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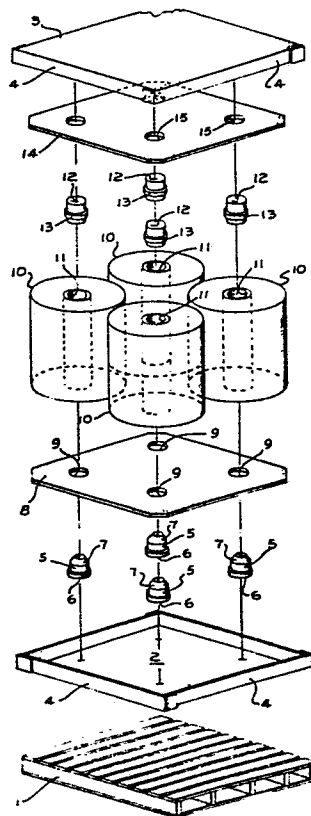
54 Packaging method.

57 A method of packaging polyvinyl butyral sheet rolls is described that reduces the damage to the sheet surface during transportation. The package is designed to restrain the rolls from lateral movement inside the container by the use of restraining means usually in the form of bosses that project into either end of the hollow cores onto which the sheet is rolled.

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Fig. 1.



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PACKAGING METHODBACKGROUND OF THE INVENTION

The present invention relates to a packaging technique and specifically to a means of transporting rolls of poly-
5 vinyl butyral (PVB) sheet material in such a way as to minimize damage thereto.

When PVB sheet materials are produced they are usually wound into rolls from about 60 to 160 cm. in length and about 40 to 60 cm. in diameter wound on a hollow core with
10 an internal diameter of about 15 cm. These rolls are usually then packaged with their axes vertical and parallel in groups of four or more for transportation to the location at which they will be used.

During transportation, the rolls frequently rub against
15 the container or against one another and thereby cause damage to the outer laps on each roll. PVB sheet rolls have an unusually low tolerance for such damage because the primary use of PVB is to provide interlayers for laminated safety glass. Visual imperfections cannot be tolerated in
20 such applications and any part of the roll bearing such defects has to be discarded. This is a wasteful situation and attempts to correct it by the insertion of resilient buffer materials between the rolls have been only partially successful.

25 A method of transporting PVB rolls has now been devised that essentially eliminates this problem and permits delivery of PVB rolls free of blemishes resulting from frictional contacts between rolls or with the container during transportation.

DESCRIPTION OF THE INVENTION

The invention provides a method of packaging PVB rolls wound onto cylindrical cores for transportation which comprises:

- 5 A. providing a package comprising upper and lower opposed parallel surfaces and connecting vertical walls, each such surface being provided with a plurality of means adapted to retain one end of a cylindrical core so as to restrict radial movement of a roll wound on said core, the
10 means being separated from adjacent retaining means on the same surface by a between centers distance greater than the diameter of the rolls and from the walls by a distance greater than the radius of the rolls, said retaining means being aligned with corresponding means on the opposed
15 parallel surface; and

B. locating rolls of polyvinyl butyral sheet material in the package such that each end of the core of each roll is retained by one of the retaining means on one of the opposed parallel surfaces.

- 20 It is often convenient to provide that the opposed retaining means have different configurations. This is because the rolls are normally transported with their axes vertical and parallel. Thus, the retaining means at the bottom may tend to be forced into the core and may be difficult to remove unless it is contoured appropriately. Thus,
25 the preferred structure for both retaining means, but especially the lower, is conical or frusto-conical. This has the added advantage that the cores are more easily located on the means since the extremities of the means act as
30 guides down which the rolls may be lowered till seated firmly on the retaining means.

- An added advantageous feature is the provision of a flange around the means to limit penetration into the core of the roll in such a way as to limit the risk of the means
35 becoming jammed into the core.

For ease of removal and other reasons it is preferred that the retaining means project not more than 30 cm and, better, less than 15 cm into the core of the roll.

The retaining means can be integral with the opposed

parallel surfaces but it is often preferred to have holes in the opposed parallel surfaces through which the retaining means can be inserted in the finished package. This makes for ease of assembly and the use of disposable materials for the surfaces. It is clear that the locating means need to be carefully engineered and are preferably of a high modulus plastic material or steel. The opposed surfaces however are, in practice, only required to maintain the locating means at pre-determined separations and therefore can be made of any rigid material such as a plastic, wood or particle-board.

It is often desirable to have the rolls of PVB individually wrapped in a moisture impermeable sheet such as a polyvinyl chloride sheet or a polyethylene sheet and in such cases the retaining means can often serve to seal such a wrapping by driving an open end into the core and sealing it against the interior surface of the tubular core.

DESCRIPTION OF THE DRAWING

Figure 1 is an exploded view of a package containing four rolls showing the upper and lower parts of the package but with the vertical walls of the package omitted.

SPECIFIC DESCRIPTION OF PREFERRED EMBODIMENTS

The invention is now particularly described with reference to the embodiment illustrated in Figure 1.

In that drawing the package which contains four rolls of PVB rests on a pallet, 1, and comprises opposed, horizontal, rectangular lower and upper trays, 2 and 3 respectively, made of stiff cardboard or corrugated board and provided with peripheral extensions, 4, that can be folded at right angles to the tray to provide shallow walls extending in the direction of the opposed tray. Four lower locator plugs, 5, having circumferential flanges, 6, and frusto-conical projections, 7, are located in spaced relationship on the lower tray with the frusto-conical projections facing upwards. A lower locator board, 8, provided with four holes, 9, adapted to accommodate the four plugs fits over the plugs such that the flanges on the plugs bear against the lower surface of the locator board and the frusto-conical projections extend through the holes. The holes are so

spaced that rolls placed on plugs projecting through the holes contact neither each other nor the vertical walls of the package.

The rolls, 10, in the package are wound on hollow cylindrical cores, 11, which fit tightly over the lower locator plugs, 5, such that the rolls are located with vertical axes.

Into the open upper ends of the cores are fitted four cylindrical upper locator plugs, 12, each provided, at the mid point of its length, with a peripheral flange, 13 which limits the projection of the plug into the core. An upper locator board, 14, provided with four holes, 15, is placed over the plugs thus retaining the upper ends of the rolls in a rigid spaced relationship. A rectangular tube, (not shown), provides the vertical walls of the package and fits over the rolls and within the peripheral extensions, 14, of the lower tray, 2. The upper tray, 3, fits over the upper locator board with its peripheral extensions around the upper end of the rectangular tube.

In use strapping is placed around the package to draw the peripheral extensions of the trays into contact with the walls of the rectangular tube and so seal the package.

It is often preferred to wrap each roll in a tubular film of a vapor-barrier material. The open end of this tube can be sealed by gathering the open end together and pushing it into the hollow core. This material is then held in place by the locator means inserted therein when the roll is packaged for transport. In such cases it may be appropriate to provide that the locating means is engineered to accommodate the effectively reduced internal diameter of the core.

The package illustrated accommodates four rolls but it is possible to adapt the structure to hold any convenient number. In addition, the means providing the outer structure of the package can be varied such that, for example, the locating means can be located directly on opposed walls of the package. Because of the manner of packing the rolls the package must be packed and unpacked with the rolls vertical. However, because the rolls are tightly located with respect to one another, the orientation of the package

during transportation is not critical.

CLAIMS

1. A method of packaging rolls of polyvinylbutyral sheet material wound onto cylindrical cores for transportation which comprises:

5 A. providing a package comprising upper and lower opposed parallel surfaces and connecting vertical walls each such surface being provided with a plurality of means each adapted to retain one end of a cylindrical core so as to restrict radial movement of the roll, the means being separated from adjacent retaining means on the same surface
10 by a between centers distance greater than the diameter of the rolls and from the walls by a distance greater than the radius of the rolls, said retaining means being aligned with corresponding means on the opposed parallel surface; and

15 B. locating rolls of polyvinylbutyral sheet material in the package such that each end of the core of each roll is retained by one of the retaining means on one of the opposed parallel surfaces.

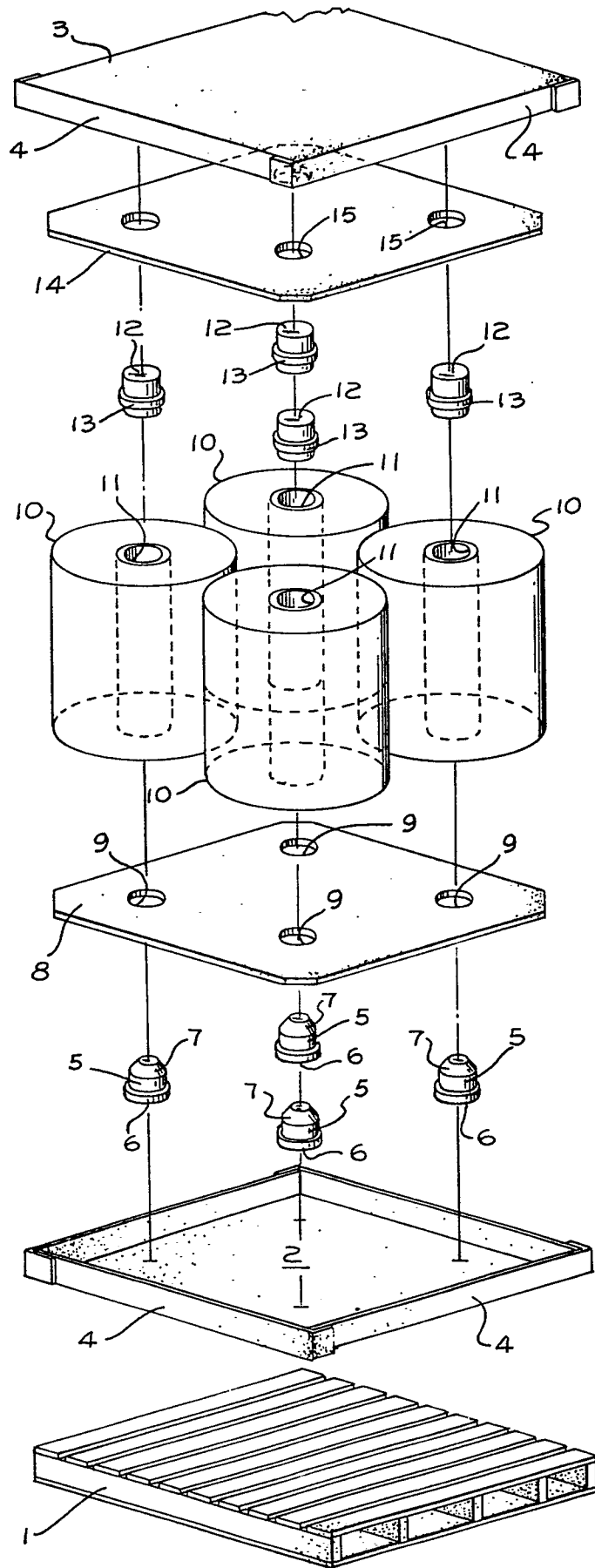
2. A method according to Claim 1 in which the cylindrical cores of the rolls are hollow and the retaining means is provided by a boss adapted to project into the roll core.

3. A method according to Claim 2 in which the boss has a frusto-conical configuration.

4. A method according to Claim 2 in which each retaining means is provided with a peripheral flange adapted to limit penetration of the boss into the core.

5. A method according to any of Claims 1 to 4 in which each opposed parallel surface is provided with four retaining means.

Fig. 1.





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
X	US-A-4 033 455 (ROBISON) * column 1, lines 6-11; column 2, lines 13-34; figures 1,5 *	1,2,3	B 65 D 85/66
X	--- US-A-3 375 919 (SCHLAGER) * column 2, lines 43-68; column 3, lines 3-10; figures 1,2 *	1,2,3	
X	--- FR-A-2 152 497 (EMBALLAGE MODERNE TRANSPARENT) * page 2, lines 18-38; figures 1,2 *	1,2,3,5	
X	--- BE-A- 647 794 (VCB) * page 1, lines 1-5; page 2, lines 12-20, 28-35; page 3, lines 1-36; page 4, lines 1-13, 32-35; page 5, lines 1-18; figure 1 *	1,2	
A	--- US-A-2 424 553 (CONTI) * column 3, lines 55-68; figure 5 *	3,4	B 65 D
A	--- GB-A-1 192 772 (FRANKLIN CONTAINER CORP.) * the whole document *	1	
A	--- GB-A-1 566 551 (WOODLAND) * the whole document *	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15-09-1982	Examiner BAERT F.G.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			