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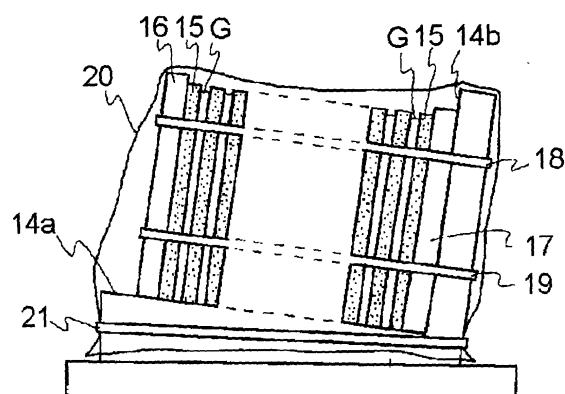
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(54) **Packaging container and packaging method for flat display glass**

(57) The present invention generally relates to a packing container (100) and a packing method for flat display glass (120) for increasing working efficiency by loading a lot of flat display glass into an 'L'-shaped frame (110) in large quantities and comprising a packing material in combination with the frame (110), comprising: a loading frame forming a basic bone structure of the packing container for the flat display glass (120), and consisting of a loading surface (112) formed to support lower ends of each loaded flat display glass and a back-plate surface (114) formed vertical to the loading surface (112) on a rear end portion of the loading surface (112) and supporting back sides of each flat display glass (120); flat glasses fixing devices (130) for fixing the loaded flat display glass; and a combined packing material (140) opening/shutting an opened space of the loading frame where the loaded flat display glass are exposed, in combination with the loading frame as one to be fixed and opened/shut.

[Drawing 11]



Description

[Brief Description of the Drawings]

[0001]

Fig. 1 is a side view of a flat glass receiving body suggested in Japanese Laid-open Patent No. 2000-203679.

Fig. 2 is a perspective view of a packing container for flat display glass in accordance with the present invention.

Fig. 3 is a using state diagram of a packing container for flat display glass in accordance with the present invention.

Fig. 4 is a using state diagram of another embodiment of a packing container for flat display glass in accordance with the present invention.

*** Symbol Descriptions on Main Parts of the Drawings ***

[0002]

100 :	Packing container for flat display glass
110 :	Loading frame
111, 113, 115 :	Buffer materials
112 :	Loading surface
114 :	Backplate surface
120 :	Flat display glass
122 :	Estranging material
124 :	Stiffener
130 :	Flat glasses fixing devices
140 :	Shutter
142 :	Shutter roll
144 :	Shutter rail
150 :	Rolling shutter
152 :	Shutter plates
154 :	Chain
156 :	Roller

[Field of the Invention]

[Purpose of the Invention]

[Background of the Invention]

[0003] The present invention generally relates to a packing container and a packing method for flat display glass, and more specifically, to a packing container and a packing method for flat display glass for increasing working efficiency by loading a lot of flat display glass into an 'L'-shaped frame in large quantities and comprising a packing material in combination with the frame.

[0004] As display apparatuses are made in large quantities, flat glasses used as substrate materials for flat display panels such as liquid crystal monitor panels

or plasma display panels also tends to be in large size. Accordingly, when an existing horizontal loading method is used to load and transfer flat display glass, not only it can remarkably decrease working efficiency, but the flat glasses can be polluted or damaged by reciprocal contact between the flat glasses or external pollutants.

[0005] To solve the above problem, technologies for increasing loading efficiency as preventing the flat glasses from being polluted have been suggested. For instance, there is a Japanese Laid-open patent No. 2000-203679(method for receiving glasses plates, hereinafter, called 'JP Laid-open Patent'), which is described in Fig. 1.

[0006] Fig. 1 is a side view of a flat glasses receiving body suggested in the above JP Laid-open patent. Like shown in Fig. 1, on the receiving body suggested in the above JP Laid-open patent, a loading surface(14a) for loading flat glasses(G) in vertical direction and a backplate surface(14b) extended in vertical, direction from a rear end portion of the loading surface are formed on an 'L'-shaped support. Since the loading surface is sloped at 2 to 20 degrees toward the backplate surface, a lot of flat glasses(G) is loaded, being lifted up as leaning against the backplate surface(14b). In addition, estranging members(15) put on rim portions only of the stacked flat glasses are inserted between the rim portions of each flag glass(G) and each flat glass. Reinforcing plates(16,17) are disposed on an external side of flat glasses located in a front line and between flat glasses located in a last line and the backplate surface(14b). Also, the estranging members(15) are put between the flat glasses(G) and the reinforcing plates, thereby preventing the flat glasses from being polluted and damaged. On the other hand, in the above JP Laid-open patent, rubber bands(18,19) are hooked over the backplate surface(14b) and the reinforcing plate(16) located in the front line so as to fix the loaded flat glasses, and an upper part thereof is covered with a packing bag(20). Then, the packing bag is sealed again by binding a rubber band(21).

[0007] Moreover, when transferring the flat glasses (G), it is transferred while being sealed with the packing bag(20) or being covered with another box thereon. Then, the loaded glasses are unloaded by releasing the rubber band after loosening the box and the packing bag.

[0008] However, in the case of the above JP Laid-open patent, it is necessary to individually manage an external packing material such as the packing bag or the box when packing the loaded flat glasses, and obtain a space where the released external packing material should be loaded after transferring. Furthermore, because the flat glasses are made in large quantities, it requires more manpower for work. Accordingly, it deteriorates working efficiency, producing a risk of a worker getting wounded and the loaded flat glasses being damaged by mistake when a final packing process is carried out with manual work. Like shown in prior art, when us-

ing estranging materials for estranging rim portions only of the loaded flat glasses, a sagging phenomenon of middle portions of the loaded glasses occurs even though the glasses are loaded by being vertically lifted up because the flat glasses get larger. Therefore, new estranging materials are highly required

[Summary of the Invention]

[0009] It is therefore an object of the present invention to provide a packing container for flat display glass capable of efficiently and safely performing a packing process of loaded flat display glass.

[0010] In addition, it is another object of the present invention to provide a packing method for flat display glass capable of safely and efficiently performing loading and packing processes of the flat display glass.

[0011] That is, the present invention provides a packing container and a packing method for flat display glass to improve working efficiency without individually managing a packing material by forming the packing material for packing loaded flat display glass in combined type, cutting down cost by remarkably reducing the number of necessary workers without obtaining another space for loading the packing material.

[COMPOSITION OF INVENTION]

[0012] In order to accomplish the above object, a packing container for flat display glass in accordance with the present invention is a packing container for flat display glass for vertically loading and packing a lot of flat display glass, comprising: a loading frame forming a basic bone structure of the packing container for the flat display glass, and consisting of a loading surface formed to support lower ends of each loaded flat display glass and a backplate surface formed vertical to the loading surface on a rear end portion of the loading surface and supporting back sides of each flat display glass; flat glasses fixing devices for fixing the loaded flat display glass; and a combined packing material opening/shutting an opened space of the loading frame where the loaded flat display glass are exposed, in combination with the loading frame as one to be fixed and opened/shut.

[0013] Desirably, buffer materials for protecting the flat display glass are further comprised on inner sides of lateral walls of the loading frame, formed by connecting an upper side of the loading surface, a front side of the backplate surface, and both side ends of the backplate surface and the loading surface. And, it is desirable to further comprise an estranging material disposed between the loaded flat display glass and contacted with entire surfaces of the loaded flat glasses or more than 90% of the entire surfaces, having a stiffener loaded in front of flat display glass loaded into a front line among the loaded flat display glass.

[0014] In addition, the flat glasses fixing devices con-

sist of a clamp, or one pair of elastic belts on the left and the right and coupling units for reciprocal coupling on one unfixed end of each belt.

[0015] The combined packing material consists of a shutter roll installed on a back side of the loading frame, a shutter rail formed in side wall of the loading frame by connecting both side ends of the backplate surface and the loading surface, as a predetermined groove up to the loading surface from the backplate surface, and a shutter whose first end portion, which is one end, is fixed by being wound and the second end portion, which is the rest end, opens/shuts an opened upper side and a front side of the loading frame as vertically moving along the shutter rail. At this time, it is desirable to further comprise a hooking end protruded in predetermined size from the second end portion, and a hook tied to the hooking end in a front end portion of the loading surface, or further comprise a magnet in the second end portion of the reciprocally contacted shutter and/or in the front end portion of the loading surface.

[0016] Also, the combined packing material can be closely adhered to side wall of the loading frame formed by connecting both side ends of the backplate surface and the loading surface. Many cylinder-shaped rollers are installed on an upper end and a lower end of left and right side walls, respectively. A series of both chains rotate in vertical direction as being wound around rollers, covering a front and a rear of the backplate surface by being wound between the rollers on inner sides of both lateral walls of many cylinder-shaped roller loading frames installed on an upper end and a lower end of both lateral walls, respectively. Many shutter plates are also comprised to cover at least the opened upper side and the front side of the loading frame, being closely adhered to each other while both side ends thereof are fixed into the both chains. It is possible to form opened part pierced vertically in order that the both chains and the shutter plates can pass through the front end portion of the loading surface.

[0017] Furthermore, in order to accomplish another object, a packing method for flat display glass in accordance with the present invention is a packing method for flat display glass for loading and packing a lot of flat display glass into a packing container for the flat display glass, which has: a loading frame consisting of a loading surface formed to support lower ends of each flat display glass and a backplate surface formed vertical to the loading surface and supporting back sides of each flat display glass, and sloped at a predetermined angle toward a back direction when a combination of the loading surface and the backplate surface configures an 'L' shape; flat glasses fixing devices for fixing the loaded flat display glass; and a combined packing material opening/shutting an opened space of the loading frame in combination with the loading frame as one to be opened/shut. The method, comprising the steps of: a first step of loading each flat display glass into a loading frame; a second step of loading a stiffener into a front

side of flat display glass loaded into a front line among the loaded flat display glass; a third step of fixing the loaded flat display glass and the stiffener with flat glasses fixing devices; and a fourth step of packing the loaded flat display glass by cutting off the opened space of the loading frame after shutting the combined packing material.

[0018] Desirably, the first step includes a 1-1 step of loading an estranging material between the loaded flat display glass.

[0019] Moreover, the fourth step includes: a 4-1 step of cutting off an opened upper side and a front side of the loading frame by shutting, along a shutter rail, a shutter whose one end is fixed by being wound around the shutter roll installed on a back side of the loading frame and the rest end is tied to a shutter rail formed as a predetermined groove up to the loading surface from the backplate surface on an inner side of a lateral wall of the loading frame, formed by connecting both side ends of the backplate surface and the loading surface; and a 4-2 step of cutting off the opened upper side and the front side of the loading frame with many shutter plates by rotating a rolling shutter consisting of both chains rotating in vertical direction, being installed as covering the backplate surface on inner sides of lateral walls of the loading frame formed by connecting both side ends of the backplate surface and the loading surface, and many shutter plates covering at least the opened upper side and the front side of the loading frame, being closely adhered to each other while fixed into the both chains.

[0020] The present invention will now be described in detail with reference to exemplary preferred embodiments as illustrated in the accompanying drawings.

[0021] Fig. 2 is a perspective view of a packing container for flat display glass in accordance with the present invention. Fig. 3 is a using state diagram of a packing container for flat display glass in accordance with the present invention, and Fig. 3(a) is a diagram illustrating a state of loading flat display glass into a packing container for the flat display glass in accordance with the present invention. Fig. 3(b) is a diagram illustrating a state of shutting a shutter of a packing container for flat display glass after loading the flat display glass. The packing container for the flat display glass in accordance with the present invention will be described as follows in reference to Fig. 2 and Fig. 3.

[0022] A packing container(100) for flat display glass in accordance with the present invention comprises: a loading frame(110) forming a basic bone structure of the container, and consisting of a loading surface(112) formed in horizontal direction and a backplate surface(114) formed vertical to the loading surface; a stiffener(124) disposed on a front side of flat display glass loaded into a front line to protect loaded flat display glass(120); flat glasses fixing devices(130a,130b) for fixing the loaded flat display glass(120); and a shutter(140) for protecting the loaded flat display glass from an external impact.

[0023] The loading frame(110) in accordance with the present invention forms the basic bone structure of the packing container(100) for the flat display glass, forming the loading surface(112) on a lower end in horizontal direction and the backplate surface(114) in vertical direction. The loading surface(112) is a part for supporting lower ends of the flat display glass when loading the flat display glass(120), buffering load of the flat display glass itself and external vibrations or impact by attaching buffer materials(113) to upper sides thereof. Also, the backplate surface(114) is a part for supporting back sides of the flat display glass when loading the flat display glass(120), buffering load of the flat display glass itself and external vibrations and impact by attaching a buffer material(115) on front sides thereof. In the meantime, it is desirable to attach a buffer material(111) to inner sides of both lateral walls(110a,110b) of the loading frame(110) protruded toward a front direction by connecting both side ends of the backplate surface(114) and the loading surface(112). On this case, the buffer materials(113,115) attached to the lateral walls(110a, 11b), the loading surface(112), and the backplate surface(114) are detachable for replacement when necessary. So, a contact side of the lateral walls, the loading surface, and the backplate surface as well as one side of the buffer materials can be formed by Velcro fastener.

[0024] The loading surface(112) and the backplate surface(114) are formed in 'L' shape by being vertical to each other, and a combination of the loading surface and the backplate surface is mounted on the loading frame(110). Thus, it is possible to stably load the flat display glass(120) into the loading surface and the backplate surface.

[0025] The stiffener(124) in accordance with the present invention protects the loaded flat display glass(120) from an external impact, being disposed on a front side of flat display glass loaded into a front line among the loaded flat display glass. And, the stiffener(124) ties and fastens the flat glasses fixing devices(130) from a front side of the stiffener when fixing the flat display glass(120), thereby preventing the flat display glass(120) from being impacted or damaged by the flat glasses fixing devices.

[0026] The flat glasses fixing devices(130) in accordance with the present invention fix the loaded flat display glass(120) into the loading frame(110), consisting of one pair of belts(130a,130b) on the left and the right fixed into grooves as one, which are formed on both sides of the backplate surface(114). At this time, it is desirable to make the both belts(130a,130b) of the flat glasses fixing devices with excellent elastic rubber materials, and to comprise a length controlling unit(not shown) in order to freely control length as a bag strap according to an amount of the loaded flat display glass(120). Also, comprise coupling units(132a,132b) to be tied to each other on one unfixed ends of the both belts(130a,130b). Desirably, form the coupling units in buckle or hook type. Therefore, the flat glasses fixing devices(130) fasten the

loaded flat display glass(120) as covering it, and are reciprocally coupled on a front side of the stiffener(124) by the coupling units(132). Furthermore, vertically comprise at least more than two flat glasses fixing devices (130) so as to stably fix the loaded flat display glass (120). Fig. 2 and Fig. 3 illustrate that the flat glasses fixing devices consist of the one pair of the belts on the left and the right, but unlike this, it is possible to configure them with two belts vertically paired in one, including various types such as supporting bars or clamps except the belts.

[0027] The shutter(140) in accordance with the present invention is a combined packing material for protecting the loaded flat display glass(120) from an external physical impact, and a portion thereof is fixed by being wound around a shutter roll(142) disposed on a back side of the loading frame(110), then is opened/shut along a shutter rail(144). After the shutter(140) is shut, the shutter is fixed by another shutter locking device(not shown), preventing the shutter from being optionally opened.

[0028] The shutter roll(142) is disposed on the back side of the loading frame(110), that is, a space formed on a back side of the backplate surface(114), fixing one end portion of the wound shutter(140) and having a buffer device for stably winding and unwinding the shutter. In addition, the shutter rail(144) guides a movement of the shutter when opening and shutting the shutter(140), formed as predetermined groove type on inner sides of the both lateral walls(110a,110b) of the loading frame (110) protruded toward a front direction by connecting both side ends of the backplate surface(114) and the loading surface(112). Meanwhile, a shutter driving roller (not shown) is further comprised on an upper end of the backplate surface(114) so that the shutter can smoothly move, without being hooked, in a part where the shutter is turned toward a front side from the back side of the loading frame(110) when opening/shutting the shutter (140) along the shutter rail(144). Accordingly, it is possible to smoothly open and shut the shutter(140) by the shutter driving roller, supporting load of the shutter and preventing the shutter from sagging.

[0029] The shutter locking device(not shown) prevents the shutter from being optionally opened after shutting the shutter(140), fixing the shutter in a front end portion of the loading surface(112). So, form a hooking end protruded in predetermined size from one end portion of the shutter(140) contacted with the loading surface(112), and comprise tying units for tying to the hooking end like a hook on a front end of the loading surface contacted with the shutter. Such shutter locking device can be modified in various types. For instance, the shutter can be fixed with magnetism by attaching a magnet to one end portion of the shutter(140) contacted to each other and/or a front end of the loading surface(112).

[0030] On the other hand, though Fig. 2 and Fig. 3 illustrate that the shutter(140) is vertically opened/shut by installing the shutter rail(144) in vertical direction, un-

like this, it is possible to configure the shutter to be horizontally opened/shut by installing it in horizontal direction. In this case, the shutter can be horizontally opened/shut by vertically installing the shutter roll on the back side of the loading frame(110) and installing the shutter rail on the front end of the loading surface(112) and an upper side of the loading frame.

[0031] A method for loading and transferring flat display glass by using a packing container for the flat display glass in accordance with the present invention will be described as follows.

[0032] In order to transfer the flat display glass(120) checked in a clean room, load the flat display glass into the loading frame(110). More specifically, support lower ends of the flat display glass(120) by the loading surface (112) and support rear sides thereof by leaning against the backplate surface(114). Moreover, when loading the flat display glass(120), an estranging material(122) contacted with entire surfaces of the loaded flat glasses or at least more than 90% of the entire surfaces is inserted between each flat display glass, thereby preventing the flat display glass from being polluted or damaged by reciprocal contact to each other. It is possible to insert the estranging material(122) between the buffer material (115) mounted on the backplate surface(114) and flat display glass loaded into a last line. In the meantime, apart from the estranging material(122), it can prevent the flat display glass(120) from being polluted by coating front sides and rear sides of the glasses with films, respectively. Thus, various types of processes are available, including a process for coating the films between the flat display glass(120) and disposing the estranging material(122) or disposing the estranging material(122) only without coating the films.

[0033] After loading all the flat display glass(120), fix the flat display glass by pulling the both belts(130a, 130b) on the left and the right of the flat glasses fixing devices(130) to tie them together after loading the stiffener(124) into the front side of the flat display glass loaded into the front line. On this occasion, it is also available to insert the estranging material(122) between the flat display glass(120) and the stiffener(124).

[0034] When finishing up the loading and the fixing of the flat display glass(120), pull down the shutter(140) along the shutter rail(144) to close the shutter, and lock the shutter by uniting the shutter locking device. Then, transfer the shutter to a transferring place. At this moment, if the shutter locking device consists of a magnet, the shutter can be united by only shutting down the shutter perfectly.

[0035] Furthermore, when unloading the loaded flat display glass after transferring, release the united shutter locking device and push up the shutter(140) along the shutter rail(144). Then, take out the stiffener(124) after releasing united states of the flat glasses fixing devices(130), and unload the flat display glass(120) one by one.

[0036] Fig. 4 is a using state diagram of another em-

bodiment of a packing container for flat display glass in accordance with the present invention, and Fig. 4(a) is a diagram illustrating a state of loading flat display glass in another embodiment of a packing container for the flat display glass in accordance with the present invention. Fig. 4(b) is a diagram illustrating a state of shutting a rolling shutter after loading flat display glass, and Fig. 4(c) is a sectional view of A-A' direction in accordance with another embodiment of the packing container for the flat display glass illustrated in Fig. 4(b). Another embodiments of the packing container for the flat display glass illustrated in Fig. 4(a) through Fig. 4(c) have a rolling shutter(150) opening/shutting an opened region of a loading frame as rotating along the loading frame(110) instead of a vertically opened/shut shutter(140). Hereinafter, another embodiments of the packing container for the flat display glass illustrated in Fig. 4(a) through Fig. 4(c) will describe another embodiment of the container, but will omit descriptions on components already described through Fig. 2 and Fig. 3.

[0037] Like shown in Fig. 4(a) and Fig. 4(b), another embodiment of a packing container(100) for flat display glass in accordance with the present invention has the rolling shutter(150) to protect loaded flat display glass(120) from an external impact by opening/shutting an opened front side and an upper side of a loading frame(110). The rolling shutter(150) is installed as sequentially covering a backplate surface(114) toward inner sides of both lateral walls(110a,110b) of the loading frame(110), forming a basic bone structure by comprising a serial of reciprocally connected chains(154) on the left and the right.

[0038] Like shown in Fig. 4(c), on one side of the rolling shutter(150), many shutter plates(152) are mounted on the chains(154) by using screws(152a) in order to cut off the front side and the upper side of the loading frame(110). On the other side thereof, the chains only are comprised without the shutter plates. Thus, as many as the shutter plates(152) should be mounted enough to cover at least the front side and the upper side of the loading frame(110). The chains(154) are installed and move across many rollers(156) comprised respectively on an upper end and a lower end of the loading frame(110). Also, install the both chains(154) to be closely adhered to the inner sides of the both lateral walls(110a, 110b) of the loading frame(110) as possible, and give enough margins between the chains and loading regions of the flat display glass so as to prevent the chains(154) from being contacted with or hooked over when loading or unloading the flat display glass(120).

[0039] Meanwhile, the rolling shutter(150) pierces through the loading surface since it should freely move in vertical direction while being connected with each other. Thus, form opened part(158) in a front end portion of the loading surface(112) so that the rolling shutter can pass through. At this time, in order that the rolling shutter(150) cannot be hooked over the opened part(158), form both widths of the opened part at least equally to those

of the rolling shutter(150), and form front/rear widths thereof at least added thickness of the shutter plates(152) and the chains(154).

[0040] In Fig. 4(a) and Fig. 4(b), though the rolling shutter(150) vertically moves by being vertically installed in the loading frame(110), it is possible to horizontally move the rolling shutter by installing it in horizontal direction. In this case, form an upper side wall for cutting off the upper side of the loading frame(110) as installing the rolling shutter between the loading surface(112) and the upper side wall, and form the opened part through which the rolling shutter passes, on the both lateral walls(110a,110b) thereof, respectively.

[0041] A method for loading and transferring flat display glass by using another embodiment of a packing container for the flat display glass in accordance with the present invention will be described as follows.

[0042] In order to transfer the flat display glass(120) checked in the clean room, load the glasses into the loading frame(110) and fix it with the flat glasses fixing devices(130). At this point, the rolling shutter(150) will be located on a side where the shutter plates(152) are not mounted. That is, the both chains(154) only will be located in the front side of the loading frame(110). On the other hand, the process of inserting the estranging material(122) and loading the stiffener(124) into front sides of the loaded flat display glass, so as to protect the flat display glass(120) when loading it, is the same as the above. If the loading of the flat display glass(120) is completed, a worker can transfer the glasses after cutting off the opened region of the loading frame by rotating the rolling shutter(150) to make the side, where the shutter plates(152) are mounted, toward the front side of the loading frame(110).

[0043] When unloading the loaded flat display glass after transferring, open the loading frame by making the side, where the shutter plates(152) are not mounted, that is, the side where the both chains(154) only are installed, toward the front side of the loading frame(110) by rotating the rolling shutter(150). And, unload the flat display glass(120) after releasing the united state of the flat glasses fixing devices(130).

[Effect of the Invention]

[0044] As stated so far, a packing container and a packing method for flat display glass in accordance with the present invention can safely and efficiently perform loading and packing processes of the flat display glass by combining a loading frame for loading the flat display glass with a packing material for packing the loaded flat display glass.

[0045] Namely, the packing container and the packing method for the flat display glass in accordance with the present invention have the benefits as follows:

First, it can improve working efficiency as reducing working cost without more manpower and spaces

for a packing material, since the packing material is combined with a loading frame such as a shutter or a rolling shutter;

Second, in prior art, a sagging phenomenon occurs in large-sized glasses (roughly, more than 1m in width and length size) because an estranging material is inserted to estrange rim portions only of flat glasses, being inserted between the flat glasses loaded in vertical direction. However, the present invention uses an estranging material contacted with entire surfaces or at least more than 90% of the entire surfaces between the flat glasses loaded in vertical direction and the flat glasses, thereby removing the sagging phenomenon;

Third, when using the shutter with the combined packing material, it is possible to stably support a movement of the shutter through a shutter rail and smoothly open/shut the shutter through a shutter roll and a shutter driving roller, thereby minimizing an impact on the loaded flat glasses. Accordingly, it can stably maintain the loaded state of the flat display glass;

Fourth, the present invention prevents the flat display glass from being damaged, by attaching buffer materials on a front side to which the loaded flat display glass are contacted, and changes a worn or a damaged buffer material by detaching the buffer material;

Fifth, it prevents the flat display glass from being polluted by reciprocal contact to each other by inserting an estranging material between the flat display glass, and prevents the glasses from being damaged by an external impact or flat glasses fixing devices, by loading a stiffener on a front side of flat display glass loaded into a front line;

Sixth, it is applicable to any types even though an loaded amount or thickness of the flat display glass is different, by making the flat glasses fixing devices with elastic rubber materials and comprising a length controlling unit; and

[0046] Finally, it can change structure of a shape of the shutter or the rolling shutter, with a variety of applications.

[0047] While this invention has been described in terms of several preferred embodiments, there are alterations, permutations, and equivalents which fall within the scope of this invention.

Claims

1. A packing container for a lot of flat display glass to vertically be loaded and packed, said container comprising:

a loading frame, forming a basic bone structure of the packing container for the flat display

glass, and

wherein said loading frame consisting of a loading surface being formed to support lower ends of each loaded flat display glass, and a backplate surface being formed vertically to the loading surface on a rear end portion of the loading surface and supporting a back side of each flat display glass;

flat glasses fixing devices for fixing the loaded flat display glass; and

a combined packing material opening/shutting an opened space of the loading frame where the loaded flat display glass are exposed, wherein said packing material being fixed to the loading frame as one and being opened/shut together.

2. The packing container of claim 1, wherein the combined packing material, comprising:

a shutter roll installed on a back side of the loading frame;

a shutter rail being formed as a predetermined groove up to the loading surface from the backplate surface on an inner side of a lateral wall of the loading frame, said lateral wall of the loading frame being formed by connecting both side ends of the backplate surface and the loading surface; and

a shutter opening/shutting an opened upper side and a front side of the loading frame, wherein one end portion of said shutter being fixed by being wound at the shutter roll and an rest end portion vertically moving along the shutter rail.

3. The packing container of claim 2, the container further comprising:

a hooking end being protruded in predetermined size from the second end portion; and a hook being tied to the hooking end at a front end portion of the loading surface.

4. The packing container of claim 2, the container further comprising, a magnet in the second end portion of the reciprocally contacted shutter and/or in the front end portion of the loading surface.

5. The packing container of claim 1, wherein the combined packing material, comprising:

a plurality of cylinder-shaped rollers being closely adhered to inner sides of left and right lateral walls of the loading frame, and being installed on an upper end and a lower end of the both lateral walls, respectively;

wherein said left and right lateral walls being

formed by connecting both side ends of the backplate surface and the loading surface,

a series of both chains covering front and rear sides of the backplate surface by being wound between the rollers on the inner sides of the both lateral walls of the loading frame, respectively, and rotating in vertical direction while being wound around the rollers; and

a plurality of shutter plates, whose both side ends being closely adhered to each other while being fixed into the both chains, and covering at least the opened upper side and the front side of the loading frame;

wherein a part along a front end portion of the loading surface being vertically formed open so that the both chains and the shutter plates can pass through.

6. The packing container of claim 1, said container further comprising,

buffer materials protecting the flat display glass, on the inner sides of the lateral walls of the loading frame formed by connecting a front side of the backplate surface with both side ends of the backplate surface and the loading surface.

7. The packing container of claim 1, said container further comprising:

an estranging material, being disposed between the loaded flat display glass, and contacted with at least more than 90% of entire surfaces of the loaded flat display glass; and
a stiffener, being loaded in front of flat display glass loaded into a front line among the loaded flat display glass.

8. The packing container of claim 1, wherein the flat glasses fixing devices consisting of a clamp.

9. The packing container of claim 1, wherein the flat glasses fixing devices consisting of one pair of elastic belts on the left and the right, and coupling units for reciprocal coupling on one unfixed end of each belt.

10. A packing method for flat display glass to load and pack a plurality of flat display glass into a packing container for the flat display glass, wherein said container comprising,

a loading frame, consisting of a loading surface formed to support lower ends of each flat display glass; and a backplate surface formed vertically to the loading surface, and supporting back sides of each flat display glass, wherein a combination of the loading surface and the backplate surface configuring an 'L' shape,

flat glasses fixing devices for fixing the loaded

flat display glass, and

a combined packing material said material opening/shutting an opened space of the loading frame in combination with the loading frame as one to be opened/shut,

said method comprising:

a first step of loading each flat display glass into a loading frame;

a second step of loading a stiffener into a front side of flat display glass loaded into a front line among the loaded flat display glass;

a third step of fixing the loaded flat display glass and the stiffener with flat glasses fixing devices; and

a fourth step of packing the loaded flat display glass by cutting off the opened space of the loading frame after shutting the combined packing material.

11. The packing method of claim 10, wherein the first step including a 1-1 step of loading an estranging material between the loaded flat display glass.

12. The packing method of claim 10, wherein the fourth step including a 4-1 step of cutting off an opened upper side and a front side of the loading frame by shutting, along a shutter rail, a shutter,

wherein one end of said shutter being fixed by being wound around the shutter roll installed on a back side of the loading frame,

and the rest end of said shutter being tied to a shutter rail, said shutter rail being formed in side wall of the loading frame, as a groove with predetermined depth up to the loading surface from the backplate surface,

wherein said side wall of the loading frame being formed by connecting both side ends of the backplate surface and the loading surface.

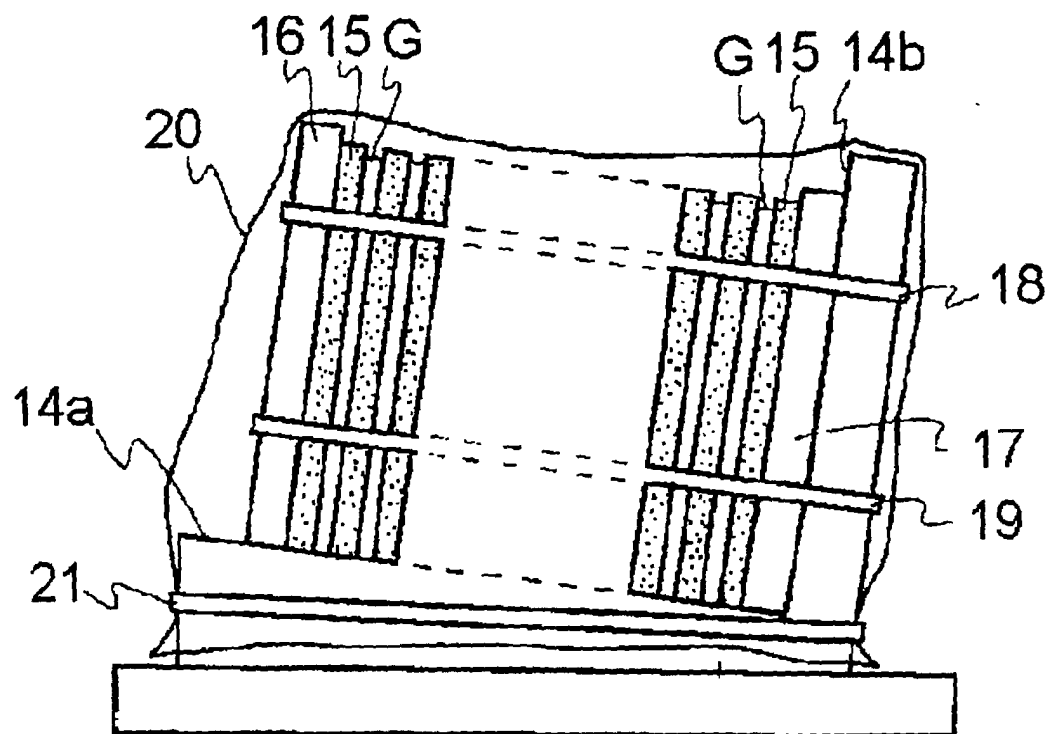
13. The packing method of claim 10, wherein the fourth step including a 4-2 step of cutting off the opened upper side and the front side of the loading frame with a plurality of shutter plates by rotating a rolling shutter,

wherein said rolling shutter comprising,

left and right chains rotating in vertical direction, being installed as covering the backplate surface on inner sides of left and right lateral walls of the loading frame, said left and right lateral walls being formed by connecting both side ends of the backplate surface and the loading surface, and;

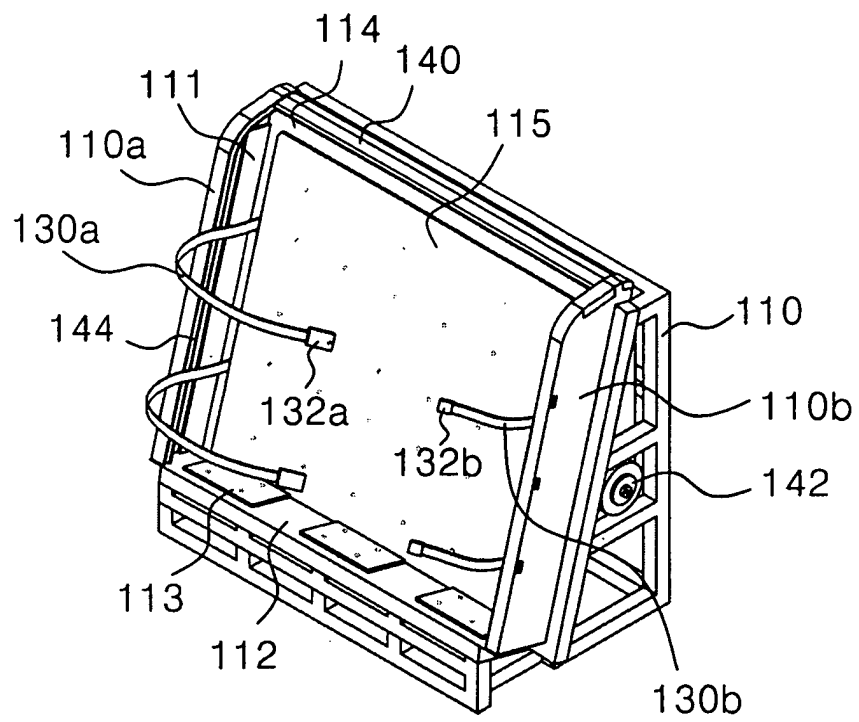
a plurality of shutter plates covering at least the opened upper side and the front side of the loading frame, said shutter plates being closely adhered to each other while fixed into the left and right chains.

【Drawing 1】

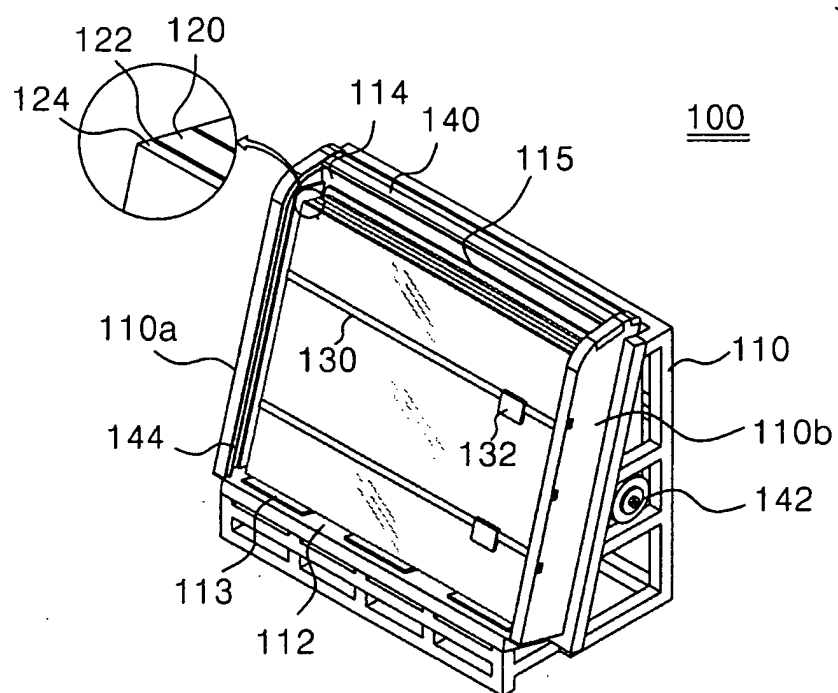


【Drawing 2】

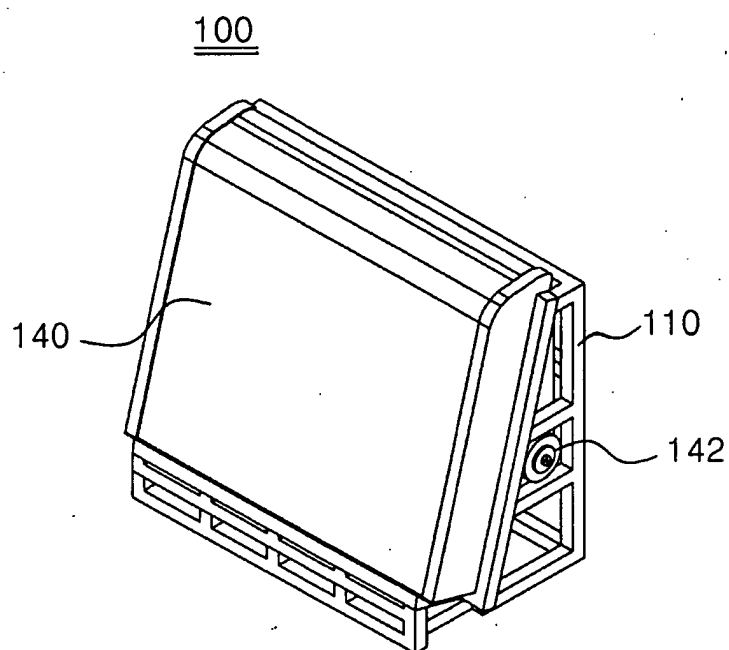
100



[Drawing 3]

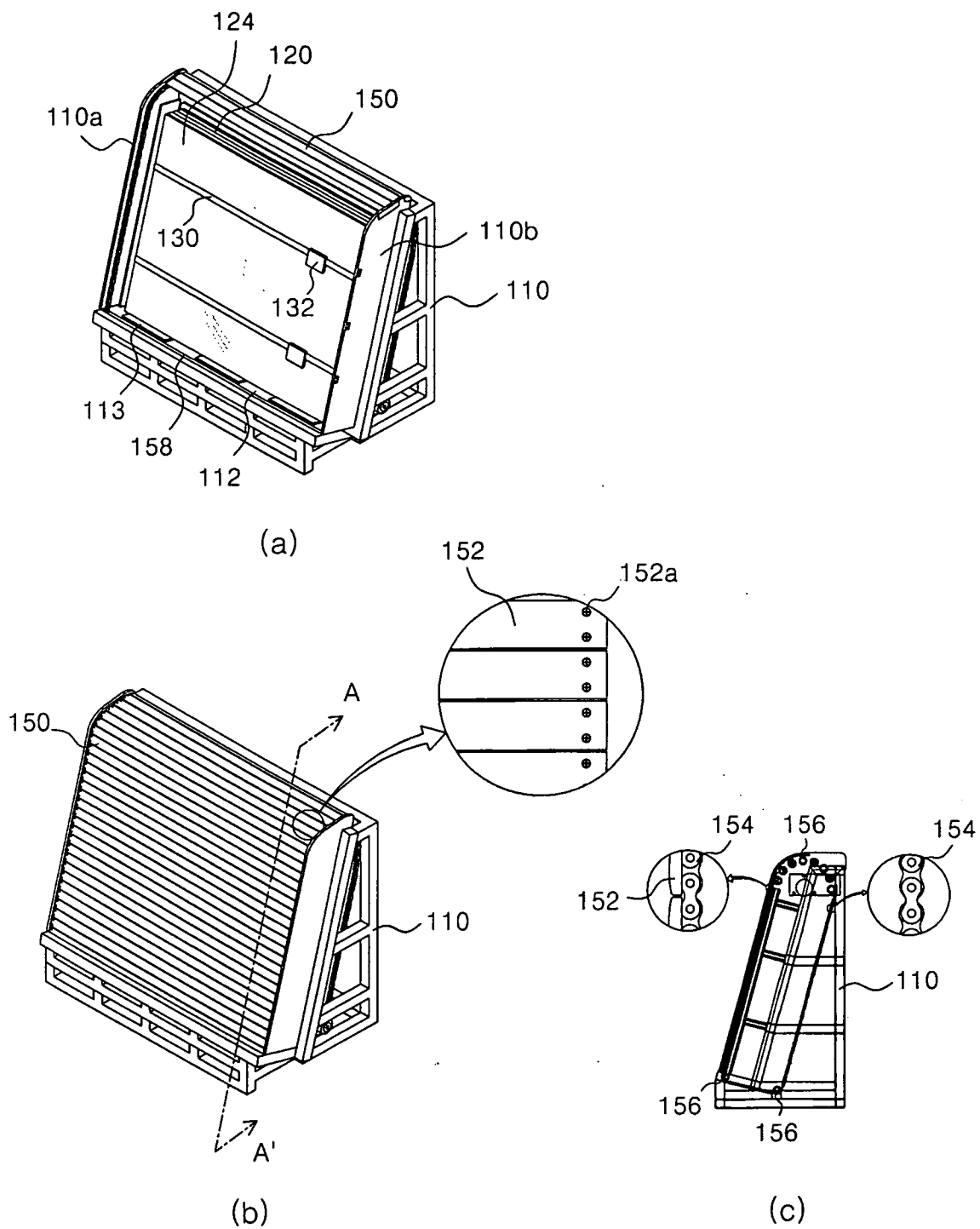


(a)



(b)

[Drawing 4]





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 02 9688

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.7)
X	DE 81 07 930 U1 (HEGLA FAHRZEUG- UND MASCHINENBAU GMBH & CO KG) 9 July 1981 (1981-07-09)	1,6	B65D85/48
Y	* page 5, line 18 - line 23 * * page 8, line 4 - line 33; figures 1,2 *	7-11	
D,Y	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 10, 17 November 2000 (2000-11-17) -& JP 2000 203679 A (NIPPON ELECTRIC GLASS CO LTD), 25 July 2000 (2000-07-25) * abstract; figures 1-4 *	7-11	
A	US 5 678 693 A (TAPP ET AL) 21 October 1997 (1997-10-21) * column 2, line 34 - line 50; figures 1-3 *	1,3	
A	US 2003/164318 A1 (LACASSE GASTON ET AL) 4 September 2003 (2003-09-04) * page 1, paragraph 22 - paragraph 23; figures 1,2 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 February 2005	Examiner Grondin, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 02 9688

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-02-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 8107930	U1	09-07-1981	NONE	

JP 2000203679	A	25-07-2000	NONE	

US 5678693	A	21-10-1997	NONE	

US 2003164318	A1	04-09-2003	CA 2354886 A1	10-02-2003
