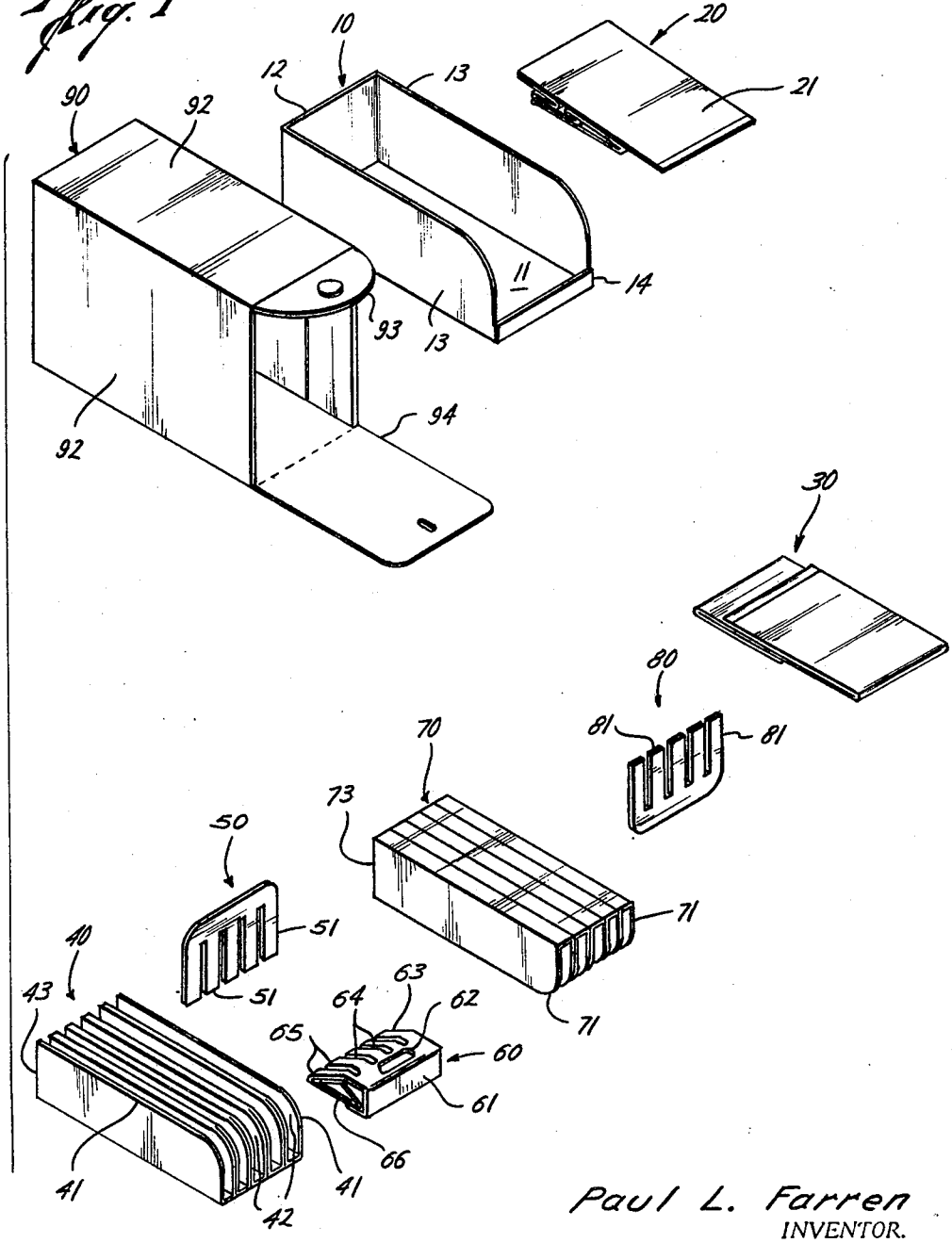
Nov. 18, 1969 P. L. FARREN 3,479,105

REEL STORAGE DEVICE

Filed Nov. 1, 1967 2 Sheets-Sheet 1

Fig. 1



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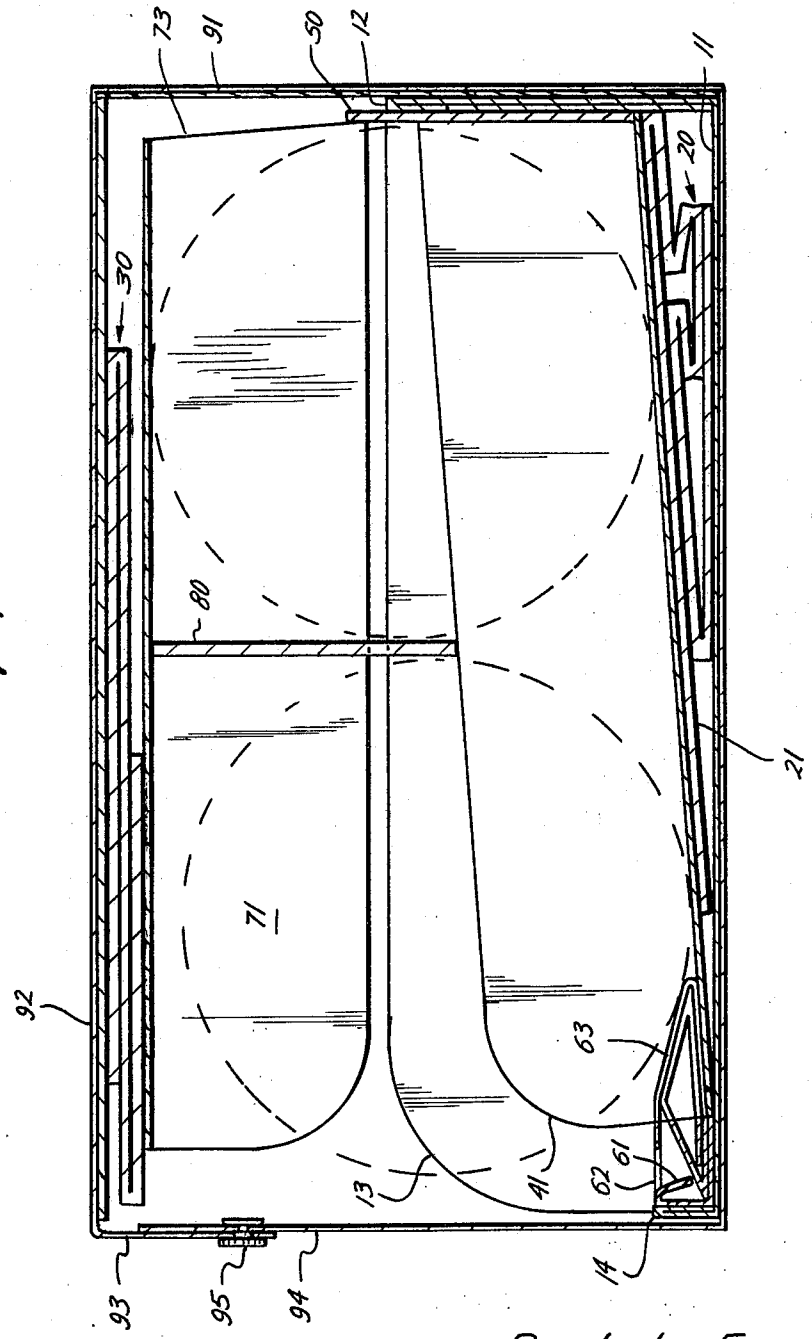


Fig. 2

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REEL STORAGE DEVICE

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U.S. Cl. 312—261 8 Claims

ABSTRACT OF THE DISCLOSURE

A modular container having a tray with vertical partitions dividing the tray into reel-receiving compartments. Similar portitions are inserted in an inverted manner over the reels to fix the reels within an outer container during shipment. Wedge-like members are inserted under the tray to bias the reels downwardly.

Background of the invention

Field of the invention.—This invention concerns containers or other equipment wherein reels, such as those containing magnetic tape thereon, may be stored and/or shipped therein.

Prior art.—Much presently used storage equipment simply provides a saddle-like shelf wherein such reels are placed side-by-side, upright, one reel in depth. Present shipping containers store the reels, again in an upright manner, with the reels being vertical or horizontal, but, in either case, resting on a flat horizontal surface.

The only prior teaching known to applicant involving the concept of biasing, in an inclined manner, tape reels during shipment and/or storage is disclosed in my prior copending application Ser. Nos. 526,262, now abandoned, and 536,760, now Patent No. 3,396,840, issued Aug. 13, 1968. Said latter application discloses a modular container of the nature disclosed herein. However the improvements disclosed hereinafter permit the entire ramp to be inclined as well as more securely fix the reels during shipment.

Summary of the invention

An outer box-like container has the normal four side walls, and flaps fixed together at one end and releasably secured at the other. A tray is insertable within the outer box, the tray having vertical sides, back and front lip. Packing material is so scored as to, on proper folding, provide a wedge of varying thickness. Such material is folded to its greater thickness, inserted intermediate the divider or ramp and the tray bottom so as to downwardly incline the divider from back to front. A divider receiving member having an inclined surface is positioned in the tray adjacent the tray lip. Vertical partitions are inserted within apertures in the divider receiving area being suitable for holding at least two reels. The partitions are fabricated from a single blank and have the appearance of a crimped piece of material. On insertion of the tray and divider within the outer box, a counterpart of the divider is inverted and placed atop the reels with the individual protuberances inserted therebetween. Comblike members may encompass the partition protuberances and position the individual reels within each ramp runway. A further strip of folded packing material may then be inserted intermediate the top wall of the box and the uppermost surface of the upper crimped partition to cause it to snugly conform and position the reels which are downwardly biased.

Description of the drawings

FIGURE 1 is an exploded perspective showing each of the components of the device; and

FIGURE 2 is a vertical section through the center of the assembled container.

Description of a preferred embodiment

As previously mentioned, this invention is particularly useful for the storing and/or shipping of information-containing tape reels. Of particular interest are magnetic tape reels such as may be used relative to oil and gas exploration, although any reel, such as those containing movie film, may be properly stored therein.

In these days of information explosion, the conservation of space is a prime goal. This invention not only accomplishes such an object, but also facilitates the classification and retrieval of stored information.

Basically, a reel-containing tray is provided which may be positioned independent of an outer container, i.e., such as on shelving. Also, an outer container and particularly useful packing material is provided, with which the tray and reels contained therein may be shipped.

Looking at the two drawing figures together, a tray **10** is depicted which has a bottom **11**, attached to a vertical rear wall **12** side walls **13** and to vertical front lip **14** of substantially lesser height than the rear wall. The side walls are seen to rise vertically from their juncture with bottom **11** and then to arcuately bend to form a horizontal top edge and thereafter to join rear wall **12** along the latter member's sides.

The next step in assembling the complete device involves placing wedge-like packing member **20** within tray **10** and atop bottom **11** thereof, so that top **21** of the wedge forms an incline for a purpose later described. It may be noted that packing members **20** and **30** are herein substantially alike, namely a long sheet of cardboard or the like which is scored so that it may be folded into forms having differing thicknesses. Note that member **20** is so folded as to present at least three layers under most of ramp **40** when inserted thereunder. This permits the divider floor or bottom to be inclined at a substantial angle as later described. Thus, wedge **20** is inserted within the tray and should rest flush with or near tray track **12**, as seen in FIGURE 2.

Next, divider or ramp element **40** may be inserted within the confines of tray **10**, with its individual partitions **41** directed in an upwardly manner as shown. This element, like its counterpart **70** is formed of a single sheet of material, such as cardboard, crimped or folded so as to form upright partitions **41** with reel-receiving channels **42** intermediate thereof.

Comb or strengthener means **50** then has its teeth **51** inserted within channels **42** of divider **40**, with the apertures intermediate the teeth encompassing all but the outer most of partitions **41**. Comb **50** is normally positioned toward the rear **43** of member **40** so as to rest near or adjacent the rear wall **12** of tray **10**, and to serve as an abutment for reels positioned within channels **42**.

Further, divider receiving and hand grip member **60** is inserted within tray **10**, at the front thereof. This portion includes vertical wall **61** which rests against the interior surface of tray lip **14**. The foldable blank comprising element **60** then bends to form an upper surface having hand receiving cutout **62** therein. Said surface is further angularly inclined to form runway **63** having parallel apertures **64** therein separating teeth **65**. Thereafter, the material bends to form base **66** which rejoins front wall **61**. With member **60** inserted within the tray, front panel **61** rests adjacent tray lip **14**, base **66** lies atop tray bottom **11** and divider partitions **41** are received within apertures **64**, resting snugly against the bases thereof.

At this stage, tape reels, two deep, may be inserted within channels **42**.

Inverted divider element **70**, a duplicate of member **40**, also is formed of a single sheet, and includes partitions **71**, channels **72** formed thereby, and back side **73**.

Comb **80**, like comb **50**, has teeth members **81**, having apertures therebetween. This comb may have its teeth upwardly inserted within channels **72** of divider **70**, at approximately said divider's longitudinal midpoint. This divider may then be positioned, inverted as shown, atop the parallel rows of reels, with comb **80** serving to separate the forwardly from the rearwardly reel within each of aligned channels **42**, **72** as well as to rigidify divider **70**.

The entire assembly, comprising tray **10**, dividers **40**, **70**, combs **50**, **80** and divider receiving member **60** may then be inserted within outer box or container **90**. Such a container would normally have rear side or flaps **91**, sides **92** with its front removably covered by flaps **93**, **94**. After such insertion, packing wedge **30** may be positioned atop the uppermost surface of divider **70** and adjacent top side **92** of container **90**. Note that, as previously mentioned, packing member **30** has lesser layers of thickness than does like member **20**. Inasmuch as it is desirable to snugly confine the reels within the container, upper divider **71** should be pressed downwardly to conform with the tops of the reels confined thereby. The most forwardly of the reels within each of channels **42** will run partially up runway **63**, and therefore be slightly displaced upwardly, as in FIGURE 2. Thus, packing **30** should be slightly less thick than **20**. Finally, end flaps **93**, **94** may be closed by fastening means such as **95**.

In summation then, a shipping container is shown which securely positions a plurality of reels. On arrival at its destination, the tray may remain within the outer container, or be stored separately, such as on shelves. The tray provides a plurality of inclined channels for holding the reels. Even with the comb-like shipping members removed, it is readily determinable whether there are two or only one reel in any channel. This is possible inasmuch as where there are two, the forwardlymost will ride partly up runway **63**. If only one is present, it will be positioned somewhat rearwardly, a convenient indexing means.

Although only a single embodiment has been described, it should be obvious that numerous modifications are possibly by one skilled in the art without departing from the spirit of the invention.

I claim:

1. Reel storage device comprising:
an outer container;
tray means having a bottom and insertable within said outer container;
ramp means inserted within said tray means said ramp means including a plurality of upright partitions defining a reel receiving channel intermediate each adjacent partition;
means for receiving one edge of each of said partitions, said receiving means being inserted within said tray adjacent one end thereof;
means for inclining said ramp means relative to the bottom of said container; and
a further member having a plurality of partitions with a reel-receiving channel intermediate each partition, said member being adapted to be inserted within said outer container and atop reels positioned within said ramp means.

2. The device of claim **1** and means for causing said further member to be angularly inclined relative to the top of said container.

3. The device of claim **2** wherein the angle between said top of said container and said further member is lesser than the angle between said ramp means and said container bottom.

4. The device of claim **2** wherein said further member and said ramp inclining means are each folded blanks, said ramp inclining means having a greater thickness so as to incline said ramp means at a greater angle relative to said container bottom than the angle between said further member and said container top.

5. A tray for storing tape reels therein, comprising
a bottom, oppositely disposed vertical sides a rear wall, and a vertical front lip of lesser height than said rear wall;
ramp means removably inserted within said tray, said ramp means being formed from a single folded blank so as to include a plurality of channel-forming vertical partitions;
partition receiving means removably inserted within said tray adjacent said lip, said receiving means including a plurality of finger elements extending within said ramp means channels, and
means for elevating the rear of said ramp means relative to its front, removably inserted in said tray intermediate said tray bottom and said ramp means, said elevating means being formed from a single folded blank so as to form at least one area of at least twice the vertical thickness of said blank.

6. The tray of claim **5** and including removable partition spacer and reinforcing means having fingers extending downwardly within said channels.

7. Reel storage device comprising:
an outer container; and
tray means for storing tape reels therein, removably insertable within said outer container, said tray means comprising;
(a) a bottom, oppositely disposed vertical sides, a rear wall, and a vertical front lip of lesser height than said rear wall;
(b) ramp means removably insertable within said tray means, said ramp means including a plurality channel-forming vertical partitions;
(c) partition receiving means removably inserted within said tray adjacent said lip, said receiving means including a plurality of finger elements extending within said ramp means channels; and
(d) means for elevating the rear of said ramp means, relative to its front, removably inserted in said tray means intermediate said tray means bottom and said ramp means, being formed from a single folded blank to as to form at least one area of at least twice the vertical thickness of said blank.

8. The device of claim **7** and including removable partition spacer and reinforcing means having fingers extending downwardly within said channels.

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U.S. Cl. X.R.

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