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(54) **Support structure for cardboard containers to be handled by fork lift trucks.**

(57) The present invention relates to a method for the construction of pallets to be used as supports for the handling and transport of salesgoods containers particularly of large dimensions and heavy weight. The pallets are adapted to be returned to the shipper for being reused, thanks to their compact construction resulting from their being composed of a plural-

ity of substantially identical, separate support elements (15,16,17) disposed substantially parallel to one another at substantially equal spacings, and provided on their top faces with abutments (8) for the releasable retention of the bottom flaps (11) of the container (2) to be transported.

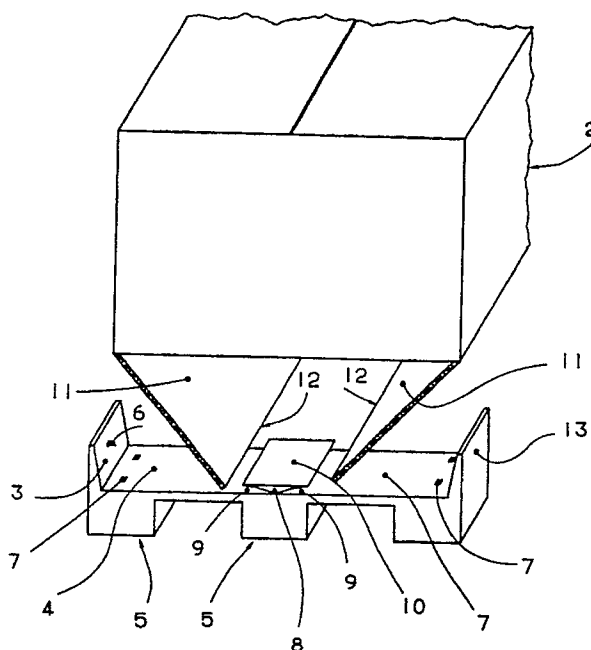


FIG. 2

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The most widespread technique for packing goods in palletized containers and/or boxes involves the use of preformed and sufficiently strong containers made of rigid cardboard, which are set up at the site of use by suitable folding a cardboard blank so as to form the walls and the bottom of the container. The thus obtained receptacle is sufficiently rigidified by means of adhesive tapes, staples or the like so as to stabilize it in its predetermined shape. The thus finished box is then placed onto a pallet, usually made of wood, plastic or suitably reinforced cardboard, and filled to the desired level with the goods to be transported, whereupon it is closed at the top.

The box and the pallet supporting it are then finally secured to one another by passing strips or tapes therearound, to result in a unitary and rigid body ready for transport.

The characteristics of the pallet, which are generally known and need therefore not be described, renders this kind of package particularly suitable for being handled by means of fork lift trucks or any other mechanical lifting and conveying machinery.

Although this kind of package offers optimum characteristics with regard to stability and conveyability, it still suffers from certain shortcomings which frequently render its usefulness questionable from the viewpoint of productivity and economy.

This is because this type of package is generally conceived as disposable due to the fact that its volume cannot be reduced after it has been emptied of the packed goods; the great volume of the emptied package or pallet renders its return to the shipper excessively expensive, thus preventing it from being reused, at least by the original user.

In the second place, but not less important, each container requires the use of a pallet having dimensions corresponding to that of the container; in view of the fact that many different types and sizes of containers are in general use, it follows that the user of this kind of packing materials has to keep numerous types of pallets in stock, resulting in economic disadvantages and storage difficulties.

There exist known modifications of this type of packing materials intended to overcome the described shortcomings.

It is thus a known practice to substitute pallets of definite and rigid dimensions by a number of elongate box-shaped supports, preferably made of cardboard, which are fixedly secured by known means, for instance adhesive or staples, to the bottom face of the container or box.

The supports are thus secured in such a manner that between one support and an adjacent one there remains a space for the insertion of the prongs of a fork lift truck or other handling ma-

chine, resulting in a geometric configuration similar to that of a conventional pallet. The box-shaped supports are then filled with a strengthening material, for instance polystyrene foam, so as to ensure the required compression and bending strength.

The described supports are exceptionally suited for replacing conventional wooden pallets, and also solve the problem of standardization of packing dimensions with regard to containers of different size, since they can be used in suitable numbers for ensuring stable support of the container, and can also be secured thereto at suitable spacings for providing the required openings therebetween for the engagement of handling equipment.

Although this solution is thus acceptable from the viewpoint of standardization of the packing materials, it does not solve the more important problem, namely that of the renewed use of one and the same pallet by the original user, since the thus formed package material is still disposable due to its rigid structure and dimensions in its once finished state.

It would therefore be desirable, and is an object of the present invention, to provide a method for making a type of packing structures capable of being handled by means of mechanical lifting equipment, which reduces to a minimum the variety of components of which it is composed, and which permits a convenient reclamation and renewed use of the components after transport and discharge of the contained goods.

These and other objects are attained by a method for making the type of packing structure to be described in the following by way of example and with reference to the accompanying drawings, wherein:

- fig. 1 shows a perspective view of a single support element used in this type of packing structure,
- fig. 2 shows a diagrammatic view illustrating the operation of mounting a container on a support element, and
- fig. 3 shows a finished packing structure comprising a container mounted on a suitable number of support elements jointly acting as a pallet.

The characteristics of the invention are defined in the attached claims.

With reference to the figures, the following elements are shown:

- 1) outer wall of upper containment pallet elements of a component of the packing structure,
- 2) box-shaped container having bottom closure flaps,
- 3) lateral inner walls of pallet elements,
- 4) container support surface on support element,

- 5) ground-engaging foot portions of support element,
- 6) retaining barbs projecting from inner walls of support element,
- 7) locking teeth projecting from support surface of support element,
- 8) symmetric abutment disposed on centerline of support surface 4,
- 9) engagement undercuts between abutment 8 and surface 4,
- 10) top surface of abutment 8
- 11) bottom flaps of container 2,
- 12) lower edges of flaps 11,
- 13) laterally containment wall portions,
- 14) securing strips or tapes,
- 15, 16, 17) support elements incorporated in a unitary packing structure.

The invention is based on the construction of a support structure for a container 2 achieved by applying a number of support elements (fig. 1) in a fixed although releasable manner to the bottom bottom wall of the container represented by its bottom flaps 11.

For facilitating the description of these support elements, depicted in the most comprehensible manner in fig. 1, it needs only be said that they resemble a short length of a conventional pallet, supplemented by a pair of small lateral containment walls 13, a central abutment 8, and a number of small projecting parts to be described in the following.

Abutment 8 is located on the centerline of the support surface 4 and is of a symmetric shape of a flat V-shaped cross-sectional configuration, so that two symmetrically disposed undercuts 9 are formed between abutment 8 and surface 4.

Surface 4 is further provided, preferably at locations adjacent the inner wall surfaces 3 of containment walls 13, with a number of upwards projecting teeth 7, wall surfaces 3 being similarly provided with downwards directed arcuate barbs 6.

The operation of assembling the packing structure according to the invention proceeds in the following manner:

After placing a number of n support elements on the floor at parallel spacings equalling $1/(n-1)$ of the length of the container 2 to be transported, a cardboard blank is used for setting up container 2, without the use of adhesive tapes or the like, so that bottom flaps 11 are free to project downward at an angle of about 45° .

Container 2 is then lowered onto the support elements, so that its bottom flaps 11 slide inwards on support surface 4 until their free edges enter the undercuts 9 of abutment 8 and the bottom of the container is thus closed.

As container 2 is being lowered, the lower rims of its lateral walls slide downwards on inner wall

surfaces 3 of the containment walls 13 provided at the end of the support elements.

For facilitating the insertion of container 2, the inner wall surfaces 3 are preferably inclined inwards to thereby improve the retention of the container on the support surfaces 4 without hampering its introduction between containment walls 13.

In order to further improve the retention of the container, barbs 6 penetrate its walls to their full length so as to subsequently prevent the container from being lifted off the support element, the latter being positively locked against lateral displacement by teeth 7 on support surface 4 penetrating bottom flaps 11, and more effectively still by the engagement of the edges 12 of bottom flaps 11 in undercuts 9 of abutment 8 over a considerable part of their length.

It is in particular the engagement of flap edges 12 with the abutments 8 on all of the support elements which imparts the required stability and strength to the finished packing structure composed of the container and support elements.

The assembly of the packing structure is terminated by securing the above described components fixedly to one another by means of strips or tapes 14 which are wound around the assembled components in the known manner as shown in fig. 3.

The result of this assembly operation is a palletized container of cubic configuration, capable of being handled by fork lift trucks and the like and offering, in addition to the advantages pointed out above, further significant advantages, such as:

- a low weight,
- easy handling,
- absence of nails and screws,
- reduced space requirement for stacking and storage,
- reduced expenditure for return transportation (the volume of each support element is only a fraction of that of a conventional pallet),
- reduced manufacturing cost.

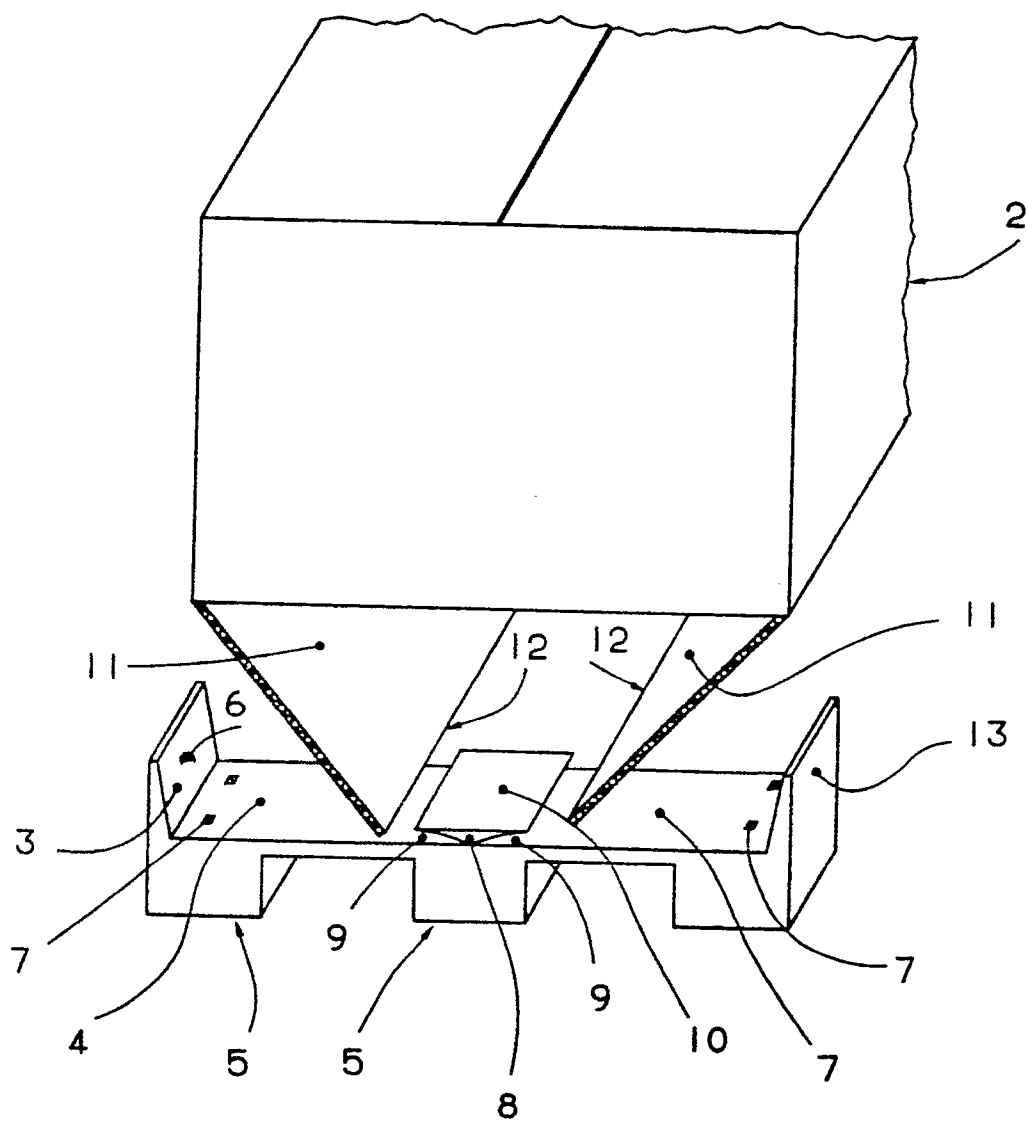
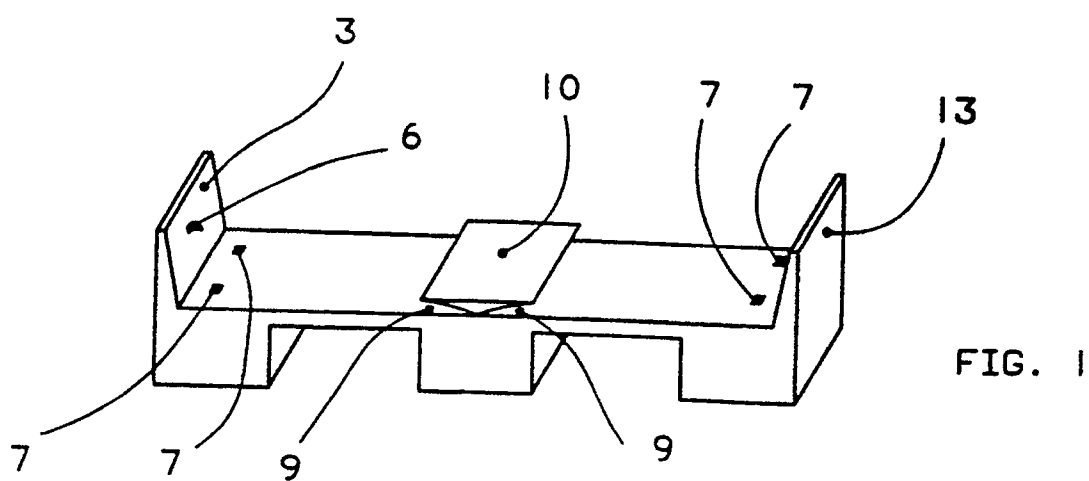
After the packing structure has arrived at its destination and been unpacked, the support elements can be readily detached from the actual container, which in its empty state is readily deformable and no longer held down on the support elements by the weight of the previously contained goods.

The support elements may then be stacked without difficulty and returned to the original shipper for renewed use, the space being occupied by the support elements being considerably smaller than that occupied by conventional pallets.

Claims

1. A method for the construction of means for

- transporting and handling box-shaped cardboard containers, said means comprising lateral apertures for the insertion therein of the prongs of a fork lift mechanism, said containers resting on the top surface of said means substantially over the full extent thereof, characterized in that said means comprise a plurality of separate, substantially identical support elements (15,16,17) disposed parallel to one another at substantially equal spacings and provided on their upper sides with respective abutments (8) for releasably locking the bottom flaps (11) of a container (2) to be transported.
2. A method according to claim 1, characterized in that said abutments (8) are of a symmetrical, flattened V-shape and positioned on the centerline of said separate support elements (15,16,17).
3. A method according to claim 2, characterized in that said abutment (8) cooperates with the top surface (4) of said support element to define a pair of substantially identical and symmetric undercuts (9) adapted to be engaged by the two bottom flaps (1) of said container (2).
4. A method according to any of the preceding claims, characterized in that said support elements (15,16,17) are provided on their top surfaces (4) with a respective number of teeth (7) projecting upwards therefrom for engagement with said bottom flaps (11) of said container (2) when set down onto said support elements (15,16,17).
5. A method according to any of the preceding claims, characterized in that said support elements (15,16,17) are provided at their lateral ends with a pair of symmetrically disposed containment walls (13) extending vertically upwards.
6. A method according to claim 5, characterized in that the inner wall surfaces (3) of said vertically extending containment walls (13) are slightly inclined inwards of said support element.
7. A method according to claim 5 or 6, characterized in that said inner wall surfaces (3) of said containment walls (13) are provided with a number of downwards directed barbs (6) adapted to come into locking engagement with the lateral walls of said container (2) when set down onto said support elements (15,16,17).



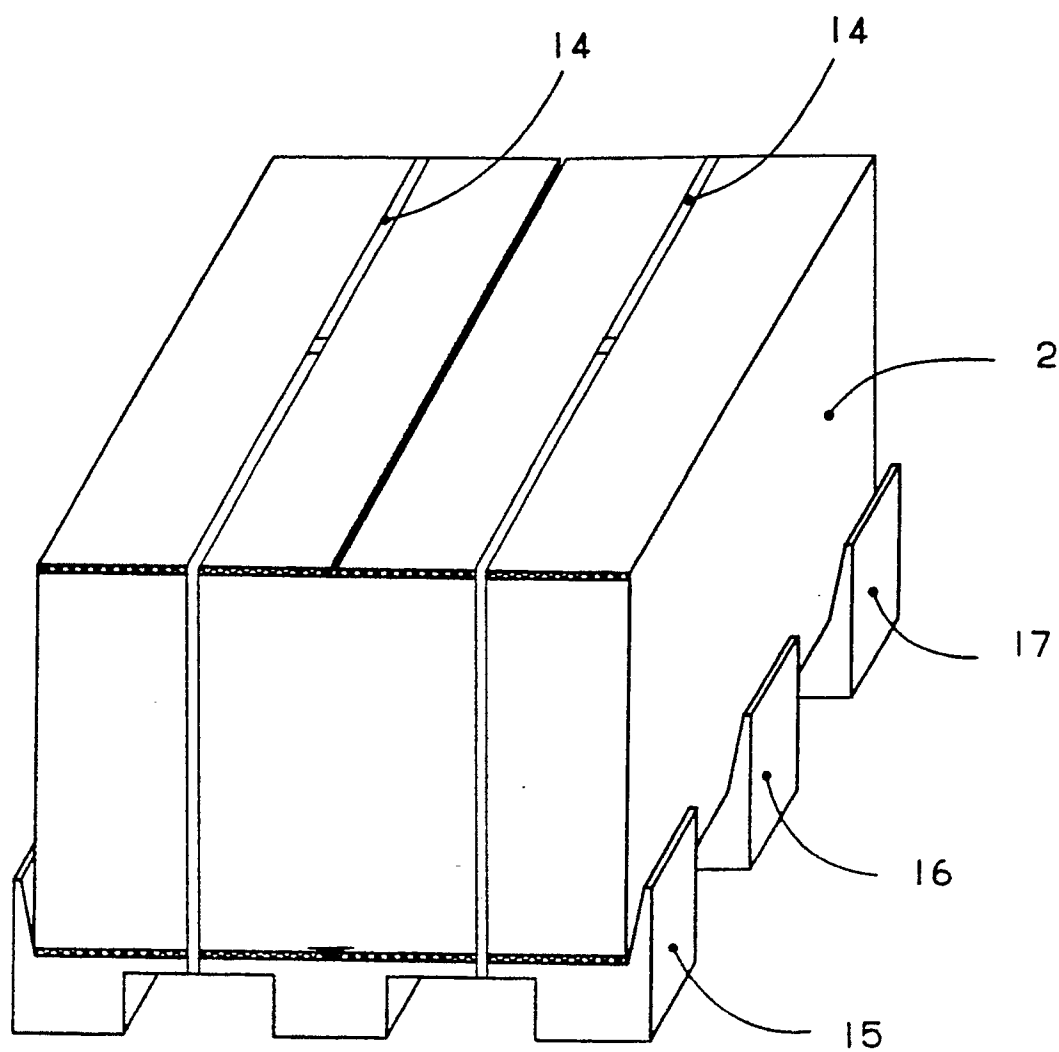


FIG. 3

EP 91 10 4070

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.5)
X	EP-A-0 168 252 (ST. REGIS PACKAGING LTD) * abstract; figures *	1-3	B 65 D 19/20
A	US-A-3 797 727 (CATERPILLAR TRACTOR CO.) * abstract; figures 4,5 *	7	
A	US-A-3 026 015 (SEVERN)		
A	US-A-3 236 197 (K & H CORRUGATED CASE CORP.)		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 D
Place of search		Date of completion of search	Examiner
The Hague		18 June 91	MARTIN A.G.M.
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