June 17, 1969 L. D. TRUESDEL ET AL 3,450,292

FLAT MAT AND CRATE ASSEMBLED FROM SAME

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Fig. 1

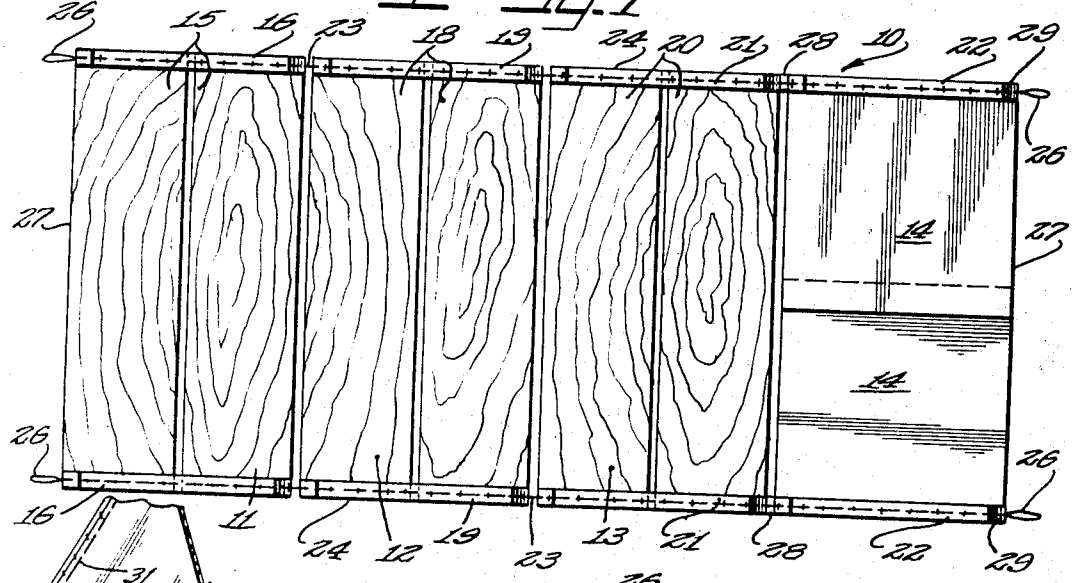


Fig. 3

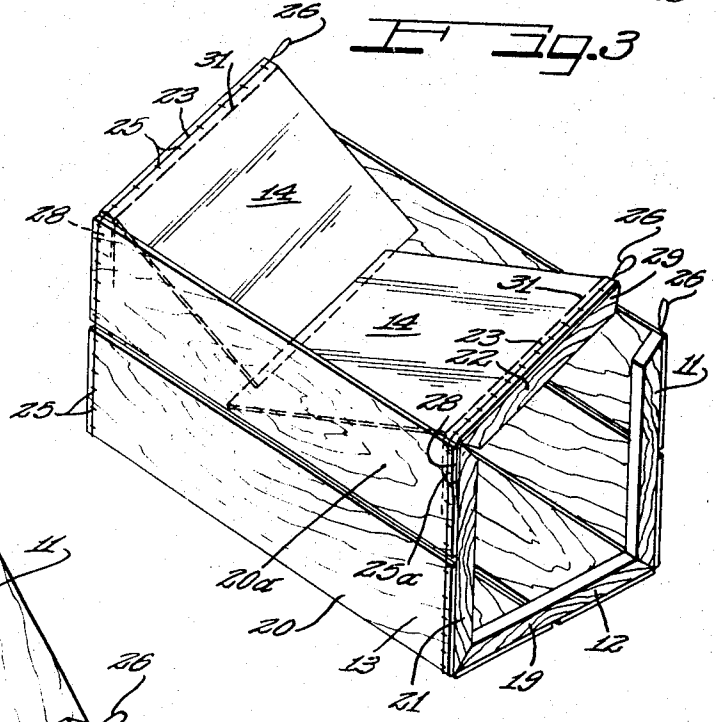
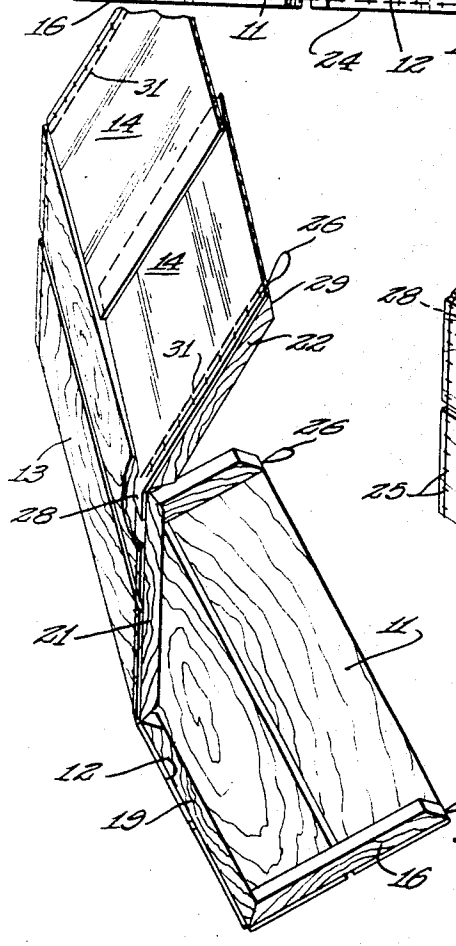


Fig. 2



INVENTORS

Lem D. Truesdel

William P. Simmons Jr.

BY Hill, Sherman, Meroni, Gross & Simpson ATTORNEYS

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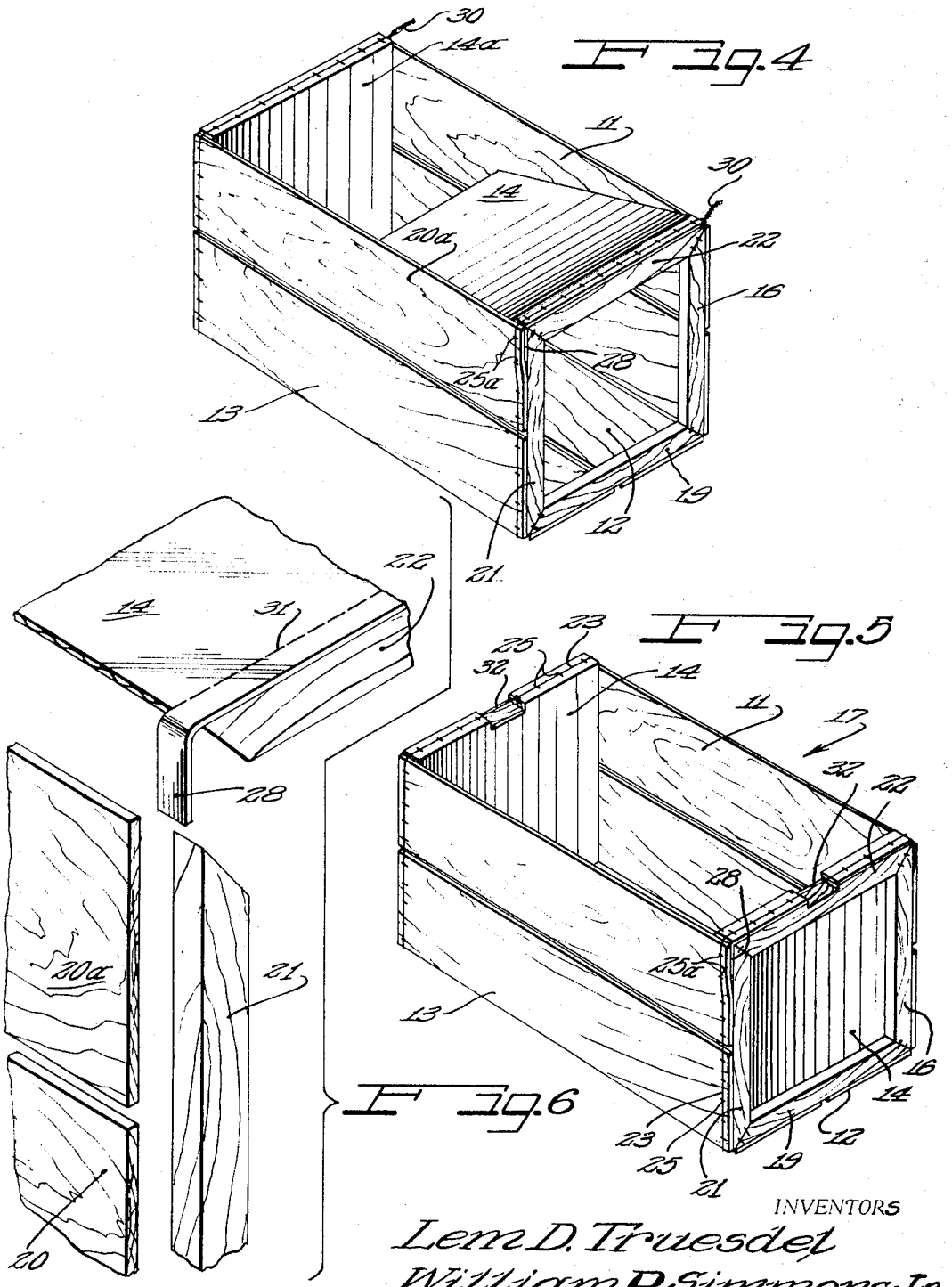


Fig. 4

Fig. 5

Fig. 6

INVENTORS

Lem D. Truesdel

William P. Simmons Jr.

BY Hill, Sherman, Meroni, Gross & Simpson ATTORNEYS

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FLAT MAT AND CRATE ASSEMBLED FROM SAME

Lem D. Truesdel and William P. Simmons, Jr., Macon, Ga., assignors to Southern Crate & Veneer Company, Macon, Ga., a corporation of Georgia

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U.S. Cl. 217—47 6 Claims

ABSTRACT OF THE DISCLOSURE

A flat mat and a crate folded therefrom having a tab on a paperboard end wall extending between an end of the cleat supporting the end wall and a side wall to give support to the cleat in addition to that provided by a flexible wire interconnecting the side wall and the end of the cleat.

BACKGROUND OF THE INVENTION

Field of the invention

This invention pertains to a flat mat and a crate assembled from this mat.

Prior art

Collapsible crates for shipping poultry, vegetables, or fruits are well-known in the art. Many of these crates are assembled by the packer from a flat mat, an example being the crate disclosed in the patent to Newhouse, U.S. Patent No. 2,419,026.

One style of collapsible crates is assembled from a flat mat which has a bottom and two side walls and cleats attached to one of the side walls which support the two end walls. When this mat is folded into a crate, the end walls attached to the cleats are folded down to form a crate having three side walls and two end walls. A top is then telescoped or assembled in some manner on the open side after the fruit or vegetables have been packed in the crate.

SUMMARY OF THE INVENTION

In the last mentioned design of a flat mat, the two cleats supporting the end walls are attached only at one end to the side wall by the flexible wire or strap, and they will tend to flap or to be bent out of alignment with possible damage to the end walls. To overcome this defect in the construction of the mat, the present invention has provided an additional support means to increase the rigidity of the connections between the ends of the cleats and the side wall to prevent this movement of the cleats supporting the end member. Therefore, when the mat is assembled into the crate, the unattached end of the cleat will be in alignment with the opposite side wall so that the ends of the flexible wire or strap may be joined together to complete the assembly of the crate. Furthermore, the damage to the end walls caused by the movement of the cleats is eliminated.

Accordingly, it is an object of the present invention to provide a collapsible crate having a support means interconnecting an end of a cleat to a side wall to aid in assembling the crate from a flat mat.

Another object of the present invention is to provide a flat mat adapted to be assembled into a crate and having a support means interconnecting the end wall cleats to a side wall to stabilize the cleats so that they will be in alignment during the assembly of the crate.

A still further object of this invention is to provide a flat mat to be assembled into a crate in which the end wall members have a tab which is attached to the adjacent side wall to provide additional support for the end wall and its cleat to insure alignment of the cleat during assembly of the mat into the crate.

Yet another object of the present invention is to provide a flat mat adapted to be assembled into a crate in which the end wall members each have a tab which is secured between the cleat and slats of an adjacent side wall to support the end wall member and its respective cleat in the desired alignment during the assembly of the mat into a crate.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description in the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

As shown on the drawings:

FIG. 1 is a planned view of the flat mat prior to assembly into a crate;

FIGS. 2, 3 and 4 illustrate the various stages of folding or assembling the flat mat of FIG. 1 into a crate;

FIG. 5 illustrates the crate assembled from the flat mat of FIG. 1; and

FIG. 6 is an exploded view showing the position of the side wall slats and cleats with respect to the supporting tab of the end wall.

The principles of this invention are particularly useful when embodied in a flat mat such as illustrated in FIG. 1 and generally indicated by the numeral **10**. The flat mat **10** has three sides **11**, **12** and **13** and a pair of end walls **14**, **14**.

The side **11** consists of a pair of slats **15**, **15** which have side wall cleats **16**, **16** at each end of the slats. The side **12** which may be a bottom wall of the assembled crate **17**, shown in FIG. 5, is made up of slats **18**, **18** with side wall cleats **19**, **19** at each end of the slats **18** and the side **13** is made of slats **20**, **20** interconnected at their ends by side wall cleats **21**, **21**. The end walls **14**, **14** each have a cleat **22** at one edge. Each of the cleats **16**, **18**, **20** and **22** have each of their ends tapered or mitered so that the cleats will form a rectangle, as shown in FIG. 5, when the mat **10** is assembled into the crate **17**.

The sides **11**, **12** and **13** and the end walls **14** are loosely hinged together by a pair of flexible means such as wires or bands **23**, **23** which extend along each side **24**, **24** of the mat **10**. The bands **23**, **23** are secured to the sides and the end walls by a plurality of stitches or staples **25** which pass through the slats into their respective side wall cleats and through the end walls **14**, **14** into the respective cleats **22**, **22** to not only hold the wire to the various sides and end walls but to secure the slats to their respective side wall cleats and the end walls **14**, **14** to the cleats **22**, **22**. Each of the wires **23** has end **26**, **26** extending past the ends **27**, **27** of the mat **10**, and the ends **26**, **26** may be formed into loops or bights.

As may be seen from FIG. 1, the various pairs of side wall cleats **16**, **19** and **21** are substantially rigid because each pair is connected together by its respective slats. The cleats **22**, **22** do not have this rigidity since the end walls **14**, **14** are not interconnected. Because of this lack of rigidity the cleats **22**, **22** in the prior art flat mats would tend to be bent or be moved out of the substantially straight line formed by the sides **24**, **24** of the mat **10**. In order to correct this misalignment which caused problems during the assembly of the flat mat of the prior art into a crate, the mat **10** of the present invention has an additional support means **28**, **28** interconnecting each cleat **22** and the adjacent end of cleat **21**. As best illustrated in FIG. 6, the support means **28** comprises a tab extending from the corrugated paperboard end wall **14** which is secured to the cleat **22**. The tab **28** is positioned between the cleat **21** and the uppermost slat **20***a* of the side **13**, as illustrated in FIG. 4 and held in this position by stitches or staples **25***a*. The provision of the tab **28** adds rigidity

to the otherwise loose connection made by the wire **23** and this rigidity prevents the cleat **22** from becoming misaligned during the handling of the flat mat **10** and during the folding or assembling of the mat into the crate **17** as shown in FIGS. 2–4.

The mat **10** is usually transported to the customer in the flat state. The customer will assemble the mat into the crate **17** by bending the various sides into the box shape shown in FIG. 3. Each of the cleats **22** supporting the end walls **14** are then bent down so that its free end **29** will contact the cleat **16** of the side **11**. The ends **26, 26** of the wires **23** are then interconnected or twisted together, as shown in FIG. 4 at points **30, 30**, to complete the assembly of the four cleats into the rectangular shape.

After the box has been wired together, the end walls **14, 14** are folded down, as shown in FIG. 4 in which one end wall **14***a* is shown already folded into the final position. To facilitate this folding each of the end walls **14, 14** may be scored along the line **31**, best illustrated in FIG. 6. As shown in FIG. 3, the alignment of the cleat **22** with the cleat **16** facilitates the joining of the ends **26, 26** of the wire **23** and saves both labor and time required to re-align these two cleats while making the engagement between the ends **26, 26**.

The crate **17**, after being filled, is closed by a suitable lid which may be corrugated material and telescoped over the open side. The lid may have a projection at each end to be engaged in the groove or notch **32** in the cleat **22** under the wire **23** (as shown only in FIG. 5).

As illustrated, the crate comprises wood cleats and wood veneer slats. The end walls **14, 14** are corrugated paperboard. It should be noted that the slats could be made of reinforced paperboard or any suitable plastic material.

The support means or tabs **28** not only facilitate the alignment of the ends **29** of the cleats **22** with the side cleat **16** during the assembly of the flat mat **10** into the crate **17**, but also prevent the end wall members **14** and the cleats **22** from flapping or becoming misaligned while the mat **10** is being handled. This prevention of the misalignment or flapping of the cleat **22** and the end wall **14** will also reduce damages to the corrugated paperboard end walls which would occur during the handling of the flat mat **10** if the cleats **22** were free to shift or move with respect to the remaining portion of the mat.

Although various minor modifications might be suggested by those versed in the art, it should be understood that we wish to employ within the scope of the patent warranted thereon all such embodiments as reasonably and properly come within the scope of our contribution to the art.

We claim as our invention:

1. A flat mat adapted to be folded into a crate having a pair of cleats extending between two side walls at their ends, respectively, to define an open side in the crate, said mat comprising:

(a) a plurality of side walls, each having ends;

(b) a pair of flexible means loosely attaching said side walls together in a side-by-side relationship at their ends, respectively;

(c) a pair of cleats, each having one end loosely attached to a respective end of one of said side walls by the flexible means;

(d) a pair of members, each member being attached to one of said cleats and being adapted to be folded to form an end wall for said crate; and

(e) support means extending between each of said cleats and its respective end of said one side wall to hold each of said cleats in alignment with said respective end of said one side wall so that as the mat is being folded into a crate, the other ends of said cleats are disposed adjacent the ends of the other of said side walls, respectively, to define the open side of the crate.

2. A flat mat according to claim **1**, wherein each member of said pair is a paperboard member and wherein said support means is a tab on said paperboard member, said tabs extending to said one side wall and attached thereto.

3. A flat mat according to claim **2**, in which said side walls include a slat and a side wall cleat at each end of said slat and each of said tabs is attached to said one side wall by being secured between said side wall cleat and said slat.

4. A flat mat according to claim **3**, in which said members have a score adjacent said cleat to facilitate the bending of said member to form said end walls.

5. A crate comprising in combination:

(a) a bottom wall;

(b) a pair of side walls disposed on opposite sides of said bottom wall with an edge of each side wall adjacent to a respective side of said bottom wall;

(c) a cleat disposed at each end of said pair of side walls and extending therebetween at an edge of each of said side walls opposite said first-mentioned edge to define an open side of the crate;

(d) an end wall attached to each of said cleats, said end wall being a paperboard member;

(e) a pair of flexible means extending around said crate at the end of said side walls, connecting said pair of said side walls to said bottom and connecting one end of each of said cleats to an adjacent end of one of said pairs of said side walls, each of said flexible means having two ends, one end extending past the second-mentioned edge of the other of said pair of side walls and the other end extending past the other end of each of the cleats, said ends of said flexible means being interengagable to secure said cleat to said other of said pair of side walls; and

(f) a tab on each of said paperboard members, said tab defining a support means extending between each of said cleats and the adjacent end of said one of said pair of side walls to hold said cleats in alignment while said crate is being assembled and said ends of said flexible means are being engaged.

6. A crate according to claim **5**, in which said one of said pair of side walls consists of a slat having a side wall cleat at each end thereof, and said tab is attached to said side wall by being secured between said slat and said side wall cleat.

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RAPHAEL H. SCHWARTZ, *Primary Examiner.*