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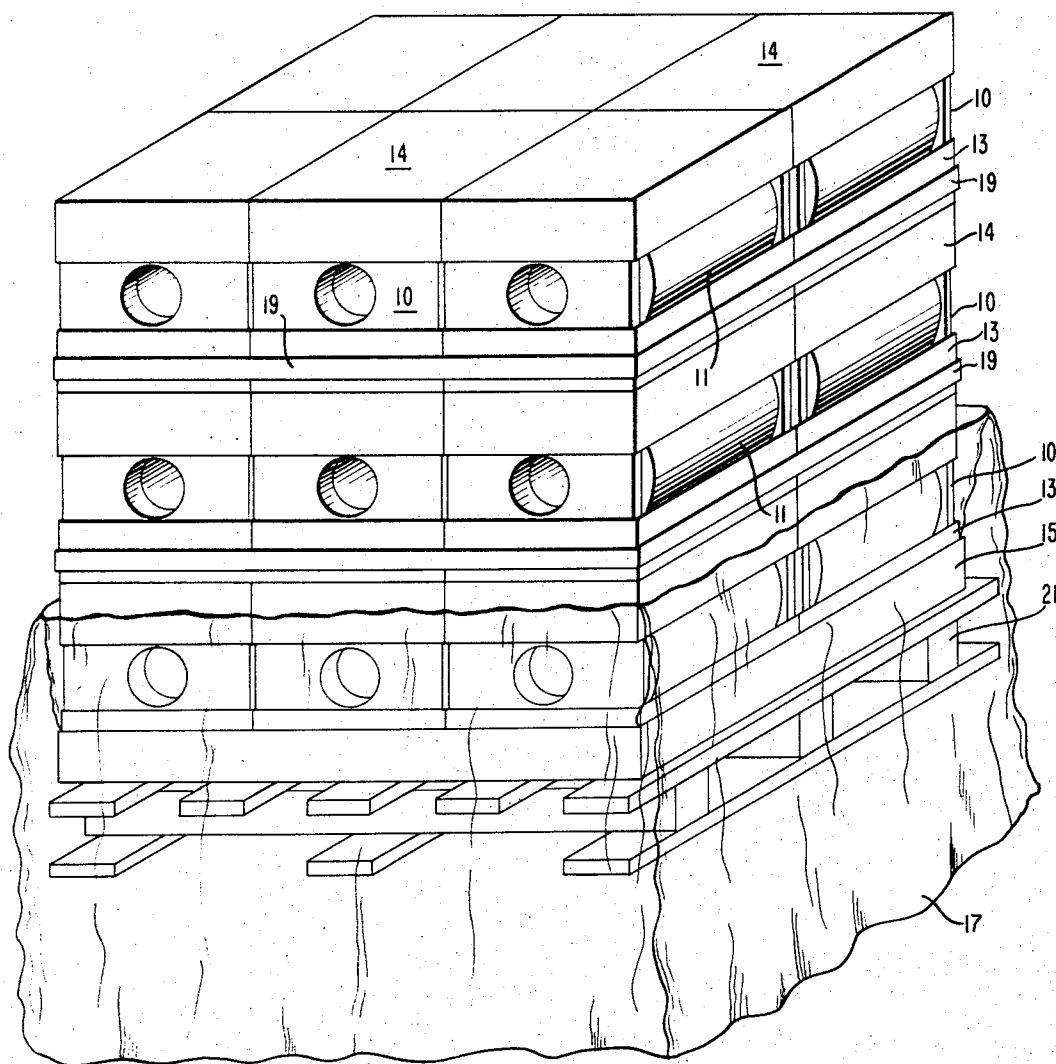
3,403,780

STACKED TRAY PALLETIZED PACKAGE FOR ROLLS

Filed June 15, 1967

2 Sheets-Sheet 1

FIG. 1



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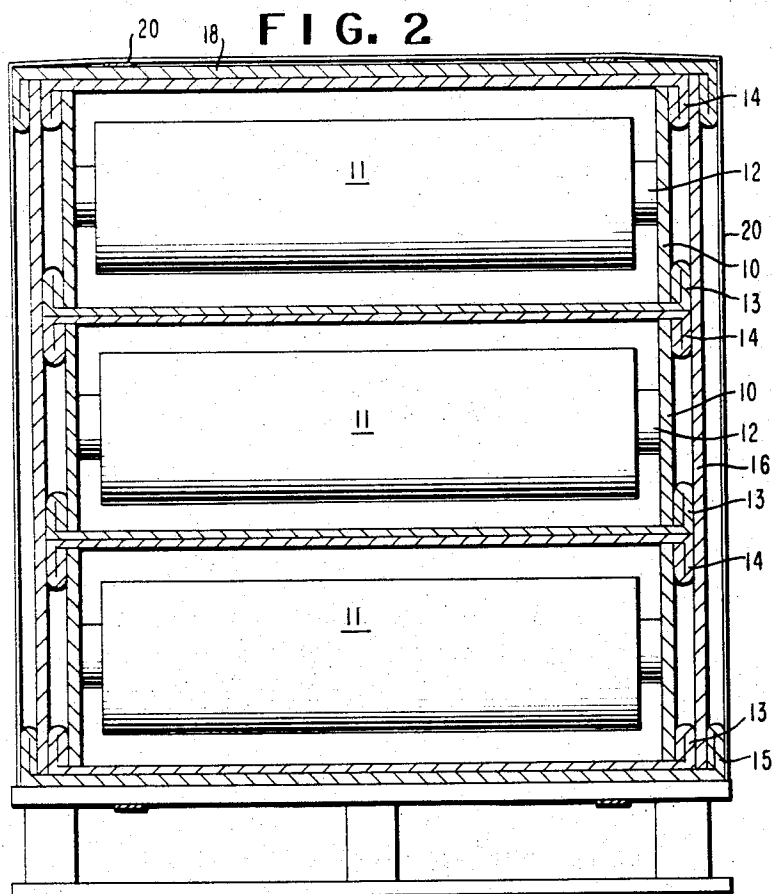
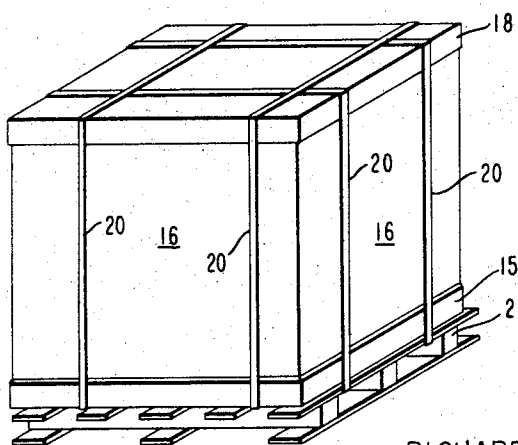


FIG. 3



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3,403,780 STACKED TRAY PALLETIZED PACKAGE FOR ROLLS

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ABSTRACT OF THE DISCLOSURE

A palletized stack of individually packaged rolls which are assembled in a tiered configuration and are enclosed within two pallet trays and four side pieces. Each roll within the individual packages is supported by suspension pieces located between a lower and an upper tray.

Background of the invention

This invention is related to packaging and more particularly to the packaging of a plurality of rolls in a single unit.

Rolls of web-like material are commonly shipped in corrugated cartons. To prevent roll flattening and finished product damage in transit the rolls are often suspended between core end supports before being packed in the carton. A multiplicity of such cartons are then assembled on a pallet and banded to the pallet in preparation for commercial shipment via truck or rail. However, the individual rolls can be damaged easily upon removal of the roll from its carton if one of the suspension pieces slips from its core end while the roll is sliding out of the carton causing the roll to drop onto an edge and thus damaging the film layers in the vicinity of the point of impact. Such conventional corrugated cartons do not provide an effective barrier to airborne contaminants. Dust and soot may enter the carton at the ends and corners because of the lack of positive flap seals. Furthermore, the removal of heavy rolls so packaged by use of mechanical hoists is not possible without first severing a portion of the carton. The severed portions of the corrugated containers then become a serious source of airborne foreign material contamination.

Summary of the invention

According to the present invention there is provided a palletized stack of individually packaged rolls assembled in a tiered configuration comprising roll suspension pieces; rolls, end supported between the roll suspension pieces; a set of lower trays supporting the roll suspension pieces; a set of upper trays identical to but being in inverted relation to the lower trays, the upper trays being aligned with the lower trays and resting on the roll suspension pieces; a pallet; a lower pallet tray resting on the pallet and supporting at least some of the lower trays; an upper pallet tray identical to but being in inverted relation to the lower pallet tray, the upper pallet tray being aligned with the lower pallet tray and resting on at least some of the upper trays; side pieces between the lower and upper pallet trays and means for securing the lower and upper pallet trays to the pallet.

The invention will be described in detail by reference to the drawings.

FIGURE 1 is a schematic view of a preferred embodiment of the palletized stack of this invention as it is being assembled.

FIGURE 2 is a cross-sectional view of a typical stack assembly of this invention.

FIGURE 3 is a perspective view of a preferred embodiment of the completed palletized stack of this invention.

Description of the preferred embodiment

Referring now to the drawings, FIGURES 1, 2 and 3 show a palletized stack of individually packaged rolls assembled in a tiered configuration comprising roll suspension pieces 10 and including rolls 11 end supported therebetween. The suspension pieces 10 consist of a square or octagonal sheet having a cylindrically shaped projection extending from its geometric center and being coaxially aligned with and of substantially the same dimension as the inside diameter of the rolls 11, which in the case of wound roll material would be the inside diameter of core 12. The horizontal and vertical dimensions of the vertically positioned square or octagonal sheet are each greater than the outside diameter of the rolls 11. The supported weight of the wound rolls is thus transferred from the core ends 12, via the suspension pieces 10, to the surface on which the suspension pieces are located. No portion of the roll surfaces bear on any surface when the rolls are so supported. There is also sufficient space surrounding the rolls 11 for an overwrap on the individual rolls providing the primary envelope for keeping contamination from the wound material. The square or octagonal sheet portions of the roll suspension pieces 10 are seated vertically on lower trays 13, engaging the inner side walls of such lower trays at opposing ends thereof. Upper trays 14, similar in design to the lower trays 13, but being in inverted relation thereto, are aligned with the lower trays and rest on the roll suspension pieces 10. At opposing ends the inner side walls of the upper trays also engage the sheet portion of the roll suspension pieces to provide for increased stability of the package. These trays 13 and 14 may be fabricated from sheet stock such as corrugated paperboard, hardboard, plywood, etc., or may be molded from thermoplastic or thermosetting polymeric materials. It is preferred that they be fabricated from corrugated paperboard and have the exposed edges on the vertically extending side walls formed by overlapping the paperboard. This reduces contamination of the rolls by the small paperboard particles which would shake loose from exposed severed sections of the corrugated paperboard during shipping.

The individually packaged rolls, each comprising suspension pieces 10, roll 11, lower tray 13, and upper tray 14, are then tiered or stacked on one another on the lower pallet tray 15 in a manner shown in FIGURES 1 and 2. When more than a single row of material is contained within the palletized stack horizontal strapping 19, which may be fabricated from steel or polymeric materials, is preferably banded around the lower trays 13 of the upper layers of the assembled stack, as shown in FIGURE 1. This prevents one individual package from shifting, upon transit, in relation to its adjacent packages. Banding for this use is preferred to the application of an adhesive between trays because of the resulting increased ease in unloading the palletized stack. Flat side pieces 16, their lower portions lying between the side walls of the lower pallet tray 15 and the lower trays 13, cover the four sides of the assembled stack. In the preferred embodiment of this invention, shown in FIGURE 1, the individual packages are placed within the projecting side walls of the lower pallet tray 15 with a thermoplastic bag structure 17 separating them from the lower pallet tray. The bag structure is drawn up and around the entire grouping of individual packages and preferably sealed on the top by use of pressure sensitive tape, not shown. This bag structure is intended to keep all external contaminants from entering the interior regions of the finished palletized stack. Its use is not essential in the formation of the palletized stack structure of this invention but is preferred for the packaging of high dielectric strength web materials which highly attract dust and other contaminating

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particles. An upper pallet tray 18, similar in design to lower pallet tray 15, is then placed over the uppermost portion of the palletized stack. The lower and upper pallet trays 15 and 18, and side pieces 16 can be made from corrugated paperboard, wood, plywood, etc. Corrugated paperboard is the preferred material of construction because of its lower cost and ease of disposition. When non-rigid materials, such as the preferred corrugated paperboard, are employed outer banding 20 is applied to unite the assembled stack with the supporting pallet 21. This banding may be fabricated from materials such as steel and polymers.

The advantages resulting from the practice of this invention in the commercial shipment of roll stock material are numerous and varied. The inner thermoplastic bag provides an effective contamination barrier for the finished product. The stack assembly is easily formed and no greater skill or care is required in forming a multi-layer stack than a single layered one. Roll removal from the stack may be accomplished using mechanical lift equipment without severing any portions of the packaging materials. Access to the contents of the stack for identification purposes is easily accomplished without destroying its essential components. The packaging components for the stack occupy less volume than conventional cartons which facilitates the disposition of the waste packaging materials.

What is claimed is:

1. A palletized stack of individually packaged rolls assembled in a tiered configuration comprising
roll suspension pieces,
rolls, end supported between said roll suspension pieces,
a set of lower trays supporting said roll suspension pieces,
a set of upper trays aligned with and position in inverted relation to said lower trays, and resting on said roll suspension pieces,
a pallet,
a lower pallet tray resting on said pallet and supporting at least some of said lower trays,
an upper pallet tray aligned with and positioned in inverted relation to said lower pallet tray, and resting on at least some of said upper trays,
external side pieces between said lower and upper pallet trays and engaging the inner side walls of said lower and upper pallet trays, and
means for securing said lower and upper pallet trays to said pallet.

2. The palletized package of claim 1 wherein each roll comprises a cylindrical core and a pellicle wound on said core.

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3. The palletized package of claim 1 wherein said suspension pieces consist of

a sheet having length and width dimensions greater than the outside diameter of said rolls, said sheet being seated vertically on said lower trays and engaging opposing inner side walls of said lower and upper trays, and

a cylindrically shaped projection extending from the geometric center of said sheet and being coaxially aligned with and of substantially the same dimension as the inside diameter of said rolls.

4. The palletized package of claim 1 wherein said side pieces are rectangular sheets with their lower portions lying flat against and between the side walls of said lower pallet tray and of said lower trays that rest on said lower pallet tray and with their upper portions lying flat against and between the side walls of said upper pallet tray and of said upper trays that support said upper pallet tray.

5. The palletized package of claim 1 wherein said suspension pieces are fabricated from a non-fibrous plastic material.

6. The palletized package of claim 1 wherein the rolls are individually contained within a protective covering.

7. The palletized packages of claim 1 wherein said sets of lower and upper trays that support the rolls through said suspension pieces form several layers and at least one of the upper layers is banded together horizontally.

8. The palletized package of claim 1 wherein said sets of lower and upper trays that support the rolls through said suspension pieces are enclosed in assembly within a protective covering.

9. The palletized package of claim 1 wherein said side pieces and lower and upper pallet trays are fabricated from corrugated paperboard and said lower and upper pallet trays have the exposed edges on their vertical side walls formed by overlapping the paperboard, thereby reducing foreign material contamination.

10. The palletized package of claim 1 wherein said upper and lower trays are fabricated from corrugated paperboard and have their exposed edges on their vertical side walls formed by overlapping the paperboard, thereby reducing foreign material contamination.

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