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3,161,160

LIBRARY SHELVING SYSTEM

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2 Sheets-Sheet 2

FIG. 4

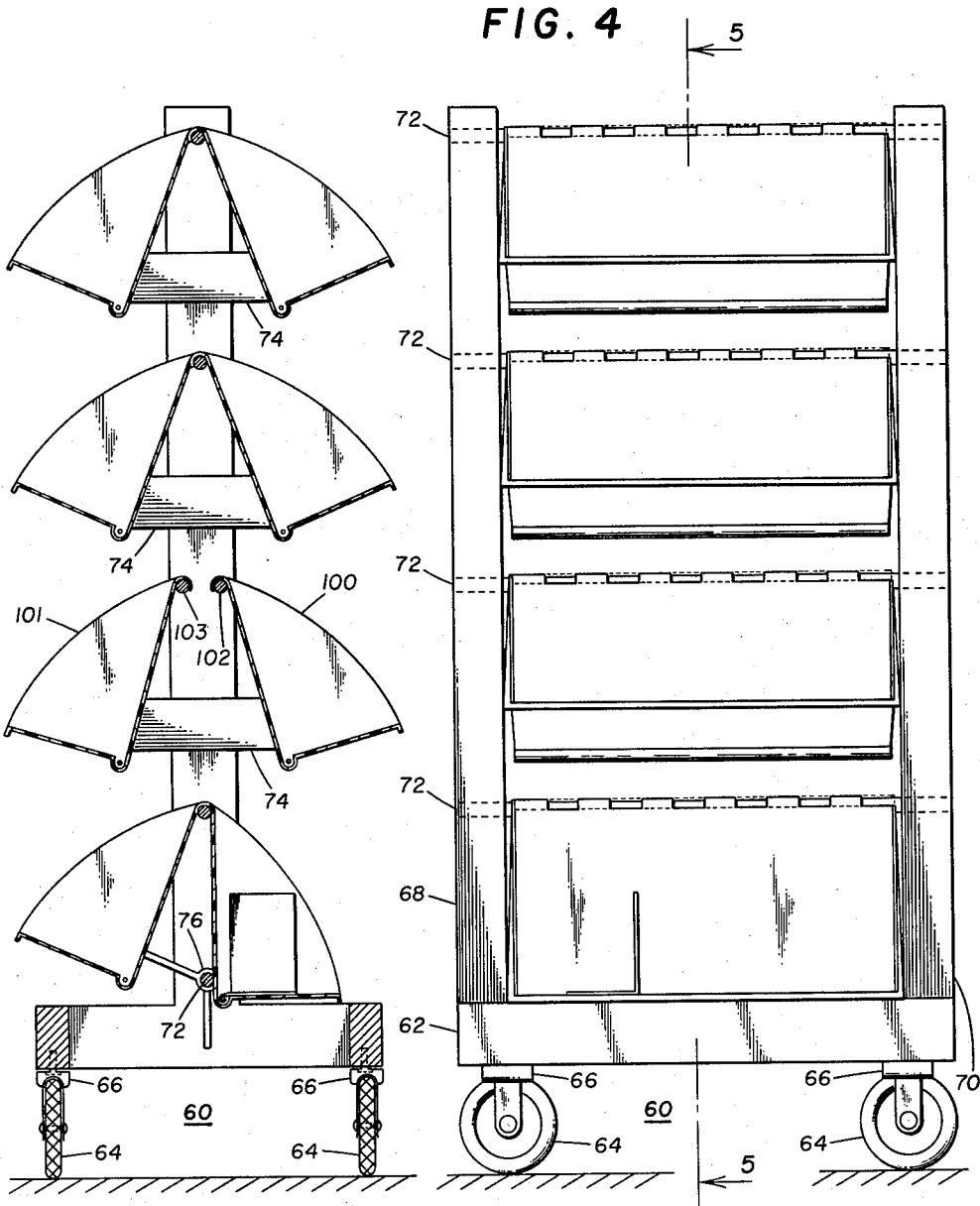


FIG. 5

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LIBRARY SHELVING SYSTEM

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4 Claims. (Cl. 108-6)

The present invention relates to book shelves and more particularly to a library shelf removable under load.

Public, institutional and home libraries face the problem of storing and displaying large numbers of books. Racks or shelves of many configurations have been devised for supporting the many existent collections.

The number of books published in any one year is large, making it necessary that many of the books be moved and rearranged to make room for the newer volumes and still maintain an ordered arrangement. As most of the known shelves or racks for storing these books are of the stationary type, in the course of this rearranging process it is usually necessary to remove the individual books from the shelves, place them on a cart, and then reshelve them individually at the desired location.

It is an object of the invention to provide a novel library system characterized by shelves readily removable while loaded to minimize individual handling of books. More particularly, in accordance with the present invention, there is provided a library structure which includes a pair of vertical supports. A plurality of substantially horizontally disposed rods extend between the vertical supports. A unitary shelf having a base, back and end panels is provided with means connected to and forming a part of the back panel for engaging one of said rods to support the shelf. The back panel engages the other of said rods near the lower rear portion thereof to maintain the shelf in desired attitude.

In a further aspect of the invention there is provided a library shelf which includes a back panel and a bottom panel disposed at right angles to the back panel and with outward flaring end panels connected to the back panel at the ends thereof and supporting the bottom panel at the ends thereof. In preferred form, a longitudinal trough is formed in the bottom panel adjacent its juncture with the back panel in which there is mounted a guide rod extending the length of the trough. A book support panel is slidably mounted on the guide rod. Rearwardly and downwardly extending hooks at the upper margin of the rear panel are provided for mounting of the same. In a preferred embodiment, the front margin of the bottom panel and side panels are flared outwardly to provide lateral reinforcement.

Further in accordance with the present invention, a removable shelf member is provided. This removable shelf is suspended from rods which extend through supporting members. The shelf may be easily removed from the rods which support it and placed on a similar rack-type member mounted on rollers. The mobile rack, containing a plurality of supporting rods, can then be used for moving a plurality of shelf members containing the books to the desired location where the removable shelf is placed on a stationary rack. The shelves are of such a size that even when loaded with books they are convenient to handle. The rearrangement of the books is simplified considerably by the fact that entire groupings of books can be expeditiously moved without the necessity for handling each book individually.

Many objects and advantages of the invention will become readily apparent to those skilled in the art as the following detailed description of the same unfolds when taken in conjunction with the appended drawings wherein like reference numerals denote like parts and in which:

FIGURE 1 is a perspective view of a stationary book rack provided by the present invention;

FIGURE 2 is a perspective view of the removable shelf member provided by the present invention;

FIGURE 3 is a perspective view of a portion of two shelf members illustrating the manner in which the removable shelf is supported;

FIGURE 4 is an elevation view showing the removable shelf mounted on a cart especially adapted for supporting the shelves; and

FIGURE 5 is a cross-sectional view taken along line 5-5 of FIGURE 4 illustrating in greater detail the manner in which the removable shelves are supported upon the cart.

Turning now to FIGURE 1 of the drawings, the stationary book shelf provided by the present invention is seen to comprise a plurality of vertical supporting members 10 which are supported or connected to the floor and ceiling by brackets 12 and 14. Horizontally disposed rods 16 extend between the vertical supporting members 10 for supporting removable shelf members 18. Horizontal rods 20 that also extend between the vertical members 10 are provided for engaging the back portion of the removable shelves at their lower extremity and maintaining the base of the shelf at the desired attitude.

In this system a supporting grid is thus formed by the vertical members 10 and the horizontal rods 16 and 20. Two or more of the units shown in FIGURE 1 may be employed to form free-standing structures where coupling as by brackets 12 to the ceiling is undesirable or inconvenient. For such free-standing structures a suitable framework may be provided for interconnecting the brackets 12 of a unit such as shown in FIGURE 1 with similar brackets of a second unit. Thus, a complete framework for the system may comprise vertical struts and horizontal bars.

The preferred embodiment of the removable shelf member 18 is shown in FIGURE 2. The shelf member 18 is seen to comprise a back 30, a base 32, and two arcuate side members 34 and 36.

A flange 38 extends downward from the front edge 39 of the base 32 to add rigidity and provide a broad front edge to the base 32. The front edge 39 of the base 32 is somewhat longer than the rear edge 41, side panels 34 and 36 being turned outwardly to a small extent; thereby, expediting the placing of books on the shelf and allowing a plurality of shelves to be nested for storage or shipment.

A groove or channel 40 extends across the rear edge 41 of the base 32. A rod 41a is secured at the ends thereof to the end closure members 41b of the groove 40. The rod 41a provides a guide for a sliding book support 41c. The support 41c has a base panel 41d and a face panel 41e. A tubular extension 41f of the base 41d provides a sliding connection to the rod 41a. By this means the support plate 41c may be adjusted to various desired positions along the length of the shelf unit 18 to support in upright position a partially loaded shelf unit.

A plurality of spaced hook members 42 extend rearward and down from the upper edge 43 of the back plate 30. The hooks 42 are of uniform length and the spaces 45 between the hook members 42 are slightly longer than the length of the hooks 42. The hook members 42 may be an integral part of the back 30 or they may be attached to the back 30 by welding, riveting, or other suitable means. The offset arrangement of the hook members 42 is provided wherein a hook 42 is adjacent the side member 34 and a space 45 terminates at the side member 36. By this means, one rod may support a pair of oppositely facing shelf units in the manner shown in

FIGURE 1. Fewer hooks can be used. However, the substantially continuous array of hooks imparts rigidity to the structure.

FIGURE 3 illustrates in greater detail the manner in which a pair of shelves 18a and 18b may be suspended from a single rod 16. It is seen that the hooks 42b of the shelf 18b fit in the spaces 45a between the hooks 42a which support the shelf 18a. The offset arrangement of the hooks 42 allows identical shelf members 18 to be placed back to back without interference of the hook members. The hooks 42a and 42b are interleaved in a manner similar to a door hinge, allowing the shelves 18a and 18b to swing from the rod 16.

Because the shelves 18 can rotate about the rod 16, the degree of tilt is easily adjustable. In this specific example, the size of the rod 20 against which the shelves 18a and 18b bear controls attitude of the base portion of the shelves 18a and 18b. By making the rod 20 approximately the same size as the rod 16, the base of the shelves will be approximately level. By making the rod 20 appreciably larger than the rod 16, the base of the shelves 18a and 18b may be caused to tilt upward, thereby tending to cause the books placed thereon to be held in place. Other auxiliary supports hereinafter described may be employed for attitude control.

FIGURES 4 and 5 illustrates a cart for supporting and carrying the shelves 18 provided by the present invention. The cart, designated by the reference numeral "60", is seen to comprise a rectangular base portion 62 supported by four wheels 64 mounted to casters 66. The base 62 can be of open construction, as shown, or it may be solid.

Two vertical supports 68 and 70 are mounted on the base 62. A plurality of horizontally disposed rods 72 extend between the vertical supports 68 and 70. The removable shelf members 18 are attached to the rod 72 by hooks 42 in the manner described with reference to FIGURE 3. The rods 72 also provide lateral support for the vertical supports 68 and 70.

As best seen in FIGURE 5, spacers 74 are provided to control the tilt of the shelves 18. Spacers 74 function to maintain the base portion of the shelves 18 in a slanting position to insure that the books being carried by the shelves remain in place. Rather than use the braces 74 or the rods 20 shown in FIGURE 1, spacer members 76 allow the shelf members 18 to be disposed in either a slanting or horizontal position. The spacer member 76 may be pivoted about a rod 72 as shown and provided with a suitable detent means to maintain the same in either of the two positions shown in FIGURE 5.

As illustrated in FIGURE 5, a modified mounting system is shown wherein the shelves 100 and 101 are supported on separate rods 102 and 103, respectively. In this case the shelves 100 and 101 are provided with hook portions at the upper extremity thereof which are continuous and extend the full length of the shelf to provide for maximum support and rigidity along the upper edge. The shelves 100 and 101 are maintained tilted by the spacer 74. However, they may be supported near the bottom edge of the back panel by rods placed directly below the rods 102 and 103.

While the cart of FIGURES 4 and 5 has been illustrated as a multi-shelf unit, it may be desirable to provide a single-shelf cart with a tilted, removable shelf thereon which may conveniently be used to transport a shelf of books from a library to a use location without requiring individual handling of the books except as required at the use location.

The present invention contemplates separate shelving of sets of books in number less than required to fill one of the complete shelves shown in the drawings. For example, any of the spaces between adjacent supports 10, FIGURE 1, may be occupied by more than a single shelf unit if desired. Shelves may be formed in modular subunits which, in different combinations, may be employed to fill the space between adjacent struts 10. Such subunits

would support two, three or four-volume works, or more extensive works, as a unit.

In a preferred form, the shelves are molded from a suitable plastic material through injection molding or suction molding techniques. By this means they may be formed relatively inexpensively while incorporating the prerequisites of strength and symmetry of line. For large library systems the shelves may be molded from raw materials of different basic colors or may be finished in different basic colors to provide a color code for various sections of a library system, thus simplifying cataloging and shelving operations.

From the above description, it is evident that a unique shelf system is provided by the present invention. It can be used for both storing books on a stationary shelf and as a means for handling a group of books without disarranging the order in which they are shelved. If it is desired to physically move the group of books, the removable shelf member is moved from the stationary shelf frame and placed on the cart which carries a frame similar in construction to the stationary shelf frame. Using the cart unit, a shelf full of books can be carried to a desired location where the entire shelf may be removed and placed upon a stationary rack.

It is not necessary to handle the books individually nor is it necessary to change the arrangement of the books. Several books can be handled at one time in an expeditious manner as the shelves accommodate any reasonable number of books depending upon the weight of the books to be shelved.

Having described the invention in connection with certain specific embodiments thereof, it is to be understood that further modifications may now suggest themselves to those skilled in the art and it is intended to cover such modifications as fall within the scope of the appended claims.

What is claimed is:

1. A library shelf which comprises:

- (a) a back panel and a bottom panel disposed at right angles to the back panel with outwardly flaring end panels connected to said back panel at the ends thereof and supporting said bottom panel at the ends thereof;
- (b) a longitudinally extending trough formed in said bottom panel at its juncture with said back panel; and
- (c) rearwardly and downwardly extending hook means attached to said back panel at the upper extremity thereof.

2. A library shelf which comprises:

- (a) a back panel and a bottom panel disposed at right angles to the back panel with outwardly flaring end panels extending from said back panel at the ends thereof for support of said bottom panel, said end panels having upwardly sloping, outwardly turned face members extending from the front margin of said bottom panel;
- (b) a downwardly turned lip member extending along said margin to form an edge bond with said face members;
- (c) a longitudinally extending trough formed in said bottom panel at its juncture with said back panel,
- (d) a guide rod mounted in and extending the length of said trough below the plane of said bottom panel;
- (e) a book support panel disposed perpendicularly to both the bottom and back panels and coupled to said rod for slide movement along the length of said shelf; and
- (f) rearwardly and downwardly extending hook means attached to said back panel at the upper extremity thereof.

3. A library shelf which comprises:

- (a) a back panel and a bottom panel disposed at right angles to the back panel with end panels supporting the back and bottom panels at the ends thereof;
- (b) a longitudinally extending trough formed in said bottom panel at its juncture with said back panel;

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- (c) a guide rod mounted in and extending the length of said trough below the plane of said bottom panel;
- (d) a book support panel disposed perpendicularly to both the bottom and back panels and coupled to said rod for slide movement along the length of said shelf; and 5
- (e) rearwardly and downwardly extending hook means attached to said back panel at the upper extremity thereof.
4. A bookshelf which comprises: 10
- (a) a pair of spaced vertical supports, 10
- (b) vertically spaced top and bottom rods horizontally extending between said vertical supports, 10
- (c) a unitary shelf module having a back panel and a bottom panel disposed at right angles to the back panel with outwardly flaring end panels connected to said back panel at the ends thereof and supporting said bottom panel at the ends thereof, 15
- (d) a longitudinally extending trough formed in said bottom panel at its juncture with said back panel, and 20
- (e) rearwardly and downwardly extending hook means

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attached to said back panel at the upper extremity thereof to suspend said module on the top rod with lateral support provided said module at the back near the base by the bottom rod.

References Cited in the file of this patent

UNITED STATES PATENTS

443,866	Pauli -----	Dec. 30, 1890
891,968	Allen -----	June 30, 1908
1,039,694	Burton -----	Oct. 1, 1912
1,608,939	Hogue -----	Nov. 30, 1926
1,997,829	McKee -----	Apr. 16, 1935
2,005,566	Schwabe -----	June 18, 1935
2,108,122	Hall -----	Feb. 15, 1938
2,508,527	Martin -----	May 23, 1950
2,551,062	Skar -----	May 1, 1951
2,884,139	Dunham -----	Apr. 28, 1959
2,974,807	Furrer -----	Mar. 14, 1961
3,021,961	Ruhnke -----	Feb. 20, 1962
3,045,835	Hawthorne et al. -----	July 24, 1962