United States Patent [19]

Webb

[11] **3,863,784**

[45] **Feb. 4, 1975**

[54] **LOAD SUPPORTING PALLET**

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[22] Filed: **July 17, 1973**

[21] Appl. No.: **380,104**

Related U.S. Application Data

[62] Division of Ser. No. 133,795, April 14, 1971, Pat. No. 3,763,792.

[52] **U.S. Cl.** ..... **214/10.5 R**, 108/51, 225/1

[51] **Int. Cl.** **B65d 57/00**

[58] **Field of Search** ..... 229/5 DS; 206/68; 108/51, 108/53, 55, 58; 214/10.5 R, 10.5 S; 225/5 DS, 1

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Primary Examiner—Andrew R. Juhasz
Assistant Examiner—Leon Gilden
Attorney, Agent, or Firm—Phillips, Moore, Weissenberger, Lempio & Strabala

[57] **ABSTRACT**

An elongated continuous storage and shipping pallet is made up of separable sections so that a selected number of tiers of cartons may be taken from a stack by lift trucks without manual handling.

12 Claims, 12 Drawing Figures

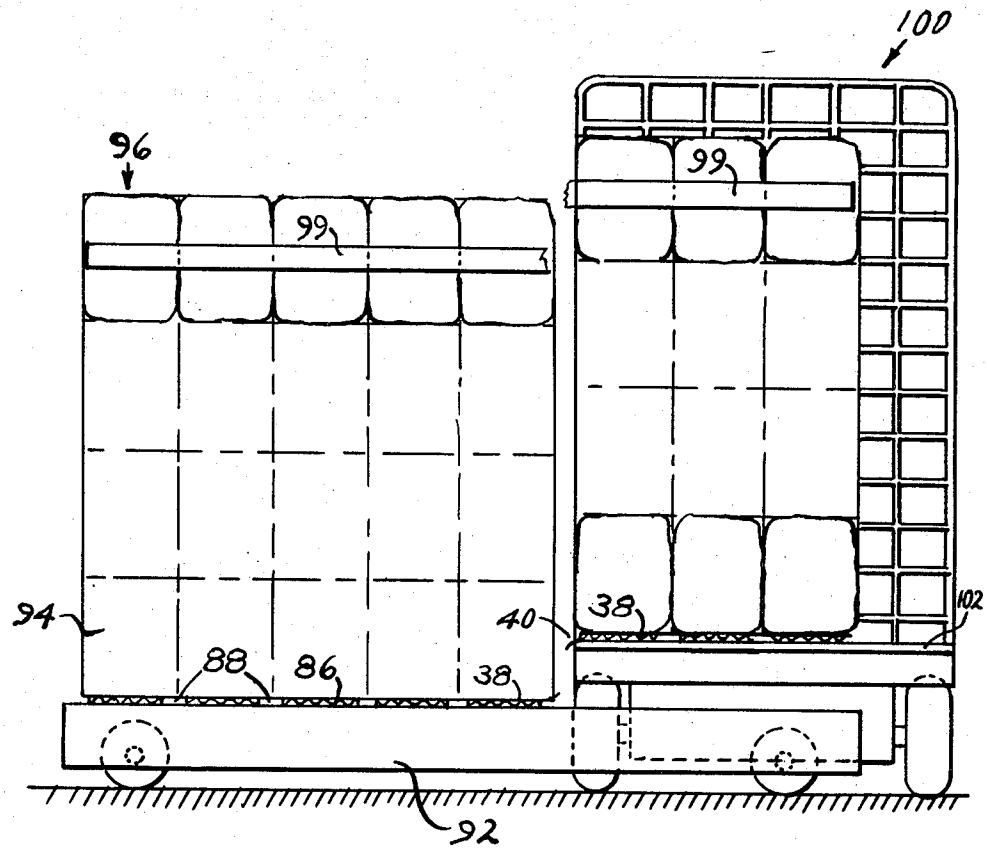


FIG. 1

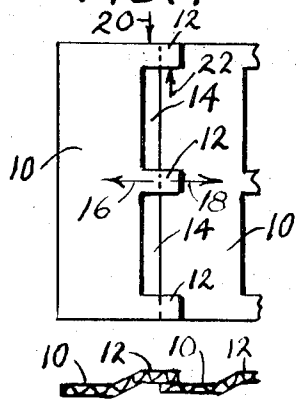


FIG. 2

FIG. 3

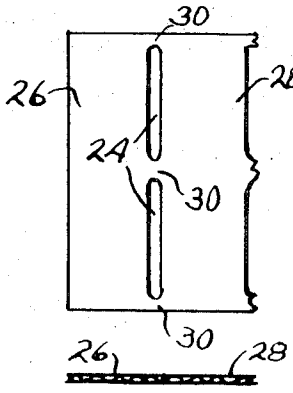


FIG. 4

FIG. 5

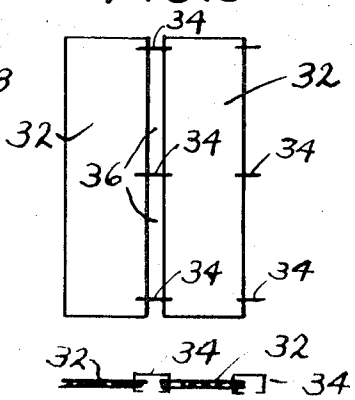


FIG. 6

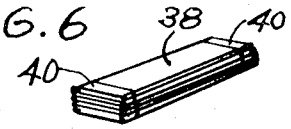


FIG. 7

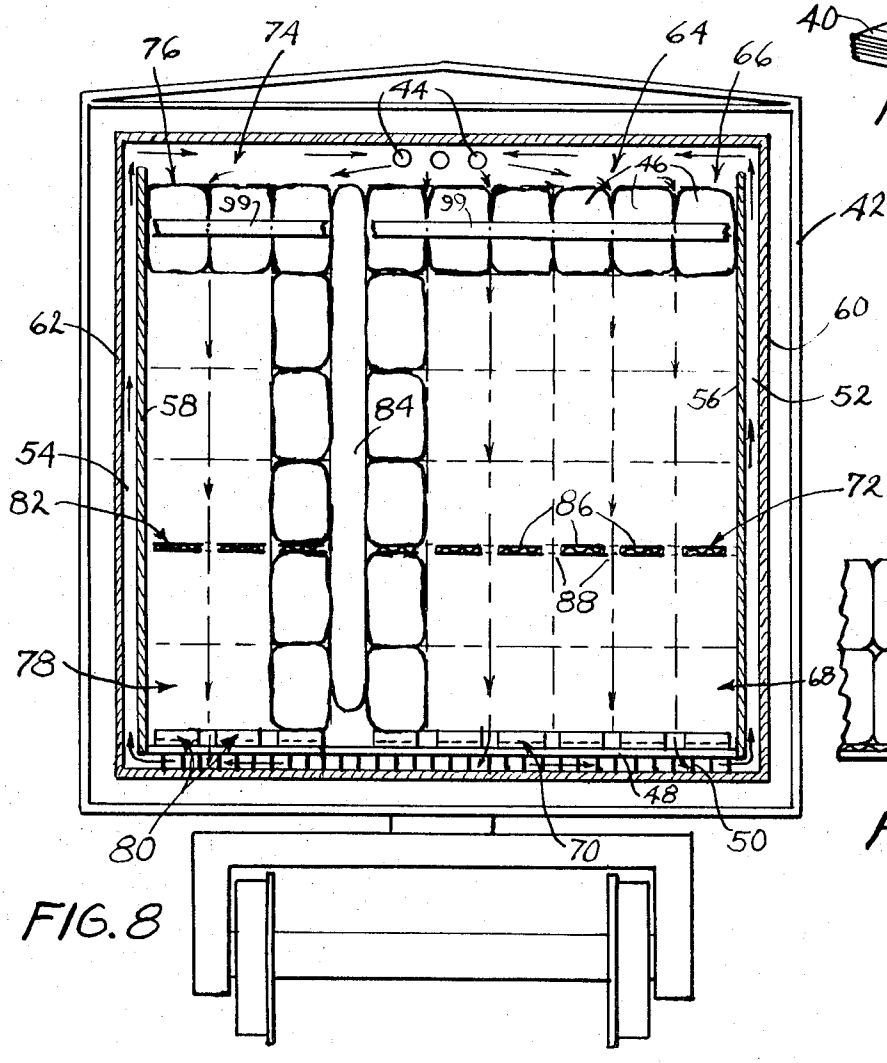


FIG. 8

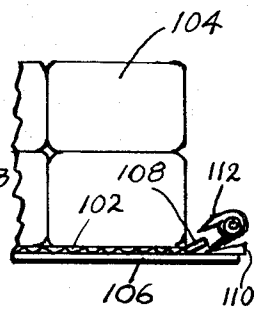
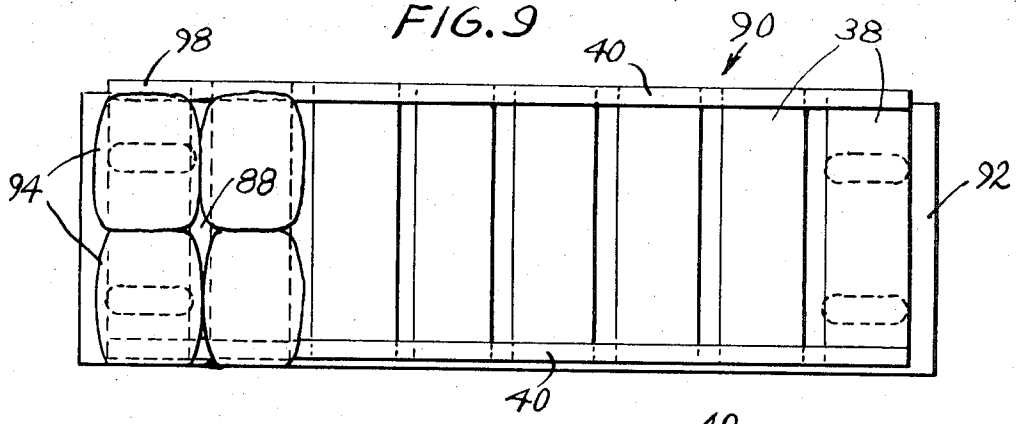


FIG. 12

FIG. 9



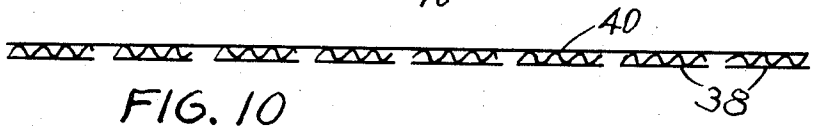


FIG. 10

FIG. 11

LOAD SUPPORTING PALLET

This is a division, of Ser. No. 133,795, filed Apr. 14, 1971 now U.S. Pat. No. 3,763,792.

BACKGROUND OF THE INVENTION

The present invention relates to article handling and pertains more particularly to improved pallets for mechanical handling of cartons and the like.

Many types of products, manufactured as well as grown, are packaged in cartons or similar packages before shipment to the consumer. Such packaging serves to segregate the products into measurable quantities as well as to facilitate handling. In other instances, the packaging serves to protect the goods from damage or contamination. A number of different materials and shapes are used for such packaging.

Because of the incompatable dimensions of presently used transport vehicles and storage areas, a great deal of the cartons and packages must be presently handled by hand. Each package may require transfer between numerous vehicles and storage areas before it reaches its final destination. Thus, if each individual package is transferred by hand between each vehicle and storage area, the cost can become enormous. Furthermore, premiums must normally be paid to workers when cartons are stacked above a certain height. This further increases the expense involved in shipping such goods to the consumer.

A certain degree of manual handling can be eliminated by stacking such packages onto pallets which are then manipulated by a lift truck into storage areas or onto transport vehicles. Several different types of pallets are available. However, numerus advantages and disadvantages are associated with the various types. For example, wooden pallets are normally ideal structurally and normally permit air circulation where needed, but are expensive to construct and maintain, and are space consuming. Fiberboard or paperboard sheet pallets are inexpensive and consume very little spaced, but are lacking in structural rigidity.

The problem of structural rigidity in fiberboard sheet pallets has been largely overcome by recent developments in lift trucks such as illustrated in U.S. Pat. No. 3,141,399, issued July 28, 1964, to R. F. Foster. Such trucks are now equipped with pullers having clamps or grippers for gripping the edge of a sheet pallet and pulling it onto closely spaced forks or a wide load supporting platform. A pusher is then employed for pushing the load from the platform.

Such sheet pallets are illustrated, for example, in Canadian Pat. No. 564,185 issued Oct. 7, 1958. These types of pallets are generally constructed of a corrugated paperboard and are becoming increasingly popular because they are inexpensive and consume very little space. They can normally be discarded at the end of the trip because of their low cost.

Another disadvantage of existing fiberboard pallets exists where certain products requiring air circulation are being transported or stored. Existing fiberboard pallets greatly reduce, and in most instances eliminate air circulation between the packages in a storage area or a transport vehicle.

These prior known sheet and other pallets, however, have a number of other disadvantages. One major disadvantage is that they are normally constructed of a given size and must be used to transfer loads between

vehicles and storage areas that are of varying sizes. Thus, for example, a 4 foot square pallet would be suitable for an 8 foot wide truck bed or a 12 foot wide storage area, but would not be suitable for a 10 foot wide railway car. The 2 foot space in the railway car would have to be either unused or loaded by hand. This diminishes the advantages of such pallets because it leaves unused space and permits the load to shift.

Hand stacking of the load of packages in a space such as the 10 foot railway car also enables the packages to be selectively placed and interlocked at the discretion of experienced labor. Such selective placing of the packages permits vacant spaces to be substantially eliminated and the load to be more firmly stacked to eliminate shifting during travel. However, a load prepared in this manner must also be unloaded by hand labor.

For these reasons, the loading and unloading of many of such products is done with manual labor. This results in increased transportation and distribution costs because of increased time and labor.

SUMMARY OF THE INVENTION

Therefore, it is the primary object of the present invention to provide a novel pallet and method of using same that overcomes the above disadvantages of the prior art.

Another object of may invention is to provide novel pallet construction that permits free circulation of air between tiers of packages.

A further object of my invention is to provide a novel pallet construction that permits selective automatic sizing of loads from already loaded pallets.

Another object is to permit loading ad unloading of any size load supporting area by means of lift trucks.

In accordance with my invention, a pallet is provided with separable support sections for supporting the tiers of cartons of a load. Any number of tiers of cartons can then be selected and removed from a given stack of cartons without disturbing the remainder of the stack.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects and advantages will become apparent to those of skill in the art from the following description when read in conjunction with the following drawings wherein:

FIG. **1** is a plan view of a pallet constructed in accordance with the present invention;

FIG. **2** is an elevational view of the construction of FIG. **1**;

FIG. **3** is a plan view of an alternate embodiment of the present invention;

FIG. **4** is an elevational view of the embodiment of FIG. **3**;

FIG. **5** is a plan view of a further embodiment of the present invention;

FIG. **6** is an elevational view of the embodiment of FIG. **5**;

FIG. **7** is a perspective view of a still further embodiment of the present invention in a folded position;

FIG. **8** is an end view, in section, of a railway car loaded with use of the present invention;

FIG. **9** is a top plan view of a partially loaded truck or dolly using pallets of the present invention;

FIG. **10** is a side view of a pallet such as used in FIG. **9**;

FIG. 11 is a side view of a loaded dolly of FIG. 9 with a lift truck in the process of unloading a portion of the load.

FIG. 12 is an elevational view of a loaded pallet in conjunction with a gripping mechanism.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings and more specifically to FIG. 1, there is illustrated a pallet constructed in accordance with the present invention, comprising a plurality of thin substantially rectangular sections 10 with a suitable shearable joint establishing connections between the adjacent sections to make a continuous pallet of indeterminate length. Each of the sections is provided with a plurality of tabs 12 which extend to and is suiably connected such as by overlapping and gluing to the adjacent section. Each of the sections 10 may be constructed of any suitable material such as fiberboard or paperboard and will have a dimension that is compatible with cartons or packages to be handled. For example, the length of each section looking from or along the horizontal as seen in FIG. 1, for maximum versatility, would be approximately the width of a package that is to be handled. The width or vertical dimension as seen in FIG. 1 would then preferably correspond to the length of forks or support platform of a lift truck to be used.

The adjacent sections 10 may be closely spaced for use in situations where circulation between tiers of packages will obviously not be needed but is constructed with slots 14 between the sections where air circulation may be needed. The shearable or separable connection formed by tabs 12 is preferably constructed to have a shear strength that is substantially less than the shear strength of the adjacent sections 10 but has a tensile strength that is somewhat greater than the shear strength of the tab or connection. The tensile strength, of course, would be determined by forces acting along arrows 16 and 18 and the shear strength would be established by forces acting along arrows 20 and 22. The purpose and advantage of this shear joint will be more fully described below.

The construction illustrated in FIGS. 3 and 4 may be formed from a continuous strip of suitable material simply by stamping out a series of suitable spaced slots 24 for establishing the length of the sections 26 and 28. This leaves a shearable joint between the sections 26 and 28 established by means of a plurality of strips or portions 30 extending between the sections. The slots 24, of course, will be of a suitable width to perform their intended function.

Another embodiment is illustrated in FIGS. 5 and 6 in which a plurality of identical rectangular sections 32 are suitably connected or attached together by a plurality of connecting elements 34 of any suitable material to serve the purpose. These elements, for example, may be wire staples. Again, as in previous embodiments, the space 36 may be provided if desired.

These individual sections 32 are also suitable for an alternate construction wherein the connecting member 34 is omitted. In other words, there is not actual physical connection between the sections. This would provide individual sections for supporting separate tiers on the common platform of a lift truck. While such a construction does not have the stability of a pallet having the sections physically connected, it would be feasible in many applications. A cooperative connection between the sections would exist by means of a lift truck platform having a width sufficient to support a plurality of the sections. Thus, by the term "pallet," herein, I intend to cover a pallet comprising a plurality of tier supporting sections, whether physically connected or not.

A further embodiment of the present invention is illustrated in FIG. 7 wherein a plurality of pallet sections 38 are connected together by strips of tape 40 and shown stacked together in a bundle. Many well known packaging tapes are suitable for this purpose. Such tapes are known for their high tensile strength and yet can be easily torn by forces applied transverse to the surface thereof. Further illustration of this embodiment is shown in FIGS. 10 and 11.

The use of pallets constructed in accordance with the present invention is shown in FIG. 8 in conjunction with a loaded railway car in which circulation of cooling air is established. A railway car 42 is suitably equipped to provide air circulation to the car. For example, suitable inlet means 44 are provided for introducing, for example, cooled air into the car above the cargo such that the air then flows such as indicated by the arrows down through and between the cartons or packages 46 to a supporting floor 48 which has suitable slots or openings to permit flow into a passageway 50 below the supporting floor. The circulating air then flows to either side of the car where it flows along passageways 52 and 54 formed between supporting side walls 56 and 58 spaced between the vertical walls 60 and 62 of the railway car.

The boxcar is loaded with a first stack 64 which comprises six adjacent tiers 66, each tier comprising a plurality of superimposed horizontal rows 68. The first stack 64 as illustrated is made up of a first group of six tiers two rows high resting on a first pallet 70 which rests on the supporting floor 48 of the car. A second group of six tiers four rows high rests on the first group of packages on another pallet 72.

A second stack of packages 74 is positioned on the opposite side of the car and consists of three tiers 76 of packages, each of which consists of six superimposed horizontal rows 78. This second stack 74 comprises a first group of three tiers two rows high resting on a first pallet 80 and a second group of three tiers four rows high resting on a pallet 82 resting on the top of the first mentioned group. The space between the two stacks 64 and 74 may be then filled with a suitable inflatable dunnage bag 84 to prevent shifting of the cargo.

As can be readily seen from this illustration, each of the tiers 66 and 76 rest directly over an individual section of a pallet such that the space between the packages or cartons, as viewed vertically between each tier, is left open to permit complete circulation of air therebetween. Looking at pallet 72, for example, there is shown a pallet made up of individual sections 86 having spaces 88 therebetween coinciding with the spaces or the division between the tiers 66.

Thus the non-restricting characteristics of the present pallets are illustrated.

The loaded car of FIG. 8 illustrates a further feature of the present invention which will be more fully discussed and illustrated in FIGS. 10 through 12. This feature is the selectability of the desired size of the pallet at least as to one dimension. That is, the number of tiers to be handled may be selected from one, up to the maximum width of the lift truck handling the loading or un-

loading operation. This permits ready selection of the desired number of tiers to fit the particular vehicles which are being loaded. This is a very important feature because of the varying sizes of transport vehicles which are used to transport cartons from a factory, or to transport fruits and vegetables from the field or even from a processing plant. This problem is further compounded by the different sizes of railway cars themselves in terms of width, length and height.

The illustrated car of FIG. **8**, for example, is of a width to take nine tiers of cartons or packages with a space left between in which the dunnage bag **84** is placed. The arrangement of the load, for example, is such as to illustrate having been loaded by means of a lift truck from a prior support area or vehicle. For example, a load on a previous vehicle could have been loaded onto a continuous pallet as shown in FIG. **10**. In FIG. **9** there is illustrated a truck or dolly **90** having a flat support surface or bed **92** on which is loaded or first placed a continuous pallet such as that described in FIG. **7** wherein a plurality of sections **38** are connected together by strips of tape **40**. Individual packages or cartons **94** are stacked on each of the pallet sections to form a plurality of tiers each having sufficient layers to achieve the desired height. The pallet is preferably positioned on the bed **92** of the dolly **90** in such a manner that an edge **98** extends beyond the edge of the dolly bed so that it may be gripped by the gripper of a lift truck and the support platform may be inserted under the edge thereof. The packages **94** are then preferably positioned such that this edge **98** extends slightly beyond one end to facilitate handling by a fork lift truck. A shearable tape **99** may be strung along a layer between the tiers to lend stability to a stack of cartons.

After the dolly or truck **90** has been loaded as shown in FIG. **11**, a suitable number of tiers as are needed to load the second vehicle are selected, such as three tiers as shown. The lift truck **100** is positioned such that its load receiving platform **102** has the left edge thereof disposed between the selected tier and a rest of the load. The load receiving platform **102** is then inserted or positioned under the selected tiers in the usual manner and begins lifting the load. This lifting action tears or shears the connection tapes **40** and **99** and thus separates the pallet between two sections **38**. This selected load is then taken by the lift truck **100** and deposited in the transport vehicle as in FIG. **8** or in a suitable storage or receiving area as desired. Thus, in this manner, it is seen that with the present invention a lift truck may be used for loading and unloading vehicles and filling storage spaces in a selected manner not heretofore possible. The lift truck vehicle may select any number of tiers of cartons or packages from one up to the number needed to fill the support platform. Thus, in this manner, the lift truck may be used to fill any available space in a transport vehicle or storage area by selecting the number of tiers needed without limitations imposed by as least one of the dimensions of the pallet.

As an example, the area between the spaced parallel walls could be filled in a number of different manners depending upon the width of the cartons and the space between the walls and the width of the load supporting platform of the lift truck used. Suppose that the lift truck platform is equal to the width of stack **64**, or six cartons. The car, however, is approximately 1½ times the width of the lift truck platform. The car is loaded simply by selecting a stack corresponding to stack **74** and putting it into place first. This leaves a remaining space approximately the width of the platform, and stack **64** such that a full lift truck load may be placed into and fill the remaining space.

In a similar manner, if the space to be filled will take several lift truck loads, a partial load may be placed in any position in the loading sequence so long as the final space will take a final load.

FIG. **12** illustrates a pallet **102** supporting a load made up of cartons **104** resting on a surface **106** of a support platform of a suitable transport vehicle or storage area. A pallet **102** is illustrated as having an end **108** extending beyond the edge of the tier of cartons **104** and turned up so as to more readily receive the forward edge of a lift fork or support platform **110** and be available for gripping by suitable grip means **112**.

A vehicle or storage area which has been loaded or filled in accordance with the present invention may also be unloaded in a similar manner simply by reversing the above steps. Thus, a lift truck may be advantageously used to unload as well as load vehicles, warehouses and similar structures in accordance with the present invention.

The present invention also makes it possible to prepare an initial load, whether loaded by hand or not, to be unloaded by means of lift trucks. Thus, the present invention makes it possible to eliminate a great deal of the manual labor normally required in transporting and storing goods.

While I have illustrated my invention with respect to particular embodiments, it is to be understood that changes and modifications may be made in the illustrated structure and manner of using the same without departing from the spirit and scope of the present invention as defined in the appended claims.

What is claimed is:

1. A method of handling a cargo comprising a plurality of indivdual cartons, said method comprising the steps of:

providing a load supporting pallet comprising a plurality of adjacently positioned individual sections connected together by severable connecting means;

placing cartons on said pallet in tiers corresponding to said individual sections to thereby separately load said individual sections;

selecting and moving a predetermined number of said loaded sections less than said plurality of sections; and

severing the connecting means between said selected tiers and adjacent non-selected loaded sections.

2. The method of claim **1** including carrying out the step of severing said connecting means prior to moving said tiers.

3. The method of claim **2** wherein said severable connection comprises a strip of tape.

4. The method of claim **2** wherein said severable connection comprises a tab extending between said sections.

5. The method of claim **2** wherein said connection comprises staples.

6. The method of claim **1** wherein the step of moving said tiers includes the step of loading said selected tiers on a load supporting platform of a lift truck and severing said connection simultaneously therewith.

7. The method of claim **1** wherein said step of severing the connection means is carried out by moving said

selected sections relative to said adjacent non-selected sections to thereby tear said connecting means.

8. The method of claim **7** wherein said selected sections are lifted relative to said adjacent non-selected sections by means of a lift truck.

9. The method of claim **1** wherein:

the step of providing a load supporting pallet includes providing an elongated strip of paperboard of sufficient length to define a plurality of said indivdual sections, and a width corresponding to the length of the platform of a lift truck,

forming transverse slits in said strip to thereby define individual sections having a length corresponding to the width of said strip and having a width corresponding to a lateral dimension of cartons to be moved,

terminating said slits at positions leaving portions of said strip extending between and interconnecting said individual sections for defining said severable connecting means;

the step of severing said connecting means includes lifting said selected section relative to an adjacent non-selected loaded section.

10. The method of claim **1** comprising the step of placing said sections in spaced relation; and,

forming a slot to permit circulation of air between said sections.

11. The method of claim **6** wherein said enclosed area has a width that is other than a multiple of the width of said load supporting platform of said lift truck.

12. The method of claim **11** comprising the further steps of filling an area between a pair of spaced parallel walls with tiers of cartons such that the last remaining space to be filled between said walls is substantially with width of said load supporting platform.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,863,784

DATED : April 29, 1975

INVENTOR(S) : WELLS A. WEBB

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 41, change "spaced" to --space--;

Column 2, line 29, change "may" to --my--;

Column 2, line 35, change "ad" to --and--;

Column 3, line 17, change "suiably" to --suitably--;

Column 3, line 46, change "suitable" to --suitably--;

Column 5, line 44, change "connection" to --connecting--;

Column 5, line 58, change "as" to --at--;

Column 8, claim 12, line 17, change "with" to --the--.

Signed and Sealed this

fifth Day of *August 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks