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(54) **Erectable tent**

(57) It is an object of the present invention to provide an inexpensive erectable tent having a simple structure in which the covering sheet can easily be removed from the structural framework assembly, and an airtight structure with respect to the surrounding atmosphere and ground surface can also easily be formed, in such a way that the air-tightness required for a hygienic gas treatment using a freshness-preserving gas or the like can easily be obtained.

The present invention provides an erectable tent in which a structural framework assembly 3 used to form a chamber space is formed in such a way that structural framework members 1 can be assembled or disassembled via couplings 2, a bag-like inner lining sheet 9 is formed having a ceiling surface inner lining sheet 7 and peripheral surface inner lining sheets 8 that are applied as an inner lining to the inside surface of the structural framework assembly, this bag-like inner lining sheet is engageably and disengageably suspended via suspension fittings 10 from ceiling framework 4 of structural framework assembly 3, the lower open surface of the bottom framework 5 of the structural framework assembly 3 is covered by a ground surface covering sheet 13, the peripheral edge parts of this ground surface covering sheet 13 and the lower edge parts of peripheral surface inner lining sheets 8 are connected, and an entry/exit 14 that can be opened and closed is formed in [one of] peripheral surface inner lining sheets 8.

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Description

FIELD OF INVENTION

[0001] The present invention relates to an erectable tent that is formed by installing a sheet on a structural framework assembly, which is used to form a chamber space, and which can be assembled and disassembled; in particular an agricultural hygienic treatment tent which is used for the hygienic treatment of fresh fruits or fresh vegetables, a typical example of this tent being an erectable agricultural hygienic treatment tent that is appropriately used in cases where fresh fruits or fresh vegetables are treated with a freshness-preserving gas.

BACKGROUND

[0002] Citations 1 through 4 describe erectable tents having a structure relating to the erectable tent of the present invention. All of these tents have a structure in which a covering sheet such as a bag-like sheet or the like is installed as an outer lining on the outer surface of a structural framework assembly, or in which panels are built into the interior portions of opening parts formed in such a structural framework assembly.

[0003] Furthermore, these tents have structures in which the floor surface or ground surface is directly exposed inside the inside the chamber (the tent), or in which an elevated floor is constructed using a floor framework.

Citation 1	Japanese Unexamined Utility Model Application No. 52-61735 "Erectable Vinyl House"
Citation 2	Japanese Unexamined Utility Model Application No. 57-1543 "Compact Hothouse"
Citation 3	Japanese Unexamined Utility Model Application No. 58-155958 "Erectable Temperature-maintaining box"
Citation 4	Japanese Unexamined Patent Application No. 2001-333648 "Simple Hothouse"

STATEMENT OF INVENTION

[0004] However, in cases where a structure is used in which a covering sheet is installed as an outer lining on the outer surface of a structural framework assembly used to form a chamber space, the following problems are encountered: the covering sheet is quickly damaged in portions that contact corners or the like of the structural framework members; furthermore, the covering sheet is limited by the structural framework members that are situated inside, in such a way that a design that conforms to the structural framework assembly is required, and such a sheet is difficult to use in cases where the dimensions of the structural framework assembly are large. Furthermore, other problems also arise: namely, the covering work and disassembly work involve considerable effort.

[0005] Especially in the case of hygienic treatment tents in which fresh fruits or the like are subjected to a hygienic treatment using a freshness-preserving gas, air-tightness with respect to the surrounding atmosphere and ground surface is required; however, it is difficult (due to structural considerations) for tents typified by Citations 1 through 4 to suitably satisfy such a requirement for the preservation of air-tightness with respect to the surrounding atmosphere and ground surface.

DETAILED DESCRIPTION

[0006] The present invention provides an inexpensive erectable tent with a simple structure in which the covering sheet can easily be removed from the structural framework assembly, and an airtight structure with respect to the surrounding atmosphere and ground surface can also easily be formed, in such a way that the air-tightness required for a hygienic gas treatment using a freshness-preserving gas or the like can easily be obtained.

[0007] In short, a structure is used in which a structural framework assembly used to form a chamber space is formed with the structural framework members able to be assembled or disassembled via couplings, a bag-like inner lining sheet having a ceiling surface inner lining sheet and peripheral surface inner lining sheets is applied as an inner lining to the inside surface of this structural framework assembly, and this bag-like inner lining sheet is suspended via engageable and disengageable suspension fittings from the ceiling framework of the structural framework assembly.

[0008] Furthermore, the lower open surface of the bottom framework of the structural framework assembly is covered by a ground surface covering sheet, and the peripheral edge parts of this ground surface covering sheet and the lower edge parts of the peripheral surface inner lining sheets are connected, in such a way that the entire body is formed into a hollow sheet structure.

[0009] Moreover, an entry/exit that can be opened and closed is formed in one of the peripheral surface inner lining sheets. For example, an opening is formed in one of the peripheral surface inner lining sheets, a door framework that is assembled with the structural framework assembly (integrally and in a manner that allows assembly and disassembly), is situated in this opening, and the opening edges of this peripheral surface inner lining sheet are caused to adhere tightly to this door framework; e.g., the opening edges of the peripheral surface inner lining sheet are wrapped onto the door framework, or are caused to adhere tightly by being pushed in or the like, thus forming the entry/exit in which a door that can be opened and closed covers the opening surface of the door framework.

[0010] A transparent synthetic resin sheet; e.g., a transparent synthetic resin sheet reinforced by reinforcing filaments, is used as the bag-like inner lining sheet, in such a way that the interior of the chamber can be

viewed through this sheet.

[0011] The peripheral edge of the ground covering sheet protrudes laterally outward from where the peripheral surface inner lining sheets are joined and form a flange, the bottom framework of the structural framework assembly being carried on this flange, in such a way that the ground surface covering sheet is secured, and in such a way that the bag-like inner lining sheet is secured.

[0012] The erectable tent is ideal for use as an agricultural hygienic treatment tent, especially a hygienic treatment tent used in cases where fresh fruits or fresh vegetables are subjected to a hygienic treatment using a hygienic treatment gas that is generated from a freshness-preserving chemical, bitterness-removing chemical, or the like. In this case, supporting means such as a supporting shelf, suspension fittings, or the like, which supports a hygienic treatment gas generating device, is situated on the ceiling framework of the structural framework assembly.

[0013] In the erectable tent of the present invention, the bag-like inner lining sheet can be separated from the structural framework assembly and dropped onto the ground surface covering sheet merely by releasing the suspension fittings of the bag-like inner lining sheet. Furthermore, a chamber space can easily be formed merely by suspending the bag-like inner lining sheet from the ceiling framework of the structural framework assembly. Thus, the overall assembly and disassembly of the covering sheet with respect to the structural framework assembly are fairly easy to perform.

[0014] The bag-like inner lining sheet that forms the covering sheet is not limited by the structural framework assembly, and can easily handle considerable dimensional differences of the structural framework assembly.

[0015] Damage to the sheet by the structural framework assembly, which limits the inner surface of the covering sheet in conventional examples, is eliminated.

[0016] Moreover, good air-tightness with respect to the surrounding atmosphere and the ground surface is obtained as a result of the cooperative action of the ground surface covering sheet that is spread on the ground and the bag-like inner lining sheet, in such a way that an airtight structure can easily be formed.

[0017] Fresh fruits or the like are introduced in the erectable tent, and then conveyed from this tent, using the entry/exit (that can be opened and closed) formed in the peripheral surface inner lining sheet. In this entry/exit, the opening edges of the peripheral surface inner lining sheet are caused to adhere tightly to the door framework by being wrapped or pushed into the door framework, in such a way that an airtight assembly can easily be obtained in the peripheral edges of the entry/exit.

[0018] A transparent synthetic resin sheet; e.g., a transparent synthetic resin sheet reinforced by reinforcing filaments, is used as the bag-like inner lining sheet, in such a way that the fresh fruits or the like inside the chamber can be viewed through this sheet.

[0019] Since the bottom framework of the structural framework assembly is carried on a flange that protrudes from the peripheral edges of the ground surface covering sheet, the ground surface covering sheet and bag-like inner lining sheet are secured; i.e., the covering sheet as a whole is secured, and loose play of the covering sheet is prevented.

[0020] The erectable tent is ideal for use as an agricultural hygienic treatment tent, and especially as a hygienic treatment tent used in cases where fresh fruits or fresh vegetables are treated with a freshness-preserving chemical, bitterness-removing chemical, or the like. In such cases, supporting means that supports a hygienic treatment gas generating device used to generate a hygienic treatment gas from the chemicals is mounted on the ceiling framework of the structural framework assembly, thus aiding in the diffusion of the hygienic treatment gas into the chamber space.

Working Examples

[0021] As was described above, the present invention provides an inexpensive erectable tent having a simple structure, in which the covering sheet can easily be removed from the structural framework assembly, and an airtight structure with respect to the surrounding atmosphere and ground surface can also easily be formed, in such a way that the air-tightness required in cases where a treatment is performed using a hygienic treatment gas generated from a freshness-preserving chemical or the like can easily be obtained.

[0022] A concrete example of the erectable tent will be described below with reference to Figures 1 through 5.

[0023] The erectable tent is constructed by means of a structural framework assembly 3 used to form a chamber space, in which structural framework members 1 can be assembled and disassembled via couplings 2.

[0024] A structure in which the respective structural framework members 1 of this structure framework assembly 3 can be assembled or disassembled via couplings 2 such as tubular couplings or the like is already known, as is indicated in the Citations 1 through 4, and such known structures that can be assembled and disassembled may be used in the present invention.

[0025] To describe a concrete example, a ceiling framework 4 is formed by arranging structural framework member 1 in a square shape, and disassemblably connecting the respective structural framework members 1 in the respective corner parts via couplings 2 such as three-way elbows or similar tubular couplings.

[0026] Similarly, a bottom framework 5 is formed by arranging structural framework members 1 in a square shape, and disassemblably connecting the respective structural framework members 1 in the respective corner parts via couplings 2 such as three-way elbows or similar tubular couplings.

[0027] The ceiling framework 4 and bottom framework 5 are connected by structural framework members 1 that constitute supporting columns, and the upper and lower

ends of these supporting column structural members 1 are connected by being inserted into one tubular coupling of the tubular couplings 2 such as three-way elbows, thus assembling the structural framework assembly 3 in a manner that allows disassembly.

[0028] Furthermore, reinforcing framework members 6 that cross in the central part of the ceiling framework 4 are disassemblably connected into a cruciform shape via a tubular coupling 2 such as a four-way elbow, and the end parts of the respective reinforcing framework members 6 are disassemblably connected via C-shaped tubular couplings 2 to the respective structural framework members 1 that constitute ceiling framework 4.

[0029] Structural framework members 1 of ceiling framework 4 and bottom framework 5, and the supporting columns, are disassemblably connected via couplings 2 by reinforcing framework members 6 that form diagonal bracing.

[0030] Meanwhile, a bag-like inner lining sheet 9 having a ceiling surface inner lining sheet 7 and peripheral surface inner lining sheets 8 is formed, this bag-like inner lining sheet 9 is installed as an inner lining on the ceiling surface and side surfaces of structural framework assembly 3, and bag-like inner lining sheet 9 is suspended via detachable suspension fittings 10 from structural framework members 1 that form ceiling framework 4 of structural framework assembly 3.

[0031] A transparent synthetic resin sheet; e.g., a transparent synthetic resin sheet reinforced by reinforcing filaments, is used as the bag-like inner lining sheet, in such a way that the interior of the chamber; i.e., the contents inside the chamber, can be viewed through this sheet, and sunlight can pass through the sheet.

[0032] Furthermore, the lower opening surface of bottom framework 5 of structural framework assembly 3 is covered by a ground surface covering sheet 13 that is spread on the ground surface, and the peripheral edge parts of this ground surface covering sheet 13 and the lower edge parts of peripheral surface inner lining sheets 8 are joined by bonding, high-frequency sealing-induced fusion, or the like, in such a way that the covering sheet as a whole is formed into a hollow sheet [structure].

[0033] Clips, surface fastener belts, suspension rings, or the like can be used as suspension fittings 10. For example, suspension fittings 10 consisting of clips or surface fastener belts are attached in advance to structural framework members 1 that form ceiling framework 4, or to the peripheral edge portions of ceiling surface inner lining sheet 7 of bag-like inner lining sheet 9.

[0034] Alternatively, suspension rings through which structural framework members 1 are passed are attached in advance to the peripheral edge portions of ceiling surface inner lining sheet 7 of bag-like inner lining sheet 9.

[0035] To describe a concrete example in detail, pads 11 are pasted to the outer surfaces of the corners formed by the peripheral edge portions of ceiling surface inner lining sheet 7 and the upper edge portions of the peripheral surface inner lining sheets 8 of bag-like inner lining sheet 9, and surface fastener belts 12 are provided which protrude to the outside from these corners, and which are supported by pads 11. These surface fastener belts 12 are wrapped around and engaged with structural framework members 1 that form ceiling framework 4, thus causing bag-like inner lining sheet 9 and ground surface covering sheet 13 to be suspended from these structural framework members in a detachable manner.

[0036] Alternatively, suspension fittings such as hooks or the like are caused to protrude from the corners formed by the peripheral edge portions of ceiling surface inner lining sheet 7 of bag-like inner lining sheet 9 and the upper edge portions of peripheral surface inner lining sheets 8, and these suspension fittings 10 are hooked onto structural framework members 1 that form ceiling framework 4, in such a way that bag-like inner lining sheet 9 and ground surface covering sheet 13 are detachably suspended from these structural framework members 1.

[0037] A tightly closed entry/exit 14 is openably and closeably provided to one of the peripheral surface inner lining sheets 8. For example, an opening 15 is formed in one of peripheral surface inner lining sheets 8 forming the bag-like inner lining sheet 9 or hollow sheet structure, a door framework 16 that is assembled with structural framework assembly 3 (integrally and in a manner that allows assembly and disassembly) via tubular couplings 2 is disposed in this opening 15, and the opening edges of this peripheral surface inner lining sheet 8 is caused to adhere tightly to this door framework 16.

[0038] For example, the opening edges of peripheral surface inner lining sheet 8 are caused to adhere tightly to door framework 16 by being wrapped onto door framework 16, or being pushed into door framework 16, and entry/exit 14 is formed by installing a door 14a that can be opened and closed, and that covers the open surface of this door framework 16.

[0039] In a concrete example, door framework 16 is formed by an inside door framework 16a having an outward-facing C-shaped channel and an outside door framework 16b having an outward-facing C-shaped channel, outside door framework 16b is integrally attached to the inner rim of door 14a, a packing material 18a is situated between the two door frameworks 16a and 16b, and both door frameworks 16a and 16b are clamped by clips 17 in the peripheral edge parts of door 14a, in such a way that air-tightness is achieved between the two door frameworks 16a and 16b.

[0040] In door 14a, one side of outside door framework 16b in a longitudinal direction can be connected to one side of inside door framework 16a in a longitudinal direction via a hinge, in such a way that one-sided opening is possible.

[0041] Furthermore, the opening edges of peripheral surface inner lining sheet 8 that form entry/exit 14 are wrapped onto the channel groove of inside door framework 16a with a packing material 18b interposed therebetween; i.e., the opening edges of peripheral surface inner lining sheet 8 are wrapped onto packing material

18b, and this is pushed onto the channel groove of inside door framework 16a, in such a way that the opening edges of the same sheet 8 are caused to adhere tightly to the same door framework 16a, thus achieving air-tightness.

[0042] The peripheral edges of ground surface covering sheet 13 are caused to protrude outward from the joint parts of this sheet 13 and the lower edges of peripheral surface inner lining sheets 8 to form a flange 19, and bottom framework 5 of structural framework assembly 3 is carried on this flange 19, in such a way that ground surface covering sheet 13 is secured, and the bag-like inner lining sheet 9 is secured. Accordingly, the covering sheet as a whole is secured, with loose play being prevented.

[0043] The erectable tent is ideal for use as an agricultural hygienic treatment tent, in particular a hygienic treatment tent used when fresh fruits or fresh vegetables are subjected to a hygienic treatment using a hygienic treatment gas that is generated from a freshness-preserving chemical, bitterness-removing chemical, or the like. In such instances, supporting means such as a supporting shelf 20, or the like, which supports a hygienic treatment gas generating device that is used to generate a hygienic treatment gas from the chemicals, is mounted on ceiling framework 4 of structural framework assembly 3. Preferably, supporting shelf 20 or other supporting means is mounted on the central crossing part of the central reinforcing framework members of ceiling framework 4.

[0044] In the erectable tent, bag-like inner lining sheet 9 can be separated from the structural framework assembly 3 and caused to drop onto ground surface covering sheet 13 merely by releasing suspension fittings 10 of bag-like inner lining sheet 9.

[0045] A chamber space can be formed merely by suspending bag-like inner lining sheet 9 from ceiling framework 4. Accordingly, overall, the assembly and disassembly of the covering sheet with respect to structural framework assembly 3 is very easily performed.

[0046] Bag-like inner lining sheet 9 is not limited by structural framework assembly 3; considerable dimensional differences in structural framework assembly 3 can also be handled. Moreover, damage to the covering sheet caused by structural framework assembly 3 can be effectively eliminated.

[0047] A structure which achieves air-tightness with respect to the surrounding atmosphere and ground surface can easily be achieved by the cooperative action of ground surface covering sheet 13 that is spread on the ground surface, and bag-like inner lining sheet 9 that is joined to this ground surface covering sheet 13.

[0048] Fresh fruits, fresh vegetables, or the like are easily placed inside the erectable tent and conveyed therefrom using the openable and closable entry/exit 14 formed in peripheral surface inner lining sheet 8. In this entry/exit 14, the opening edges of peripheral surface inner lining sheet 8 are caused to adhere tightly to door framework 16 by being wrapped or pushed onto door framework 16, in such a way that an airtight assembly can easily be obtained in the peripheral edges of the entry/exit 14.

[0049] Since bottom framework 5 of structural framework assembly 3 is carried on a flange 19 that protrudes from the peripheral edges of ground surface covering sheet 13, the covering sheet as a whole is secured, in such a way that loose play of bag-like inner lining sheet 9 and ground surface covering sheet 13 is prevented.

[0050] Supporting shelf 20 for the hygienic treatment gas generating device attached to ceiling framework 4 of structural framework assembly 3 of the erectable tent provides a convenient arrangement of the hygienic treatment gas generating device, and the hygienic treatment gas has more widespread diffusion into the chamber space from the ceiling, in such a way that hygienic treatment can be performed effectively.

BRIEF DESCRIPTION OF THE DRAWINGS

[0051]

Figure 1 is a perspective view of the structural framework assembly that forms the erectable t

Figure 2 is a perspective view showing a state in which the bag-like inner lining sheet is suspended from the structural framework assembly, and the ground covering sheet is installed.

Figure 3 is a side view of the same.

Figure 4 is a sectional view of essential parts showing a state in which the bag-like inner lining sheet is engageably and disengageably suspended from the ceiling framework of the structural framework assembly by means of a surface fastener belt.

Figure. 5 is a cross-sectional view showing a state in which the entry/exit of the erectable tent is formed by a door.

Key to Symbols

[0052]

1:	Structural framework member
2:	Coupling
3:	Structural framework assembly
4:	Ceiling framework
5:	Bottom framework
6:	Reinforcing framework
7:	Ceiling surface inner lining sheet
8:	Peripheral surface inner lining sheet
9:	Bag-like inner lining sheet
10:	Suspension fitting
11:	Pad
12:	Surface fastener belt
13:	Ground surface covering sheet
14:	Entry/exit
14a:	Door

15: Opening
16: Door framework
16a: Inside door framework
16b: Outside door framework
17: Clip
18a, 18b: Packing materials
19: Flange
20: Supporting shelf

Claims

1. An erectable tent **characterized in that** a structural framework assembly used to form a chamber space is formed in such a way that the structural framework can be assembled or disassembled via couplings; an inner lining sheet in the form of a bag is formed having a ceiling surface inner lining sheet and peripheral surface inner lining sheets, which are applied as an inner lining to an inside surface of the structural framework assembly; the bag-like inner lining sheet is suspended via engageable and disengageable suspension fittings from the ceiling framework of the structural framework assembly; a lower open surface of a bottom framework of the structural framework assembly is covered by a ground surface covering sheet; a peripheral edge part of the ground surface covering sheet and a lower edge part of the peripheral surface inner lining sheets are connected; and an entry/exit that can be opened and closed is formed in one of the peripheral surface inner lining sheets.

2. The erectable tent according to Claim 1, **characterized in that** the bag-like inner lining sheet is made of a transparent synthetic resin sheet.

3. The erectable tent according to Claim 1, **characterized in that** a peripheral edge of the ground covering sheet protrudes laterally outward from where the peripheral surface inner lining sheets are joined and forms a flange, the bottom framework of the structural framework assembly being carried on this flange.

4. The erectable tent according to Claim 1, **characterized in that** supporting means for supporting a hygienic gas generating device that is used to subject fresh fruits or fresh vegetables to a hygienic treatment is installed on the ceiling framework of the structural framework assembly.

5. The erectable tent according to Claim 1, **characterized in that** an opening is provided to one of the peripheral surface inner lining sheets that form the bag-like inner lining sheet; a door framework that is integrally fastened to the structural framework assembly is situated in the opening; edges of the opening of the peripheral surface inner lining sheet are caused to adhere tightly to the door framework; and the entry/exit is formed by installing a door that can be opened and closed, and that covers the open surface of the door framework.

Figure 1

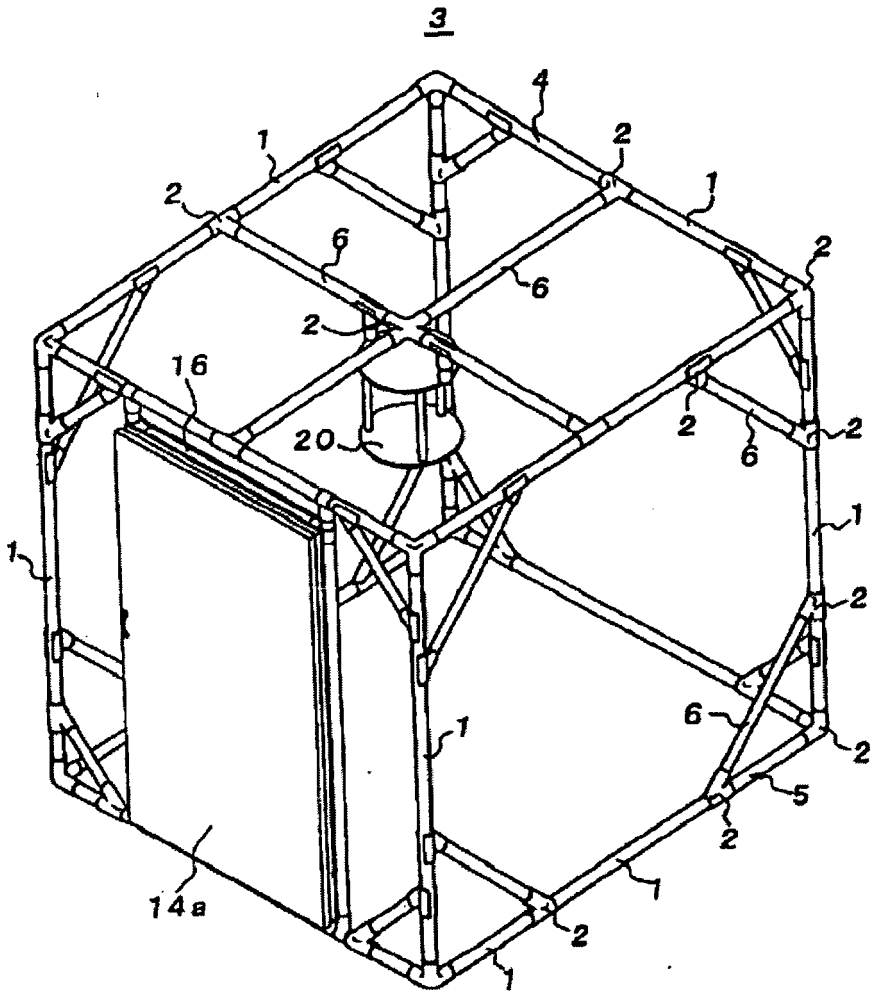

Figure 2

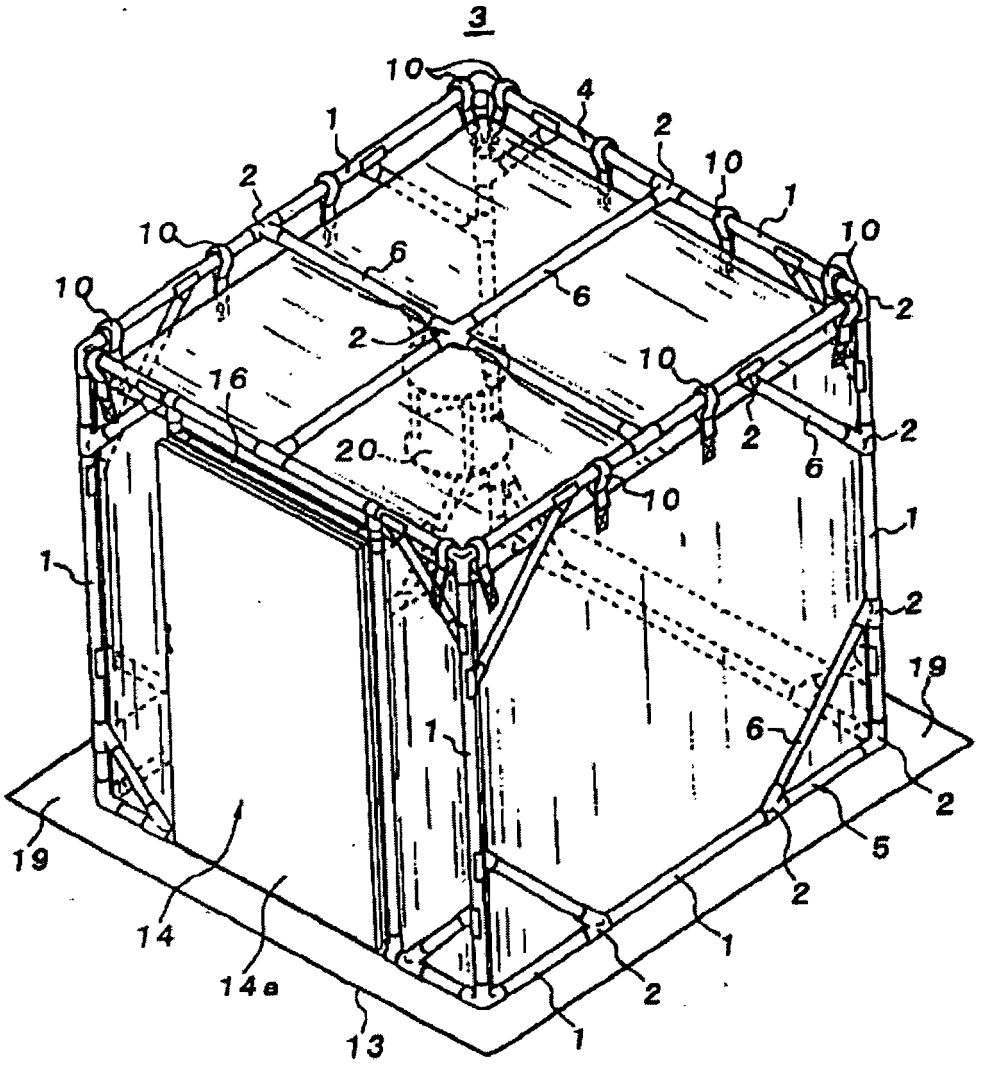
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Figure 3

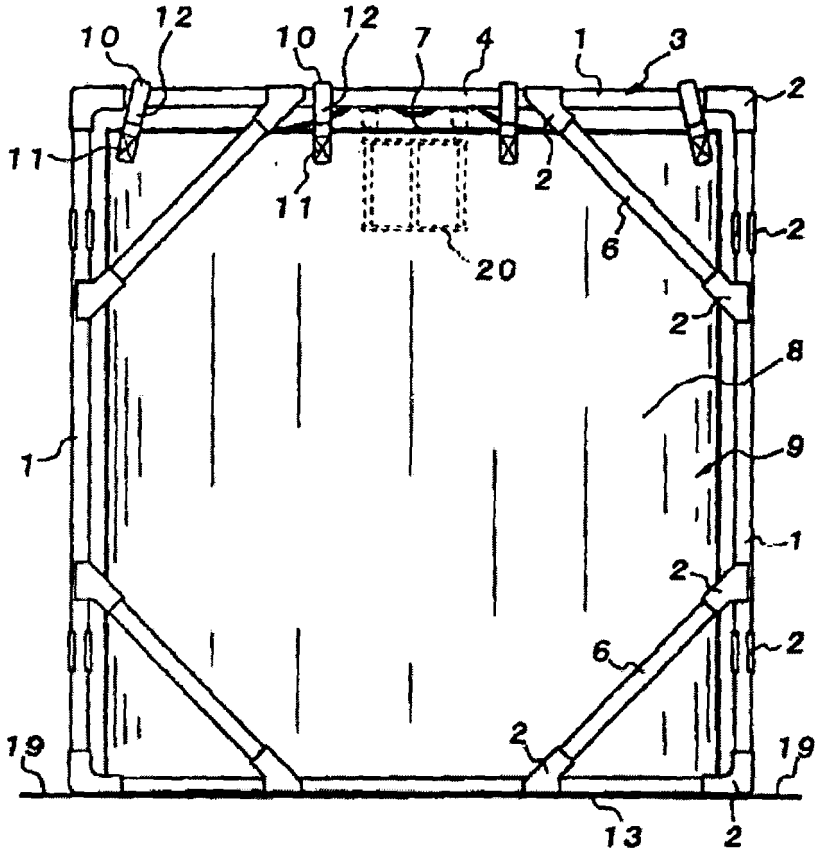


Figure 4

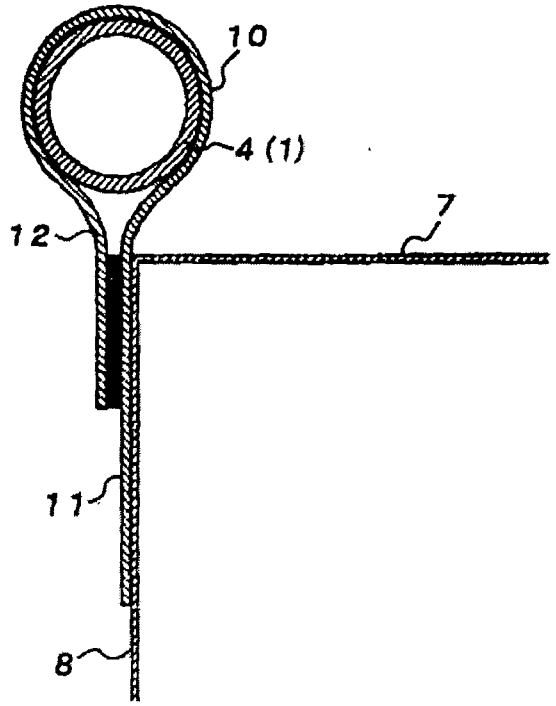
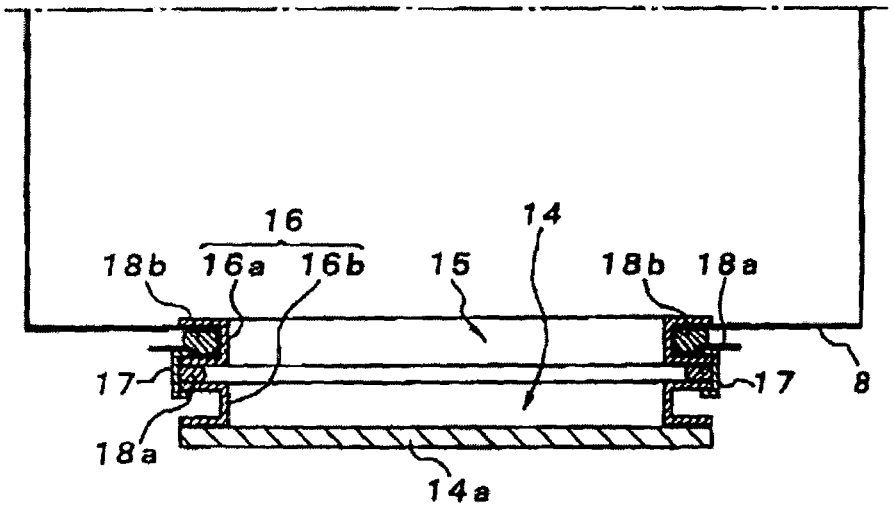


Figure 5



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EUROPEAN SEARCH REPORT

Application Number
EP 06 25 1500

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

E04H
A01G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 August 2006	Stefanescu, R

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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