March 24, 1942. G. C. BABCOCK ET AL 2,277,056

BOX

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Fig. 1.

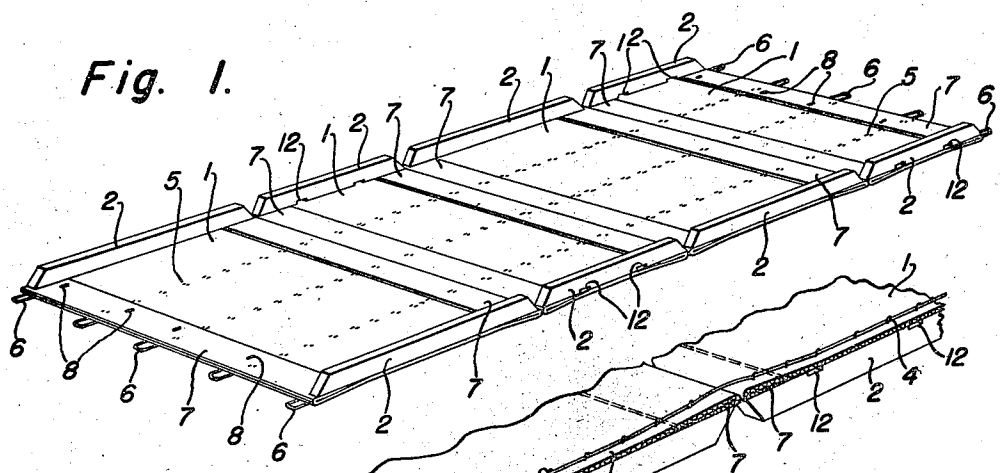


Fig. 2.

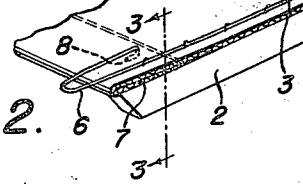


Fig. 3.

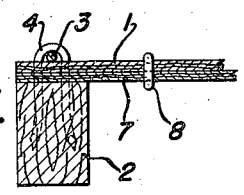
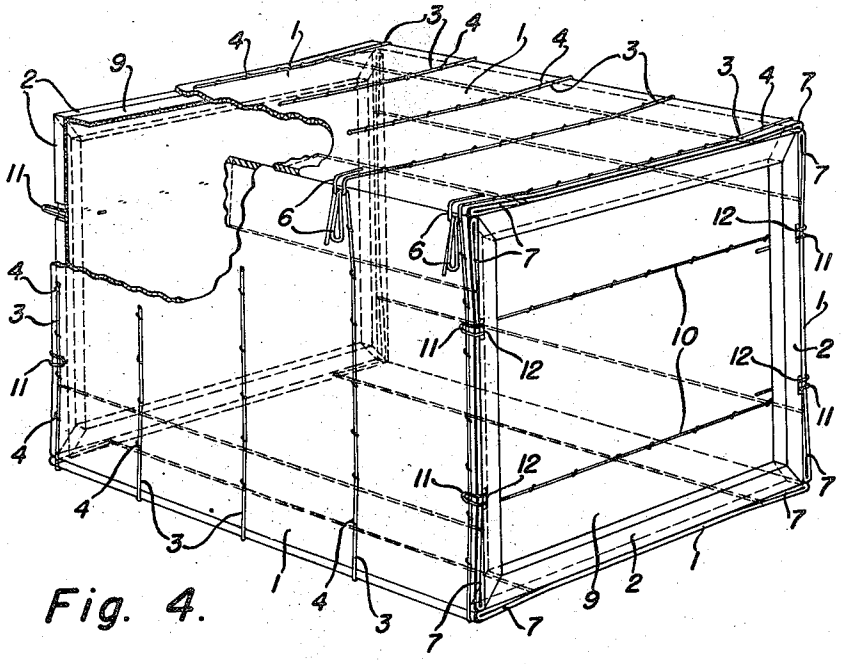


Fig. 4.



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BOX

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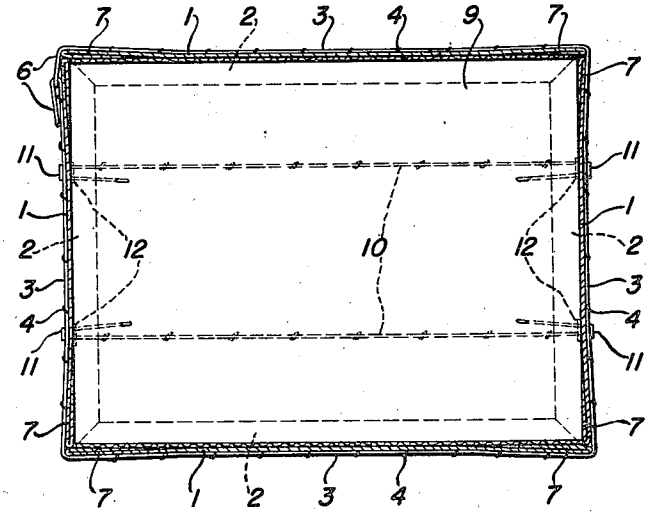


Fig. 5.

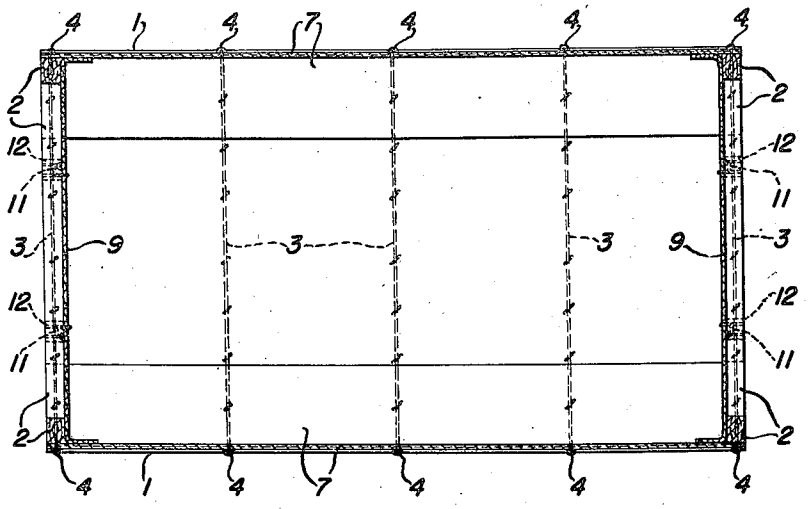


Fig. 6.

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UNITED STATES PATENT OFFICE

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BOX

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Application March 14, 1940, Serial No. 323,906

13 Claims. (Cl. 229—23)

This invention relates to boxes and particularly to wirebound fiberboard boxes.

Among other objects, the invention is intended to provide a strong and dependable wirebound fiberboard box; to provide a wirebound fiberboard box which is light in weight and economical to manufacture; to provide a wirebound fiberboard box which is flexible and elastic; to provide a wirebound fiberboard box so constructed and arranged as to increase the resistance of the fiberboard to stresses and strains at the points where it is subjected to the greatest stresses and strains; and generally to provide a balanced wirebound fiberboard box strong enough at all points to carry its load and not excessively strong at any point.

As conducive to a better understanding of this invention, it should be noted that in prior wirebound fiberboard box constructions, such as that shown in United States Patent No. 1,334,271, dated March 16, 1920, encircling binders and a sheet of fiberboard side material bent integrally over the box corners were stapled to end cleat frames. In such construction, the fiberboard extending integrally over the box corners resisted initial relative longitudinal shifting of adjacent box sides under stresses and strains, but continued or increased stresses and strains caused the fiberboard at box corners to shear or tear along the corner lines. Also, the single thickness of fiberboard at the box corners frequently failed to resist biting in of the tensioned wire bindings and destructive blows to which a box corner is subjected in rough handling. The present invention is intended to remove the foregoing deficiencies in prior constructions by providing a sectional wirebound fiberboard box reinforced at box corners and adapted to flex under stresses and strains without shearing or tearing the fiberboard.

In the drawings:

Figure 1 is a perspective view of a box blank embodying the invention, which when folded into box form constitutes the four sides of the box.

Fig. 2 is an enlarged perspective view of a portion of the box blank inverted from the position shown in Fig. 1.

Fig. 3 is an enlarged sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view, partly in section, of a completed box embodying the invention.

Fig. 5 is a sectional end view of the box shown in Fig. 4.

Fig. 6 is a sectional front view of the same.

The illustrative box blank shown in Figs. 1 and 2 comprises four separate sections of side material 1 and end cleats 2 connected together in foldable relationship by binders 3 secured to the side material 1 and cleats 2 by staples 4 which straddle each end binder 3, pass through the side material 1 and anchor in the cleats 2. The intermediate binders 3 are secured to the side material 1 by staples 4 which straddle the binder, pass through the side material 1, and are clinched as shown at 5 in Fig. 1.

The side material 1 is fiberboard, and preferably corrugated fiberboard. The cleats 2 are made of wood or other material capable of receiving and holding the staples which are anchored in the cleats.

The binders 3 are preferably wires provided at their ends with loops or bights 6 which may be hooked together to close the box, as shown in Fig. 4.

As best shown in Figs. 2 and 3, the box corner edges of each section of side material 1 are folded back against the body of the side material, as shown at 7, to provide a double thickness of fiberboard on each section adjacent box corners. The folded portions 7 are preferably folded under the body of the side material, as shown, so that the folded portion 7 will be located between the body of the side material and the cleat to which the side material is stapled. The folded portion 7 preferably extends far enough under the body of the sheet to receive at least one staple 4 and to serve as an anchorage for the legs of the loops or bights 6 which are driven through the side material and clinched, as shown at 8 in Fig. 3.

As best shown in Fig. 5, the side material 1 of the top and bottom sections preferably extend beyond the ends of the cleats of the sections a sufficient distance to overlap the edges of the side material of the front and rear sections. This overlapping may be varied, i. e., the edges of the side material 1 of the front and rear sections may overlap the edges of the side material 1 of the top and bottom sections, or a follow-around overlap may be provided.

The ends of the box may be closed by end sections comprising a sheet of fiberboard 9 having cross binders 10, preferably wires, stapled thereto and provided with loops or bights 11 adapted to pass through openings 12 in cleats 2 and be bent, as shown in Fig. 4, to hold the end section in place.

It should be noted that the separate sections of the box are disconnected except by the flexible binders 3 which, while resisting, permit one section to shift longitudinally relative to an adja-

cent section under diagonal stresses and strains. Such a shifting merely bends the binder between its points of anchorage to adjacent sections and does not tear or injure the side material of either section.

It should be noted also that the double thickness of fiberboard of each section adjacent the box corners strengthens the side material at the points where it is subjected to the greatest strains, namely, the pressure of the tensioned binders over the box corners and the blows received in rough handling. The double thickness of side material extending lengthwise each box corner also resists endwise pressures having a tendency to crush or crumple the side material and permits the use of thinner side material on major areas of the box sides.

The folded portion 7 of the side material 1 usually extends under the side material 1 only far enough to receive one or two staples 4 and to serve as an anchorage for the legs of the loops or bights 6 which are driven through the side material. The folded portions 7 of each section may extend under the side material 1 of the section any desired distance limited only by the dimensions of the section. This is particularly advantageous, as the strength of the box sides may be varied to suit different loads.

The term "fiberboard" will be understood as including other material of similar character suitable for box siding, which tends to crumple or crush rather than break under distorting pressures.

It will be understood that the invention is not to be limited to the specific embodiment shown herein for illustration. For example, tongue-and-groove cleats may be substituted for the plain mitre cleats shown, without departing from the invention. Tongue-and-groove cleats, or mortise-and-tenon cleats as they are sometimes called, tend to increase the initial rigidity of the box and to resist a turning or rotating movement of the cleats under stresses and strains.

We claim:

1. A wirebound fiberboard box comprising four separate sections of fiberboard side material and end cleats connected together by wires tensioned over box corners and stapled to the side material and the cleats; edges of each section of fiberboard side material being folded under the body of the side material to provide a double thickness of side material lengthwise box corners to strengthen the corners and resist the pressure of the tensioned wires.

2. A wirebound fiberboard box comprising a plurality of separate sections of fiberboard side material and end cleats connected together by wires tensioned over box corners and stapled to the side material and the cleats; edges of each section of fiberboard side material being folded under the body of the side material to provide a double thickness of side material lengthwise box corners to strengthen the corners and resist the pressure of the tensioned wires.

3. A wirebound fiberboard box comprising four separate sections of fiberboard side material and end cleats connected together by wires tensioned over box corners and stapled to the side material and the cleats; edges of each section of fiberboard side material being folded back against the body of the side material to provide a double thickness of side material lengthwise box corners to strengthen the corners and resist the pressure of the tensioned wires.

4. A wirebound fiberboard box comprising a plurality of separate sections of fiberboard side material and end cleats connected together by wires tensioned over box corners and stapled to the side material and the cleats; edges of each section of fiberboard side material being folded back against the body of the side material to provide a double thickness of side material lengthwise box corners to strengthen the corners and resist the pressure of the tensioned wires.

5. A wirebound fiberboard box comprising a plurality of separate sections of fiberboard side material and end cleats connected together by wires tensioned over box corners and stapled to the side material and the cleats; edges of sections of fiberboard side material being folded back against the body of the side material to provide a double thickness of side material lengthwise box corners to resist the pressure of the tensioned wires.

6. A wirebound fiberboard box comprising a plurality of separate sections of fiberboard side material and end cleats connected together by wires tensioned over box corners and stapled to the side material and the cleats; edges of sections of fiberboard side material being folded back against the body of the side material to provide a double thickness of side material lengthwise box corners.

7. A metalbound fiberboard box comprising a plurality of separate sections of fiberboard side material and end cleats connected together by flexible binders secured to the side material and the cleats; edges of sections of fiberboard side material being folded back against the body of the side material to provide a double thickness of side material lengthwise box corners.

8. A metalbound fiberboard box comprising a plurality of separate sections of fiberboard side material and end cleats connected together by a flexible binder secured to side sections; edges of sections of fiberboard side material being folded back against the body of the side material to provide a double thickness of side material lengthwise box corners.

9. A wirebound fiberboard box blank comprising four separate sections of fiberboard side material and cleats connected together in foldable relationship by wires stapled to the side material and the cleats; edges of each section of side material being turned under the body of the side material to provide a double thickness of side material lengthwise potential box corners to resist the thrust of the binding wires when the box blank is folded into box form.

10. A wirebound fiberboard box blank comprising a plurality of separate sections of fiberboard side material and cleats connected together in foldable relationship by wires stapled to the side material and the cleats; edges of each section of side material being turned under the body of the side material to provide a double thickness of side material lengthwise potential box corners to resist the thrust of the binding wires when the box blank is folded into box form.

11. A wirebound fiberboard box blank comprising a plurality of separate sections of fiberboard side material and cleats connected together in foldable relationship by wires stapled to the side material and the cleats; edges of sections of side material being folded back against the body of the side material to provide a double thickness of side material lengthwise potential box corners to resist the thrust of the binding wires when the box blank is folded into box form.

12. A metalbound fiberboard box blank com-

prising a plurality of sections of fiberboard side material and cleats connected together in foldable relationship by flexible binders secured to said sections; edges of sections of side material being folded back against the body of the side material to provide a double thickness of side material lengthwise potential box corners to resist the thrust of the flexible binders when the box blank is folded into box form.

13. A metalbound fiberboard box blank comprising a plurality of separate sections of fiberboard side material and cleats connected together in foldable relationship by a flexible binder secured to side sections; edges of sections of side material being folded back against the body of the side material to provide a double thickness of side material lengthwise potential box corners.

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