

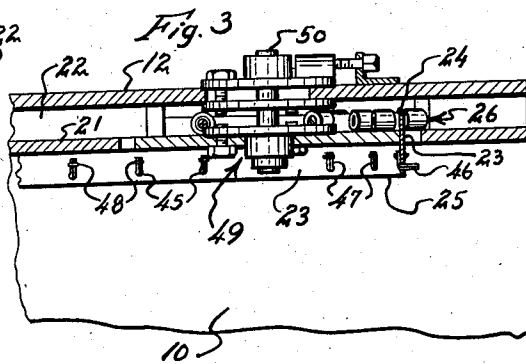
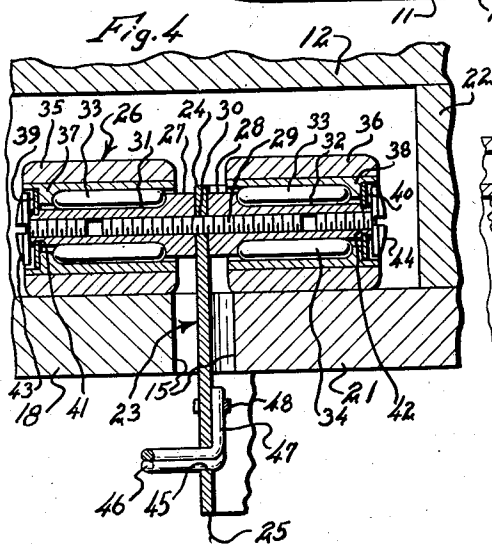
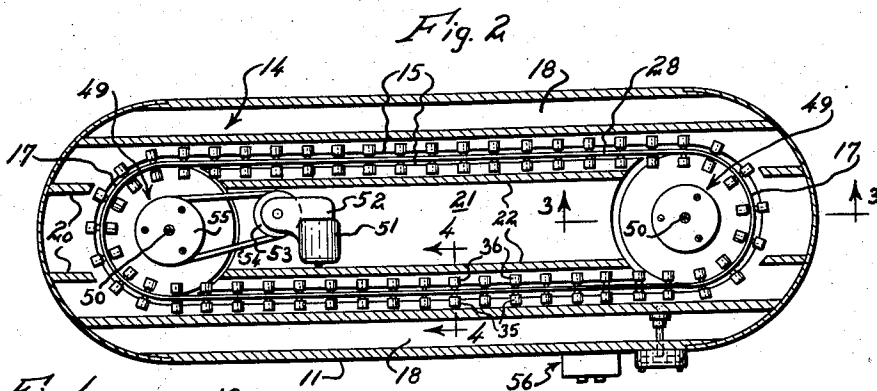
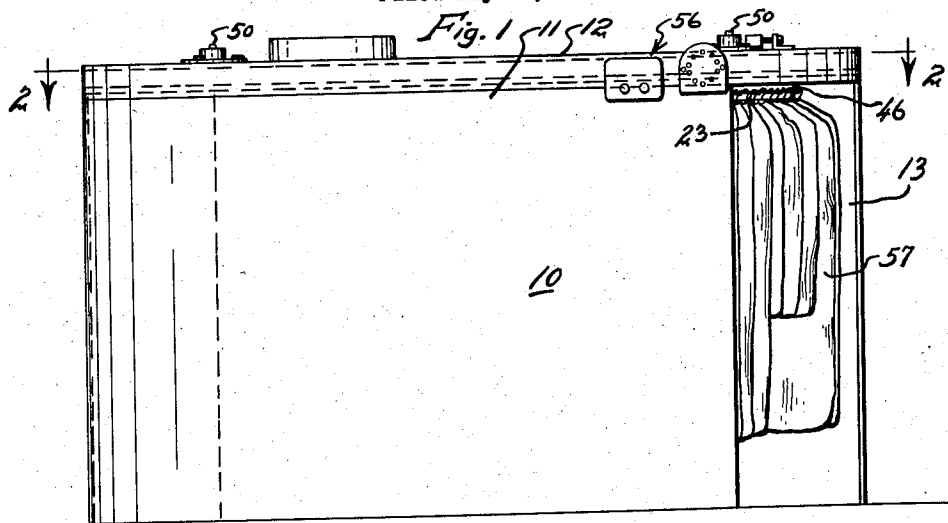
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TRAVELING RACK

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TRAVELING RACK

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5 Claims. (Cl. 211-1.5)

This invention relates to a traveling rack and more particularly to a rack for supporting and moving articles such as garments depending therefrom.

It has been customary in such businesses as dry cleaning and article storage, to provide lockers or racks having fixed supports, or at best, sliding supporting bars having a limited movement in a short space. When placing or removing each article from its suspended position, it has been a requisite for the person in charge of such activity to physically go to the position on the rack and search out from the plurality of articles the position of the article to be placed or removed. Many devices and systems have been proposed to simplify and make more efficient the work of the person who handles the articles. Most of these propositions have to do with marking, tagging, indexing and selecting proper positions for the articles, but it still has been necessary for the person to go to the particular location of the article rather than having an article come to him.

In order to have the articles themselves travel to a prescribed location, it is necessary in a business such as dry cleaning to conserve space and therefore the nature of a traveling rack, to be useful, requires that it have switchbacks or tortuous pathways formed over an area of space rather than along a straight line only. If the rack is to be continuous as well as tortuous, there is presented a problem by the great total weight of the garments and the attendant friction of the moving rack, especially in the region of the curves. Furthermore, unless there is individual power means for locomotion at a plurality of positions or along the rack member, it becomes necessary to apply tension upon the continuous member which holds the suspended articles. The stress created by tension lengthwise of the rack and also vertically by weight of the articles, multiplies the problems in operating a continuous rack for traveling in a tortuous pathway.

My invention contemplates achieving the foregoing objectives while overcoming the noted difficulties and has for an important object providing an apparatus for efficiently and simply moving in a well-conserved area, a traveling rack for a plurality of articles such as garments so that any one of them may be placed or removed at a preselected fixed position.

Another object of the invention is to provide a flexible article carrying belt for traveling in a tortuous horizontal path wherein the belt may be stressed longitudinally to cause the belt to travel freely along the path and at the same time be stressed vertically by the weight of the individual articles suspended therefrom.

A further object of the invention is to provide an article supporting flexible belt which is suspended in relation to a tortuous track and which is provided with radial thrust members to maintain free movement of the belt around the bends of the tortuous track.

A still further object of the invention is to provide an efficient storing apparatus housed within an enclosure and having a traveling article suspension system which

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will permit placing and removing articles on the system through an opening in the enclosure at a prescribed location.

These and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

Fig. 1 is a side elevation of my traveling rack disposed within an enclosure;

Fig. 2 is a horizontal view of the traveling belt mechanism taken on the line 2-2 of Fig. 1, portions of the apparatus being cut away to better show the hidden parts;

Fig. 3 is an enlarged vertical segment taken on the line 3-3 of Fig. 2 and showing the belt and radial thrust assembly at one of the belts in the track; and

Fig. 4 is an enlarged vertical section of a segment of the track member taken on the line 4-4 of Fig. 2, certain portions of the section being shown in full line.

With continued reference to the drawing and particularly to Fig. 1, my invention includes a supporting structure 10 which preferably comprises an enclosure having vertical side walls 11 and a top or ceiling 12 which extends across the tops of the vertical side walls 11. The enclosure is also provided with one or more openings 13 which provides an access to the interior and may be closed if it is desired to maintain the enclosure in dust-proof condition. The enclosure may be of any general shape and may comprise individual units or a large unit having an irregular shape and adapted to conserve and utilize space within an establishment such as a dry cleaning place of business.

Disposed horizontally and secured to the supporting structure at the roof or ceiling 12 is a track element indicated generally at 14 as shown in Fig. 2. The track element may take any of a number of forms but provides a track or guideway 16 which is unobstructed and which is preferably arranged in endless fashion to provide a tortuous pathway having a plurality of arcuate bends 17 as shown. It is understood that the track element may provide a series of switchbacks angulated in different directions and occupying irregular areas. In the instant case, the track element is constructed of a flat sheet member 18 which is secured to the underside of rafters 19 which provide spacing members as well as interconnecting supports for attachment to the roof or ceiling 12. The outside rafters 19 may be of single length for the entire length of the enclosure and shorter rafters 20 may be interposed between the sheet 18 and roof 12 around the arcuate bends 17 as shown. It is understood that the spacing supports may be in other forms than the rafters shown, such as cylindrical spacers in conjunction with bolts and the like. The elongated rafters, however, are the simplest which I have found to accomplish the securing of the track element and also provide a working clearance with the roof 12 for the mechanism as will be presently described. The inner portion of the track element is shown at 21 and may likewise constitute a sheet which is coplanar with sheet 18 and the respective outer and inner peripheries 15 of which sheets form a slotted guideway or track 16 of uniform width in its straight sections as well as at the curved portions 17. Spacers or rafters 22 similar to the rafters 19 and 20 are secured to the sheet 21 and are in turn secured to the underside of roof 12 so as to rigidly support the track element and yet allow free and unobstructed movement through the guide or slot formed therebetween.

A flexible member such as belt 23 is disposed for travel along the track element 16 and preferably is endless in form and conforms to the tortuous path including

bends 17 in the trackway. The flexible belt may be any strong and flexible element suitable for resisting stress in a longitudinal as well as in a lateral direction but is preferably constructed of leather belting of a flat character with an upper edge 24 and a lower edge 25 as shown in Fig. 3. The flexible belt has attached thereto low friction guiding and suspension means such as the rollers 26, the rollers being set forth in enlarged detail in Fig. 4. The guiding and suspension means preferably constitutes a shaft 27 and a shaft 28 which have central bores which are drilled and tapped and drawn together by the threaded rod 29 as shown in Fig. 4. The stub shafts 27 and 28 are then in aligned abutment on each side of the belt 23 with the threaded bar 29 passing through an opening 30 formed near the upper edge 24 of the flexible belt 23. The stub shafts 27 and 28 have an annular race at 31 and 32 respectively, the race being adapted to accommodate a plurality of roller bearing members 33 on the race 31 and 34 on the race 32. A roller element preferably constructed of wood or plastic at 35 on stub shaft 27, and 36 on stub shaft 28, is rotatably mounted, each of the rollers having a roller bearing retainer and outer race 37 and 38 respectively. A washer 39 and a washer 40 is secured in abutting relation with a shouldered reduced end 41 and 42 of the stub shafts 27 and 28 respectively, and bolts 43 and 44 respectively secure the washers in place and permit the rollers 35 and 36 to rotate freely on the aligned stub shafts 27 and 28. The track element 14 supports the guiding and suspension means 26 at its respective rolls 35 and 36 upon the peripheral edges 15 of the respective sheet members 21 and 18 as shown in Fig. 4.

The flexible belt 23 has disposed in spaced relation adjacent the lower edge 25, a series of openings 45 between each of which adjacent pair is disposed a fastening member 46 for supporting articles such as garments suspended therefrom upon a clothes hanger. In order to conform with the flexible quality of the belt and to be able to flex in either direction, I prefer U-shaped wire members which extend outwardly in a lateral direction through openings 45 and have L-shaped inner end extensions 47 which are adapted to lie against the upstanding surface of flexible belt 23 at the side opposite the U-shaped extension, as shown in Fig. 4. The ends 47 of each of the fastening or hanger members 46 lie closely together and may be secured to the belt by such means as a staple 48 which binds the two extensions at each opening 45 tightly against the side of the flexible belt. It is preferred that each of the guiding and suspension means 26 be spaced at frequent intervals as shown in Fig. 2 and that the fastening members 46 be continuous and overlapping in their connection with the flexible belt 23.

Referring now to Fig. 2, it will be observed that a radial thrust member shown generally at 49 is mounted rotatably with respect to the supporting structure 10 and forms with the track element 14, a means for applying stress outwardly against the flexible belt at the arcuate bends 17 so as to prevent distortion or misalignment of the belt as it is pulled around the track element. The radial thrust member is preferably in the form of a flat disc wheel mounted upon a vertical shaft 50 and is rotatable in a horizontal direction. It is preferred that the wheel 49 be coplanar with both the sheets 18 and 21 so that one of the rollers 35 and 36 will rest upon the wheel 49 while the other roller rests upon the marginal edge 15 of sheet 18. It is understood that as many wheels 49 as desired may be utilized, one of such thrust wheels being employed for each of the arcuate bends in the system. With the arrangement shown, it is possible for the flexible belt to extend in any direction and can be bent to either side, depending upon the shape of the switchbacks in utilizing the area and floor space of any particular building. The belt is caused to travel by a powered means such as motor 51 which is preferably in driving connec-

tion with a gear reduction box 52 which in turn drives a pulley wheel 53. The pulley wheel 53 in turn drives through belt member 54 a driven pulley 55 which is also secured to one of the vertical shaft members 50 which rotatably supports the radial thrust wheel 49 as shown. Under normal circumstances, only one of the drive means may be employed in connection with a wheel 49 although it is understood that several may be used, especially where the flexible belt is extremely long in its total length.

An electrical control system indicated generally at 56 may be employed to start and stop the motor 51 and, if desired, to reverse the direction of the belt so as to bring articles 57 to the access or doorway 13 for selection by a person standing at the prescribed location.

In the use and operation of my traveling rack, and especially in connection with the storage and handling of garments in a dry cleaning establishment, I place the garments on wire hangers with the usual paper coverings as shown in Fig. 1, and hang the garments at preselected positions upon the fastening members 46 as shown. I prefer that the U-shaped members 46 extend only far enough away from the side of belt 23 to permit the entrance of hangers 58 as shown in Fig. 1. The hangers will tend to lie in an angular direction with respect to the belt 23 and hence will not occupy as much room as though they were strictly normal to the longitudinal direction of the belt. When it is desired to place or remove a garment from a position which is not accessible at the time through access-way 13, the control 56 is actuated so that motor 51 will drive wheel 49 in one direction or the other at the will of the operator. Wheel 49 thrusts outwardly against the flexible belt 23 at the arcuate bend 17 and also provides the longitudinal stress for driving the belt along the track element 14. As the belt travels, each of the guiding and suspension members 26 rolls along the trackway, providing a reduced friction support for the belt and permitting considerable weight to be suspended from the belt at frequent intervals along its entire length. As each of the rollers approaches a bend 17, it follows the guideway or track 15, the continuation of which at the bend is formed by the wheel 49. The belt is prevented from pulling inwardly under longitudinal stress by the outward radial thrust of wheel 49 and is kept in freely guided condition around the bend and back to a straight track or guideway for continued travel throughout the length of the track element.

It may thus be seen that I have devised a novel traveling rack which will accommodate, with a minimum of motive power, a large number of suspended articles traveling in spaced conserving manner over a considerable area, the articles being brought at will to a predetermined location for placement or removal from the rack.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What I claim is:

1. A traveling rack for supporting and carrying a plurality of articles which comprises, a supporting structure, a track element disposed horizontally and secured to said supporting structure at an elevated position providing a substantially unrestricted space beneath, said track element having a plurality of arcuate bends in spaced relation throughout its length, a flexible belt disposed vertically edgewise for travel below said track element and conforming to the bends therein, low friction guiding and suspension means attached to said flexible belt adjacent the upper edge and mounted in spaced relation along said track element, fastening members formed along said flexible belt adjacent the lower edge for holding said articles in suspended relation therefrom, and a horizontal wheel rotatably mounted with respect to the supporting structure and bearing laterally against said flexible belt at the inner curve of each of said arcuate bends for maintaining the belt in alignment with the track during travel.

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2. A traveling rack for supporting and carrying a plurality of articles which comprises, a supporting structure, a track element disposed horizontally and secured to said supporting structure at an elevated position providing a substantially unrestricted space beneath, said track element having a plurality of arcuate bends in spaced relation throughout its length, a flexible belt disposed vertically edgewise for travel beneath said track element and conforming to the bends therein, low friction guiding and suspension means attached to said flexible belt adjacent the upper edge and mounted along said track element for movement therealong, fastening members formed along said flexible belt adjacent the lower edge thereof for holding said articles against vertical stress, a radial thrust member disposed at the inner curved side of the flexible belt at each of said arcuate bends and interposed with respect to said supporting structure and said flexible belt for maintaining the belt in alignment with the track during travel, and driving means for placing tension on said belt and thereby pulling it in a horizontal direction along said track with said articles suspended therefrom and traveling therewith.

3. A traveling rack for supporting and moving a plurality of articles such as garments comprising, a supporting structure, an endless track element disposed horizontally and secured to said supporting structure at an elevated position and providing a substantially unrestricted space therebeneath, said track element having a plurality of arcuate bends disposed at spaced relation one with the other throughout the length of said track, guiding and suspension means disposed in spaced relation along said endless track and having low friction movement therealong in downward bracing engagement with said track, a continuous elongated belt flexible at least in a horizontal direction disposed vertically edgewise beneath the guiding and suspension means and together therewith conforming to the pathway defined by said track, a radial thrust member rotatably mounted on a vertical axis and exerting radial outward pressure upon the horizontally flexible belt intermediate the upper and lower edges thereof to prevent inward flexing of the belt at the arcuate bends of the track, a plurality of fasteners secured along said belt adjacent the lower edge thereof and terminating in hanger-engaging members adjacent the belt and freely overlying said unrestricted space, and power means for causing said belt together with articles hung therefrom to travel in suspended conformance with the track while stressed against lateral misalignment at the arcuate bends thereof.

4. A traveling rack for supporting and moving a plurality of articles such as garments comprising, a supporting structure, an endless track disposed horizontally and secured to said supporting structure at an elevated position and providing a substantially unrestricted space therebeneath, said track having a plurality of arcuate bends disposed at spaced relation one with the other

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throughout the length of the track, a plurality of guide wheels secured to said supporting structure, one guide wheel being disposed at each arcuate bend in said track, an endless, flexible member trained about said guide wheels, said guide wheels engaging longitudinal medial portions of said flexible member to impart radial outward thrust to the member at the track bends, a plurality of pairs of rollers secured at longitudinally spaced points to the upper edge of said flexible member engaging said track and suspending the flexible member therefrom, a plurality of fasteners secured at longitudinally spaced points independent of said rollers along said flexible member overlying said unrestricted space and presenting adjacent the lower edge thereof means by which garment hangers may be suspended.

5. A traveling rack for supporting and moving a plurality of articles such as garments comprising, a supporting structure, an endless track disposed horizontally and secured to said supporting structure at an elevated position and providing a substantially unrestricted space therebeneath, said track including inner and outer portions, the inner and outer portions presenting flap upper surfaces and the respective outer and inner peripheries of the inner and outer portions being spaced apart to define a slotted guideway therebetween, said guideway having a plurality of arcuate bends disposed at spaced relation one with the other throughout the length of the track, a plurality of guide wheels secured to said supporting structure, one guide wheel being disposed at each arcuate bend in said track between said inner and outer track portions and spaced from the inner periphery of the outer track portion to continue the guideway in the region of the arcuate bends, said guide wheels having flat upper surfaces coplanar with the upper surfaces of said track portions, an endless, flexible member trained about said guide wheels, said guide wheels engaging longitudinal medial portions of said flexible member to impart radial outward thrust to the member at the track bends, a plurality of pairs of rollers secured at longitudinally spaced points to the upper edge of said flexible member engaging the upper surfaces of said track portions and suspending the flexible member therefrom, a plurality of fasteners secured at longitudinally spaced points along said flexible member and independent of said rollers below said track portions and presenting adjacent the lower edge of the flexible member means by which garment hangers may be suspended.

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