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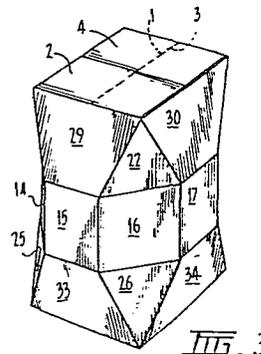
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Containers and sleeves, especially containers and sleeves made by folding from sheet material.

A reinforced container comprising a body of corrugated board shaped by means of score lines or folds to define an octagonal mid-section comprising eight interconnected rectangular panels (12 to 19), four triangular panels (20 to 27) extending from either side of the central panels (12, 14, 16 and 18) and four trapezoidal panels (28 to 35) sharing sides in common with the adjacent triangular panels and extending from opposite sides of the central panels (13, 15, 17 and 19), and slotted end flaps (1 to 4; 5 to 8) connected to the ends of said triangular and trapezoidal panels, said triangular and trapezoidal panels causing said container to converge from said mid-section to a rectangular shape which is closed by said slotted end flaps (1 to 4 and 5 to 8); the combined effect of said octagonal mid-section and the converging portions of said container is to provide a container having improved resistance to bulging and vertical compressive strength.



"CONTAINERS AND SLEEVES, ESPECIALLY CONTAINERS
AND SLEEVES MADE BY FOLDING FROM SHEET MATERIAL"

This invention relates to improvements in reinforced containers and sleeves. More particularly, the invention relates to containers of the type adapted to contain liquids (with a plastics liner) or other free-flowing materials, such as granules or powder, but the invention is not limited thereto.

Corrugated board containers for liquids and dry free-flowing materials are well known. However, in order to provide the necessary strength against bulging in the walls of the container, such containers have in the past been made in an octagonal configuration. This results in the necessity for separate lids having to be made for the container since the flaps of the container cannot be made to close the container. This in turn increases the cost of the container and makes the transport of the collapsed container difficult due to the separate lids.

It is an object of the present invention to provide a reinforced container or sleeve which is resistant to bulging and which has good vertical compressive strength, and which nevertheless can have its ends closed by integral flaps.

The invention therefore provides a reinforced container comprising a body of relatively stiff material including at least six interconnected rectangular panels defining a mid-section which is at least hexagonal in shape, each said rectangular panel having a further shaped panel extending from its opposite free sides to define end portions of the container which extend convergently from said mid-section to a rectangular shape at each end of the container, and integral slotted rectangular closure flaps extending from each end of the container and shaped to close the ends of the container, said converging end portions and said

rectangular mid-section panels co-operating to provide a container having increased resistance to bulging and increased vertical compressive strength.

It will be appreciated that in the case of a reinforced sleeve, the closure flaps are not required.

Where the ends of the container are substantially square, the slotted closure flaps may be arranged to close substantially the whole of each end of the container. Where the ends of the container are other than square, one pair of flaps will completely close the ends of the container while the other pair of flaps will close the end to a reduced extent. In such an arrangement, the hexagonal mid-section will be in the form of an irregular hexagon.

In a preferred form of the invention, the mid-section is in the form of a regular or irregular octagon with the container converging to a square at each end thereof.

If desired, the container or sleeve may be moulded in the above configurations from polystyrene or other suitable plastics material. However, the most significant advantages are gained where the container is made from corrugated board, box board or solid fibre, hereinafter referred to generally as "board".

In the particularly preferred form of the invention referred to above, the mid-section of the container is octagonal since this configuration is the most symmetrical and is conveniently achieved by die cutting, scoring and folding an essentially rectangular blank of board. The hexagonal or octagonal mid-section is defined by six or eight rectangular panels defined by crease lines. Each panel has a further shaped panel extending from either side thereof and defining the converging portions of the container. In the preferred form, every alternate further panel extends inwardly towards the ends of the container while the intermed-

iate panels extend outwardly towards the ends of the container. This panel arrangement provides a form of "interlocking" construction which substantially increases the rigidity of the container against bulging and also contributes significantly to its vertical compressive strength.

The panels of the container defining the hexagonal or octagonal mid-section are preferably greater in height than in width and the inwardly extending further panels are preferably trapezoidal in shape while the outwardly extending further panels are preferably triangular in shape. To enable completion of the container, one end of the blank is die cut to follow the outline of the crease at the other end of the blank and the remaining portion of the blank extending from the crease is glued to the outer or inner surface of the blank at the other end to form a suitable joint.

A particularly preferred form of the invention will now be described in greater detail with reference to the accompanying drawings in which:

Figure 1 is a plan view of the blank from which the container is formed;

Figure 2 is a perspective view of the container in its collapsed state;

Figure 3 is a perspective view of the container in its erected state;

Figure 4 is a plan view of the container from one end, and

Figures 5 and 6 are side elevations respectively from the directions A-A and B-B in Figure 4.

Referring firstly to Figure 1 of the drawings, the shape of the blank from which the container embodying the invention is formed is clearly shown. It will be appreciated that the dimensions of the blank in Figure 1 are for one particular form of the invention and may be varied to achieve containers of other

suitable dimensions. For example, while the blank shown forms a container having square ends, the invention is equally applicable to containers having rectangular ends of varying dimensions. However, the arrangement shown in the drawings is preferred since it is the most practical and economic shape for a container having the dimensions shown. The broken lines shown in Figure 1 represent crease lines defined by scoring or otherwise.

10 . The blank shown in Figure 1 has four regular slotted end flaps 1 to 4 and 5 to 8 on either side of the blank and one end of the blank is die cut at 9 in a shape corresponding to the score line 10 at the opposite end of the blank. The portion 11 extending from score
15 line 10 has glue applied to its inner face and adheres to the outer face of the blank at the other end with the die cut portion 9 aligned with the score line 10. Alternatively, the glue is applied to the outer face of portion 11 and it is adhered to the inner face of the
20 blank.

The score lines define eight central rectangular panels 12 to 19 which define an octagonal mid-section when the blank is erected as shown in Figure 3. The crease lines also define four triangular panels 20 to
25 27 extending from either side of the central panels 12, 14, 16 and 18. Similarly, four trapezoidal panels 28 to 35 sharing sides in common with the adjacent triangular panels extend from opposite sides of the central panels 13, 15, 17 and 19. Additional crease lines 36
30 and 37 are provided to facilitate collapsing of the formed blank as shown in Figure 2 of the drawings.

Referring now to Figures 3 to 6 of the drawings, it will be noted that when the container is erected, the trapezoidal panels 28 to 35 extend inwardly from their
35 central panels 13, 15, 17 and 19 towards the ends of

the container while the triangular panels 20 to 27 extend outwardly from their central panels 12, 14, 16 and 18 to the respective corners of the ends of the container. As mentioned above, the inward and outward
5 inclination of the adjacent panels in combination provides a form of "interlocking" construction that contributes to the container's rigidity against bulging as well as its vertical compressive strength. This arrangement is believed to improve the rigidity of the
10 container in comparison with known octagonal containers whilst providing the quite distinct advantages of integral end flaps of standard construction. When used as a reinforced sleeve, the end flaps may of course be removed.

15 While the octagonal configuration of the mid-section is preferred for the reasons outlined above, the invention is equally applicable to configurations having hexagonal mid-sections or any other greater multiple of two.

20 Where the container is totally enclosed, that is, with flaps at both ends of the container, the outermost flaps may be secured by means of adhesive tape or by means of tear tape to facilitate easy opening. Where the container is for liquids, a polyethylene or
25 similar plastics bag may be fixed within the container in any suitable manner. If desired a dispensing valve may be provided in a manner similar to those provided in wine casks.

30 Where a reinforcing sleeve is to be located within another container, the glued joint may be omitted.

CLAIMS

1. A reinforced container comprising a body of relatively stiff material including at least six interconnected rectangular panels defining a mid-section which is at least hexagonal in shape, each said rectangular panel having a further shaped panel extending from its opposite free sides to define end portions of the container which extend convergingly from said mid-section to a rectangular shape at each end of the container, and integral slotted rectangular closure flaps extending from each end of the container and shaped to close the ends of the container, said converging end portions and said rectangular mid-section panels cooperating to provide a container having increased resistance to bulging and increased vertical compressive strength.
2. The container of claim 1, wherein each alternate further panel extends inwardly from its rectangular panel towards the end of the container while the other further panels extend outwardly towards the end of the container to provide an interlocking construction which increases the rigidity of the container.
3. The container of claim 2, wherein said rectangular panels are greater in height than in width and said inwardly extending further panels are trapezoidal in shape while the outwardly extending further panels are triangular in shape.
4. The container of claim 1, 2 or 3, wherein said body is formed from a blank of stiff sheet material creased to define said panels, said blank being die cut at one end to follow the outline of the crease adjacent the opposite end of the blank, said blank having an extended portion from the last mentioned crease, said extended portion being adhered to the outer face of the blank adjacent said die cut end to complete the container.

5. The container of claim 2, 3 or 4, wherein said mid-section has an octagonal shape and said end portions converge to a square at each end of the container.

6. The container of claim 5, wherein said mid-section has an irregular octagonal shape.

7. The container of any preceding claim wherein said body is formed from corrugated board.

8. A reinforced sleeve for a container comprising a body of relatively stiff material including at least six interconnected rectangular panels defining a mid-section which is at least hexagonal in shape, each said rectangular panel having a further shaped panel extending from its opposite free sides to define end portions which extend convergingly from said mid-section to a rectangular shape at each end of said sleeve, said converging end portions and said rectangular mid-section panels co-operating to provide a sleeve having increased resistance to bulging and increased vertical compressive strength.

9. The sleeve of claim 8, wherein each alternate further panel extends inwardly from its rectangular panel towards the end of the container while the other further panels extend outwardly towards the end of the sleeve to provide an interlocking construction which increases the rigidity of the sleeve.

10. The sleeve of claim 9, wherein said body is formed from a blank of stiff sheet material creased to define said panels, said blank being die cut at one end to follow the outline of the crease adjacent the opposite end of the blank, said blank having an extended portion from the last mentioned crease, said extended portion being adhered to the outer face of the blank adjacent said die cut end to complete the sleeve.

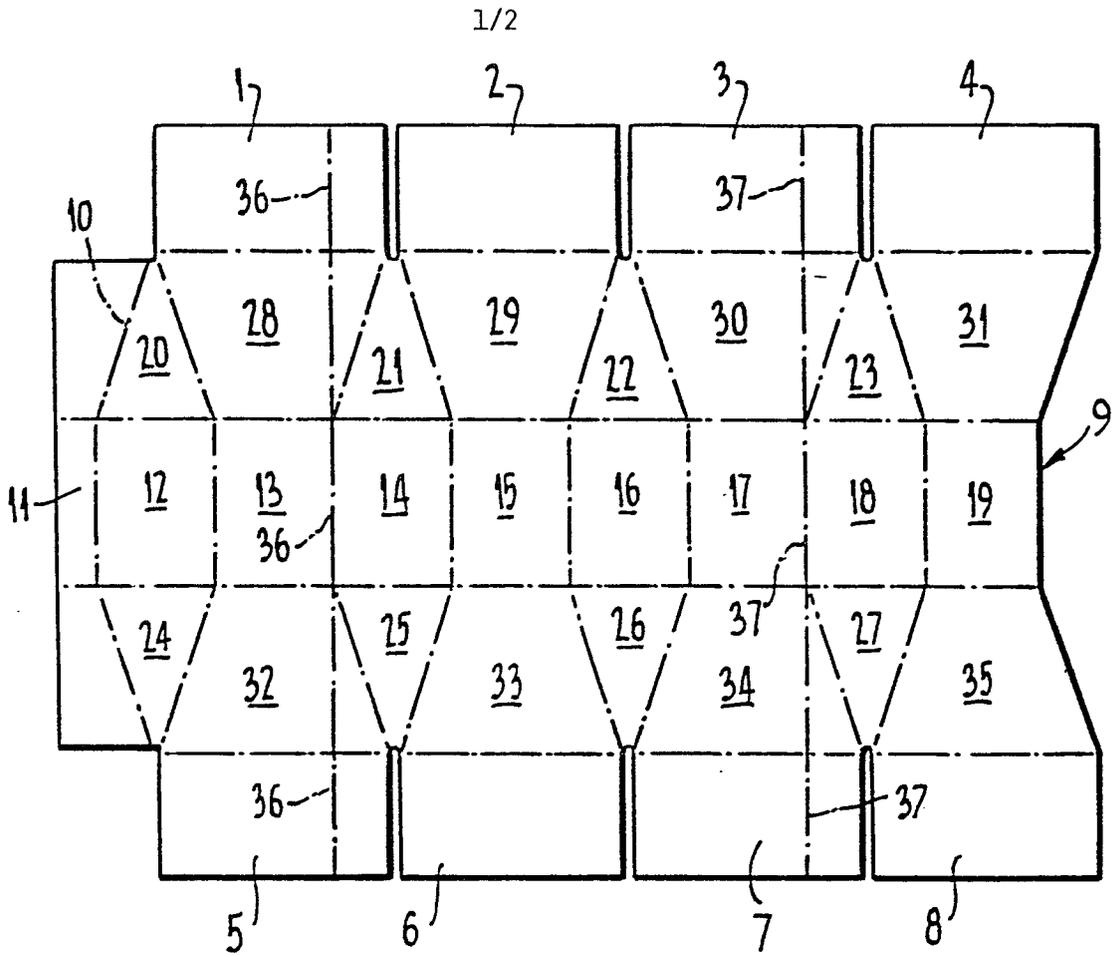
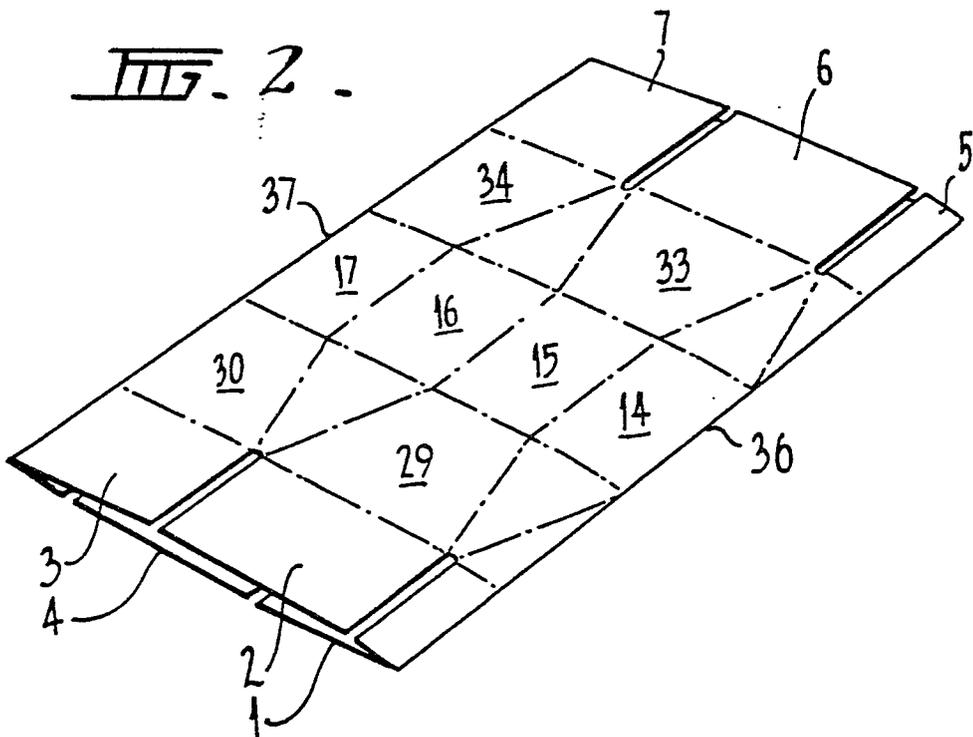


FIG. 1.

FIG. 2.



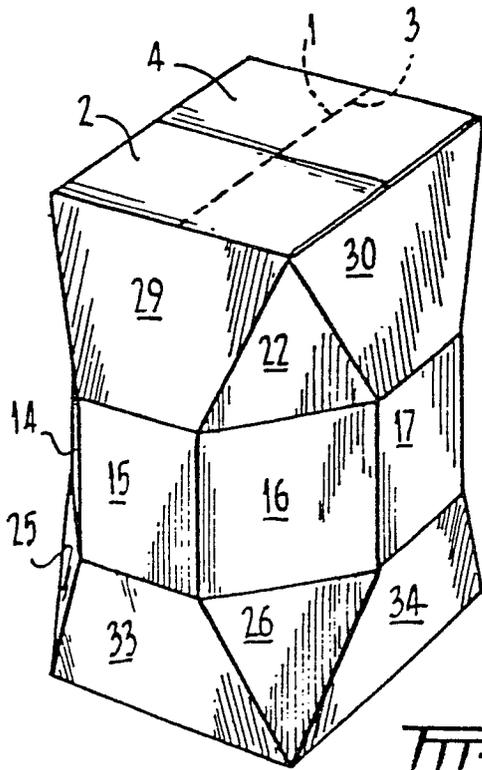


FIG. 3.

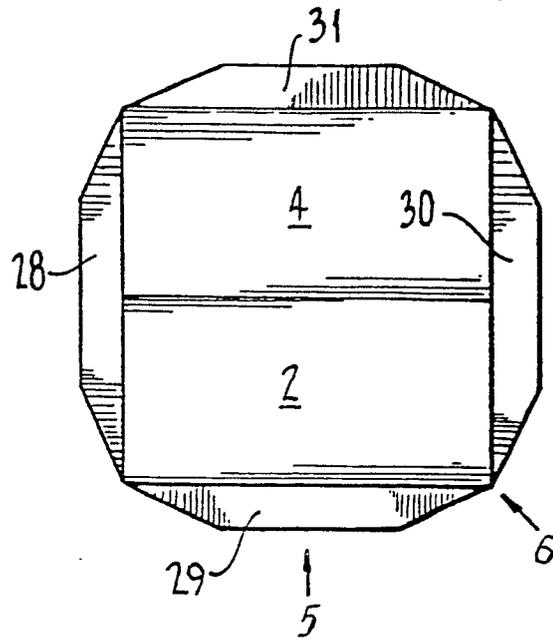


FIG. 4.

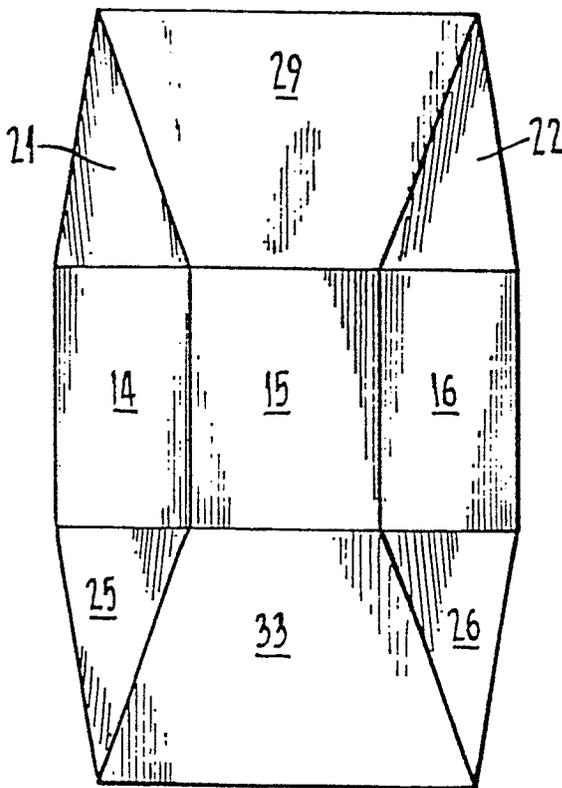


FIG. 5.

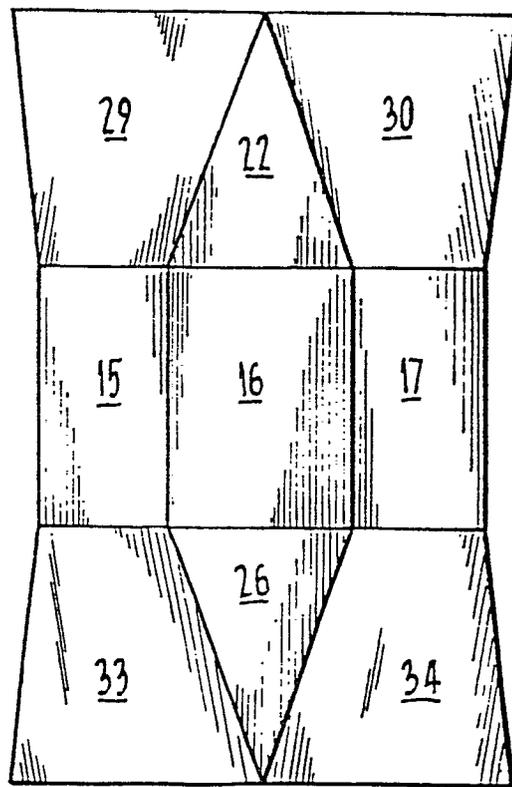


FIG. 6.



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<p><u>FR - A - 1 137 479 (SACCAR)</u></p> <p>* Page 1, left-hand column, lines 1-3; page 1, right-hand column, last paragraph - page 2, left-hand column, paragraph 5; page 3, left-hand column, paragraphs 3,4; figures 1,7, 7a *</p> <p style="text-align: center;">--</p>	1-5,7-10	B 65 D 5/02
X	<p><u>US - A - 2 067 998 (M.I. WILLIAMSON)</u></p> <p>* Page 4, lines 18-47; figure 26 *</p> <p style="text-align: center;">--</p>	1-3,7-9	TECHNICAL FIELDS SEARCHED (Int. Cl.)
	<p><u>FR - A - 2 170 779 (J. WADDING-TON LTD.)</u></p> <p>* Page 6, line 19 - page 7, line 10; figures 12,13 *</p> <p>& GB - A - 1 381 975</p> <p style="text-align: center;">--</p>	1,4-8,10	B 65 D
	<p><u>FR - A - 2 068 063 (SOCIETE CIVILE D'INVENTION & DE PROMOTION)</u></p> <p>* Page 2, line 25 - page 5, line 22; figures 1-4 *</p> <p style="text-align: center;">----</p>	1-4,7-10	CATEGORY OF CITED DOCUMENTS
			<p>X: particularly relevant</p> <p>A: technological background</p> <p>O: non-written disclosure</p> <p>P: intermediate document</p> <p>T: theory or principle underlying the invention</p> <p>E: conflicting application</p> <p>D: document cited in the application</p> <p>L: citation for other reasons</p>
<input checked="" type="checkbox"/>	The present search report has been drawn up for all claims		&: member of the same patent family, corresponding document
Place of search	Date of completion of the search	Examiner	
The Hague	09-01-1981	MARTENS	