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(54) A stackable container

(57) The present invention describes a stackable container (10,10'). The assembly formed by stacking said containers (10,10') remains stable, independently from the direction of a side force acting on said container (10,10'). This is accomplished through at least two ribs (14a,14b) and/or grooves (18a,18b) engaged into the corresponding ribs and/or grooves of another stacked container (10,10'). At least one of said (14a,14b) and/or grooves (18a,18b) is perpendicular to the others. Therefore stable assemblies are made available.

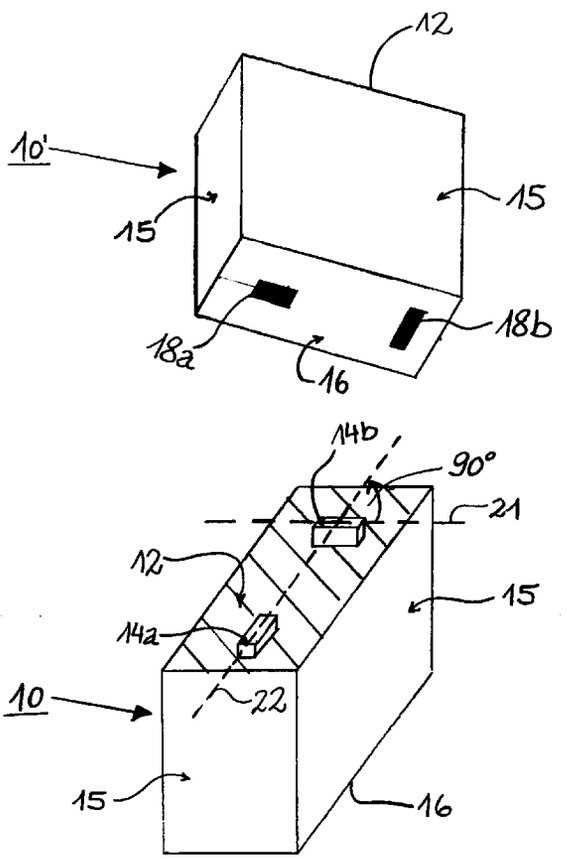

Fig. 1

EP 0 690 006 A1

Description

Field of the Invention

The present invention relates to containers. The containers of the present invention are stackable in a stable manner.

Background of the Invention

Liquid laundry detergents are mainly delivered in plastic bottles. But also granular laundry detergents in plastic containers are supplementing the paperboard cartons. These plastic containers are more resistant to possible mechanical damages, and protect their content from any penetration of humidity and fluids from the outside.

During storage and transportation it is highly preferable to stack these containers one over another, forming an assembly of containers. Such stackable containers avoid having to use complicated and expensive transport systems which would otherwise be required to provide the stackability of the containers. Stacked assemblies of stackable containers, especially those formed from containers of smaller size, are sensitive to side forces during transportation. Side forces are the forces perpendicular to gravity. Stacked containers have to remain in the stacked position even if a certain amount of side forces is applied, to avoid that the assembly is partially or completely destroyed. The resistance to the side forces has to be independent of the direction of said side forces. Therefore, it is an object of the present invention to provide a stackable container which ensures the stability of the assembly formed by stacking said containers, for any direction of the side forces.

Summary of the Invention

The present invention provides a container comprising side walls, a top wall and a bottom wall. Said top wall comprises two elongated securing top ribs and/or grooves. Said bottom wall comprises two elongated bottom ribs and/or grooves. Said top ribs and/or grooves engage with said bottom ribs and/or grooves when an identical container is stacked over said container. At least one of said securing two top ribs and/or grooves is substantially perpendicular to the other.

Brief Description of the Figures

Figure 1 shows a perspective view of the top with the ribs and the bottom with the grooves of a container according to the present invention.

Figure 2 illustrates in a top view of the top of a container according to another embodiment of the present invention.

Detailed Description of the Invention

Since the top ribs and/or grooves always correspond to the bottom ribs and/or grooves, we shall concentrate in the following description only on the ribs. Thus the following description of the ribs also applies to the grooves. Furthermore, in the following "axis" means the axis which is along the direction which connects the two distal points of the elongated ribs and/or grooves.

Figure 1 shows two containers : one container (10) is shown from a perspective top view, whereas the other one (10') from a perspective bottom view. The container (10) or (10') comprises a top (12), a bottom (16) and side walls (15). The side, top and bottom walls may be of any form, rounded or polygonal. The two ribs (14a) and (14b) of the top (12) of the container (10) are able to engage in the corresponding grooves (18a) and (18b) of the bottom (16) of the container (10') when both containers are stacked one over the other. Lines (21) and (22) are the axis of said ribs. These axis are substantially perpendicular to each other, i.e. lines (21) and (22) form an angle of 90°deg. This ensures that the stacking is stable for any direction of side forces acting on the side walls of the container. These side forces are perpendicular to the axis of said container on its upright position or, in other words, perpendicular to gravity. Indeed, any direction of a side force is counteracted with the interplay of the perpendicular ribs engaged in the corresponding grooves. Therefore the stacking of the containers is stable, and particularly unaffected by side forces of any direction.

The same result may be achieved with more than two ribs. But at least one of these ribs has to be perpendicular to the other ones. Also different forms of the ribs, and consequently of the grooves, may achieve the same invariance from the direction of the side force. In Figure 2, for example, one of the ribs (23) is arched. The axis of rib (23), i.e. the line connecting the two distal points of the extremities of the rib (23), as shown with line (32), is perpendicular to the axis of the other rib drawn by the line (33). Therefore, any person skilled in the art may choose the number and the form of the ribs/grooves with many possible variations.

The ribs are preferably on the top wall and the grooves on the bottom wall. But also the inverse is possible, by having ribs on the bottom wall and the grooves on the top wall of the container. In this latter case, the bottom of the container has to be formed in such a way that the ribs do not impede a stable upright standing of said container. Also a combination of ribs and grooves are possible on the top wall and correspondingly on the bottom wall. If the container has a lid, the ribs and/or grooves will be located on top of said lid.

We also found that the stability is increased by spacing the ribs and/or grooves apart from each other. Indeed, a higher degree of stability is achieved when two ribs and/or grooves are more distanced from each other, instead of of having them more concentrated in the middle of the top or bottom wall. In fact, a greater side force is needed to disengage two stacked containers from

each other when said ribs and/or grooves are more spaced away or distanced from each other.

These containers are preferably made of a plastic material. Polyethylene is for example a possible plastic material. In the case that the container has a reversible detachable lid, this lid may be made also from a different plastic material than the container itself, like for example polypropylene. Also said containers may contain any substance. Preferably these containers contain liquid or granular laundry detergents.

As preferable options, the container of the present invention may comprise a also a pouring spout and a handle.

Claims

1. A container comprising side walls, a top wall and a bottom wall, said top wall comprising two elongated securing top ribs and/or grooves, said bottom wall comprising two elongated bottom ribs and/or grooves, wherein said top ribs and/or grooves engage with said bottom ribs and/or grooves when an identical container is stacked over said container, characterized in that at least one of said securing two top ribs and/or grooves is substantially perpendicular to the other.

2. A container according to any of the preceding claims characterized in that said container comprises a lid, the top of said lid comprising said top ribs and/or grooves.

3. A container according to any of the preceding claims characterized in that said two top and bottom ribs and/or grooves are distanced apart from each other.

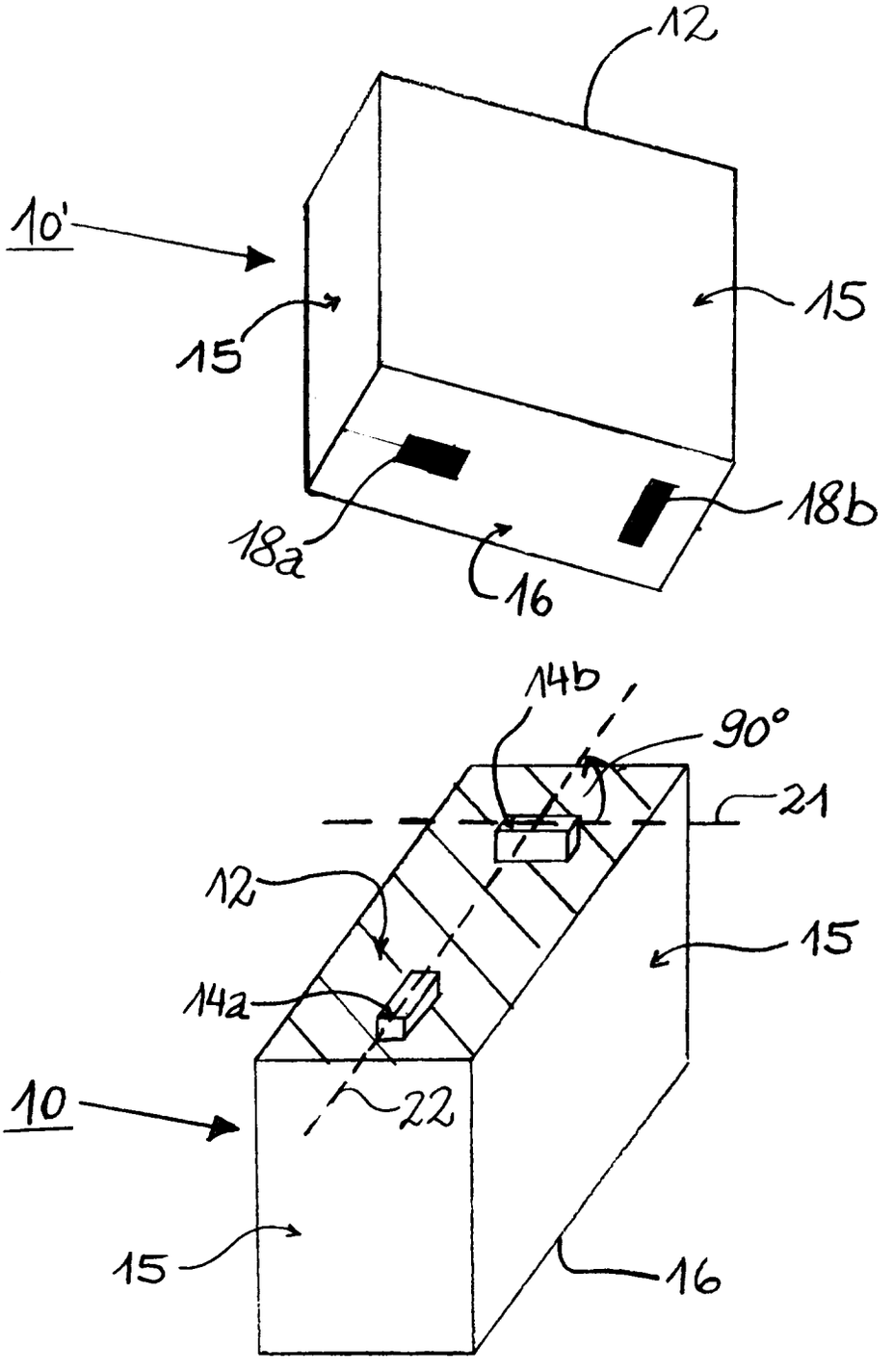

Fig. 1

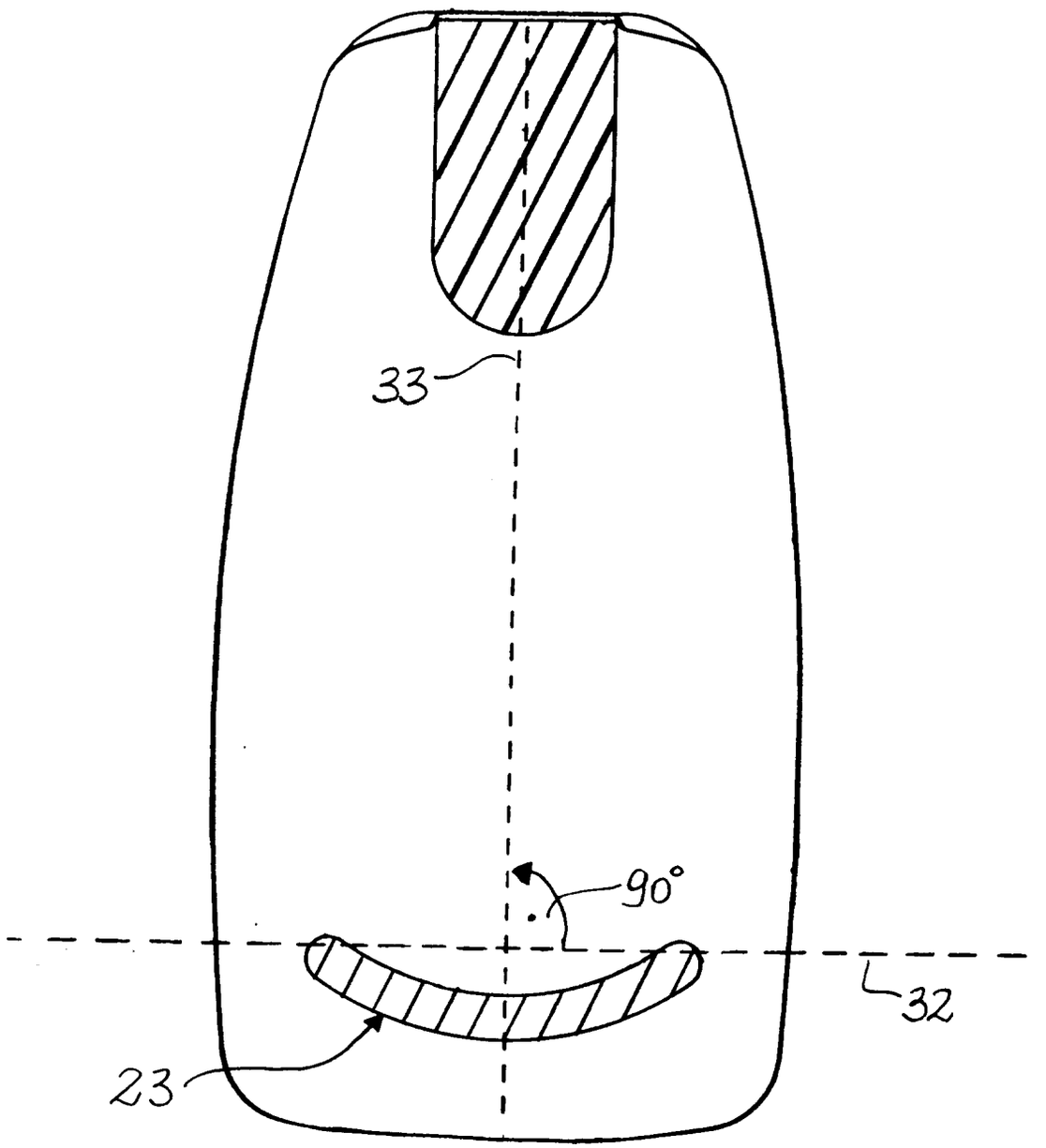

Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 94 87 0110

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE-C-816 342 (SIKORA) * page 2, line 43 - line 54; figures 1,2,4 * ---	1,2	B65D21/02
X	US-A-3 845 875 (DOUGLAS) * column 2, line 57 - line 63 * * column 3, line 12 - line 21; figures 1,2,4,5 * ---	1-3	
X	US-A-2 641 374 (DER YUEN) * figures 1-4 * ---	1-3	
A	DE-A-36 21 833 (KRÜGER GMBH) * column 2, line 44 - line 68; figures 1-3 * ---	1	
A	DE-U-89 09 327 (FELIX BÖTTCHER GMBH) * page 5, line 19 - page 6, line 18; figures 1,2 * ---	1	
A	DE-A-34 40 033 (KANIS) * claim 3; figure 1 * ---	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	FR-A-1 343 060 (MAUSER KG) ---		B65D
A	DE-A-19 60 113 (SPUMALIT-ANSTALT) -----		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 November 1994	Berrington, N

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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P : intermediate document

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