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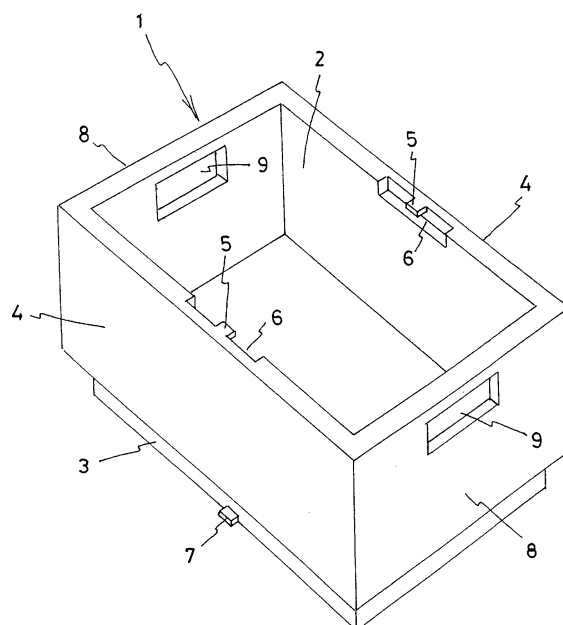
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(54) **ARTICLE STORAGE CASE**

(57) The present invention addresses the problem of providing an article accommodation case that can be formed at low costs, is excellent in connecting workability, and secures high stability in a stacked state. In order to solve the above problem, an article accommodation case 1 having an opening 2 at an upper part thereof and having a substantially cubic shape or a substantially rectangular shape is provided, wherein a convex part 3 serving as a leg part is formed on a bottom-wall lower surface thereof, the convex part being configured to fit into the upper opening of a case below the case when the cases are stacked; inwardly or outwardly protruding upper tongue pieces 5 are formed in a vicinity of upper-end centers of mutually facing side walls 4 thereof; and lower tongue pieces 7 protruding in directions opposite to directions, in which the upper tongue pieces protrude, are formed on the bottom-wall lower surface, the lower tongue pieces engaging the upper tongue pieces of the lower case when the cases are stacked to connect the cases to each other.

Fig.1



Description

[0001] The present invention relates to article accommodation cases and relates specifically to article accommodation cases that can be easily connected to each other when stacked.

[0002] In factories or the like, substantially cubic or substantially rectangular article accommodation cases each having an opening at its upper part and molded by plastic or the like have been frequently used to store and convey components. Such an article accommodation case is configured to have a convex part serving as a leg part on its bottom-wall lower surface and make the convex part fit into the upper opening of a case below the case when the cases are stacked to prevent a deviation when the cases are stacked and increase stability in a stacked state (for example, PTL 1 and 2). Further, article accommodation cases each having a configuration that connects stacked cases to each other have been developed to secure further stability in a stacked state (for example, PTL 3).

Patent Literature :

[0003]

[PTL 1] Japanese Patent Application Laid-open No. 2004-123221

[PTL 2] Japanese Patent Application Laid-open No. 2004-329035

[PTL 3] Japanese Patent Application Laid-open No. H09-169339

[0004] However, only the fitting of a convex part into an opening as disclosed in PTL 1 and 2 easily causes load collapse since the fitting easily disengages and stacked cases deviate from each other when an upwardly thrusting impact is applied to the cases during conveyance by a truck or the like. Further, when lifting stacked cases, it is necessary to grip a lowermost case to lift the stacked cases even if the stacked cases are empty. Therefore, an operator is forced to bear burdens since he/she is required to perform an operation with a stoop.

[0005] A configuration as disclosed in PTL 3 that connects stacked cases to each other avoids some of such problems. However, according to a connecting structure disclosed in PTL 3, steel connecting tools are rotatably attached at the upper opening edges of a case, and the connecting tools are rotated to engage the upper edge and/or the connecting tools of a counterpart case. Therefore, a connecting operation by the connecting tools is required and burdensome. In addition, the structure is complex and costly since the connecting means is large in size.

Summary of the Invention:

[0006] The present invention has been made in view of the above problems residing in the background art and objects to an article accommodation case that can be formed at low cost, is excellent in connecting workability, and secures high stability in a stacked state.

[0007] In order to achieve the above object, the present invention provides an article accommodation case defined in claim 1 and advantageous embodiments are described in the dependent claims, per items 1 to 6, as follows:

[1] An article accommodation case having an opening at an upper part thereof and having a substantially cubic shape or a substantially rectangular shape, wherein a convex part serving as a leg part is formed on a bottom-wall lower surface thereof, the convex part being configured to fit into the upper opening of a case below the case when the cases are stacked; inwardly or outwardly protruding upper tongue pieces are formed in a vicinity of upper-end centers of mutually facing side walls thereof; and lower tongue pieces protruding in directions opposite to directions, in which the upper tongue pieces protrude, are formed on the bottom-wall lower surface, the lower tongue pieces engaging the upper tongue pieces of the lower case when the cases are stacked to connect the cases to each other.

[2] The article accommodation case described in the above item [1], wherein concave parts are formed around the upper tongue pieces.

[3] The article accommodation case described in the above item [1], wherein the upper tongue pieces are formed to protrude from upper-end surfaces of the side walls.

[4] The article accommodation case described in the above item [1], wherein the upper tongue pieces have on lower surfaces thereof engagement concave parts respectively, and the lower tongue pieces have on upper surfaces thereof engagement convex parts respectively, the engagement convex parts fitting into the engagement concave parts of the upper tongue pieces.

[5] The article accommodation case described in the above item [1], wherein the upper tongue pieces are formed on the mutually facing side walls on a long side respectively, and the lower tongue pieces are formed on the convex part serving as the leg part on the bottom-wall lower surface.

[6] The article accommodation case described in the above item [1], wherein a rectangular lid body that closes the

upper opening of the case is provided, the lid body has on a lower surface thereof a convex part, the convex part is configured to fit into the upper opening of the case, and the convex part has tongue pieces that engage the upper tongue pieces formed on the case.

Advantageous Effects of Invention:

[0008] In the article accommodation case according to the present invention, the addition of special separate components to connect cases to each other is not required, and the upper tongue pieces and the lower tongue pieces are only required to be integrally formed on the case by molding or the like. Therefore, the article accommodation case that reduces manufacturing costs and is easily recycled can be provided.

[0009] Further, in the article accommodation case according to the present invention, the stacked cases are connected to each other by the engagement between the upper tongue pieces and the lower tongue pieces. Therefore, the article accommodation case is excellent in connecting workability and makes it possible to perform connection with high reliability.

Brief Description of Drawings:

[0010]

Fig. 1 is a perspective view showing an embodiment of an article accommodation case according to the present invention.

Fig. 2 is a partially cutaway side view showing a state in which the article accommodation cases shown in Fig. 1 are being stacked.

Fig. 3 is a partially cutaway side view showing a state in which the article accommodation cases shown in Fig. 1 are stacked in two stages.

Fig. 4 is a partially cutaway side view showing a state in which the article accommodation cases shown in Fig. 1 are stacked in three stages and lifted in a vertical direction with an uppermost article accommodation case gripped, Fig. 4 being also a cross-sectional view showing an essential part in an enlarged manner.

Fig. 5 is a partially cutaway side view showing a state in which the article accommodation cases shown in Fig. 1 are stacked in three stages and laid down in a horizontal direction with a lowermost article accommodation case gripped, Fig. 5 being also a cross-sectional view showing an essential part in an enlarged manner.

Fig. 6 is a perspective view of the lid body of the article accommodation case according to the present invention when seen from its lower side.

Fig. 7 is a partially cutaway side view showing a state in which the article accommodation cases shown in Fig. 1 are stacked in five stages and the lid body is attached to an uppermost article accommodation case, Fig. 7 being also a cross-sectional view showing an essential part in an enlarged manner.

Fig. 8 is a perspective view showing another embodiment of the article accommodation case according to the present invention.

Fig. 9 is a plan view of the article accommodation case shown in Fig. 8.

Fig. 10 is a bottom view of the article accommodation case shown in Fig. 8.

Fig. 11 is an essential-part perspective view showing a modified example of an upper tongue piece and a lower tongue piece.

Fig. 12 is an essential-part perspective view showing another modified example of the upper tongue piece and the lower tongue piece.

Description of Embodiments:

[0011] Hereinafter, a description will be given, with reference to the drawings, in detail of embodiments of the article accommodation case according to the present invention. An article accommodation case 1 according to the present invention is integrally molded by, for example, plastic in its entirety. As shown in Fig. 1, the article accommodation case 1 has a substantially rectangular shape and has an opening 2 at its upper part. Further, the article accommodation case 1 has a convex part 3 serving as a leg part on its bottom-wall lower surface. The convex part 3 fits into the upper opening 2 of a case below the case when the cases are stacked to secure stability in a stacked state.

[0012] The article accommodation case 1 has inwardly-protruding upper tongue pieces 5 in the vicinity of the upper-end centers of facing side walls 4 on its long side and has concave parts 6 around the upper tongue pieces 5. Further, the convex part 3 formed on the bottom-wall lower surface and serving as the leg part has outwardly-protruding lower tongue pieces 7 that engage the upper tongue pieces 5 when the cases are stacked to connect the cases to each other. Further, the article accommodation case 1 has grips 9 in the vicinity of upper centers on the outer surface sides of facing

side walls 8 on its short side.

[0013] When the article accommodation cases 1 according to the present invention configured as described above are stacked, the lower tongue pieces 7 are inserted through the concave parts 6 formed around the upper tongue pieces 5 so that the lower tongue pieces 7 of an upper case 1B are placed under the upper tongue pieces 5 of a lower case 1A as shown in Fig. 2. Thus, as shown in Fig. 3, the article accommodation cases 1 are so stacked that the lower tongue pieces 7 of the upper case 1B are positioned under the upper tongue pieces 5 of the lower case 1A, and the stacked cases 1A and 1B can be connected to each other so as to be prevented from coming off in a vertical direction.

[0014] In the case of, for example, lifting article accommodation cases 1A, 1B, and 1C stacked as described above, all the stacked article accommodation cases 1A, 1B, and 1C can be lifted when the uppermost article accommodation case 1C is gripped and lifted as shown in Fig. 4. Further, as shown in Fig. 5, even when the stacked article accommodation cases 1A, 1B, and 1C are laid down in a horizontal direction with the uppermost case 1A gripped, the upper tongue pieces 5 and the lower tongue pieces 7 come in contact with each other with their lower ends serving as fulcrums to prevent the article accommodation cases 1A, 1B, and 1C from coming off. Therefore, it is possible to convey the article accommodation cases 1A, 1B, and 1C without spreading out their stacked state even when the article accommodation cases 1A, 1B, and 1C are laid down in the horizontal direction.

[0015] The above functions are particularly effectively performed in the conveyance operation of the article accommodation case 1 in an empty state and can greatly reduce burdens on an operator. Further, even when an upwardly thrusting impact is applied to the article accommodation cases 1A, 1B, and 1C stacked as described above during conveyance by a truck or the like, the upper tongue pieces 5 and the lower tongue pieces 7 come in contact with each other to prevent the article accommodation cases 1A, 1B, and 1C from coming off. Therefore, the article accommodation cases 1A, 1B, and 1C hardly deviate from each other. The above function can effectively prevent load collapse during the conveyance of the stacked article accommodation cases 1A, 1B, and 1C.

[0016] Fig. 6 is a perspective view of a lid body used in the article accommodation case according to the present invention when seen from its lower side. A lid body 50 has a rectangular shape integrally molded by, for example, plastic in its entirety. The lid body 50 has a convex part 51 on its lower surface and is configured to make the convex part 51 fit into the upper opening 2 of the case 1. Further, the convex part 51 has outwardly-protruding tongue pieces 52 that engage the upper tongue pieces 5 provided at the side-wall upper ends of the case 1. [0016] As shown in, for example, Fig. 7, the lid body 50 is used to close an opening 2 of an uppermost case 1E among article accommodation cases 1A, 1B, 1C, 1D, and 1E stacked in five stages according to the present invention. In the attachment of the lid body 50, like the connection between the cases described above, the tongue pieces 52 of the lid body 50 are inserted through the concave parts 6 formed around the upper tongue pieces 5 so that the tongue pieces 52 are placed under the upper tongue pieces 5 of the case 1E. Thus, as shown in Fig. 7, the lid body 50 is so attached that the tongue pieces 52 of the lid body 50 are positioned under the upper tongue pieces 5 of the case 1E, and can be attached so as not to easily deviate from the case 1E.

[0017] Even when an upwardly thrusting impact is applied to the stacked article accommodation cases 1A, 1B, 1C, 1D, and 1E during conveyance by a truck or the like in which the opening 2 of the uppermost case 1E is closed by the lid body 50 as described above, load collapse is prevented due to the connection between the cases as described above. In addition, accommodated articles are prevented from popping up and scattering since the lid body 50 does not disengage from the case 1.

[0018] Fig. 8 is a perspective view showing another embodiment of the article accommodation case according to the present invention. A case 10 is formed of thin plastic in its entirety and has flanges 11 and ribs 12 at its appropriate places to secure its rigidity. The case 10 has upper tongue pieces 14 in the vicinity of the upper-end centers of facing side walls 13 on its long side in which the upper tongue pieces 14 are formed to protrude from the upper-end surfaces of the side walls, and has concave parts 15 around the upper tongue pieces 14. Thus, the thickness of the upper tongue pieces 14 is secured, and the insertion of lower tongue pieces 16 that will be described later is facilitated.

[0019] Further, as shown in Fig. 10, the case 10 has convex parts 17 serving as leg parts on its bottom-wall lower surface. The convex parts 17 are formed linearly and have L-shaped convex parts 17a formed at corners and I-shaped convex parts 17b formed in the vicinity of a center on the long side. The convex parts 17a and 17b internally fit into an upper opening 18 of a lower case when the cases are stacked to secure stability in a stacked state. The I-shaped convex parts 17b have outwardly-protruding lower tongue pieces 16 that engage the upper tongue pieces 14 when the cases are stacked to connect the cases to each other. Further, as shown in Fig. 8, the lower flanges 11 have concaves 19 used to turn aside the upper tongue pieces 14 formed to protrude from the upper-end surfaces of the side walls. The article accommodation case 10 according to the embodiment also produces the same functions and effects as those of the case 1.

[0020] The embodiments of the article accommodation case according to the present invention are described above. However, the present invention is not limited to the above embodiments, and further various deformations and modifications are made possible as a matter of course within the scope of the technological thoughts of the present invention as defined by the appended claims. For example, the embodiments describe the article accommodation cases 1 and

10 having a substantially rectangular shape. However, an article accommodation case having a substantially cubic shape may be provided. Further, the upper tongue pieces 5 or 14 and the lower tongue pieces 7 or 16 formed on the cases have an inwardly or outwardly protruding simple plate shape. However, as shown in Figs. 11 and 12, an upper tongue piece 20 may have an engagement concave part 21 on its lower surface, and a lower tongue piece 22 may have an engagement convex part 23 that fits into the engagement concave part of the upper tongue piece on its upper surface. The tongue pieces 20 and 22 having the engagement parts 21 and 23, respectively, seek centering when coming in contact with each other and can further prevent the stacked cases from deviating from each other.

[0021] Further, the embodiments describe the upper tongue pieces 5 or 14 formed to inwardly protrude and the lower tongue pieces 7 or 16 formed to outwardly protrude. However, the upper tongue pieces and the lower tongue pieces may be formed to protrude in opposite directions. That is, the upper tongue pieces may be formed to outwardly protrude, and the lower tongue pieces may be formed to inwardly protrude. It should be noted that as the deformation of lower tongue pieces, the tongue pieces 52 formed on the lid body 50 can also be deformed. Further, the convex part 51 formed on the lid body 50 may be replaced by a linear convex part as shown in Fig. 10 or may be replaced by convex parts existing in a dotted state where necessary.

[0022] Moreover, the article accommodation case according to the present invention accommodates any type of articles not only as a case that accommodates components in a factory or the like but also as a case that accommodates beer bottles, a case that accommodates vegetables, or the like. Further, the material of the article accommodation case according to the present invention is not limited to a particular material, but the article accommodation case can be made of various materials such as plastic, wood, and metal. Furthermore, the article accommodation case according to the present invention is not necessarily integrally formed in its entirety but may be constituted by the combination of many components or may be replaced by a built-up article accommodation case.

Industrial Applicability

[0023] As described above, the article accommodation case according to the present invention is an article accommodation case that can be formed at low cost, is excellent in connecting workability, and secures high stability in a stacked state. Therefore, the article accommodation case can be widely used as a case that accommodates components in a factory or the like, a case that accommodates beer bottles, a case that accommodates vegetables, or the like.

Reference Signs List

[0024]

1, 1A, 1B, 1C, 10	Article accommodation case
2, 18	Opening
3, 17	Convex part serving as leg part
4, 13	Side wall on long side
5, 14, 20	Upper tongue piece
6, 15	Concave part
7, 16, 22	Lower tongue piece
8	Side wall on short side
9	Grip
11	Flange
12	Lib
17a	L-shaped convex part
17b	I-shaped convex part
19	Concave
21	Engagement concave part
23	Engagement convex part
50	Lid body
51	Convex part
52	Tongue piece

Claims

1. An article accommodation case having an opening at an upper part thereof and 1. having a substantially cubic shape or a substantially rectangular shape, wherein

a convex part serving as a leg part is formed on a bottom-wall lower surface thereof, the convex part being configured to fit into the upper opening of a case below the case when the cases are stacked; inwardly or outwardly protruding upper tongue pieces are formed in a vicinity of upper-end centers of mutually facing side walls thereof; and

lower tongue pieces protruding in directions opposite to directions, in which the upper tongue pieces protrude, are formed on the bottom-wall lower surface, the lower tongue pieces engaging the upper tongue pieces of the lower case when the cases are stacked to connect the cases to each other.

2. The article accommodation case according to claim 1, wherein concave parts are formed around the upper tongue pieces.

3. The article accommodation case according to claim 1, wherein the upper tongue pieces are formed to protrude from upper-end surfaces of the side walls.

4. The article accommodation case according to claim 1, wherein the upper tongue pieces have on lower surfaces thereof engagement concave parts respectively, and the lower tongue pieces have on upper surfaces thereof engagement convex parts respectively, the engagement convex parts fitting into the engagement concave parts of the upper tongue pieces.

5. The article accommodation case according to claim 1, wherein the upper tongue pieces are formed on the mutually facing side walls on a long side respectively, and the lower tongue pieces are formed on the convex part serving as the leg part on the bottom-wall lower surface.

6. The article accommodation case according to claim 1, wherein a rectangular lid body that closes the upper opening of the case is provided, the lid body has on a lower surface thereof a convex part, the convex part is configured to fit into the upper opening of the case, and the convex part has tongue pieces that engage the upper tongue pieces formed on the case.

Fig.1

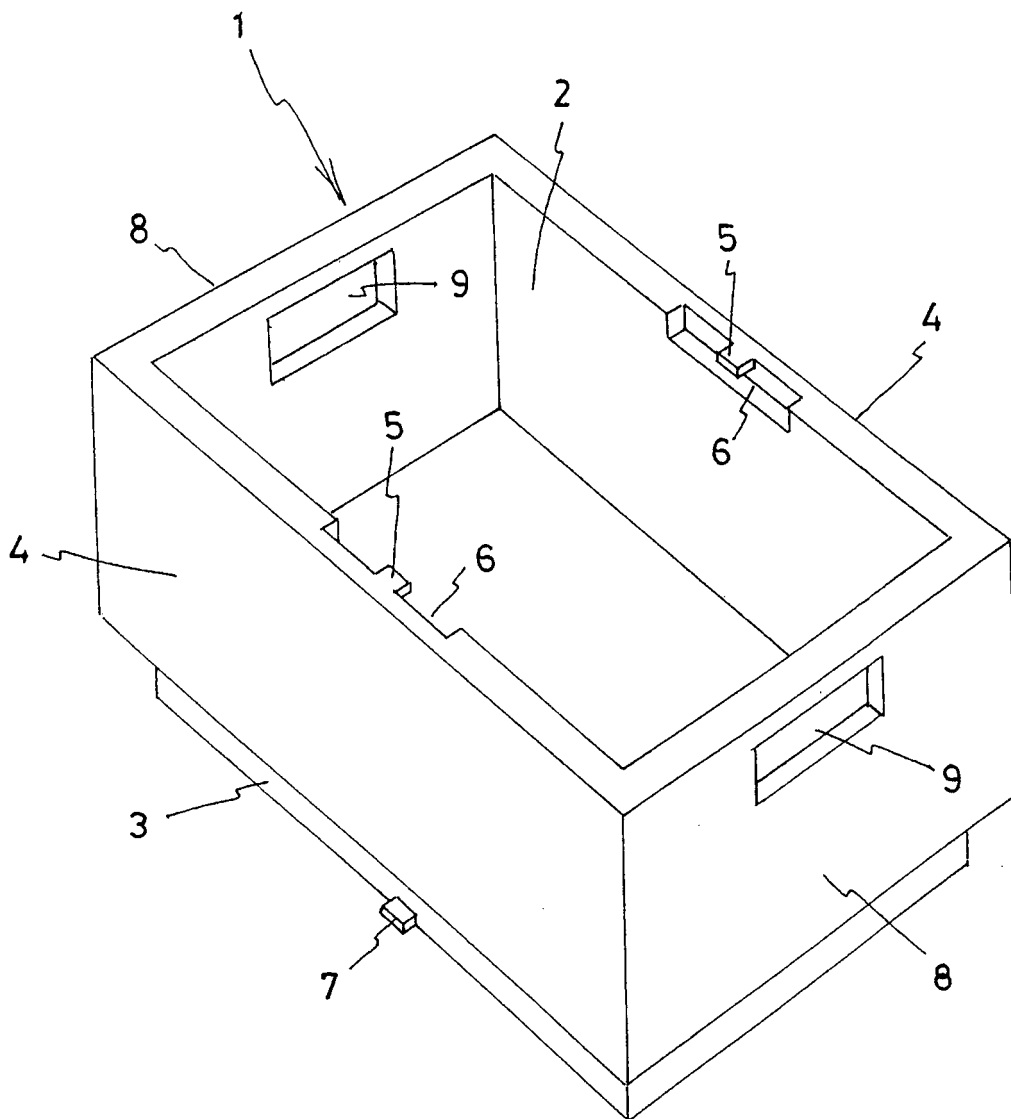


Fig.2

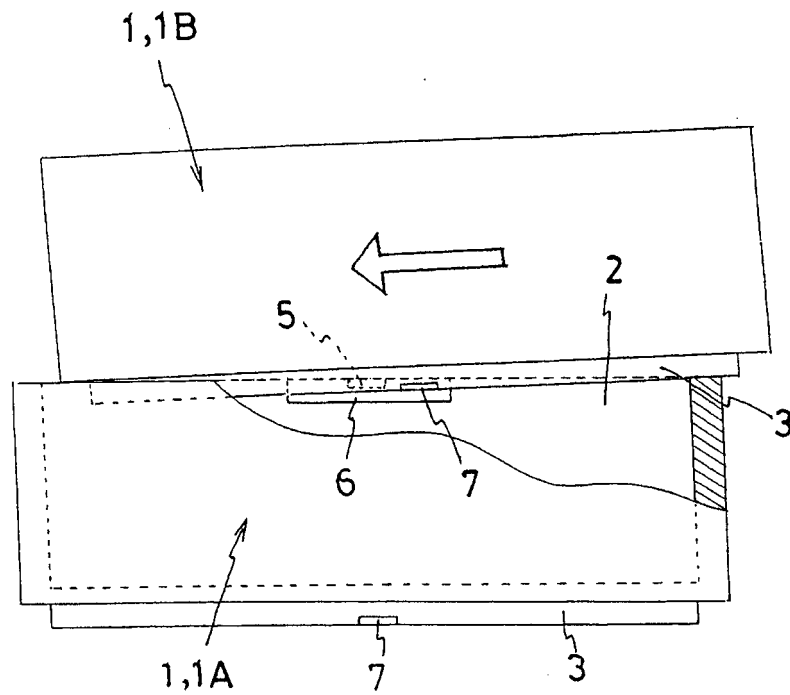


Fig.3

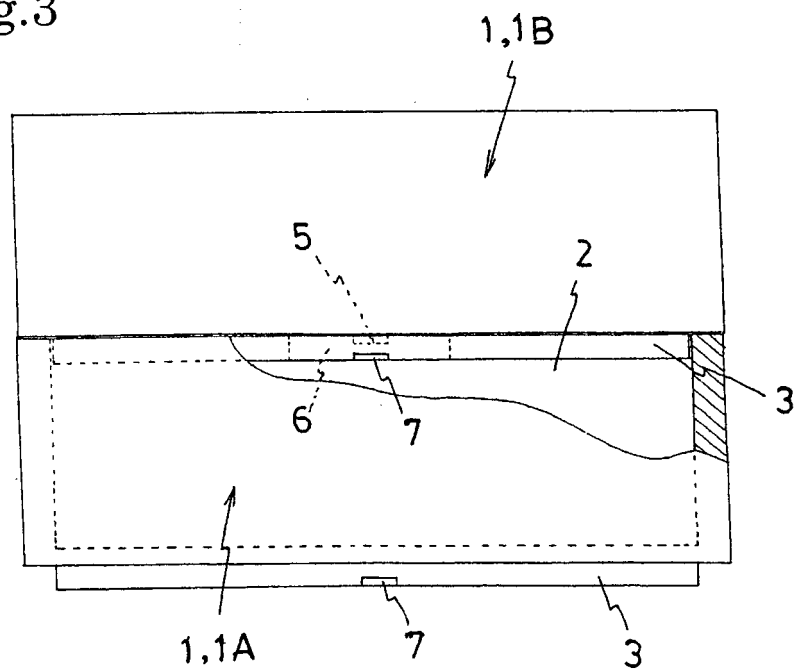


Fig.4

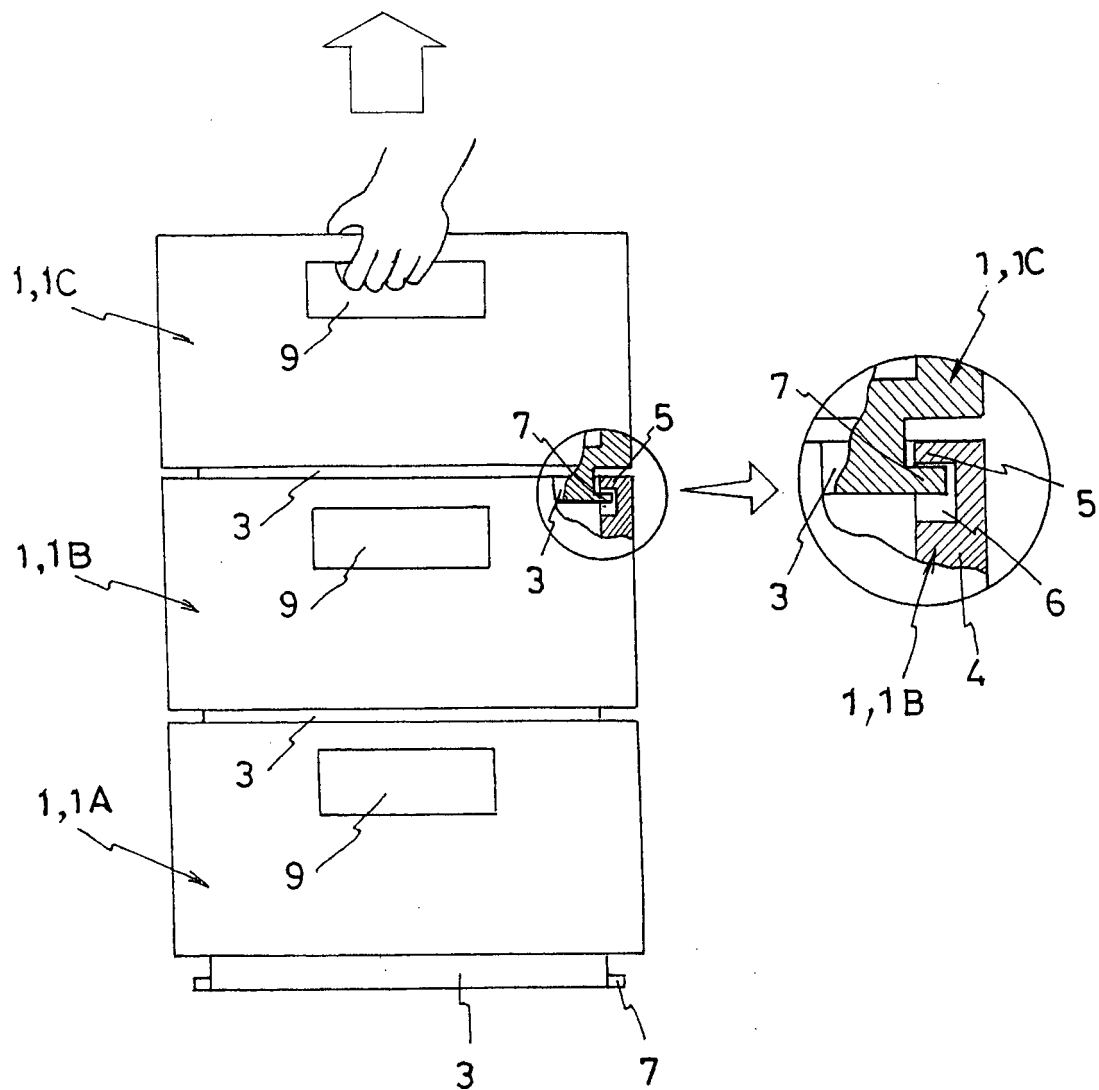


Fig.5

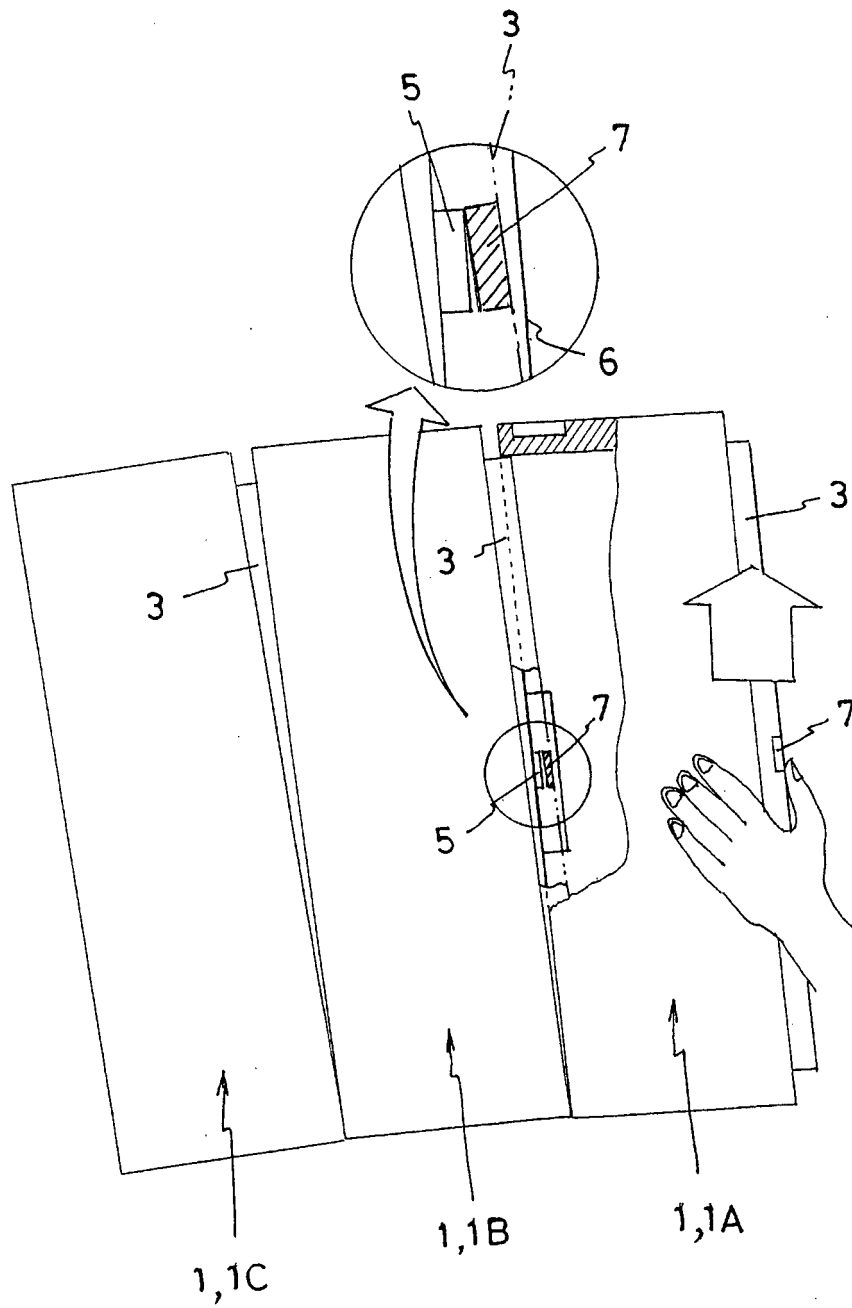


Fig.6

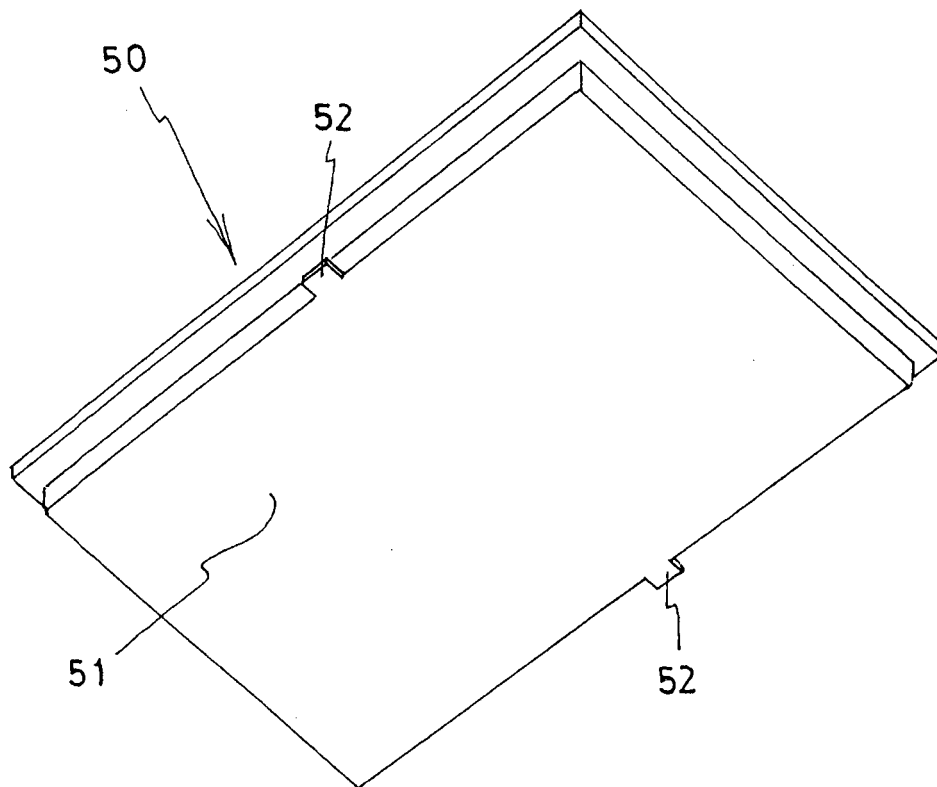


Fig.7

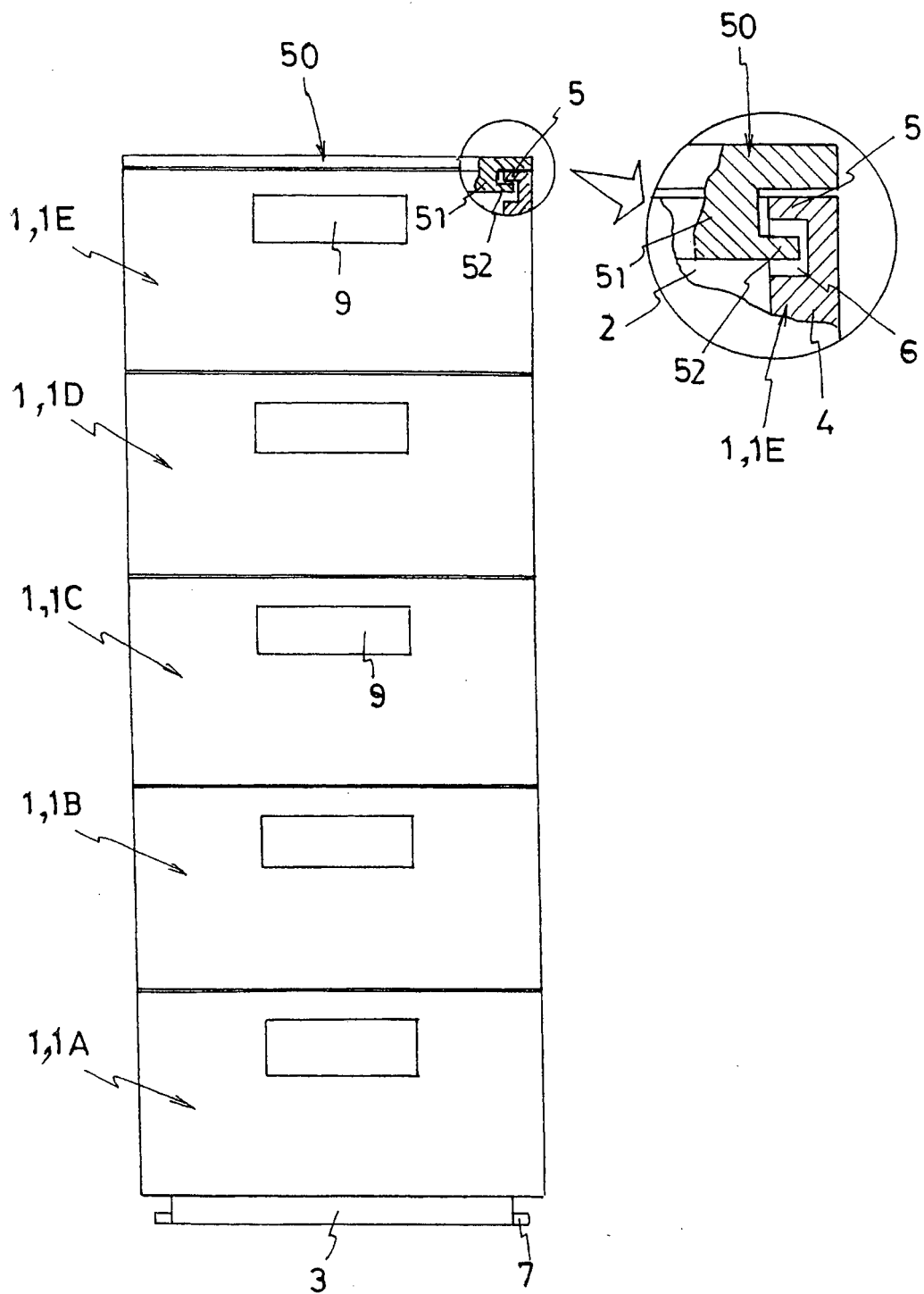


Fig.8

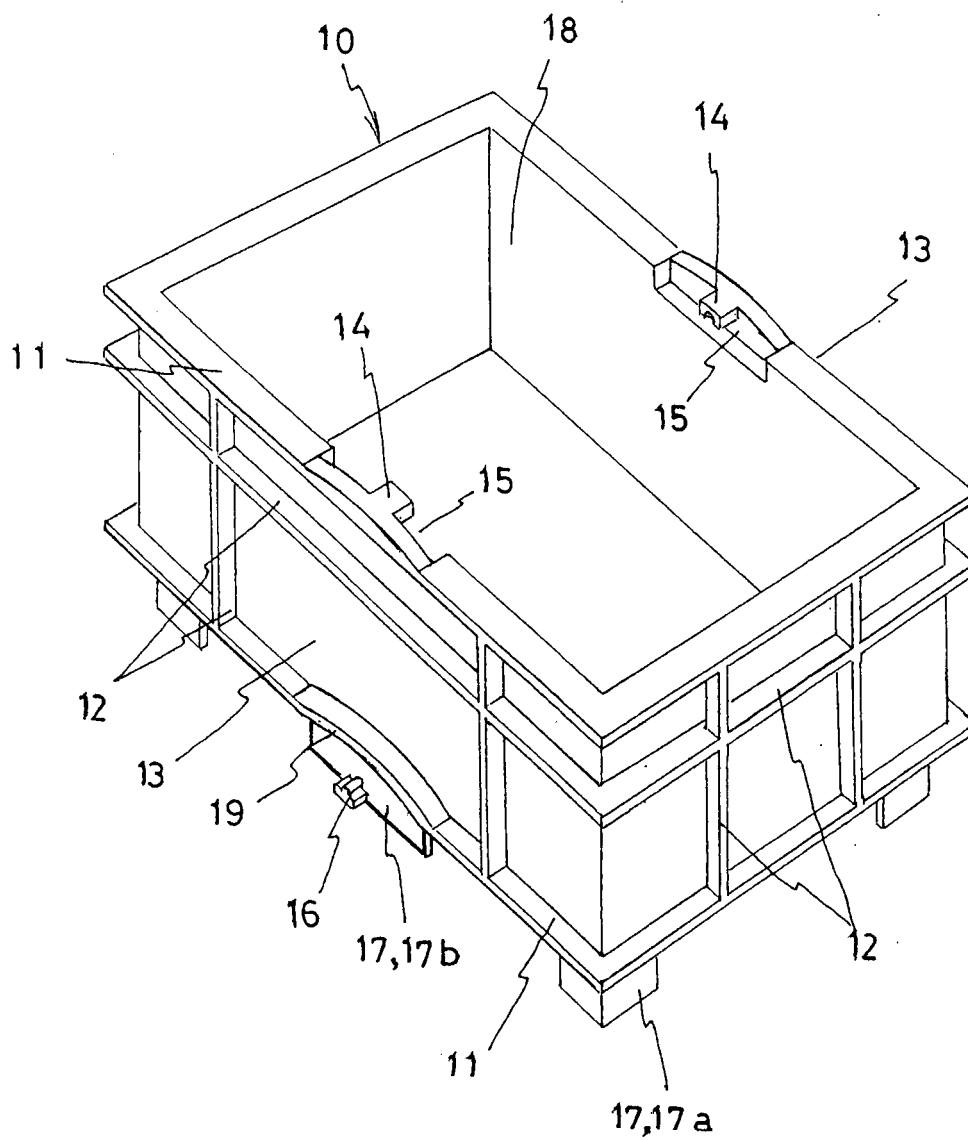


Fig.9

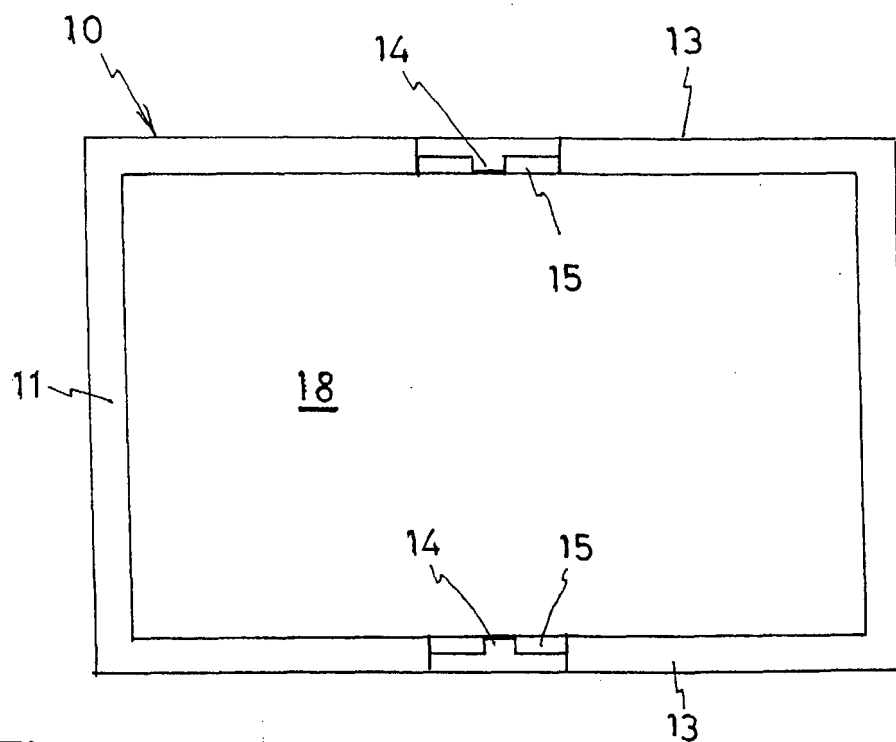


Fig.10

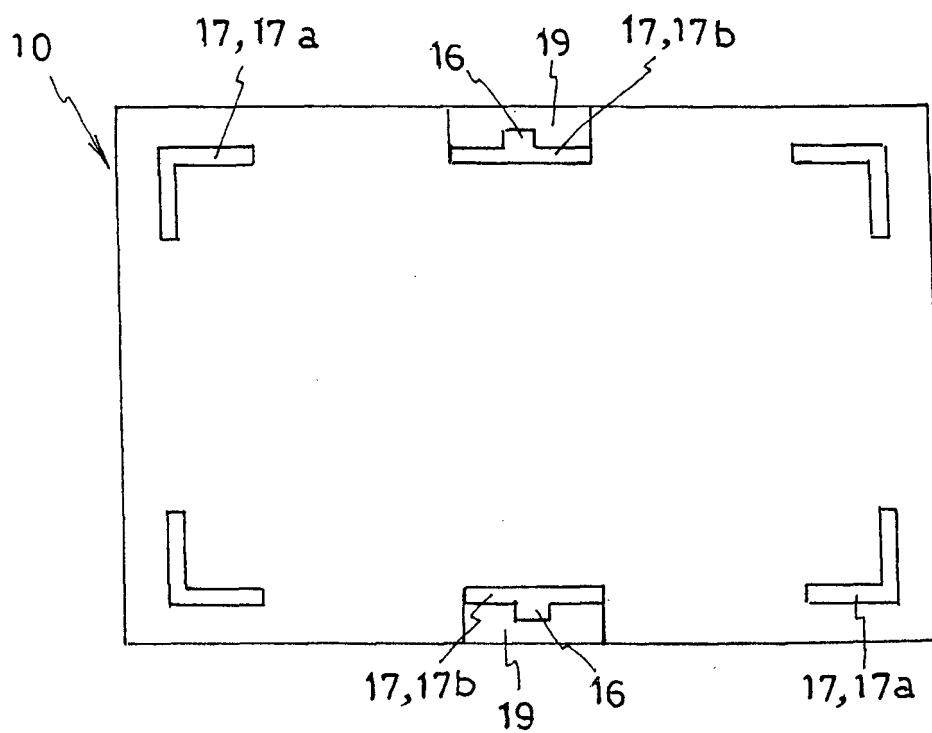


Fig.11

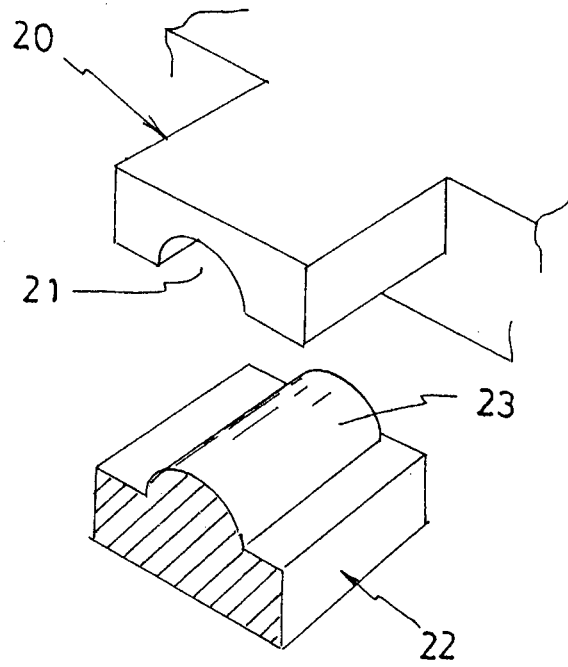
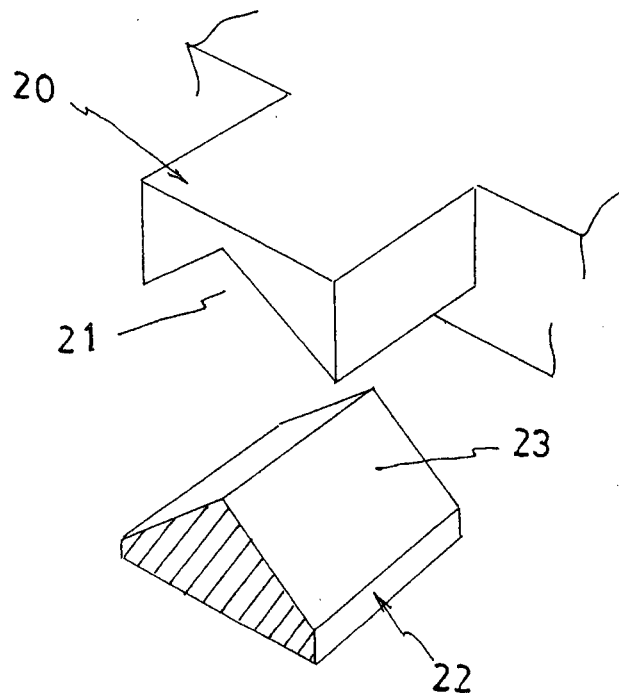


Fig.12



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2017/017322

A. CLASSIFICATION OF SUBJECT MATTER

B65D21/02(2006.01)i, B65D21/036(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)

B65D21/02, B65D21/036

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 1996-2017

Kokai Jitsuyo Shinan Koho 1971-2017 Toroku Jitsuyo Shinan Koho 1994-2017

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 A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 141008/1972 (Laid-open No. 096229/1974) (Aiho Kagaku Kabushiki Kaisha), 20 August 1974 (20.08.1974), specification, page 1, line 18 to page 2, line 19; fig. 1 to 3 (Family: none)	1, 2, 5, 6 3, 4
A	JP 40-033175 Y1 (Sekisui Chemical Co., Ltd.), 19 November 1965 (19.11.1965), (Family: none)	3

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

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Date of the actual completion of the international search
13 June 2017 (13.06.17)Date of mailing of the international search report
20 June 2017 (20.06.17)Name and mailing address of the ISA/
Japan Patent Office
3-4-3, Kasumigaseki, Chiyoda-ku,
Tokyo 100-8915, Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2017/017322

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 07-136011 A (Gifu Plastic Industry Co., Ltd.), 30 May 1995 (30.05.1995), (Family: none)	3
A	JP 2009-029516 A (Ingenious Designs L.L.C.), 12 February 2009 (12.02.2009), & US 2009/0026158 A1 & EP 2018816 A1 & KR 10-2008-0061347 A & CN 101352283 A	4
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 027142/1975 (Laid-open No. 108943/1976) (Katashi AOKI), 31 August 1976 (31.08.1976), (Family: none)	5

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- JP 2004123221 A [0003]
- JP 2004329035 A [0003]
- JP H09169339 B [0003]