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(54) Intermediate bulk container and method of packaging.

(57) The frame structure of the container system includes a pallet base 12, a plurality of uprights 14 and a spreader frame 16. The uprights 14 are located within sockets 18 formed in the pallet base 12 and pins 20 of the spreader frame 16 are located in the upper open ends of the uprights 14. A sheet material container constituted by a low density polyethylene (LDPE) tube is located within the erected frame structure and filled with the intended contents. The uprights 14 tend to retain the LDPE tube 10 against its natural tendency to bulge outwardly in particular points of restraint. After filling, the entire container and frame structure is stretch wrapped with a limited stretch film wrapping. The container 10 can be sealed after filling and partially evacuated by means of a vacuum probe or the like. Due to its palletised base 12, the container system can be handled in accordance with palletised loading techniques.

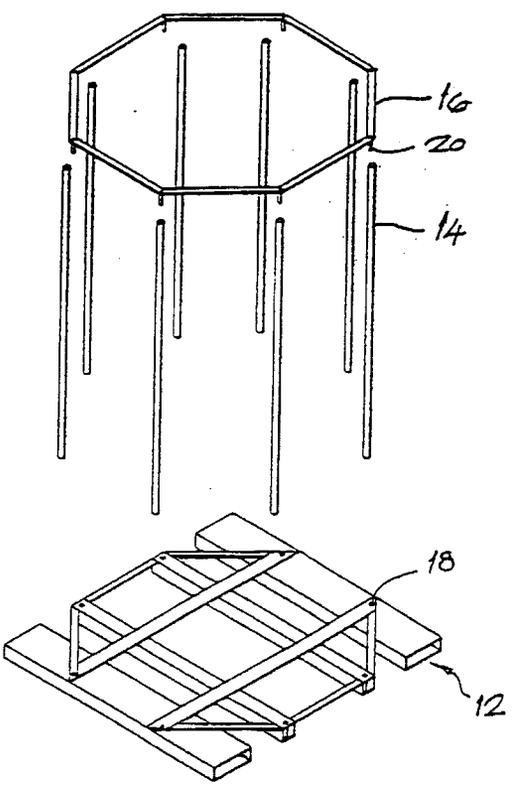

figure 1

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BACKGROUND TO THE INVENTION

This invention relates to an intermediate bulk container.

Intermediate bulk containers currently in use normally comprise large bags of various types of sheet material, which are provided with lifting loops and which are strengthened or reinforced by means of fabric strips. Bags of this type typically assume circular or partly circular plan outlines when filled and it will be appreciated that this reduces the packing density of such containers.

It is an object of this invention to alleviate this problem.

SUMMARY OF THE INVENTION

According to this invention, a container system includes a flexible sheet material container and a foraminous external frame structure, which is adapted to support the container and to determine the filled container shape by the retention of the container, through predetermined positioning of the frame elements.

By selecting the degree of flexibility, stretch or both, of the container material, the container may be configured or shaped to assist in defining the filled container shape in conjunction with the frame structure.

The container system may include a sheet material wrapping which is adapted to extend about a substantial portion of the filled container and the frame structure.

The container may conveniently include an inner liner and an external sheath and in one form of the invention the sheath is adapted for securement to the frame structure.

The frame structure is preferably demountable and in a preferred form of the invention, at least the base of the frame structure is pallet shaped to facilitate the handling of the container system by means of palletised load handling techniques.

The invention includes a method of packaging in flexible sheet material containers, the method including the steps of locating the sheet material container within a foraminous external frame structure which is adapted to support the container and to determine the filled container shape by the prior positioning of the frame elements in predetermined positions and filling the container.

The method may include the step of wrapping the sheet material container and a substantial portion of the frame structure with a tensionable sheet material wrapping.

The container system and packaging method of the invention find particular application in the packaging of fluent materials, including both granular and liquid materials. For such materials in particular, the system and method may be adapted to allow at least partial evacuation of fluids other than the packaged material, from the container after filling. This will facilitate wrapping of the system and allow the packed, evacuated container to supplement the rigidity and compression resistance of the system as a whole.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described with reference to the accompanying drawings in which:

Figure 1 is an isometric view, partly exploded, of a frame structure for the container system of the invention;

Figure 2 is a diagrammatic plan view of the container system with the container filled; and

Figure 3 is an isometric view of the frame structure of Figure 1 after demounting thereof.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

The container system of the invention comprises, in essence, a flexible sheet material tube which is hollow and which is located within a frame structure adapted to support the tube and to determine its final filled shape.

Referring to Figure 1, the frame structure of the container system includes a pallet base 12, a plurality of uprights 14 and a spreader frame 16. The pallet base 12 and the spreader frame 16 are provided with sockets 18 and pins 20 in complementary positions on substantially similar plan outlines. In the example of Figure 1, the plan outline is octagonal.

In use, the uprights, which are constituted by hollow steel tubes, are located within the sockets 18 formed in the pallet base 12. The pins 20 of the spreader frame 16 are located in the upper open ends of the uprights 14, thereby to complete the frame structure.

In the example illustrated in Figure 2, a sheet material container is located within the erected frame structure. The container is constituted by a low density polyethylene (LDPE) tube which is either sealed of folded at the bottom. The container can now be filled with the intended contents.

In Figure 2, the pallet base is shown in dotted outline 12.1 and the container or LDPE tube is shown in dotted outline 10. The uprights 14 of the frame structure tend to retain the LDPE tube 10 against its natural tendency to bulge outwardly in particular points of restraint. In the example shown, the tube 10 therefore adopts a roughly square plan outline shape as the filling material fills the container 10.

After filling, the top of the LDPE tube 10 is folded over and the entire container and frame structure is then stretch wrapped with a limited stretch film wrapping. Particularly where the content of the container 10 is dry or granular, the container 10 can be sealed after filling and partially evacuated - air can be removed from the interior of the container 10 by means of a vacuum probe or the like. This is done prior to stretch wrapping and has the effect of utilising the container contents to provide the greater part of the structural integrity of the container system. The frame structure and container 10 can now be stretch wrapped. Notwithstanding possible loss of vacuum during transport and loading, therefore, the wrapping will tend to maintain the vacuum induced packing density within the container 10.

Due to its palletised base 12, the container system can be handled in accordance with palletised loading techniques. The use of an external frame structure will provide additional structural integrity and stacking capabilities to the container system. It will also be appreciated that the frame structure can be adjusted to provide a variety of plan outlines to the container 10, depending on the intended contents of the container and the loading configuration required of the container system.

The container 10 may include an inner lining and an outer sheath, with the LDPE tube serving as the liner. The outer sheath may be of woven polypropylene and, in addition, it may be adapted for attachment to the frame or elements of the frame. The sheath can, for instance, be formed with sleeves which are intended to house the uprights 14 of the frame structure. An additional advantage of such a sheath is that it can be shaped in a manner that provides a more effective means of determining the plan outline shape of the filled container.

To empty the container 10, the pallet base is merely loaded on an emptying station with the pallet straddling the intended container discharge point. The base of the container can then be cut to allow the contents thereof to discharge. To ensure complete emptying, the top of the container 10 can be engaged and drawn upwardly through the frame structure, thereby to ensure that the sides of the container 10 are lifted clear of the pallet base and the container is completely emptied. During this process the stretch wrapping will fall away from the outside of the container 10 and frame structure uprights 14 and upon completion of the process, the container 10 and the stretch wrapping can be discarded.

The frame structure can now been dismantled to a virtually flat configuration substantially as is illustrated in Figure 3. In this drawing the uprights are shown ready for insertion into the gap between the pallet frames 12.2, where a retaining mechanism, such as a T-bar and wing nut (not shown) can be used to locate the uprights 14. The spreader frame 16 can now be brought downwardly onto the pallet base 12 so that the pins 20 are engaged within the sockets 18 in the pallet base.

The frame structure can be reused many times. This will substantially reduce the cost of utilising the container system of the invention. In addition, the amount of waste packaging material generated by the use of this system is substantially less than existing systems with the result that it is substantially more beneficial to the environment, particularly if the discarded materials are recyclable.

Claims

1. A container system including a flexible sheet material container and an external frame structure comprised of a plurality of frame elements, characterised in that at least some of the frame elements are capable of pre-positioning in the frame structure, which is adapted to support the container and to determine the filled container shape by the retention of the container in one of a number of predetermined positions of the frame elements.

2. A container system according to claim 1 characterised in that the container is constituted by an inner liner and an external sheath.

3. A container system according to claim 2 characterised in that the external sheath is adapted for securement to the frame structure.

4. A container system according to claim 1 characterised by the provision of a sheet material wrapping which is adapted to extend about a substantial portion of the filled container and the frame structure.

5. A container system according to claim 1 characterised in that the frame structure is demountable and at least the base of the frame structure is shaped to facilitate the handling of the container system by means of palletised load handling techniques.

6. A method of filling a flexible sheet material container located within an external frame structure comprised of a plurality of frame elements, at least some of which are capable of pre-positioning within the frame structure, the method being characterised by the steps of pre-positioning the frame elements in the frame structure, locating the container within

the frame structure for the frame structure to support the container and filling the container while allowing the position of the frame elements to determine the filled container shape.

7. A method of filling a flexible sheet material container according to claim 6 characterised by the step of wrapping the sheet material container and a substantial portion of the frame structure with a sheet material wrapping under tension.

8. A method of filling a flexible sheet material container according to claim 7 characterised by the additional step of at least partially evacuating fluids other than the packaged material, from the container after filling prior to wrapping.

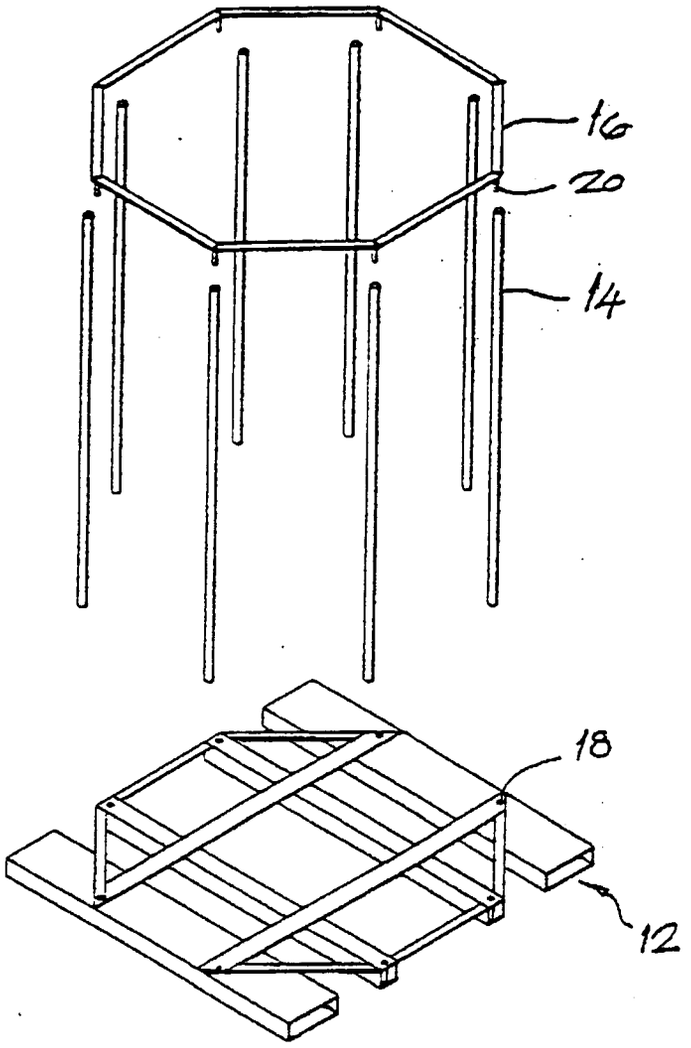

figure 1

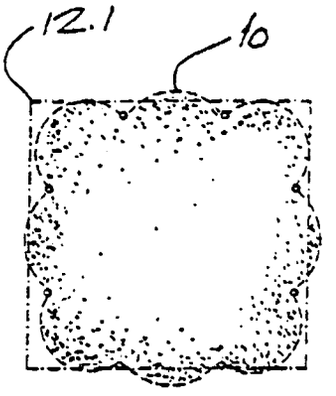

figure 2

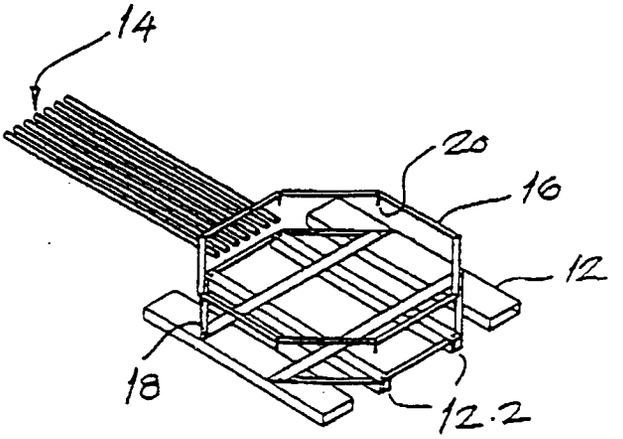

figure 3

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EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT

EP 93115485.0

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	FR - A - 2 634 469 (SOCIETE DE FABRICATION DE MATERIEL D'EMBALLAGE) * Abstract; figs. 1-4 * --	1-3,5, 6	B 65 D 90/20
Y	GB - A - 2 250 976 (PALLETOWER (G.B.) LIMITED) * Abstract; claims 1-10; fig. 1 * --	1-3,5, 6	
A	US - A - 4 221 296 (FELL et al.) * Abstract; fig. 1 * --	1-6	
A	EP - A -0 373 506 (SARIG) * Abstract; fig. 1 * ----	1-3,6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	23-12-1993	WIDHALM

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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