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(71) Applicant: **KONICA CORPORATION**
Tokyo (JP)

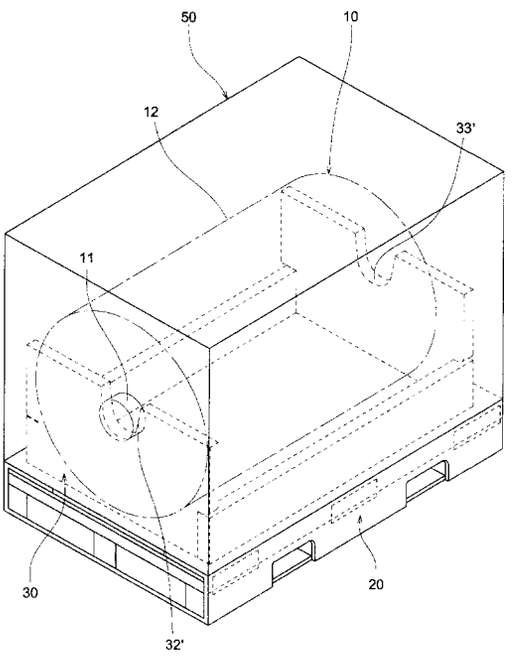
(72) Inventors:
- **Yamaai, Hiroyuki**
  Hino-shi, Tokyo 191-8511 (JP)
- **Kishino, Yoshimasa**
  Hino-shi, Tokyo 191-8511 (JP)
- **Takakura, Motonori**
  Hino-shi, Tokyo 191-8511 (JP)

(74) Representative: **Nicholls, Michael John**
J.A. KEMP & CO.
14, South Square
Gray's Inn
London WC1R 5JJ (GB)

(54) Packaging structure for roll-shaped materials

(57) A packaging structure for packaging roll-shaped materials (10) wound on a core (11), comprises: a bottom plate (21); left and right supporting plates (32,33) to support both end portions of the core (11) from a bottom side of the core (11); front and rear holding plates (34,35) to support the left and right supporting plates (32,33) from front and rear sides of the left and right supporting plates (32,33) so as to hold a stand-up condition that the left and right supporting plates (32,33) stand on the bottom plate (21); and a supporting structure (30) to make the bottom plate (21), the left and right supporting plates (32,33) and the front and rear holding plates (34,35) in a single body structure and to make the left and right supporting plates (32,33) and the front and rear holding plates (34,35) collapsible.

FIG. 1



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Description

BACKGROUND OF THE INVENTION

[0001] This invention relates to packaging structure for roll-shaped materials.

[0002] Light sensitive materials, for example, such as the photographic film or photographic paper, are wound up in a form of roll at the final step of the manufacturing process, and are packaged into a moisture-proof and light intercepting condition by enveloping them with a medium such as a light intercepting film, and are packaged again by in a transport structure for transport or storage.

[0003] For the above packaging structure, a method normally used is one in which the lightproof packaged light sensitive material is suspended at both ends of its core in a wooden frame resting on a wooden pallet, mentioned in official gazettes such as TOKUKAIHEI 3-53243 or Japanese patent 2683938.

[0004] The matters which must be considered for transport and storage of the light sensitive materials are not only maintaining the lightproofing but also preventing moisture damage and preventing deformation of the light sensitive materials. If deformation of the light sensitive materials cannot be prevented, the layer of the light sensitive materials wound in rolls would be firmly adhered to each other. Hitherto, various kinds of ideas including the technique of lightproof have been proposed. The deformation of the light sensitive materials is usually due to the bending of the core by the weight of the light sensitive material itself. A countermeasure for this, there is a proposal by TOKUKAI 2000-33943.

[0005] There is a special packaging material problem in transport and storage of light sensitive materials. As mentioned above, a normally used method is one in which the lightproof packaged light sensitive material is suspended on both ends of its core in a wooden frame mounted on a wooden pallet, and since wood is used for the packaging material of this embodiment, though the pallet and the frame portion are separated for disposal, it is difficult and costly to mass-produce them, and it also takes much time for assembling. Moreover, it is a single-use type, and the cost becomes prohibitive.

[0006] Among roll-shaped materials, there are not only the above light sensitive materials but also films or textiles which are transported or stored by winding onto core, and the above inconvenience or problems are also found in the packaging of these roll-shaped materials.

SUMMARY OF THE INVENTION

[0007] In consideration of the above, the object of this invention is to provide packaging structure for roll-shaped materials, the part of which are easy to transport and store when it is not used, and which can be reused.

[0008] The above object of this invention can be achieved by the following structures and methods.

[0009] (1-1) A packaging structure for packaging roll-shaped materials wound on a core, comprises:

a bottom plate;
left and right supporting plates to support both end portions of the core from a bottom side of the core;
front and rear holding plates to support the left and right supporting plates from front and rear sides of the left and right supporting plates so as to hold a stand-up condition that the left and right supporting plates stand on the bottom plate; and
a supporting structure to make the bottom plate, the left and right supporting plates and the front and rear holding plates in a single body structure and to make the left and right supporting plates and the front and rear holding plates collapsible.

[0010] (1-2) In the packaging structure of (1-1), the front and rear holding plates engages with the left and right supporting plates at the front and rear sides of the left and right supporting plates so as to hold the stand-up condition and each of the left and right supporting plates has a notch to support the both end portions of the core from the bottom side of the core.

[0011] (1-3) In the packaging structure of (1-1), the left and right supporting plates are structured to be collapsible by being extended from the bottom plate in left and right directions and the front and rear holding plates are structured to be collapsible by being extended from the bottom plate in front and rear directions.

[0012] (1-4) In the packaging structure of (1-1), the bottom plate, the left and right supporting plates, the front and rear holding plates and the supporting structure are made of a corrugated cardboard.

[0013] (1-5) In the packaging structure of (1-1), the bottom plate is a palette having a bottom member, a top member, a longitudinal joist member and a transverse joist member, the longitudinal joist member and the transverse joist member are provided between the bottom member and the top member, and each of the bottom member, the top member, the longitudinal joist member and the transverse joist member is made of a corrugated cardboard covered with a outer covering sheet having a waterproof property.

[0014] (1-6) In the packaging structure of (1-5), the palette is structured such that a plurality of longitudinal joist members and a plurality of transverse joist members are mounted on the bottom member, the top member is mounted on the plurality of longitudinal joist members and the plurality of transverse joist members, folk insertion holes are provided between the plurality of longitudinal joist members and a water penetration preventing measure is applied to the both ends of each of the plurality of longitudinal joist members.

[0015] (1-7) In the packaging structure of (1-1), the bottom plate is a palette, and wherein the left and right supporting plates, the front and rear holding plates and the supporting structure are fixed on the palette.

[0016] (1-8) In the packaging structure of (1-7), further comprising:

an outer covering structure being a collapsible box having a ceiling plate and an open bottom so as to mount on the palette; and
an enforcing structure including left and right enforcing plates to be placed at both sides of the left and right supporting plates and front and rear enforcing plates to be placed at front and rear sides of the front and rear holding plates, wherein the left and right enforcing plates and the front and rear enforcing plates are connected so as to surround the left and right supporting plates and the front and rear holding plates and wherein the left and right enforcing plates and the front and rear enforcing plates are placed on the palette so as to support the ceiling plate of the box.

[0017] (1-9) In the packaging structure of (1-8), the left and right supporting plates, the front and rear holding plates, the supporting structure, the palette, the outer covering structure and the enforcing structure are made of a corrugated cardboard.

[0018] (1-10) In the packaging structure of (1-1), further comprising:

a pair of narrow width adapting blocks each including a core supporting plate having the same shape and same size as that of the left and right supporting plates, and front and rear standing plates connected to the core supporting plate so as to be collapsible,
wherein the pair of narrow width adapting blocks are placed between the left and right supporting plates and the core of roll-shaped materials having a narrow width is supported between the pair of narrow width adapting blocks by the core supporting plates, and
wherein the bottom plate, the left and right supporting plates, the front and rear holding plates, the supporting structure and the pair of narrow width adapting blocks are made of a corrugated cardboard.

[0019] (1-11) A method of transporting roll-shaped materials wound on a core, comprises:

packaging the roll-shaped materials with a packaging structure comprising,

a bottom plate;
left and right supporting plates to support both end portions of the core from the bottom of the core;
front and rear holding plates to support the left and right supporting plates from front and rear sides of the left and right supporting plates so as to hold a stand-up condition that the left and right supporting plates stand on the bottom plate; and
a supporting structure to make the bottom plate, the left and right supporting plates and the front and rear holding plates in a single body structure and to make the left and right supporting plates and the front and rear holding plates collapsible; and

transporting the roll-shaped materials packaged with the packaging structure.

[0020] (1-12) In the method of (1-11), an entire figure of the core and the roll-shaped materials wound on the core are enclosed with a light intercepting film.

[0021] (1-13) In the method of (1-12), the light intercepting film is shaped in a cylinder.

[0022] (1-14) In the method of (1-11), the packaging structure further comprises a pair of core caps each comprising an inserted section having an outer diameter corresponding to an inside diameter of the core and a flange connected to one end of the inserted section so as to stop the insertion, and wherein the pair of core caps are inserted into both ends of the cores so as to prevent deformation of the core caused by the weight of the roll-shaped materials.

[0023] Further, the above object of this invention may be achieved by the following preferable structures.

[0024] (2-1) In packaging structure for packaging roll-shaped materials wound on a core, the packaging structure is characterized in that left and right supporting plates which support both ends of the above core from the bottom of the core and front and rear holding plates which support the left and right supporting plates from front and rear sides so as to hold the stand-up condition of the left and right supporting plates are made in a single body structure in which the left and right supporting plates and the front and rear holding plates are collapsible.

[0025] (2-2) In packaging structure for packaging roll-shaped materials wound on a core, the packaging structure is characterized in that left and right supporting plates which have notch to support both ends of the above core from the bottom of the core and come in contact with the both ends of the roll-shaped materials from the sides of the both ends of the roll-shaped materials and front and rear holding plates which engage with the left and right supporting plates from front and rear sides of the left and right supporting plates are made in a single body structure in which the left and right supporting plates and the front and rear holding plates are collapsible.

[0026] (2-3) In the packaging structure for packaging roll-shaped materials wound on a core, the packaging structure is characterized in that the packaging structure comprises a bottom plate, left and right supporting plates formed to be collapsible by being extended in left and right directions from the above bottom plate, and

front and rear holding plates formed to be collapsible by being extended in front and rear directions from the bottom plate, wherein the left and right supporting plates and the front and rear holding plates are structured to hold a stand-up condition by an engagement structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027]

Fig. 1 is a perspective view of one form of a packaging system of roll-shaped materials embodying the present invention.
Fig. 2 is an exploded perspective view of one form of a pallet embodying the present invention.
Fig. 3 is an explanatory view of a structure of a corrugated cardboard used in the present invention.
Fig. 4 is a perspective view of one form of a supporting structure embodying the present invention.
Fig. 5 is a perspective view of one form of an engagement structure embodying the present invention.
Fig. 6 is a perspective view of another form of an engagement structure embodying the present invention.
Fig. 7 is a perspective view of one form of a finished packaging condition with its interior being partially illustrated in perspective, embodying the present invention. (A multi-stage reinforcement assembly is abbreviated.)
Fig. 8 is a perspective view of one form of a multi-stage reinforcement assembly embodying the present invention.
Fig. 9 is a perspective view of another form of a finished packaging condition with its inside been partially illustrated in perspective embodying the present invention.
Fig. 10 is a perspective view of one form of a narrow width adapter block embodying the present invention.
Fig. 11 is a perspective view of one form of a core cap embodying the present invention.
Fig. 12 is a perspective view of another form of a finished packaging condition using a narrow width adapter block with its inside been partially illustrated in perspective embodying the present invention. (The multi-stage reinforcement assembly is abbreviated.)
Fig. 13 is a perspective view of a supporting structure on which the multi-stage reinforcement assembly is mounted.
Fig. 14 is a cross sectional view showing a light sensitive material packaging body according to the present invention.
Fig. 15 is cross sectional view showing a light sensitive material packaging body according to prior art.
Fig. 16 is a perspective view showing a packaging structure according to prior art.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0028] This invention is particularly understood with reference to the following attached drawings. This description is concerned with the case where the roll-shaped materials is the light sensitive material, however, it is needless to say that this invention is also applicable to packing materials of various kinds of roll-shaped materials, as mentioned above.

[0029] Referring to Fig. 1, the packaging structure of this invention for the roll-shaped light sensitive material 10 is fundamentally composed of supporting structure 30, and outer covering structure 50, which are built on pallet 20. Supporting structure 30, as mentioned later, has an embodiment in which the lower surface of its bottom plate is fixed, or an embodiment in which it is not fixed, onto the upper surface of pallet 20.

[0030] The packaging structure of this invention compose one unit as illustrated in Fig. 1 either for storage or transport, and are used by stacking more than two units, or, for example, may be stacked four units high. Accordingly, it is essential that pallet 20, supporting structure 30, and outer covering structure 50 must have the strength which can withstand the weight of a maximum of these stacked units.

[0031] In this invention, it is preferable that corrugated cardboard is used for all the structural material such as pallet 20, supporting structure 30, outer covering structure 50, and core cap 70. As mentioned later, various kinds of corrugated cardboard, especially reinforced corrugated cardboard can be used, and at least for pallet 20, partly or entirely, waterproof corrugated cardboard is used. However, when anti-waterproof corrugated cardboard is used, waterproof face sheets are used in order to prevent water from permeating through the front, rear, length and breadth of each of the structure members. These will be detailed later.

[0032] Features of the packaging structure of this invention is that pallet 20, supporting structure 30, and outer covering structure 50, have a folding structure, and can thus be transported with every member folded onto the upper surface of pallet 20, except when used for actual packaging. Herein, roll-shaped light sensitive material 10 which is packaged with the packaging structure of this invention will be described in further detail.

[0033] Roll-shaped light sensitive material 10, shown in a rough sketch of Fig. 1 has the structure that light sensitive material such as photographic film or paper strips are wounded on core 11, and are packaged in moisture-proof and light intercepting condition in a light-shielding medium such as light intercepting film. Each end of core 11 is covered with core cap 70. The light sensitive material 10 is referred to as "supply roll", having, for example, various widths ranging from 500 to 1500 mm.

[0034] The structure of pallet 20 is described as follows. Referring to the drawings as shown in Fig. 2, pallet 20 is comprised of longitudinal joist member 22 and lateral joist member 23 secured to bottom plate 21, and covered by top plate 24. The above members are composed by cutting corrugated cardboard. In the following paragraphs, the structure and characteristics of the corrugated cardboard will be explained.

[0035] Fig. 3 shows a sample piece of stratified corrugated cardboard, with sectional views taken on line B-B, and line C-C. Since the stratified corrugated cardboard has a structure of corrugated sheets being stacked between flat sheets, openings of corrugations formed by the corrugated sheet exist continuously in the direction of Y1 or Y2, but there is not continuous opening in the direction of X1 or X2 due to being blocked with the corrugated cardboard. Therefore, not being a waterproof structure, water can flow in section Y1-Y2, but water permeation is prevented from the section of X1-X2, though the surface may become wet. However, in case when a waterproof adhesive agent, such as a waterproof paste, is not used for the adhesion of the flat sheets to the corrugated sheets, it is preferable to use a waterproof adhesive agent between flat and corrugated sheets, to prevent the possibility of the adhesive parts being dissolved by contact with water.

[0036] The stratified corrugated cardboard has alternating section Y1-Y2 and section X1-X2 as shown in D-Sec. This structure of the corrugated cardboard, is designed for strength in both directions, length and breadth, can be effectively used for the packaging structure of this invention. However, for the packaging structure of this invention, the stratified corrugated cardboard having section of Y1-Y2 is mainly used for preventing water permeation (direction Y1-Y2).

[0037] Each member, such as bottom plate 21, longitudinal joist member 22, lateral joist member 23 and top plate 24, are used in such a manner as section Y1-Y2 and section X1-X2 show in Fig. 2.

[0038] In cases when the surface of section Y1-Y2 is exposed on, a waterproof structure is essential for these parts, because water will easily permeate through the openings of the corrugations of the corrugated sheets, as mentioned above. As an example of a waterproof structure, there is a method in which single or double layered corrugated cardboard sheets are cut to the same size on section Y1-Y2, and adhered to section Y1-Y2 by a waterproof adhesive agent using waterproofed surface paper or backing paper, and there is also another method in that waterproof corrugated cardboard is used instead of normal corrugated cardboard.

[0039] In addition to the above structures, it is preferable to have a waterproof structure on the surface of section X1-X2 of the corrugated cardboard, by covering those ends with waterproofed surface paper. Still more, in Fig. 2, No.25 are fork insertion cut-out for fork lift, and No.26 and 27 are the front surface covering plate and the rear surface covering plate, respectively, and have fork insertion cut-out 28 corresponding to the fork insertion cut-out 25.

[0040] Referring to other embodiments of the pallet 20, there is pallet structure shown in Fig. 2 whose top plate 24 is removed, and which extends both the ends of front and rear of bottom plate 21, and is adhered to top plate 29 by wrapping the front and rear of the pallet (the structure where front and rear surface covering plates 26 and 27 are omitted from top plate 29). It is preferable to use waterproof paper for the surface paper and a waterproof adhesive agent in this case.

[0041] Furthermore, referring to supporting structure 30 in Fig. 4, both ends of right and left of bottom plate 31 are extended, and left supporting plate 32 and right supporting plate 33 are composed to be collapsible, and both ends of front and rear of bottom plates 31 are extended, and front holding plate 34 and rear holding plate 35 are composed to be collapsible. Still further, notched portions 32' and 33' are composed on left and right supporting plates 32 and 33, in which both ends of core 11 are set and supported.

[0042] The following method is shown for the embodiment of the collapsible structure. That is, underside surface paper and outside surface paper of left and right supporting plates 32 and 33 are made by extending top surface paper of bottom plate 31, and these surface papers join bottom plate 31 and left and right supporting plates 32 and 33 which have thickness respectively, and they become collapsible on their contacting lines. Furthermore, outside surface paper of the front and rear holding plates 34 and 35 are made by extending upside surface paper of bottom plate 31, and these surface papers join underside plate 31 and front and rear holding plates which have thickness within measure respectively, and they become collapsible on their contacting lines.

[0043] In order to maintain the standing position of left and right supporting plate 32 and 33, engagement structures 36 are provided for front and rear holding plates 34 and 35, and left and right supporting plates 32 and 33. The following is one form of engagement structure 36. That is, as shown in Fig. 5, at the front and rear base of left and right supporting plates 32 and 33, cut-out portion 37 with a rounded portion is provided, and engagement piece 40 is fixed, which has cut-out portion 38 on its upper section and engagement inserter 39 on its lower section.

[0044] On the other hand, engagement notch 43 which receives engagement inserter 39 is provided on left and right side supporting plates 32 and 33 so as to make it possible to compose connecting portion 41 which meets the vertical wall of cut-out portion 37 and to make it possible to compose connecting portion 42 which meets the vertical wall of cut-out portion 38. In this embodiment, while left and right supporting plates 32 and 33 are standing, engagement inserter 39 can be mated with engagement hole 43 by operation which stands front and rear holding plates 34 and 35, and at the same time, connecting portions 41 and 42 can be

fixed to the vertical wall of cut-out portions 37 and 38 respectively.

[0045] Another embodiment, shown in Fig. 6, of supporting structure 30, is composed of engagement projection 40 at the bases of left and right supporting plates 32 and 33. In Fig. 6, the parts which are indicated by same number as the parts of Fig. 5, mean the same part names as the parts of Fig. 5.

[0046] Next, referring to outer covering structure 50, Fig. 7 illustrates one embodiment of the finished packaging structure of the packaging structure of the present invention. That is, all members of supporting structure 30 on pallet 20 are covered by outer covering box 51 whose bottom is open.

[0047] Since the packaging units of the present embodiment may be stacked four high, the following multi-stage reinforcement assemblies are used. That is, as shown in Fig. 8, multi-stage reinforcement assembly 56 is used, which is composed of left and right reinforcing plates 52 and 53 that are mounted above left and right supporting plates 32 and 33, and extend to the top plate of outer covering box 51, and is further composed of front and rear reinforcing plates 54 and 55 that cover the outside of front and rear holding plates 34 and 35.

[0048] It is preferable that this multi-stage reinforcement assembly 56 is collapsible by connecting front and rear reinforcing plates 54 and 55 at the outside of left and right supporting plates 32 and 33 (refer to points A in Fig. 8). Moreover, above multi-stage reinforcement assembly 56 is composed so as to cover supporting structure 30 from top as shown in Fig. 13. As another embodiment, for example, cutting and dividing front and rear reinforcing plate 54 at the center, (refer to points B in Fig. 8), it may compose a left and right unit. In this case, there is no problem of compromising strength, because the whole unit is covered by outer covering box 51 (which is a box style with its bottom opened, and is collapsible).

[0049] Since the light sensitive materials which are transported in the packaging of this invention have various widths, it is preferable for the narrower light sensitive materials to make supporting structure 30 in accordance with the greatest width of the light sensitive materials, and to use a narrow width adapter block 60. It is preferable that the narrow width adapter block 60 is made of corrugated cardboard.

[0050] One embodiment of this narrow width adapter block 60 is shown in Fig. 10, and is composed of front and rear standing plates 62 and 63 collapsible, by extending both ends of core supporting plates 61 which are nearly the same shape and size as left and right supporting plates 32 and 33. Besides, notched portion 64 in Fig. 10 corresponds to notched portions 32' and 33'. In this invention, two narrow width adapter blocks 60 are used for one unit, and narrower light sensitive material rolls are centered in the unit. That is, mounting two narrow width adapter blocks 60 so as to face each other and set on bottom plate 31 and further to be between left and right supporting plates 32 and 33, and then setting core 11 on each of notched portions 64 of core supporting plate 61, both ends of various widths of light sensitive materials (supply roll) 10 will be supported with each roll end surface touching to core supporting plates 61. By preparing various sized narrow width adapter blocks 60 for which various lengths of front and rear stabilizers 62 and 63 exist, it becomes possible to securely ship and store the various widths of photographic materials 10 (supply roll). Further by composing an engagement structure which can engage front and rear stabilizers 62 and 63 with front and rear holding plates 34 and 35, it is also possible to need only one pair of narrow width adapter blocks 60.

[0051] The embodiment of narrow width adapter block 60 enables a structure which is collapsible into a flat plate by folding front and rear stabilizers 62 and 63 to be aligned with core supporting plate 61.

[0052] By inserting core cap 70 into the opening of both ends of core 11, crushing of the core by the weight of the light sensitive materials (supply roll) may be prevented. One embodiment of core cap 70, made of corrugated cardboard, is shown in Fig. 11. That is, provided are inserting portion 71, which has slightly smaller external diameter than the internal diameter of core 11, and flange 72 which prevents inserting portion 71 from being totally inserted into roll core 11. This invention is applicable to not only the above roll-shaped light sensitive materials but also other roll-shaped materials.

[0053] With this invention, it is possible to have a unit which is collapsible and small-sized, easy to transport or store when it is not used for packaging, and can be used repeatedly. When it does not use any wooden members, such as a wooden box or a guide plates, a fumigation process is not necessary and it provides a green packaging unit.

[0054] Next, a preferred embodiment of a packaging body of the roll-shaped light sensitive material according to the present invention will be explained.

[0055] Fig. 15 is a sectional view showing a packaging body of the roll-shaped light sensitive material according to prior art.

[0056] As shown in Fig. 15, a peripheral surface of a bulky roll 92 wound around a roll core 91 is wrapped with Kraft paper 93 and further wrapped with a light intercepting film 94. Sides of the light intercepting film 94 are bent at 90 degrees at the side surface of the bulky roll 92 so as to shield the sides of the bulky roll. Thereafter, the light intercepting film 94 are temporarily fixed with a rubber ring at portions where light intercepting film 94 comes in contact with the core and both ends of the light intercepting film 94 are fixed on the core with an adhesive tape 96.

[0057] Further, as shown in Fig. 16, the both ends of the core 91 are engaged with guide plates 97 so that the bulky roll is suspended in are in a wooden box 98.

[0058] In the result that the present inventors has continued to study about the above packaging body, the fol-

lowing problem is found. Since the light intercepting film is glued on the outside of the core, it may be difficult depending on the material of the core to intercept moisture invading from the inside of the core. Accordingly, since the perfect moisture proof could not performed, sticking trouble of the light sensitive material may happen.

[0059] The present invention solves the above problems with a light sensitive material packaging body in which an entire body of a roll core and a roll-shaped light sensitive material wound around the roll core is wrapped with a light intercepting film.

[0060] Fig. 14 is a cross sectional view showing an example of the light sensitive material packaging body according to the present invention.

[0061] In Fig. 14, numeral 81 is a roll core. If the roll core has a strength capable of enduring the tension applied at the time of winding the roll-shaped light sensitive material, any material may be used for the roll core. On the roll core, a bulky roll 82 is wound up as same as prior art. On the peripheral surface of the bulky roll, a light intercepting paper 83 is wound up several times. On the light intercepting paper, a cylindrical light intercepting film covers and wraps. The both ends of the light intercepting film are squeezed. After the tip ends are bent once, the both ends are bound with a binding member such as a string. Then, each of the bound both ends is pushed and pressed into the inside of the roll core. Here, the light intercepting paper 83 and the light intercepting film 84 may be made with a single layer or multi layers.

[0062] The core 81 of the present invention, for example, may be made of paper with a diameter from 100 to 300 mm, preferably from 150 to 200 mm, more preferably from 160 to 180 mm, and a length from 1,000 to 1,600 mm, more preferably from 1,100 to 1,400 mm. The diameter of the bulky roll is 500 to 700 mm, preferably 600 to 650 mm and the length is 900 to 1500 mm, preferably 1000 to 1400 mm. The embodiment of light intercepting structure is as follows. That is, as the light intercepting paper 83, double wound paper of 85.6 g/m^2 which does not influence photographic character, may be used, and as the cylindrical light intercepting film 84, a film which is made of high pressure method polyethylene containing a black master batch containing a carbon of 40 % by 5% and has a diameter of 670 mm, a length of 2500 mm and a thickness of 0.9 mm may be used by being superimposed to be two sheets. The both ends of the cylindrical light intercepting film are bound with an insulation-rock (not shown in drawings) having a length of 300 mm.

[0063] As stated above, the light sensitive material packaging body of the present invention comprises a roll core, a roll-shaped light sensitive material wound around the roll core, a light intercepting paper wrapping the peripheral surface of the light sensitive material and a cylindrical light intercepting film wrapping a peripheral surface and side surfaces of the light sensitive material and the roll core together as one unit. To shield both ends of the cylindrical light intercepting film may be realized by biding them after bending them one time. As a material to bind them, any material such as a string and an adhesive tape may be used if the material is not loosened.

[0064] In the light sensitive material packaging body of the present invention, by wrapping the roll-shaped light sensitive material and the roll core as one unit with the cylindrical light intercepting film, the light intercepting property and the moisture proof property are secured.

[0065] In the packaging body of the light sensitive material shown in Fig. 14, by inserting the cap shown in Fig. 11 into the inner side of the roll core and then by loading the packaging body on the supporting structure as shown in Fig. 1, the deformation due to the weight of the light sensitive material concentrated at the lower portion of the roll core may be avoided.

Claims

1. A packaging structure for packaging roll-shaped materials wound on a core, comprising:

   a bottom plate;
   left and right supporting plates to support both end portions of the core from a bottom side of the core;
   front and rear holding plates to support the left and right supporting plates from front and rear sides of the left and right supporting plates so as to hold a stand-up condition that the left and right supporting plates stand on the bottom plate; and
   a supporting structure to make the bottom plate, the left and right supporting plates and the front and rear holding plates in a single body structure and to make the left and right supporting plates and the front and rear holding plates collapsible.

2. The packaging structure of claim 1, wherein the front and rear holding plates engages with the left and right supporting plates at the front and rear sides of the left and right supporting plates so as to hold the stand-up condition and each of the left and right supporting plates has a notch to support the both end portions of the core from the bottom side of the core.

3. The packaging structure of claim 1, wherein the left and right supporting plates are structured to be collapsible by being extended from the bottom plate in left and right directions and the front and rear holding plates are structured to be collapsible by being extended from the bottom plate in front and rear directions.

4. The packaging structure of claim 1, wherein the bottom plate, the left and right supporting plates, the front and rear holding plates and the supporting structure are made of a corrugated cardboard.

5. The packaging structure of claim 1, wherein the bottom plate is a palette having a bottom member, a top member, a longitudinal joist member and a transverse joist member, the longitudinal joist member and the transverse joist member are provided between the bottom member and the top member, and each of the bottom member, the top member, the longitudinal joist member and the transverse joist member is made of a corrugated cardboard covered with a outer covering sheet having a waterproof property.

6. The packaging structure of claim 5, wherein the palette is structured such that a plurality of longitudinal joist members and a plurality of transverse joist members are mounted on the bottom member, the top member is mounted on the plurality of longitudinal joist members and the plurality of transverse joist members, folk insertion holes are provided between the plurality of longitudinal joist members and a water penetration preventing measure is applied to the both ends of each of the plurality of longitudinal joist members.

7. The packaging structure of claim 1, wherein the bottom plate is a palette, and wherein the left and right supporting plates, the front and rear holding plates and the supporting structure are fixed on the palette.

8. The packaging structure of claim 7, further comprising:

an outer covering structure being a collapsible box having a ceiling plate and an open bottom so as to mount on the palette; and
an enforcing structure including left and right enforcing plates to be placed at both sides of the left and right supporting plates and front and rear enforcing plates to be placed at front and rear sides of the front and rear holding plates, wherein the left and right enforcing plates and the front and rear enforcing plates are connected so as to surround the left and right supporting plates and the front and rear holding plates and wherein the left and right enforcing plates and the front and rear enforcing plates are placed on the palette so as to support the ceiling plate of the box.

9. The packaging structure of claim 8, wherein the left and right supporting plates, the front and rear holding plates, the supporting structure, the palette, the outer covering structure and the enforcing structure are made of a corrugated cardboard.

10. The packaging structure of claim 1, further comprising:

a pair of narrow width adapting blocks each including a core supporting plate having the same shape and same size as that of the left and right supporting plates, and front and rear standing plates connected to the core supporting plate so as to be collapsible,
wherein the pair of narrow width adapting blocks are placed between the left and right supporting plates and the core of roll-shaped materials having a narrow width is supported between the pair of narrow width adapting blocks by the core supporting plates, and
wherein the bottom plate, the left and right supporting plates, the front and rear holding plates, the supporting structure and the pair of narrow width adapting blocks are made of a corrugated cardboard.

11. A method of transporting roll-shaped materials wound on a core, comprising:

packaging the roll-shaped materials with a packaging structure comprising,

a bottom plate;
left and right supporting plates to support both end portions of the core from the bottom of the core;
front and rear holding plates to support the left and right supporting plates from front and rear sides of the left and right supporting plates so as to hold a stand-up condition that the left and right supporting plates stand on the bottom plate; and
a supporting structure to make the bottom plate, the left and right supporting plates and the front and rear holding plates in a single body structure and to make the left and right supporting plates and the front and rear holding plates collapsible; and

transporting the roll-shaped materials packaged with the packaging structure.

12. The method of claim 11, wherein an entire figure of the core and the roll-shaped materials wound on the core are enclosed with a light intercepting film.

13. The method of claim 12, wherein the light intercepting film is shaped in a cylinder.

14. The method of claim 11, wherein the packaging

structure further comprises a pair of core caps each comprising an inserted section having an outer diameter corresponding to an inside diameter of the core and a flange connected to one end of the inserted section so as to stop the insertion, and wherein the pair of core caps are inserted into both ends of the cores so as to prevent deformation of the core caused by the weight of the roll-shaped materials.

FIG. 1

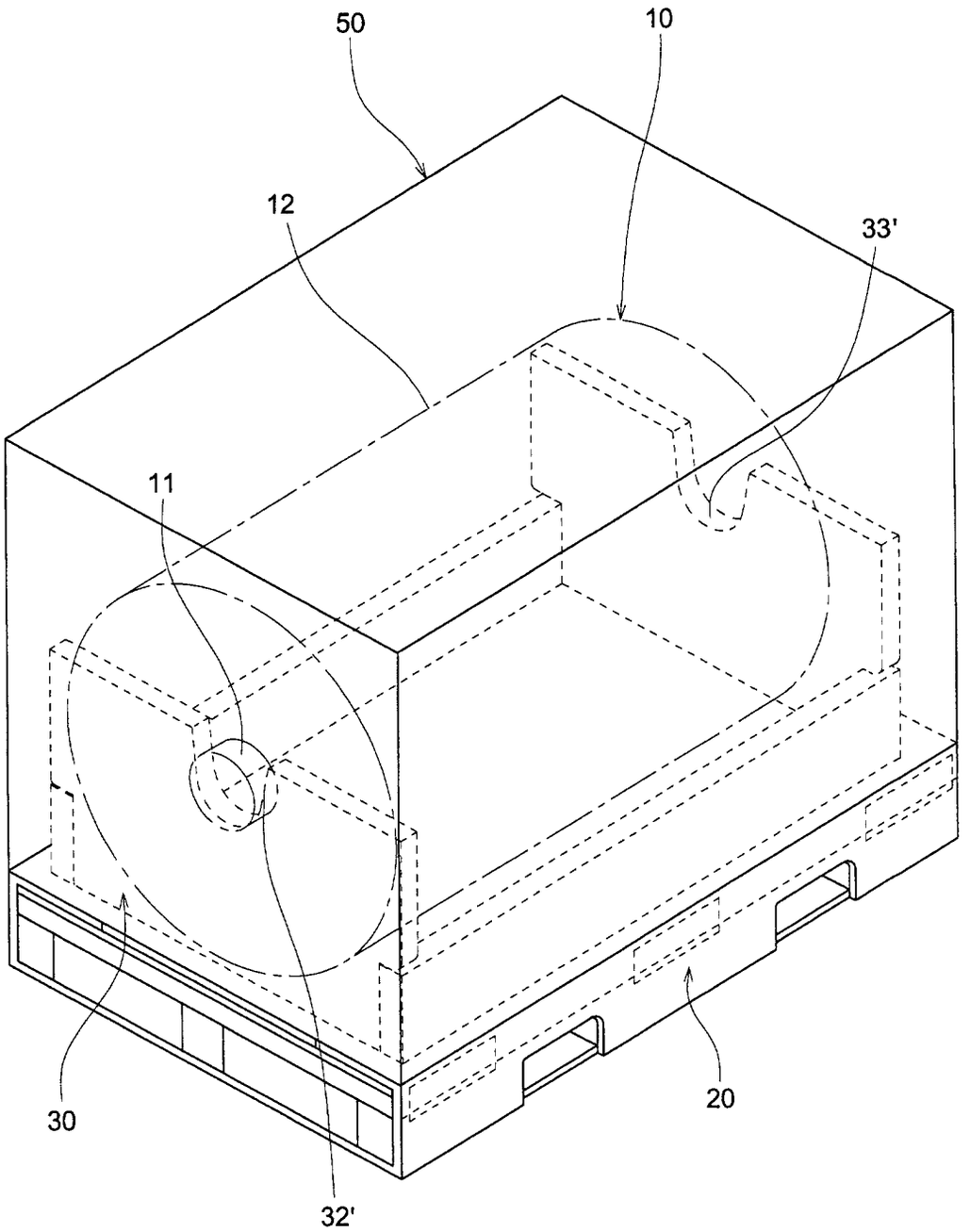


FIG. 2

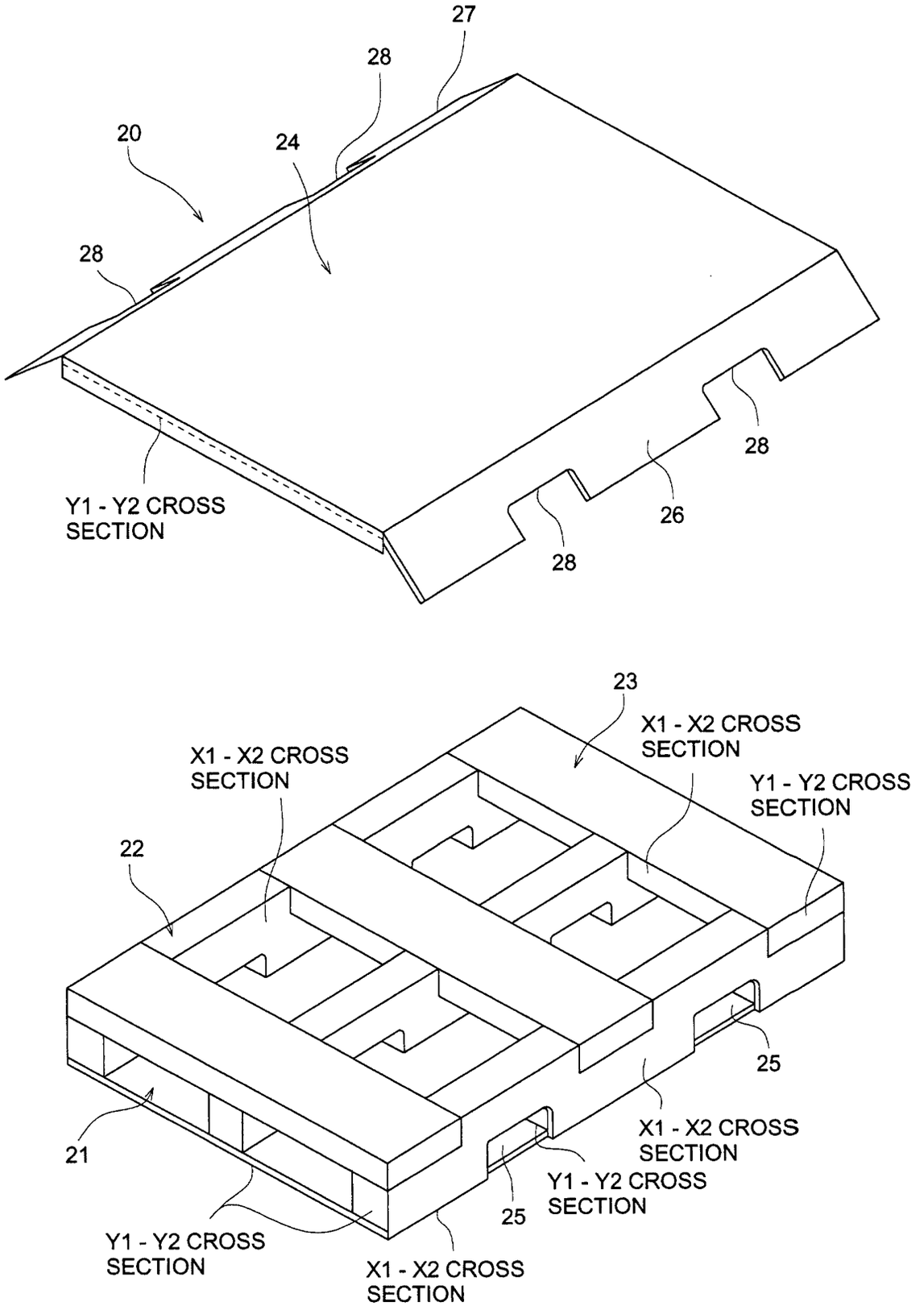
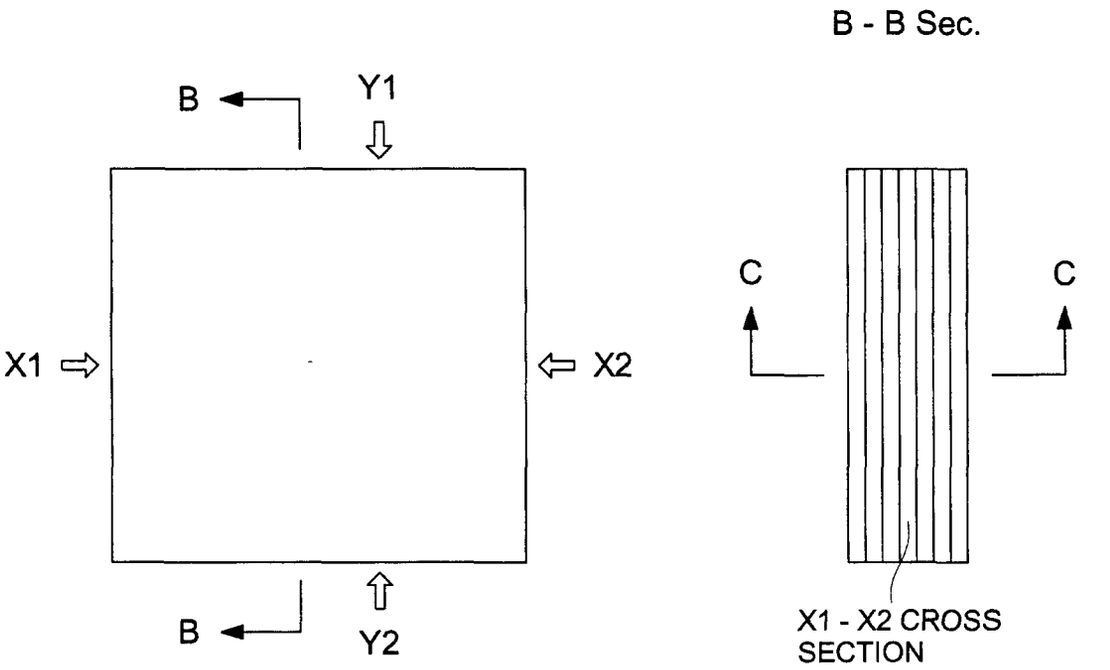

27
28
20
24
28
28
26
28
Y1 - Y2 CROSS SECTION
23
X1 - X2 CROSS SECTION
X1 - X2 CROSS SECTION
Y1 - Y2 CROSS SECTION
22
25
X1 - X2 CROSS SECTION
21
Y1 - Y2 CROSS SECTION
25
Y1 - Y2 CROSS SECTION
X1 - X2 CROSS SECTION

FIG. 3


B - B Sec.
B
Y1
X1
X2
B
Y2
C
C
X1 - X2 CROSS SECTION

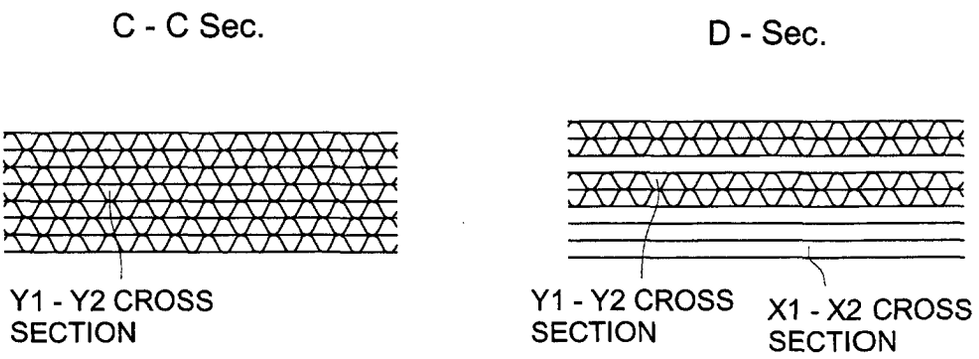

C - C Sec.
Y1 - Y2 CROSS SECTION
D - Sec.
Y1 - Y2 CROSS SECTION
X1 - X2 CROSS SECTION

FIG. 4

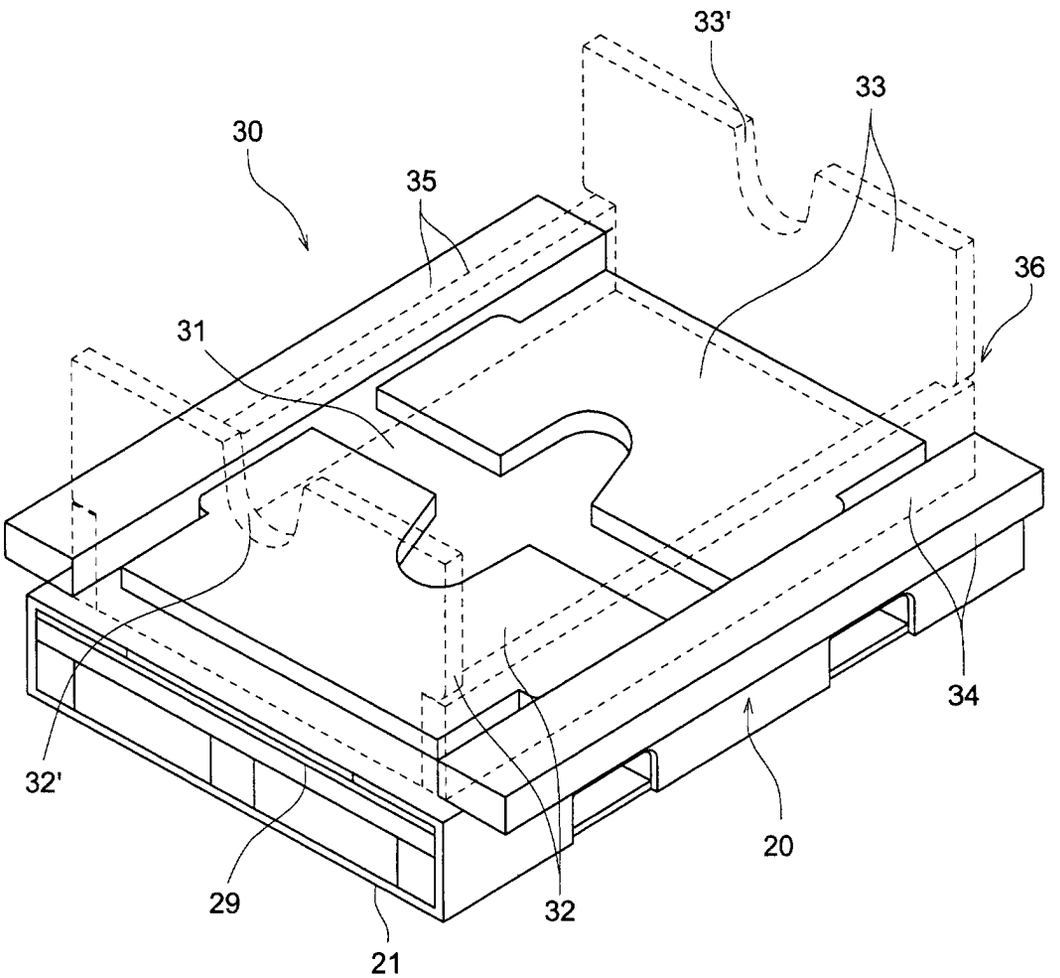


FIG. 5

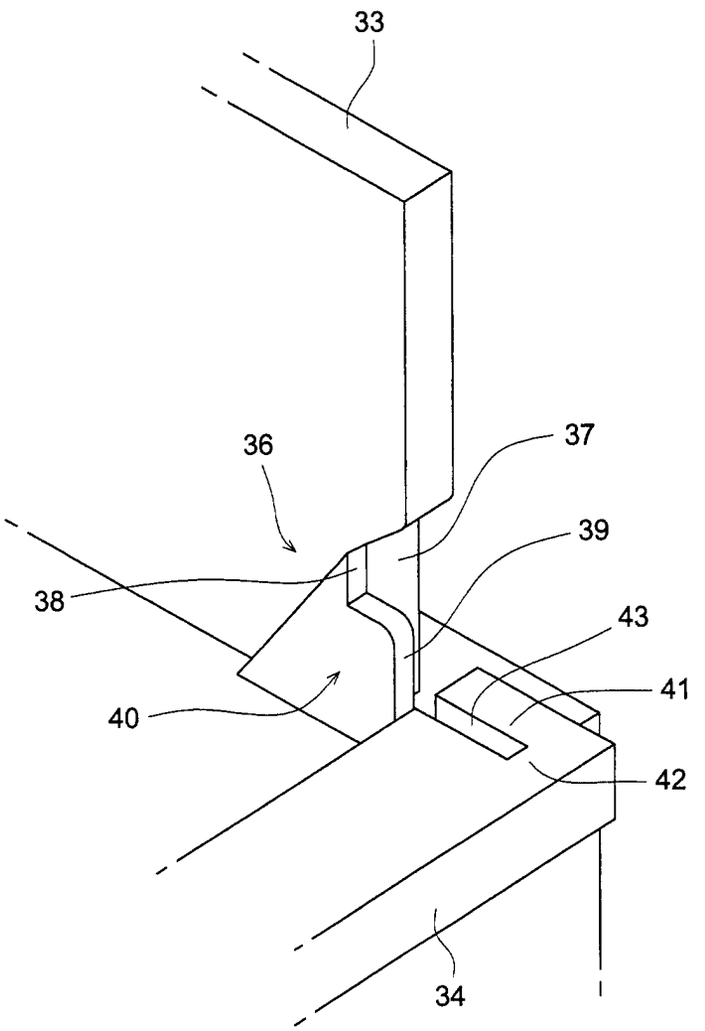


FIG. 6

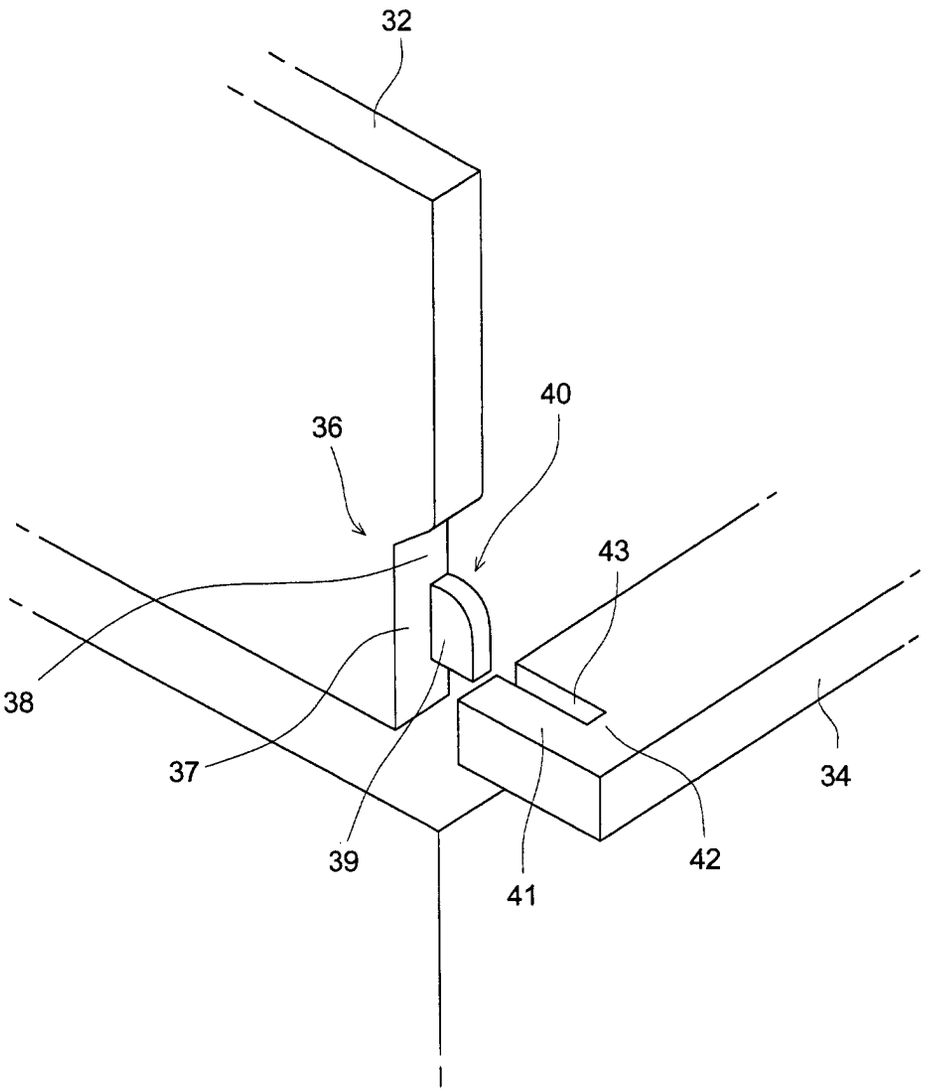


FIG. 7

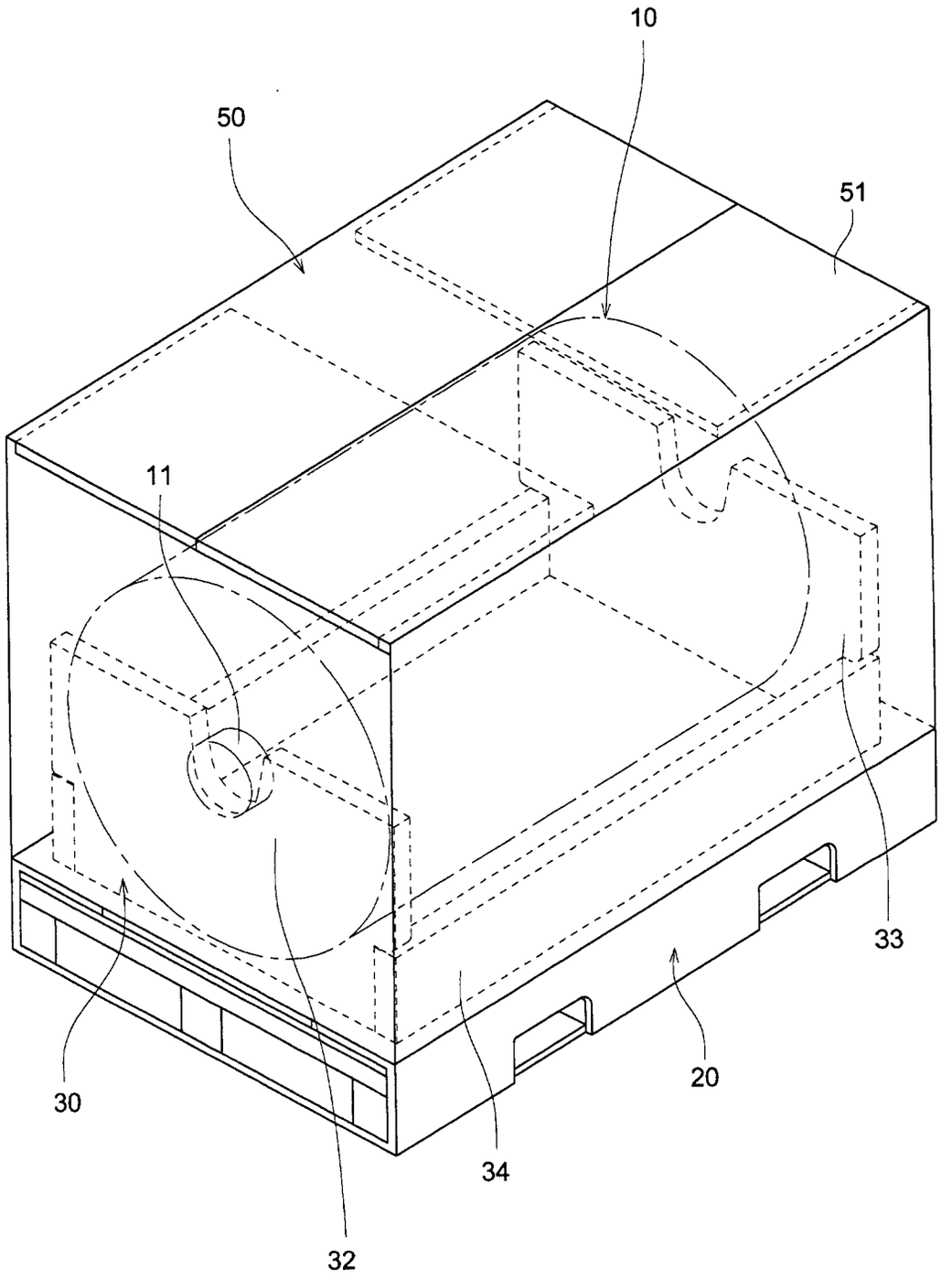


FIG. 8

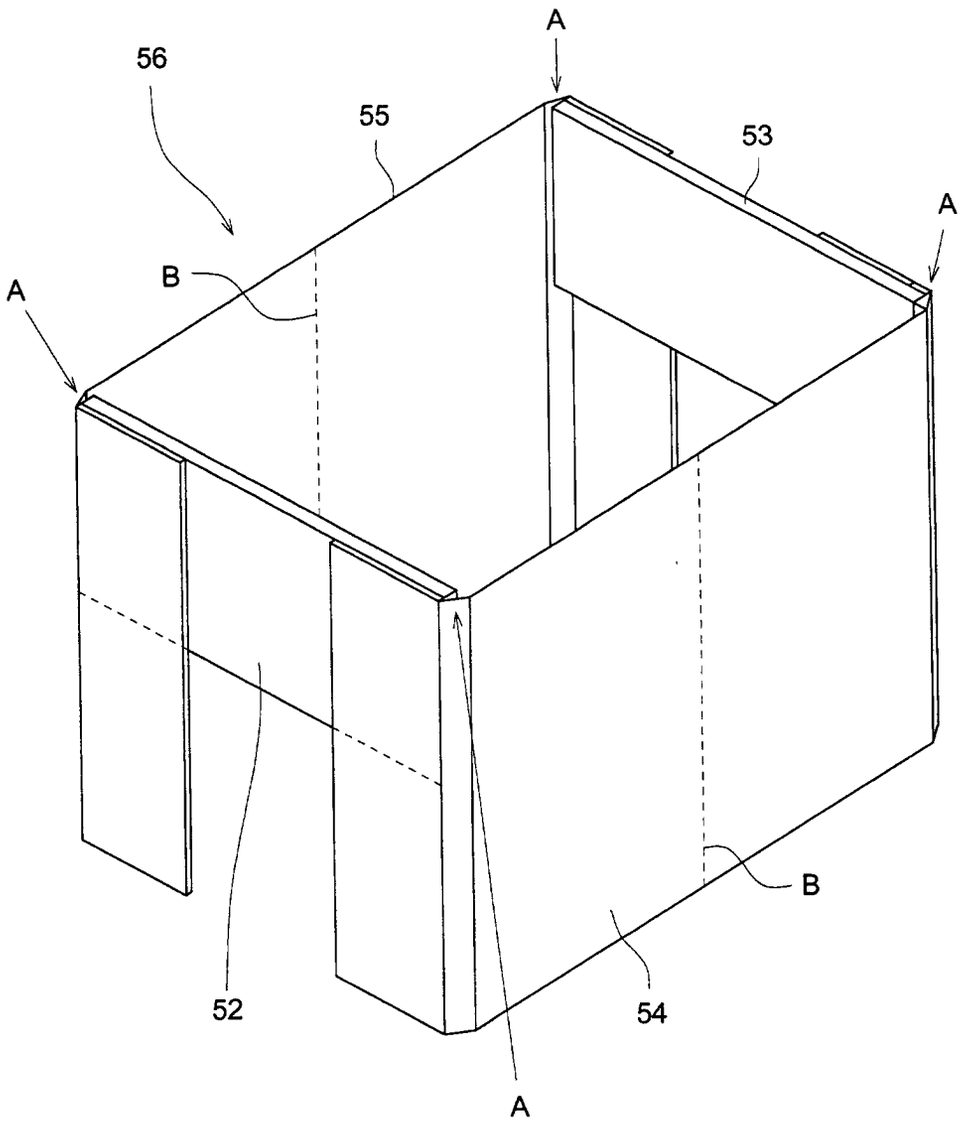


FIG. 9

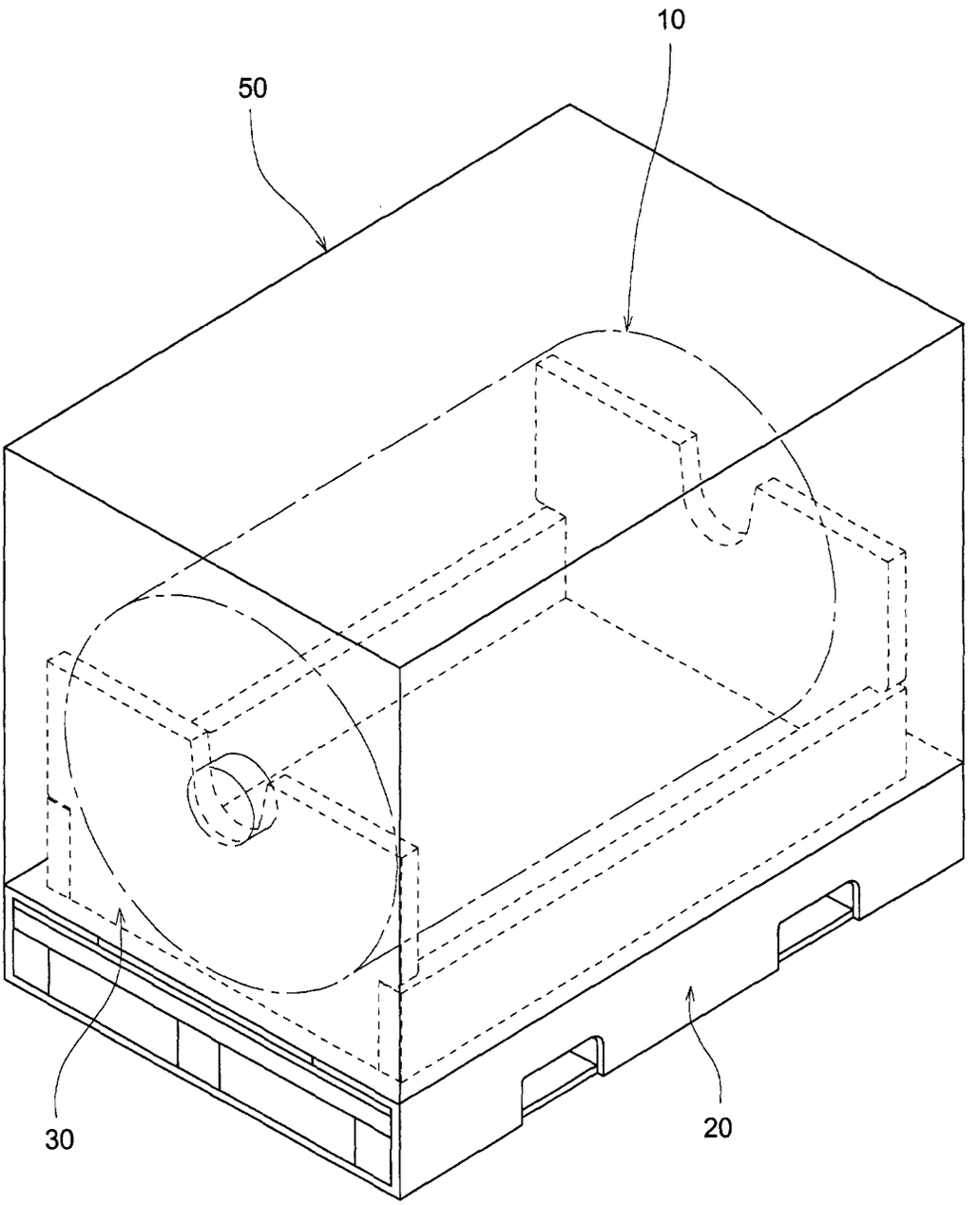


FIG. 10

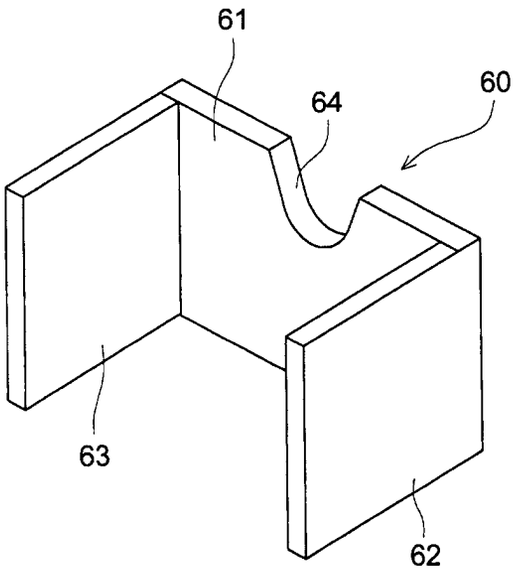


FIG. 11

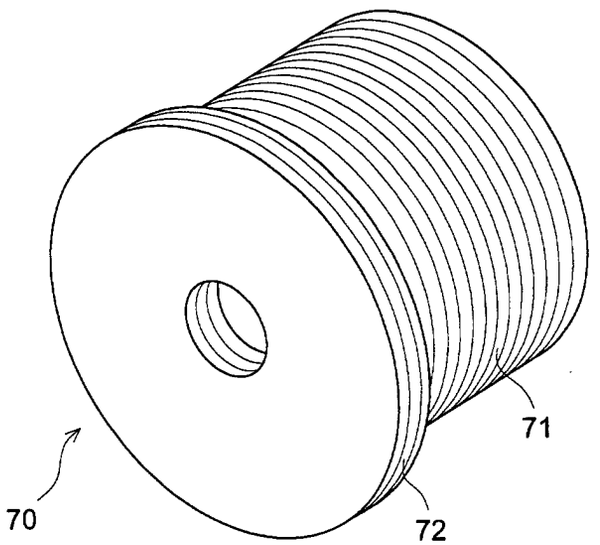


FIG. 12

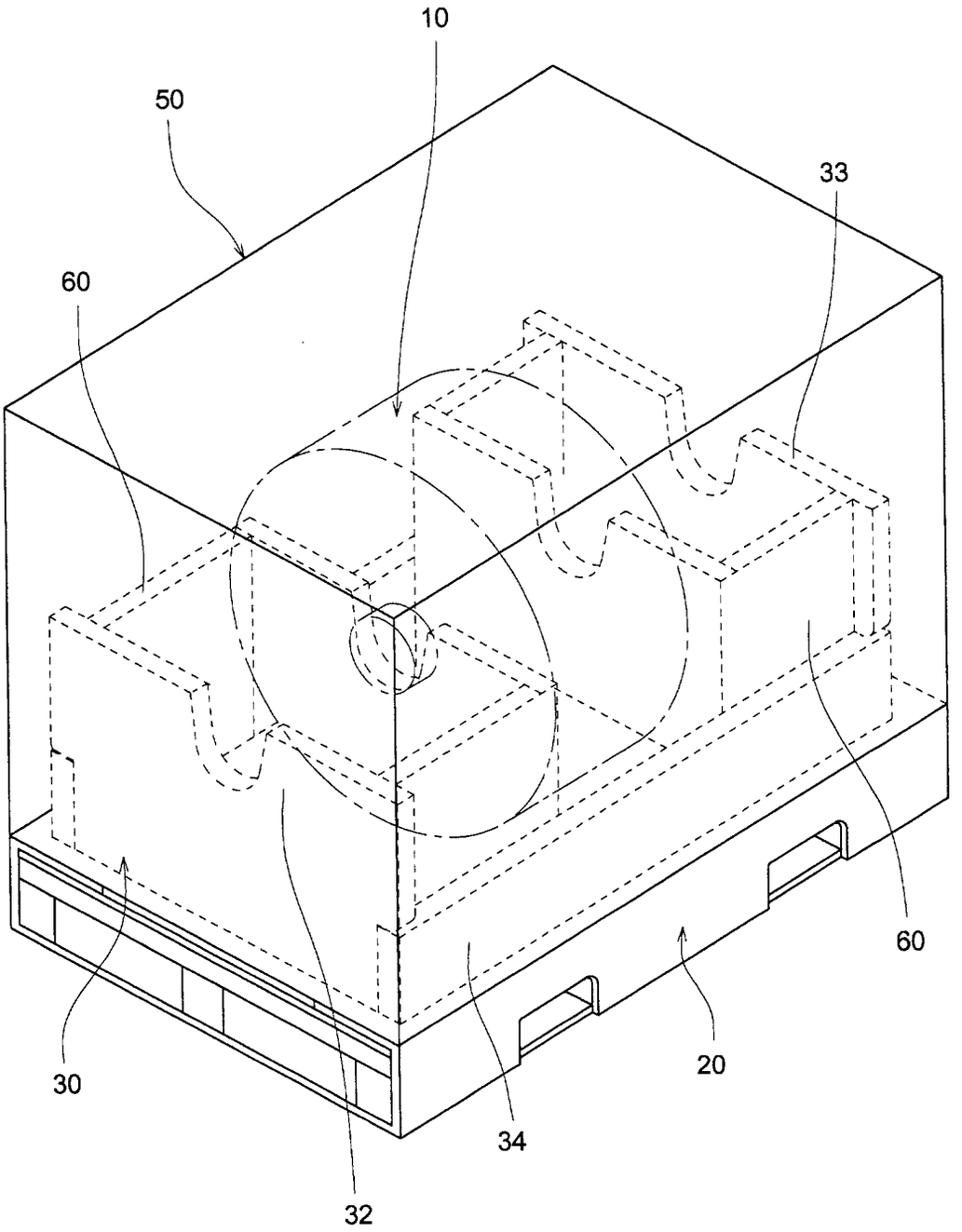


FIG. 13

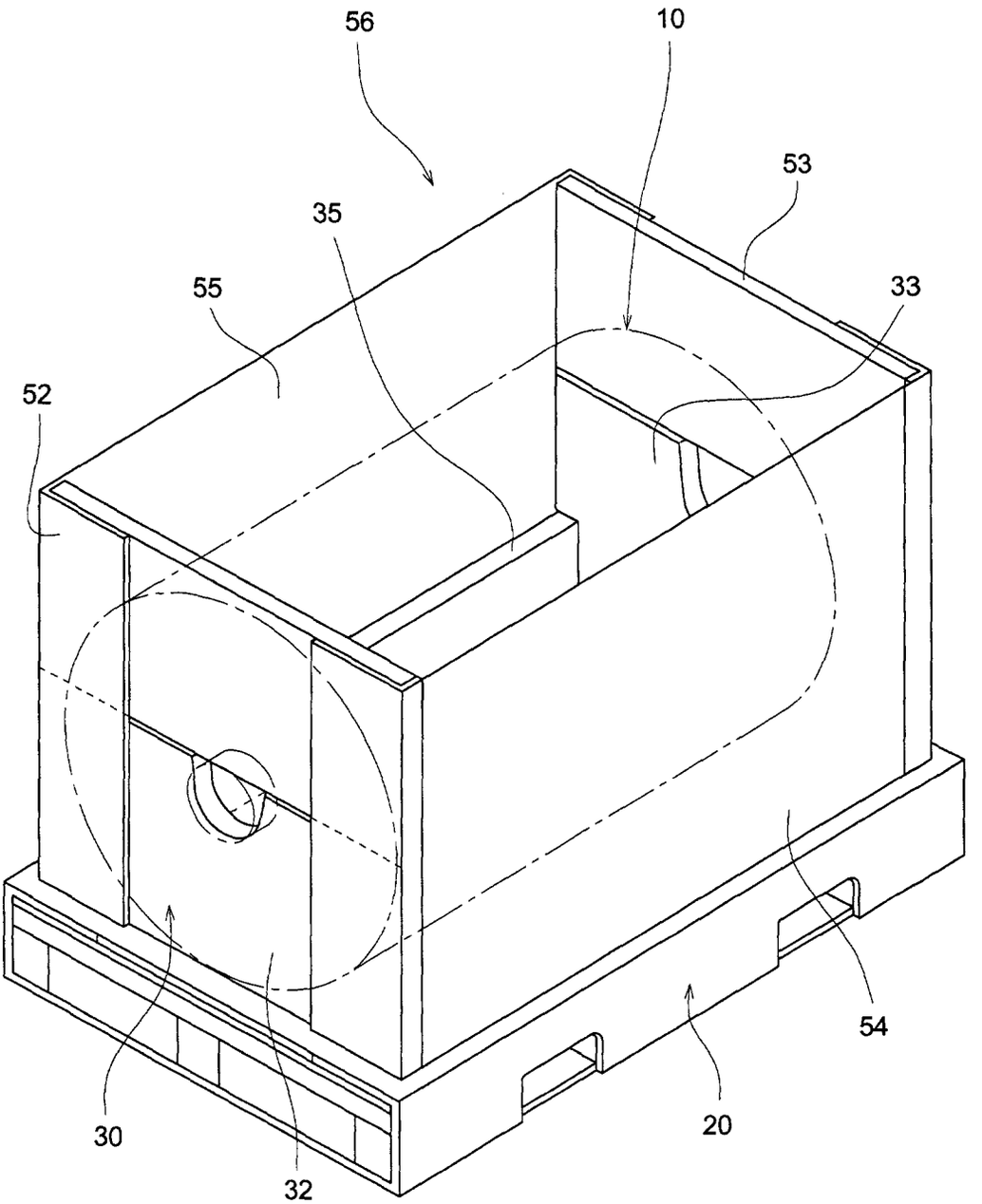


FIG. 14

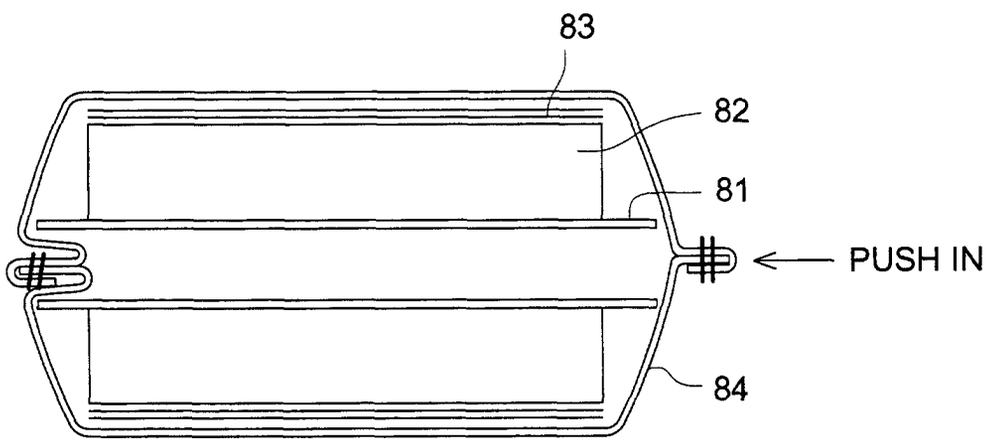


FIG. 15

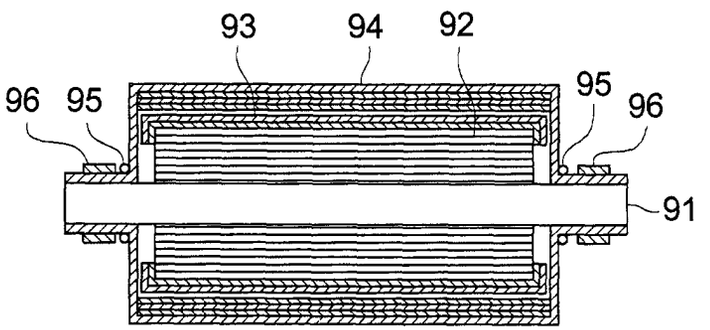
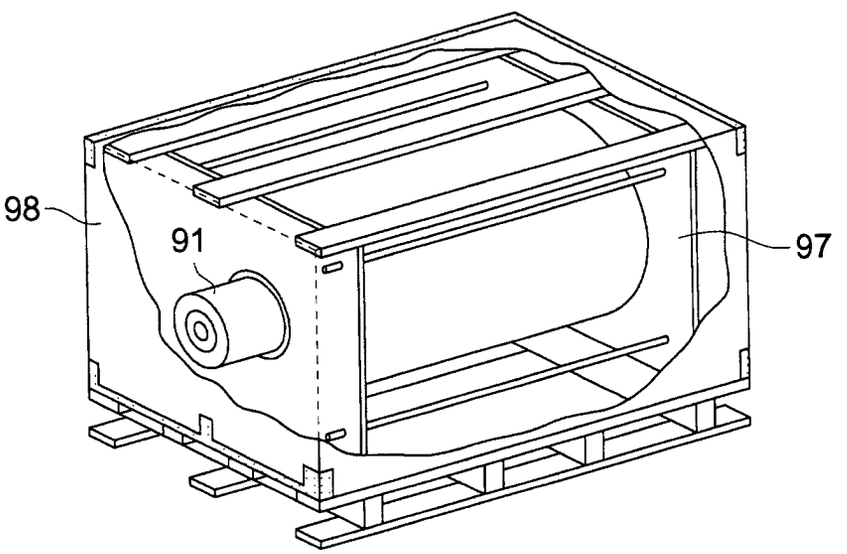


FIG. 16



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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 3569

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	1 August 2001	Schultz, O

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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 3569

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