, and a main building member, either, and sill, and the device is characterized by constructing the shape retention by the mounting of a member or combination of them.

[0025] Mounting of the girder member, etc., and the column and beam unit, it is preferable that the same and connection mode in which the column and beam unit from a viewpoint of reducing the number of components and cost reduction. For example, when the connection of the column-beam unit is made to be a fastening-loose connection composed of a bolt and a nut, it is preferable that the column and beam unit and the beam member are attached to each other even if the column and beam unit and the girder member are attached to each other. Further, it is preferable that the same material is selected and a column and beam unit material of girder member and the like, a metal material in consideration of the strength and the like, and a resin material, and also by selecting the combination of the plurality of materials.

Effects of the Invention

[0026] Since the column and beam unit for building the hut of the present invention has the above-described configuration, the following effects are obtained.

First of all, since the framework for construction of the hut is formed by connecting the ascending beam members and the column members, and the ascending beam members are supported by the ridge-side beam support member and the eaves-side beam support member which are inclined, the ascending beam members and Compared with the column and beam unit (hereinafter referred to as "patent column and beam unit") of Japan Patent No. 4886078 in which the beam support member is parallel while forming a climbing gradient, the shape retention and durability of the entire unit are equal to or more than , And demonstrate the technical effect that the internal space can be widely secured.

[0027] Then, a rapid assembling and decomposition performance and decomposition of moving the hut construction, easy replacement of a part of a member, a column and beam unit equivalent to that of maintenance properties, flexibility of dimension change of an inner space and outside dimension equal to the maintenance property.

[0028] Also in the hut construction constructed by using the column and beam unit for constructing a hut of the present invention of the present invention, the degree of freedom of the installation place is similarly high, and the internal space can also be secured wider than the patent column and beam unit.

Brief Description of the Drawings

[0029]

[Fig.1] The front view showing a column and beam unit for hut construction of the present invention.

[Fig.2] A partial enlarged view of fig. 1

[Fig.3] An assembled perspective view (A) showing a connecting structure of the ascending beam member and the ridge-side beam support member of the present invention and an assembled perspective view (B) showing a connecting structure of the eaves-side beam support member and the column member.

[Fig.4] An explanatory view (A) and (B) showing variations of a column and beam unit for hut construction of the present invention.

[Fig.5] An explanatory view (C) and (D) showing variations of a column and beam unit for hut construction of the present invention.

[Fig.6] A perspective view showing a hut structure using a column and beam unit for hut construction of the present invention.

Best Mode for Carrying Out the Invention

[0030] Hereinafter, an embodiment (hereinafter referred to as "the present unit ") of a column and beam unit for constructing a cabin according to the present invention will be described in detail with reference to the accompanying drawings.

[0031] The present unit 1 shown in FIG. 1 comprises a pair of ascending beam members 2, 2 formed on three dimensions (about 9 cm) from thinned wood, a pair of column members 3, 3, a pair of the ridge-side beam support members 4,4, And the eaves-side beam support members 5, 5, In the following description, the right side of FIG. 1 is defined as "right side" of the present unit 1, the left side is defined as "left side", the side visible on the drawing as "front side", the side visible on the drawing as "rear side" .

[0032] The ascending beam member 2 is connected such that one end side of the ascending beam member 2 forms a predetermined roof gradient and a ridge portion so that the ascending beam member 2 on the right side of the ridge portion is on the rear side. The connection means 7 of the ascending beam member 2 employs a coupling mode by fastening-loose means. Specifically, the bolt 71 is inserted into the connection port 74 formed in each ascending beam members 2, 2, and the bolt 71 is fastened with the nut 72 and the two washers 73, 73. Because of this connection mode, if the fastening state of the bolt 71 or the nut 72 is loosened, a pair of ascending beam members 2, 2 becomes freely rotatable with respect to each other. In addition, as long as the connection means 7 can be rotatable connected, it may be changed to another mode such as, for example, a thumb screw and a wing nut, a pin and a bush, a pin connection composed of a shaft and a shaft holder, and the like.

[0033] The upper end portions of the upright column members 3, 3 are connected to the opposite side end portions which are lowered from the ridge to which the

ascending beam members 2, 2 are connected to the pole plate side. In contrast to the ascending beam member 2 forming a predetermined roof gradient, the column member 3 is connected so as to be substantially vertical, and the ascending beam member 2 is erected and held. Here, the right column member 3 is connected to the front side of the ascending beam member 2, and the left column member 3 is connected to the rear side of the ascending beam member 2.

[0034] Similarly to the case of the ascending beam members 2 the ascending beam member 2 and the column member 3 are connected to each other by inserting the bolt 71 into the connection port 74 formed in the ascending beam member 2 and the column member 3, and the nut 72 and the washer 73 And has concluded. Then, if the fastening state of the bolt 71 or the nut 72 is relaxed, the ascending beam member 2 and the column member 3 are rotatable with respect to each other. In addition, a plurality of connection ports 74 other than the ascending beam member 2 being connected is formed along the ridge direction of the column member 3. The connection port 74 of the column member 3 may be deformed into a long hole (not shown) as necessary. An end portion of an eaves-side beam support member 5 (to be described later) is connected to an arbitrary position of the plurality of connection ports 74 and long holes.

[0035] Both end portions of the pair of ridge-side beam support members 4, 4 are connected to the above-mentioned ascending beam member 2 so as to intersect with each other by the connection means 7 of the same mode. The one ridge-side beam support member 4 has a left upper end on the left side ascending beam member 2 is connected to the vicinity of an upper connection part which is lowered from the rigid connection of the ridge part to the pole plate side, and the right side lower end thereof is rigidly connected to the lower surface in the vicinity of the middle of the right-side ascending beam member 2. The other ridge-side beam support member 4 is symmetrical with the above one ridge-side beam support member 4 and the right upper end is symmetrical with the ridge-side beam support member 4 of the upper joining portion which is lowered from the ridge of the right-side ascending beam member 2 to the eaves girder side and its lower left end is rigidly connected to the lower surface near the middle of the left-side ascending beam 2. A pair of ridge-side beam support members 4, 4 is arranged so as to draw an approximately x-shape in which the upper side crosses the ascending beam member 2 and the whole of the Present unit 1 is held in shape.

[0036] The ridge-side beam support member 4 positioned on the right side is connected to the rear side with respect to the left ascending beam member 2 and the ridge-side beam support member 4 positioned on the left side is connected to the front side with respect to the right ascending beam member 2 and is connected to the front side of the ridge-side beam support member 4 on the right side. The intersections of the ridge-side beam support member 4 are also connected by the same connec-

tion means 7 as the other members.

[0037] An eaves-side beam support member 5 is connected to each column member 3 so as to be connected to the ascending beam member 2 to which the column member 3 is connected. Specifically, one eaves-side beam support member 5 is connected at the lower right end to the upper side of the right side column member 3 and below the connection position of the ascending beam member 2, and the left upper end thereof is connected to the right ascending beam member 2 to the lower surface side in the vicinity of the middle of the two. The other eaves-side beam support member 5 is symmetrical with the one eaves-side beam support member 5 described above and the left lower end is on the upper side of the left side column member 3 and is located below the connection position of the ascending beam member 2 and its right upper end is rigidly connected to the lower surface side in the vicinity of the middle of the left ascending beam member 2.

[0038] The ridge-side beam support member 4 and the eaves-side beam support member 5 are formed by machining a part of the upper surface of the end portion at the rigid portion with the ascending beam member 2 so as to abut against the lower surface of the ascending beam member 2, in a butted state in which the respective end surfaces in the direction are brought into contact with each other.

[0039] In addition, the rigid connection of the ascending beam member 2, the ridge-side beam support member 4, and the eaves-side beam support member 5, in addition to nails and adhesion, as shown in FIG. 2, a metal or a wooden plate body covering a rigid part as a coupling member 6 is formed, it is may be brought into contact with each other from the front face side (or the rear face side) to be screw-fixed to each other

[0040] The present unit 1 forms a column and beam structure having a predetermined roof gradient by connecting the pair of ascending beam members 2, 2 and the pair of column members 3, 3, and in the ascending beam member 2, the eaves-side beam support member 5 which connects the intermediate position with the pair of ridge-side beam support members 4, 4, in an intersecting manner and at the rigid connection part of the ascending beam member 2 to the column member 3 obliquely It is bridged and rigidly connected, and the whole is shaped and reinforced.

[0041] The present unit 1 having such a configuration has the following characteristics.

That is, in the present unit 1, since the ascending beam member 2, the column member 3, the ridge-side beam support member 4, and the eaves-side beam support member 5 are fastened by the connection means 7, the fastened state of the bolt 71 is loosened By changing the rigid position of the ridge-side beam support member 4 and the eaves-side beam support member 5 to the ascending beam member 2 and by changing the connecting position of the column member 3 and the eaves-side beam support member 5, the present unit 1 It is possible

to change the fixed open angle of the roof gradient of the ascending beam member 2 and the dimension between the column members.

[0042] Also, in the present unit 1, the rigid connection state of the ridge-side beam support member 4 and the eaves-side beam support member 5 to the ascending beam member 2 is canceled, and can be folded when the rotation of the connection means 7 so as to come close to each other face each other, and the column member 3, and the conveyance of the present unit 1 is facilitated.

[0043] With this simple structure, the present unit 1 can be easily assembled and disassembled at the installation site, while it is assembled at a factory or the like in advance, transported in a folded state, deployed at the installation site, and then the ascending beam member 2 and the installation side it can be assembled by the ridge-side beam support member 4 and the eaves-side beam support member 5.

[0044] Here, a modified example of the present unit 1 will be described. The arrangement of the ridge-side beam support member 4 and the eaves-side beam support member 5 of the present unit 1 can also be modified as follows.

[0045] First, as shown in FIG. 4 (A), the eaves-side beam support member 5 is omitted only by rigidly connecting the end portion side of the ridge-side beam support member 4 to the ascending beam member 2. In order to improve the shape retain ability in this form, as shown in FIG. 4 (B), the end portion side of the ridge-side beam support member 4 is rigidly connecting by the ascending beam member 2 and the metal plate 61, the column member 3 is rigidly connecting by the auxiliary metal plate 62 instead of the eaves-side beam support member 5.

[0046] Furthermore, as shown in FIG. 5 (C), in the rigid portion of the ridge-side beam support member 4 and the eaves-side beam support member 5 with the ascending beam member 2, the end portion are not abutted but the metal, and is integrated into a rigid state via a metal plate 61. In addition, as shown in FIG. 5 (D), a bending reinforcement member 63 as a coupling member 6 is provided between the ridge-side beam support member 4 and the eaves-side beam support member 5 so as to extend along the lower surface side of the ascending beam member 2 and the both end surfaces of the bending reinforcement member 63 and the ridge-side beam support member 4 and the end surface of the eaves-side beam support member 5 are abutted against each other to bring them into a rigid state.

[0047] Next, a hut structure 8 (hereinafter, abbreviated as "the present hut structure ") using the present unit 1 will be described.

[0048] First, a plurality of the present unit 1 are assembled with the connection means 7, or are deployed from the folded state, the bolt 71 of the connection means 7 and the nut 72 are retaining the shape of the rigid connection, after so that the ascending beam member 2 is rigidly connected to the ridge-side beam support member

4 and the eaves-side beam support member 5. When assembling and tightly fastening, it is necessary to adjust the dimension between the column members by vertically moving the connecting position between the column member 3 and the eaves-side beam support member 5.

[0049] Next, a plurality of (three in the present embodiment) the present units 1, are arranged at appropriate intervals in the ridge direction of the spar of rows while their female face positions are opposed to each other in parallel, and this group of the present units 1, is formed, the present hut structure 8 is constructed by attaching the pole plate member 81, the main building member 82, and the girder member 83 and shaping it. The girder member 83 connects the column members 3 positioned at the front and rear, and the pole plate member 81 and the main building member 82 couple the ascending beam member 2 to each other. As in the case of the connection of the ascending beam member 2, such a connection is also intended to reduce the number of parts by appropriately using the connection means 7 comprising a bolt 71, a nut 72, and a washer 73.

[0050] Even after construction of the present hut structure 8, if the connection means 7 at a predetermined location is loosened and the rigid connection positions of the column member 3, the ridge-side beam support member 4 and the eaves-side beam support member 5 are changed, the present hut structure 8 it is possible to easily change the dimensions between the column members and the height of the whole cabin and flexibly cope with the change of the installation position.

[0051] Moreover, in addition to easily replacing a part of each member, it is possible to add a ridge beam member and a base (not shown) to the present hut structure 8 as necessary to improve its structural strength. The connection between the Pole plate member 81, the main building member 82, and the girder member 83 and the present unit 1 is not limited to the form of the connection means 7 by means of the bolt 71 and the nut 72, and other types of such as a nail, a rope, etc. It may be changed to a means.

[0052] After completion of the construction of the present hut structure 8, it is used as a so-called vinyl house or a small-scale temporary hut of another purpose by covering the whole with a vinyl sheet or the like appropriately, or attaching a tongue plate or a plywood board to a desired position as appropriate be able to.

Description of the Reference Numerals

[0053]

- 1: Present unit
- 2: Ascending beam member
- 3: Column member
- 4: Ridge-side beam support member
- 5: Eaves-side beam support member
- 6: Coupling member
- 61: Metal plate

- 62: Auxiliary metal plate
 63: Bending reinforcing member
 7: Connection means
 71: Bolt
 72: Nut
 73: Washer
 74: Connection port
 8: Hut structure
 81: Pole plate member
 82: Main building member
 83: Girder member

Claims

1. A column and beam unit (1) for hut construction comprising:

- a pair of ascending beam members (2) which connect end parts of two rod-like members to each other and are arranged with a constant opening angle to form a ridge part and a roof gradient;
- a column member (3) erected and held by being connected to an upper end part in the vicinity of an end part on the eaves girder side of the ascending beam member; and
- position falling from ridge part of one ascending beam member to eaves girder side; and a pair of ridge-side beam support members (4) connected to the intermediate part of the other side of the ascending beam member.

2. The column and beam unit for hut construction according to claim 1, further **characterized by** providing an eaves-side beam support member (5) connected in a state of being bridged between the ascending beam member (2) and the column member.

3. The column beam unit for hut construction according to claim 2, wherein each of end parts of the ridge-side beam support member (4) and the eaves-side beam support member (5) are attached to the ascending beam member and connected to each other.

4. The column beam unit for hut construction according to claim 3, wherein said each of end parts of the eaves-side beam support member (5) and the ridge-side beam support member (4) are connected by abutting end surfaces of said each end parts.

5. The column beam unit for hut construction according to claim 3, further comprising a bending reinforcing member (63) wherein said each of end parts of eaves-side beam support member (5) and the ridge-side beam support member (4) is coupled each other

by interposing the bending reinforcing member (63) between said each end parts of eaves-side beam support member (5) and the ridge-side beam support member (4) by abutting.

6. The column beam unit for hut construction according to claim 1, 2, 3, 4, or 5, the pair of ridge-side beam supporting members (4) are connected to each other are connected at an intersecting portion thereof.

7. The column beam unit for hut construction according to claim 2, 3, 4, or 5, wherein the connection between the eaves-side beam support member (5) and the column member (3) is performed by a connection means modifiable attached to a position modifiable along the longitudinal direction.

8. The column beam unit for hut construction according to claim 1, 2, 3, 4, 5, 6, or 7, wherein the connection structure of each member is selected from a group consisting of a fastening and loosening coupling, a pin coupling, and a rigid coupling, a fitting coupling, and an engagement coupling, or a structure in which these are combined.

9. Hut structure which is shape retained by:

a column beam unit (1) according to any one of claims 1 to 8 which is shape retained by a pair of ascending beam members (2) held at a predetermined angle, a column member (3) erected and held at an installation position, and a ridge-side beam support member (4) and eaves-side beam support member (5) each of end part of which are connected to each other; a plurality of said column and beam units (1) comprising a proper number of column and beams units in which two or more of the column and beam units are arranged at a proper interval in the ridge direction at a position opposite to and in parallel with the end face position; and installing each of ascending beam member and each of column member of said plurality of column and beam units, a member comprising a Girder member, ridge beam member, a pole plate member, a main building member, or combination thereof.

Fig.1

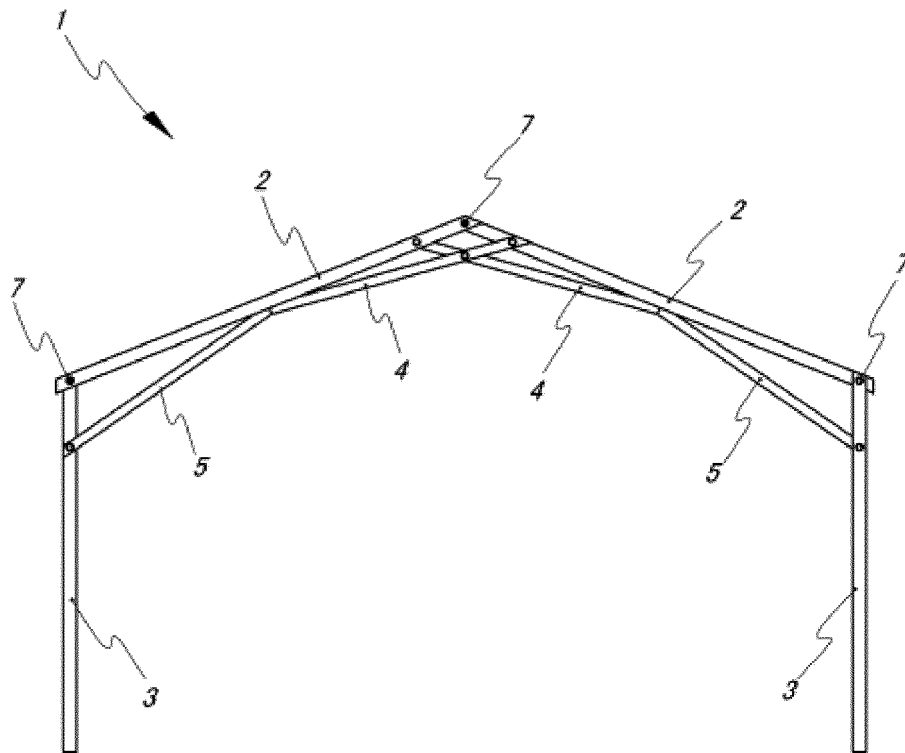


Fig.2

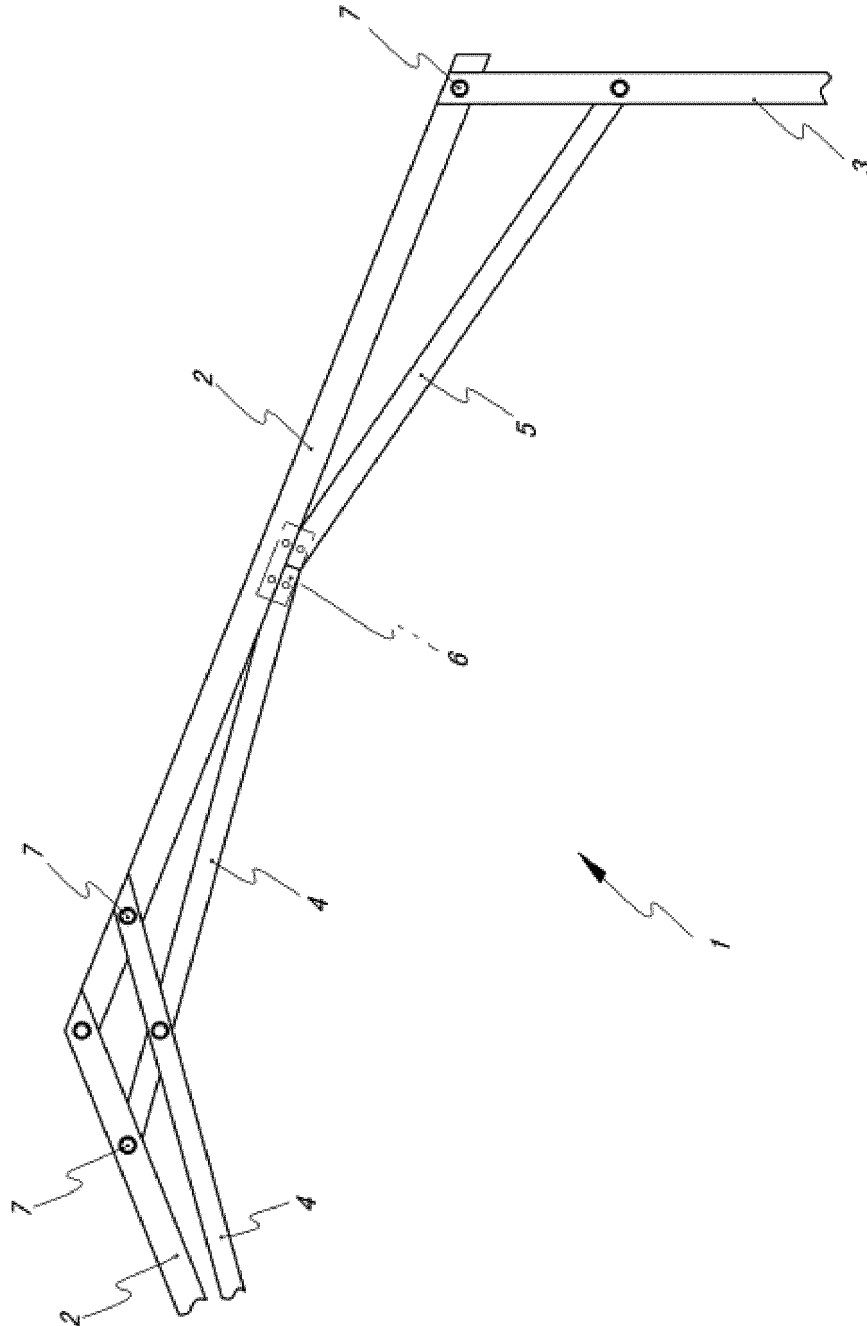


Fig.3

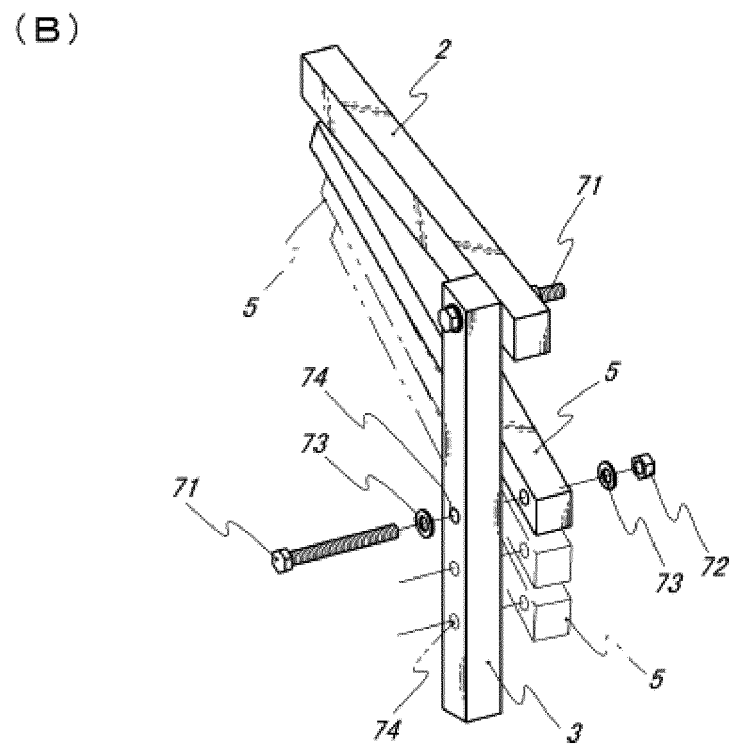
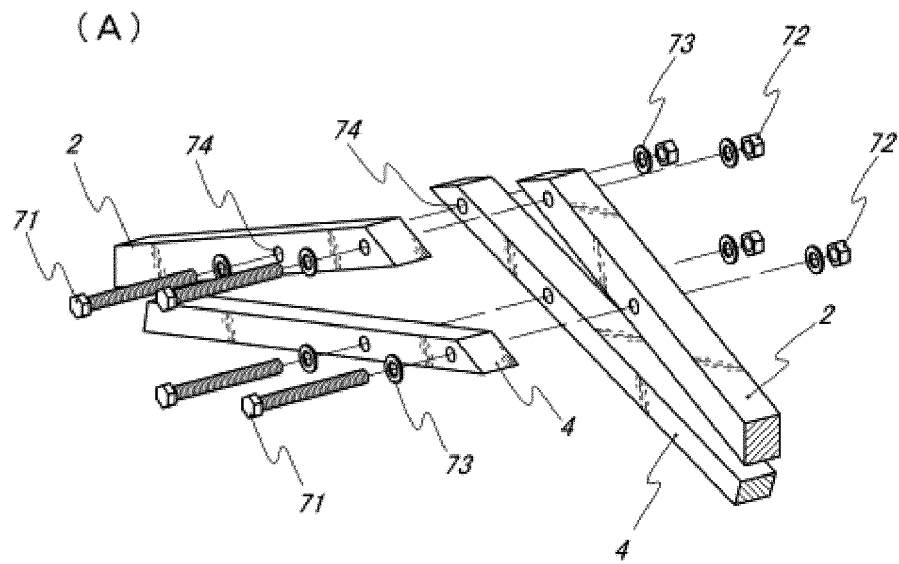


Fig.4

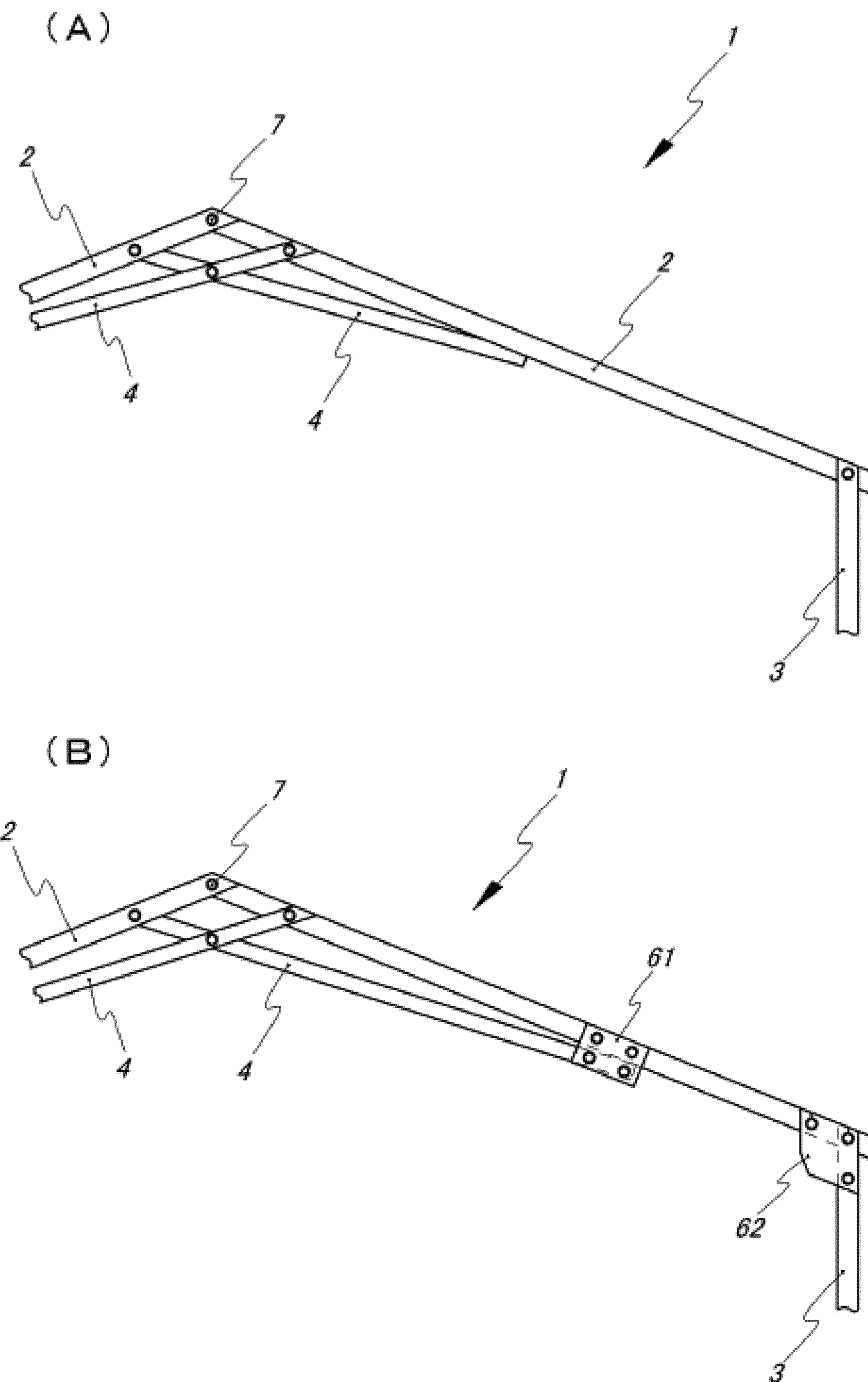


Fig.5

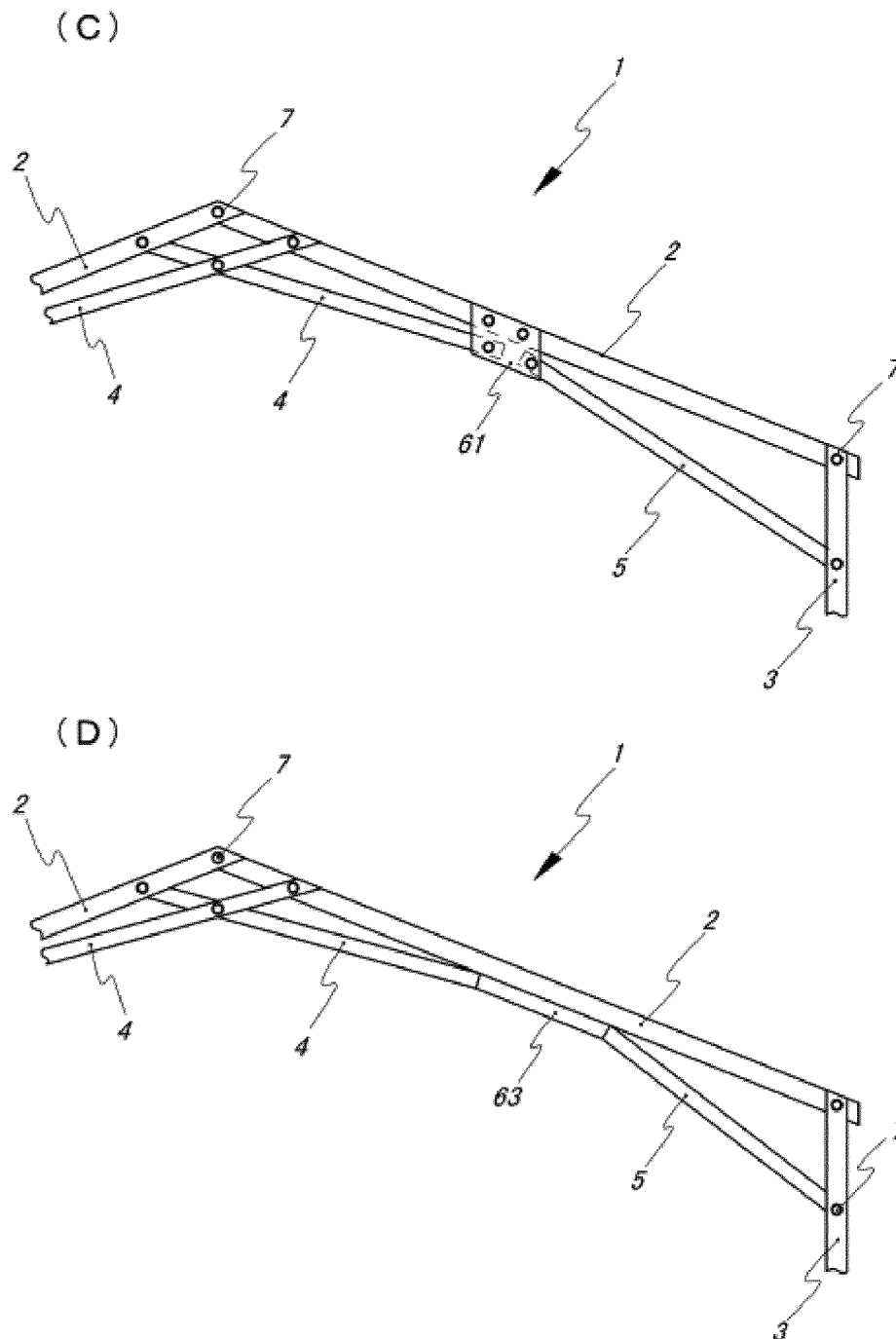
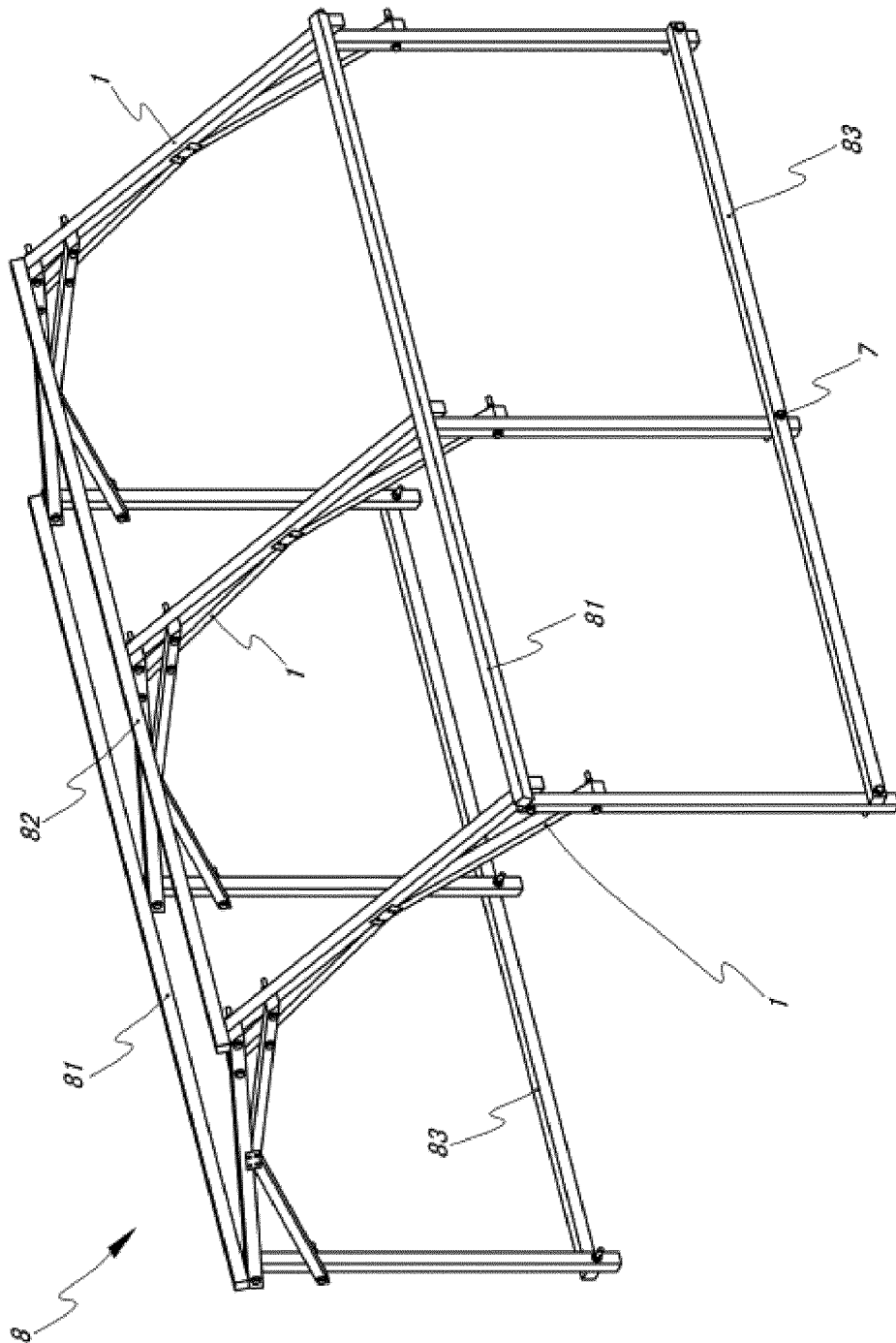


Fig.6



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2016/081513

A. CLASSIFICATION OF SUBJECT MATTER

E04B1/344(2006.01) i, E04B7/02(2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E04B1/344, E04B7/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2016

Kokai Jitsuyo Shinan Koho 1971-2016 Toroku Jitsuyo Shinan Koho 1994-2016

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 11-93262 A (Yugen Kaisha Ikkaku),	1, 6, 8
A	06 April 1999 (06.04.1999), paragraphs [0007] to [0014]; all drawings (Family: none)	2-5, 7, 9
A	JP 4886078 B1 (Hideaki KUMAGAI), 29 February 2012 (29.02.2012), paragraphs [0023] to [0039]; all drawings (Family: none)	1-9

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search

11 November 2016 (11.11.16)

Date of mailing of the international search report

22 November 2016 (22.11.16)

Name and mailing address of the ISA/

Japan Patent Office

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Telephone No.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 4886078 B [0007] [0008] [0026]
- JP H09228531 B [0008]
- JP 2002038645 A [0008]