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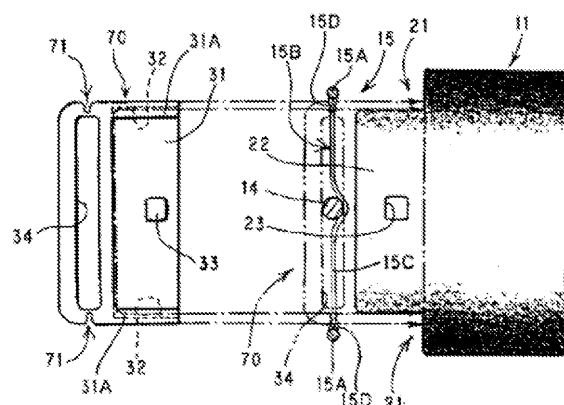
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(54) **BLIND**

(57) A blind in which slats can be easily cleaned and replaced, bending of a slat is prevented, and a gap is not formed between slats when the blind is closed. A narrow width section (22) is provided to each end of each slat (11), and recessed corners (21) are formed on both sides of the narrow width section (22). A stationary member (70) is attached to the narrow width section (11). A lifting cord (14) is inserted through an elongated hole (34) in the stationary member (70), and a pair of horizontal-cord-member insertion sections (71) penetrating from the front

side to the rear side of the stationary member (70) is formed near the ends in the longitudinal direction of the elongated hole (34). A horizontal cord member (15B) of a ladder cord (15), composed of vertical cord members (15A) and horizontal cord members (15B), is placed on the lower face side of the stationary member (70), and opposite ends of that horizontal cord member (15B) pass through the horizontal-cord-member insertion sections (71), exit to the upper face side of the stationary member (70), and are joined to the vertical cord members (15A).

Fig. 2



Description

Technical Field

[0001] The present invention relates to a blind having a structure provided with a plurality of slats, each formed in a shape of an elongated rectangular thin plate, and a ladder cord formed in a ladder shape, in which the plurality of slats are suspended and supported by the ladder cord.

Background Art

[0002] A Venetian blind in which a plurality of thin-plate shaped slats, each formed in an elongated rectangular shape, are aligned vertically with the longitudinal direction thereof kept horizontal have been conventionally used.

The Venetian blind is provided with a plurality of slats arranged in parallel so that the longitudinal direction thereof is set substantially horizontally, a head box disposed above the slats and arranged at the highest position of the blind, and a bottom rail disposed below the slats and arranged at the lowest position of the blind.

Here, between the head box and the bottom rail are disposed a lifting cord penetrating the slats and extending downward and a ladder cord going by the vicinity of both side edges of the slats and extending downward.

[0003] Each of the slats is provided with a plurality of elongated holes, extending in a direction substantially orthogonal to the longitudinal direction of the slat, at positions separated from the both ends thereof by a predetermined distance.

The lifting cord passes from the head box through the elongated holes of the plurality of slats aligned below and reaches the bottom rail.

The ladder cord is formed in a ladder shape with a pair of vertical cords extending in the vertical direction and a plurality of horizontal cords connecting the vertical cords. In other words, in the ladder cord, the plurality of horizontal cords are aligned with an equal intervals along the perpendicular direction of the vertical cords, and the pair of vertical cords are connected to each other at plural sites by these horizontal cords.

[0004] This ladder cord supports each of the slats with the plurality of horizontal cords aligned along the perpendicular direction of the vertical cords. Then, the lower ends of the vertical cords of the ladder cord are joined to the bottom rail.

Then, in a state in which the slats are substantially horizontal and gaps are formed between the slats, by lifting one of the pair of vertical cords of the ladder cord, the side edges of the slats located on one side are lifted, while the side edges on the opposite side go down, whereby the slats start rotating.

Then, by lifting the vertical cord on the one side till the slats become substantially vertical, the gaps between the slats can be closed.

[0005] On the other hand, in a state in which the slats are substantially vertical and the gaps between the slats are closed, by lifting one of the pair of vertical cords of the ladder cord, which is closer to the side edges located at a lower position of the slats, the side edges located at a higher position of the slats goes down and the side edges on the opposite side goes up, and the slats start rotating in the direction opposite to the above-described direction. Then, by lifting the vertical cord till the slats become substantially horizontal, the gaps between the slats can be opened.

In this blind, the plurality of slats can be overlapped with each other immediately below the head box by taking the lifting cord into the head box and by lifting the slats and the bottom rail.

[0006] In this state, by feeding out the lifting cord from inside the head box, the slats and the bottom rail goes down so that the blind can be extended over the entire window (See Patent Document 1, for example).

Patent Document 1: JP 2005-30084 A (Fig.1)

Summary of Invention

[0007] In the above-described blind, since the lifting cord penetrates through the elongated holes of the slats and, moreover, the horizontal cord of the ladder cord supports the slats from below, the lifting cord and the horizontal cord of the ladder cord obstruct cleaning. Moreover, if a force is applied to the thin-plate shaped slats in a state suspended in the air, the slats can be easily deformed, which makes cleaning of the slats difficult. Thus, the blind might be removed from the window or the slats might be removed from the blind for cleaning. However, the work for that is extremely cumbersome.

Moreover, if the slats are kept being rotated for closing the gaps between the slats, the side edge on the lower side of the slat interferes with the lifting cord when it reaches a certain rotation angular position, and the slats cannot be rotated more than the rotation angle. As a result, a slight gap is generated between the slats.

[0008] Therefore, there is a problem that the slats cannot be fully closed and a gap is generated between the slats even in a state in which the slats are closed to the maximum.

Then, as a result, even if the slats are closed in order to shield the sunlight, there is a problem that direct sunlight enters through the gaps between the slats depending on the cases.

Further, since the lifting cord goes through the elongated holes of the slats, if the slats are deformed, a replacement work for them is difficult. Moreover, an appearance of the blind is damaged by the deformation of the slats, which cannot be solved easily.

Thus, each invention in the present application was made in view of the above-described problems and has objects to enable easy cleaning of slats in a blind, to solve the problem that a slat can be easily broken due to provision

of a hole in a middle portion of the slat, to facilitate replacement of the slats, and to solve a gap between the slats when they are closed. Moreover, in addition to these objects, it also has an object to enable shielding of a view even if the slats are opened.

(First invention)

[0009] In view of the above objects, a first invention of the present application is a blind comprising a plurality of slats formed in the shape of an elongated rectangular thin plate and aligned substantially in parallel with each other in a state with the longitudinal direction set substantially horizontal, a ladder-shaped ladder cord formed including a pair of vertical cord members extending vertically for suspending and supporting these slats in an aligned state and a plurality of horizontal cord members connecting these vertical cord members, a lifting cord for lifting said plurality of slats, a head box capable both of introducing the lifting cord into the inside and leading it to the outside, and a bottom rail arranged below said plurality of slats and to which end portions of said ladder cord and said lifting cord are connected, respectively, **characterized in that:**

said slat is provided with recessed corners formed in a shape in which its corners on both sides of end portions in the longitudinal direction are notched in a stepped shape, and with a narrow width section having a width dimension reduced from the width dimension of said slat by the recessed corners being formed and made smaller than the width dimension of said slat;

a stationary member having a width dimension corresponding to the width dimension of the narrow width section is attached to each of the narrow width sections of said slats;

each of these stationary members extends in a direction substantially crossing the longitudinal direction of said slats at a right angle, and is provided with an elongated hole penetrating from a top to a bottom of the stationary member, and with a pair of horizontal-cord-member insertion sections penetrating from the top to the bottom of the stationary member in the vicinity of end portions of this elongated hole in the longitudinal direction;

said lifting cord goes through the elongated hole of said stationary member attached to each end portion of said plurality of slats aligned vertically from said head box and reaches said bottom rail;

said ladder cord has a length dimension of said horizontal cord member smaller than the width dimension of said slat and larger than the width dimension of said stationary member;

said vertical cord member of said ladder cord goes through said recessed corner formed at each end portion of said plurality of slats aligned vertically from said head box and reaches said bottom rail; and

the horizontal cord member of said ladder cord has its middle portion arranged on the lower face side of said stationary member in order to support said stationary member by the middle portion and its parts near the ends go through said horizontal-cord-member insertion sections and reach the upper face side of said stationary member and are joined to the vertical cord members.

[0010] Here, as to the ladder cord, it is possible to employ not only a general ladder cord in which a linearly extending vertical cord is disposed as the vertical cord member but also a so-called ladder tape in which a vertical tape material extending in a band-like shape is disposed as the vertical cord member.

Moreover, as to the horizontal cord member of the ladder cord, it is possible to employ not only those in which one or two horizontal cords are disposed per one supported portion of the slat but also a horizontal cord member in which a plurality of (e.g. five or six) horizontal cords extending linearly are bundled if, for example, the ladder tape is employed as the ladder cord.

(Second invention)

[0011] On the other hand, in view of the above objects, a second invention of the present application is a blind comprising a plurality of slats formed in the shape of an elongated rectangular thin plate and aligned substantially in parallel with each other in a state with the longitudinal direction set substantially horizontal, a ladder-shaped ladder cord formed including a pair of vertical cord members extending vertically for suspending and supporting these slats in an aligned state and a plurality of horizontal cord members connecting these vertical cord members, a lifting cord for lifting said plurality of slats, a head box capable both of introducing the lifting cord into the inside and leading it to the outside, and a bottom rail arranged below said plurality of slats and to which end portions of said ladder cord and said lifting cord are connected, respectively, **characterized in that:**

a joint member having a width dimension smaller than the width dimension of said slat is attached to each of both end portions of said slat, by which said slat is provided with recessed corners formed in a shape in which its corners on both sides of the end portion in the longitudinal direction are notched in a stepped shape between an end edge of the slat and a side edge of the joint member, and portions where the joint members protrude from the both ends of the slat are made as a narrow width section having the width dimension smaller than the width dimension of the slat by the recessed corners being formed;

a stationary member having the width dimension corresponding to the width dimension of the narrow width section is attached to each of said narrow width sections;

each of these stationary members extends in a direction substantially crossing the longitudinal direction of said slats at a right angle, and is provided with an elongated hole penetrating from a top to a bottom of the stationary member, and with a pair of horizontal-cord-member insertion sections penetrating from the top to the bottom of the stationary member in the vicinity of end portions of this elongated hole in the longitudinal direction;

said lifting cord goes through said elongated hole of said stationary member attached via said joint member to each end portion of said plurality of slats aligned vertically from said head box and reaches the bottom rail;

said ladder cord has a length dimension of said horizontal cord member smaller than the width dimension of said slat and larger than the width dimension of said stationary member;

said vertical cord member of said ladder cord goes through said recessed corner formed at each end portion of said plurality of slats aligned vertically from said head box and reaches said bottom rail; and

the horizontal cord member of said ladder cord has its middle portion arranged on the lower face side of said stationary member in order to support said stationary member by the middle portion and its parts near the ends go through said horizontal-cord-member insertion sections and reach the upper face side of said stationary member and are joined to the vertical cord members.

[0012] That is, in the second invention, the narrow width section in the first invention is formed as the joint member, which is a member separately from the slat. Then, the joint member is attached to each of the both ends of the slat and, furthermore, the stationary member is attached to the joint member so as to realize the configuration similar to the first invention.

Here, as in the first invention, as to the ladder cord, it is possible to employ not only a general ladder cord in which a linearly extending vertical cord is disposed as the vertical cord member but also a so-called ladder tape in which a vertical tape material extending in a band-like shape is disposed as the vertical cord member.

Moreover, as also in the first invention, as to the horizontal cord member of the ladder cord, it is possible to employ not only those in which one or two horizontal cords are disposed per one supported portion of the slat but also a horizontal cord member in which a plurality of (e.g. five or six) horizontal cords extending linearly are bundled if, for example, the ladder tape is employed as the ladder cord.

(Third invention)

[0013] A third invention of the present application is, in addition to the features of the above-described first or second invention, **characterized in that** said horizontal-

cord-member insertion section is formed in a shape of a notch by an edge of said stationary member being recessed, and that a removal-inhibiting portion that makes it difficult for the horizontal cord member of said ladder cord to be removed from inside of said horizontal-cord-member insertion section is disposed at an inlet portion of this horizontal-cord-member insertion section.

(Fourth invention)

[0014] A fourth invention of the present application is, in addition to the features of the above-described third invention, **characterized in that** the horizontal cord member of said ladder cord is thinner than the vertical cord member, and that only the horizontal cord member out of the horizontal cord member and the vertical cord member of said ladder cord is made capable of being inserted into said horizontal-cord-member insertion section.

(Fifth invention)

[0015] A fifth invention of the present application is, in addition to the features of the first or second invention, **characterized in that**, in each of said plurality of slats, a reinforcing rib extending substantially over the entire length of the longitudinal direction thereof is formed in order to ensure rigidity in the longitudinal direction.

(Sixth invention)

[0016] A sixth invention of the present application is, in addition to the features of the above-described fifth invention, **characterized in that** said reinforcing ribs are arranged substantially at the same positions as said plurality of slats on a plan view and formed in a sectional shape bent in the mountain-like shape so that one of the adjacent ribs is inserted into the other when said plurality of slats are overlapped with each other.

(Seventh invention)

[0017] A seventh invention of the present application is, in addition to the features of the above-described fifth invention, **characterized in that** said reinforcing rib is formed as a projecting rim along the longitudinal direction of the slat.

(Eighth invention)

[0018] An eighth invention of the present application is, in addition to the features of the above-described first or second invention, **characterized in that** a shielding reinforcing member that forms an angle to bend downward with respect to the slat substantially in the horizontal state is formed on one of the side edges along the longitudinal direction of said slat.

[0019] The present invention constituted as above ex-

erts effects described below.

(Effects of the first invention)

[0020] According to the first invention, by disposing the recessed corners in the shape in which the corners on both sides are notched on the end portions of each slat, the narrow width section with a smaller width is disposed. Then, the stationary member that corresponds to this narrow width section and has an elongated hole extending in a direction orthogonal to the longitudinal direction of the slat is attached to the narrow width section. Furthermore, the lifting cord is inserted through the elongated hole of the stationary member and also the horizontal cord member of the ladder cord is inserted through the recessed corners formed on both sides of the stationary member. Thus, the slat does not directly engage with the ladder cord and the lifting cord. When the stationary member is formed to be removable from the slat, the slat can be easily removed from the blind.

[0021] Then, when the slats are removed from the blind, the slats can be cleaned while placed on the floor, a table or the like. Thus, it is possible to wipe them easily without worrying about deformation of the thin-plate shaped slats.

Moreover, since the recessed corners are formed on both sides of the stationary member, by placing the surface of the slat substantially vertically in order to close the slats, the lifting cord is contained in the recessed corners, whereby the side edges of the slats do not interfere with the lifting cord any longer. Thus, gaps are not generated between the slats. As a result, the gaps between the slats during closure can be solved.

Furthermore, the horizontal-cord-member insertion section is disposed on the stationary member, and the horizontal cord member of the ladder cord is inserted through the horizontal-cord-member insertion section, whereby the stationary member is held by the horizontal cord member of the ladder cord. Thus, the stationary member is made immovable with respect to the longitudinal direction of the slats. Moreover, even if the end portions of the slats to which the stationary members are attached are pressed along the longitudinal direction of the slats, the stationary member is not easily removed from the horizontal cord member of the ladder cord. As a result, it is possible to prevent the slat from dropping downward accidentally.

[0022] Moreover, the lifting cord and the ladder cord are engaged with the stationary member so that the slats do not engage directly with the lifting cord and the ladder cord. Thus, when cleaning the slats with a cleaning tool, the lifting cord and the ladder cord do not obstruct movement of the cleaning tool any longer, whereby cleaning of the slats can be facilitated.

Furthermore, the elongated hole through which the lifting cord is inserted is disposed in the stationary member. Thus, strength of the slats is not lowered by the elongated hole. Furthermore, the elongated hole of a dimension

required for rotation of the slats can be ensured, whereby a smooth opening and closing operation of the slats can be realized. Furthermore, strength of the slats can be sufficiently ensured.

[0023] Then, since a fixed position (or a contacting point) of the horizontal cord member of the ladder cord is located inward from the width of the slats, in other words, since the slat width is outside the interval between the ladder-cord vertical cord members, the ladder cord does not interfere with the slats when the slats are closed, and a gap between the slats can be solved.

(Effect of the second invention)

[0024] According to the second invention, even if there is a problem in view of strength in disposing the narrow width section on both ends as in the case of a wooden slat, e.g., or even if attachment of the stationary member is difficult for the increased thickness of the slat, the stationary member can be disposed similarly to the first invention through the joint member. As a result, each of the above-described effects of the first invention can be similarly exerted.

(Effect of the third invention)

[0025] According to the third invention, in addition to the above-described effects of the first or second invention, the following effects are exerted.

That is, according to the third invention, the notch-shaped horizontal-cord-member insertion sections with recessed end edges are disposed on the stationary member, and the horizontal-cord-member insertion sections are opened at the end edge portions of the stationary member. Thus, when the horizontal cord member of the ladder cord is to be inserted through the horizontal-cord-member insertion sections, by pushing the middle portion in the longitudinal direction of the horizontal cord member into openings formed in the end edge portions of the stationary member, the horizontal cord member can be inserted through the inside of the horizontal-cord-member insertion sections. Thus, the cumbersome work to insert the horizontal cord member of the ladder cord through the inside of the horizontal-cord-member insertion section from the tip end of the horizontal cord member is not required any longer. Moreover, the horizontal cord member of the ladder cord can be easily inserted through the horizontal-cord-member insertion sections. Thus, even if the horizontal cord member of the ladder cord is inserted through the horizontal-cord-member insertion sections and the stationary member is held by the horizontal cord member of the ladder cord, an assembling work of the blind is not complicated. Furthermore, the horizontal cord member inserted into the horizontal-cord-member insertion section becomes difficult to be removed by the removal-inhibiting portion.

(Effect of the fourth invention)

[0026] According to the fourth invention, in addition to the above-described effects of the third invention, the following effects are exerted.

That is, according to the fourth invention, the horizontal cord member of the ladder cord is made thinner than the vertical cord member, and only the horizontal cord member out of the vertical cord member and the horizontal cord member of the ladder cord is made capable of insertion into the horizontal-cord-member insertion section. Thus, in the assembling work of the blind, the vertical cord member of the ladder cord is not accidentally inserted through the horizontal-cord-member insertion section any longer, and occurrence of a defect by a manufacturing error can be prevented. Moreover, also in usual use, the vertical cord member is not accidentally inserted into the horizontal-cord-member insertion section any longer.

(Fifth Invention)

[0027] According to the fifth invention, in addition to the above-described effects of the first or second invention, the following effects are exerted.

[0028] That is, according to the fifth invention, the reinforcing rib extending substantially over the entire length of the longitudinal direction is formed on each of the slats so as to ensure rigidity in the longitudinal direction of the slats. Thus, deflection of a portion not supported by the ladder cord is prevented, and even if the slat is made longer, the opening and closing operation of the slats is not obstructed at all.

Therefore, since the rigidity in the longitudinal direction of the slat can be sufficiently ensured, even if the length of the slat is increased, the slat can be supported only by the ladder cord engaged with the both ends thereof. As a result, there is no more need to support the middle of the slats by the ladder cord.

(Sixth Invention)

[0029] According to the sixth invention, in addition to the above-described effects of the fifth invention, the following effects are exerted.

[0030] That is, according to the sixth invention, the sectional shape of the reinforcing rib is the shape bent in a mountain-like shape so that when another slat is placed on the slat, one of the reinforcing ribs is inserted into the other. Thus, when the plurality of slats are overlapped with each other, they are brought into close contact with each other.

Therefore, even if the reinforcing rib is formed on the slat, the plurality of slats can be overlapped with each other in a close contact state. Thus, by lifting all the slats to the vicinity of the head box, the entire blind can be collected in a compact manner.

(Seventh Invention)

[0031] According to the seventh invention, in addition to the above-described effects of the fifth invention, the following effects are exerted.

[0032] That is, according to the seventh invention, the reinforcing rib is formed as a projecting strip along the longitudinal direction of the slat. Thus, the slat can be formed by extrusion molding easily and inexpensively.

(Eighth Invention)

[0033] According to the eighth invention, in addition to the above-described effects of the first or second invention, the following effects are exerted.

[0034] That is, according to the eighth invention, even if the slats are formed by a material with poor rigidity, they are reinforced by the shielding reinforcing member along the longitudinal direction, and deflection is prevented. In addition, even if the slats are in the opened state, the gaps between the slats are blocked by the shielding reinforcing member. As a result, even if the slats are in the open state, the window can be shielded so that the inside of the room cannot be seen from the outside through the window to which the blind is attached.

[0035] Further, if this shielding reinforcing member is formed by a material having translucency, daylight can be sufficiently ensured even if the window is shielded by the shielding reinforcing member. Moreover, the slats and the shielding reinforcing member can be integrally molded by extrusion molding of a resin or the like. In this case, integral molding is possible with different materials by two-color molding such that the slat portion is made of a non-translucent resin and the shielding reinforcing member is made of a translucent resin.

Brief Description of Drawings

[0036]

Fig. 1 is a perspective view illustrating an entire blind according to a first embodiment of the present invention.

Fig. 2 is an enlarged plan view illustrating an essential part of the first embodiment of the present invention.

Fig. 3 is an enlarged sectional view illustrating an essential part of the above embodiment.

Fig. 4 is an enlarged plan view illustrating an example of a removal-inhibiting portion according to the above embodiment.

Fig. 5 is an enlarged plan view illustrating another example of the removal-inhibiting portion according to the above embodiment.

Fig. 6 is an enlarged plan view illustrating still another example of the removal-inhibiting portion according to the above embodiment.

Fig. 7 is an enlarged plan view illustrating another example of the removal-inhibiting portion according

to the above embodiment.

Fig.8 is an enlarged plan view illustrating still another example of the removal-inhibiting portion according to the above embodiment.

Fig.9 is an enlarged plan view illustrating an essential part of a variation of the above embodiment.

Fig.10 is a perspective view of a joint member.

Fig.11 is an enlarged plan view illustrating an essential part of a second embodiment of the present invention.

Fig.12 shows an end face of a slat in a third embodiment of the present invention.

Fig.13 is a sectional view illustrating an opened and closed state of the slat according to the above embodiment.

Fig.14 shows an end face of a slat in a variation of the above embodiment.

Fig.15 shows a sectional view (A) and a perspective view of a shielding reinforcing member (B) of a fourth embodiment of the present invention.

Fig. 16 is a perspective view of the shielding reinforcing member in a variation of the above embodiment.

Fig.17 schematically shows an operation of the above embodiment.

Fig.18 is an enlarged plan view illustrating a variation of the present invention.

Fig.19 is an enlarged plan view illustrating another variation of the present invention.

Fig.20 is a sectional view on XX-XX line in Fig.19.

Fig.21 is an enlarged plan view illustrating another variation of the present invention.

Fig.22 is an enlarged plan view illustrating still another variation of the present invention.

Fig. 23 is a schematic diagram for explaining an operation of the blind according to a comparative example.

Best Mode for Carrying Out the Invention

[0037] Embodiments that show the best modes for carrying out the present invention will be described below based on the attached drawings.

[First Embodiment]

[0038] Figs.1 to 10 show a first embodiment of the present invention. Fig.1 is a perspective view illustrating an entire blind according to this embodiment. Fig. 2 is an enlarged plan view illustrating an essential part of this embodiment. Fig. 3 is an enlarged sectional view illustrating an essential part of this embodiment. Fig.4 is an enlarged plan view illustrating an example of a removal-inhibiting portion according to this embodiment. Fig.5 is an enlarged plan view illustrating another example of the removal-inhibiting portion according to this embodiment. Fig.6 is an enlarged plan view illustrating still another example of the removal-inhibiting portion according to

this embodiment. Fig.7 is an enlarged plan view illustrating another example of the removal-inhibiting portion according to this embodiment. Fig.8 is an enlarged plan view illustrating still another example of the removal-inhibiting portion according to this embodiment. Fig.9 is a sectional view illustrating another state of the slats according to this embodiment. Fig.10 is a perspective view of a joint member in Fig.9.

[0039] A blind 1 according to this embodiment is of a type of a so-called Venetian blind and can be used for shielding direct sunlight into a room through a window or for blocking the window so that the inside of the room cannot be seen from the outside.

That is, the blind 1 has a plurality of slats 11 with the longitudinal direction set substantially horizontally aligned vertically as shown in Fig.1. In other words, the blind 1 is provided with a plurality of the slats 11, each formed in the shape of an elongated rectangular thin plate, aligned substantially in parallel with each other in a state with the longitudinal direction substantially horizontal.

In such blind 1, a head box 12 is disposed at the highest position thereof, and this head box 12 is attached to a window frame or a curtain box.

[0040] Then, at the lowest position of the blind 1, a bottom rail 13 is disposed. This bottom rail 13 is connected to the head box 12 arranged at the highest position at end portions thereof by a lifting cord 14 and a ladder cord 15 suspended from the head box 12.

Inside the head box 12, a lifting mechanism (not shown) that rewinds and feeds out the lifting cord 14 so as to elevate up and down the bottom rail 13 and the slats 11 is disposed.

In order to operate the lifting mechanism, an operation cord 16 is disposed in the vicinity of the end portion of the head box 12 in the right in Fig.1.

In more detailed explanation, the lifting mechanism introduces the lifting cord 14 into the head box 12 so as to raise the bottom rail 13 and the slats 11 when a user performs a predetermined winding operation with the operation cord 16.

[0041] On the other hand, if the user performs a predetermined feeding-out operation with the operation cord 16 in a state in which all the slats 11 are wound up, the lifting mechanism feeds out the lifting cord 14 to the outside of the head box 12 so as to lower the bottom rail 13 and the slats 11.

Moreover, inside the head box 12, a rotating mechanism (not shown) that rotates the slats 11 through the ladder cord 15 is disposed.

In order to operate this rotating mechanism, a tilt pole 17 is disposed adjacently to the operation cord 16 in the vicinity of the end portion of the head box 12 in the right in Fig.1.

In more detailed explanation, the rotating mechanism is operated to rotate all the slats 11 at the sites where they are and to close gaps between the slats 11 when the user grabs the tilt pole 17 with fingertips and operates to

rotate it in a predetermined direction.

[0042] Then, the blind 1 closes the gaps between the slats 11 when the surfaces of the slats 11 become substantially vertical.

On the contrary, in a state in which the gaps between the slats 11 are closed, when the user operates to rotate the tilt pole 17 in a direction opposite to that shown previously, the rotating mechanism rotates all the slats 11 in the opposite direction at the sites where they are and operates to open the gaps between the slats 11.

Then, the blind 1 opens the gaps between the slats 11 when the surfaces of the slats 11 become substantially horizontal.

In this first embodiment, a stationary member 70 is formed to be held by a horizontal cord 15B of the ladder cord 15.

[0043] Fig.2 shows an end portion of the slat 11. On the slat 11 are disposed recessed corners 21 in the shape in which corners on the both sides of the end portion in the longitudinal direction are notched in a stepped shape and a narrow width section 22 having a width dimension smaller than the width dimension of the slat 11.

To the narrow width section 22 of the slat 11 is attached the stationary member 70 having a width dimension corresponding to the width dimension of the narrow width section 22. At the center part of the narrow width section 22 is disposed a fitting hole 23 that fixes the stationary member 70.

The stationary member 70 is, as shown in Figs.2 and 3, a plate-shaped member thicker than the slat 11 and having a sectional shape corresponding to the slat 11. In the stationary member 70 is formed a recessed portion 31 whose surface is partially recessed in order to fit the slat 11 therein. In a side wall 31A of this recessed portion 31 is formed a groove 32 into which the side edge of the narrow width section 22 is inserted.

[0044] Moreover, on a bottom face of the recessed portion 31 is disposed a fitting projection 33 with which the fitting hole 23 formed at the center part of the narrow width section 22 is fitted.

Here, by applying the narrow width section 22 of the slat 11 to the end edge of the recessed portion 31 and by moving it along the longitudinal direction, the side edge of the narrow width section 22 is smoothly inserted into the groove 32. Furthermore, the fitting projection 33 is fitted in the fitting hole 23.

On the other hand, by pulling the stationary member 70 from the slats 11 in a state in which the fitting projection 33 is pressed so as to release fitting with the fitting hole 23, it can be easily removed from the narrow width section 22 of the slat 11.

Then, by fixing the stationary member 70 to the narrow width section 22 of the slat 11, the recessed corners 21 formed on the both sides of the narrow width section 22 are extended to the distal end of the stationary member 70.

[0045] Moreover, the stationary member 70 is, as shown in Fig.2, provided with an elongated hole 34 ex-

tended in a direction substantially orthogonal to the longitudinal direction of the slat 11. Then, in this stationary member 70, a pair of horizontal-cord insertion sections 71 penetrating the stationary member 70 are formed in the vicinity of the both end portions of the elongated hole 34.

The lifting cord 14 goes from the head box 12 through the elongated hole 34 of the stationary member 70 attached to each end portion of the plurality of slats 11 aligned vertically and reaches the bottom rail 13 (not shown).

The horizontal cord 15B of the ladder cord 15 is, as shown in Figs.2 and 3, thinner than a vertical cord 15A. Moreover, the horizontal-cord insertion section 71 has an inner diameter through which only the horizontal cord 15B of the ladder cord 15 can be inserted.

[0046] The horizontal cord 15B of the ladder cord 15 is shorter than the width dimension of the slat 11 and longer than the width dimension of the stationary member 70.

The vertical cord 15A of the ladder cord 15 goes from the head box 12 through the recessed corner 21 formed at each end portion of the plurality of slats 11 aligned vertically and reaches the bottom rail 13.

The horizontal cord 15B of the ladder cord 15 has a middle portion 15C thereof arranged on the lower face side of the stationary member 70 so as to support it as shown in Fig. 3.

On the other hand, a portion 15D near the end portion of the horizontal cord 15B goes through the horizontal-cord insertion section 71 of the stationary member 70, reaches the upper face side of the stationary member 70 and is connected to the vertical cord 15A.

[0047] The horizontal-cord insertion section 71 in this embodiment will be described below in detail citing a plurality of types of specific examples.

Fig.4 shows the simplest example of the horizontal-cord insertion section 71 in this embodiment as a horizontal-cord insertion section 71A. In Fig.4, the horizontal-cord insertion section 71A is in the notched shape with the side edge of the stationary member 70 recessed.

This horizontal-cord insertion section 71A has, as shown in Fig. 4, a substantially circular container portion 72A having an inner diameter corresponding to the thickness of the horizontal cord 15B in order to contain the horizontal cord 15B of the ladder cord 15 inside. At an inlet portion of the container portion 72A of the horizontal-cord insertion section 71A is disposed a removal-inhibiting portion 73A whose width dimension is made smaller. This removal-inhibiting portion 73A is formed as a bottle neck to make it difficult for the horizontal cord 15B of the ladder cord 15 to be removed from the container portion 72A.

[0048] Then, on an inlet side of the removal-inhibiting portion 73A of the horizontal-cord insertion section 71A is further formed a guide portion 74A opened to the outside.

When the horizontal cord 15B of the ladder cord 15 is inserted into the container portion 72A of the horizontal-

cord insertion section 71A, by pushing in the horizontal cord 15B toward the horizontal-cord insertion section 71A, the guide section 74A guides the horizontal cord 15B and a force to push in the horizontal cord 15B is concentrated toward the removal-inhibiting portion 73A. As a result, the horizontal cord 15B can be easily inserted into the container portion 72A.

Fig.5 shows another example of the horizontal-cord insertion section 71 in this embodiment as a horizontal-cord insertion section 71B. In Fig.5, the horizontal-cord insertion section 71B has a notched shape formed by recessing the end edge of the stationary member 70 and has substantially an L-shape whose intermediate portion is bent.

[0049] In this substantially L-shaped horizontal-cord insertion section 71B, a container portion 72B formed substantially circularly for containing the horizontal cord 15B is arranged at a distal end of one side of the L-shape. Moreover, the distal end side of the other side of the L-shape is a guide portion 74B opened to the outside.

Between the container portion 72B and the guide portion 74B of the horizontal-cord insertion section 71B is disposed a removal-inhibiting portion 73B whose width is made smaller. This removal-inhibiting portion 73B is formed as a bottle neck for suppressing removal of the horizontal cord 15B similarly to the above-described removal-inhibiting portion 73A.

When the horizontal cord 15B of the ladder cord 15 is inserted into the container portion 72B of the horizontal-cord insertion section 71B, the horizontal cord 15B is pushed into the guide portion 74B and the direction of a pushing force is turned and the horizontal cord 15B is pushed into the container portion 72B so that the horizontal cord 15B can be easily inserted into the container portion 72B.

[0050] In the example shown in Fig.5, since the container portion 72B is disposed in the depth of the horizontal-cord insertion section 71B bent in the L-shape, a side-edge direction of the stationary member 70 seen from the container portion 72B is blocked. Thus, even if the horizontal cord 15B is pulled in the side-edge direction of the stationary member 70, the horizontal cord 15B is not removed from the container portion 72B.

Fig.6 shows a still another example of the horizontal-cord insertion section 71 in this embodiment as a horizontal-cord insertion section 71C. In Fig.6, the horizontal-cord insertion section 71C has a notched shape in which the side edge of the stationary member 70 is recessed.

In this horizontal-cord insertion section 71C, the side edge direction of the stationary member 70 is opened, and this portion is a guide portion 74C opened to the outside.

[0051] In this horizontal-cord insertion section 71C are disposed a pin-shaped member 73C as a removal-inhibiting portion that suppresses removal of the horizontal cord 15B of the ladder cord 15 from the container portion 72C of the horizontal-cord insertion section 71A, a fixing portion 75 that fixes one end of the pin-shaped member

73C, and a locking portion 76 provided with a groove 77 that locks the other end of this pin-shaped member 73C. Then, when the horizontal cord 15B of the ladder cord 15 is inserted into the container portion 72C of the horizontal-cord insertion section 71C, the pin-shaped member 73C is removed from the locking portion 76 to open the guide portion 74C. By pressing the horizontal cord 15B to the guide portion 74C in this state, the horizontal cord 15B can be easily inserted into the container portion 72C.

Here, by fitting the pin-shaped member 73C in the groove 77 of the locking portion 76 to be locked by the locking portion 76, the horizontal cord 15B is not removed from the container portion 72C even if the horizontal cord 15B is pulled to the side-edge direction of the stationary member 70, since the container portion 72C has the side-edge direction of the stationary member 70 blocked.

[0052] Fig.7 shows another example of the horizontal-cord insertion section 71 in this embodiment as a horizontal-cord insertion section 71D. The horizontal-cord insertion section 71D has, as shown in Fig.4, a substantially square container portion 72D instead of the substantially circular container portion 72A in Fig.4.

Moreover, a guide portion 74D of the horizontal-cord insertion section 71D is formed in the arc shape and has a pair of sides 78 formed so as to gradually go closer to the container portion 72D.

Then, between the container portion 72D and the guide portion 74D of the horizontal-cord insertion section 71D is disposed a removal-inhibiting portion 73D whose width dimension is made smaller similarly to the above-described horizontal-cord insertion section 71A.

Fig.8 shows a horizontal-cord insertion section 71E, which is still another example of the horizontal-cord insertion section 71 in this embodiment. The horizontal-cord insertion section 71E is, as shown in Fig.8, formed substantially in the L-shape in which its middle portion is bent similarly to the horizontal-cord insertion section 71B in Fig.5.

[0053] Then, the horizontal-cord insertion section 71E is provided with a guide portion 74E whose inlet side is opened to the outside similarly to the above-described horizontal-cord insertion section 71B.

However, the horizontal-cord insertion section 71E is different from the above-described horizontal-cord insertion section 71B in a point that a linear slit portion 75E extending from the guide portion 74E to the depth thereof is disposed in the horizontal-cord insertion section 71E. The linear slit portion 75E extends in the linear shape with the same width dimension and forms one side of the L-shape.

Then, the other side of the L-shape of the horizontal-cord insertion section 71E extends toward a container portion 72E formed substantially in the rectangular shape and becomes a tapered slit portion 76E which is tapered toward the container portion 72E. A boundary portion between the tapered slit portion 76E and the container portion 72E is a removal-inhibiting portion 73E whose width

dimension is small.

[0054] In such horizontal-cord insertion section 71E, when the horizontal cord 15B of the ladder cord 15 is inserted into the container portion 72E of the horizontal-cord insertion section 71E, the horizontal cord 15B is pushed into the guide portion 74E and further inserted through the inside of the linear slit portion 75E and, moreover, a pushing force is turned and the horizontal cord 15B is pushed into the container portion 72E. Then, the horizontal cord 15B can be easily inserted into the container portion 72E through the tapered slit portion 76E. Here, since the container portion 72E is disposed in the depth of the horizontal-cord insertion section 71E bent in the L-shape similarly to the above-described horizontal-cord insertion section 71B, the container portion 72E has the side-edge direction of the stationary member 70 blocked. Thus, even if the horizontal cord 15B is pulled in the side-edge direction of the stationary member 70, the horizontal cord 15B is not removed from the container portion 72E.

According to this embodiment, the following effects can be obtained.

[0055] That is, the horizontal-cord insertion section 71 is disposed on the stationary member 70, the horizontal cord 15B of the ladder cord 15 is inserted through this horizontal-cord insertion section 71, and the stationary member 70 is held by the horizontal cord 15B of the ladder cord 15. Thus, the stationary member 70 cannot move any more in the longitudinal direction of the slat 11. Moreover, even if the end portion of the slat 11 to which the stationary member 70 is attached is pressed along the longitudinal direction, the stationary member 70 is not easily removed from the horizontal cord 15B of the ladder cord 15, and accidental downward drop of the slat 11 can be prevented.

Moreover, by inserting the horizontal cord 15B of the ladder cord 15 through the horizontal-cord insertion section 71, the stationary member 70 is held by the horizontal cord 15B of the ladder cord 15. Thus, a slat clip that fixes the uppermost slat to the ladder cord in the conventional blind is not needed any longer, whereby the number of blind components can be reduced and a manufacturing cost can be lowered.

[0056] Moreover, by employing the horizontal-cord insertion section 71A or 71B in which the end-edge portion of the stationary member 70 is opened all the time, when the horizontal cord 15B of the ladder cord 15 is inserted through the horizontal-cord insertion section 71A or 71B, the horizontal cord 15B can be inserted through the horizontal-cord insertion section 71 only by pushing the middle portion of the horizontal cord 15B into an opening of the end-edge portion of the stationary member 70. Thus, a cumbersome work to insert the distal end of the horizontal cord 15B through the horizontal-cord insertion section 71 is not required. Therefore, an assembling work of the blind 1 is not complicated.

Furthermore, since the horizontal cord 15B of the ladder cord 15 is made thinner than the vertical cord 15A and

only the horizontal cord 15B can be inserted through the horizontal-cord insertion section 71, the vertical cord 15A of the ladder cord 15 is not accidentally inserted through the horizontal-cord insertion section 71 any longer during the assembling work of the blind 1. In addition, also in daily use, the vertical cord 15A is not accidentally inserted through the horizontal-cord insertion section 71.

[0057] Further, if a problem with strength such as easy breakage can be caused by formation of the narrow width section 22 at the end portion in view of the material of the slat 11, and if attachment of the stationary member 70 is difficult due to the thickness of the slat 11, as in a variation shown in Fig.9, a joint member 100 can be attached to the end portion of the slat 11. That is, as shown in Fig.9(A), a mounting hole 11A is formed in the end portion of the slat 11, and the joint member 100 is attached here by a rivet 130 as shown in Fig.9(B). Further, the joint member 100 is constituted by a sandwiching portion 110 that sandwiches the end portion of the slat 11 and a projection portion 120 to which the stationary member 70 is attached as shown in Fig.10. The sandwiching portion 110 is constituted by a first horizontal portion 111 in contact with the lower face of the slat 11, a second horizontal portion 112 shorter than the first horizontal portion 111 and in contact with the upper face of the slat 11, and a vertical portion 113 that connects the first horizontal portion 111 and the second horizontal portion 112. In this vertical portion 113, the projection portion 120 is projected. At the center part of the projection portion 120 is disposed, similarly to that shown in Fig.2, a fitting hole 121 that fixes the stationary member 70. Then, a rivet hole 114 penetrating the first horizontal portion 111 and the second horizontal portion 112 on the same planar position is also disposed, and positioning with the mounting hole 11A of the slat 11 is made here and the joint member 100 is attached through the rivet 130. In this way, as shown in Fig.9(B), the recessed corner 21 is formed between the side edge of the joint member 100 and the end portion of the slat 11. Furthermore, a portion of the joint member 100 protruding from the end portion of the slat 11 is made as the narrow width section 22 and as shown in Fig.9(C), the stationary member 70 is attached similarly to the above-described first embodiment.

[Second Embodiment]

[0058] Fig.11 is an enlarged plan view illustrating an essential part of a second embodiment of the present invention.

In this second embodiment, a so-called ladder tape 18 is used as the ladder cord 15 in the above-described first embodiment.

As for the ladder tape 18 as the ladder cord in this embodiment, as shown in Fig.11, a vertical tape material 18A extending in the band shape is disposed as a vertical cord member instead of the vertical cord 15A extending linearly.

Then, though the individually disposed horizontal cord 15B can be employed as a horizontal cord member of such ladder tape 18, two pairs of horizontal cord bundles 18B in which a plurality of horizontal cords 15B extending linearly are bundled, respectively, are employed in this embodiment. These horizontal cord bundles 18B are arranged on the both sides of the corresponding lifting cord 14.

[0059] On the other hand, in a stationary member 90 disposed on an end portion of the slat 11, a horizontal-cord insertion section 91 having a container portion 92B formed in an elongated shape along the width direction of a vertical tape material 18A disposed on the ladder tape 18 is disposed in accordance with the ladder tape 18 described above. Inside such elongated container portion 92B, the two pairs of the horizontal cord bundles 18B arranged on the both sides of the lifting cord 14 are both inserted.

According to this embodiment described above, even if the ladder tape 18 is employed instead of the ladder cord 15, the same working effects as those of the above-described first embodiment can be achieved.

[Third Embodiment]

[0060] In a third embodiment of the present invention, as shown in Fig.12, in a slat 11, a pair of reinforcing ribs 40 extending substantially over the entire length in the longitudinal direction except the narrow width section 22 is formed in order to ensure rigidity in the longitudinal direction.

[0061] Each of these reinforcing ribs 40 is in the shape in which a portion close to the side edge of the slat 11 is bent in the mountain-like shape. In other words, the reinforcing rib 40 is formed with a sectional shape bent in the mountain-like shape and is disposed on the side edge on the both sides of the slat 11, respectively. As a result, in each of the plurality of slats 11 disposed in the blind 1, the reinforcing rib 40 is arranged substantially at the same position as the reinforcing ribs 40 of the other slats 11 on a plan view. As a result, when the plurality of slats 11 are overlapped with each other, the reinforcing rib 40 on the lower side can be inserted into the reinforcing rib 40 on the upper side. Thus, even if the reinforcing rib 40 protrudes from the surface, the plurality of slats 11 can be overlapped with each other substantially in the close contact state. As a result, in the blind 2, all the slats 11 can be collected in a compact manner near the head box 12 only by winding up the slats 11 in which the reinforcing ribs 40 are formed.

[0062] Further, also in this embodiment, the portion 15D near the end portion of the horizontal cord 15B goes through the horizontal-cord insertion section 71 of the stationary member 70 and reaches the upper face side of the stationary member 70, and is connected to the vertical cord 15A similarly to the above-described first embodiment.

Here, as shown in Fig.23(A) as a comparative example

to this embodiment, if the stationary member 70 is fixed to the vertical cord 15A of the ladder cord 15, as shown in Fig.23(B), if only one of the vertical cords 15A is raised and the stationary member 70 is inclined, the vicinity portion of a fixing portion 15E fixed to the stationary member 70 of the vertical cord 15A is bent. In other words, in order to close the slats 11, it is necessary to bend the vertical cord 15A up to a sharp angle in the vicinity portion of the fixing portion 15E fixed to the stationary member 70 of the vertical cord 15A. Thus, when the slats 11 are to be closed, the vertical cord 15A repels the bending and exerts large resistance and becomes tense between the stationary members 70. Thus the stationary member 70 is not rotated to the closed position, and it is difficult for the slats 11 to be brought into the closed state.

[0063] On the other hand, as shown in Fig.13(A), by raising only the left vertical cord 15A in Fig.13(A), for example, in the pair of vertical cords 15A disposed in the ladder cord 15 in a state in which the surfaces of the slats 11 are made substantially horizontal and the gaps between the slats 11 are opened, the left side edges of the slats 11 are raised, while the right side edges go down, whereby the slats 11 start rotating.

Then, by raising only the left vertical cord 15A till the surfaces of the slats 11 become substantially vertical, as shown in Fig.13(B), the gaps between the slats 11 are closed. At this time, since the vertical cord 15A is not directly engaged with the stationary member 70, the vicinity portion of the fixing portion 15E fixed to the stationary member 70 of the vertical cord 15A is not bent as shown in Fig.23(B).

[0064] On the contrary, as shown in Fig.13(B), by raising only the right side vertical cord 15A in Fig.13(B), for example, in the pair of vertical cords 15A disposed in the ladder cord 15 in a state in which the surfaces of the slats 11 are made substantially vertical and the gaps between the slats 11 are closed, the left side edges of the slats 11 go down, while the right side edges are raised, whereby the slats 11 start rotating in a direction opposite to the above-described direction. Then, by raising only the other vertical cord 15A until the surfaces of the slats 11 become substantially horizontal, as shown in Fig.13(A), the gaps between the slats 11 are opened.

Further, the reinforcing ribs 40 maybe, as shown in Fig. 14, projecting rims integrally formed along the longitudinal direction of the slats 11.

[Fourth Embodiment]

[0065] In a fourth embodiment of the present invention, to one of the side edges along the longitudinal direction of the slat 11, a shielding reinforcing member 200 is attached so as to form an angle to bend downward with respect to the slat 11 substantially in the horizontal state. As this shielding reinforcing member 200, the one formed separately from the slat 11 may be attached as shown in Fig.15 or it may be integrally molded with the slat 11 as shown in Fig.16. Further, in the case shown in Fig. 15,

by forming the shielding reinforcing member 200 by a translucent member, for example, day light can be ensured when the slats 11 are made horizontal. On the other hand, even in the case shown in Fig.16, by using a non-translucent resin for the slat portion 11 and by using a translucent resin for the shielding reinforcing member portion 200 for two-color molding, the portions with different translucency can be integrally formed.

[0066] An opened and closed state of the slats 11 in this embodiment is shown in Fig.17. In Fig.17, it is supposed that the left side in the figure corresponds to the indoor side, while the right side to the outdoor side.

Fig.17(A) shows a state in which the slats 11 are substantially in parallel and opened. In this state, though the shielding reinforcing member 200 covers the upper half of the gap between the slats 11, the day light can be sufficiently ensured by the translucency. By raising the outdoor-side vertical cord (not shown) from this state, the shielding reinforcing member 200 is also raised in conjunction with the rising rotation of the outdoor side of the slats 11 (Fig.17(B)), and when the closed state shown in Fig.17(C) appears, the member is located on the upper-end side of the slats 11, which does not obstruct the closed state.

[0067] On the other hand, by raising the vertical cord on the indoor side (not shown) from the state shown in Fig.17(A), the shielding reinforcing member 200 is also lowered in conjunction with the lowering rotation of the outdoor side of the slats 11, but, as shown in Fig.17(D), the lower-end edge of the shielding reinforcing member 200 is brought into contact with the upper face of the slat 11 and brought into a half-closed state. Lines of light and vision from above can be sufficiently shielded even in this state and some brightness can be also ensured by indirect light from below.

Further, the present invention is not limited to the above embodiment but includes variations and improvements within a range that can achieve the objects of the present invention.

For example, the slat 11 is not limited to a single thin-plate material extending in the width direction of the blind but may be those formed by connecting a plurality of thin-plate materials.

[0068] Specifically, it may be so configured that the plurality of slats 11 are aligned in the longitudinal direction thereof and the narrow width sections 22 formed at the end portions of the slats 11 are connected to each other by a connecting member 80 to which the horizontal-cord insertion section 71 is added as shown in Fig.18.

Here, as the connecting member 80, the one provided with the recessed portion 31 and the elongated hole 34 similarly to the stationary member 70 in the above-described embodiment can be employed.

In more detailed explanation, the connecting member 80 is a plate-shaped member thicker than the slat 11 and having a sectional shape corresponding to the slat 11. In the connecting member 80, the recessed portions 31 whose surfaces on the both sides are partially recessed

in order to fit the narrow width sections 22 of the slat 11 arranged on the both sides are formed as shown in Fig. 18.

[0069] In the side wall 31A of the recessed portion 31 extending in the longitudinal direction of the slat 11, the groove 32 into which the side edge of the narrow width section 22 is inserted is formed similarly to the stationary member 70. Moreover, on the bottom face of the recessed portion 31 is disposed the fitting projection 33 to be fitted in the fitting hole 23 on the narrow width section 22 side. Then, a side wall is not formed on the end edge of the recessed portion 31 to be an end edge portion of the connecting member 80 but the side edge is opened. By using such connecting member 80, the slats 11 can be easily connected to each other. That is, by applying the narrow width section 22 of the slat 11 on one side to the opened end edge of the recessed portion 31 in the connecting member 80 and moving the connecting member 80 toward the slat 11, the side edge of the narrow width section 22 of the slat 11 is smoothly inserted into the groove 32 of the connecting member 80. Furthermore, by moving the connecting member 80, the fitting projection 33 of the connecting member 80 is fitted in the fitting hole 23 of the narrow width section 22, and the connecting member 80 is attached to the narrow width section 22 of the slat 11 on the one side. After that, by performing the similar work for the other slat 11, the slats 11 can be easily connected to each other.

[0070] Moreover, by connecting the plurality of slats 11, the connected body of the slats 11 made of the plurality of slats 11 becomes extremely long if the width of the blind is made extremely long. Since, however, they are supported by the ladder cord 15 at the portion of the connecting member 80, the intermediate portions of the slats 11 are not deflected.

Moreover, as the fitting projection that connects the stationary member to the slat, not limited to the columnar fitting projection 33 shown in the above-described embodiment, a fitting projection 33A formed in the shape of a wedge may be used as shown in Figs. 19 and 20. By employing such wedge-shaped fitting projection 33A, when the slat 11 is connected to the stationary member 70, the wedge-shaped slope guides the distal-end edge of the slat 11. Thus, the fitting projection 33A can be smoothly fitted in the fitting hole 23 formed in the narrow width section 22 of the slat 11.

[0071] Moreover, as the horizontal-cord insertion section disposed on the connecting member, the horizontal-cord insertion section 71E formed substantially in the L-shape in which the middle portion is bent as shown in Fig.21 may be employed. Alternatively, if the ladder tape 18 is used, the horizontal-cord insertion section 91 having the container portion 92B formed in an elongated shape along the width direction in accordance with the ladder tape 18 as shown in Fig.22 may be used.

Moreover, as the shielding member 52, not limited to those having non-translucency but transmitting day light, the one made of a synthetic resin in which a pigment is

not mixed may be used as long as a shielding performance can be sufficiently ensured by the rib member 54. Moreover, as the shielding member 52, not limited to the extrusion molded products, but injection molded products may be used.

Industrial Applicability

[0072] The present invention can be applied to blinds.

Claims

1. A blind comprising a plurality of slats formed in the shape of an elongated rectangular thin plate and aligned substantially in parallel with each other in a state with the longitudinal direction set substantially horizontal, a ladder-shaped ladder cord formed including a pair of vertical cord members extending vertically for suspending and supporting these slats in an aligned state and a plurality of horizontal cord members connecting these vertical cord members, a lifting cord for lifting said plurality of slats, a head box capable both of introducing the lifting cord into the inside and leading it to the outside, and a bottom rail arranged below said plurality of slats and to which end portions of said ladder cord and said lifting cord are connected, respectively, **characterized in that:**

said slat is provided with recessed corners formed in a shape in which its corners on both sides of end portions in the longitudinal direction are notched in a stepped shape, and with a narrow width section having a width dimension reduced from the width dimension of said slat by the recessed corners being formed and made smaller than the width dimension of said slat; a stationary member having a width dimension corresponding to the width dimension of the narrow width section is attached to each of the narrow width sections of said slats; each of these stationary members extends in a direction substantially crossing the longitudinal direction of said slats at a right angle, and is provided with an elongated hole penetrating from a top to a bottom of the stationary member, and with a pair of horizontal-cord-member insertion sections penetrating from the top to the bottom of the stationary member in the vicinity of end portions of this elongated hole in the longitudinal direction; said lifting cord goes through the elongated hole of said stationary member attached to each end portion of said plurality of slats aligned vertically from said head box and reaches said bottom rail; said ladder cord has a length dimension of said horizontal cord member smaller than the width dimension of said slat and larger than the width

dimension of said stationary member; said vertical cord member of said ladder cord goes through said recessed corner formed at each end portion of said plurality of slats aligned vertically from said head box and reaches said bottom rail; and the horizontal cord member of said ladder cord has its middle portion arranged on the lower face side of said stationary member in order to support said stationary member by the middle portion and its parts near the ends go through said horizontal-cord-member insertion sections and reach the upper face side of said stationary member and are joined to the vertical cord members.

2. A blind comprising a plurality of slats formed in the shape of an elongated rectangular thin plate and aligned substantially in parallel with each other in a state with the longitudinal direction set substantially horizontal, a ladder-shaped ladder cord formed including a pair of vertical cord members extending vertically for suspending and supporting these slats in an aligned state and a plurality of horizontal cord members connecting these vertical cord members, a lifting cord for lifting said plurality of slats, a head box capable both of introducing the lifting cord into the inside and leading it to the outside, and a bottom rail arranged below said plurality of slats and to which end portions of said ladder cord and said lifting cord are connected, respectively, **characterized in that:**

a joint member having a width dimension smaller than the width dimension of said slat is attached to each of both end portions of said slat, by which said slat is provided with recessed corners formed in a shape in which its corners on both sides of the end portion in the longitudinal direction are notched in a stepped shape between an end edge of the slat and a side edge of the joint member, and portions where the joint members protrude from the both ends of the slat are made as a narrow width section having the width dimension smaller than the width dimension of the slat by the recessed corners being formed; a stationary member having the width dimension corresponding to the width dimension of the narrow width section is attached to each of said narrow width sections; each of these stationary members extends in a direction substantially crossing the longitudinal direction of said slats at a right angle, and is provided with an elongated hole penetrating from a top to a bottom of the stationary member, and with a pair of horizontal-cord-member insertion sections penetrating from the top to the bottom of the stationary member in the vicinity of end portions of this elongated hole in the longitudinal direction;

- tudinal direction;
 said lifting cord goes through said elongated hole of said stationary member attached via said joint member to each end portion of said plurality of slats aligned vertically from said head box and reaches the bottom rail;
 said ladder cord has a length dimension of said horizontal cord member smaller than the width dimension of said slat and larger than the width dimension of said stationary member;
 said vertical cord member of said ladder cord goes through said recessed corner formed at each end portion of said plurality of slats aligned vertically from said head box and reaches said bottom rail; and
 the horizontal cord member of said ladder cord has its middle portion arranged on the lower face side of said stationary member in order to support said stationary member by the middle portion and its parts near the ends go through said horizontal-cord-member insertion sections and reach the upper face side of said stationary member and are joined to the vertical cord members.
3. The blind according to claim 1 or 2, wherein said horizontal-cord-member insertion section is formed in a shape of a notch by an edge of said stationary member being recessed; and a removal-inhibiting portion that makes it difficult for the horizontal cord member of said ladder cord to be removed from inside of said horizontal-cord-member insertion section is disposed at an inlet portion of this horizontal-cord-member insertion section.
4. The blind according to claim 3, wherein the horizontal cord member of said ladder cord is thinner than the vertical cord member; and only the horizontal cord member out of the horizontal cord member and the vertical cord member of said ladder cord is made capable of being inserted into said horizontal-cord-member insertion section.
5. The blind according to claim 1 or 2, wherein, in each of said plurality of slats, a reinforcing rib extending substantially over the entire length of the longitudinal direction thereof is formed in order to ensure rigidity in the longitudinal direction.
6. The blind according to claim 5, wherein said reinforcing ribs are arranged substantially at the same positions as said plurality of slats on a plan view and formed in a sectional shape bent in the mountain-like shape so that one of the adjacent ribs is inserted into the other when said plurality of slats are overlapped with each other.
7. The blind according to claim 5, wherein said rein-
- forcing rib is formed as a projecting rim along the longitudinal direction of the slat.
8. The blind according to claim 1 or 2, wherein a shielding reinforcing member that forms an angle to bend downward with respect to the slat substantially in the horizontal state is formed on one of the side edges along the longitudinal direction of said slat.

Fig. 1

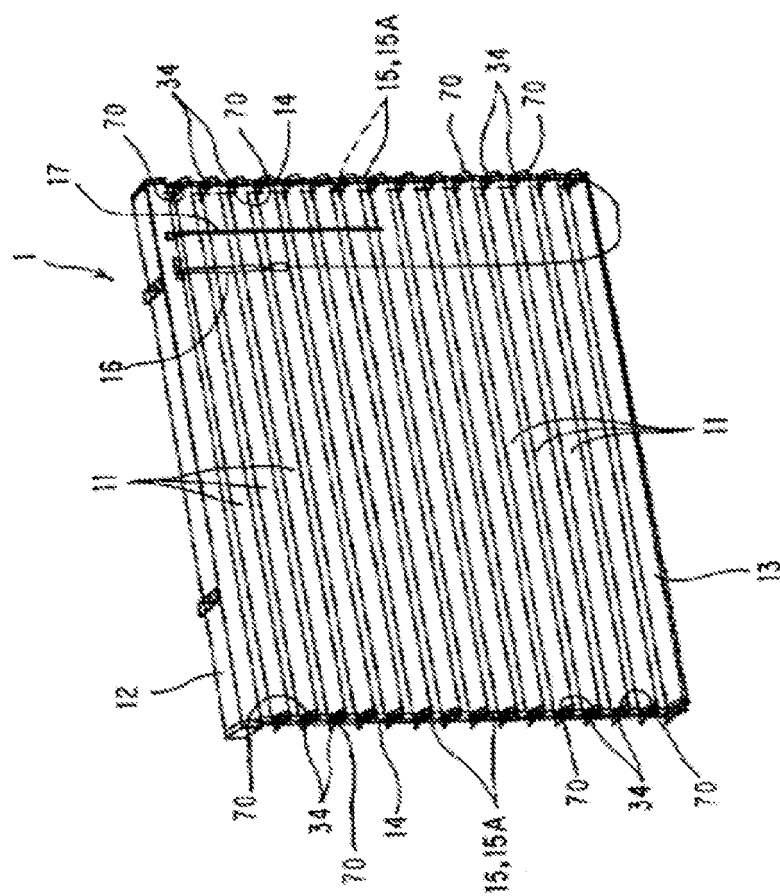


Fig. 2

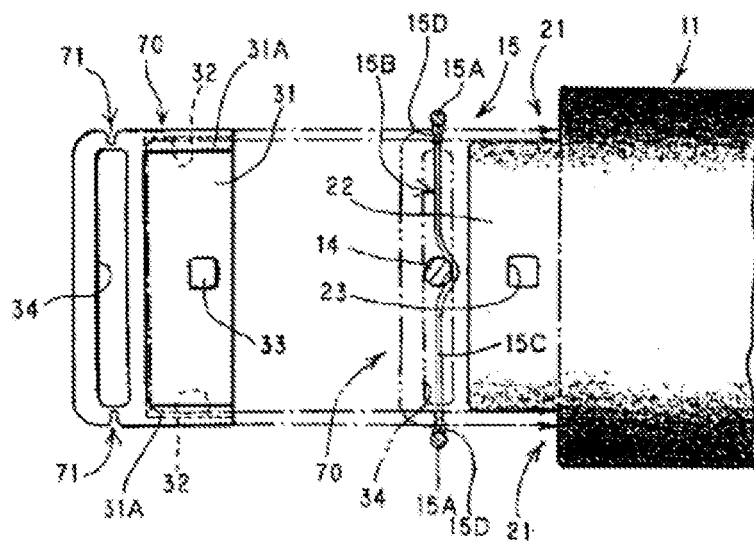


Fig. 3

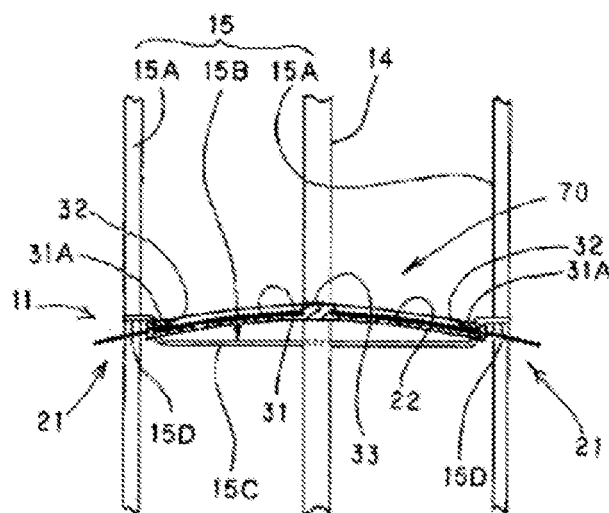


Fig. 4

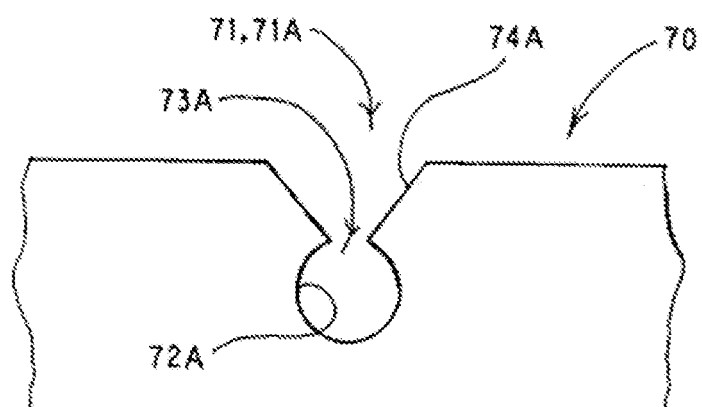


Fig. 5

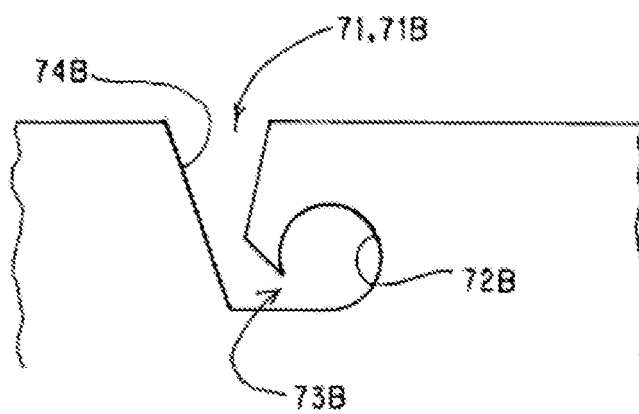


Fig. 6

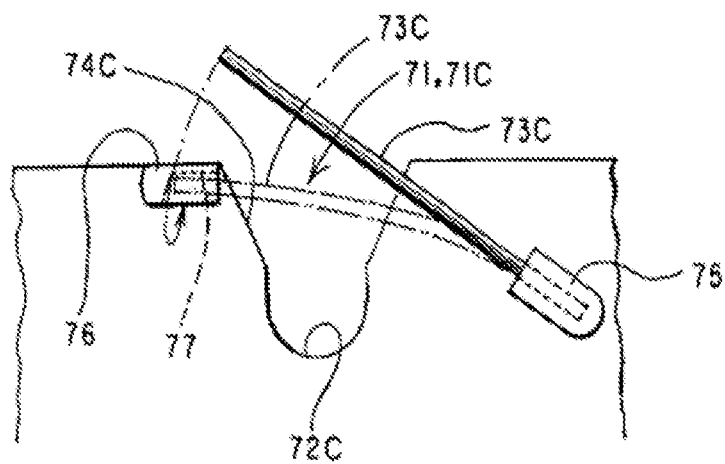


Fig. 7

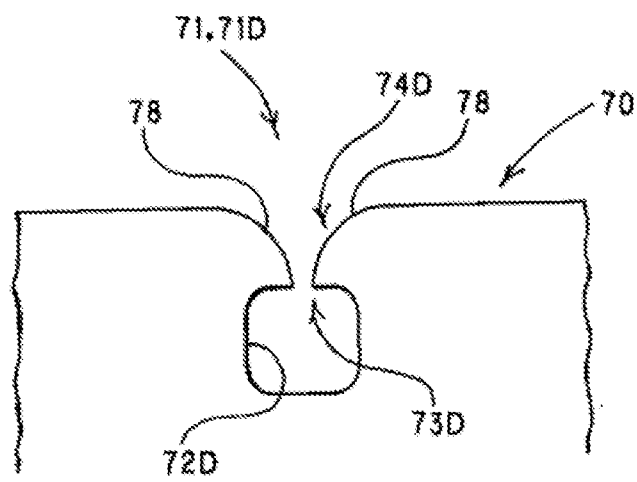


Fig. 8

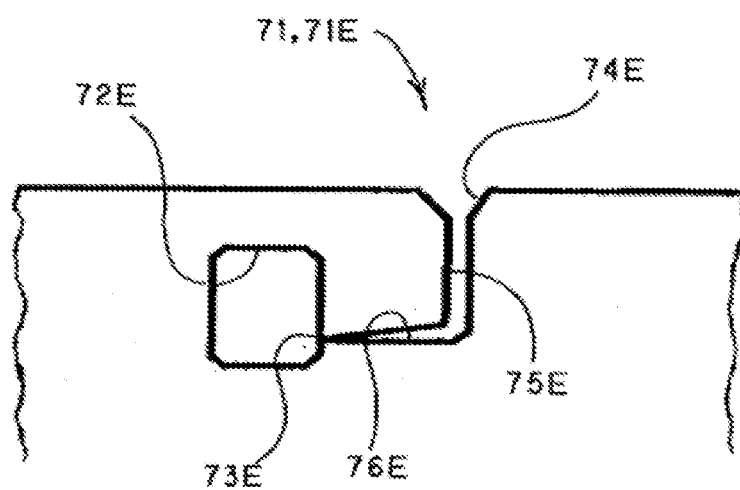


Fig. 9

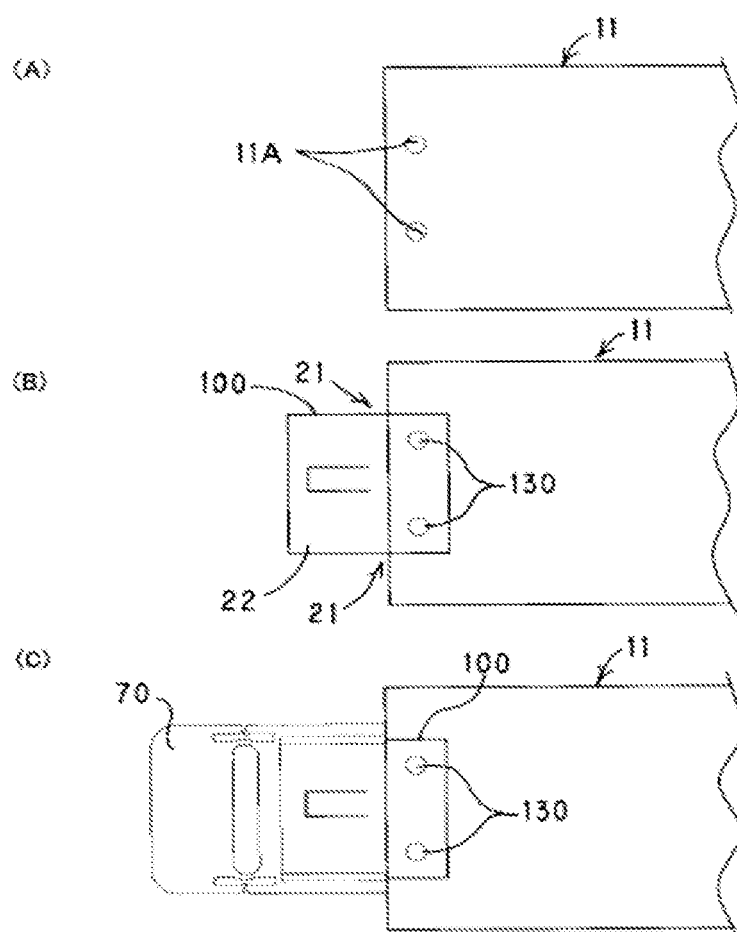


Fig. 10

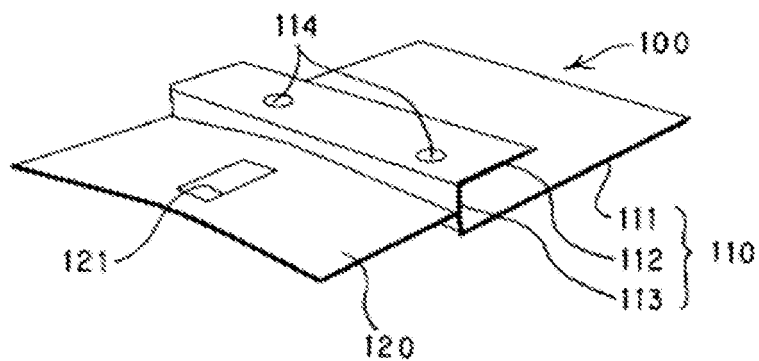


Fig. 11

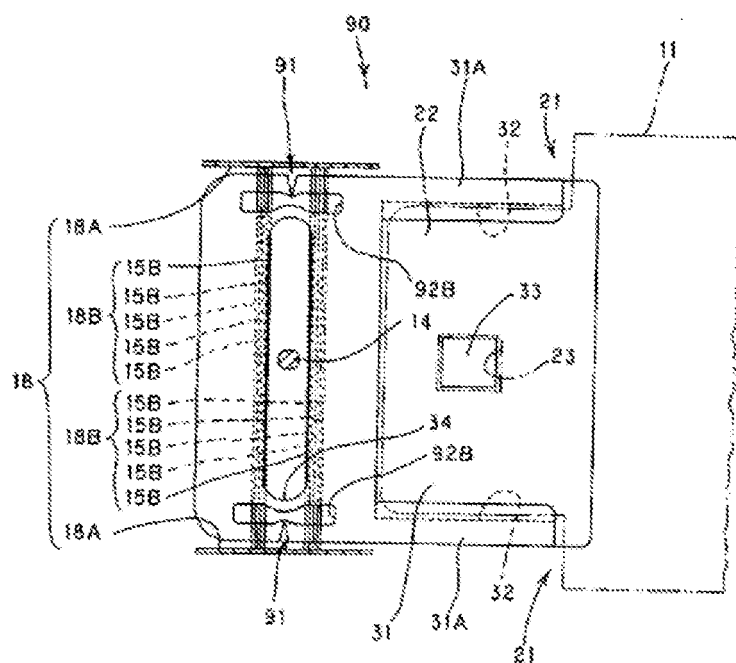


Fig. 12

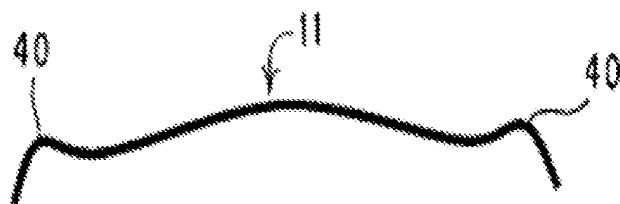


Fig. 13

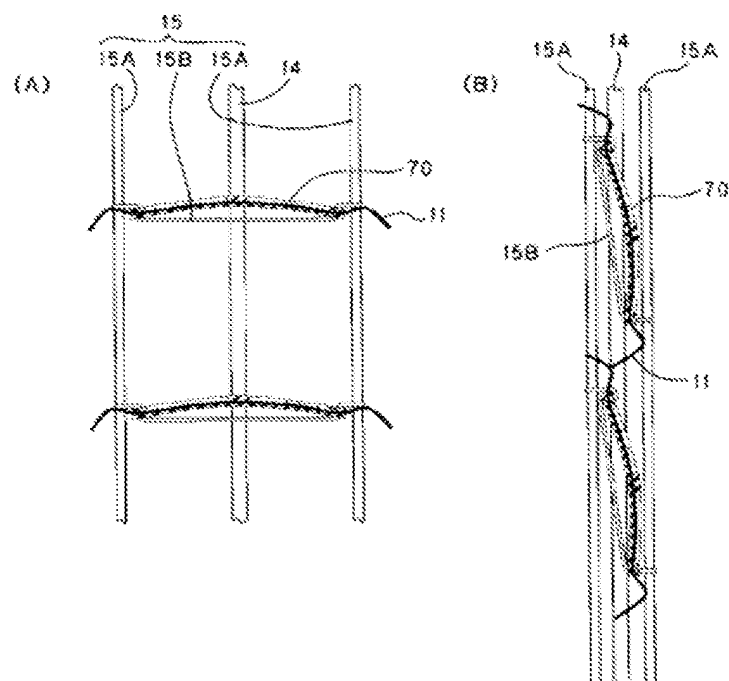


Fig. 14

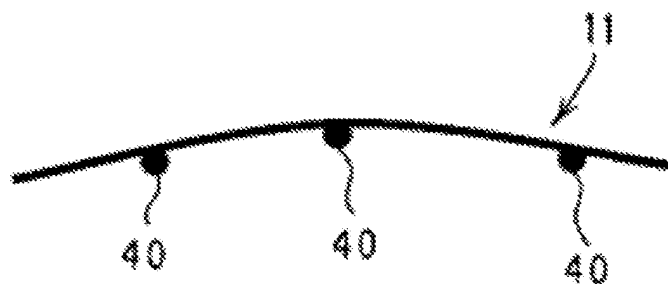


Fig. 15

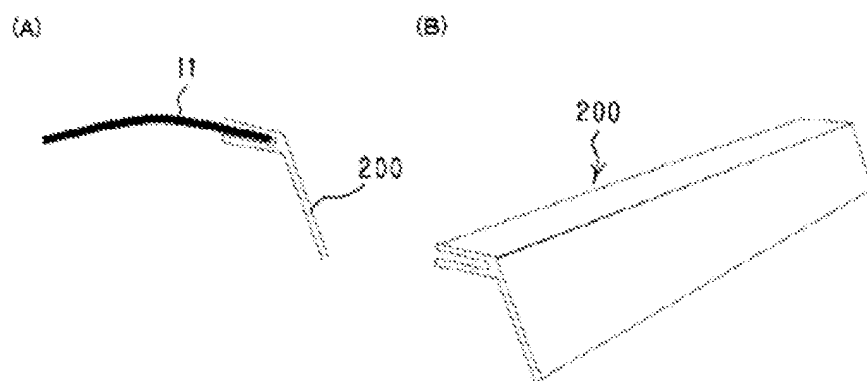


Fig. 16

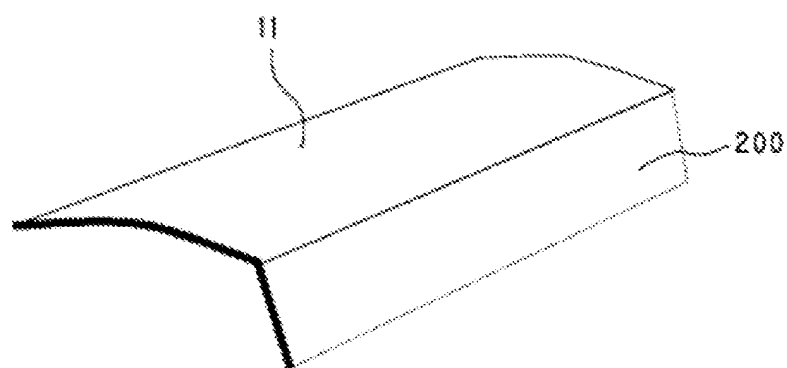


Fig. 17

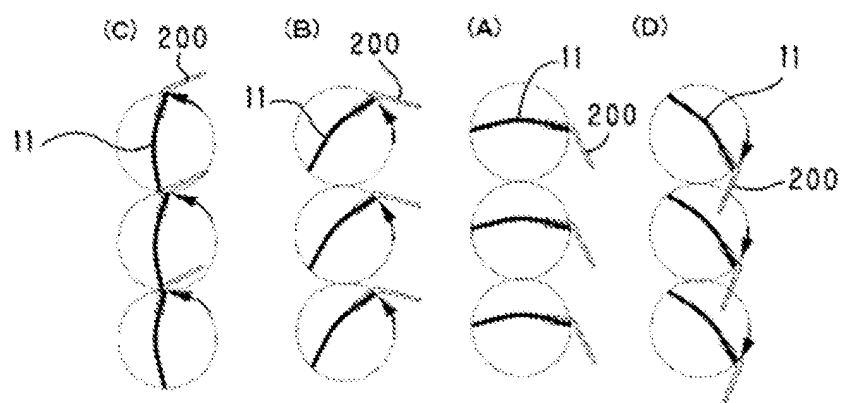


Fig. 18

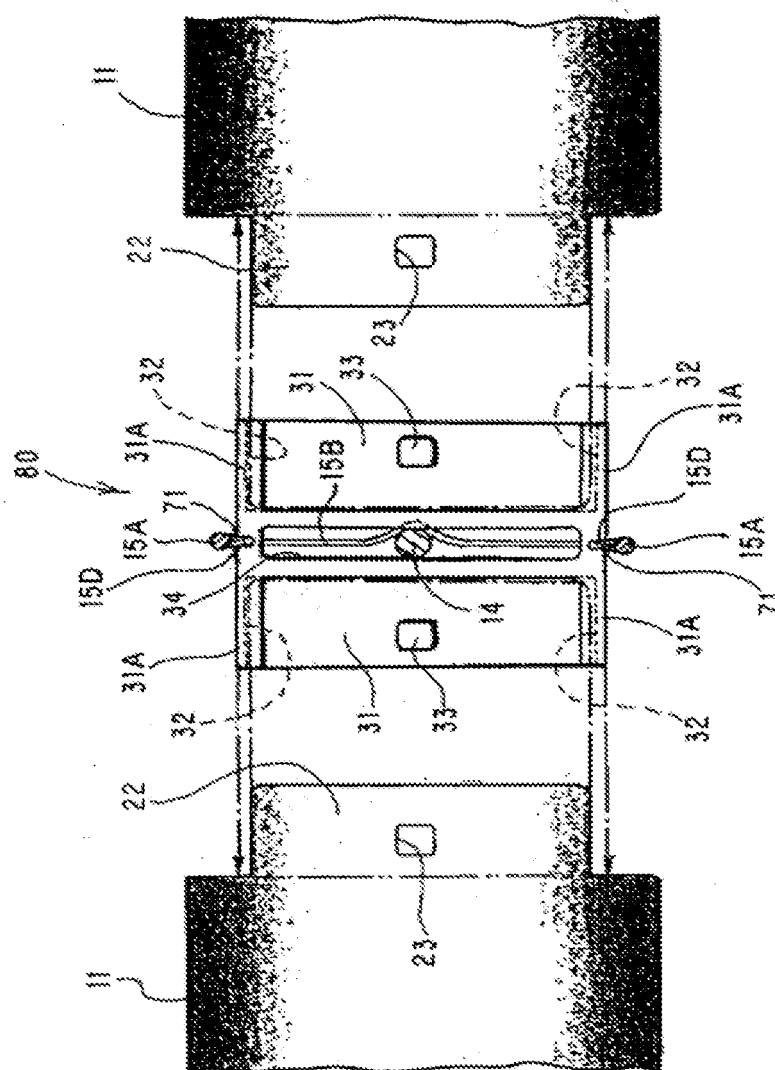


Fig. 19

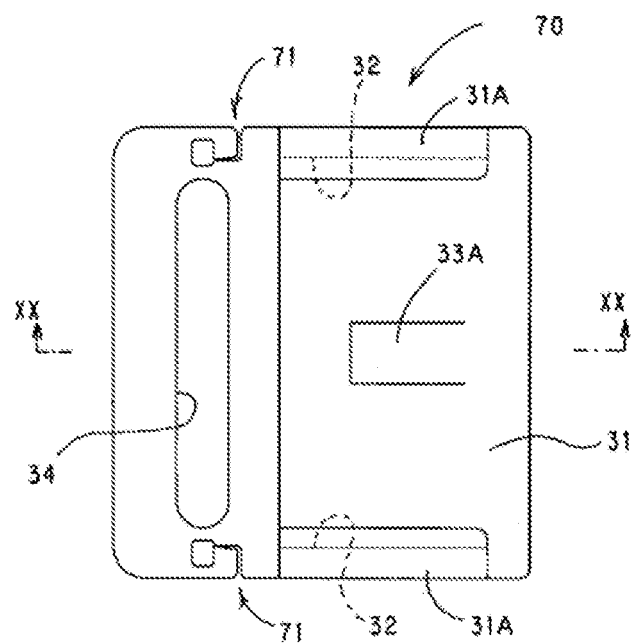


Fig. 20

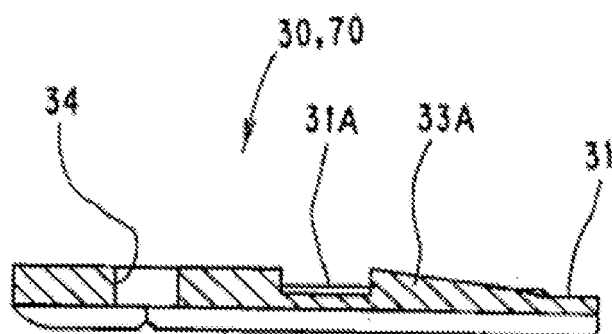


Fig. 21

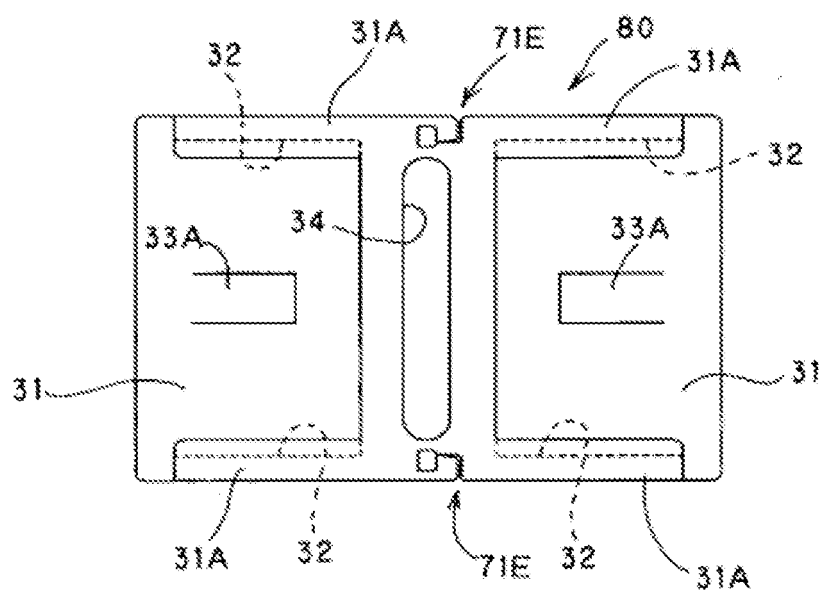


Fig. 22

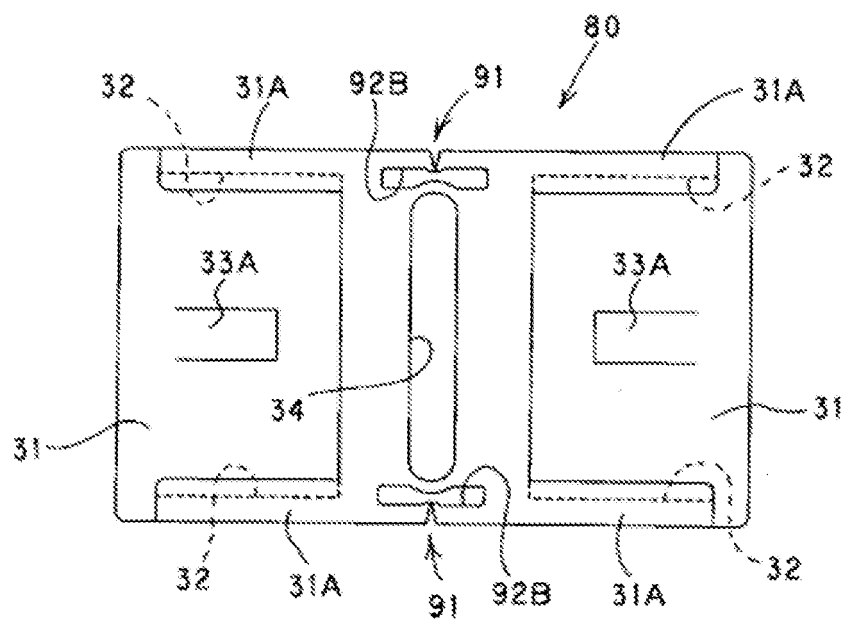
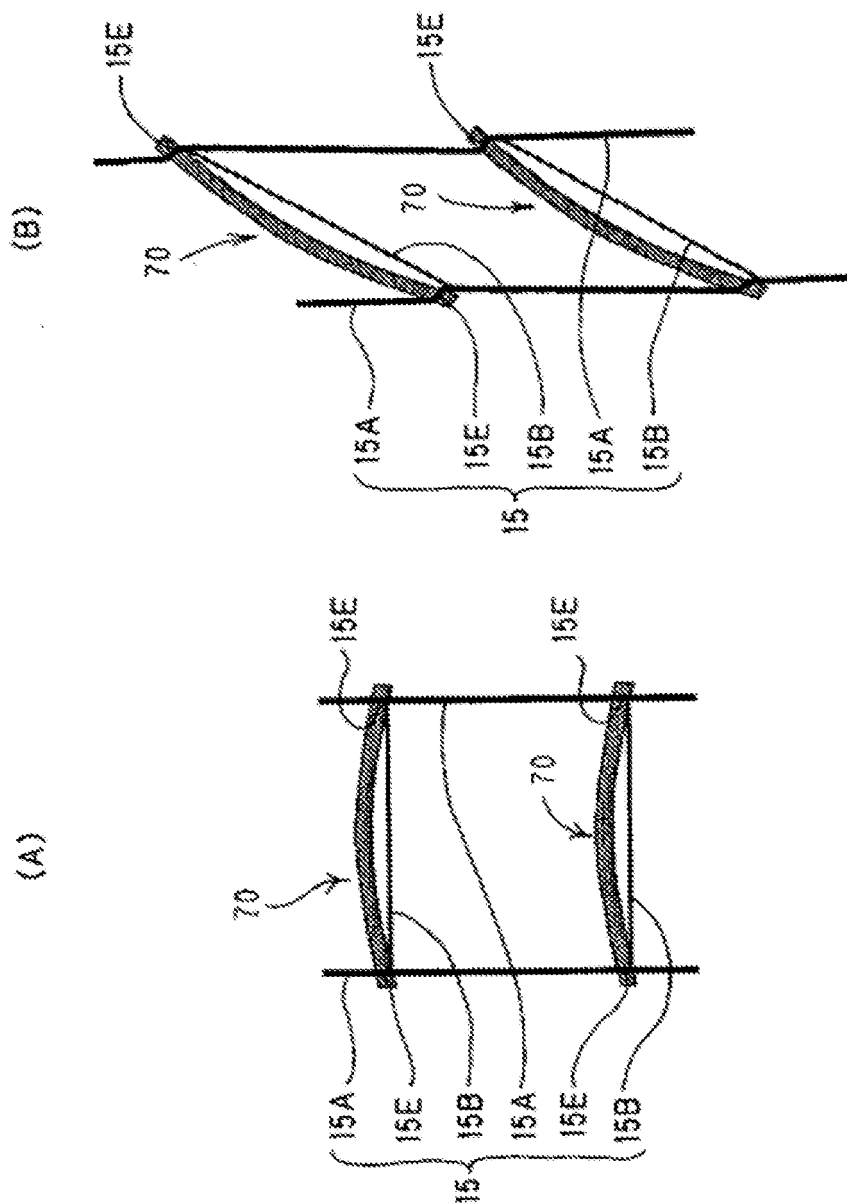


Fig. 23



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2008/073705

A. CLASSIFICATION OF SUBJECT MATTER

E06B9/384 (2006.01) i, E06B9/386 (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)

E06B9/384, E06B9/386

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 1996-2009

Kokai Jitsuyo Shinan Koho 1971-2009 Toroku Jitsuyo Shinan Koho 1994-2009

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.
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 116002/1984 (Laid-open No. 32395/1986) (Yokota Co., Ltd.), 27 February, 1986 (27.02.86), Page 1, line 17 to page 7, line 7; all drawings (Family: none)	1-8
Y	JP 2006-63704 A (Oiles Eco Corp.), 09 March, 2006 (09.03.06), Par. Nos. [0019] to [0060]; all drawings & EP 1801345 A1 & WO 2006/022090 A1	1-8

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

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

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Date of the actual completion of the international search
30 January, 2009 (30.01.09)Date of mailing of the international search report
10 February, 2009 (10.02.09)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2008/073705

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 17510/1981 (Laid-open No. 129899/1982) (Sasaki Buraindo Kogyo Kabushiki Kaisha), 13 August, 1982 (13.08.82), Page 2, line 19 to page 4, line 15; all drawings (Family: none)	5-7
Y	CD-ROM of the specification and drawings annexed to the request of Japanese Utility Model Application No. 52935/1992 (Laid-open No. 14334/1994) (Naka Corp.), 22 February, 1994 (22.02.94), Par. Nos. [0008] to [0015]; all drawings (Family: none)	5-7
Y	JP 8-303151 A (Yoneichi IKEDA), 19 November, 1996 (19.11.96), Par. Nos. [0013] to [0019]; all drawings (Family: none)	8
Y	JP 2004-278068 A (Hokuto Control Corp.), 07 October, 2004 (07.10.04), Par. Nos. [0010] to [0018]; all drawings (Family: none)	8

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2005030084 A [0006]