United States Patent [19]

Berkman

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[54] **RACK**

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[52] U.S. Cl. **211/163;** 206/387; 211/40; 211/131; 312/11

[51] **Int. Cl.** **A47b 81/00**

[58] **Field of Search** 211/40, 41, 58, 77, 78, 211/95, 115, 126, 128, 131, 129, 144, 163, 165, 166, 42, 177; 312/10, 11, 202, 285; 206/387

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Assistant Examiner—Thomas J. Holko
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[57] **ABSTRACT**

Stackable rack elements and rack assembled therefrom for supporting both magnetic tape cartridges and cassettes. The basic rack element is provided with a generally square-shaped supporting surface, four dividing walls radiating outwardly of the center, and four edge walls of the same height as the four dividing walls extending from the ends of the dividing walls, and together define four front and top opened bins. The bins are further provided with bosses and rib means for accomodating both magnetic tape cartridges and cassettes.

5 Claims, 8 Drawing Figures

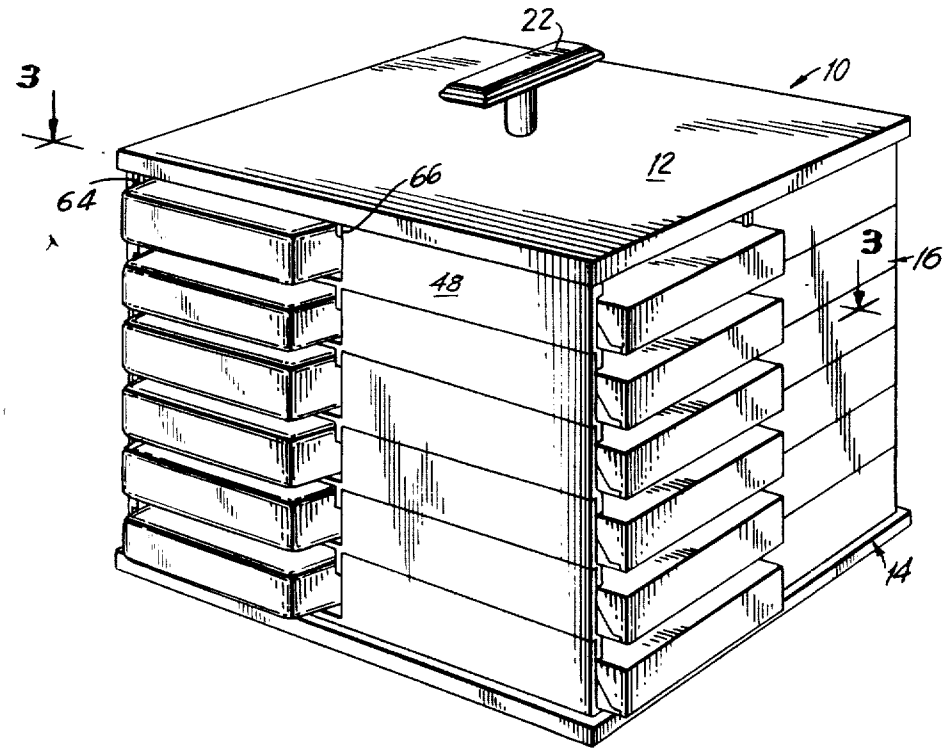


FIG. 1

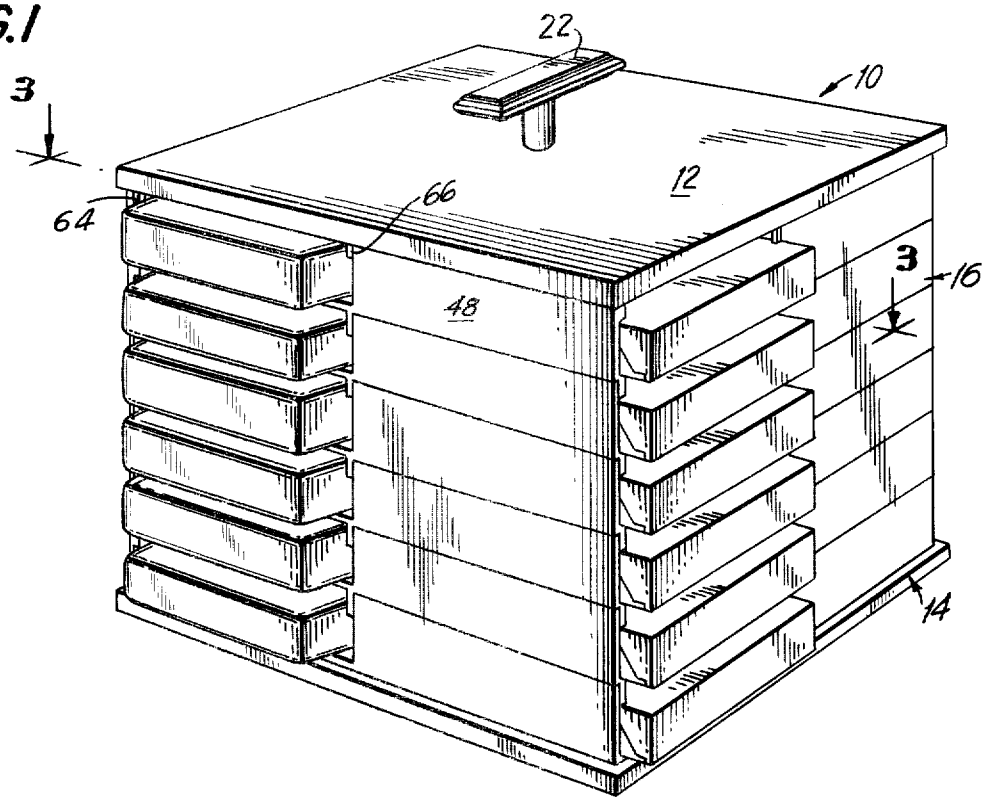

22
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FIG. 4

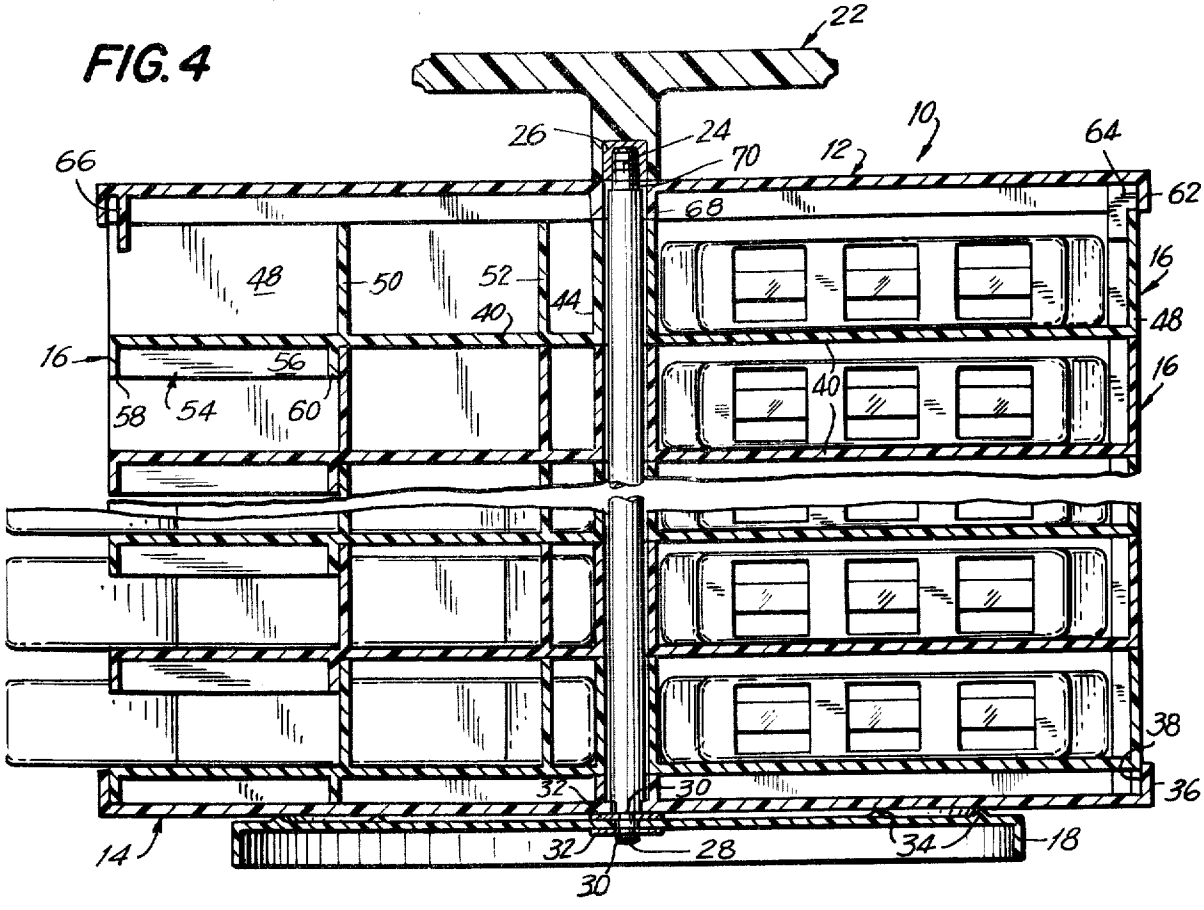

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FIG. 2

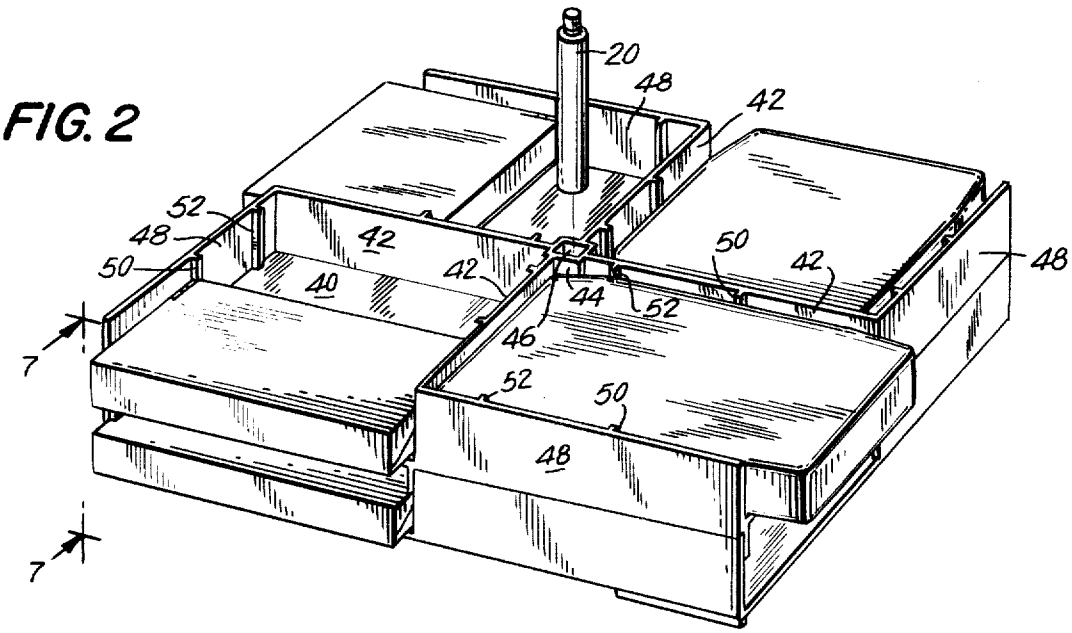


FIG. 5

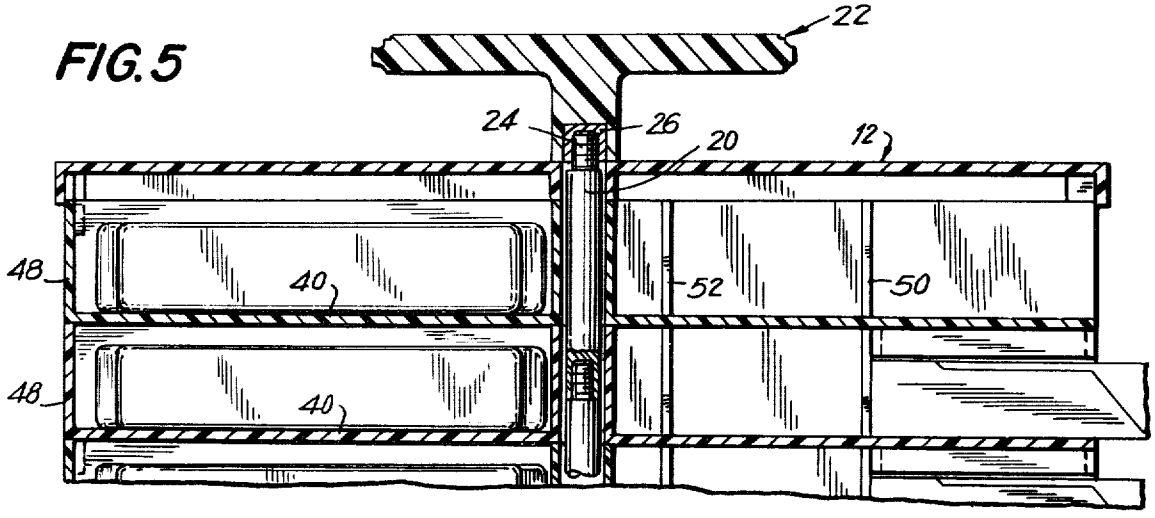


FIG. 7

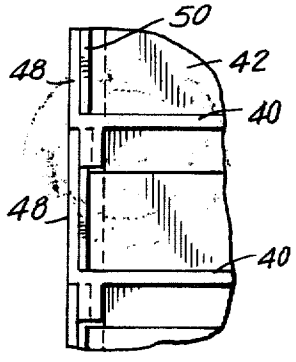


FIG. 8

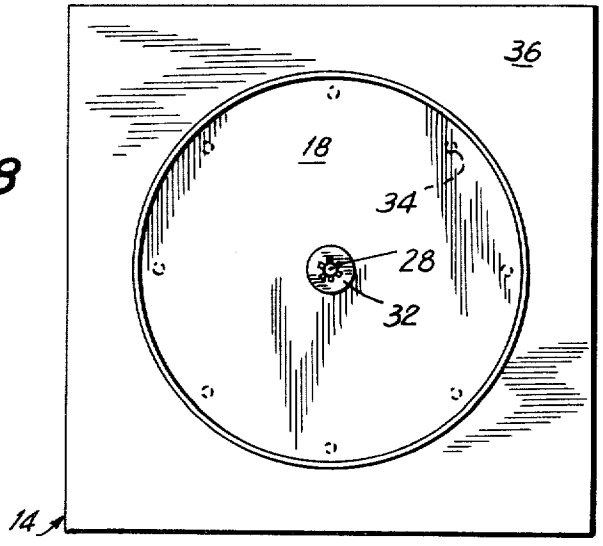


FIG. 3

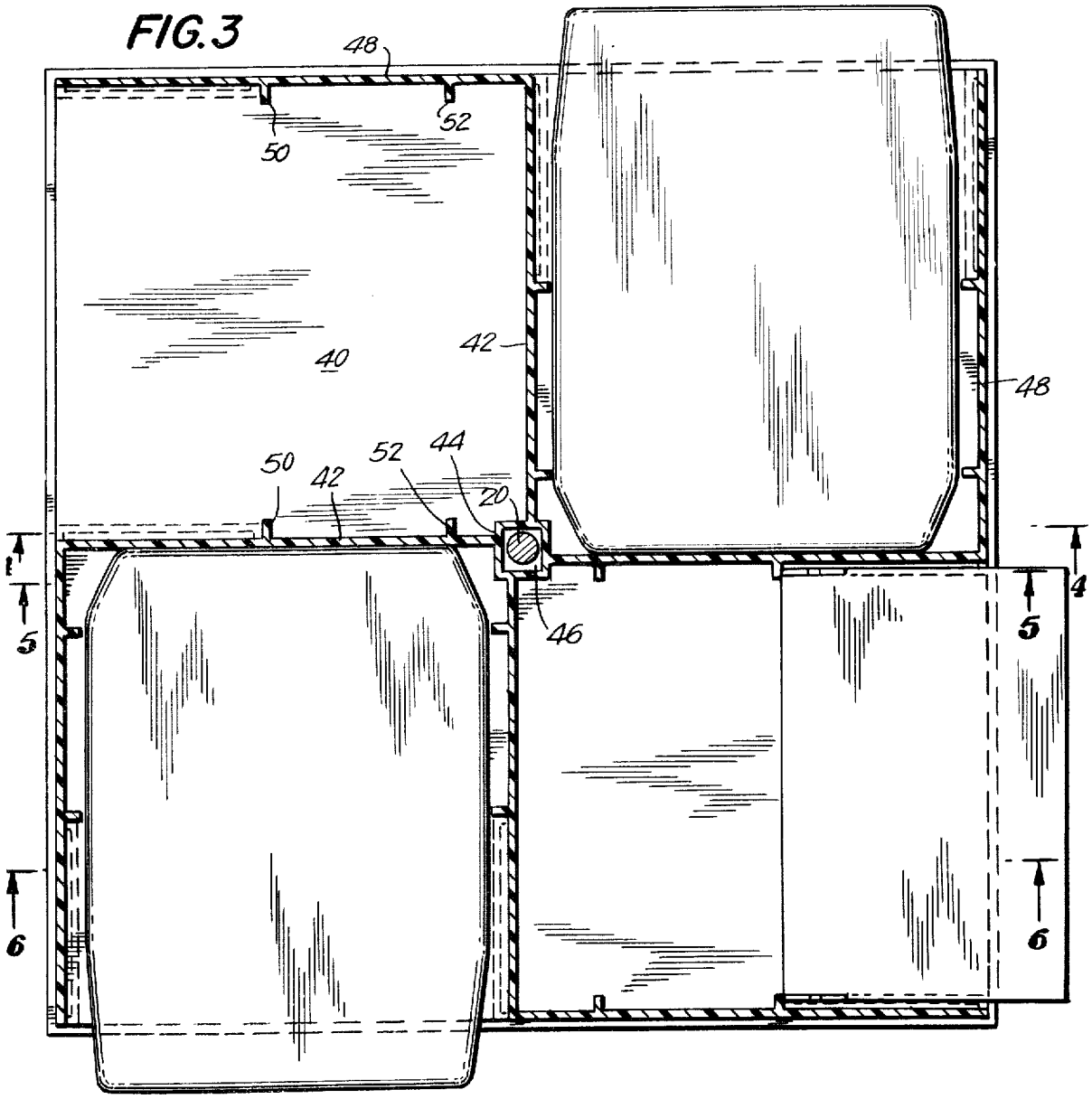
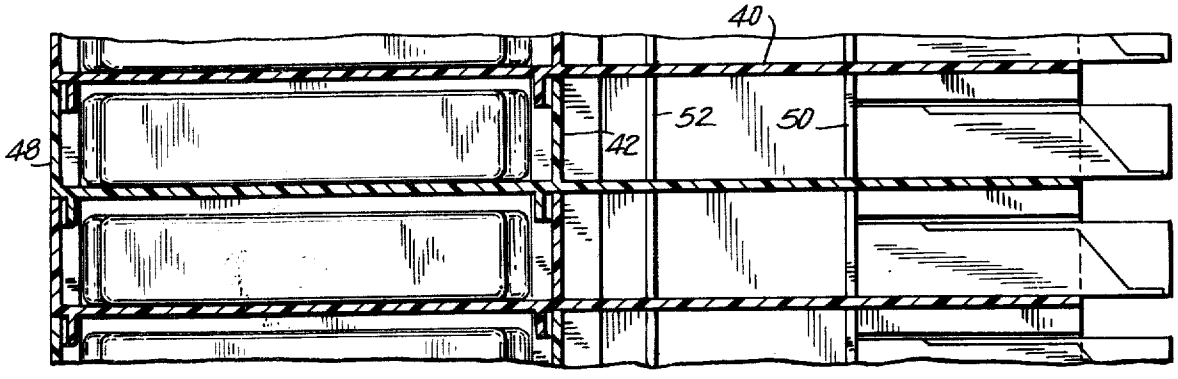


FIG. 6



RACK

This invention relates generally to racks and, more particularly, to rack elements for both magnetic tape cartridges and cassettes.

It is a primary object of the present invention to provide novel and improved racks and rack elements for supporting both standard magnetic tape cartridges and cassettes.

It is another primary object of the present invention, in addition to the foregoing object, to provide novel and improved rack elements of unitary one piece plastics construction which may be stacked, one above the other, and interlocked through cooperation of bosses forming portions of the integral one piece rack element to provide a multiple level rack for supporting both standard magnetic tape cartridges and cassettes.

Another primary object of the present invention, in addition to each of the foregoing objects, is the provision of such novel and improved racks and rack elements wherein standard magnetic tape cartridges and cassettes may be intermixed while yet maintaining an aesthetic appearance.

Yet still another primary object of the present invention, in addition to each of the foregoing objects, is the provision of such novel and improved racks and rack elements which may be supported for rotational movement for easy selection of cartridges and cassettes stored therein.

Yet still another primary object of the present invention, in addition to each of the foregoing objects, is the provision of such novel and improved racks and rack elements which may be readily expanded by the stacking of additional rack elements.

Another and further primary object of the present invention, in addition to each of the foregoing objects, is the provision of such novel and improved racks and rack elements which provide individual compartments for each of the cartridges and cassettes stored therein.

Yet another primary object of the present invention, in addition to each of the foregoing objects, is the provision of such novel and improved racks and rack elements which store standard magnetic tape cartridges and cassettes while enabling quick and easy selection, removal and replacement thereof.

Another and still further primary object of the present invention, in addition to each of the foregoing objects, is the provision of such novel and improved racks and rack elements which support magnetic tape cartridges and cassettes with the titles thereof being clearly displayed.

Another and still further primary object of the present invention, in addition to each of the foregoing objects, is the provision of such novel and improved racks and rack elements which are economic to manufacture, durable in use and aesthetically appealing.

The present invention resides in the combination, construction, arrangement and disposition of the various component parts and elements incorporated in rack elements and rack structures constructed in accordance with the principals of this invention. The present invention will be better understood and objects and important features, other than those specifically enumerated above will become apparent when consideration is given to the following details and description, which when taken in conjunction with the annexed drawing, describes, discloses, illustrates and shows a

preferred embodiment or modification of the present invention and what is presently considered and believed to be the best mode of practice in the principals thereof. Other embodiments or modifications may be suggested to those having the benefit of the teachings herein and such other embodiments or modifications are intended to be reserved especially as they fall within the scope and spirit of the subjoined claims.

IN THE DRAWING

FIG. **1** is a perspective illustration of a cartridge and cassette rack constructed in accordance with the principals of the present invention;

FIG. **2** is a perspective illustration similar to FIG. **1** showing two of the rack elements of the present invention stacked one above the other;

FIG. **3** is an enlarged cross-sectional planned view taken along line **3—3** of FIG. **1**;

FIG. **4** is an elevational cross-sectional view taken along line **4—4** of FIG. **3**;

FIG. **5** is a partial elevational cross-sectional view taken along line **5—5** of FIG. **3**;

FIG. **6** is a partial elevational cross-sectional view taken along line **6—6** of FIG. **3**;

FIG. **7** is an enlarged elevational partial cross-sectional view taken along line **7—7** of FIG. **2**; and,

FIG. **8** is a bottom planned view of the rack shown in FIG. **1**, on a reduced scale.

With reference now to the drawing, there is shown and illustrated a rack **10** for supporting and storing a plurality of standard eight track magnetic tape cartridges and cassettes in standard norelco style boxes. The rack **10** comprises a top cover **12**, a base plate **14** and a plurality of stacked, unitary and one piece rack elements **16** stacked one above the other between the top cover **12** and the base plate **14**. There may be further provided a turntable base **18**, a support rod **20** extending generally perpendicularly upwardly centrally thereof and a handle member **22** secured with the upper end portion of the support rod **20**, as by means of holding means **26**. The holding means **26** may be internally threaded to cooperate with external thread provided on the upper end of portion **24** of the support rod **20**. The lower end portion **28** of the support rod **20** may be mounted with the turntable base **18** as by being provided with a pair of slots **30** into which a pair of C - washers may be engaged on opposite sides of the turntable **18** so that the rack **10** may rotate about the support rod **20** and the turntable base **18**. A series of upwardly extending dimples **34** arranged, for example, in a circle around the upper surface of the turntable base **18** may engage the underside of the base plate **14** to provide rotative support thereto.

Each of the rack elements **16**, as heretofore pointed out, comprises a unitary one piece plastics molding fabricated, for example, of styrene, in accordance with the present invention has a generally square periphrey. The base plate **14** is of similar square configuration and is provided along its outer edges with a generally upstanding peripheral wall **36** to define a generally square shaped shallow recess **38** for engaging and supporting the lower most one of the stack rack elements **16**.

Each of the one piece, unitary rack elements **16** comprises a plate-like supporting surface **40** of generally square configuration and four arm-like dividing walls **42** of substantially similar uniform height corresponding generally to the thickness of a standard magnetic

tape cartridge extending generally perpendicular of the plate-like surface and radiating generally outwardly of the center of the rack element generally perpendicular the edges thereof. At the center, each of the one piece unitary rack elements **16** may be provided with four center walls **44** defining a generally square bore **46** extending through each of the rack-like elements **16** through which the center post or support rod **20** fits. The center walls **44** may, as shown, be substantially the same height as the dividing walls **42.** Further, as shown, the dividing walls **42** may be slightly offset from the center position as shown.

The one piece unitary rack element further comprises four edge walls **48** extending along the edges of the plate-like supporting surface **40** from the outboard end of each of the dividing walls to one of the corners of the supporting surface **40.** As shown, with the dividing walls **42** being offset, the edge walls **48** extend to the opposite corner, that is, the corner opposite the direction of offset. The edge walls **48** are also of a height substantially the same as the height of the dividing walls **42.** Accordingly, the one piece unitary rack-like element is divided into four similar, generally rectangular, generally open top and open ended bins having an open front side and being closed on two non-adjacent sides by a pair of side walls consisting of one of said dividing walls and one of said edge walls and at the back side, that is, the side opposite the open front, by an adjacent one of said dividing walls. The generally open and unobstructed front opening extends between the dividing wall defining the side wall of the bin and the adjacent one, that is, the corner towards which the dividing wall is offset.

Each of the bins is of a dimension such that a standard cartridge, when inserted therein with its rear surface against the back wall will have a predetermined extension of the front thereof outwardly through said front opening. The width of each of said bins is selected so as to coincide with the width of a standard norelco type cassette box. Since the width of a standard norelco type cassette is slightly wider than the width of a standard cartridge, each of the side walls of each of the bins are provided with a plurality of ribs defined by a forward pair of ribs **50** and a rearward pair of ribs **52** extending generally perpendicular the side walls and the plate-like surface and extending into the bins generally equidistantly so as to define a gap between each pair of ribs substantially defined by the width of a conventional or standard magnetic tape cartridge. The ribs **50** and **52** are of a height substantially equal the height of the walls **42** and **44.** The forward pair of ribs **50** within each bin or compartment are spaced rearwardly from the front opening thereof, a distance, as shown, such that when a standard norelco type cassette box is inserted thereagainst, the forward edge of the cassette box will extend forwardly outwardly of the bin a distance equal the projection of the cartridge when the cartridge is enclosed within the bin. Hence, cartridges and cassette boxes may be intermixed in a series of stacked bins and provide a similar projection and an aesthetically pleasing appearance thereby.

If desired, for savings of plastics material, or for design purposes, the plate-like supporting surface **40** may be cut away or relieved within the middle portion of each of the bins.

The forward pair of ribs **50** in each bin or compartment align the cartridge generally centrally therein and the rearward pair of ribs **52** further locate the cartridge by precluding rotation thereof within the compartment or bin. The forward pair of ribs **50** further define the rearward extent or stop for a cassette box and the dimensioning of the bins, that is, the length of the side walls **48** and the depth to the forward pair of ribs **50** is such that each of the cartridges and cassette boxes inserted therein project substantially uniformly outwardly from the bins.

As heretofore pointed out, each of the rack elements **16** consists of a one piece unitary plastics molding which interlocks and stacks one above the other to define the body portion of the rack **10.** To provide for such interlocking, each of the rack elements comprises an integrally formed pair of bosses **54** depending from the plate-like supporting surface **40** generally oppositely each of the walls **42** and **44** and oppositely the front opening of each of the bins or compartment for engagement between the side walls of the subjacent bin or compartment. The bosses **54** extend generally perpendicularly the supporting surface **40** opposite the outboard end portions of each of the walls **42** and **44** and offset therefrom a distance equal to the thickness of the walls **42** and **44.** Accordingly, each of the bosses **54** house an outer edge which fits within the subjacent bin and abuts against the inside surface of the side wall thereof. Since each of the bins or compartments of each rack element extends in an opposite direction, the locking of the bosses **54** within each of the bins or compartments fully position each of the rack elements with the succeeding rack element and fully interlocks such elements together precluding any transverse movement or rotation therebetween.

To more securely interlock each of the rack elements **16** with the succeeding elements, each of the bosses **54** may be longitudinally extensive extending along each of the side walls from the front opening of the bin generally parallel the side walls rearwardly of the bin terminating for engagement with the forward pair of ribs **50** of the succeeding rack element. As shown, the bosses **54** may be relieved, generally immediately, so that each boss is of generally elongated C-shaped configuration having a longitudinally extensive side wall **56,** a front wall **58** and a rear wall **60** with the front and rear walls **58** and **60** engaging the side wall of the succeeding rack element and the rear wall **60** of the boss **54** of one rack element engaging the forward rib **50** of the succeeding rack element **16** when in the stacked, interlocked configuration. The bosses **54** may be of a width substantially equal to the width of the ribs **50** and **52** so as to enable a tape cartridge inserted within the bin or compartment of the succeeding rack element to fit therebetween. Moreover, inasmuch as a standard norelco type cassette box is thiner than the height of a standard cartridge, the walls **42** and **48** being generally equal to the height or thickness of a standard cartridge, the bosses **54** may be of a height substantially equal to the difference in height or thickness between a standard norelco type cassette box and a standard cartridge so as to restrict the edge portion of the compartments formed between succeeding stacked and interlocked rack elements to fit a standard norelco type cassette box. In other words, when the rack elements **16** are stacked and interlocked, the distance between the lower edges of the bosses **54** of one rack element and the upper surface of the plate-like supporting surface **40** of the succeeding rack elements defines a space for

receiving the height or thickness of a standard norelco type cassette box.

The top cover **12** interlocks, stacks with and interengages with the upper most one of the rack elements **16** by means of two separate structural arrangements. Firstly, the top cover is provided with a generally downwardly depending outer wall **62** which extends around the periphrey thereof for engagement with the periphrey of the edge walls **48** of the upper most one of rack elements **16.** Second, the top cover **12** is provided with a number of downwardly depending corner bosses or extensions **64** and intermediate side bosses **66** which extend downwardly into engagement with the upper most one of the rack elements **16** and provide similar interengagement and latching thereof against lateral movement and rotation similar to the restraint provided by the bosses **54** and, further, restrict the front opening of the upper most one of the rack elements **16** to define an opening for standard norelco type cassette boxes therewithin.

Yet, further, the top cover **12** is provided with a plurality of central walls **68** defining a generally central bore **70** through which the central support rod **20** extends. The central walls **68** are of a height such that the handle **22** may not be screwed too tight upon the support rod **20** so that the binding thereof is precluded.

The support rod **20,** as shown, may comprise a plurality of screw threaded sections enabling the rack structure **10** to be sequentially assembled to substantially any desired height.

While the invention has been described, disclosed, illustrated and shown in terms of an embodiment or modification which it has assumed in practice, the scope of the invention should not be deemed to be limited by the precise embodiment or modification herein described, disclosed, illustrated or shown, such other embodiments or modifications as may be suggested to those having the benefit of the teachings herein being intended to be reserved especially as they fall within the scope and breadth of the claims here appended.

What is claimed is:

1. Rack element adapted for storing both magnetic tape cartridges and cassettes, comprising: a plate-like supporting surface of generally square configuration, four arm-like dividing walls of substantially uniform height radiating outwardly of the center generally perpendicular the edges, four edge walls of substantially similar uniform height extending along the edges of said supporting surface from the outward end of each of said dividing walls to each corner, of said supporting surface, thereby defining four similar generally open topped generally rectangular bins enclosed on two non-adjacent sides by a pair of side walls consisting of one of said dividing walls and one of said edge walls and at the back by a back wall comprising an adjacent one of said dividing walls and having a generally open and unobstructed front opening extending between a said one of said edge walls and one of said dividing walls opening outwardly along an edge of said surface; at least a pair of bosses extending generally perpendicularly of said supporting surface opposite the said walls and offset therefrom by the thickness thereof so that a plurality of such rack elements may be stacked in general alignment one above the other and be retained in such general alignment by engagement of said bosses of one rack with the side walls of the next adjacent rack element; and rib means on said rack element serving as stop means for a magnetic tape cassette box, wherein said side walls are spaced apart a distance substantially equal to the width of a magnetic tape cassette box, and said rib means being spaced inwardly of said front opening a distance such that a cassette box abutted against said rib means projects at one side thereof from said opening of a bin a distance substantially equal the projection of a magnetic tape cartridge inserted within a bin against said backwall, thereby providing an aesthetically pleasing appearance to said rack element with said cartridges and cassettes in general projecting alignment.

2. Rack element defined in claim **1** wherein each of said back walls are offset from the center of said rack a distance substantially equal to the difference between the width of a standard cassette box and the length of a cartridge less the desired projection of said cartridge outwardly of said rack to provide said rack with a balanced and square configuration.

3. Rack element defined in claim **1,** wherein each of said rib means for a bin constitute a forward pair and are spaced apart a distance substantially equal to the width of a standard tape cartridge.

4. Rack element defined in claim **3,** further comprising a rearward pair of rib means positioned between each pair of said first pair of rib means and each of said backwalls to maintain a tape cartridge inserted therebetween in correct position and preclude rotation and angular disorientation thereof.

5. Rack element defined in claim **1,** wherein said bosses are of a height substantially equal to the difference in height between a standard tape cartridge and a standard tape cassette box and extend, when a plurality of such racks are stacked, into a space adjacent each of said side walls and forward of said forward rib means of the succeeding rack element to define a bin space for receiving in alignment the height or thickness of a standard tape cassette box inserted into said rack.

* * * * *