

[54] **DISPLAY CASE**

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[22] Filed: **Nov. 29, 1972**

[21] Appl. No.: **310,607**

[52] U.S. Cl. **211/4; 211/40; 211/169; 312/120**

[51] Int. Cl.² **E05B 73/00**

[58] Field of Search **211/4, 40, 163, 165, 166, 211/58, 78, 131, 168, 174; 312/18, 120, 125, 135; 206/DIG. 36; 271/42, 43, 102**

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[57] **ABSTRACT**

Apparatus is described for displaying objects such as tape cartridges in a high density, pilfer proof array. A plurality of parallel rods are mounted in a lockable case. On each rod several housings are mounted that are adapted to receive therebetween the tops and bottoms of both multiple-track stereo tapes and tape cassettes. The housings may be rotated about the rod and, when the casing is unlocked, slid along the rod to permit removal of a cartridge. Means are provided to prevent the housings from sliding on the rod when the casing is locked, thereby preventing unauthorized removal of the cartridges.

3 Claims, 7 Drawing Figures

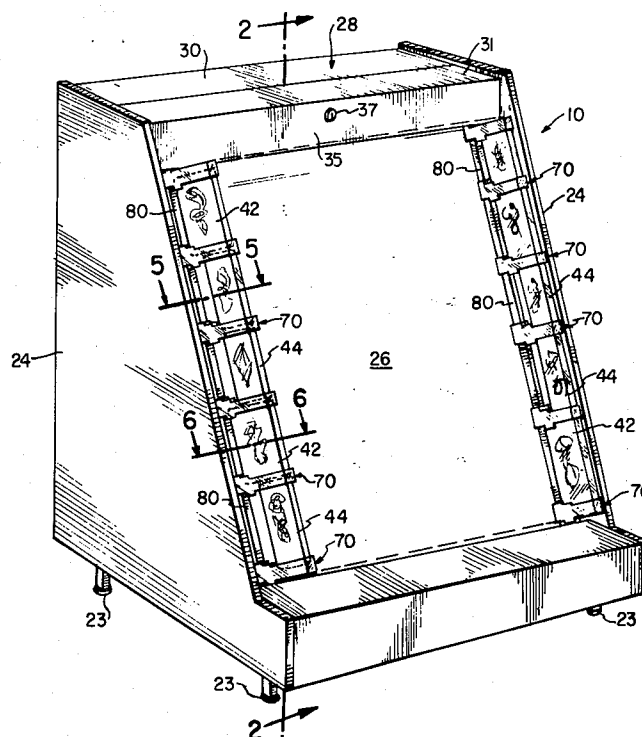


FIG. 1

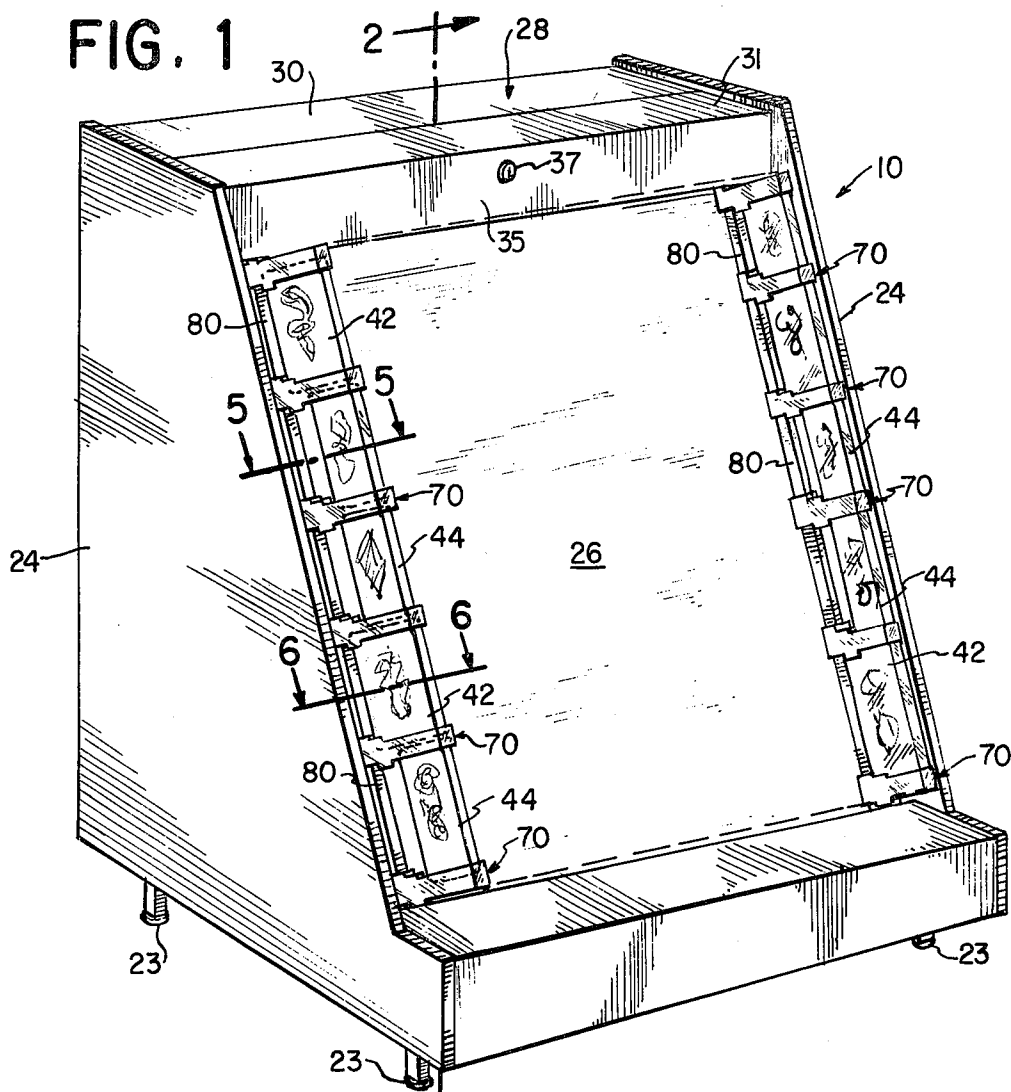


FIG. 5

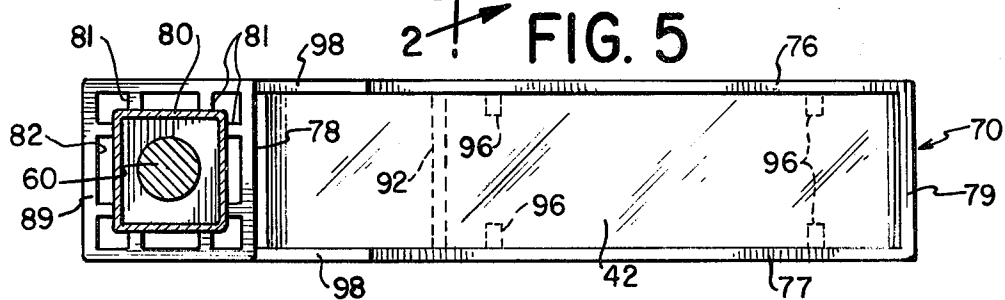
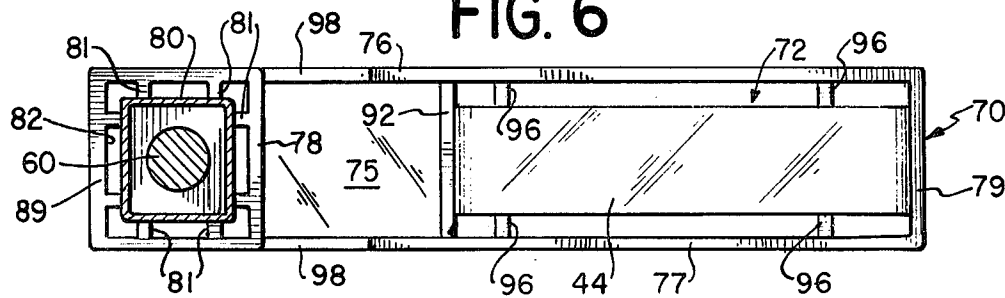


FIG. 6



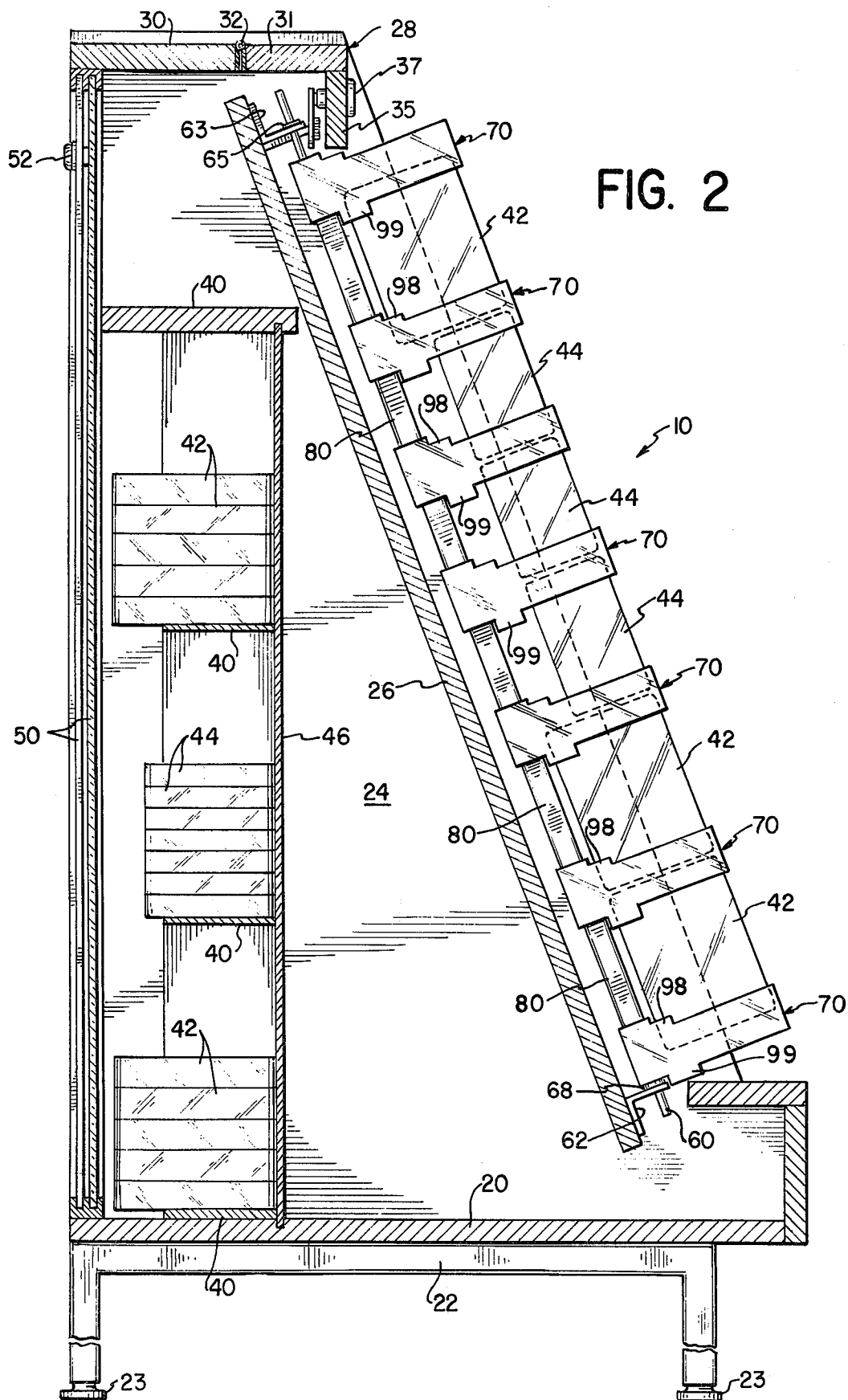


FIG. 4

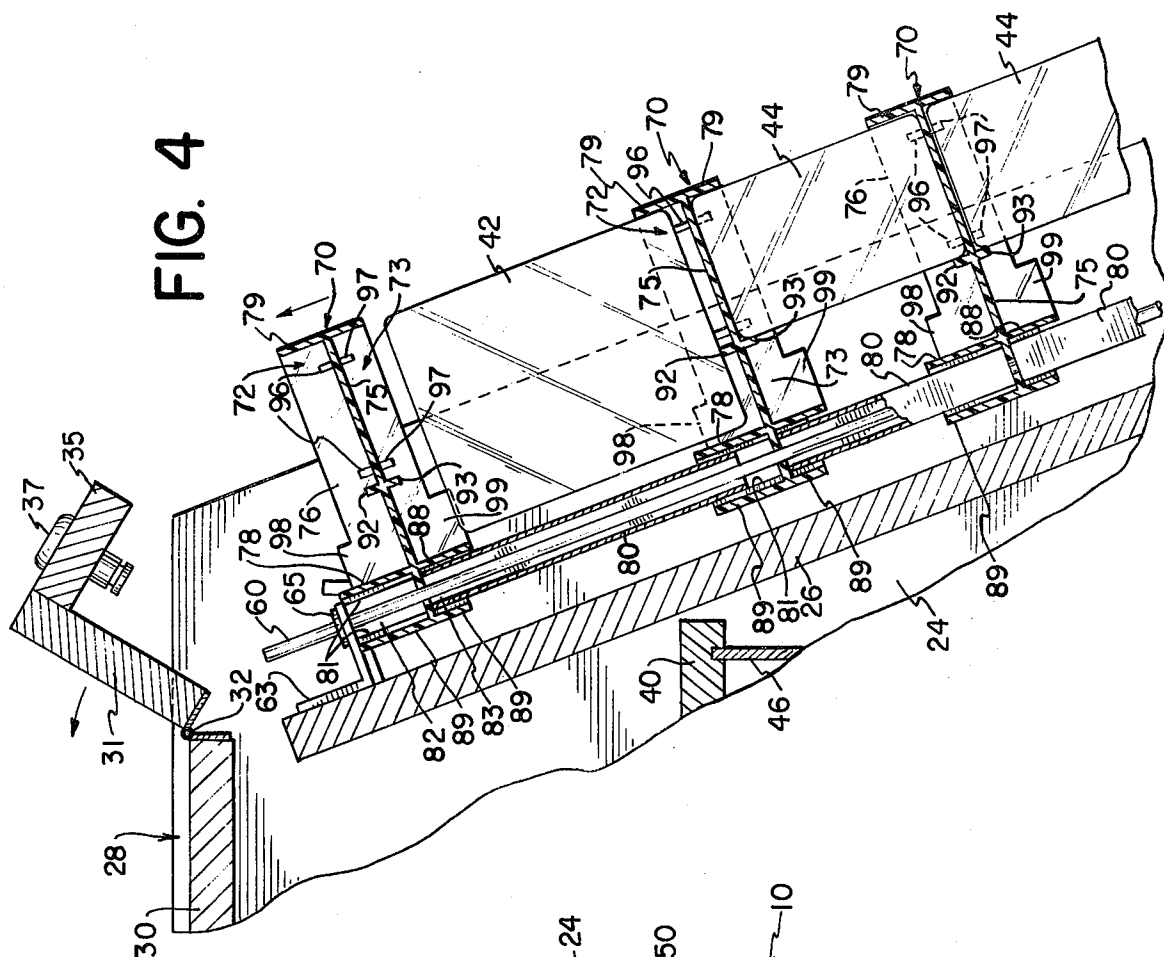
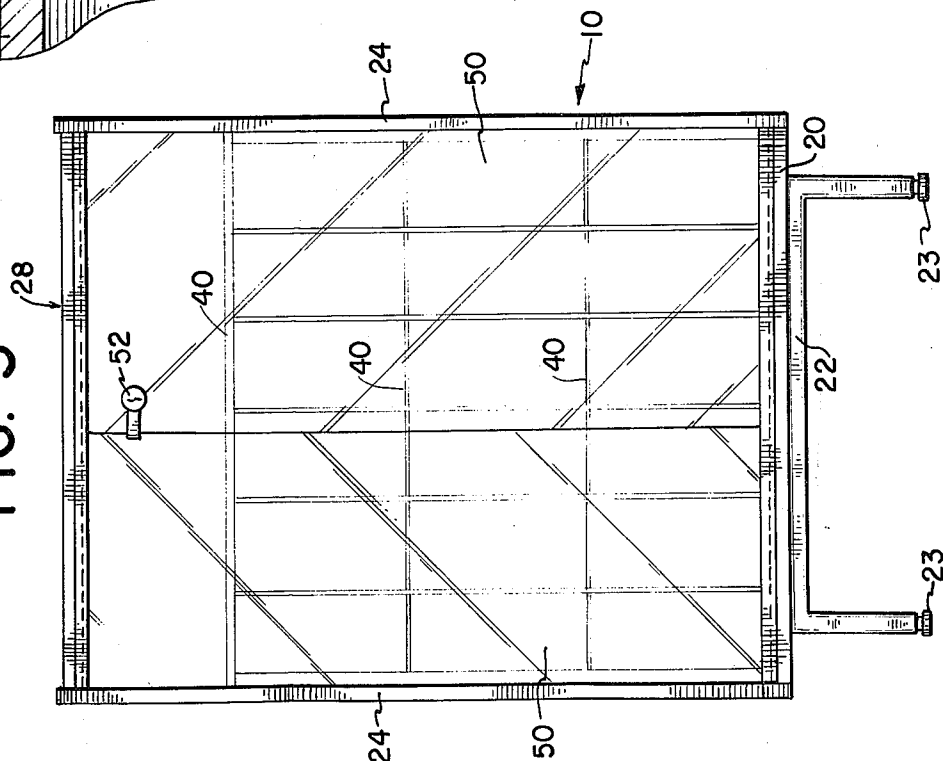
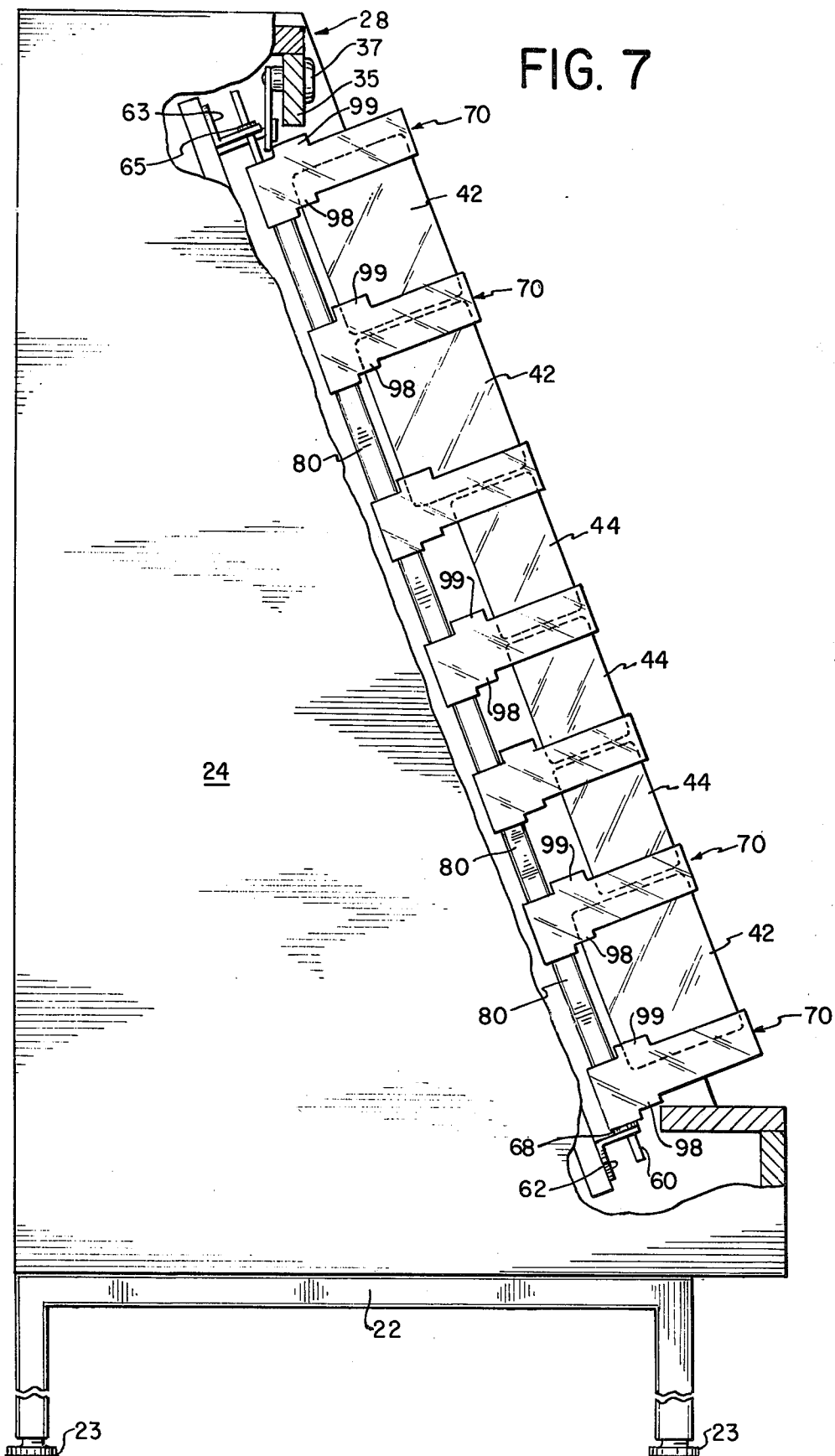


FIG. 3





DISPLAY CASE

BACKGROUND OF THE INVENTION

The protection of tape cartridges, such as tape cassettes and multiple-track stereo tapes, from pilferage is a major problem to many merchandising outlets. Many merchandisers simply lock the cartridges in glass cases or make only empty cartons available to the shoppers. Others use lockable display racks such as described in U.S. Pat. Nos. 3,644,010 and 3,674,156 in which the tape cartridges are stacked one above the other in columns of lockable housings each of which can be rotated about a vertical axis. Although these housings have the advantage that they permit one to read descriptive information printed on both the front and rear major surfaces of the tape cartridge carton, the housings are designed so that they can receive only one size of tape cartridge—either a stereo tape or a tape cassette—but not both.

SUMMARY OF THE INVENTION

To provide for convenient display of objects such as tape cartridges while at the same time securing these objects from theft, we have devised display apparatus comprising a plurality of generally parallel rods mounted in a lockable casing with a multiplicity of housings mounted on each rod. Each housing contains an upper and lower recess in back-to-back relationship, the upper recess being adapted to receive the base of one object and the lower recess being adapted to receive the top of another object. As a result of this arrangement, an adjacent pair of housings cooperate to secure between them a single object. The housings are mounted on the rod so that they may be rotated about it through a substantial sector of a circle thereby permitting display of both the front and rear surfaces of the object as well as one of its sides. To permit insertion of the object into the housings, the housings may also be slid along the rod when the casing is unlocked. However, to prevent unauthorized removal of the objects, the housings are prevented from sliding along the rod whenever the casing is locked.

Each housing is adapted to store both multiple-track stereo tapes and tape cassettes even though these objects are of different size. The two recesses in each housing are large enough to accommodate the larger object, namely the multiple-track stereo tape. In the preferred embodiment of our invention, a small raised ridge and several standoffs within each recess define a smaller area that conforms to the shape of the smaller object. Thus, the larger object is secured in the housing by resting it on top of the ridge and standoffs within the recess while the smaller object is held within the housing in the space defined by the ridge, standoffs and the walls of the recess.

BRIEF DESCRIPTION OF THE DRAWING

These and other objects, features, and elements of our invention will be more readily apparent from the following detailed description of the drawing in which:

FIG. 1 is a perspective view of an illustrative embodiment of the display device of our invention;

FIG. 2 is a cross-sectional view along line 2—2 in FIG. 1 but on an enlarged scale;

FIG. 3 is a view of the back of the display device of FIG. 1;

FIG. 4 is a cross-sectional view similar to that of FIG. 2 but showing only a portion of the device on an enlarged scale with the locking mechanism removed;

FIG. 5 is an enlarged view taken along line 5—5 in FIG. 1;

FIG. 6 is an enlarged view taken along line 6—6 in FIG. 1; and

FIG. 7 is a side elevation partly in section of a second embodiment of our invention.

DETAILED DESCRIPTION OF THE DRAWING

Different views of an illustrative display unit 10 of our invention are presented in FIGS. 1, 2, and 3. The structure of the display unit comprises a base 20 that is supported by a four-legged frame 22, sidewalls 24, a sloping front wall 26, and a top 28 that serves as a counter. Leveling screws 23 are threaded into the open ends of the legs of frame 22 to permit the adjustment of the display unit to the surface on which it stands. Top 28 is divided into a rearward part 30 and a forward part 31 that are connected by a hinge 32. A flange 35 is rigidly connected to forward part 31 and extends downwardly on the front of display unit 10. A lock 37 is located in flange 35.

As shown in FIGS. 2 and 3, the back of display unit 10 is provided with several storage shelves 40 on which extra tape cartridges such as 8-track tapes 42 and cassettes 44 are stored. The shelves are supported by sidewalls 24 and a vertical panel 46 that also keeps the tape cartridges from falling into the interior of the display unit. Sliding glass doors 50 permit sales personnel to view the storage area and locate any tape cartridges they may be seeking. A conventional lock 52 is used to prevent unauthorized movement of sliding glass doors 50.

On the front of display unit 10, a plurality of cylindrical generally parallel rods 60 are mounted in brackets 62, 63 that are secured to front wall 26. A flange or threaded nut 65 at the upper end of each rod 60 keeps the rod from falling through holes in brackets 62 and 63; and a spacer 68 of suitable length ensures that the total length of the elements on the different rods 60 is approximately the same.

On each of rods 60 there are a plurality of housings 70 that are adapted for the display of tape cartridges such as 8-track tapes 42 and cassettes 44. As is apparent from the cross-sectional view of FIG. 4, each housing 70 has a first recess 72 having an open end therein where there may be inserted the base of a tape cartridge and a second recess 73 having an open end therein where there may be inserted the top of a tape cartridge. Recess 72 is defined by a base 75 and sidewalls 76, 77, 78, 79 shown in FIGS. 5 and 6; and recess 73 is defined by base 75, sidewalls 76, 77, 79, and a sidewall 88 shown in FIG. 4. The sidewalls of both recesses are continuous and each recess prevents movement of an object from the recess in any direction not substantially parallel to the axis of the rod on which it is mounted.

Housings 70 are spaced apart from one another by spacers 80. As is apparent from FIGS. 4, 5, and 6, each spacer 80 is a hollow shaft with a square cross section. The spacers are received in a third recess 82 and a fourth recess 83 in each housing 70. Recess 82 is defined by a continuation of base 75 and sidewalls 76 and 77, by sidewall 78, and by an additional sidewall 89. To minimize the friction there otherwise would be be-

tween spacer 80 and the sidewalls of recess 82, standoffs 81 are provided in recess 82 to engage the spacer and prevent its twisting within the recess. Recess 83 is similarly defined by a continuation of base 75 and sidewalls 76, 77, by sidewall 88, and by sidewall 89. Again, a set of standoffs minimize friction and prevent twisting of spacer 80 in recess 83. Preferably, the fit between these standoffs and spacer 80 is a little tighter than that between standoffs 81 and spacer 80 with the result that spacer 80 is tightly secured in recess 83. The sidewalls surrounding recess 82 are higher than those surrounding recess 83. As shown in FIG. 4, this additional height is enough that when an upper housing and the spacer secured in it are lifted to permit removal of a tape cartridge, the bottom end of the spacer remains in recess 82.

The use of spacers 80 insures that the distance between adjacent housings will be the same even if the stereo tape or tape cassette stored between them is removed. In addition, the spacers provide considerable rigidity to the assembly on a given rod and in particular permit the mounting of all the housings in the same relative orientation with the first recess of one housing and the second recess of an adjacent housing facing one another. Because the cross section of each spacer is square and the spaces in recesses 82, 83 in which it is received are similarly shaped, the housings cannot be twisted about the rod in order to effect unauthorized removal of a tape cartridge.

In each recess 72, 73 of each housing 70, raised ridges 92, 93, respectively, extend across base 75 between sidewall 76 and sidewall 77. In addition, sets of standoffs 96, 97, respectively, are also found in each of these recesses. The height of these ridges and standoffs is considerably less than the height of the side walls of the recess in which they are located. These ridges and standoffs cooperate to make it possible to house both tape cassettes and multiple-track stereo tapes in housings having the same exterior dimensions. Specifically, as shown in FIGS. 4 and 5, the distances between sidewalls 78 and 79 and between sidewalls 76 and 77 are designed to accommodate the larger of these tape cartridges, namely a multiple-track stereo tape 42. Because the sidewalls are much higher than the ridges and standoffs which the stereo tape contacts, the stereo tape is securely held by a pair of adjacent housings. The length of spacer 80 is similarly selected to correspond to approximately the height of the stereo tape plus the height of ridges 92, 93 so that the distance between the ridges on adjacent housings is approximately the height of the stereo tape. For storage of a smaller tape cassette 44 as shown in FIGS. 4 and 6, the spacing between ridges 92, 93 and sidewall 79 is slightly larger than one of the dimensions of the tape cassette; and the spacing between standoffs 96 attached to opposing sidewalls corresponds to the thickness of the tape cassette. Consequently, the bottom of tape cassette 44 rests flush against base 75 in the region defined by ridge 92, standoffs 96, and end wall 79. Because the height of a tape cassette is smaller than that of a stereo tape, the spacer 80 used to space the two housings 70 in which the tape cassette is fitted is shorter in length and is approximately the height of the tape cassette. Consequently, the top of tape cassette 44, as shown in FIG. 4, is also flush with base 75 of the housing in which it fits and the top edges of the tape cassette are located within the area defined by ridge 93, standoffs 97, and sidewall 79.

Because the size of stereo tapes is not standardized, some stereo tapes will be freer than others to move in the space between adjacent housings. To prevent the removal of such stereo tapes from recesses 72, 73 in the housings, raised portions 98, 99 are provided on sidewalls 76, 77 of these recesses as shown in FIGS. 2 and 4 to make them higher near sidewalls 78, 88 than they are near sidewall 79. In addition, sidewall 88 is the same height as the raised portion 99 of sidewalls 76, 77.

Typical dimensions of housing 70 are as follows. Sidewalls 76, 77 are 5 1/2 inches long and have an interior spacing of one inch. The distance between sidewalls 78, 88 and sidewall 79 is 4 1/4 inches; and ridges 92, 93 are slightly less than three inches removed from sidewall 79. Ridges 92, 93 and standoffs 96, 97 are one-eighth inch high and the spacing between standoffs on opposite sides of the housing is approximately three-fourths inch. Near sidewall 79, the height of the sidewalls of recess 72 is three-fourths inch and the height of the sidewalls of recess 73 is five-eighths inch. In the raised portions 98, 99 adjacent sidewalls 78, 88, sidewalls 76, 77 are one inch high on recess 72 and one inch high on recess 73. Raised portion 98 extends three-fourths inch from sidewall 78 and raised portion 99 extends one inch from sidewall 88.

Spacers 80 are three-fourths inch on each side and are either 5 3/4 inches long or 4 5/16 inches long. Opposing standoffs 81 are approximately 13/16 inch apart and those in recess 83 are about three-fourths inch apart. The sidewalls of recess 82 are 1 1/4 inch high. Three of the sidewalls of recess 83 are five-eighths inch high and the fourth, sidewall 88, is one inch high.

To fill the display unit, the unit is unlocked and flange 35 is swung upward as shown in FIG. 4. With the flange in this position, there is sufficient play (i.e., greater than five-eighths inch for the dimensions in the example given above) in the housings on rod 60 that a housing may be slid along the rod enough to permit insertion of a stereo tape or tape cassette in the space between adjacent housings. This may be done for all of the tape storage spaces between adjacent housings on all of the rods in the display unit.

Once the display unit is filled, flange 35 is then returned to its locked position. In this position, the lower edge of flange 35 is quite close to the top edge of the uppermost housing mounted on each rod 60. Consequently, there is substantially no play in the housings and no way of separating two adjacent housings enough to permit the removal of a stereo tape or tape cassette stored therebetween.

Because the height of the stereo tapes and tape cassettes vary, different mixes of stereo tapes and tape cassettes may produce a different overall length between the upper edge of the uppermost housing on a rod and the lower edge of the lowermost housing. To compensate for this, spacer 68 is provided between the lowermost housing 70 and flange 62 in which rod 60 is mounted. The length of spacer 68 is selected so that the distance from flange 62 along rod 60 to the top of the uppermost housing on the rod is approximately the same for each rod and is such that there is very little play in the housings on the rod. Obviously, variable spacer 68 could also be located between the top of the uppermost housing on the rod and flange 63. In this position, the spacer alone would be enough to prevent play in the housings on a rod; and flange 35 would simply prevent access to the rod mountings and spacers.

As will be evident to those skilled in the art, numerous variations may be made in the above-described apparatus without departing from the spirit and scope of our invention. Indeed, as shown in FIG. 7, we have found it preferable to assemble the elements of our display case so that housings 70 are inverted from the position in which they are shown in FIGS. 1-6. Because the same elements are used in the display case of FIG. 7 as are used in that of FIGS. 1-6, the same numbers are used in referring to these elements. The operation of the display case shown in FIG. 7 is also the same except in two respects. Because spacer 80 fits tightly into recess 83 and only loosely into recess 82, it is the upper of the two housings holding a tape cartridge that moves with respect to the spacer when the upper housing is lifted to permit the placement of a tape cartridge between the housings or its removal therefrom. Secondly, because the lower recess surrounding the rod on each housing has four walls of equal height, these four walls can rest directly against bracket 62 without preventing rotation of the housings on rod 60. As shown in FIG. 2, spacer 68 in the other embodiment of our invention holds housing 70 high enough that rotation of the housings is possible. It should be noted, however, that a spacer 68 may also be used in the apparatus of FIG. 7 on any rods where it is needed to ensure that the distance from bracket 62 to the uppermost housing is approximately the same.

Various means will be evident for mounting an array of housings in a display case in such a fashion that they may be rotated by a customer. For example, it is possible to combine the functions of the rod and the spacers. If all the housings and spacers fit snugly together, the rods may be replaced simply by mounting means on which the housings and spacers rotate. In this case, the housings would rotate not about the rod but about an axis defined by the mounting means. This axis would be approximately parallel to the spacers. Alternatively, the housings can be secured to slots in a shaft that is rotatably mounted in the display case. Again, the housings would rotate about an axis defined by the mounting means. To permit the mounting of housings at different distances apart, numerous slots would be provided in the shaft. When the display case was unlocked, the slots would permit considerable travel in a direction parallel to the axis of the shaft, thereby permitting insertion and removal of tape cartridges stored between the housings. However, when the display case was locked, a flange similar to flange 35 would engage the uppermost housing on a shaft and thereby prevent all movement of the housings on that shaft.

The size and shape of the housings that are used may of course be modified to conform to the dimensions of the particular objects being displayed. Numerous different shaped objects suitable for display in the display case of our invention will be evident to the reader. The particular means used for dividing the recesses in the housings into smaller areas adapted for holding smaller objects may be varied depending on the dimensions of the objects being stored. For example, if one object is wider and thinner than the other object, then the raised ridges that are used might extend along one or both sidewalls 76, 77 from the base of the housing to the top of the sidewall and no standoffs 96, 97 need be used. Other variations will be immediately apparent.

As suggested above, numerous other arrangements may be made for spacing the different housings. To

prevent twisting of the housings, it is desirable that the spacer have a surface that can readily be engaged and prevented from moving. The square cross section of spacer 80 is, of course, one of the simplest such cross sections that meets this requirement. However, triangular or polygonal cross sections would also work; and in general, any cross section other than a circular cross section would be suitable. It should be noted that the surface that is engaged need not be an exterior surface because means can be devised for engaging the interior surface of the spacer. The particular construction of recesses 82, 83 and the enclosed standoffs may also be varied.

If desired, it is possible to design the spacers and recesses so that the spacer rests on the bottom of the recess when it is in one orientation and on a raised platform in the recess when it is in another orientation. This would permit the use of spacers of the same length for the storage of objects having different heights.

It should be understood that the dimensions set forth in the example above are only illustrative of a present embodiment of our invention and that these dimensions may readily be varied to provide for the storage of other objects than stereo tapes and tape cassettes. Similarly, dimensions such as the height of the sidewalls and the length of spacer 80 may be changed to alter the amount of security provided by the housing or, as indicated above, to enable one to use spacers of a single length.

Still other variations in our invention will be evident to those skilled in the art.

What is claimed is:

1. Apparatus for displaying different sized objects comprising:
 - a plurality of housings;
 - means for spacing the housings apart in an assembly at different distances corresponding to the size of the objects to be displayed therebetween and the same relative orientation;
 - means for supporting said assembly and for permitting its rotation about an axis approximately parallel to said spacing means;
 - each housing comprising a first recess having an open end therein where there may be inserted the base of an object and a second recess having an open end therein where there may be inserted the top of an object, said first and second recesses being back to back with a base therebetween, the first recess of one housing and the second recess of an adjacent housing facing one another and cooperating to secure an object therebetween;
 - said first and second recesses having sidewalls which prevent movement of the object from the housing in any direction other than through said open end;
 - a wall running across the base of the housing between the sidewalls of at least one recess in a pair of facing first and second recesses, said wall having a height that is appreciably less than said sidewalls whereby there is defined within said recess a region smaller than said recess that is adapted to receive therein an object smaller than that which may be received in the whole recess; and
 - selectively engageable means for limiting the movement between a housing and a spacing means so that an object may not be withdrawn from the recesses in the housings in which it is located.

2. Apparatus for displaying different-sized objects comprising:

at least one rod;

means for supporting said rod;

a plurality of housing supported on said rod and slidable thereon, said housings being rotatable about an axis approximately parallel to said rod;

each housing comprising a first recess having an open end therein where there may be inserted the base of an object and a second recess having an open end therein where there may be inserted the top of an object, said first and second recesses being back-to-back with a base therebetween, the first recess of one housing on the rod and the second recess of the adjacent housing on the rod facing one another and cooperating to secure an object therebetween;

said first and second recesses having sidewalls which prevent movement of the object from the housing in a direction that is not substantially parallel to the rod;

a wall running across the base of the housing between the sidewalls of at least one recess in a pair of facing first and second recesses, said wall having a height that is appreciably less than said sidewalls whereby there is defined within said recess a region smaller than said recess that is adapted to receive therein an object smaller than that which may be received in the whole recess;

means for spacing the housings apart at different distances corresponding to the size of the objects to be displayed therebetween; and

selectively engageable means for limiting the distance the housing may be slid on the rod so that objects may not be withdrawn from the recesses in the housings in which they are located.

3. The apparatus of claim 2 wherein each housing comprises two substantially rectangular recesses and the wall running across the base of the housing defines within at least one recess another substantially rectangular region smaller than the whole recess.

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