Sept. 8, 1970 H. W. JOHNSON 3,527,357

DRAW OPERATED PANTS HANGER

Filed Sept. 27, 1967 2 Sheets-Sheet 1

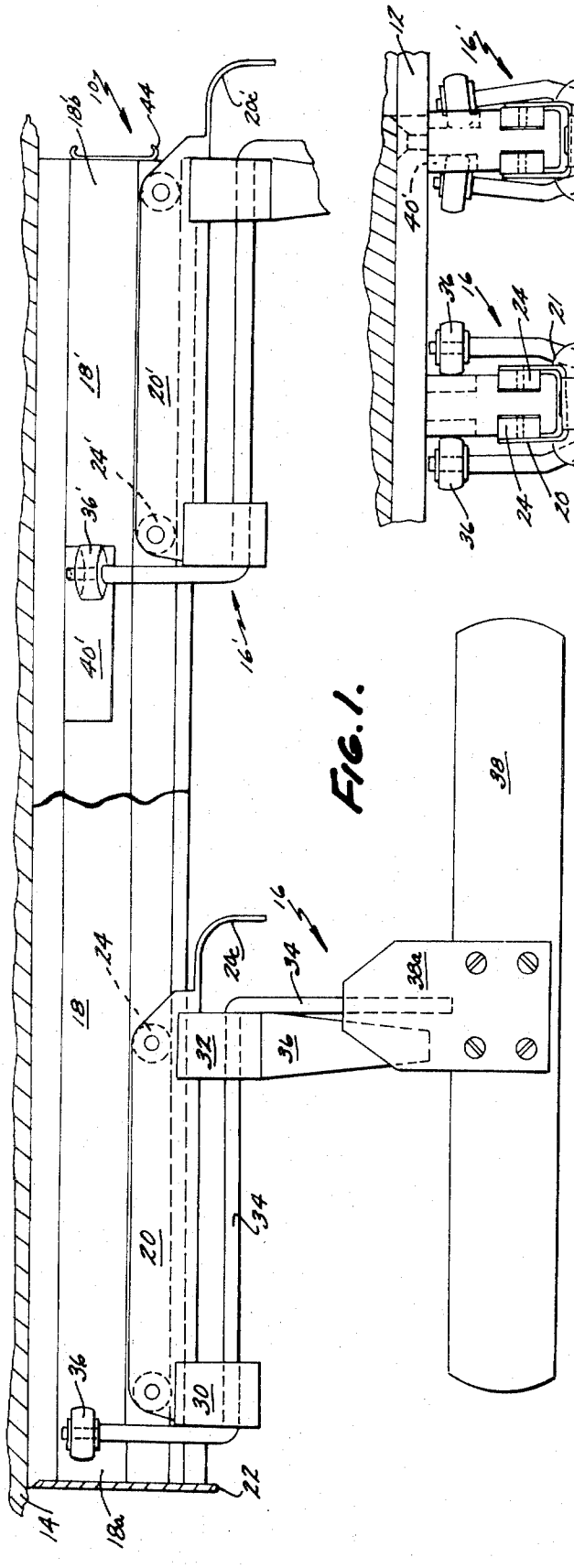


FIG. 1.

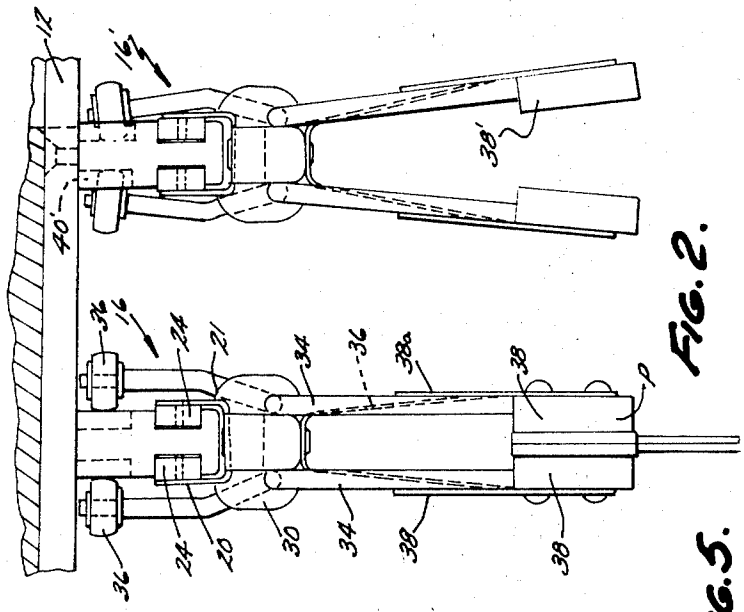


FIG. 2.

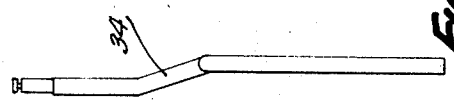


FIG. 5.

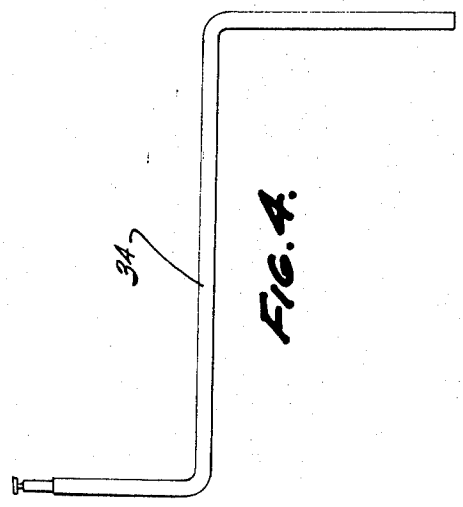


FIG. 4.

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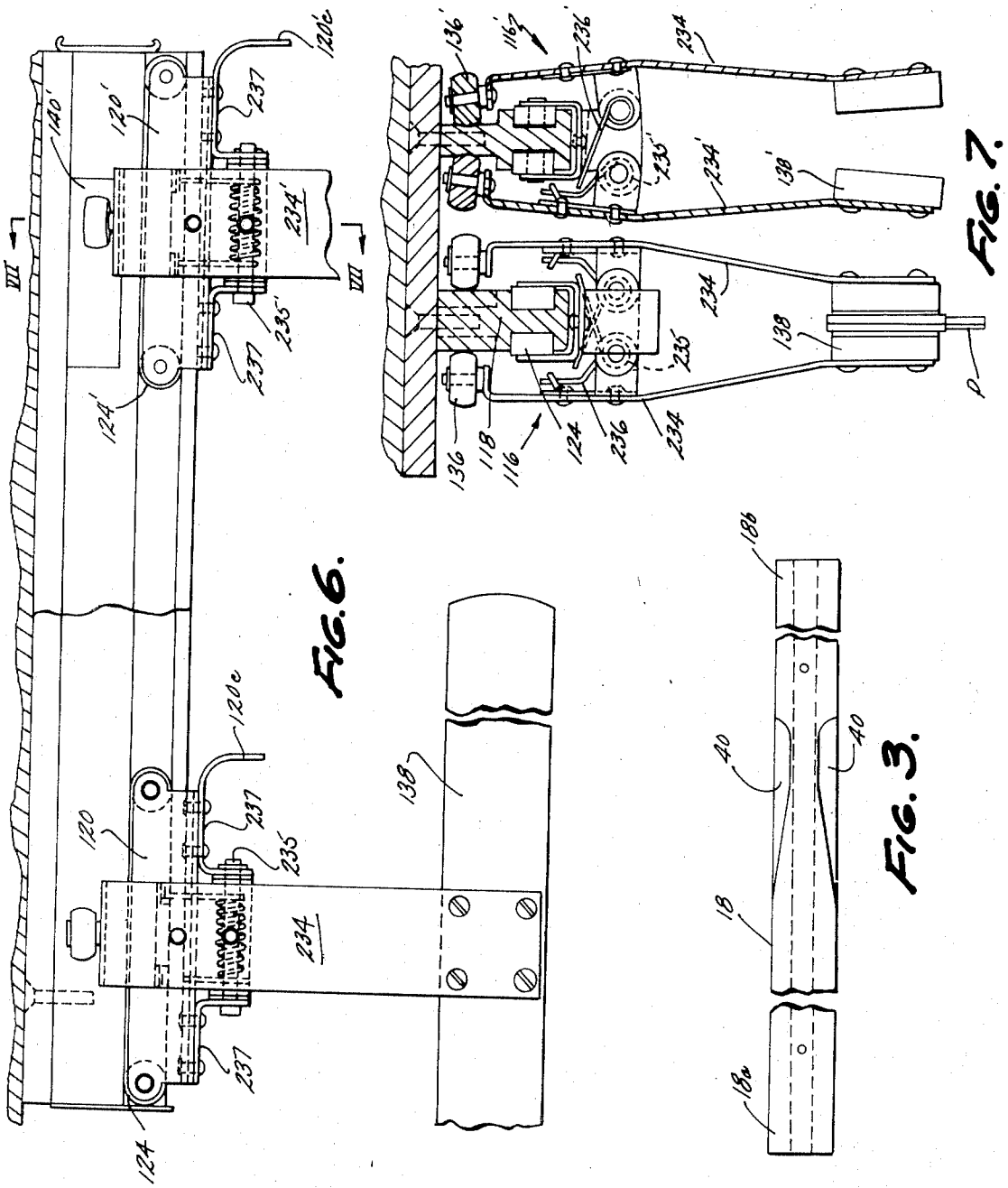


Fig. 6.

Fig. 7.

Fig. 3.

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DRAW OPERATED PANTS HANGER

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ABSTRACT OF THE DISCLOSURE

A pants hanger assembly employing fixed, elongated, mounted tracks having front and rear ends, with pants hanger carriages on the tracks, the pants hangers on said carriages being shifted between pants receiving or releasing condition at the track front end and pants gripping and retaining storage position at the track rear end by the action of cam surfaces on the tracks cooperating with cam followers on the carriage as the carriage is shifted between the front and rear track ends.

BACKGROUND

This invention relates to pants hanger assemblies, and more particularly to push-pull, draw operated pants hanger assemblies.

Because pants hangers that are removable from their support rod are so frequently stolen when used in public places such as motels and hotels, non-removable types have been devised. However, known pants hangers that are not removable from their support are normally difficult and inconvenient to use.

Moreover, for either the removable or non-removable type hangers, substantial extra lateral space along the support rod is required to allow a practical amount of access to the support.

Where a large number of pairs of pants are hung together, as in a clothing store, conventional hangers of both types have the distinct disadvantage of preventing convenient viewing of selective pairs unless substantial empty space is left on the support bar and groups of pairs are slid along it each time a person wishes to look at a particular pair.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a novel pants hanger assembly of the non-removable type that allows convenient usage, easy access for viewing, and maximum space efficiency.

Another object of this invention is to provide pants hanger assemblies capable of hanging pairs of pants closely adjacent each other in a compact space, in complete orderly fashion, free from the tendency of the hangers to intertangle.

Another object is to provide a push-pull or draw operated battery of pants hangers that receive each pair of pants when extended, and that clamp each pair of pants in retained condition as the pants are pushed back into a compact storage position, all in a convenient manner. Further, each pair may be conveniently pulled to viewing position short of a fully extended releasing position, without moving any of the other closely adjacent pairs.

These and other objects of this invention will become apparent from the following description. The novel assembly combines a fixed elongated, front-to-rear track with a movable pants hanger carriage shiftable between the front and rear ends of the tracks, each hanger being cammed to gripping condition when shifted to the rear of the track, retaining its gripping condition when shifted partly forwardly for viewing, and being biased to releasing or receiving position when fully extended to the front of the track.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of two of the novel pants hanger units in an assembly, with the guide track of one being partially broken away to illustrate the mechanism of the hanger and its track immediately therebehind;

FIG. 2 is a front end view of the apparatus in FIG. 1, shown with the front carriage stop element removed;

FIG. 3 is a plan view of one of the fixed tracks of the apparatus in FIGS. 1 and 2;

FIG. 4 is a side elevational view of one of the hanger element mounting supports for the apparatus in FIG. 1;

FIG. 5 is an end elevational view of the supports in FIG. 4;

FIG. 6 is a side elevational view of a slightly modified pants hanger assembly of the invention, shown with the track of one of the sub-assemblies broken away to illustrate the sub-assembly immediately therebehind; and

FIG. 7 is a sectional view of the apparatus in FIG. 6, taken on plane VII—VII of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the first embodiment illustrated in FIGS. 1 through 5, the complete pants hanger assembly **10** there shown includes a mounting bracket **12** securable to an overhead ceiling or other structural element **14**, and suspending therefrom a plurality of independently mounted pants hanger sub-assemblies **16**, **16'**, etc., only two of which are illustrated for purposes of convenience.

Sub-assembly **16** includes an elongated front-to-rear track **18** fixed to mount **12** and having a movable pants hanger carriage **20** that is shiftable between the rear end **18***a* of the track and the front end of the track, while the carriage **20'** of sub-assembly **16'** is shiftable between the rear end of its track **18'** and the front end **18'***b* of its track. Movement of either carriage to the rear of its track may be limited by a wall panel **22** or alternatively by a fixed stop plate mounted to the track.

Track **18** has a pair of elongated parallel grooves along its opposite sides to receive rollers **24** rotatably secured to carriage **20** at the upwardly extending parallel legs of the U-shaped carriage bracket **21**. Secured at spaced interval to this bracket is a pair of blocks **30** and **32** which serve to pivotally support the rod-like, generally Z-shaped elements **34** and a generally V-shaped spring member **36**. Elements **34** each have a vertically extending upper end which has a cam follower roller **36** mounted thereto, these elements **34** being generally astraddle of the track so that the two rollers **36** are on opposite side walls of the track as illustrated in FIG. 2. The central portions of element **34** are horizontal, extending in the direction of the track, and generally along side it and beneath it, to be pivotally supported in journal members **30** and **32** for pivoting of the lower ends toward and away from each other as controlled by cam following rollers **36**. Secured to the vertically depending lower ends of element **34** is a pair of pants gripper members **38**. These pants grippers are biased apart by spring **36** which engages the inside faces of a pair of plates **38***a* attached to grippers **38**.

Adjacent the front end of each of tracks **18** and **18'** is a pair of non-parallel recesses **40** and **40'** respectively, which are tapered (as illustrated in FIG. 3) gradually outwardly toward the rear end of the track and abruptly outwardly toward the front end **18***b* of the track to provide camming surfaces for cam followers **36**. The movement of each of the carriages to the front end of the track is limited by a special stop plate **44** or the equiv-

alent. The push-pull movement may be caused by gripping the downwardly curled handle element **20***c* on carriage **20**, and **20'***c* on carriage **18'**.

Actually, the sub-assemblies are preferably in large numbers in ordinary usage, mounted laterally alongside each other, extending toward the front of the closet or storage space, with the carriages being movable forwardly and rearwardly. To hang a pair of pants P on the particular sub-assembly, e.g. **16**, handle **20***c* is grasped and the carriage is pulled forwardly to the front end. As cam follower rollers **36** move along the side walls of track **18** and drop into recesses **40** and **40'**, the biasing springs **36** force the lower ends of rods **34** and the pants hanger elements apart to the spread position illustrated by sub-assembly **16'** in FIG. 2. The cuffs of the pair of pants P are then placed between gripper elements, e.g. **38'**, and the unit is pushed to the rear of the track. As the cam follower rollers, e.g. **36'**, move over the tapered surface of the camming recesses or slots, the rollers are forced outwardly to thereby pivot elements **34** and shift grippers **38** toward each other against the bias of spring **36**, squeezing the pair of pants into a stored retained position (illustrated by sub-assembly **16** in FIG. 2). When it is desired to again retrieve the pair of pants, this carriage is moved forwardly to the front end of the track, causing the cam followers to move into the camming slots, allowing the spring to bias the grippers apart and thereby dropping the pants. If it is desired to view the pair of pants, but not necessarily remove them, the carriage is pulled part way out to a intermediate track position where the cam followers have not dropped into their recesses. Hence, the parts are forwardly of adjacent pants but have not been released.

It will be readily visualized that the entire lateral space of a storage area can be efficiently employed, that pants can be viewed, removed, and reinserted conveniently, and that all is orderly.

In FIGS. 6 and 7 is illustrated a second similar embodiment of the apparatus. Here again, sub-assemblies **116** and **116'** include a fixed track for each, specifically **118** and **118'**, each having camming slots, **140** and **140'** respectively adjacent the front end of the fixed track for the cam followers **136** and **136'** to follow on opposite sides of each track. These cam followers are mounted to plate type support members **234** and **234'** which are pivotally mounted on pins **235** and **235'** to L-shaped brackets **237** and **237'** beneath the carriages **120** and **120'**. The carriages may be moved along the track on their respective rollers **124** and **124'** by pulling on the curled tabs or handles **120***c* and **120'***c*. The pants gripper elements **138** and **138'** are biased toward each other on the lower ends of elements **234** and **234'**, by torsion springs **236** and **236'** which are wrapped around pins **235** and **235'** respectively. These springs bias the gripper elements apart to the position illustrated at assembly **116'** in FIG. 7, so that, when the carriage is in its front end position as illustrated at the right end of FIG. 6, the grippers will be separated for receiving or releasing a pair of pants P. When a unit it utilized for storing a pair of pants, the cuffs are positioned between the grippers, and the carriage is shifted to the rear as with the first embodiment, causing the cam follower members to ride up over the cam surfaces out of recesses **140**, which biases or forces the gripper elements into engagement with a pair of pants as illustrated by the sub-assembly **116** on the left side of FIG. 7.

It is conceivable that certain obvious details of construction may be made in these embodiments without departing from the concept of the invention, and hence the invention is intended to be limited only by the scope of the appended claims and the reasonably equivalent structures to those defined therein.

I claim:

1. A pants hanger assembly, comprising: track means including at least one fixed track and means to mount said track in a storage space; each track having a rear end portion for pants storage and a front end portion for pants insertion or removal; a pants hanger carriage retained on each track and movable between said rear end portion and said front end portion, including pants gripping means shiftable between a pants gripping condition and a pants receiving or releasing condition; each said track having camming portions, and each said carriage having cooperative cam follower portions, said cam follower portions being operably associated with said pants gripping means to shift them between said conditions, and said camming portions being arranged to shift said pants gripping means, through said cam follower portions, to pants receiving or releasing position at said track front end portion and to pants gripping condition at said track rear end portion.

2. The pants hanger assembly in claim **1** wherein each said carriage has rollers received by said track.

3. The pants hanger assembly in claim **1** wherein: said pants gripping means comprises a pair of depending elements pivotally shiftable between said conditions; and said carriage includes biasing springs engaging said elements in a manner biasing them towards said pants releasing or receiving condition.

4. The pants hanger assembly in claim **1** wherein said track includes an intermediate pants retaining and viewing portion between said front and rear end portions.

5. A pants hanger assembly comprising: a plurality of elongated tracks spaced side by side, and a plurality of respective pants supporting carriages independently and movably supported on said tracks; each track having a rear portion for pants storage, an intermediate portion for pants viewing, and a front portion for hanging or removing pants; said carriages being selectively movable between said portions, for selective storage, viewing, and hanging or removing of pants, each of said carriages including pants gripping means having pants retention and pants releasing or receiving conditions, and cooperative actuation means between said tracks and each carriage to shift said gripping means to pants retention condition in said rear and intermediate track portions, and to pants releasing or receiving condition at said front track portion.

6. The pants hanger assembly in claim **5** including cooperative cam and cam follower means between said tracks and each gripping means to automatically shift said gripping means to their respective conditions at said respective track portions.

7. The pants hanger assembly in claim **6**, wherein said cam means includes portions of said tracks which are non-parallel, and said cam follower means includes a roller on one end of each of said gripping means for engagement with said non-parallel portions.

8. The pants hanger assembly in claim **7**, further including a plurality of parallel grooves spaced from said non-parallel portions, said parallel grooves supporting said carriages.

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