US 20090145863A1

(19) **United States**

(12) **Patent Application Publication**

Kostigian

(10) **Pub. No.: US 2009/0145863 A1**

(43) **Pub. Date: Jun. 11, 2009**

(54) **CARPET DISPLAY RACK**

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(21) Appl. No.: **12/289,760**

(22) Filed: **Nov. 3, 2008**

(30) **Foreign Application Priority Data**

Dec. 7, 2007 (CA) 2,613,838

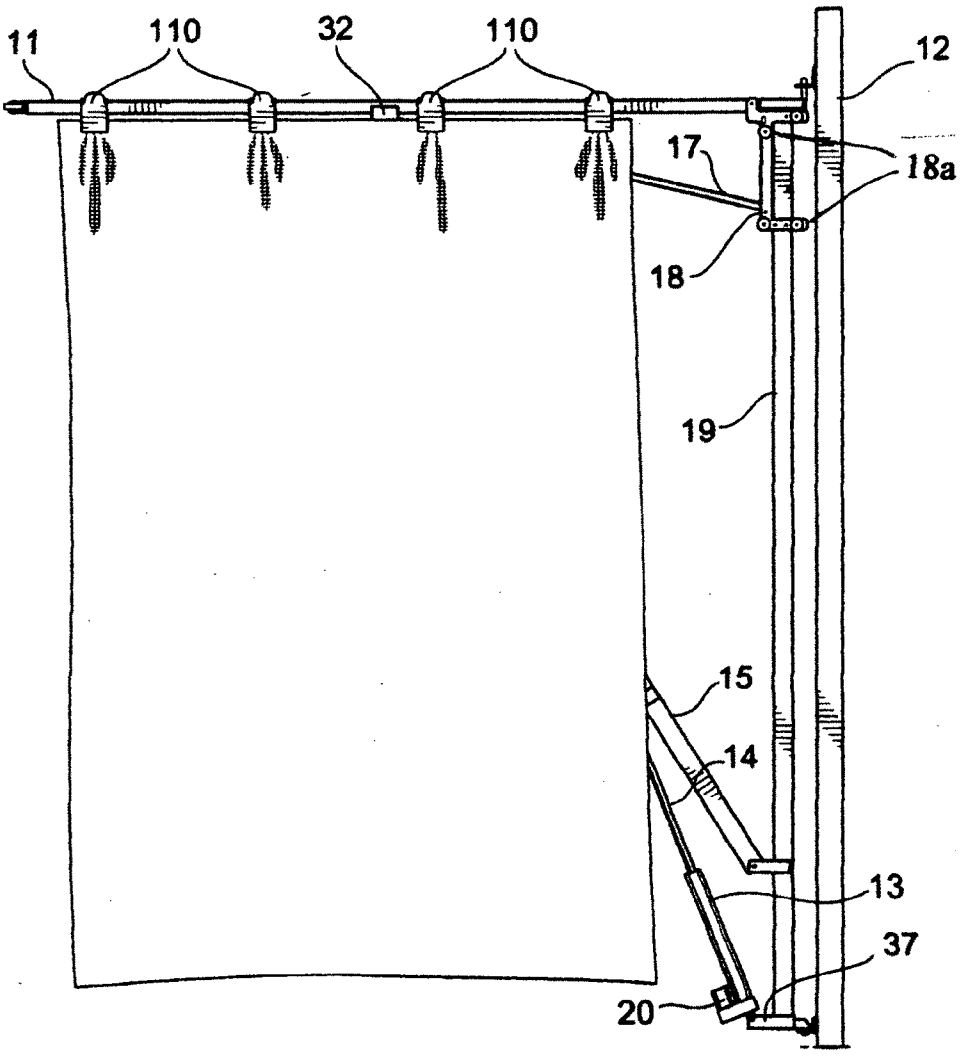
Publication Classification

(51) **Int. Cl.**
A47B 81/00 (2006.01)

(52) **U.S. Cl.** **211/41.1**

(57) **ABSTRACT**

A rack for hanging room sized carpets in show rooms. The rack has a plurality of uprights, each of which has a horizontal arm supporting a hanging carpet. The arm is adapted to be raised and lowered by a rod in a cylinder and the rod is driven by a motor or other means and the motor would be a gear drive type motor. The belt and motor-driven pulley are mounted on the rack.



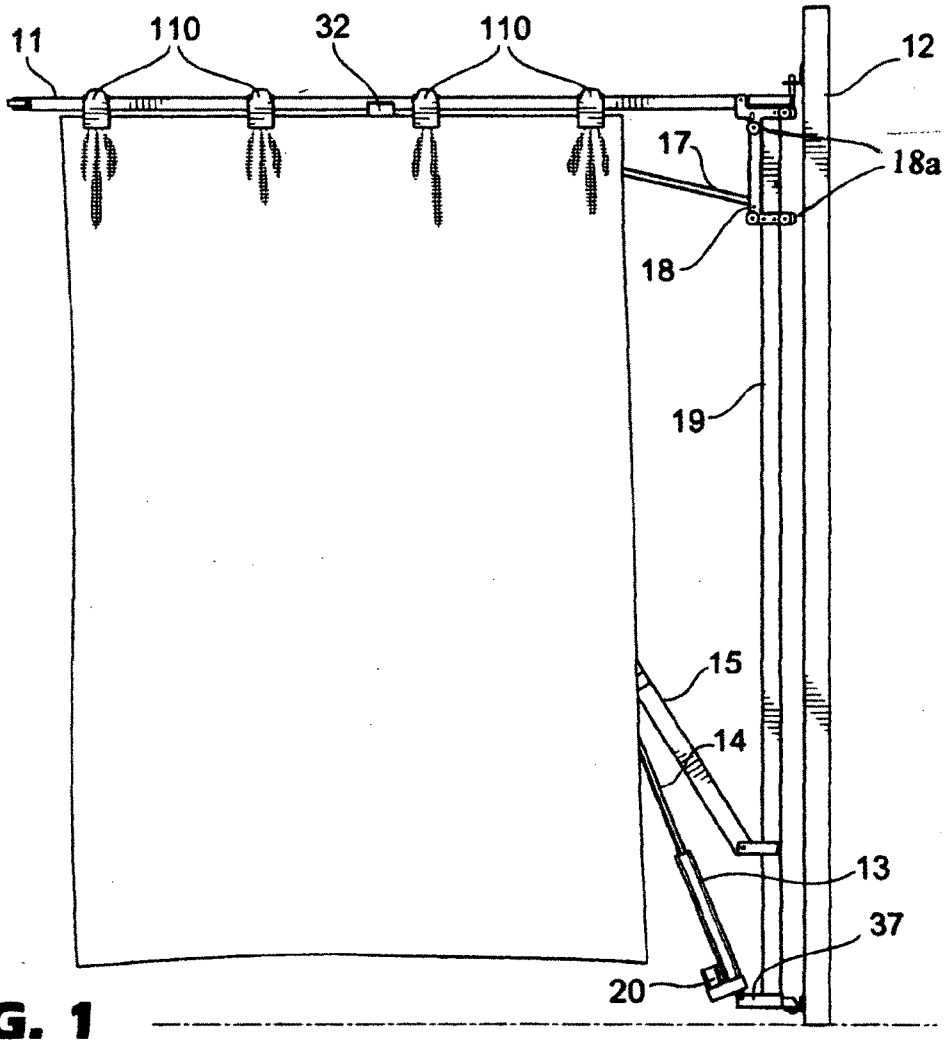


FIG. 1

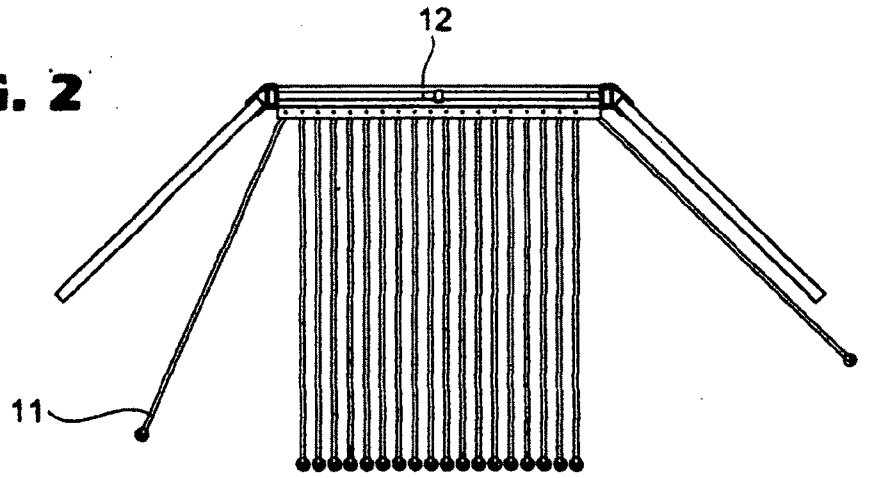


FIG. 2

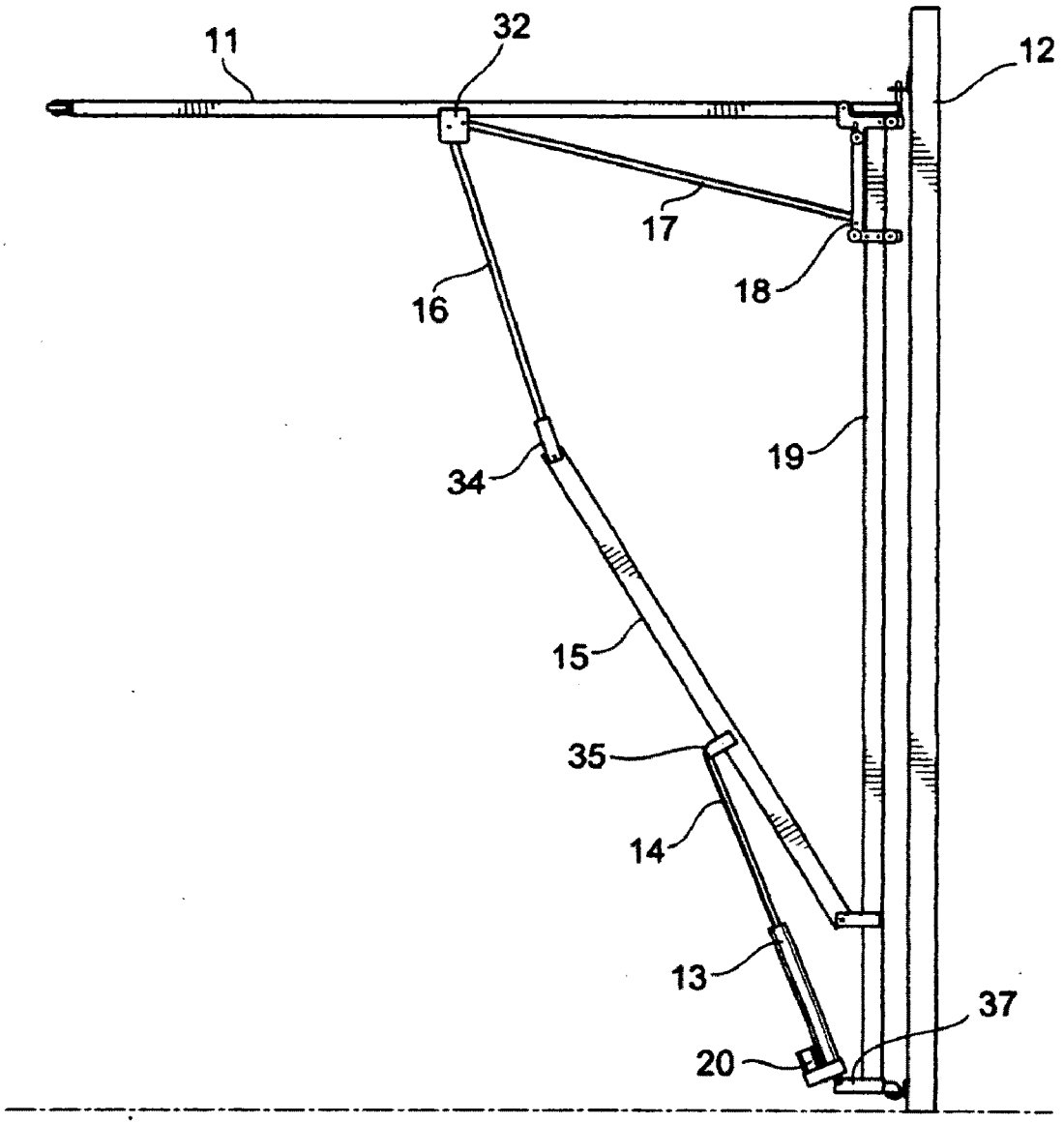


FIG. 3

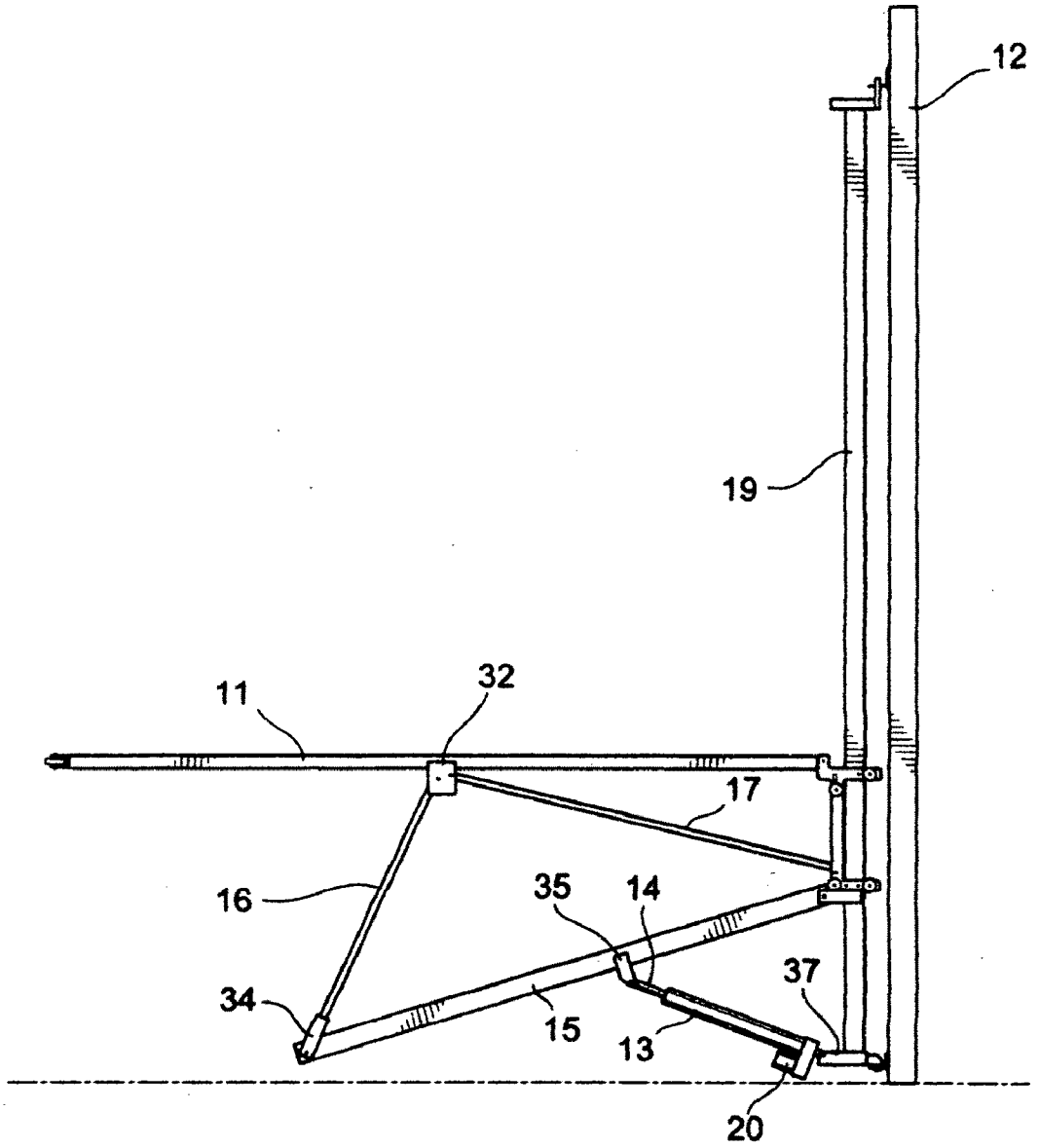


FIG. 4

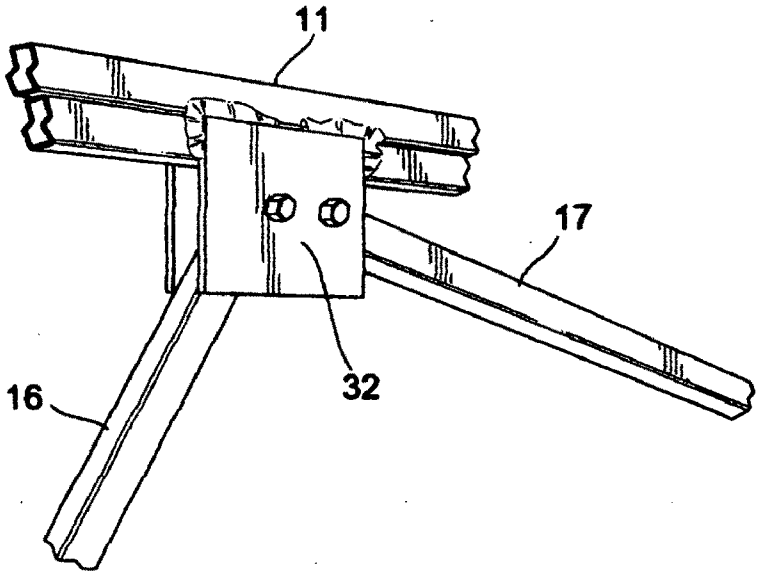


FIG. 5

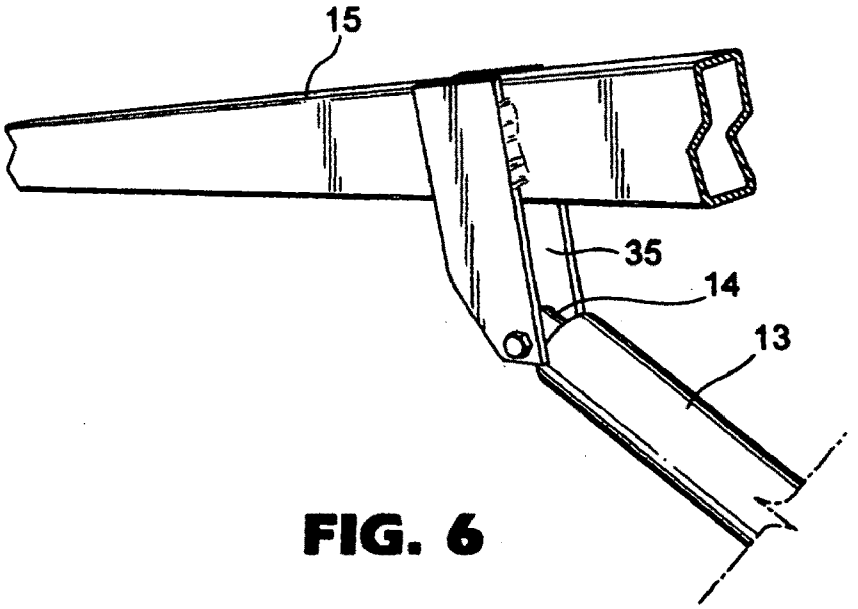


FIG. 6

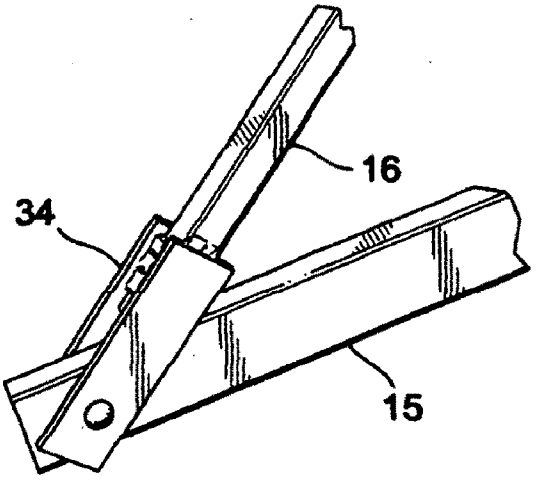


FIG. 7

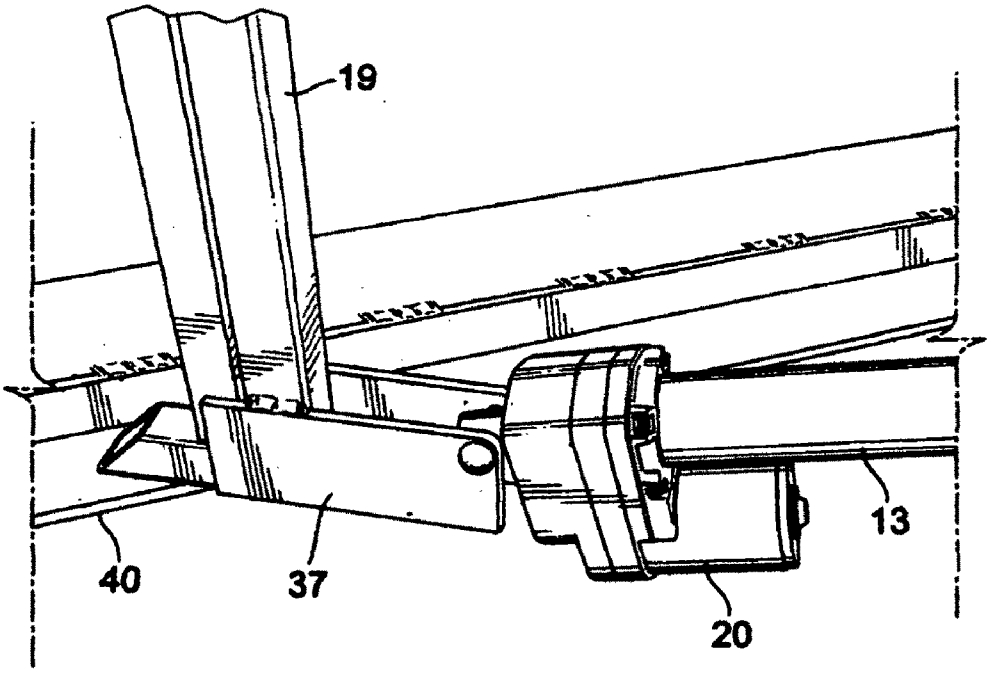


FIG. 8

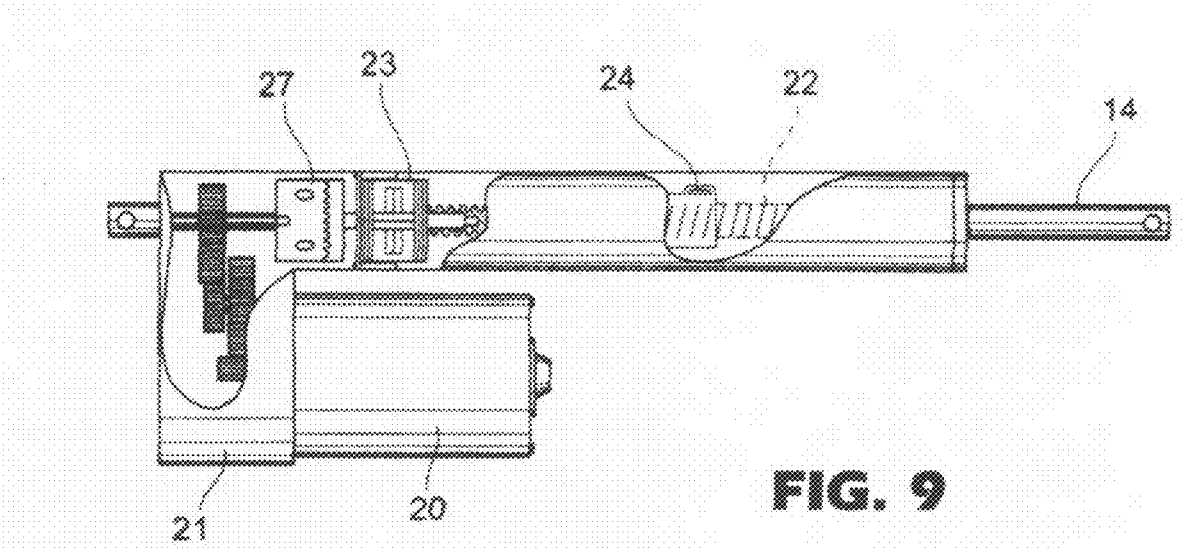


FIG. 9

CARPET DISPLAY RACK

[0001] This application corresponds to Canadian Patent Application No. 2, 613, 838 filed Dec. 7, 2007.

FIELD OF THE INVENTION

[0002] Rack device uses cables, pulleys and a winch mechanism to provide the lifting effort required to raise the carpet hanging bar. U.S. Pat. No. 2,000,336 uses a hand drawn rope to raise the This invention relates to display racks, and more particularly, to improvements in display racks for hanging room sized carpets.

[0003] It is desirable to have carpets hanging vertically in such a manner that each carpet can be viewed by a simple movement that requires a maximum of effort and uses retail space efficiently. This is achieved by raising the carpets and suspending from a vertical hanging bar and several of these hanging bars are placed in a row, spaced inches apart, and each hanging bar has capacity to hang two carpets, one on either side. Hanging bars typically are made to accommodate each size of carpet that is currently available on the market. The rugs or carpets are secured to the hanging bars in several different manners using, clips, piercing pins, clamping bars or the like.

[0004] The carpet hanging bars are held in a frame work that is either five standing and self-supporting or it is fastened onto the building. The frame system provides upper and lower pivot points that hold the overhung load of the carpet arms and provide a means for the arms to pivot side to side for viewing the individual carpets.

[0005] This invention seeks to provide a motor driven ball screw and a ball screw nut for raising a carpet hanging bar of a carpet rack.

[0006] This application is also concerned with lowering the carpet hanging bar so that an average person standing on the floor can fasten the caret to the arm and then raise the arm, and carpet, up to the height required for display. A similar device has been patented by Galt Display Rack, U.S. Pat. No. 5,292, 011. The difference between this patented device and the new apparatus described here is the method of raising the carpet hanging bars. The Galt Display caret hanging bar. Other prior attempts include those disclosed in U.S. Pat. Nos. 3,187,900, 3,330,418 and 3,315,813 W. Schneider.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. **1** is a side elevational view of the lever action rug rack of this invention.

[0008] FIG. **2** is a top plan view,

[0009] FIG. **3** is a side view of the rack in the raised position,

[0010] FIG. **4** is a side view of the rack in the lowered position,

[0011] FIGS. **5**, **6**, **7** and **8** are perspective views of the connection between frame members, and

[0012] FIG. **9** is a side view partly in section of the drive cylinder for moving the levers of the rack.

[0013] Referring to FIG. **2** a cylinder **13** having an internal rod **14** is provided. The rod **14** can be extended from the barrel exerting a pushing force as the overall length of the two items increases. The rod **14** is caused to extend from the barrel **13** by being forced from its base by means of either a mechanical screw, hydraulic fluid or pneumatic pressure applied within the barrel assembly. Both the barrel **13** and rod **14** provide separate means of attachment to an external frame work **12** which both supports the cylinder **14** and, more importantly, provides a method of applying the force produced to leaver arm **15**.

[0014] Referring to FIGS. **3** and **4** the construction and operation of the mechanism is as follows. The carpet hanging bar **11** is fastened to the coupling trolley **18** which has four wheels **18***a* in the corners that are located on each side of the vertical member **19**. The wheels provide friction free travel of the bar **11** as it travels from the lower position to the raised position, while vertical member **19** guides and supports the mechanism. The cross bar **17** provides a means of support that ensures that the bar II remains horizontal at all times. The cylinder barrel **13**, is pivotally connected by a pin to vertical member **19** and allowed to rotate around the pin connection during raising and lowering cycles cylinder rod **14** is pin connected to leaver arm **15**, and is also allowed to pivot, as necessary to allow movement of rod **14** and extends from cylinder barrel **13** as previously described above, and pushes on leaver arm **15** as the length of rod **14** in the barrel **13** increases to cause arm **15** to rotate upward on its pivotal connection **30** to move coupling **18** on member **19**. As arm **15** rotates upward it pushes on driver link **16**, which is connected to arm **15** and the bar **11** and therefore can rotate to allow the necessary motion and exert lifting force on the bar **11** to raise it on the vertical member **19** which is supported by horizontal member **40**.

[0015] The cylinder, comprised of the barrel **13** and rod **14**, is required to hold the load in position once raised. Therefore, the cylinder must be of a type that can not drift or leak down in periods of non use. For this reason it is desirable to use a cylinder that incorporates a screw type drive system for extending and retiring previously disclosed in U.S. Pat. Nos. 6,772,653 to Franksson and 4,934,203 to Bailey et al. It is not necessary to have a cylinder that produces a retraction force for lowering the bar **11**, but it necessary to control this down ward movement. This downward control is easily and economically delivered by the screw type cylinder which incorporates a brake mechanism **23**. It will be noted here that the entire operation described above can be achieved satisfactorily by using hydraulic fluid power or pneumatic pressure to extend and control the retraction of the cylinder.

[0016] As shown in FIGS. **5**, **6**, **7**, and **8** the pivotal connections **32**, **34**, **35**, and **37**, including pins, are reinforced by side by side plates secured as by welding to the arms **11**, **15**, **16**, and **19**.

[0017] Referring to FIG. **9**; the cylinder consists of an electric motor **20**, gear box **21**, ball screw, **22**, brake assembly **23**, ball screw nut **24** as well as the cylinder rod **14**, and cylinder barrel, **13**. Motor **20** converts electrical energy to mechanical force as it turns. The mechanical force is amplified through the gearbox, **21**. The amplified mechanical force is, in turn, applied to the end of ball screw **22** and as it turns causes ball screw nut **24** to be forced outward, and, because it is directly attached to the rod **14**, forces it out as well. The brake assembly **23** is self applying and suitably strong enough to hold the load.

[0018] As for the cylinder capacity; the carpet hanging bar **11**, must have a capacity of 250 pounds to be useful in the industry. The linkage incorporated to make the mechanism work influences a mechanical disadvantage on the cylinder and this 250 pound working load is amplified at the cylinder to 1450 pounds, at the point of greatest disadvantage. It is

therefore suggested that the cylinder be of a capacity of no less then 1800 pound of force to over come certain factional loads and guaranty sufficient service from the unit. Further more, the cylinder output needs to be limited to 1800 pounds of force since it is possible that a jammed or stuck member could cause and overload of certain structural pieces and subsequent failure. The load is limited by a clutch, **27** that will slip when the force limit is reached, thus protecting the entire mechanism from overload.

[0019] As previously mentioned, the cylinder could be of the above described electrical/ball screw design to supply the force required, or could be of the type that uses hydraulic fluid power or pneumatic pressure. In the case of either hydraulic or pneumatic type cylinder, a supply of the given medium would be required to generate the forces needed. For hydraulic cylinder a reservoir would hold sufficient oil to operate the system, a pump would draw oil from this reservoir and force it out to the cylinder via a controlling valve system. The controlling valve system would have capability to stop the flow of oil from the pump to the cylinder while simultaneously holding the oil in the cylinder stopping its motion and holding the load, i.e. the rug bar, at any given height. The valve would then be engaged to send oil in one direction to raise the load or in the other direction to lower the load. In the case of lowering the load the valve would need to be of a design to restrict the flow of oil, from the cylinder to the reservoir in a controlled manner that will prevent the load from dropping too quickly. The valve could be controlled manually or remotely through electrical or other means. Because of the risk of freefall due to a ruptured hose or fault in the system, there would be a safety device required at the base of the cylinder to prevent the load from falling uncontrollably, and to hold the load from drifting lower over time due to inherent leakage in the system. A pneumatic system would have all the same considerations as listed for hydraulic based system, but require a source for compressed gas, i.e., Carbon Dioxide or compressed air created on site. The complexity of the above described system, as well as the possibility of undesirable dirt in the retail environment; it has been decided to pursue the electrically operated linear actuator at this time.

[0020] The carpets are conveniently fastened to the bar **11** by carpet clips **110** as shown in FIG. **1**.

We claim:

1. A display rack for hanging carpets comprising:

an upright support member, an arm assembly including a horizontal member, a rod in a cylinder connected to said horizontal member and a motor for moving said rod in and out of said cylinder to move the horizontal bar from a lowered position to an upper display position.

2. A display rack for hanging carpets comprising:

an upright support member, an arm assembly including a horizontal member, a diagonal brace, an upper horizontal support bar, a lower roller on an end of a diagonal brace bearing on an upright support, a first lever pivotally connected to said upright and to second lever pivotally connected to the horizontal bar for moving from an upper stored position to a lowered position

3. A display rack for hanging carpets comprising: an arm assembly including a horizontal member on an upright support member, a motor driven screw and a screw nut for raising the horizontal bar from a lowered position to an upper display position

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