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PATENT SPECIFICATION

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(54) LIQUID PACKING CONTAINER

(71) We, SANYO-KOKUSAKU PULP KABUSHIKI KAISHA, a joint-stock company duly organized under the laws of Japan, of No. 4-5, 1-chome, Marunouchi, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

The present invention relates to a laminated liquid packaging container, and more particularly, to a bottom structure for the above mentioned type of liquid packaging container.

Recently, various types of laminated cardboard liquid packaging containers have been utilized since these are easily fabricated from preprinted blanks. Although partially successful many suffered from the disadvantage that they tended to leak along their bottom seams in use or that their design required materials of a superior quality to allow successful application.

The present invention seeks to provide a liquid packaging container of this type of improved design.

According to the present invention, therefore, there is provided a container blank comprising five adjacent rectangular side panel portions delineated by parallel score lines, one end panel of which is smaller than the other four panels, and is adapted to overlie in use the side panel portion remote therefrom;

five adjacent bottom panel portions delineated by parallel score lines contiguous with the parallel score lines delineating the side panel portions, one end panel of which is smaller than any other bottom panel portion and is adapted to overlie in use the bottom panel portion remote therefrom, the bottom panels being delineated from the side panels by second score lines perpendicular to said parallel score lines, a pair of said bottom panels each comprising a tongue and being adapted to be disposed opposite each other

in use each being provided with a pair of angled score lines disposed at 45° to their respective parallel score lines and forming with their respective second score lines a trapezoidal area therein.

The following is a description by way of example only and with reference to the accompanying drawings of methods of carrying the invention into effect.

Figure 1 is a plan view of a blank illustrating the bottom of a conventional liquid packaging container prior to folding;

Figure 2 is a plan view of a blank according to one example of a bottom structure of the liquid container according to the present invention;

Figure 3 is a perspective view from below illustrating the blank of Figure 2 as it is being folded;

Figure 4 is a perspective view from below illustrating the blank of Figure 2 as it is being folded to form a complete container;

Figure 5 is a plan view illustrating another example of a blank for a container according to the present invention;

Figure 6 is a perspective view from below illustrating the assembly of a blank shown in Figure 5; and

Figure 7 is a perspective view illustrating the finally assembled container of the blank of Figure 5.

In the description which follows the terms "vertical", "horizontal", "up" and "down" refer to the orientation of the container and the container blank in the accompanying drawings.

Referring first to the embodiment of Figures 2 to 4, there is provided a blank of four equal size panels 1, 2, 3 and 4. Each of these panels is delineated vertically by a vertical score line (shown as a broken line in Figures 2 and 5), similarly side panel 4 is vertically delineated by a score line between it and a side bonding panel 5. The remote free edges of panels 1 and 5 are parallel to the vertical score lines. Each of the panels 1 to 5 terminates at its lower end in a horizontal score line and is attached at said score line to respective bottom panels

6, 7, 8, 9 and 5'. These bottom panels are vertically delineated from each other by vertically disposed score lines which are continuations of those that separate the side panels. Each of said bottom panels has a free edge remote from said side panels. Bottom panels 7 and 9 are similarly rectangularly shaped; the free edge portions of one panel being adapted to overlie the other in use, and to be heat sealed to each other.

Bottom panels 6 and 8 are substantially L-shaped, the long arm of said 'L' being horizontally disposed, the short arm being downwardly depending and adjacent each other across bottom panel 7. Each of said bottom panels 6 and 8 comprises an angled score line from point A to the free edge of the bottom panel. This forms with the vertical score line at an angle of 45°; the arrangement being such that a regular trapezoidal shape having its long edge contiguous with the respective edge of the side panel 1 or 3 is formed such that one of said angled score lines also joins the point A with the inner right-angle of the L-shape. Thus, for convenience the L-shape is divided into an area 6c or 8c respectively corresponding to the short arm, and areas 6a and b and 8a and b which are both triangular portions. The inner length of the short arm of the L-shape of Figure 2 is designated W.

In use a blank as described above is bent inwardly through 90° along all vertical score lines. It will thus be found that the free side edge of side panel 1 will come into abutment with the remote side edge of panel 4, and that a face of side bonding panel 5 can then be heat sealed onto the edge portion of panel 1 which it overlies, and parts 5' and 5'a can be heat sealed on to the remote side edge portion of bottom panel 6.

Subsequently, the bottom portions of the blank are bent through 90° inwardly along their horizontal score lines and outwardly along their angled lines. It will then be found that with the trapezoidal sections set at right angles to the assembled sides the container will adopt the configuration as shown in Figure 3. Bottom panels 7 and 9 may then be folded fully inwardly and heat sealed both to each other and to the various parts of the bottom panels 6 and 8 which in turn bond to each other where they overlie, thereby to form a container as shown in Figure 4.

It will be appreciated that both in this embodiment and that of Figures 5 to 7, the width W referred to above should be at least equal to the shortest edge of the trapezoidal portion of bottom panels 6 and 8. It will also be appreciated that the angled score line must be accurately set at 45°

from the vertical if the various portions are to mate correctly.

Turning now to the embodiment of Figures 5 to 7, it will be observed that side panels 1 to 5 and bottom panels 7, 9, 5' and 5'a are identical with those of Figure 2 to 4 and will, not therefore be further described.

The essential difference in this embodiment lies in the lateral displacement of the areas 6c and 8c to form a rectangular tongue contiguous on one edge with the shortest edge of the trapezoidal portion of the bottom panels 6 and 8 and separated therefrom by a second horizontal score line; the other opposite free edge being spaced away from said one edge either to the solid or the broken line as shown in Figure 5. In use side panels are assembled hereinbefore set forth, and the bottom panels are folded inwardly through 90°. Angled score lines are folded outwardly along with the second horizontal score lines. When bottom panels 6 and 8 are folded through 90° the arrangement shown in Figure 6 is adopted with the areas 6c and 8c being folded back on and heat sealed to their respective bottom panels. The bottom panels 7 and 9 are then caused to overlie each other and heat sealed to each other and to the various portions of the bottom panels 6 and 8 which present themselves to form the arrangement set forth in Figure 7.

A liquid packaging container of the type just described may be formed of a cardboard laminated with a thermoplastics synthetic resin thus allowing the container to be conveniently heat sealed. It will be appreciated that containers for liquid of the type described are particularly efficacious since the arrangement of the bottom panels when in use ensures that every potential leak point is protected by a comparatively large area of heat sealed panel.

This arrangement has been found to be cheap and effective in use and because of the efficiency in sealing allows the use of comparatively thin sheet materials in manufacture.

WHAT WE CLAIM IS:—

1. A container blank comprising five adjacent rectangular side panel portions delineated by parallel score lines, one end panel of which is smaller than the other four panels, and is adapted to overlie in use the side panel portion remote therefrom;

five adjacent bottom panel portions delineated by parallel score lines contiguous with the parallel score lines delineating the side panel portions, one end panel of which is smaller than any other bottom panel portion and is adapted to overlie in use the bottom portion remote therefrom, the bottom panels being delineated from the side panels by second



6, 7, 8, 9 and 5'. These bottom panels are vertically delineated from each other by vertically disposed score lines which are continuations of those that separate the side panels. Each of said bottom panels has a free edge remote from said side panels. Bottom panels 7 and 9 are similarly rectangularly shaped; the free edge portions of one panel being adapted to overlie the other in use, and to be heat sealed to each other.

Bottom panels 6 and 8 are substantially L-shaped, the long arm of said 'L' being horizontally disposed, the short arm being downwardly depending and adjacent each other across bottom panel 7. Each of said bottom panels 6 and 8 comprises an angled score line from point A to the free edge of the bottom panel. This forms with the vertical score line at an angle of 45°; the arrangement being such that a regular trapezoidal shape having its long edge contiguous with the respective edge of the side panel 1 or 3 is formed such that one of said angled score lines also joins the point A with the inner right-angle of the L-shape. Thus, for convenience the L-shape is divided into an area 6c or 8c respectively corresponding to the short arm, and areas 6a and b and 8a and b which are both triangular portions. The inner length of the short arm of the L-shape of Figure 2 is designated W.

In use a blank as described above is bent inwardly through 90° along all vertical score lines. It will thus be found that the free side edge of side panel 1 will come into abutment with the remote side edge of panel 4, and that a face of side bonding panel 5 can then be heat sealed onto the edge portion of panel 1 which it overlies, and parts 5' and 5'a can be heat sealed on to the remote side edge portion of bottom panel 6.

Subsequently, the bottom portions of the blank are bent through 90° inwardly along their horizontal score lines and outwardly along their angled lines. It will then be found that with the trapezoidal sections set at right angles to the assembled sides the container will adopt the configuration as shown in Figure 3. Bottom panels 7 and 9 may then be folded fully inwardly and heat sealed both to each other and to the various parts of the bottom panels 6 and 8 which in turn bond to each other where they overlie, thereby to form a container as shown in Figure 4.

It will be appreciated that both in this embodiment and that of Figures 5 to 7, the width W referred to above should be at least equal to the shortest edge of the trapezoidal portion of bottom panels 6 and 8. It will also be appreciated that the angled score line must be accurately set at 45°

from the vertical if the various portions are to mate correctly.

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WHAT WE CLAIM IS:—

1. A container blank comprising five adjacent rectangular side panel portions delineated by parallel score lines, one end panel of which is smaller than the other four panels, and is adapted to overlie in use the side panel portion remote therefrom; five adjacent bottom panel portions delineated by parallel score lines contiguous with the parallel score lines delineating the side panel portions, one end panel of which is smaller than any other bottom panel portion and is adapted to overlie in use the bottom portion remote therefrom, the bottom panels being delineated from the side panels by second



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score lines perpendicular to said parallel score lines, a pair of said bottom panels each comprising a tongue and being adapted to be disposed opposite each other in use each being provided with a pair of angled score lines disposed at 45° to their respective parallel score lines and forming with their respective second score lines a trapezoidal area therein.

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2. A blank according to claim 1 wherein the tongued bottom panel has an L-shaped configuration.

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3. A blank according to claim 1 wherein the tongued bottom panel comprises a first rectangular portion adjacent the second score line and a second rectangular tongue portion disposed on the free edge thereof.

4. A container blank according to any preceding claim wherein the width W

defined herein is at least equal to the shortest edge of the trapezoidal portion.

5. A container blank according to any preceding claim including a thermoplastics synthetic resin laminate.

6. A container formed from a blank as claimed in any one of the preceding claims.

7. A container blank substantially as hereinbefore described with reference to Figures 2 or 5 of the accompanying drawings.

8. A container substantially as hereinbefore described with reference to Figures 3, 4 or 6 and 7 of the accompanying drawings.

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