March 2, 1965 D. WEISBERGER 3,171,541

DISPLAY APPARATUS

Filed March 5, 1963

FIG. 1

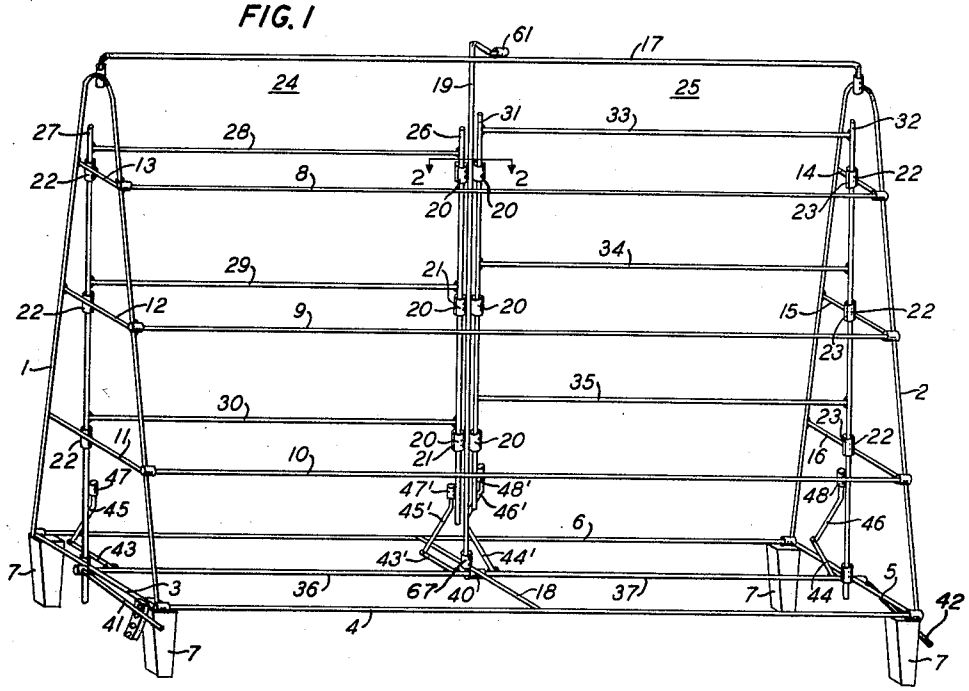


FIG. 2

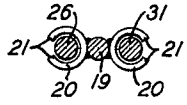


FIG. 4

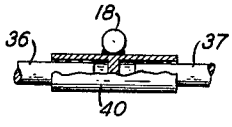


FIG. 5

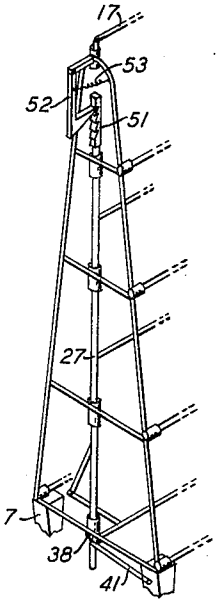
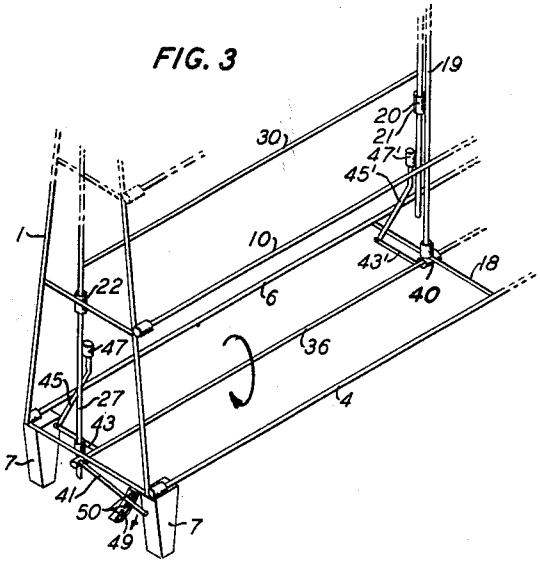


FIG. 3



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DISPLAY APPARATUS

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7 Claims. (Cl. 211—37)

This invention relates to display apparatus and more particularly, to merchandise display racks having one or more shelves which are adjustable in slope.

Two highly desirable attributes of shelved display racks, such as those of the type useful in exhibiting retail merchandise, are a high degree of adjustability and a simplified procedure by which these various adjustments may be accomplished. Such racks when used in retail shoe stores, for example and without limitation, are often employed to accommodate merchandise of varying shapes, each of which for its most stable and attractive display may require placement on a shelf having a different horizontal slope. Ladies' high heel shoes, for instance, have been found to present a particularly attractive display when placed on a shelf which is oriented at a relatively steep angle. Such an orientation, however, does not impair the stability of the display since the heels of these shoes may rest behind and engage the rear edge of the steeply sloped shelves, thereby preventing the shoes from sliding downwardly. Shoes with so-called low, or flat, heels are also attractively displayed on sloped shelves, but, owing to the lesser depth of their heels and the resulting greater likelihood that such shoes when removed for inspection will not be properly replaced, considerations of stability require that the slopes of the shelves should be less steep than in the case of high heel shoes. Finally, such a rack may be called upon to display various flat bottomed articles such as bedroom slippers or any number of common accessories such as ladies' handbags, costume jewelry and the like, in which case the shelves upon which these goods sit are preferably horizontal.

In order to provide a wide variety in the display of such merchandise, it is usual to readjust from time to time the slopes of these shelves. Where a display in one instance might be comprised of all high heel shoes, it might be desired to modify such a display by substituting all low heel shoes, all flat bottom goods, or a combination of these articles. This modification requires a corresponding readjustment in the slopes of the shelves involved. Moreover, in deciding upon the final version of a retail merchandise display a number of preliminary arrangements are usually explored, during which frequent readjustment of the shelves may be necessary.

Accordingly, it is one object of the invention to display a variety of different wares at various angular orientations.

It is another object of the invention to simplify the procedure for angularly readjusting shelves in a merchandise display rack.

The objects of the invention are accomplished, broadly, by the provision of a frame, first and second members mounted on said frame and relatively positioned to define at least a single shelf for supporting mechandise or the like, at least one of the aforementioned members being movable in sliding translation relative to the other member, and linkage means for imparting translatory motion to the movable members.

The objects, features and various advantages of the invention will be more thoroughly understood by reference to the following detailed description of an illustrative embodiment of the invention in conjunction with the accompanying drawing of which:

FIG. 1 is a perspective view of the invention embodied in a merchandise display rack;

FIG. 2 is a sectional view of the center guide bar of FIG. 1;

FIG. 3 is a fragmentary view of the display rack of FIG. 1 showing in detail the linkage mechanism of the invention;

FIG. 4 is an exploded view of a portion of the rack of FIG. 1; and

FIG. 5 is another fragmentary view showing the linkage mechanism of the invention.

With reference to the drawing, FIG. 1 shows one embodiment of a merchandise display rack constructed in accordance with the invention. As shown, the frame of the rack is wedge shaped in general outline, and comprises a pair of inverted V-shaped end members 1 and 2, the spread ends of which terminate in the corners of a rectangularly shaped platform bounded by rods 3 through 6, and the vertices of which are held in proper spaced relation by tie bar 17. The entire rack rests upon legs 7 which extend downwardly from the corners of the aforementioned platform. A plurality of supporting members 8 through 10, spaced vertically from each other, extend horizontally between corresponding legs of V-shaped end members 1 and 2, and thereby form a "front wall" of the wedge shaped rack. Tie rods 11 through 13 which are spaced vertically from each other, connect together the front and rear legs of V-shaped end member 1 to form the left side wall of the wedge shaped rack. Tie rods 14 through 16 are similar to their counterparts 13 through 11 with respect to V-shaped end member 2, and form the right side wall of the wedge shaped rack. A rod 18 is rigidly connected to the midpoints of rods 4 and 6.

Extending upwardly from a sleeve 67 on rod 18 is a vertical guide bar 19, the upper end of which is suitably bent for lateral insertion into sleeve 61 of the tie bar 17. Rigidly connected along guide bar 19 are several pairs of split sleeves 20. As shown in FIG. 2, the individual sleeves 20 of each pair reside on opposite sides of bar 19, and each pair of sleeves is disposed in vertical alignment with the pair of sleeves above. The casing of each sleeve 20 is split in order to provide a vertical opening 21 which is located diametrically opposite to guide bar 19. Rigidly connected to tie rods 11 through 16 on the inside of the wedge shaped frames are individual sleeves 22. It will be observed that the sleeves associated with the respective V-shaped end members 1 and 2 are in vertical alignment with each other. Each of sleeves 22 is split to provide a vertical opening 23 diametrically opposite to the tie rod to which that sleeve is connected. Accordingly, the vertical openings 21 in the sleeves 20 which are situated to the right of guide bar 19 face the vertical openings 23 in the sleeves 22 which are connected to tie rods 14 through 16. Likewise, the vertical openings 21 in the sleeves 20 which are situated to the left of guide bar 19 face the vertical openings 23 (not shown) in the sleeves 22 which are connected to tie rods 11 through 13. Preferably, sleeves 20 and 22 are constructed of resilient material.

Mounted vertically for sliding translation relative to the wedge shaped frame are ladder-like members 24 and 25 which are respectively located to the left and to the right of guide bar 19. Ladder-like member 24 is an integral structure comprising a pair of vertical runners 26 and 27 which are separated by spaced horizontal rungs 28 through 30. Ladder-like member 25 is identical to ladder-like member 24 and comprises vertical runners 31 and 32 which are separated by spaced horizontal rungs 33 through 35. The slidable mounting for ladder-like structure 24 is provided by respectively inserting runners 26 and 27 through openings 21 and 23 of the sleeves 20 and 22 which are disposed to the left of guide bar 19. Similarly, the slidable mounting for

ladder-like structure 25 is provided by respectively inserting runners 31 and 32 through openings 21 and 23 of the sleeves 20 and 22 which are disposed to the right of guide bar 19. Accordingly, the diameter of runners 26, 27, 31 and 32 are slightly smaller than the inside diameter of sleeves 20 and 22 so that sliding may occur with minimum friction. The resiliency of sleeves 20 and 22 permits the runners 26, 27, 31 and 32 to be snapped into proper position through vertical openings 21 and 23.

It will be observed that the vertical spacing of rungs 28 through 30 and 33 through 35 on ladder-like structures 24 and 25, respectively, correspond to the vertical spacing of supporting members 8 through 10. Thus, the rungs 28 through 30 and left-hand portions of supporting members 8 through 10 define a first group of stacked shelves, the slopes of which are determined by the vertical position of ladder-like structure 24. Likewise, the rungs 33 through 35 and the right-hand portions of supporting members 8 through 10 define a second group of stacked shelves, the slopes of which are determined by the vertical position of ladder-like structure 25.

In accordance with one feature of the invention linkage means are provided for applying independent vertical forces to ladder-like structures 24 and 25, thereby to slidingly vary the vertical position of one of the ladder-like structures relative to the other, and thus to slidingly vary the slopes of one group of stacked shelves relative to the other. One illustrative arrangement for applying the aforementioned independent vertical forces to ladder-like structures 24 and 25 is shown in FIGS. 1 and 3. As pictured in FIG. 1, a pair of separate coaxial shafts 36 and 37 are mounted beneath the rectangular platform defined by rods 3 through 6 in a direction parallel to rods 4 and 6. The far ends of shafts 36 and 37 extend loosely through rings 38 and 39, respectively, which are affixed to the undersurfaces of rods 3 and 5, and the near ends, as shown in detail by FIG. 4, are rotatably supported in a horizontal sleeve 40.

Rigidly connected to the respective far ends of shafts 36 and 37, slightly beyond the side walls of the wedge shaped frame, are lever arms 41 and 42 which extend forward in planes parallel to rods 3 and 5. Rigidly connected to the respective shafts 36 and 37, slightly within the side walls of the wedge shaped frame, are first linkage arms 43 and 44 which extend in a rearward direction in planes parallel to rods 3 and 5. Second linkage arms 45 and 46, respectively, are pivotally connected to the ends of arms 43 and 44 remote from shafts 36 and 37, and from there extend generally upward for rigid connection to runners 27 and 32 via sleeves 47 and 48. In order to distribute the independent vertical forces uniformly across the respective ladder-like structures 24 and 25, linkage arms 43 and 45, which are disposed at the far end of shaft 36, are duplicated at the near end of shaft 36 by a corresponding set of linkage arms 43' and 45', and linkage arms 44 and 46, which are disposed at the far end of shaft 37, are likewise duplicated by a corresponding set of linkage arms 44' and 46'.

Extending downwardly from rod 3, at a point forward of shaft 36, is an arcuate tab 49 having several vertically spaced and outwardly protruding balls 50 rigidly connected thereto. Extending downwardly from rod 5, at a point forward of shaft 37, is a planar tab (not shown) which is similar in both construction and function to tab 49 of rod 3. Tab 49 is situated so that lever arm 41 slidingly engages balls 50 and is thereby selectively positioned in rotational angle. The aforementioned tab associated with rod 5 positions lever arm 42 in rotational angle in the same manner that tab 49 positions lever arm 41.

The apparatus described above provides a merchandise display rack having a left-hand group and a right-hand group of stacked shelves which are defined by front and rear horizontal bars. If it is desired to vary the slopes of the shelves of one of the groups, it is only necessary

to properly rotate the particular lever arms, 41 or 42, associated with the group of shelves to be adjusted. For example, if it is desired to increase the slopes of the shelves comprising the left-hand group, it is necessary only to rotate lever arm 41 downwardly as indicated in FIG. 3. In response, shaft 36 is rotated in the direction indicated by the appropriate arrow in FIG. 3, and linkage arms 43 and 43' are consequently rotated upwardly. As a result, the vertical component of force at the pivoted end of linkage arms 43 and 43' are transferred through linkage arms 45 and 45' to the runners 26 and 27 of ladder-like structure 24. Thus, by merely rotating lever arm 41, a vertical force is applied so as to slidingly raise rungs 28, 29 and 30 relative to supporting members 8, 9 and 10, and thereby slidingly vary the slopes of the left-hand group of stacked shelves relative to the right-hand group. A similar result is obviously obtained with respect to the right-hand group of shelves by merely rotating lever arm 42. Preferably, the sleeves 20 and 22 are of large enough inside diameter with respect to the diameters of runners 26, 27, 31 and 32, and all of the various linkage arms are sufficiently flexible, that the slight inherent components of horizontal force applied to arms 45, 45', 46 and 46' owing to the circular paths described by the pivotal ends of arms 43, 43', 44 and 44' do not substantially increase the dynamic friction involved vertically in sliding ladder-like members 24 and 25.

In the embodiment of the invention illustrated in FIGS. 1 and 3, the preselected vertical levels to which ladder-like structures 24 and 25 may be raised, and consequently the various preselected slopes of the groups of stacked shelves, are determined by the relative positions of balls 50 on tab 49 for the left-hand group, and on the corresponding tab (not shown) depending from rod 5 for the right-hand group. As shown, lever arm 41 is held in rotational position by its being lodged between a pair of adjacent balls 50. Preferably, the resiliency of lever arm 41 is sufficient to permit the lever arm to be frictionally slid past balls 50, and when the selected rotational position is reached, to be relodged between a set of adjacent balls.

FIG. 5 illustrates a second arrangement for regulating the slopes of a group of stacked shelves. As shown, an outwardly facing toothed rack 51 is fastened to the ladder-like structure 24 at the uppermost end of runner 27. A latch 52 is pivotally connected to the vertex of end member 1, and is loaded by spring 53 into locking engagment with the teeth of rack 51. Since the lever arm 41 resides near the bottom of the frame close to the floor, and the latch mechanism is located at the top of the frame, the angular orientation of a group of stacked shelves may conveniently be varied by, firstly, pulling latch 52 out of engagement with the teeth of rack 51, secondly, manipulating lever arm 41 by foot, and finally, releasing latch 52 back into locking engagement with rack 51 when the desired slopes have been reached. A similar latch and rack mechanism (not shown) is disposed on end member 2 and runner 32 so as to vary the slopes of the shelves of the right-hand group in the same manner.

In all cases it is to be understood that the particular embodiments of the invention described herein are merely illustrative of the underlying principles involved, and numerous other arrangements, modifications and adaptations may be conceived without departing from the spirit and scope of the invention.

What is claimed is:

1. Display apparatus comprising in combination, a frame including a pair of substantially V-shaped end members, a plurality of spaced supporting members affixed to corresponding arms of said end members, a ladder-like structure comprising runners separated by a plurality of spaced rungs, said structure being movably mounted on said frame for sliding translation, and said structure being further mounted on said frame such that said supporting members and said rungs are relatively po-

sitioned to define a plurality of stacked shelves, and linkage means connected to said frame and to said ladder-like structure for imparting translatory motion to said structure relative to said frame, thereby to vary the angular orientation of said shelves.

2. Display apparatus comprising in combination, a frame including a pair of substantially V-shaped end members, a plurality of spaced supporting members affixed to corresponding arms of said end members, a ladder-like structure comprising runners separated by a plurality of spaced rungs, sleeves affixed to said frame ends disposed transverse to said supporting members, means for mounting said ladder-like structure on said sleeves for sliding translation relative to said frame, said ladder-like structure being so disposed on said frame that said supporting members and said rungs define a plurality of stacked shelves, and linkage means for imparting translatory motion to said ladder-like structure relative to said frame, thereby to vary the angular orientation of said shelves.

3. Display apparatus in accordance with claim 2 wherein said linkage means comprises a shaft mounted for rotation on said frame, a lever arm connected to said shaft to impart rotation thereto, a first link fixedly connected to said shaft, and a second link fixedly connected to said ladder-like structure, said links being pivotally interconnected at respective ends thereof.

4. Display apparatus comprising, in combination, a frame defined by a pair of end members, a plurality of spaced supporting members affixed to said end members in stacked relation, first and second ladder-like structures, each of said structures comprising a pair of runners separated by a pluarality of spaced rungs, means for mounting said ladder-like structures for sliding translation on said frame and between said end members such that said supporting members and the rungs of said first ladder-like structure define one group of stacked shelves and said supporting members and the rungs of said second ladder-like structure define another group of stacked shelves, means for imparting translatory motion to said first ladder-like structure, thereby to vary the angular orientation of said one group of stacked shelves relative to the angular orientation of said other group, and means

for imparting translatory motion to said second ladder-like structure, thereby to vary the angular orientation of said other group of stacked shelves relative to the angular orientation of said one group.

5. Display apparatus in accordance with claim 4 wherein said means for mounting said ladder-like structures comprises a guide bar connected to said frame, a plurality of sleeves connected to said guide bar, said sleeves slideably embracing one of said runners of each of said ladder-like structures, first and second shafts respectively associated with said first and second ladder-like structures, first and second lever arms for respectively imparting rotation to said first and second shafts, and mechanical linkages respectively connected between said first and second shafts and said first and second ladder-like structures.

6. Display apparatus in accordance with claim 5 wherein said means for mounting said ladder-like structures further comprises a tab member for each of said lever arms, said tabs being mounted on said frame and each having a plurality of spaced projections positioned for frictional engagement with one of said lever arms.

7. Display apparatus in accordance with claim 5 wherein said means for mounting said ladder-like structures further comprises a toothed rack connected to each of said ladder-like structures, a latch for each of said racks connected to said frame, and means for tensioning said latches into locking engagement with their respective racks.

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CLAUDE A. LE ROY, *Primary Examiner.*