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(54) Multi-purpose container.

(57) A multi-purpose container which is constructed by easily assemblying standing main frame members (2, 3), a bottom frame member (1), standing side frame members (4) and a roof frame member (5). The multi-purpose container is easily disassembled, thereby to bulk small at its entirety, for recovery. The multi-purpose container in which an inner shelf member (6) is assembled in an ascending and descending manner, thereby to load automobiles therein by self running method.

Fig.1 - 1

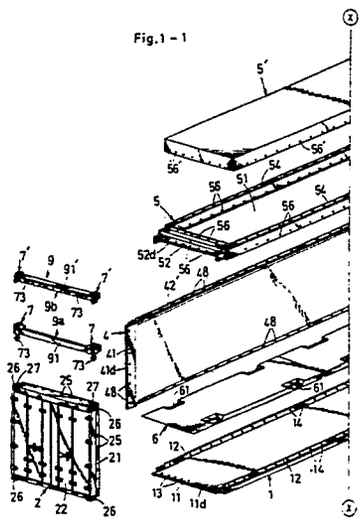
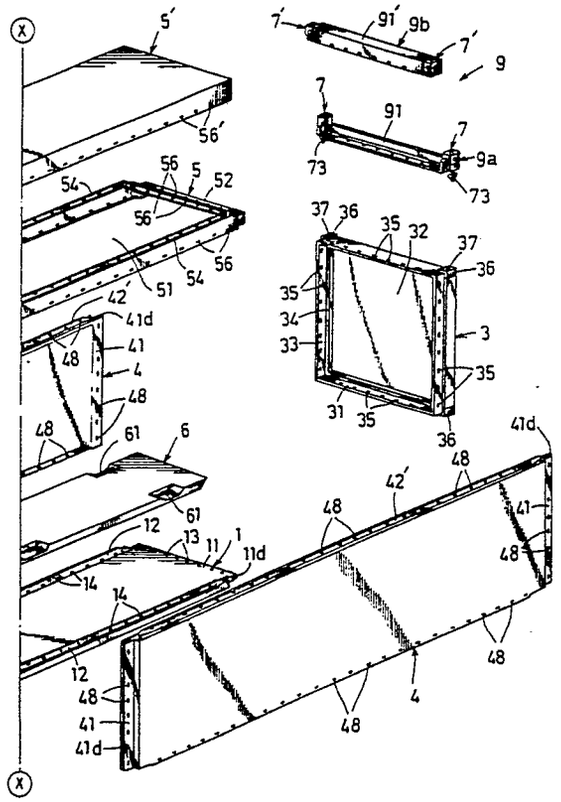


Fig.1 - 2



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Multi-purpose Container

Background of the Invention

Field of the Invention

This invention relates to a multi-purpose container in which various cargoes especially automobiles are loaded, being bulked small when no cargo is housed.

Description of the Related Art

Conventionally, various containers corresponding to a variety of cargo are supplied, thereby to reliably protect cargoes during transportation on land or sea.

Containers in which limited sort of cargoes are housed, for example a refregerating container, a tank container, a container only for animals etc., are constructed most suitably to the housing cargoes. So remarkable difficulty during loading operation does not recognized.

A popular dry-container houses general merchandises mainly, but the sort of the housing cargoes is not limited.

Loading of the cargoes is achieved by using folk-lift car etc. through an opened door of the container. So the loading operation is not suitable for a long sized cargo, a bulk cargo for its weight (especially a bulk cargo in a length direction of the container) etc.

Accordingly, open-top containers provided disassemble top member, top surface of which is covered by canvas cover to protect from intruding water, or flatrack containers provided four pillars standing at four corners, because the cargoes for example glass plates, plant products, bulk bulldozers, iron materials, may be housed in the container by using a crane.

At the arrival place, unloading operation using cranes similarly to the departure place is carried out, thereby to load or unload cargoes to or from the container in trouble occasionally.

As to the automobile industry, on-the-spot producting of automobiles is becoming active, so the transportation of parts to on-the-spot producing factories and the transportation of produced automobiles through different routes, become necessary. But the transportation of produced automobiles using containers scarcely achieved, because the utilizing efficiency of the container in case of transporting the produced automobiles remarkably goes down in comparison with the utilizing efficiency of the container in case of transporting the parts of automobiles.

In the transportation using the container, the frequency of transporting empty containers is nearly same as the frequency of transporting filled containers, so the space occupied by the empty container is same as the space occupied by the filled container, thereby to decrease the utilizing efficiency of ships, trucks, freight trains and accumulating place for empty containers.

More specifically, the containers are mainly 20 feet in length and 40 feet in length, each size fall under ISO standard.

Each total weight is arranged 20 tons and 30 tons respectively, and the maximum height is arranged 8 feet 6 inches to conform the Road Traffic Control Law and the traffic control for example the height of tunnels. The standard of container is examining to change the total weight and the maximum height of the 20 feet sized container to 24 tons and 9 feet 6 inches respectively.

These containers are constructed in not permitting disassemblance because enough strength and protection from water are needed considering transportation on sea in the piled condition, thereby to occupy the same space regardless of empty or full. Accordingly, the same space as the space of the ships, trucks, freight trains when transporting the cargoes, is needed when transporting the empty containers, thereby to increase the energy waste rate per the volume of transporting cargoes.

This disadvantage will be remarkable when the standard of container is improved as aforementioned.

Summary of the Invention

It is an object of the present invention to produce a novel multi-purpose container.

It is another object of the present invention to load and unload variable cargoes easily.

It is a further object of the present invention to increase the space efficiency for loading automobiles into the multi-purpose container.

It is still another object of the present invention to decrease the space needed for transporting the container in which no cargo is loaded.

It is a still further object of the present invention to sumplify assembling operation and disassembling operation of the multi-purpose container.

In order to achieve the objects above- mentioned, the multi-purpose container in accordance with the present invention, being assembled to be a cube, comprises:

quadrilateral main frame members,
a rectangular bottom frame member,
side frame members,
a roof frame member,
holes formed at the connecting portion of each members,
connecting members inserted in said hole in extractable manner,
two pairs of holding members for holding said members piled, being possible to be fixed to corner metal fittings provided at the top portion of said main frame members, each pair of holding members being possible to be connected one another, and
an inner shelf member for loading automobiles, supported between said side frame members in movable up and down manner and in disattachable manner.

Preferably, the room frame member comprises an edge member substantially formed as a square frame and a quadrilateral cover attached to the edge member in a disattachable manner, to cover the top opening of the edge member.

One short edge side portion of the inner shelf member may be connected to the rest portion in a rotatable up and down manner, preferably in this case, support members are further attached to the assembled container in a disattachable manner, thereby to hold the upward rotated state of the short edge side portion.

The inner shelf member may be attached to the assembled container allowing movement up and down, preferably in this case, support members are further attached to the assembled container in a disattachable manner, thereby to hold the upward moved state of the inner shelf member.

Preferably in these cases, wheel support portion of the inner shelf member is dented in the depth not greater than the distance of the bottom surface of the wheel and the bottom surface of the automobile body.

Preferably, a connecting member holding member united sealing member is further housed in each holes.

Preferably, a step is further formed at the edge portion of the members, thereby to ensure the connection of neibouring members, more preferably in this case, a sealing member is further fixed to the step.

Preferably, the connecting portion of the bottom frame member with the side frame member is a guiding projection united fitting member of the side frame member, and the connecting portion of the side frame member with the roof frame member is a guiding projection united fitting member of the roof frame member.

Preferably, each pair of holding members comprises a holding member attached to the corner metal fittings of the main frame member in a disattachable manner, and a holding member attached to the holding member in a disattachable manner, and connecting members are housed in one of the holding member, more preferably in this case, each pair of holding members are attached to the main frame member to suit the top surface of the roof frame member.

According to the multi-purpose container having the arrangement above-mentioned, the main frame members, the bottom frame member, the side frame members and the roof frame member are assembled to form the cubic multi-purpose container satisfying the strength established with the ISO standard, by inserting the connecting members into the holes. Loading or unloading cargoes is achieved after assembling the members. On the contrary, assembling the members is achieved after loading cargoes on the bottom member. Each pair of holding members are attached to the corner metal fittings provided at the top portion of the main frame members by the connecting members, and each pair of holding members are connected as one body by the connecting members.

When the inner shelf member is further supported at the predetermined position, thereby to devide the inner space into upper chamber and lower chamber, automobiles are loaded in each chamber.

Especially, loading automobiles in each chamber is achieved by driving automobiles, thereby not to necessitate extra apparatus for loading.

The multi-purpose container thus assembled must satisfy requisites for protecting from extracting inner cargo from outside after performing seallock at the lock portion of the door, and for confirming all connecting member from outside, thereby to transport cargoes securely and certainly.

After finished the transportation of automobiles, bulk space with no partition is obtained by moving the inner shelf member downward or disattaching the inner shelf member, thereby to transport various cargoes.

When recovering the multi-purpose container, disattach two pairs of holding members from main frame members at first, disconnect each members by pulling out all connecting members at second, then pile up each members in the state that main frame members are positioned at the intermediate position as sandwitched by other members, thereby to decrease bulk at its entirety. After that, the edge portion of the top piled member and the edge portion of the bottom piled member are held by each holding member of each pair of holding members respectively, then both holding members are moved apart to the permitted limit of the connecting member, maintained the connected state of

both holding members, thereby to get together comprising member of the multi-purpose container.. The volume thus got together is decreased to the one several-th of the volume of the assembled multi-purpose container.

Further objects and advantages of this present invention will become apparent as the following description proceeds and the features of novelty which characterize this present invention are pointed out with particularly in the claims annexed hereto.

Brief Description of the Drawing

Fig. 1 is an exploded perspective view of multi-purpose container in accordance with an embodiment of the present invention,

Fig. 2 is a perspective view of multi-purpose container in the assembled state,

Fig. 3 is a vertical section view showing the connecting portion of the front main frame member and the bottom frame member,

Fig. 4 is a vertical section view showing the connecting portion of the bottom frame member and the side frame member,

Fig. 5 is a vertical section view showing the connecting portion of the roof frame member and the side frame member,

Fig. 6 is a side view showing the main portion of the holding member,

Fig. 7 is a vertical section view showing the main portion of the holding member,

Fig. 8 is a bottom view showing the main portion of the holding member in the connected state,

Fig. 9 is a horizontal section view taken along the line IX-IX in Fig. 6,

Fig. 10 is a perspective view taken away part of outer members showing the automobiles loaded state,

Figs. 11 and 12 are vertical section views showing the automobiles loaded state,

Fig. 13 is a perspective view showing the automobiles loaded state with top cover is being to attach to the roof frame member,

Fig. 14 is a perspective view showing the got together state for recovery,

Fig. 15 is a vertical section view showing the connecting portion of the front main frame member and the bottom frame member, embloyed other construction, and

Fig. 16 is a vertical section view showing the connecting portions of the front main frame member, the bottom frame member and the side frame member, embloyed other construction.

Description of the Preferred Embodiment

Fig. 1 is an exploded perspective view of a dry container which is an instance of the multi-purpose container in accordance with the present invention, while Fig. 2 is a perspective view thereof showing the assembled state.

In Figs. 1 and 2, the dry container has a bottom frame member 1, a front main frame member 2, a rear main frame member 3, a pair of side frame members 4, a roof frame member 5, a roof cover 5′, an inner shelf member 6 and two pairs of holding members 9.

Now referring to Figs. 3, 4 and 5, the multi-purpose container is described in detail.

The bottom frame member 1 is a rigid plate whose width is 8 feet and length is about 40 feet. Each short edge of the bottom frame member 1 is shaped as a first connecting projection 11 in the shape of somewhat narrow width and cut out at its bottom side (see Fig. 3). Each long edge of the bottom frame member 1 is projected upward, and a guiding projection 12 having a predetermined height is shaped at the top edge of the long edge (see Fig. 4). Tapered holes 13 and 14 are formed at the first connecting projection 11 and the guiding projection 12 at every predetermined interval respectively. A downward projection 16 is formed at the predetermined position of the bottom surface of the first connecting projection 11, thereby to ensure touch with the main frame member.

The side frame member 4 is a rigid plate whose width is 8 feet 6 inches and length is 40 feet. Each short edge of the side frame member 4 is shaped as a second connecting projection 41 in the shape of somewhat narrow width and cut out at its outer side (see Fig. 1). A guiding groove 42 is formed at the bottom surface of the downward edge of the side frame member 4, thereby to engage the guiding projection 12. A guiding projection 42′ is shaped at the upward long edge of the side frame member 4, thereby to engage guiding grooves 53 formed at the bottom surface of the roof frame member 5. A sealing member 46 is housed interior of the guiding groove 42. A skirt member 47 is projected downward from the outer surface of the portion having the guiding groove 42, thereby to touch with the side face of the bottom frame member 1. Tapered holes 48 are formed at the portion having the guiding groove 42, thereby to communicate with the tapered holes 14 formed at the guiding projection 12. Tapered holes 48 are also formed at the guiding projection 42′. Tapered holes 48 are also formed at the second projection 41, thereby to communicate with tapered holes 25 of the main frame member described later.

The roof frame member 5 is a rigid plate

whose width is 8 feet and length is about 40 feet. A large opening 51 is formed at the center of the rigid plate.

The roof cover 5′ is attached to the strong plate to cover the large opening 51 in a disattachable manner.

Each short edge of the roof frame member 5 is shaped as a third connecting projection 52 in the shape of somewhat narrow width and cut out at its top side (see Fig. 1). The height of the roof cover 5′ is equal to the height of holding members 9 described later. In more detail, guiding grooves 53 are formed at the bottom surface of the roof frame member 5, thereby to engage with the guiding grooves 42′. A guiding projection 54 is shaped at the top surface of the roof frame member 5, thereby to engage with the top cover 5′. A sealing member 55 is housed interior of the guiding groove 53. Tapered holes 56 are formed at the portion having the guiding groove 53, thereby to communicate with the tapered holes 48 formed at the guiding projection 42′. Tapered holes 56 are also formed at the third connecting projection 52, thereby to communicate with tapered holes formed at the main frame member described later. Skirt members 57 are projected downward from the long edge of the roof frame member 5, thereby to touch with the side face of each side frame member 4.

A guiding groove 54′ to engage the guiding projection 54 is formed at the side bottom surface of the roof cover 5′. A sealing member 55′ is housed interior of the guiding groove 54′. Tapered holes 56′ are formed at the portion having the guiding groove 54′, thereby to communicate with the tapered holes 56 formed at the guiding projection 54.

The front main frame member 2 comprises a square frame 21 and a double door 22. The square frame 21 is to be touch with the outer surface of the connecting projections 11, 41 and 52 shaped at the short edge of the bottom frame member 1, a pair of the side frame members 4 and the roof frame member 5. The double door 22 is fixed to the square frame 21. The rear inner portion of the square frame 21 is cut out to form a step 23. The step 23 is the tapered shape. Sealing members 24 is fixed to the step 23 against to engaging portions 11d, 41d and 52d fixed to the projecting surface of the connecting projections 11, 41 and 52. Tapered holes 25 are formed at the square frame 21 to communicate tapered holes 13, 48 and 56. Corner metal fittings 26 each having engaging holes, are fixed to the corner of the square frame 21.

The rear main frame member 3 is different from the front main frame member 2, that is a shut plate 32 is fixed to the square frame 31 instead of the double door 22.

The inner shelf member 6 is a rigid plate having the predetermined width. The predetermined length adjacent to the front main frame member 2 is cut off and connected to the rest in a rotatable up and down manner. When it is rotated downward, loading and unloading of automobiles by driving the vary automobiles are permitted. On the contrary, when it is rotated upward, loaded automobiles are kept horizontally.

The inner shelf member 6 is housed in the assembled container in a disattachable manner, and is supported by a driving device driven by pressured oil and guiding member 62, thereby to move up and down. Dents 61 to receive wheels of automobiles loaded in the upper chamber, are formed at the inner shelf member 6 at the shifted position to the roof of automobiles loaded in the down chamber. The dent 61 is formed at the predetermined depth to prevent touch the bottom surface of the automobile body with the inner shelf member 6. Wedges 8 are inserted to the communicated tapered holes as shown in Figs. 3, 4 and 5.

The pair of holding members 9 comprises a first holding member 9a attached to the main frame member 2 and 3, and a second holding member 9b attached to the first holding member 9a. The first holding member 9a comprises a cubic frame 9a to house the short edge of the bottom frame member 1 and connecting members 7 fixed to both ends of the cubic frame 91. A main locking member 73 is fixed to the predetermined position of the connecting member 7, thereby to connect with the corner metal fitting 26. A lock system including the main locking member 73 may be attached to the connecting member 7 in a disattachable manner.

The second holding member 9b comprises a cubic frame 91′ to house the short edge of the roof frame member 5 and connecting members 7′ fixed to both ends of the cubic frame 91′. The second holding member 9b is held on the roof frame member 5 by guiding pieces (not shown) attached to the roof frame member 5 in a disattachable manner, being parallel to the first holding member 9a.

Both connecting members 7 and 7′ have nearly same construction one another. More specifically, the connecting member 7 comprises a casing 71, a rotating member 72 housed in the casing rotatably, the main locking member 73 rotating and going in and out follow the rotation of the rotating member 72 and a driving wire 74 to rotate the rotating member 72.

The casing 71 is formed a space 71a corresponding to a corner metal fitting nearly equal in shape to the corner metal fitting 26 of the front main frame member 2 and a space 7lc to house the rotating member 72 rotatably, interior thereof.

The rotating member 72 comprises a disc plate 72a formed a groove 72b for winding the driving

wire 74 at the outer surface and a screw shaft 72c projected at the center of the disc plate 72a.

Click stop balls 72f energized upwardly by springs 72e, are housed in holes formed at the bottom edge ward position of the disc plate 72a.

Engaging dents 71d are formed at the predetermined position of the space 71c, thereby to control the rotating position of the disc plate 72a by engaging the click stop balls 72f with the engaging dents 71d.

The main locking member 73 comprises a screw pipe 73a engaged with the screw shaft 72c, an engaging head 73b engagable with the corner metal fitting 26 and a spring 73c housed in the screw pipe 73a, in the compressed condition. The engaging head 73b is formed rectanglar figure in plan view and the top surface thereof is projected as the equilateral triangle. An engaging projection 73f is formed at the predetermined position of the outer surface of the casing 71, thereby to limit the rotation of the main locking member 73 by engaging the engaging head 73b with the engaging projection 73f.

The main locking member 73 is moved to and from the corner metal fitting 26 following the movement of the pair of holding members 9. The main locking member 73 is also rotated following the rotation of the rotating member 72 by the effect of the spring 73c, within the regulated limit by the engaging projection 73f. The regulated limit is about 90 degrees. The main locking member 73 is allowed to rotate over the regulated limit, thereby to move to and from according to the relative rotation of the screw shaft 72c and the screw pipe 73a. That is, after the engaging head 73b is engaged with the engaging projection 73f, the rotating member 72 is rotated in one direction with keeping the engaged condition, thereby to move the main locking member 73 to the casing 71 against the energizing force of the spring 73c. On the contrary, the rotating member 72 is rotated in opposite direction with keeping the engaged condition, thereby to move the main locking member 73 from the casing 71 utilizing the energizing force of the spring 73c. Accordingly, the engaging head 73b is regulated the rotation by the engaging projection 73f, thereby to achieve engagement and disengagement to the corner metal fitting 26 easily.

The connecting member 7′ has the construction nearly same to the connecting member 7, except the following points. First different point is that the length of the main locking member is different one another. Second different point is that the rotating member and the main locking member are housed at the folded condition, in the second holding member 91′. Brackets (not shown) and set pins (not shown) are disattachably attached to the folding portion.

Accordingly, after engaging the main locking members 73 of the connecting members 7 with the connecting members 7′, the distance between both holding members 9a and 9b are enlarged, thereby to form the space for housing disassembled members.

Assembling operation of the multi-purpose container above-mentioned is as follows:

At first, the side frame members 1 are connected with the bottom frame member 4 by engaging the guiding grooves 42 formed at the bottom surface of the side frame members 4 with the guiding projections 12 shaped at the top surface of the bottom frame member 1, and inserting wedges 8 into the communicated holes 48 and 14 (see Fig. 4). At this state, the top edge of the guiding projection 12 is contacted hardly to the sealing member 46 housed interior of the guiding groove 42, and the skirt member 47 is contacted to the side face of the bottom frame member 1. As a result, entering the wind and water are securely prevented, and increasing the pressing force to extremely high is securely prevented, thereby to prevent damage of the sealing member 46.

The guide grooves 53 are engaged with the guide projections 42′ shaped at the top edge of the side frame members 4, and the wedges 8 are inserted into the communicated tapered holes 48 and 45 one another, thereby to maintain the predetermined distance between the top edges of the side frame members 4. Then the cubic pipe like container body portion is formed. As to this engaging portion, the sealing members 55 housed interior of the guiding grooves 53 and the skirt members 57 contacted to the outer surface of the side frame members 4, cooperate to prevent wind and water from entering and to prevent contacting pressure from increasing for diminishing the damage of the sealing members 55, similarly to the above-mentioned engaging portion. Then the inner shelf member 6 is attached at the predetermined position of the container body portion. The short edge side portion of the inner shelf member 6 adjacent to the front main frame member 2, is rotated downward to form a slope way, if necessary. After that, the square frame 21 of the front main frame member 2 is attached to contact each outside of the first connecting projection 11 of the bottom frame member 1, the second connecting projection 41 of the side frame member 4 and the third connecting projection 52 of the roof frame member 5, then the wedges 8 are inserted into the communicated tapered holes 25 and tapered holes 13, 48 and 56 (see Fig. 3), thereby to connect the front main frame member 2 with the bottom frame member 1, the side frame members 4 and the roof frame member. More particularly, the engagement of the square frame 21 with the bottom frame member 1,

the side frame members 4 and the roof frame member 5 is achieved by engaging steps one another. As to this engaging portion, the first connecting projection 11 engages with the tapered inner surface of the square frame 21, the edge surfaces and the cutaway steps of the bottom frame member 1, side frame members 4 and roof frame member 4 are contacted with pressure respectively, with the square frame 21, thereby to diminish the damage of the sealing member 24, and to prevent wind and water from intruding. The rear main frame member 3 is also attached to the bottom frame member 1, side frame members 4 and roof frame member 5 in the same manner as the front main frame member 2, thereby to prevent wind and water from intruding. The first holding members 9a are fixed to each main frame members 2, 3 by holding and fixing the connecting members 7 to the corner metal fittings 26 of each main frame members 2 and 3, the holding and fixing are achieved by inserting the main locking members 73 into the corner metal fittings 26 and rotating the rotating members 72. The second holding members 9b are also fixed to the roof frame members 5 as the same manner above mentioned. The fixing operation may be executed before or after loading cargoes into the container. Finally, the roof cover 5′ is attached to the roof frame member 5 to cover the large opening 51, thereby to form the closed up space to house cargoes.

The dry container having about 40 feet length is formed by achieving above-mentioned operations, thereby to load cargoes easily loadable in the assembled container after the above-mentioned operations. On the contrary, cargo hardly loadable in the assembled container, is to load at half way of the assemblying operations, for example only the side frame members 4 are attached to the bottom frame member 1, by using cranes etc. After that, rest assembling operation should be executed.

Especially, when automobiles should be loaded, an automobile is loaded on the bottom frame member 1 at the state the inner shelf member 6 is moved upwardly, then an automobile is loaded on the inner shelf member 6 by driving automobiles through a sloped way at the state the inner shelf member 6 is moved downwardly closing to the roof of loaded automobile and the sloped way is formed by rotating the short edge side portion downwardly (see Figs. 10, 11 and 12). In the latter case, the roof cover 5′ may be disattached, thereby to prevent contact the roof cover 5′ and the roof of the loaded automobile. After that, an automobile is loaded on the bottom frame member 1 at the state the short edge side portion of the inner shelf member 6 is rotated upwardly, then the short edge side portion is rotated to be parallel to the rest portion. Another automobile is loaded on the inner shelf member 6 by attaching an extra sloped way to the inner shelf member 6. Finally, the roof cover 5′ is attached to the roof frame member 5, thereby to complete the loading operations.

Loading automobiles on the inner shelf member 6 may be achieved by a crane through the large opening 51 of the roof frame member 5. If a driving device driven by pressured oil bearable to great load, is used, loading automobiles on the inner shelf member 6 is executed firstly, then loading automobiles on the bottom frame member 1 is executed after moving the inner shelf member 6 upwardly, and finally, moving the inner shelf member 6 downwardly and attaching the roof cover 5′ to the roof frame member 5 is executed. That is, four automobiles are loaded in the container having 40 feet length, and the interior thereof is certainly kept water proofed conditions, thereby to transport automobiles securely.

When cargoes other than automobiles are to be loaded, a bulk space for loading is obtained interior of the container by moving the inner shelf member 6 upwardly to be housed in the roof frame member 5.

The strength of the assembled multi-purpose container in the width direction is assured by the strength of both main frame members 2 and 3. The strength of the assembled multi-purpose container in the length direction is assured by the engagement of the square frames 21 and 31 of both main frame members 2 and 3 with the top edges and the steps cut away of the bottom frame member 1, side frame members 4 and roof frame member 5, and the connection of the uneven engaging portion of guiding projections with the guiding grooves using inserted wedges. The strength of the assembled multi-purpose container at its entirety is nearly the same with the conventional container satisfying the ISO standard. Preventing the sealing members from damage and preventing wind and water from entering is well accomplished.

The sequence of the assembling operations is not limited to the above-mentioned sequence, but one of the main frame members is connected to the bottom frame member 1 at the halfway of the assembling and the other main frame member is connected thereto finally are allowed.

After the wedges 8 are inserted into the communicated tapered holes, rubber plugs 10 are attached to the outerside tapered holes (see Fig. 3), thereby to prevent wind and water from intruding and to prevent wedges from slipping out.

Further more, when the height of the loaded cargo on the flat rack container is excessed, it seems impossible to pile another container on the flat rack container. But the multi-purpose container having the construction above-mentioned, is able to be piled on the flat rack container by attaching the

second holding members 9b to the bottom side of each main frame member 2 and 3 to increase the height of the connecting portion, thereby to utilize the space in holds etc. efficiently.

Loading operation of the multi-purpose container attached two pairs of holding members 9 by a crane utilizing connecting members 7 are allowed, and connecting containers one another, fixing containers etc. are also allowed in the manner mentioned above.

Further more, positioning members (not shown) may be formed at the corresponding frame member, to be positioned easily to the connecting members attached in projected manner.

When recoverinng the multi-purpose container, that is transforming the empty multi-purpose container, the multi-purpose container is disassembled into each frame members by executing operations in inverse sequence to the assembling operations. Then each frame members are piled up as one body by the following operations. The inner shelf member 6 is piled on the bottom frame member 1 between the guiding projections 12, both main frame members 2 and 3 are piled on the top face of the guiding projections 12 of the bottom frame member 1, then the side frame members 4 and roof cover 5′ are piled thereon, finally the roof frame member 5 is piled thereon, thereby to reduce the volume to the minimum. The contacting portion of both main frame members 2 and 3 to the guiding projections 12 have already been cut away. After that, the first connecting projections 11 are held by the first holding members 9a, and the third connecting projections 52 are held by the second holding members 9b, then the wedges 8 are inserted into the communicated tapered holes to fix each holding members with each frame members. Finally, the main locking members fixed to one holding member is connected with the connecting members fixed to another holding member, thereby to reduce the entire volume and to be one body (see Fig. 14).

Preferably, engaging portions are formed at the contating surface of the bottom frame member 1 and the main frame members 2 and 3 to ensure the connection of both main frame members 2 and 3. The engaging portions are positioned and have the predetermined size not to avoid the operability of assembling and disassembling and not to lessen the strength of the assembled multi-purpose container. Housing the inner shelf member 6 interior of the roof frame member 5 and the roof cover 5′, and housing the driving device driven by pressured oil etc. interior of the roof frame member 5 and the roof cover 5′ are allowed.

Wedges 8 and rubber plugs 10 having been used to assemble the multi-purpose container, are housed interior of housing boxes (not shown) through an openable door. The housing boxes are conventional housing boxes attachable to a dry container etc., and are attached to the multi-purpose container in a surplus space. The driving device driven by pressured oil and the guiding member 62 to move the inner shelf member 6 and others are housed in the downdard space of the roof cover 5′, if necessary.

Accordingly, only one several-th space needed for transporting cargoes is needed when the multi-purpose container is recovered, thereby to utilize holds, loading plat forms of trucks or freight trains, or van pool space efficiently.

Above description are made only for the multi-purpose container having 40 feet length, but the multi-purpose container having 20 feet length may also be disassembled itself, and cargoes may also be loaded and unloaded into and out from the multi-purpose container.

The engaging part of the square frames 21 and 31 of the main frame members 2 and 3 with the bottom frame member 1, side frame members 4 and roof frame member 5 may be constructed by contacting projections one another, or by contacting side face one another and contacting top and bottom uneven faces formed by cutting away, as shown in Fig. 15, thereby to connect the container body to main frame members. As a result, the demand for the strength of ISO standard is satisfied. Further, a tapered portion and a flat portion follows the tapered portion may be formed at the end of the guiding projections 12 of the bottom frame member 2, cone shaped projections may be formed in the surplus space, a tapered portion, a flat portion and cone shaped holes may be formed at the edge of the side frame member 4 engaged with the tapered portion, flat portion and cone shaped projections respectively, thereby to locate the side frame members 4 accurately. The engaging part of the side frame members 4 with the roof frame member 5 may be constructed as above-mentioned manner, thereby to locate the roof frame member 5 accurately.

This present invention is not limited to the embodiment above mentioned. Screw wedges and screw bolts etc. may be used instead of the wedges 8. The wedge and rubber plug may be made as one body. A wedge holding member united sealing member may be attached interior of the tapered hole. The positioning of the guiding projection 12 and the guiding groove 42 may be reversed. A cut away dent may be formed instead of the guiding groove 42. The multi-purpose container may be a tall container. A pair of holding members 9 may be made as one body.

Claims

1. A multi-purpose container being assembled assembled to be a cube, comprises:
quadrilateral main frame members (2, 3),
a rectangular bottom frame member (1),
side frame members (4),
a roof frame member (5, 5′) holes (13, 14, 25, 35, 48, 56) formed at the connecting portion(11, 12, 21, 31, 41, 52) of each members (1, 2, 3, 4, 5),
connecting members (8) inserted in said hole (13, 14, 25, 35, 48, 56) in extractable manner,
two pairs of holding members(9) for holding said members (1, 2, 3, 4, 5, 5′) piled, being possible to be fixed to corner metal fittings (27, 37) provided at the top portion of said main frame members (2, 3), each pair of holding members (9) being possible to be connected one another, and
an inner shelf member (6) for loading automobiles, supported between said side frame members (4) in movable up and down manner and in disattachable manner.

2. A multi-purpose container as set forth in claim 1, wherein said roof frame member (5, 5′) comprises a square edge member (5) anda quadrilateral cover(5′) attached to said edge member (5) in a disattachable manner, to cover a top opening (5′) of said edge member (5).

3. A multi-purpose container as set forth in claim 1, wherein said inner shelf member (6) is separated into two portions at the predetermined position, and one portion is connected to the rest portion in a rotatable up and down manner.

4. A multi-purpose container as set forth in claim 3, further comprising support members (62) attached to said bottom frame member (1) or side frame members (4) for holding one portion upward rotated state, in a disattachable manner.

5. A multi-purpose container as set forth in claim 1, wherein said inner shelf member (6) is assembled to said bottom frame member (1) or side frame member(4) in a movable up and down manner.

6. A multi-purpose container as set forth in claim 5, further comprising support members (62) attached to said bottom frame member (1) or side frame members (4) for holding said inner shelf member (6) upward moved state, in a disattachable manner.

7. A multi-purpose container as set forth in claim 1, wherein said inner shelf member (6) further comprising dents (61) for supporting a wheel of an automobile, the depth of said dent (61) is determined not greater than the projecting distance of the wheel.

8. A multi-purpose container as set forth in claim 1, said hole (13, 14, 25, 35, 48, 56) further comprising a connecting member holding member uniting a sealing member.

9. A multi-purpose container as set forth in claim 1, one side or both side of the connecting portion (11, 12, 21, 31, 41, 52) of each member (1, 2, 3, 4, 5) further comprising a step (23).

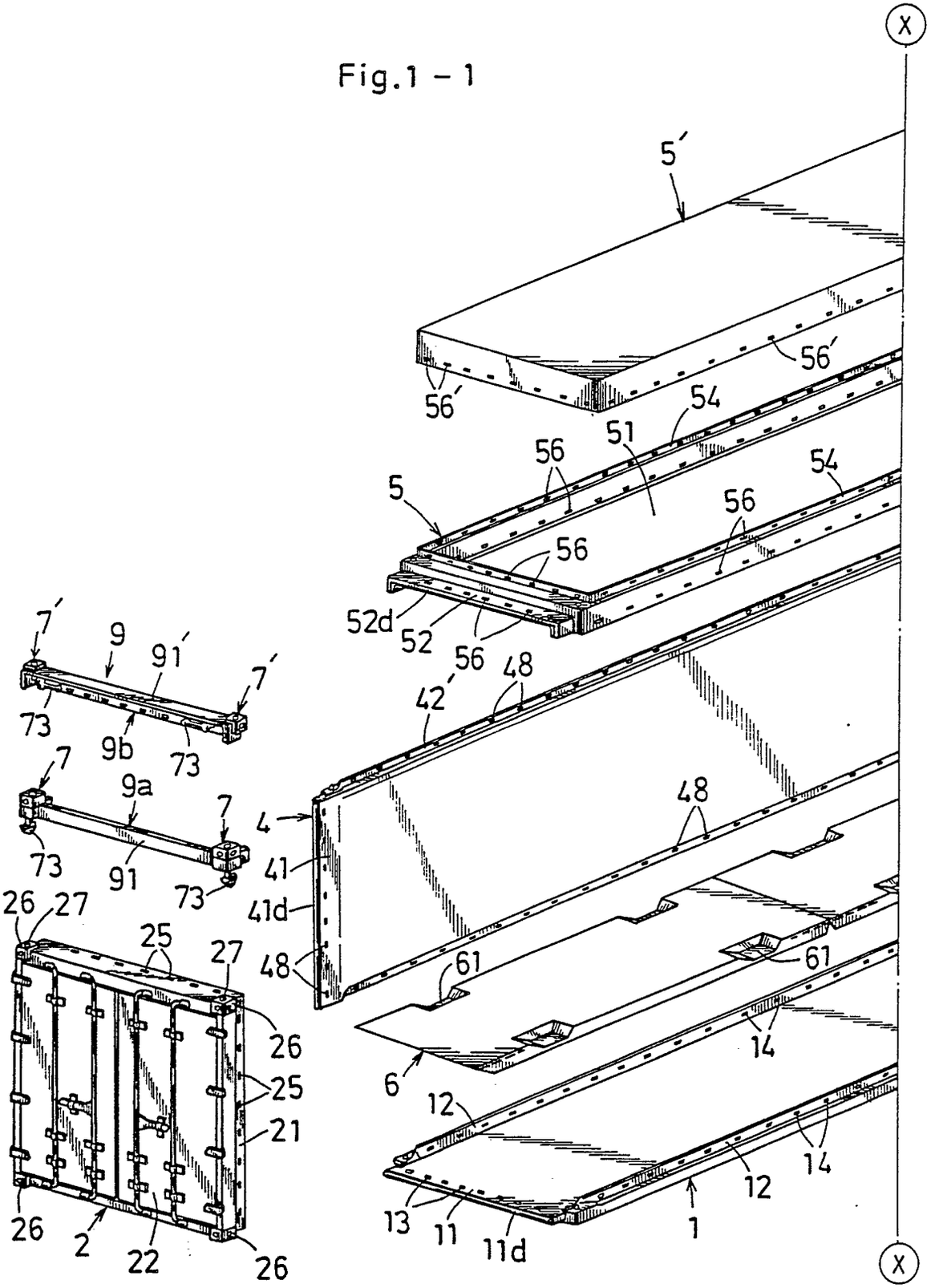
10. A multi-purpose container as set forth in claim 9, said step (23) further comprising a sealing member (24).

11. A multi-purpose container as set forth in claim 1, wherein connecting portions (12) formed at said bottom frame member (1) with said side frame members (4), is guiding projections uniting locating members for said side frame members (4), and a connecting portion (42′) formed at said side frame member (4) with said roof frame member (5), is guiding projection uniting a locating member for said roof frame member (5).

12. A multi-purpose container as set forth in claim 1, said pair of holding members (9) comprising a holding member (9a) attached to said corner metal fittings (27, 37) of said main frame member (2, 3) in a disattachable manner, a holding member (9b) attached to said holding member (9a) in a disattachable manner, and connecting members (73) for connecting both holding members(9a, 9b) said connecting members (73) are attached to one of said holding members (9a), being possible to be housed therein.

13. A multi-purpose container as set forth in claim1, wherein said pair of holding members (9) connected one another are attached to said main frame member (2, 3) to suit the top surface of said roof frame member (5).

Fig.1 – 1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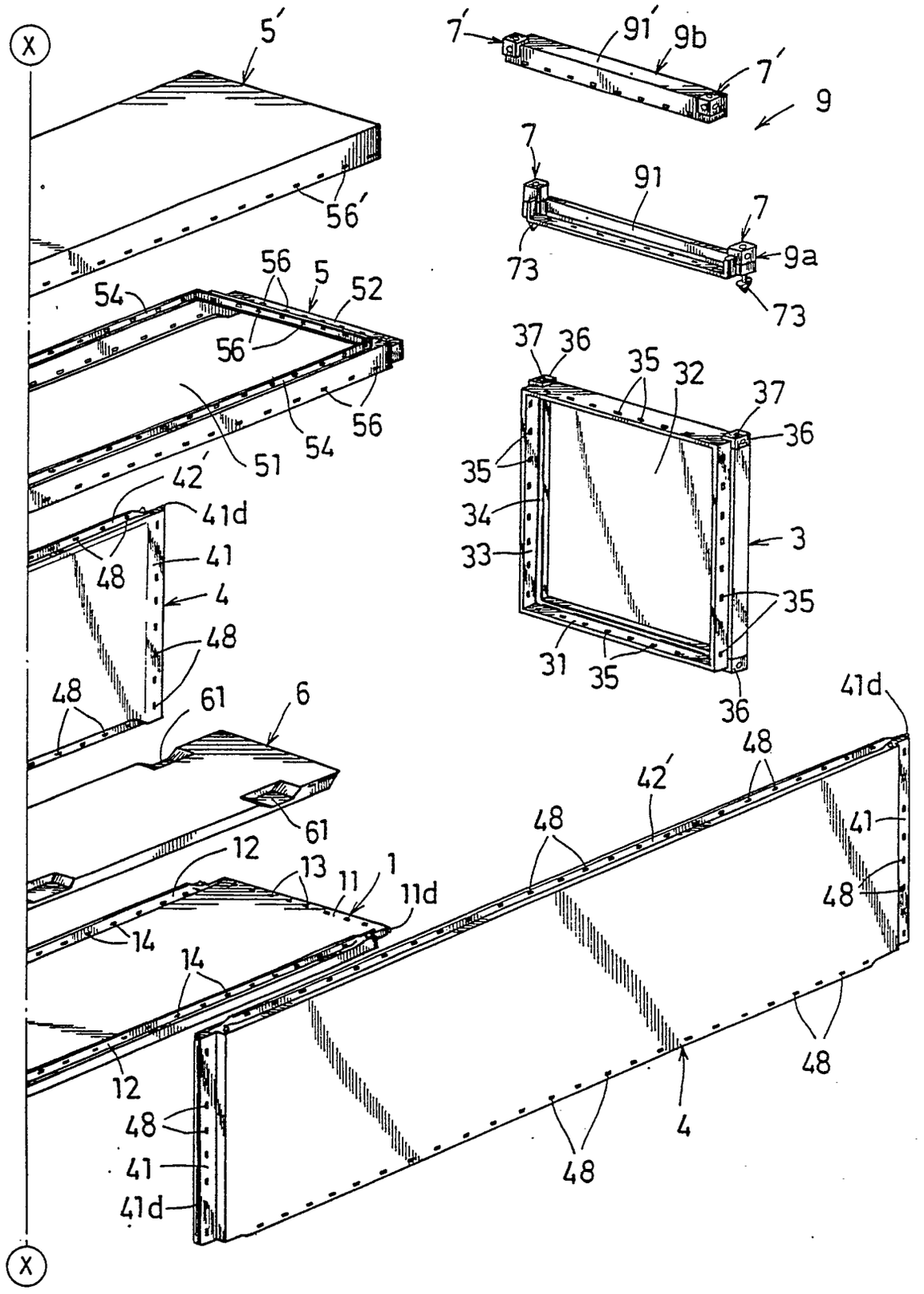
56'
56'
54
51
56
54
5
56
56
52d
52
56
48
42
7'
9
91'
7'
73
9b
73
7
9a
7
73
91
73
4
41
41d
48
48
61
61
14
6
12
12
14
13
11
11d
1
26
27
25
27
26
25
21
26
2
22
26
X

Fig.1 - 2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52
54
56
51
54
56
42'
41d
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41
4
48
48
61
6
61
12
13
11
1
11d
14
14
12
48
41
41d
7'
91'
9b
7'
9
7
91
7
73
9a
73
37
36
35
32
37
36
35
34
33
3
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31
35
36
41d
48
42'
48
41
48
48
4
48
48
48
X

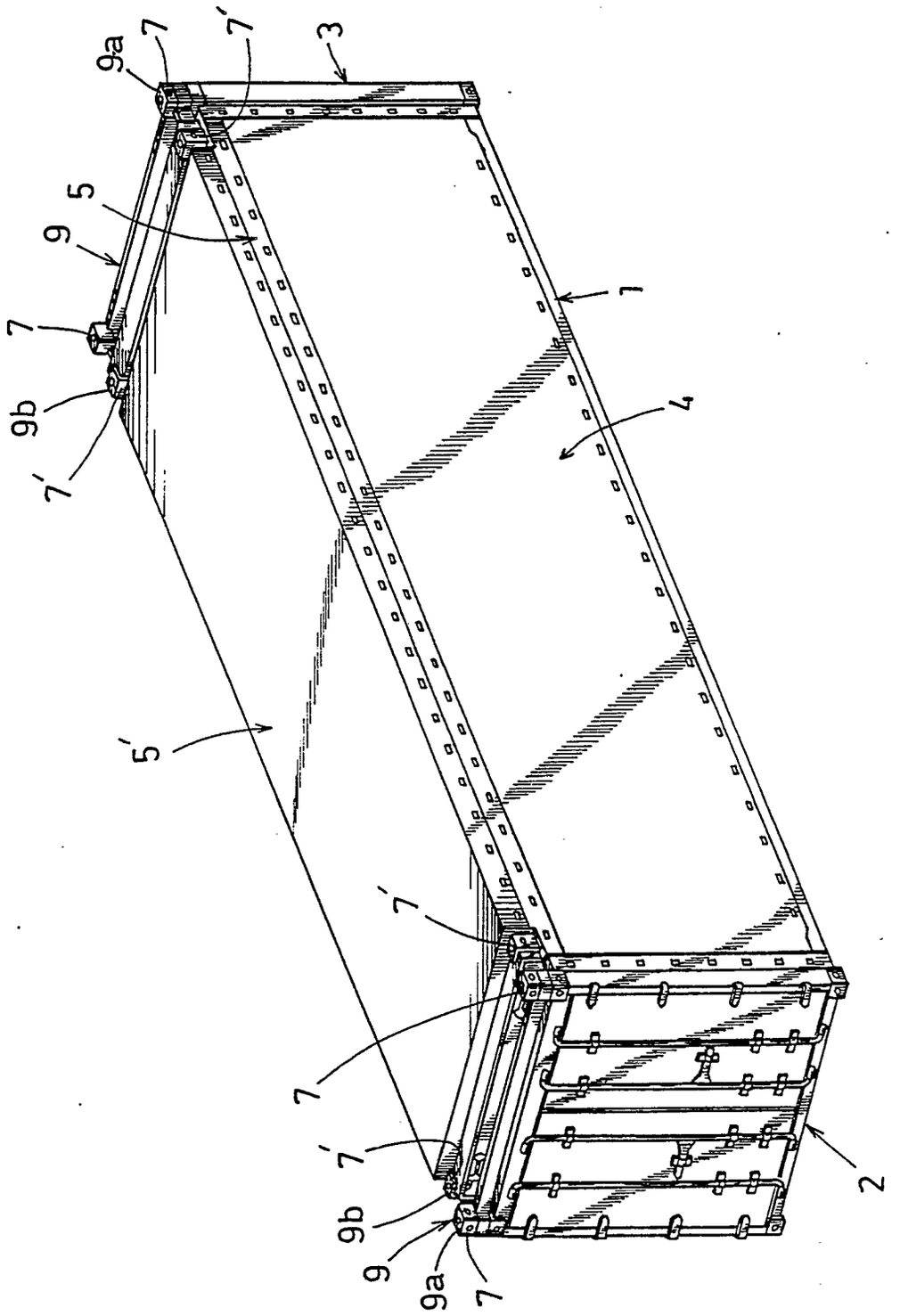


Fig. 2

Fig.3

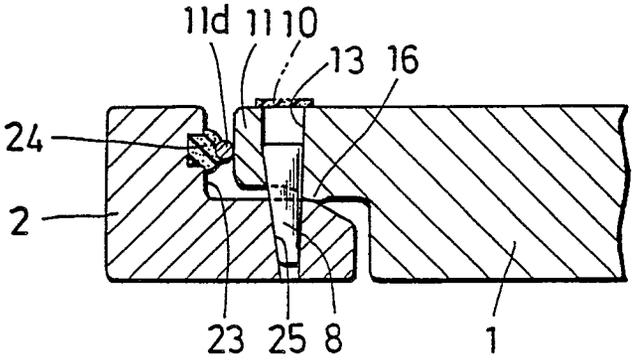


Fig.4

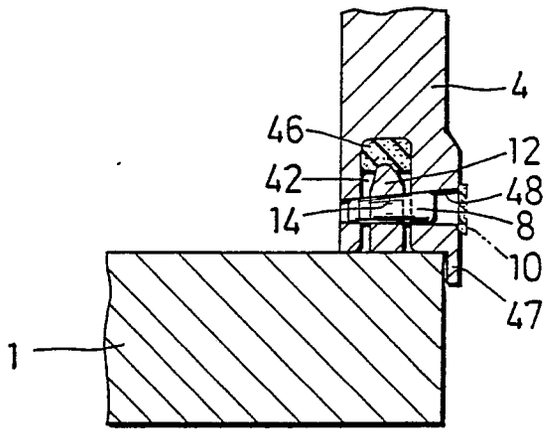


Fig.5

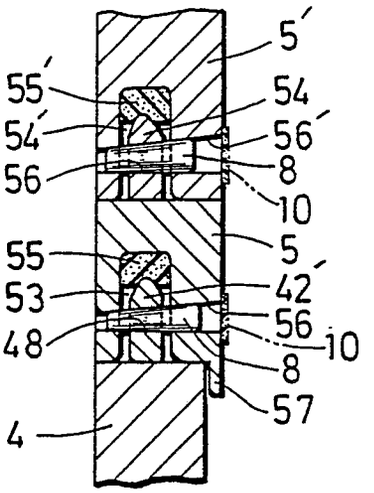


Fig.6

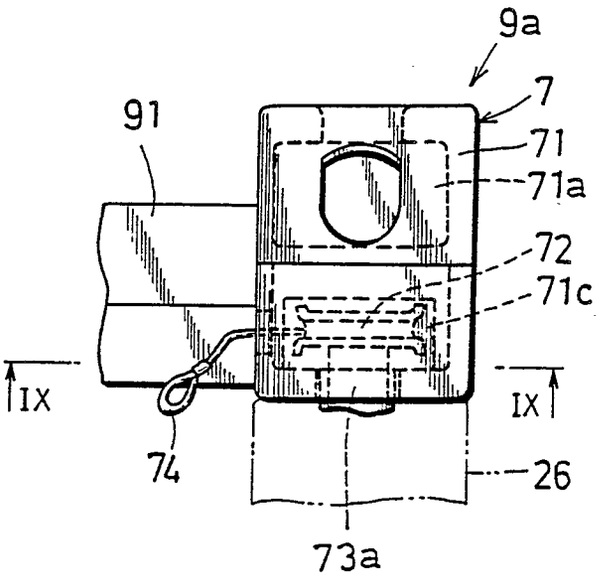
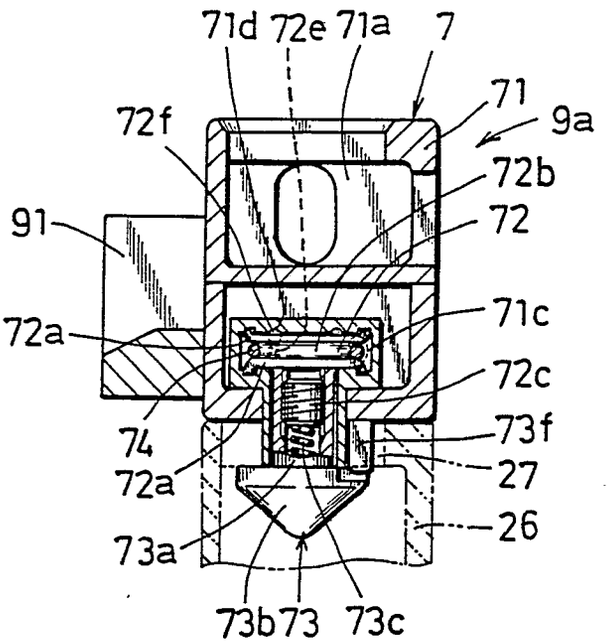

9a
7
91
71
71a
72
71c
IX
IX
74
26
73a

Fig.7


71d
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71a
7
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9a
72f
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71c
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74
73f
72a
27
26
73a
73b
73
73c

Fig.8

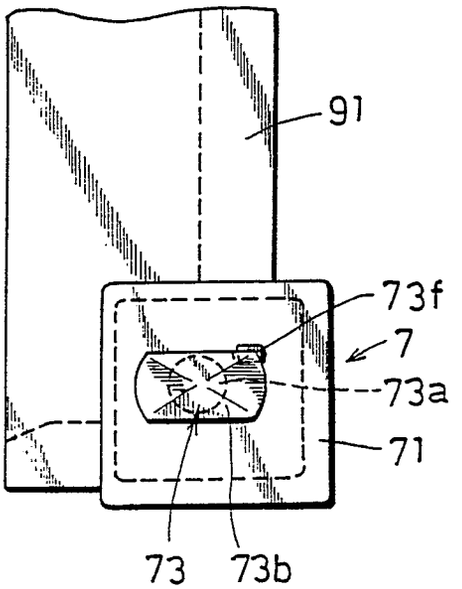
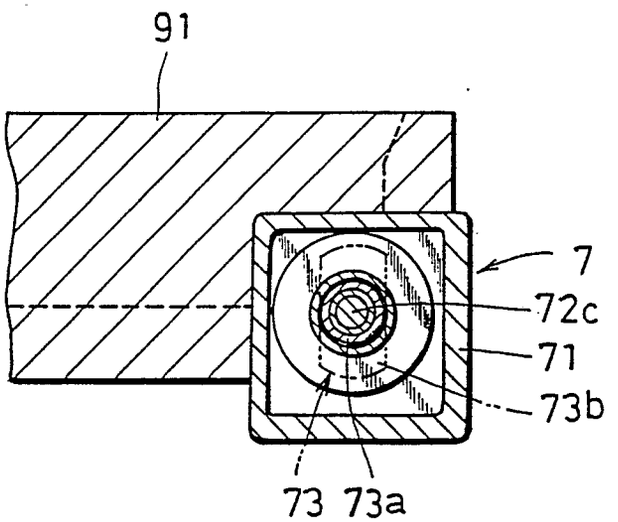


Fig.9



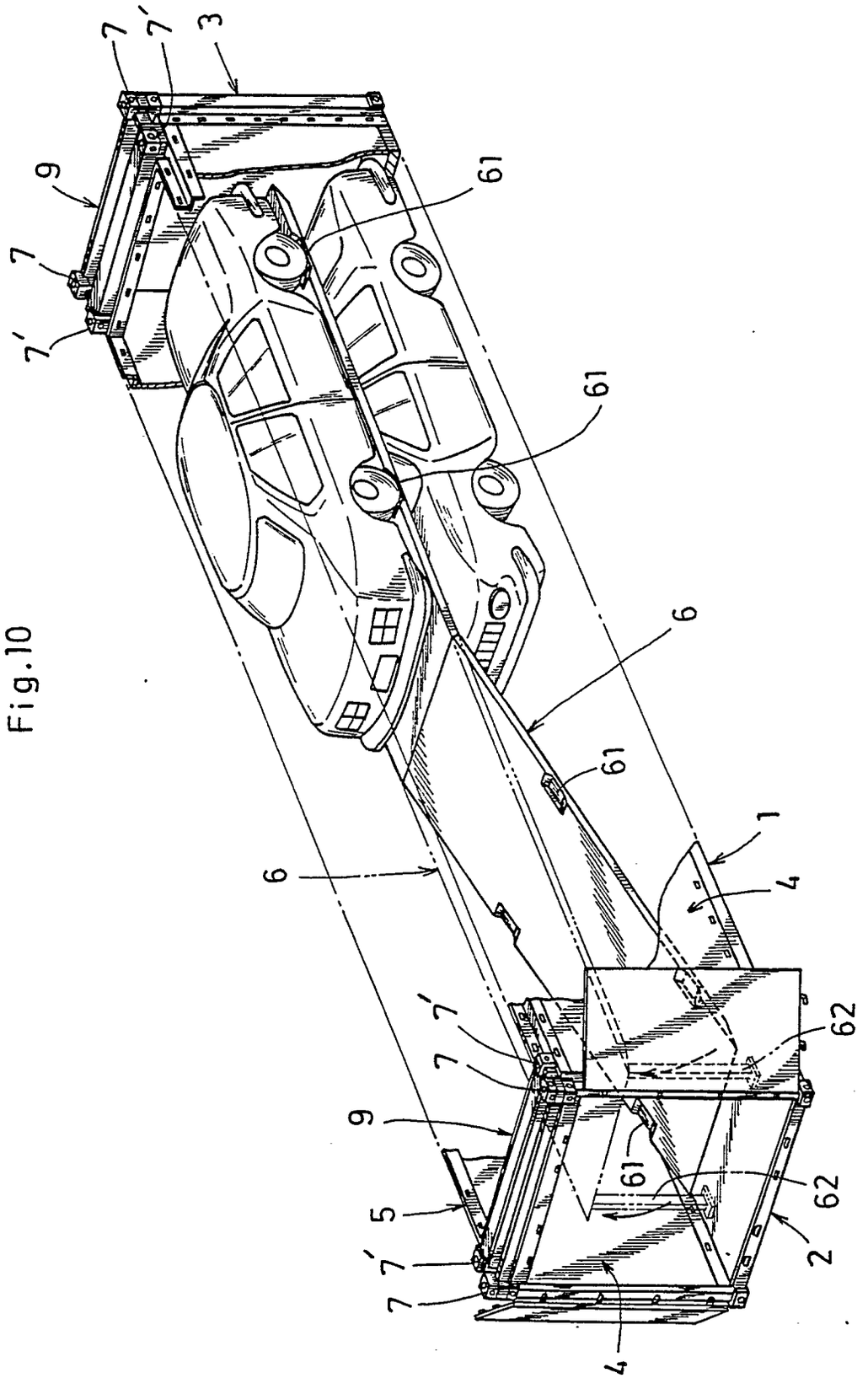


Fig.10

Fig.11

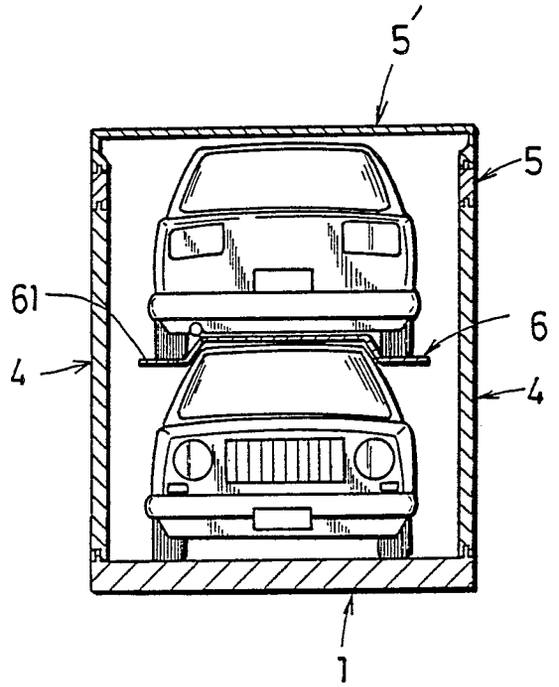
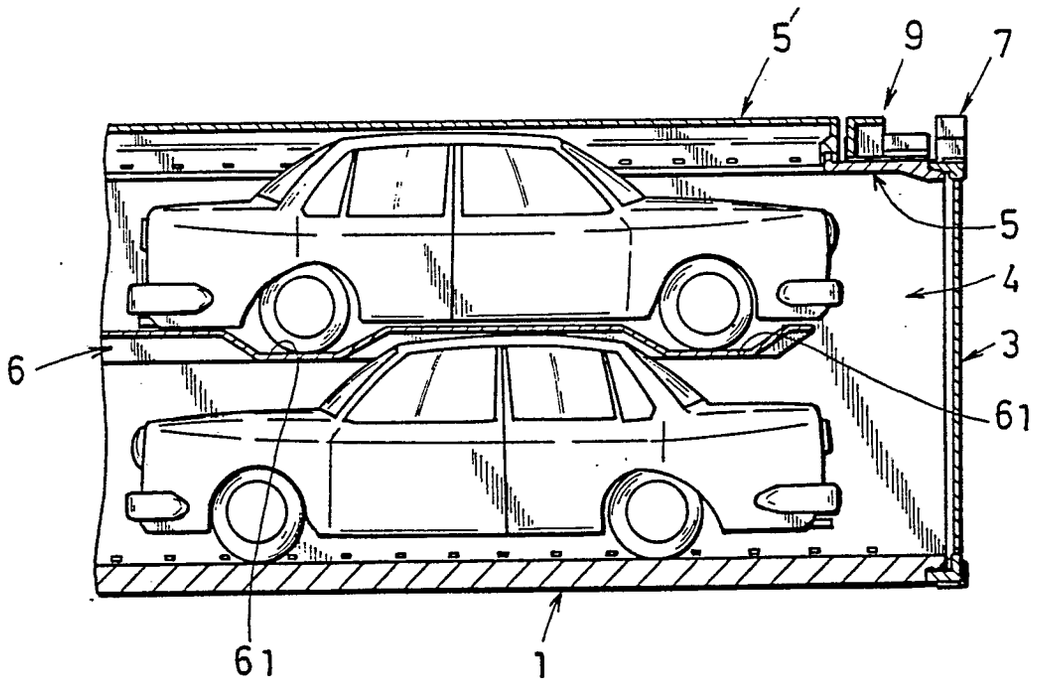


Fig.12



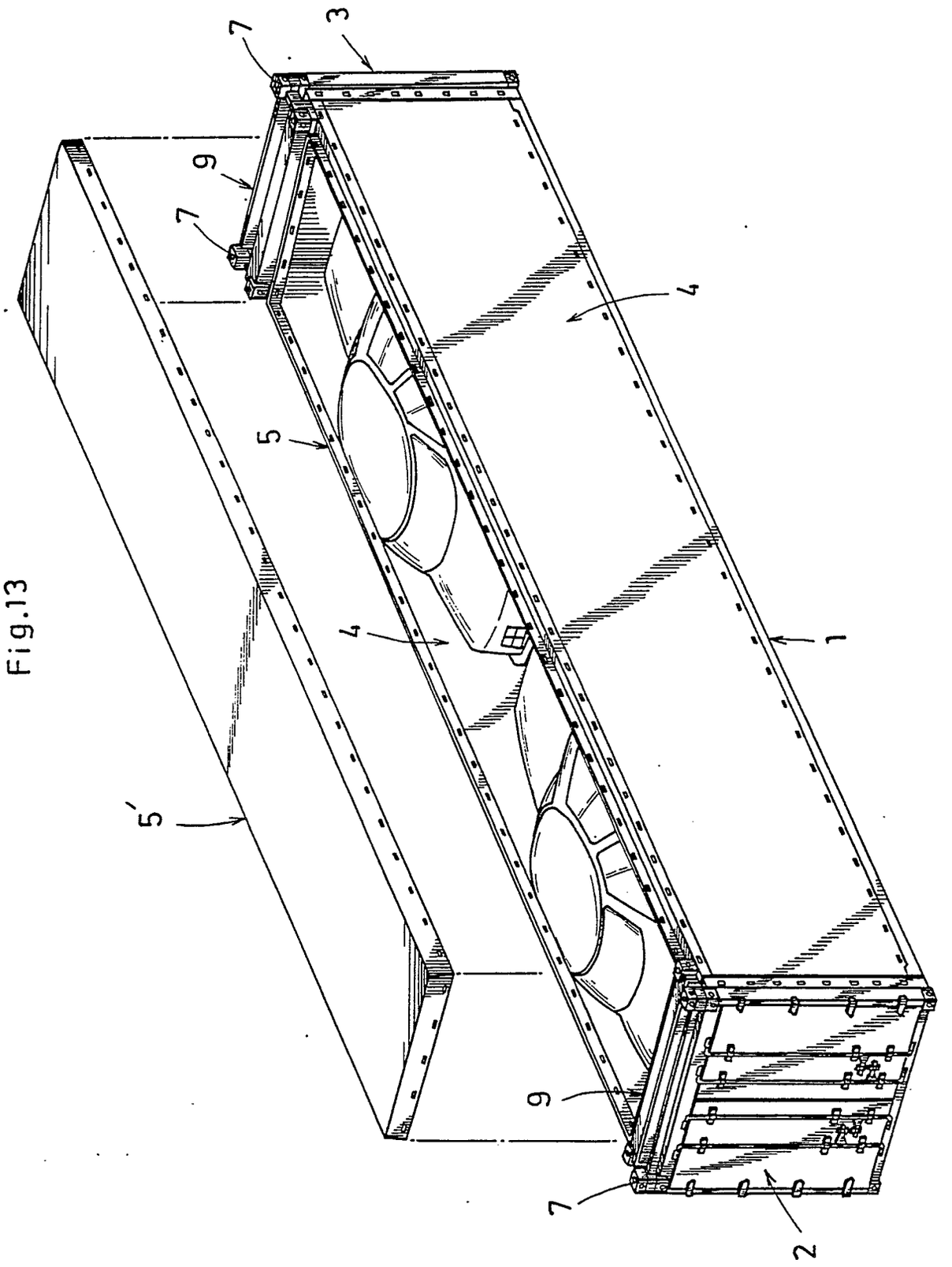


Fig.13

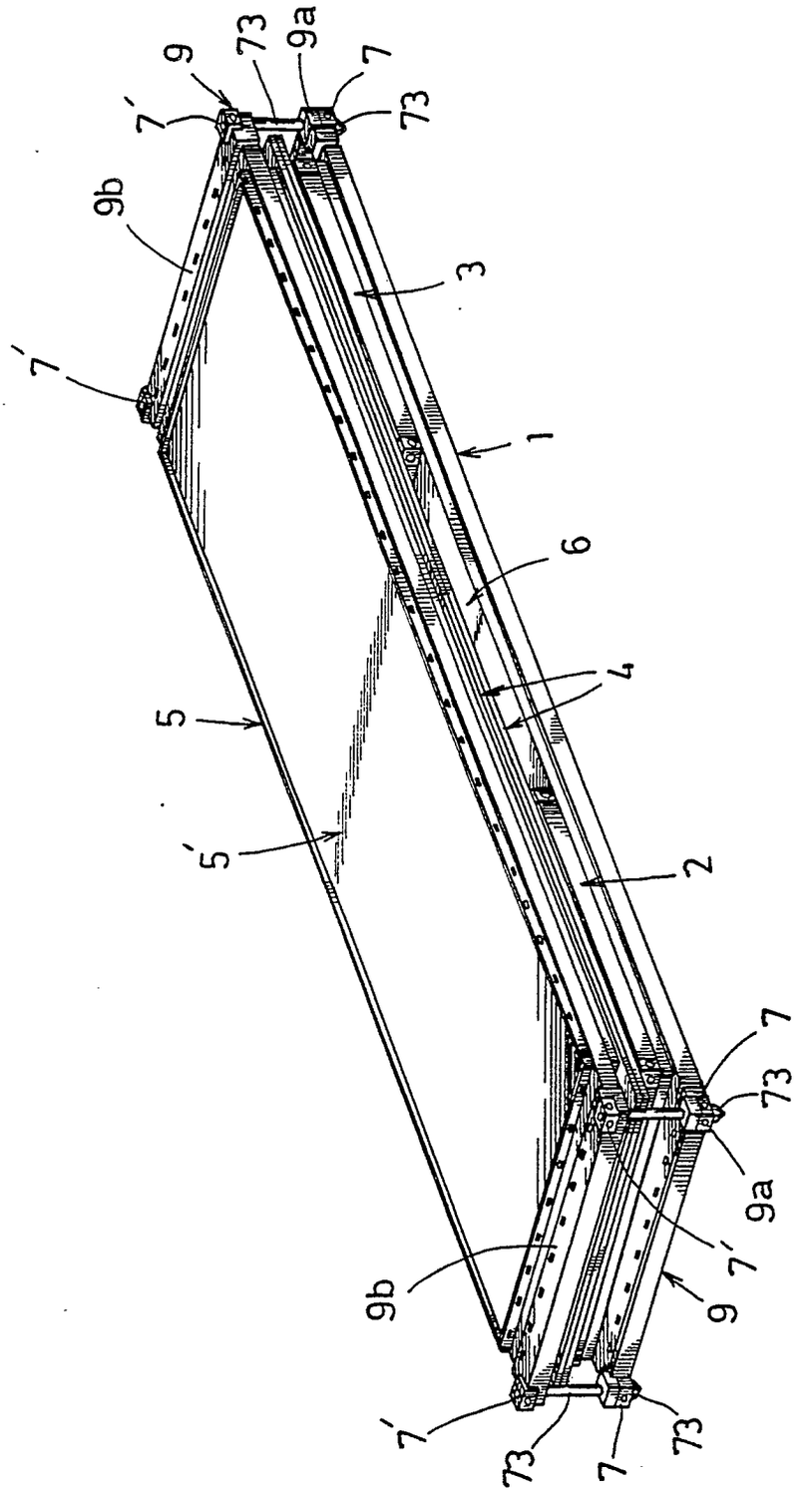


Fig.14

Fig.15

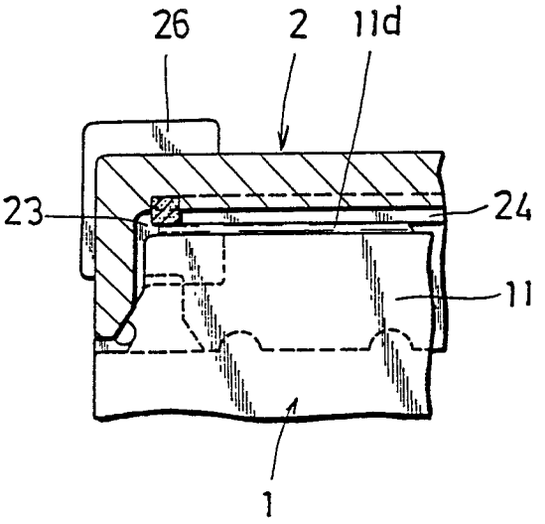
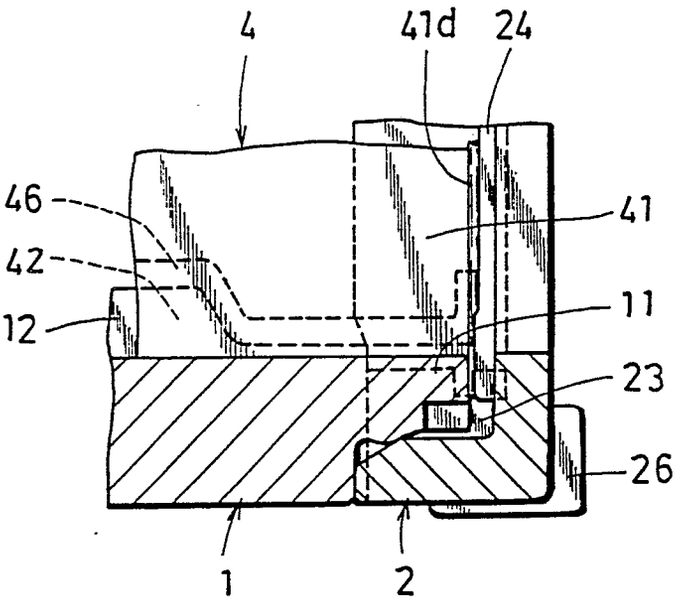


Fig.16



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 11 9988

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	LU-A- 29 866 (A.L. DAUPHIN) * Abstracts 1,2; figures *	1	B 65 D 88/52 B 61 D 3/18
Y	WO-A-8 101 997 (Y. YONAHARA) * Abstract; figures *	1	
A	BE-A- 783 493 (THE DURAMIN ENG. CO.) * Claims 1,2; figures *	2,9,10, 11	
A	US-A-3 003 435 (H.W. CHAPMAN) * Claim 1; figures *	4,5	
A	DE-A-1 580 995 (NIEDERSÄCHSISCHE WAGGON-FABRIK J. GRAAFF GmbH) * Claims 1,2 *	7	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 65 D
B 61 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18-02-1989	VAN ROLLEGHEM F.M.

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