

Feb. 6, 1968

J. F. WHITBY

3,367,556

BOX

Filed Jan. 6, 1966

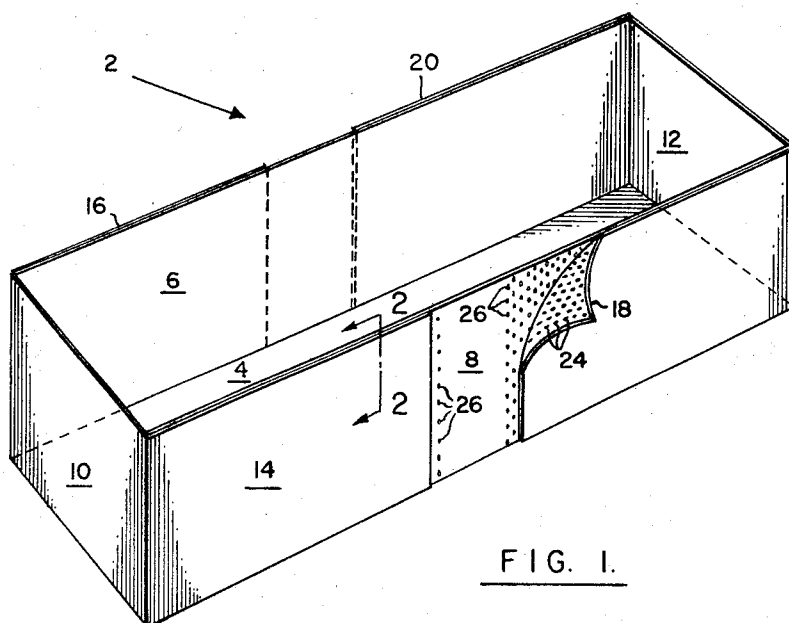


FIG. 1.

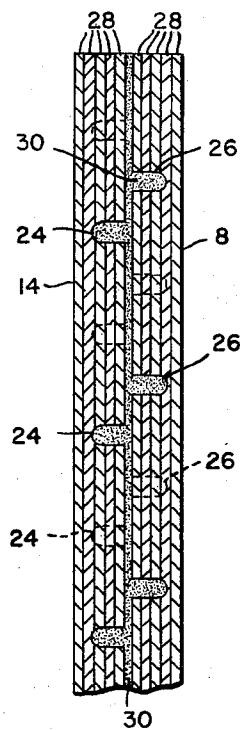


FIG. 2.

INVENTOR

JAMES F. WHITBY

BY

*Bruce Smith & Harding*

ATTORNEYS

1

3,367,556  
BOX

James F. Whithy, Richmond, Va., assignor to Southern Special Products Corporation, Richmond, Va., a corporation of Virginia

Filed Jan. 6, 1966, Ser. No. 519,143  
4 Claims. (Cl. 229—32)

### ABSTRACT OF THE DISCLOSURE

A box of solid fiberboard having a minimum of three plies has bottom side and end panels with a flap hingedly connected to each end of each end panel. At least two plies of the abutting portions of the flaps and side panels are perforated with a multiplicity of small perforations to provide a high shear strength when the flaps and side panels are secured together with an adhesive.

This invention relates to a box and more particularly to a box formed from a single sheet of solid fiberboard.

It is well known to form a box from a single sheet of solid fiberboard. Typically, solid fiberboard has a plurality of plies of kraft adhesively secured together. Such boxes are held together by securing together overlapping portions thereof with staples or an adhesive. Where substantial shear strength such as 100 p.s.i. between the portions secured together is required the use of an adhesive is unsatisfactory since as heretofore employed it failed to prevent shearing between inner plies by relatively low shear forces. Thus where high shear strength is required it has been necessary heretofore to employ staples. However, for applications such as for transporting and storing bags of explosives which are susceptible to being opened by the staples and rendered sensitive by any rust particles from the staples, the employment of staples has been unsatisfactory. In accordance with this invention, the problem of eliminating staples without a sacrifice in the shear strength of the portions of the box secured together has been solved.

The invention and its objects will be clarified by reading of the following description in conjunction with the drawings in which:

FIGURE 1 is a front perspective view of a box in accordance with the invention; and

FIGURE 2 is a vertical section, partially broken away, taken on the plane indicated by the line 2—2 in FIGURE 1.

Referring first to FIGURE 1, a single sheet fiberboard box 2 in accordance with the invention has a bottom panel 4, a pair of side panels 6 and 8 hingedly connected to the bottom panel and a pair of end panels 10 and 12 hingedly connected to the bottom panel. Flaps 14 and 16 are hingedly connected to end panel 10 and flaps 18 and

2

20 are hingedly connected to end panel 12. As thus described, the box 2 is entirely conventional.

As seen in FIGURE 2, the box 2 has five planar plies 28 of, for example, kraft. Three plies of the abutting portions of each flap and side panel are perforated with a multiplicity of small, pinpoint perforations to form openings 24 in flaps 14, 16, 18 and 20 and openings 26 in side panels 6 and 8. Each flap is adhered to the abutting portion of the adjacent side panel by an adhesive 30 which penetrates into openings 24 and 26 to anchor the adhesive and provide for a secure interlocking of the four inner plies of each flap and the four outer plies of the adjacent portion of side panel.

It is required that the fiberboard sheets have a minimum of three plies and that at least two plies be perforated in the abutting portions.

It will be evident from an inspection of FIGURE 2 that the construction of the invention will greatly increase the shear strength of the connected portions of the box. Indeed, in practice it has been found that the shear strength of these connections made in accordance with the invention at least equals that achieved when stapling is employed.

It will be understood that the above embodiment is by way of illustration and is not intended to be limited.

What is claimed is:

1. A box of solid fiberboard having a minimum of three plies and having:

- a bottom panel,
- a pair of side panels hingedly connected to the bottom panel,
- a pair of end panels hingedly connected to the bottom panel,
- a flap hingedly secured to each end of each end panel and abutting a portion of the adjacent side panel,

at least two plies of the abutting portions of the flaps and of the side panels being perforated with a multiplicity of small perforations, and

an adhesive between the abutting portions of the flaps and side panels and in the said perforations.

- 2. The box of claim 1 in which the plies are kraft.
- 3. The box of claim 1 in which the fiberboard has five plies and the perforations extend through three plies.
- 4. The box of claim 3 in which the plies are kraft.

### References Cited

#### UNITED STATES PATENTS

Re. 20,428	6/1937	Kells	229—32
837,324	12/1906	Mitchell	229—33
2,012,131	8/1935	Kondolf	229—3.5

JOSEPH R. LECLAIR, *Primary Examiner.*

R. PESHOCK, *Assistant Examiner.*