This invention relates generally to the supporting of a plurality of articles in spaced relation within a unit package. More particularly, it relates to a packaging carton which is adapted for storing and shipping a plurality of textile bobbins arranged in layer form. The invention is further related to components of the unit package which facilitate handling of textile bobbins in shipping and processing.

Most of the greater portion of textile yarns are processed by machinery which is adapted to receive the yarns in the form of bobbins. The bobbins are usually shipped in cartons designed to protect the yarn from abrasion. In order to protect the yarn from abrasion, the packages are individually wrapped or supported in fixed positions to avoid contact between themselves or with other materials.

Conveyors are sometimes employed in connection with the yarn processing machinery to expedite transfer of the yarn packages from one processing station to another. Accordingly, a carton having components capable of use in conjunction with such conveyors would be particularly advantageous.

Textile cartons having separators between layers of bobbins have been heretofore suggested. However, most of these comprise a single thickness of corrugated cardboard, with extensions for fixedly positioning the bobbins, and thus are incapable of solely supporting the entire weight of a layer of bobbins without flexing or of withstanding abuse on a processing conveyor line. One type of separator that has been suggested is one wherein extensions or protuberances extend from both faces of the separator, assumes dimensions corresponding to the interior of the carton when placed therein and tends to assume a flat position when removed from the carton (U.S. Patent No. 2,710,689). While these prior suggested separators may serve their intended function, they are not sufficiently rigid to support an entire layer of bobbins when the layer is removed from the carton, nor are they capable of being loaded and unloaded as the separators of the instant invention are.

It is accordingly an important object of this invention to provide a carton adapted to support apertured articles in layers which may be easily loaded and unloaded.

A further object of this invention is to provide a carton wherein a plurality of yarn bobbins are maintained in spaced relation.

Another object of this invention is to provide a carton comprising a plurality of platforms or pallets, each of which is sufficiently rigid to function as a carrying tray.

The nature of this invention and further objects and advantages thereof will appear from the following description of specific embodiments thereof and from the accompanying drawing, in which:

FIG. 1 is a pictorial view of a carton embodying the invention;

FIG. 2 is a pictorial view of the platform separator incorporated in the carton shown in FIG. 1;

FIG. 3 is a pictorial view of one type of bobbin spool which this invention is particularly adapted to support;

FIG. 4 is an exploded pictorial view of the platform separator shown in FIG. 2 but in expanded form and disclosing in more detail the construction of the mounting posts;

FIG. 5 is a pictorial view of an alternate form of a structurally reinforced platform separator; and

FIG. 6 is a pictorial view of an alternate form of mounting posts.

One embodiment of the invention described in detail involves a plurality of platform separators within a packing carton for supporting and separating apertured or recessed articles such as bobbins upon which yarn is wound. The several bobbins are arranged in a stack of layers and are fixedly positioned within the layers by mounting posts. The mounting posts are of a platform intersecting and mating members aligned in rows. Each member within a row is preferably interconnected by web sections with other members within the row to form a strip. The mounting posts are in registry with and project through apertures in the top wall of a double wall platform to receive an apertured bobbin. The lower platform wall preferably presents a smooth surface for engagement with a subjacent layer of bobbins. The web sections of the strips are intermediate the top and bottom rails of the platform to impart structural reinforcement and rigidity thereto. Thus the resulting structure defines a platform by means of which an entire layer of bobbins may be removed from the carton, through a removable or hinged side, as a unit.

Referring to FIG. 1, a container, generally designated by the numeral 9, is shown comprising a carton 11 with removable top 13, sides 15, 17, 19 and 21, and bottom 23. Side 21 is shown to be hinged to bottom 23 to expose the interior of the carton 11 and a lateral side of the stack of bobbins 46 within the carton 11 and thereby facilitate the removal of each of the bobbin layers as a unit.

Each of the layers is supported upon a platform 10, the details of which may be more readily observed in FIGS. 2 and 3.

In FIGS. 2 and 4, the platform 10 there shown consists of a top member 12 having side portions 14 and 16 hinged thereto along fold lines 18 and 20, respectively. A pair of bottom panels or members 22 and 25 are hinged to side portions 14 and 16 along fold lines 24 and 26, respectively. The bottom members 22 and 25 are each provided with tang members 28 hinged along fold lines 30. The tang members 28 are adapted to be inserted in apertures 32 of top member 12 to provide an affixing or interlocking relation therewith. The top member 12 is also provided with a plurality of apertures 34 having a criss-cross configuration, each aperture being adapted to receive a projection. The apertures 34 are preferably arranged in a repitious pattern for purposes which will become apparent in the subsequent description.

Intermediate the bottom members 22 and 25 and the top member 12 are positioned a plurality of strip members 36. For the sake of description, the strip members extending in a first direction, the corresponding to a row of apertures are designated by the numeral 36a, while mating strip members extending along a line transverse to said first direction are designated by the numeral 36b and as columns. Each of the strip members 36 defines a plurality of projections 40 interconnected by web sections 42. Each of the projections 40a of strip 36a is provided with a longitudinal slot 41 extending from the top of the projection while each of the projections 40b of strip 36b is provided with a longitudinal slot 43 extending from the base of the web section 42. Hence, a pro-
jection 40a is matable with a projection 40b to define a mounting post 44 for extension through an aperture 34 of top member 12 for receiving the recessed portion 47 of bobbin 48.

The top member 12 is adapted to receive a plurality of mounting posts 44 through apertures 34 and to rest upon the bases 46 of web sections 42. The bottom members 22 and 25 are folded to abut against the web members 49 of web section 42. By virtue of this arrangement, a structurally reinforced pallet or platform having a plurality of mounting posts is provided.

In FIG. 5 is shown an alternate form of structurally reinforced platform. The platform 110 there shown consists of a top member 112, strip members 36a and 36b, and a bottom member 122. The bottom member 122 has side portions 114 and 116 hinged thereto along fold lines 118 and 120, respectively. The side portions 114 and 116 in turn are provided with tang members 128 which extend through apertures 132 of top member 112 to provide an interlock therewith.

It is to be noted that in both of the platform embodiments described a flat extended surface is presented by the bottom members 22 and 122 to form a seat which may rest on a subjacent layer of bobbins and which facilitates removal of the platform as a unit and of separating the positions of the bobbins in said subjacent layer.

It will be understood that, while mounting posts formed by intersecting projections of strip members have been described in connection with the preferred embodiment of this invention, the mounting posts may take other forms without departing from the spirit of this invention if they impart structural rigidity to the platform surface so that the platform may be utilized as a carrying tray and/or a conveyor pallet for a plurality of articles. For example, the mounting posts 144, as shown in FIG. 6 may comprise strip members 136 extending in a linear direction wherein individual mating members 137 traversing the strip members 136 may be provided. The strip members 136 may also be interconnected by sections 138, if desired.

It will also be understood that the apertures 34 may assume other forms than the cross-cross configuration shown, e.g., circular. The cross-cross configuration is preferred for mounting posts defined by intersecting members because the lateral displacement of the mounting posts is more restrained within the apertures.

The advantages of the invention in simplicity of blanking the components, ease in rapid assembly and disassembly which facilitates shipment of loaded and empty containers, ease in mounting the individual posts with articles, structural rigidity of the individual separators, which adapts them for use as pallets and ease in loading and unloading the cartons with filled pallets, will be apparent to those skilled in the art from the foregoing description of the preferred embodiments of the invention. It should also be understood that although the container has been described in detail as to its component parts, such detail is for the purpose of illustration and not by way of limitation. The appended claims are therefore intended to cover any modifications coming within the true scope of the invention.

What I claim is:

1. A container for apertured articles comprising: a carton having at least one of its vertical sides movably to expose the interior of said carton; and a plurality of platforms each supporting a layer of said articles, each of said platforms comprising a top member defining a plurality of apertures adapted to receive a mounting post, a bottom member having a flat extended surface to form a seat for a subjacent layer of articles, mounting posts extending through said apertures of said top member and being adapted to receive and position said articles in spaced relation, and reinforcing sections intermediate of and spacing each of said top and bottom members apart a distance greater than the thickness of the material forming said reinforcing sections, the total spaced apart area between said top and bottom members being greater than the contact areas of said top and bottom members with the reinforcing sections.

2. A container for apertured articles comprising: a carton having at least one of its vertical sides hinged; and a plurality of platforms, each supporting a layer of said articles, each of said platforms comprising a top member defining a plurality of apertures, a bottom member, and mounting posts extending through said apertures of said top member, at least a portion of each mounting post being positioned intermediate of and spacing said top and bottom member to structurally reinforce said platform, said top and bottom members being spaced apart a distance greater than the thickness of the material forming said mounting posts, the total spaced apart area between said top and bottom members being greater than the contact area of said top and bottom members with the portions of the mounting posts positioned intermediate of said top and bottom members, each of said platforms being slidably removable from said carton through one of said hinged vertical sides without interfering with a subjacent layer of articles.

3. A platform releasably positioning a plurality of apertured textile bobbins comprising: a top member defining a plurality of apertures arranged in a repetitious pattern; a bottom member having a flat extending surface; and mounting posts extending through said apertures of said top member and receiving and positioning said textile bobbins in spaced relation, and reinforcing sections intermediate of and spacing said top and bottom members, said top and bottom members being spaced apart a distance greater than the thickness of the material forming said reinforcing sections.

4. A platform for releasably positioning a plurality of recessed articles comprising: a top member having a plurality of apertures arranged in a repetitious pattern; a bottom member in spaced and parallel relation with and affixed to said top member; mounting posts seated on said bottom member and extending through the apertures of said top member, said mounting post being adapted to receive the recessed portions of said articles; and reinforcing sections intermediate of and spacing said top and bottom members, said top and bottom members being spaced apart a distance greater than the thickness of material forming said reinforcing sections.

5. A platform as described in claim 4, wherein the cross-sectional plan configuration of said apertures corresponds to the cross-sectional plan configuration of said mounting posts.

6. A platform as described in claim 4, wherein said bottom member is provided with flange members hinged thereto for maintaining said spaced relation with said top member.

7. A platform as described in claim 4, wherein said bottom member is provided with flange members hinged thereto for maintaining said spaced relation with said top member.

8. A platform as described in claim 4, wherein said apertures are arranged in a pattern of rows and columns and the mounting posts for each of said apertures is formed by a strip member extending along a line corresponding to the row in which the aperture is aligned and by a mating member intermediate of and spacing said top member in said aperture, said strip member having at least two projections, one of said projections extending through one aperture of a linear row and the other of said projections extending through another aperture of said linear row.

9. A pallet for releasably positioning and supporting a plurality of recessed articles comprising: a top member having a plurality of apertures arranged in a repetitious pattern; a pair of side flanges hinged to said top member along a first pair of parallel fold lines; a pair of bottom
members hinged to said flanges along fold lines parallel to said first pair of fold lines, each of said bottom members presenting a flat extended bottom surface; a tang member extending from each of said bottom members and being adapted to be affixed to said top member; and mounting posts extending through said apertures of said top member to receive and position said articles in spaced relation.

10. A pallet as described in claim 9, wherein said mounting posts are formed by strip members having projections intersecting at said apertures and extending therethrough.

11. A pallet as described in claim 10, wherein said apertures are arranged in a pattern of rows and columns and some of said strip members having projections extending through at least two apertures of one of said rows and columns.

12. A pallet for releasably positioning and supporting a plurality of apertured articles comprising: a top member having a plurality of apertures arranged in a repetitious pattern of rows, there being at least two rows extending in a first direction and two rows extending in a second direction transverse to said first direction; a mounting post for each of said apertures formed by a strip member having a plurality of projections interconnected by a web portion, said strip member having projections extending through at least two apertures of one of said rows and by a mating projection intersecting one of said strip projections; and a bottom member secured to said top member, said web portion being positioned intermediate said top and bottom member to form a substantially rigid and unitary structure therewith.

13. A pallet as described in claim 12 wherein said mating projection is one of a series interconnected by a web portion, said web portion of the mating projection series imparting rigidity to said pallet in a direction transverse to the web portion of said strip member.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Inventor</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,499,994</td>
<td>Marx</td>
<td>July 1, 1924</td>
</tr>
<tr>
<td>2,633,285</td>
<td>Kells</td>
<td>Mar. 31, 1953</td>
</tr>
<tr>
<td>2,792,112</td>
<td>Ellis</td>
<td>May 14, 1957</td>
</tr>
<tr>
<td>2,893,550</td>
<td>Sandmeyer</td>
<td>July 7, 1959</td>
</tr>
</tbody>
</table>