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(71) Applicant: **KAWASAKI KISEN KAISHA**
8, Kaigan-Dori Chuo-ku
Kobe 650 Hyogo-ken (JP)

(72) Inventor: **Hamada, Hiroshi c/o Kawasaki Kisen Kaisha**
2-9, Nishi-Shinbashi 1-chome
Minato-ku Tokyo 105 (JP)

Watanabe, Takamitsu c/o Kawasaki Kisen Kaisha
2-9, Nishi-Shinbashi 1-chome
Minato-ku Tokyo 105 (JP)

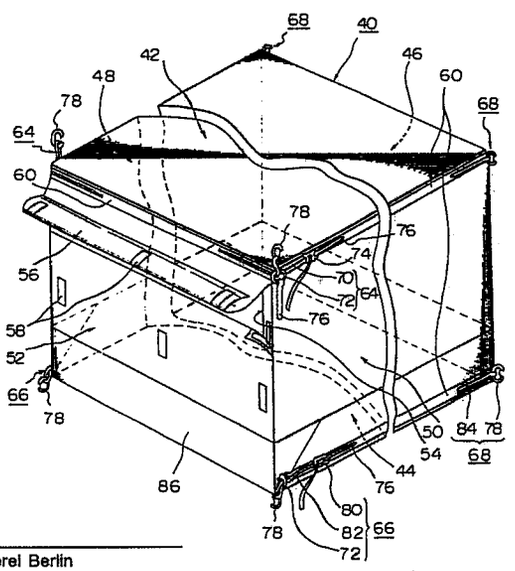
Suzuki, Mitiharu c/o Kawasaki Kisen Kaisha
2-9, Nishi-Shinbashi 1-chome
Minato-ku Tokyo 105 (JP)

(74) Representative: **Purvis, William Michael Cameron et al**
D. Young & Co. 10 Staple Inn
London WC1V 7RD (GB)

(54) Container liner.

(57) A container liner (40) includes an upper wall (42), a bottom wall (44), a rear wall (46), side walls (48, 50) and a front wall (52) to form a hexahedron and has mounting arrangements (64, 66, 68) for mounting the liner (40) to inner walls of a container. The liner (40) includes a box-like member (86) forming at least the outer surface of the bottom wall (44) and of the lower portions of the rear wall (46), the side walls (48, 50) and the front wall (52). The box-like member (86) comprises a bottom made of a middle portion of a single cloth member and side walls made of outer portions of the single cloth member folded upright relative to the middle portion of the single cloth member. Corners of the box-like member (86) can be reinforced by ears formed by corner portions of the single cloth member.

Fig. 2



EP 0 280 493 A2

Description

CONTAINER LINER

This invention relates to a container liner for use in transportation.

Containers have been widely used for transporting bulk goods such as corn, food, raw materials for industries and industrial goods. If these goods are directly received in a container, the interior of the container is likely to be contaminated by the goods and the odor of the goods can remain in the container and detrimentally affect goods subsequently received in the container for transportation. In order to avoid such a disadvantage, goods are often received in a liner supported in a container thereby avoiding direct contact between the goods and the container.

One example of such a liner hitherto used (Japanese Laid-Open Patent Application No. 49-105,686) will be explained hereinafter by referring to Figure 1 of the accompanying drawings.

Figure 1 is a schematic perspective view illustrating a hitherto proposed container liner 8 which has an upper wall 10, a bottom wall 12, a rear wall 14, side walls 16 and 18 and a front wall 20 to form a hexahedron. The liner further comprises hangers 22 and 24 and dump-up fixtures 26 provided at edges of the hexahedron for mounting the liner to the inside of a container. Thus, the liner can be hung and extended in a container by the hangers 22 and 24 and the dump-up fixtures 26 and can receive goods.

Reference numerals 28 and 30 denote charging openings and a small discharging opening, respectively. In the illustrated example, the charging openings 28 are provided on the upper wall 10 for charging the goods, and the small discharging opening 30 is provided on the front wall 20 of the liner 8 for discharging the goods therefrom. Reference numerals 32 and 34 denote a screen canvas and a skirt canvas to form the front wall 20.

In manufacturing such a liner for a container, a plurality of constituting panels having required shapes and sizes are prepared and are joined by sewing or welding to form the container liner. As a result, seams or welds are formed at edges of the liner or jointed together panels are formed in the form of closed loops extending over the upper wall 10, the side walls 16 and 18 and the bottom wall 12. In Figure 1, one example of jointed panels in the form of a closed loop is indicated in dot - and - dash lines a.

Container liners of the prior art have the disadvantage that they are weak in construction and susceptible to damage at a bottom wall portion and jointed panels due to stress concentration at the bottom wall portion and the jointed panels in the proximities of edges of the bottom wall. As a result, goods may be discharged out of the liner through the damaged portions at the jointed panels or exposed parts of the goods may be damaged.

According to the invention there is provided a container liner including an upper wall, a bottom wall, a rear wall, side walls and a front wall to form a hexahedron and having mounting arrangements for mounting the liner to inner walls of a container, characterised in that the liner includes a box-like member forming at least the outer surface of the bottom wall and of lower portions of the rear wall, the side walls and the front wall, the box-like member comprising a bottom made of a middle portion of a single sheet member and side walls made of outer portions of the single sheet member and folded upright relative to the middle portion of the single sheet member.

In a preferred embodiment of the invention, corners of the box-like member are reinforced by ears formed by corner portions of the single sheet member as the box-like member is formed from the single sheet member.

With such a container liner, as the box-like member is formed by the single sheet member, the liner is prevented from being damaged due to stress concentration at the bottom wall and lower portions of the front, side and rear walls.

The invention is diagrammatically illustrated by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a schematic perspective view of a container liner of previously proposed kind;

Figure 2 is a schematic perspective view of a first embodiment of a container liner according to the invention;

Figures 3a and 3b are perspective views illustrating manufacturing steps for the liner of the first embodiment of the invention;

Figure 4 is a plan view illustrating a cloth member for constituting a box-like member for a second embodiment of a container liner according to the invention; and

Figure 5 is a plan view illustrating a cloth member for constituting a box-like member for third embodiment of a container liner according to the invention.

Figure 2 shows a container liner 40 having an upper wall 42, a bottom wall 44, a rear wall 46, side walls 48 and 50 and a front wall 52 to form a hexahedron.

The liner 40 is provided with an opening 54 at an upper portion of the front wall 52 for charging goods and with a cover member 56 extending from a location above the opening 54 for opening and closing the opening 54. Moreover, particulate material such as grain may be discharged through the opening 54 by means of vacuum suction means.

Fastening members, as shown surface fasteners 58, are provided to anchor the free end of the cover member 56 to a middle portion of the front wall 52 to close the opening 54.

Reinforcing cloth strips 60 are provided along edges of the inner bag in this embodiment to reinforce the liner 40, if required.

Mounting arrangements 64, 66 and 68 are provided on the liner 40 for mounting the liner 40 to inner walls of a container.

In this embodiment, the mounting arrangements

64 are provided at the two upper corners of the front wall 52 of the liner. The mounting arrangements 66 are provided at the two lower corners of the front wall 52, and the mounting arrangements 68 are located at the four corners of the rear wall 46.

Any constructions of the mounting arrangements 64, 66 and 68 are acceptable. In this embodiment, for example, the mounting arrangements 64 may be case hanging previously proposed by the applicants. Each mounting arrangements 64 comprise a strap 70 with one end fixed to one face of the respective corner of the liner 40 and the free end anchored to a buckle 74 provided at another face of the corner of the liner, and an ring 72 provided at the corner. In the illustrated embodiment, the ring 72 is secured at the corner by a further strap 76, and the buckle 74 is provided to the side edge of the corner by means of a further strap 76.

Part of the strap 70 between the fixed and free ends passes through the ring 72 to form a loop. This loop is connected to an attaching portion (not shown) of an inner wall of a container by means of a C-shaped mounting ring 78.

The length of the loop of the mounting arrangement 64 can be made smaller by pulling the free end of the strap 70. In hanging and extending the inner bag in a container, the loop of the strap 70 is made smaller to tension the liner 40.

The buckle 74 in this embodiment is provided with a stopper which is inoperative, that is it does, not anchor the free end of the strap 70 when the free end is pulled in a direction making the loop smaller, but is operative to anchor the free end when the strap is subjected to a force in a direction opposite to the direction making the loop smaller. Accordingly, a small size loop is held to its size by the buckle 74, so that the inner bag is maintained under the tensioned condition.

The mounting arrangement 66 comprises a ring 72 and a strap 82 with one end fixed to a one face of the respective corner of the liner and the free end anchored by a buckle 80 provided in the proximity of the face to which the fixed end is fixed. The ring 72 is provided at the corner of the liner. In this embodiment, a buckle 80 is provided at said face of the corner of the liner with the aid of a further strap 76, and the ring 72 is mounted at the corner with the aid of a reinforced cloth strap 60.

In the mounting arrangement 66, part of the strap 82 passes through the ring 72 to form a loop in the same manner as in the jointing arrangement 64. The loop can be connected to an attaching portion of an inner wall of a container with the aid of a mounting ring 78. By making the loop of the strap 82 smaller, the liner can be tensioned.

The loops of the straps 70 and 82 may if desired be directly connected to attaching portions of the inner walls of a container.

The mounting arrangement 68 comprises a strap 84 fixed to a face of a corner of the liner and a mounting ring 78 fixed to the strap 84. In hanging and extending the liner in a container, the mounting ring 78 of the mounting arrangement 68 is connected to an attaching portion on an inner wall of a container.

In Figure 2, reference numeral 86 denotes a box-like member forming at least the outer surface of the lower 44 and of lower portions of the rear wall 46, side walls 48 and 50 and front wall 52, respectively.

The box-like member 86 of this embodiment will be explained in detail by referring to Figures 3a and 3b which illustrate assembling steps of the box-like member 86. Figure 3a is a perspective view illustrating a cloth member 88 for forming the box-like member 86. Figure 3b is a perspective view illustrating the box-like member 86 formed by the cloth member 88.

The cloth member 88 shown in Figure 3a is preferably a single member devoid of any joints such as sewed seams which would cause reduction in strength due to stress concentration. In this embodiment, the cloth member 88 is substantially rectangular.

The cloth member 88 comprises a middle portion 90, outer portions 92 and corner portions 94 illustrated by cross-hatching.

In forming the box-like member 86, first the outer portions 92 are folded along dash lines shown in Figure 3a to raise the outer portions 92 upright relative to the middle portion 90.

As a result, the box-like member 86 is formed, comprising a bottom formed by the middle portion 90 and side walls formed by the raised outer portions 92 as shown in Figure 3b. At the same time, triangular ears 96 made of the corner portions 94 of the cloth member 88 are formed at the four corners of the box-like member 86 by folding the square corner portions 94 along diagonal lines to obtain triangular portions. The triangular ears 96 are joined to the side walls of the box-like member 86, for example, by sewing so as to serve as reinforcements for the corners. In jointing the ears to the side walls, it is preferable to joint the ears to lower outer surfaces of the box-like member formed by lower outer surfaces of the side walls 48 and 50 of the liner 40.

With the liner constructed as above described, as the box-like member 86 is formed by a single cloth member 88, the liner can be formed without forming any jointed portions for example sewed or welded seams at the respective lower outer surfaces of the rear wall 46, side walls 48 and 50 and front wall 52 and at the bottom wall 44, particularly without forming any jointed portions at the bottom wall 44 and edges of the bottom wall 44. Such a construction brings about the following advantages.

Firstly it is possible to mitigate occurrence of damage due to stress concentration at the bottom wall 44 and the respective lower outer surfaces of the rear wall 46, the side walls 48 and 50 and the front wall 52.

Secondly at least the bottom wall and its edges can be made very smooth. Accordingly, when goods, for example, barleycorn for beer are discharged from the inner bag in a dump-up position, the goods will be smoothly discharged without goods staying on the bottom surface, so that there is no remainder of the goods in the liner. In discharging the goods from the liner in the dump-in position,

moreover, it may be allowable to form a discharging opening simply by slashing the lower portion of the front wall 52 with a knife.

Thirdly the ears 96 are connected to the side walls of the box-like member 86 by welding to prevent water from entering the liner or to prevent a liquid from leaking out of the liner through the bottom surface.

In the second embodiment shown in Figure 4 which is a plan view illustrating a cloth member 8 for forming a box-like member, the cloth member 98 has been cut at the corners to remove four corner portions. The removed corner portions could be in any other suitable shape to that shown in the drawing.

Thus the cloth member 98 has a configuration corresponding to the cloth member 88 of Figure 3a but with the corner portions 94 removed. Cut edges of the corner portions are indicated by p in Figure 4. The cloth member 90 includes a middle portion 100 and outer portions 102.

In forming the box-like member of this embodiment, first the outer portions 102 of the cloth member 98 are folded to raise them upright to form a box-like member 86 having a bottom surface formed by the middle portion 100 and side walls formed by the outer portions 102. In this case, the adjacent edges p are jointed by for example welding or sewing. Reinforcements are preferably provided at the corners, for example at outer surfaces thereof, in order to reinforce the jointed portions of the edges p. In Figure 4, lines along which the outer portions 102 are folded are shown dashed.

This second embodiment can also bring about the same advantages as those in the first embodiment, although the second embodiment is somewhat inferior to the first embodiment because the cut edges p are jointed to form the box-like member.

Figure 5 is a plan view for explaining the third embodiment of the invention.

This third embodiment is substantially similar to the first embodiment of the invention with the exception of ears at corners of the box-like member which serve to reinforce the corners.

Referring to Figure 5, a cloth member 104 of this embodiment is also substantially rectangular.

Reference numerals 106 denotes an outer portions on the left side as viewed in Figure 5, and reference numerals 108 and 110 show corner portions adjacent to the outer portion 106. In this embodiment, boundaries between the outer portion 106 and the corner portions 108 and 110 are cut to separate these corners from the outer portion 106.

On the right side of the cloth member 104, boundaries between an outer portion 112 and corner portions 114 and 116 are cut to separate these corners from the outer portion 112 in the same manner as on the left side. In Figure 5, the corner portions 108, 110, 114 and 116 are indicated by cross-hatching and lines to be cut are shown by soid lines q.

The cloth member 104 further includes outer portions 118 and 120 and a middle portion 122.

In forming the box-like member in this embodiment, the outer portions 106, 112, 118 and 120 are folded along dashed lines shown to raise them upright to form side walls, so that a box-like member 86 is formed, which comprises a bottom formed by the middle portion 122 and side walls formed by the outer portions 106, 112, 118 and 120.

In this case, ears are formed by the corner portions 108, 110, 114 and 116 at corners of the box-like member 86. The corner portions 108 and 110 forming the ears are jointed to the outer portion, preferably its outer surface and the corner portions 114 and 116 forming the ears are jointed to the outer portion 112, preferably its outer surface by welding or sewing, so that these corner portions 108, 110, 114 and 116 are used as reinforcing members for the corners of the box-like member.

With this embodiment of the box-like member constructed as above described, it is preferable to form the outer portion 106 as one side surface 48 or 50 and the outer portion 112 as the other side surface 50 or 48 to form a liner 40 (refer to Figure 2).

This third embodiment can bring about the same effects as in the first embodiment.

This invention is not limited to the embodiments above described and various changes may be made depending upon requirements in designing.

For example, the mounting arrangements may be those used for liners for containers of the prior art. Positions and constitutions of the charging and discharging openings of the hitherto used liners may be used.

Although the box-like members formed from cloth members of particular shapes and sizes in the above embodiments, cloth members varied according to various requirements in shape, size, material and the like.

Moreover, this invention can be applied to liners for containers of the prior art. A bottom wall and lower portions of the rear wall, side walls and front wall may be formed by the box-like member of the invention.

As can be seen from the above explanation, with a liner for a container according to the invention, a box-like member is formed by a single sheet member to mitigate the damage to the liner which might otherwise occur due to stress concentration occurring at the bottom wall and the lower portions of the front wall, side walls and rear wall. As a result, occurrence of damage of liners for containers can be reduced in comparison with the prior art liners. Therefore, the invention can provide a constructionally high strength liner, particularly including a high strength bottom portion.

Claims

1. A container liner (40) including an upper wall (42), a bottom wall (44), a rear wall (46), side walls (48 and 50) and a front wall (52) to form a hexahedron and having mounting arrangements (64, 66, 68) for mounting the liner (40) to inner walls of a container, characterised in that the liner (40) includes a box-like member (86) forming at least the outer surface of the

bottom wall (44) and of lower portions of the rear wall (46), the side walls (48 and 50) and the front wall (52), the box-like member (86) comprising a bottom made of a middle portion (90, 100, 122) of a single sheet member (88, 98, 104) and side walls made of outer portions (92, 102, 106, 112, 118, 120) of the single sheet member folded upright relative to the middle portion (90, 100, 122) of the single sheet member (88, 98, 104).

2. A container liner according to claim 1, wherein corners of the box-like member (86) are reinforced by ears (96) formed by corner portions (94) of the single sheet member (88) as the box-like member is formed from the single sheet member (88).

3. A container liner according to claim 2, wherein a square corner portion (94) is folded along its diagonal line and the triangular portions thereby obtained are joined to each other to form each of the ears (96) which are then joined to the side walls.

4. A container liner according to claim 2, wherein one edge (g) of a square corner portion (108, 110, 114, 116) continuous to one outer portion (106, 112) of the single sheet member (86) is cut to obtain each of the ears which are joined to the side walls.

5. A container liner according to claim 1, wherein the box-like member (86) is made of a single sheet member (98) whose four square corners are removed by cutting.

6. A container liner according to any one of the preceding claims, wherein the single sheet member (88, 98, 104) is a cloth member.

Fig. 1

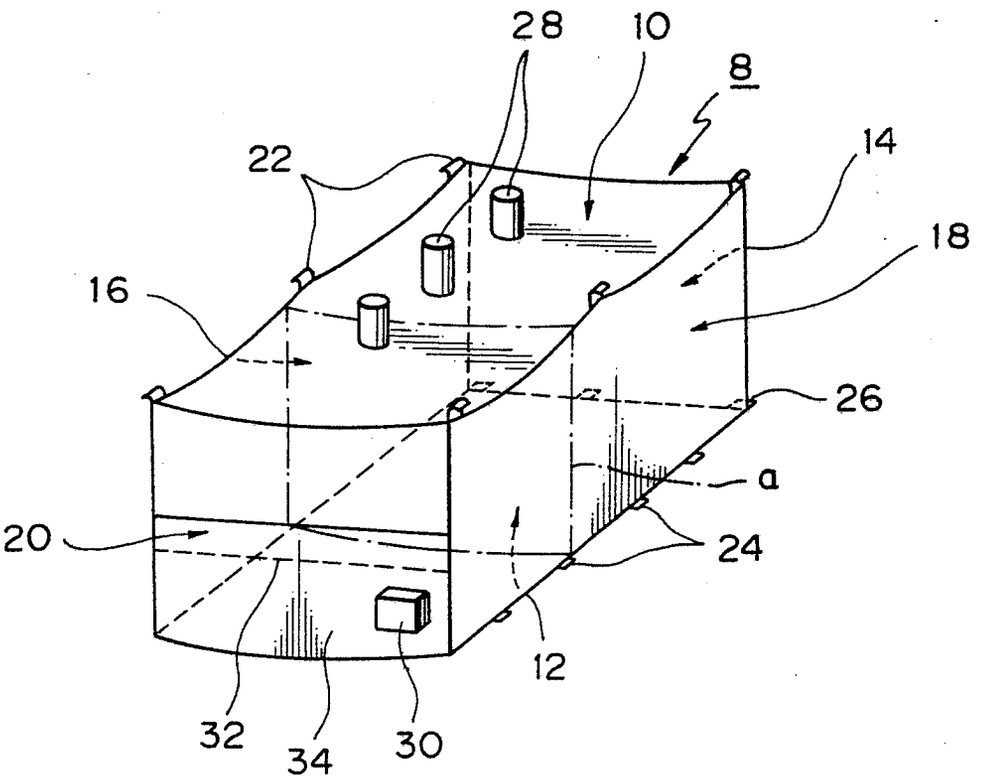


Fig. 2

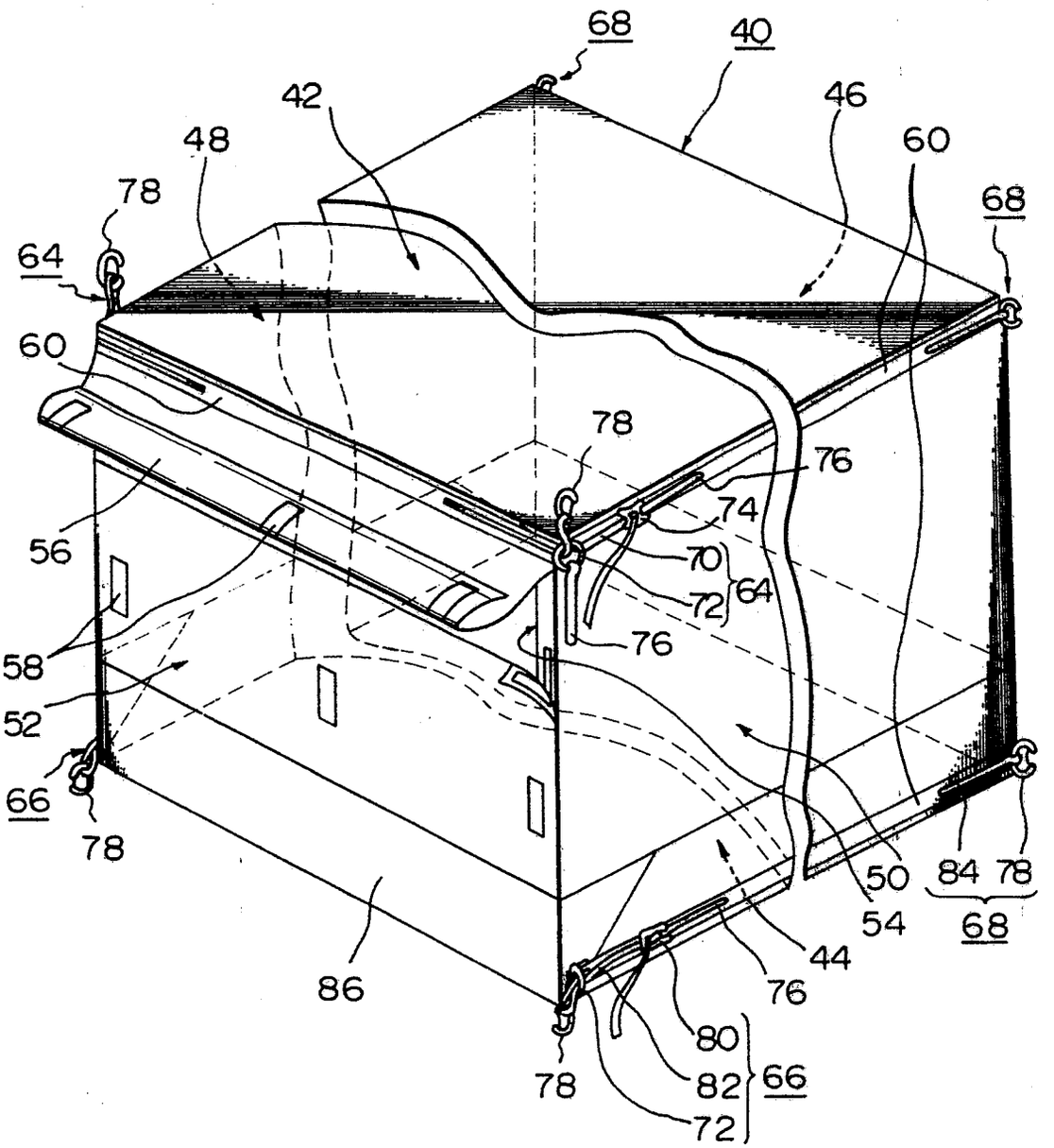

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Fig. 3a

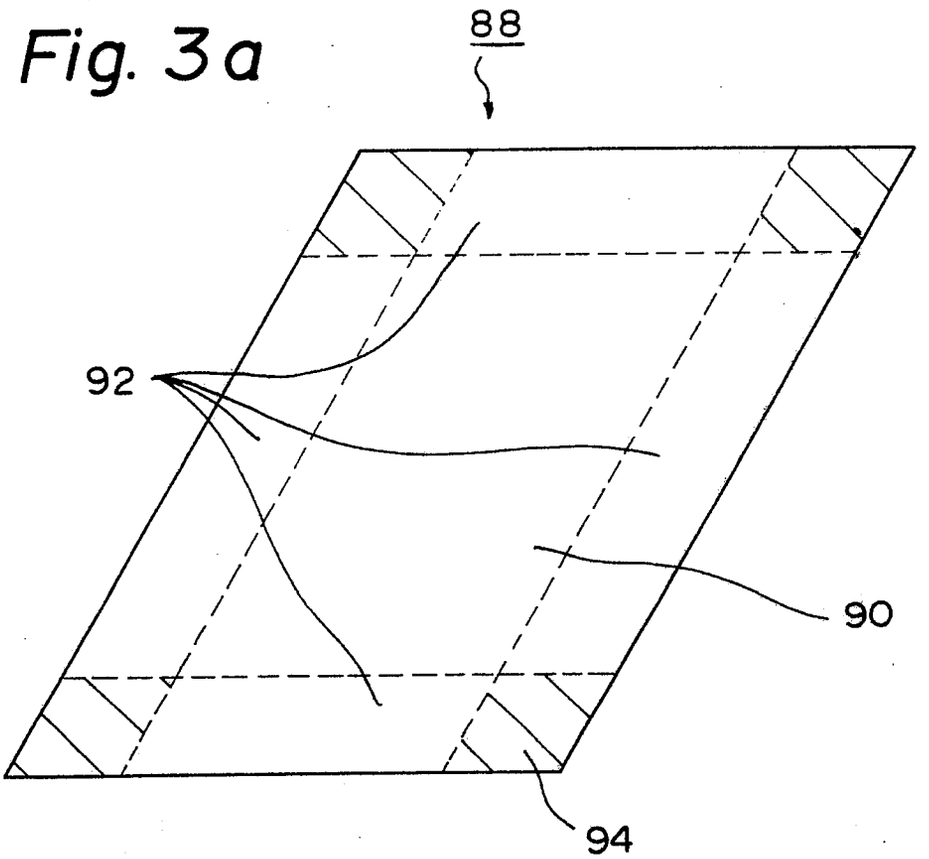

Fig. 3b

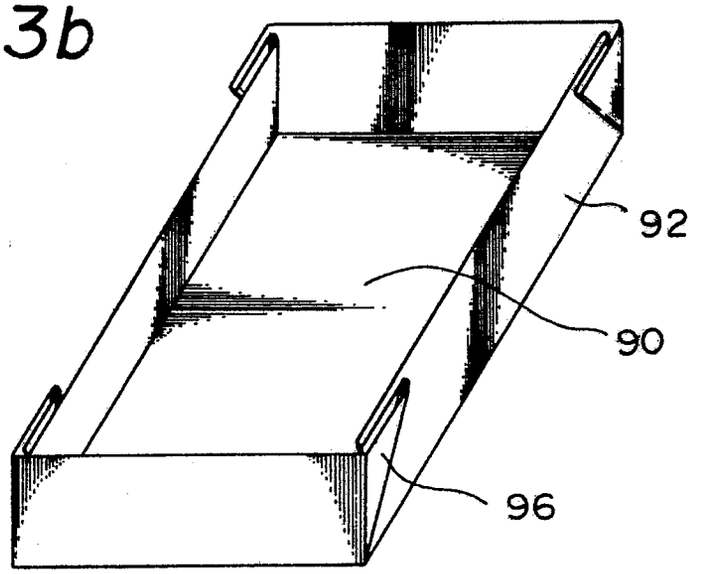

Fig. 4

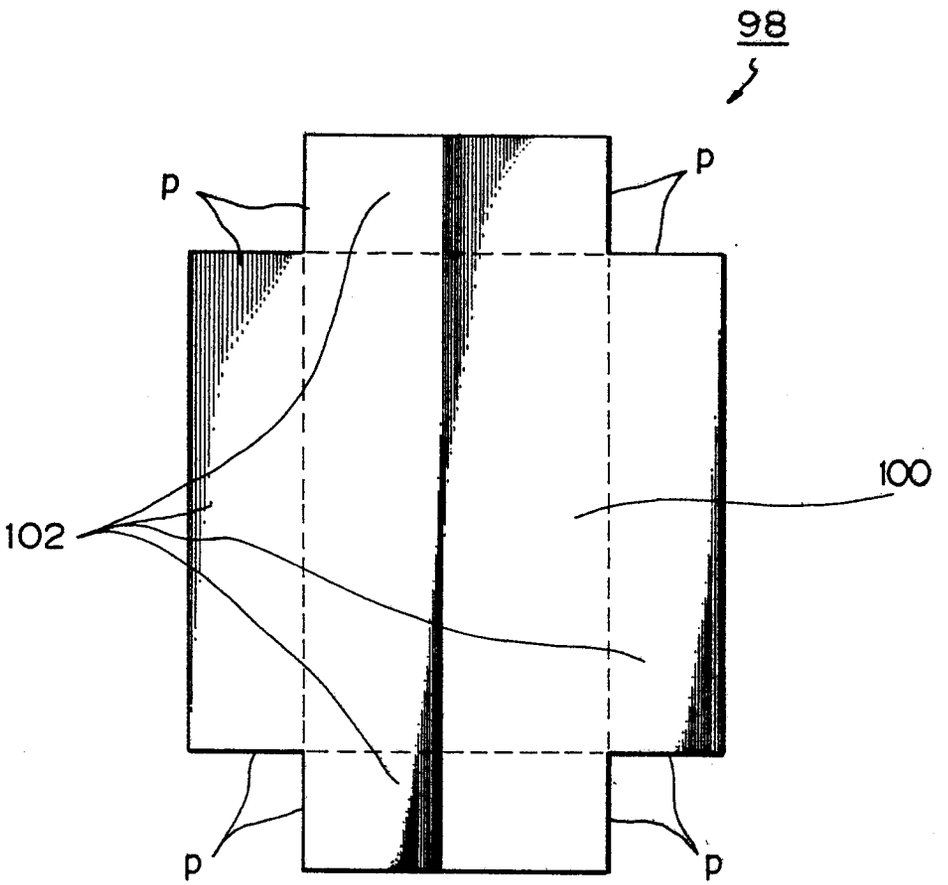

Fig. 5