

March 23, 1954

L. F. PROSSEN

2,673,022

CARTON

Filed Jan. 4, 1950

FIG. 1.

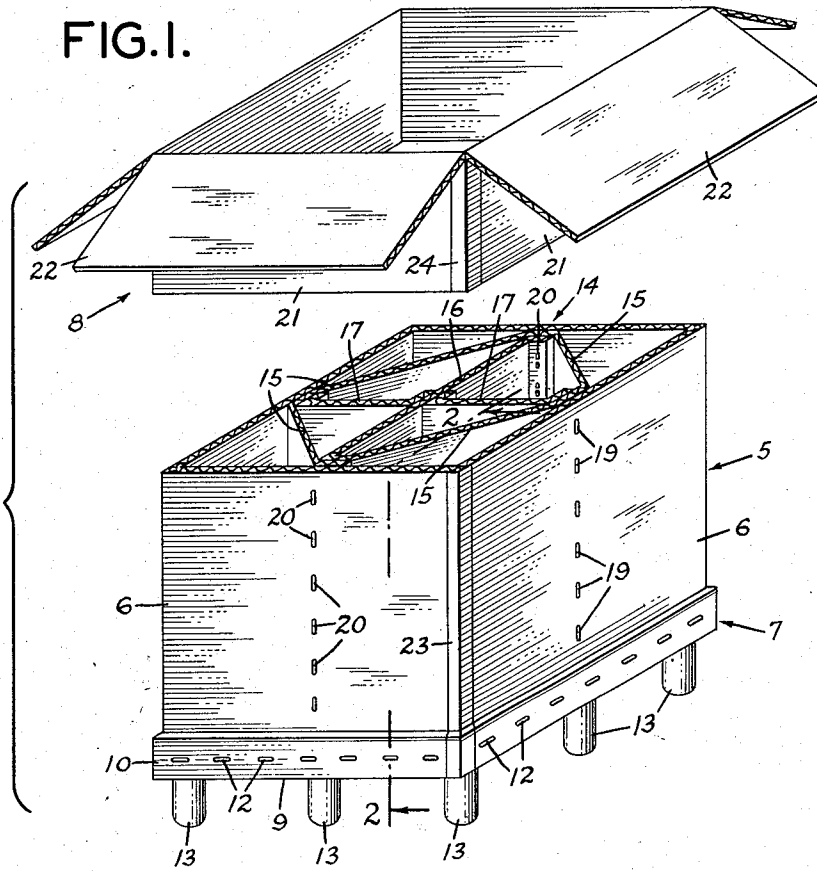
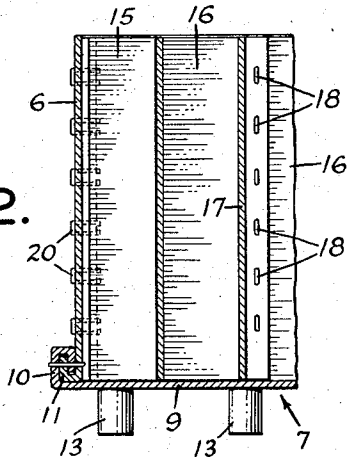


FIG. 2.



INVENTOR.  
LOUIS F. PROSSEN

BY

*J. Kelly & Co. Inc.*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE

2,673,022

CARTON

Louis F. Prossen, Cliffside, N. J., assignor to Celanese Corporation of America, New York, N. Y., a corporation of Delaware

Application January 4, 1950, Serial No. 136,779

3 Claims. (Cl. 229—15)

1

This invention relates to cartons and relates more particularly to an improved carton adapted to be employed for the storing and shipping of dry bulk materials comprising discrete particles.

In the shipping of such dry bulk materials, various types of shipping containers may be utilized. Bagging operations are a frequently employed expedient for the shipping of certain bulk commodities. However, the handling of bagged materials entails a relatively high labor cost. Since the bagged materials are usually handled manually at some stage during shipment, each bag can only contain but a limited amount of the bulk material. Furthermore, the bags do not lend themselves very readily to handling by such labor-saving equipment as fork-lift trucks and the like without some manual operations. The use of square or rectangular corrugated paper cartons with a palletized base is a practical alternative to the use of bags in the shipping and storage of bulk materials since the palletized base is readily adapted to fork-lift truck operations and greatly reduces handling costs. The advantages which are obtained by the use of palletized cartons are very greatly enhanced with increased carton size. Up to the present time, the use of such corrugated paper cartons of a size sufficient to hold two or more tons of bulk material of a relatively small, discrete particle size has been found to be impractical. The weight of the bulk material exerts a substantial outward pressure on the walls of the carton and this pressure tends to bulge the same toward the cylindrical, particularly as the bulk material settles down and becomes more solidly compacted during transit. Where the pressure becomes sufficiently great the walls may be fractured and serious losses may thus result. Even if the pressure on the walls does not ultimately fracture the same, the carton distortion resulting from the outward pressure of said bulk materials makes stacking a very unsatisfactory and dangerous operation since any change from the original square or rectangular shape prevents the stacked cartons from being set securely relative to each other. Furthermore, if the distortion occurs after stacking, the outer cartons of the stack are pushed outwardly to a highly unstable position while the inner cartons are wedged so tightly as to make their withdrawal substantially impossible without initially removing the outer portion of the stack.

It is, therefore, an important object of this invention to provide a carton of a novel structure which is adapted to be employed for the storing and shipping of bulk materials in relatively large

2

amounts without undergoing any distortion in shape during storage or transit.

Another object of this invention is the provision of a novel carton for the storage and shipment of bulk materials in relatively large amounts which is easily fabricated, assembled and sealed, and which may be readily handled by mechanical equipment not only for stacking and shipping but during discharging operations as well.

Other objects of this invention, together with certain details of construction and combinations of parts, will appear from the following detailed description and the accompanying drawing.

In the drawing,

Fig. 1 is a view, in perspective and partly exploded, of the novel carton structure of my invention, and

Fig. 2 is a sectional view of said novel carton structure taken along the line 2—2 of Fig. 1.

Like numerals indicate like parts through the several views of the drawing.

Referring now to the drawing, and more particularly to Fig. 1 thereof, the novel carton of my invention, generally indicated by reference numeral 5, comprises a plurality of side walls 6, a base generally indicated by reference numeral 7 and a cover indicated by reference numeral 8. Base 7 comprises a flat sheet 9 cut and scored so as to provide flaps 10. Flaps 10 are scored with parallel score lines so as to enable a double fold to be formed as shown in Fig. 2 by interleaving flaps 10 with flaps 11 which are formed by suitable scoring and bending the base of each of walls 6. The interleaved flaps thus assembled are then joined, by suitable means such as staples 12 or by stitching, adhesive or the like, to form a firm stress-resistant union in the manner more particularly shown in Fig. 2. A plurality of legs 13 are also provided, said legs being suitably attached to base 7 in any convenient manner to support the weight of the carton structure uniformly and at the desired distance from the floor. Legs 13 serve to form a series of passageways thereunder for the passage of the fork of a mechanical lift for fork-lift handling of the carton structure.

In order to provide a rigid structure whose outer walls 6 are adapted to resist deformation due to any force exerted thereon by the bulk material, there are provided a plurality of interior walls generally indicated by reference numeral 14, which interior walls are firmly fixed to said outer walls 6 in a manner to be hereinafter described in detail. The interior walls, generally indicated by reference numeral 14, comprise a plurality of

3

diagonally disposed walls 15 and a pair of centrally disposed dividing walls 16 and 17. Diagonal walls 15 may be formed integrally with central walls 16 from a continuous sheet, as shown, or they may be formed of separate sections as in the case of central interior walls 17. To provide the desired rigidity, central walls 17 are attached to wall 16 at the center thereof by suitable stapling or stitching 18. The opposite ends of walls 17 are fixed to diagonal walls 15 and to side walls 6 by stapling or stitching 19 while central wall 16 is attached to diagonal walls 15 and to side walls 6 by stapling or stitching 20. Thus, side walls 6 are firmly held in position and any possible bulging or deformation due to the pressure of the bulk material in the carton structure is minimized due to the bracing effect of the interior walls and to the uniform distribution of the stresses present.

In order to seal the carton structure 5 for shipment so as to prevent spillage, a telescopically fitted cover 8 is provided, as mentioned above. Cover 8 comprises side walls 21 and flaps 22, the dimensions of side walls 21 being such that when cover 8 is slid on to the carton structure 5, a fairly tight friction fit will result due to the resulting contact between the surfaces of cover side walls 21 and carton side walls 6.

When filling carton 5 with the desired bulk material, cover 8 is telescopically fitted on the outside of carton 6 so that about two thirds of its height projects above the topmost edges of carton side walls 6 and flaps 22 are bent outwardly in open fashion as shown in Fig. 1. A liner of paper or other suitable lining material (not shown) is preferably placed within the open cover 8 to form a chute for the loose bulk material to be placed in said carton and the bulk material is then introduced. A sufficient amount of the bulk material is placed within the carton 5 to fill all of the separate sections thereof and to then fill the open cover 8 with a volume of the bulk material equal to about 15 to 20% of the capacity of the carton proper. The excess is placed in the carton to compensate for the normal settling of the bulk material during transit. Flaps 22 are then folded over to close the top and, after being sealed with gummed tape or adhesive, for example, cover 8 is pressed downwardly until the inner surfaces of flaps 22 are close to or touch the upper edges of outer carton walls 6. This acts to compress the contents quite solidly. To retain cover 8 in position, the cover and carton body thus assembled are then encircled with steel strapping (not shown) and, in strapped form the carton is ready for shipment.

The novel structure of my invention is sufficiently strong and rigid to be fabricated in sizes large enough to hold several tons of bulk material without being subject to bulging or other deformation or without placing an undue strain on the tape 23 and 24 joining carton walls 6 and cover walls 21, respectively. The carton may be emptied by cutting the steel strapping, removing cover 8 and dumping the carton, or staples 12 may be removed while the carton is upright and the upper portion lifted away to allow the contents to discharge.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

4

Having described my invention what I desire to secure by Letters Patent is:

1. A carton for storing and shipping bulk materials comprising a rectangular base and four vertical outer walls attached to said base, a first vertical partition strip beginning at the vertical center line of a first vertical outer wall and extending diagonally and successively to the vertical center lines of each of the vertical outer walls, returning to the vertical center line of said first vertical outer wall and then extending across the carton to the center line of the opposite outer wall, said strip being fastened to each of said outer walls along said center lines, and second vertical partition strips fastened to the vertical center lines of each of those outer walls which are adjacent to said first vertical outer wall and also fastened to said first vertical partition strip along the vertical center line of the carton, said partition strips each extending the full height of the carton.

2. A carton for storing and shipping bulk materials comprising a rectangular base and four vertical outer walls attached to said base, a pair of centrally disposed intersecting vertical dividing walls dividing the carton into four rectangular compartments of equal size, one dividing wall extending from the center line of one of said vertical walls to the center line of the opposite vertical wall and the other dividing wall extending at right angles to the first dividing wall from the center line of another of said vertical walls to the center line of the opposite vertical wall, said centrally disposed vertical dividing walls being secured to one another throughout their height along their line of intersection and to said vertical walls throughout their height along their lines of contact therewith, and four diagonally disposed vertical walls dividing each of said four rectangular compartments into two triangular compartments of equal size, each diagonally disposed wall extending from the center line of one of said vertical walls to the center line of an adjoining vertical wall and being attached at its ends to said vertical walls throughout its height, each of the dividing walls extending the full height of the carton.

3. A carton for storing and shipping bulk materials comprising a rectangular base and four vertical outer walls attached to said base, a pair of centrally disposed intersecting vertical dividing walls dividing the carton into four rectangular compartments of equal size, one dividing wall extending from the center line of one of said vertical walls to the center line of the opposite vertical wall and the other dividing wall extending at right angles to the first dividing wall from the center line of another of said vertical walls to the center line of the opposite dividing wall, said centrally disposed vertical dividing walls being secured to one another throughout their height along their line of intersection and to said vertical walls throughout their height along their lines of contact therewith, four diagonally disposed vertical walls dividing each of said four rectangular compartments into two triangular compartments of equal size, each diagonally disposed wall extending from the center line of one of said vertical walls to the center line of an adjoining vertical wall and being attached at its ends to said vertical walls throughout its height, each of the dividing walls extending the full height of the carton, and a sep-

5

erable cover provided with cover flaps for telescoping the outer walls.

LOUIS F. PROSSEN.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,162,887	Streit -----	Dec. 7, 1915
1,714,295	Bomberger -----	May 21, 1929
1,990,829	Jensen -----	Feb. 12, 1935
2,021,208	Stouffer -----	Nov. 19, 1935

Number
2,077,174
2,074,175
2,132,666
2,312,846
2,426,883
2,540,595

10 Number
4,446

6

Name	Date
Hyndman -----	Apr. 13, 1937
Krannert -----	Sept. 28, 1937
Williams -----	Oct. 11, 1938
Olvey -----	Mar. 2, 1943
Kartyshai -----	Sept. 2, 1947
Props -----	Feb. 6, 1951

FOREIGN PATENTS

Country	Date
Great Britain -----	Sept. 18, 1883