Sept. 20, 1971 J. A. MILLER 3,606,002

STABILIZER FOR A PLURALITY OF ABUTTING RECTILINEAR SURFACES

Filed Feb. 12, 1970 2 Sheets-Sheet 1

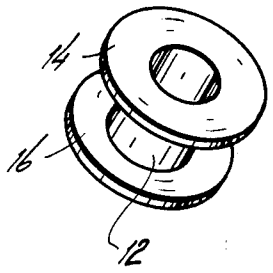


FIG. 1

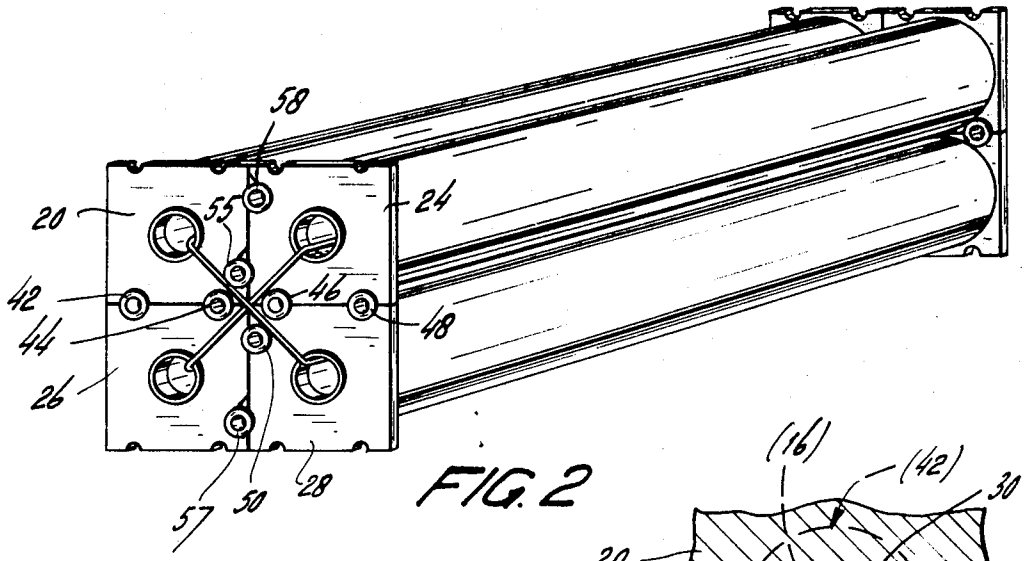


FIG. 2

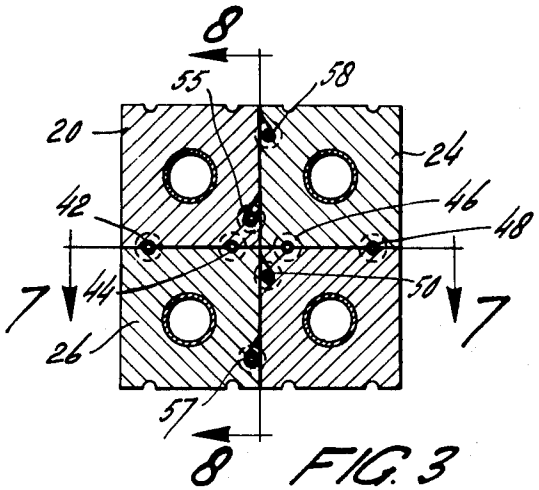


FIG. 3

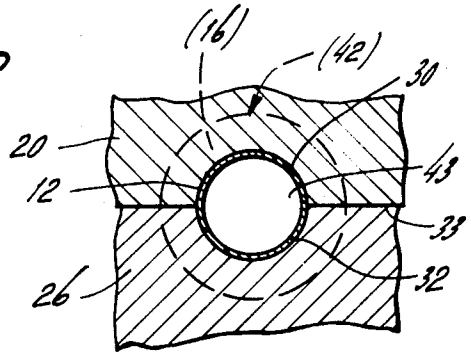


FIG. 4

INVENTOR
JAMES A. MILLER

BY David H. Lemmon

ATTORNEY

Sept. 20, 1971 J. A. MILLER 3,606,002

STABILIZER FOR A PLURALITY OF ABUTTING RECTILINEAR SURFACES

Filed Feb. 12, 1970 2 Sheets-Sheet 2

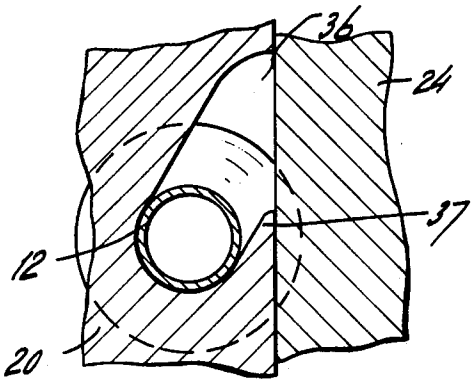


FIG. 5

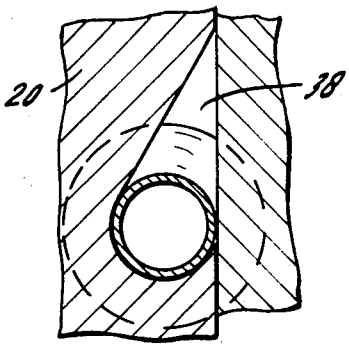


FIG. 6

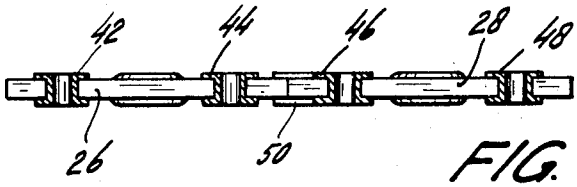


FIG. 7

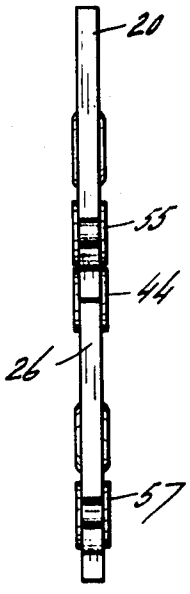


FIG. 8

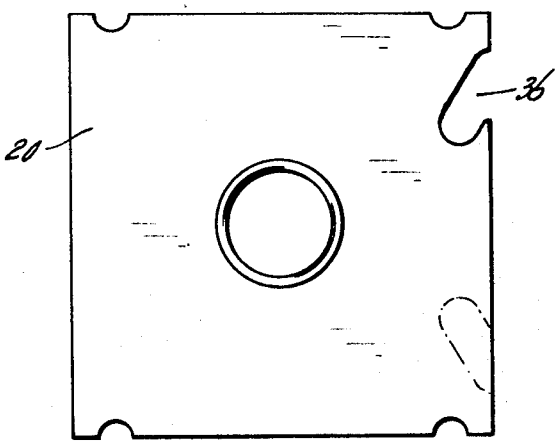


FIG. 9

INVENTOR
JAMES A. MILLER

BY David H. Lemmes
ATTORNEY

United States Patent Office 3,606,002 Patented Sept. 20, 1971

3,606,002

STABILIZER FOR A PLURALITY OF ABUTTING RECTILINEAR SURFACES

James A. Miller, Rte. 1, Box 225, Tiffin, Ohio 44883

Continuation-in-part of application Ser. No. 816,205, Apr. 15, 1969. This application Feb. 12, 1970, Ser. No. 10,857

Int. Cl. B65g 1/14

U.S. Cl. 206—65R 10 Claims

ABSTRACT OF THE DISCLOSURE

A stabilizer for a plurality of abutting rectilinear surfaces, so as to hold the surfaces in longitudinal and lateral alignment in a desired support plane, particularly a method for so stabilizing a plurality of squared spool ends. The stabilizer includes the notching one of two opposed abutting surfaces so as to define a cylindrical shoulder downwardly inclined away from one surface and its abutting with the other surface, then securing the abutting surfaces against lateral movement by imposing a cylindrical force within the aperture and securing the abutting surfaces against longitudinal movement by applying opposed lateral forces radially outwardly of said aperture on both sides of said abutting surfaces.

CROSS-REFERENCES TO RELATED APPLICATIONS

A continuation-in-part of applicant's Method for Stabilizing a Plurality of Abutting Rectilinear Surfaces, Ser. No. 816,205, filed Apr. 15, 1969. The present application is directed to a particular stabilizer apparatus disclosed in FIG. 6 of the parent application.

BACKGROUND OF THE INVENTION

(1) Field of the invention

Sheet fabric and sheet plastic, such as is trademarked Cellophane, Plyafilm, and Koraseal, are shipped conventionally on spools or mandrels supported in square end boards. A principal problem has been in stacking the spool end boards side-by-side and vertically one upon the other, while maintaining the end boards in lateral and longitudinal alignment. The end boards are made of hardboard or other material having thicknesses varying from ½ to 3 inches with a hole cut in the center of the board for attachment of the center pole or mandrel around which the material is wrapped. When several rolls are so stacked and shipped on a skid the end boards are inclined to slip out of longitudinal or lateral alignment, with the sharp cornered end board engaging and cutting into the adjacent fabric or plastic sheet material. The only effective albeit expensive, alternative has been to package each individual spool separately.

(2) Description of the prior art

Prior art has not directed itself specifically to the problem of stabilizing a stack of squared spool ends, but has addressed itself to stabilizers or indexing means which fit

within complementary recesses in opposed crates or packages. Prior art searching has developed:

Lagasse, 1,782,307
McKelligon, 1,881,822
Chandonia, 2,198,106
Haack, 2,358,160
Pizzi, 2,998,940
Miller, 3,216,538
Cannon, 3,384,228

Lagasse is typical of the prior art concept of fitting stabilizers or indexing means within complementary recesses in opposed crates or packages. However, none of these prior inventors have approached applicant's technique of providing both lateral and longitudinal stability in the abutting surfaces. Chandonia stabilizes baking pans by means of his triangular clips. Haack stabilizes beehives by means of a vertical dowel pin. Pizzi shows a reel-supporting pallet and Miller shows a bracket for securing metal awning panels.

Both McKelligon and Cannon relate to four sided boxes which are secured to each other by spools extending through at least two sides of the boxes. There are no vertically abutting surfaces, and no suggestion of inclined notching to keep spools from slipping out of vertically abutting surfaces.

SUMMARY OF THE INVENTION

According to the present invention, a plurality of horizontally and vertically stacked spool ends are stabilized both laterally and longitudinally, so as to maintain the spool ends within a limited vertical plane. Within the abutting surfaces of the spool ends complementary notches are cut so as to define a cylindrical aperture. One side of the spool end is provided with an inclined notch which is used to secure a locking spool end in vertical alignment with another vertically aligned and abutting surface. The abutting surfaces adjacent the aperture are secured against lateral movement by imposing a cylindrical force in said aperture and they are secured against longitudinal movement by applying opposed lateral forces radially outwardly of said aperture on the inside and outside of the abutting surfaces. A suggested stacking stabilizer includes a cylindrical core having peripherally extending flanges at either end so as to define an annular recess about the core. The core is inserted within the cylindrical notch defined in the opposed abutting surfaces and the peripherally extending flanges abut the front and rear of the abutting surfaces radially outwardly of the aperture, so as to support the spool ends in longitudinal alignment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a proposed stacking stabilizer construction;

FIG. 2 is a perspective view of four rolls of film material having their end boards stabilized laterally and longitudinally, according to the present invention;

FIG. 3 is a vertical sectional view of the four end boards stacked in FIG. 2;

FIG. 4 is a fragmentary enlarged vertical section of the FIG. 1 lateral stabilizer positioned within a cylindrical aperture defined in abutting surfaces of the end boards in FIG. 2;

FIG. 5 is fragmentary enlarged vertical section showing the stacking stabilizer positioned in an inclined notch de-

fined in one of two vertically abutting surfaces, the inclined notch preventing the stabilizer from slipping out, as the abutting surfaces are parted;

FIG. 6 is a like vertical section showing inclined notching of the spool end board wherein the abutting surfaces are aligned against longitudinal displacement by positioning a stabilizer in a modified and inclined notch defined in one of the abutting surfaces;

FIG. 7 is a transverse section taken along section line 7—7 of FIG. 3;

FIG. 8 is a vertical section taken along section line 8—8 of FIG. 3; and

FIG. 9 is a front elevation of a proposed spool end board, having an axial aperture for the mandrel or spool and stabilizer notches defined in three of its four sides.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1, a proposed stacking stabilizer is illustrated as comprising a cylindrical core **12** having peripherally extending flanges **14** and **16** at either end of the core. Flanges **14** and **16** define an intervening annular recess. Dimensions of core length, diameter, and the peripheral flanges, of course, may be varied to suit a variety of end board materials.

In FIG. 2, stacking stabilizers of the type illustrated in FIG. 1 are shown positioned in the abutting rectilinear surfaces of the spool end boards. In FIGS. 2 and 3, four spools **18** positioned in end boards **20**, **24**, **26**, and **28** are shown as laterally and longitudinally aligned by the use of the stacking stabilizers **42**, **44**, **46**, **48**, **50**, **55**, **57** and **58**. As illustrated in FIG. 4, stacking stabilizer **42** is shown positioned in complementary notches **30** and **32** defined in the opposed abutting surfaces of end boards **20** and **26**, so as to define a cylindrical aperture **43**. The stabilizer core **12** is thrust longitudinally through the aperture and the stabilizer periperal flanges **16** and **14** abut, respectively, the inside and the outside of the end board **20** and **26** surfaces. Lateral slipping of end boards **20** and **26** is prevented by the core extending through the opposed abutting surface line **33** and longitudinal slipping is prevented by the flanges **16** and **14** abutting the inside and outside of the end board.

In FIG. 5, this concept of stabilizing *vertically* abutting surfaces is further carried out wherein a modified inclined notch **36** is formed in end board **20**. The inclined notch shoulder **37** prevents the core **12** from slipping out and falling, as the end boards are separated. In normal practice the end boards are separated one by one hence the necessity for a vertical retainer means such as shoulder **37**.

In FIG. 6, the basic inclined notch is illustrated wherein increased stability is obtained by having an inclined notch **38** with a partially cylindrical base defined in end board **20** so that spool **12** does not fall out of place, as one of the spool end boards is removed from the pack illustrated in FIG. 2.

In the FIG. 7 transverse sectional view, stacking stabilizers **42**, **44**, **46**, **48**, and the lower stabilizer **50** are shown positioned in end boards **26** and **28** each having an axial aperture **22** for receipt of the spool mandrel.

In FIG. 8, vertical stabilizers **58** and **50** are illustrated as engaging end boards **20** and **26**.

As shown in FIG. 2, an optional securement consists in the use of elastic lines **62** and **64** which may be inserted through the aperture **22** and through the mandrels (not illustrated).

Manifestly, the proposed method provides both longitudinal and lateral stability while permitting the end boards or spool ends to be removed quickly and separately. The stabilizers are positioned easily by inserting them first in one notch and moving the other spool end board into abutment, so as to achieve a positive "lock." The present method eliminates the necessity for further securement by ordinary straps of steel or other tie lines. The stabilizer may be made from two steel straps welded together. However, the stabilizer may be plastic-molded. The dimensions of the spool and notches may be varied without departing from the spirit of invention.

I claim:

1. Stabilizer for a plurality of abutting rectilinear surfaces comprising:

(A) at least two abutting end boards, each end board having:

(i) a plurality of semi-cylindrical notches in its sides;

(ii) an inclined notch in at least one side defining a cylidnrical seat adjacent said one side; and

(B) a plurality of spools for said semi-cylindrical notches and said inclined notches, said spools having:

(i) a cylindrical axis seatable complementally in opposed semi-cylindrical notches, as well within said cylindrical seat;

(ii) peripheral flanges at each end of said axis, extending at right angles to said cylindrical axis and defining an intervening annular recess engageable with the front and back of said end boards.

2. A stabilizer for a plurality of abutting rectilinear surafces as in claim **1**, said annular recess in said spools being of the same width as said end boards.

3. A stabilizer for a plurality of abutting rectilinear surfaces as in claim **2**, said semi-cylindrical notches being defined at the top and bottom of said end boards and said inclined notch being defined at a vertical side thereof.

4. A stabilizer for a plurality of abutting rectilinear surfaces as in claim **2**, said end board including a central core recess for mounting an article to be supported within opposed and longitudinally spaced end boards.

5. A stabilizer for a plurality of abutting rectilinear surfaces as in claim **4**, said inclined notch including an outer shoulder extending above the mid-point of said cylindrical seat, intermediate said seat and said side.

6. A stabilizer for a plurality of abutting rectilinear surfaces as in claim **4**, one opposed abutting rectilinear surface extending vertically into said cylindrical seat within the inclined notch of another opposed rectilinear surface.

7. A stabilizer for a plurality of abutting rectilinear surfaces as in claim **6**, said spool flanges overlapping said abutting vertical surfaces.

8. A roll of sheet material comprising:

(A) a mandrel upon which said roll of said sheet material is rolled;

(B) a pair of end boards, each end board having:

(i) a central core engaging and supporting an end of said mandrel;

(ii) a plurality of semi-cylindrical notches in its sides;

(iii) an inclined notch in at least one side defining a cylindrical seat adjacent said one side; and

(C) a plurality of spools for said semi-cylindrical notches and said inclined notches, said spools having:

(i) a cylindrical axis seatable complementally in opposed semi-cylindrical notches in abutting end boards, as well as within said cylindrical seat;

(ii) peripheral flanges at each end of said axis, extending at right angles to said cylindrical axis and defining an intervening annular recess encompassing a cross-section of said abutting boards and the flanges being engageable with the front and back of said abutting end boards.

9. A plurality of stacked rolls of sheet material as in claim **8**, such that their end boards abut in a rectilinear plane and are stabilized with respect to each other by means of said spools.

10. A plurality of stacked rolls of sheet material as in claim 9, said end boards in a single rectilinear plane being further stabilized with respect to each other by means of a cord extending through adjacent cores and over the front and back of said end boards.

References Cited

UNITED STATES PATENTS

1,881,822	10/1932	McKelligon	220—7
2,698,571	1/1955	Harrison	214—10.5X
3,384,228	5/1968	Cannon	206—65

GERALD M. FORLENZA, Primary Examiner

F. E. WERNER, Assistant Examiner

U.S. Cl. X.R.

214—10SR; 220—97B