Aug. 18, 1953 K. C. JONES ET AL 2,649,279

RUG HANDLING MECHANISM

Filed Sept. 29, 1948 2 Sheets-Sheet 1

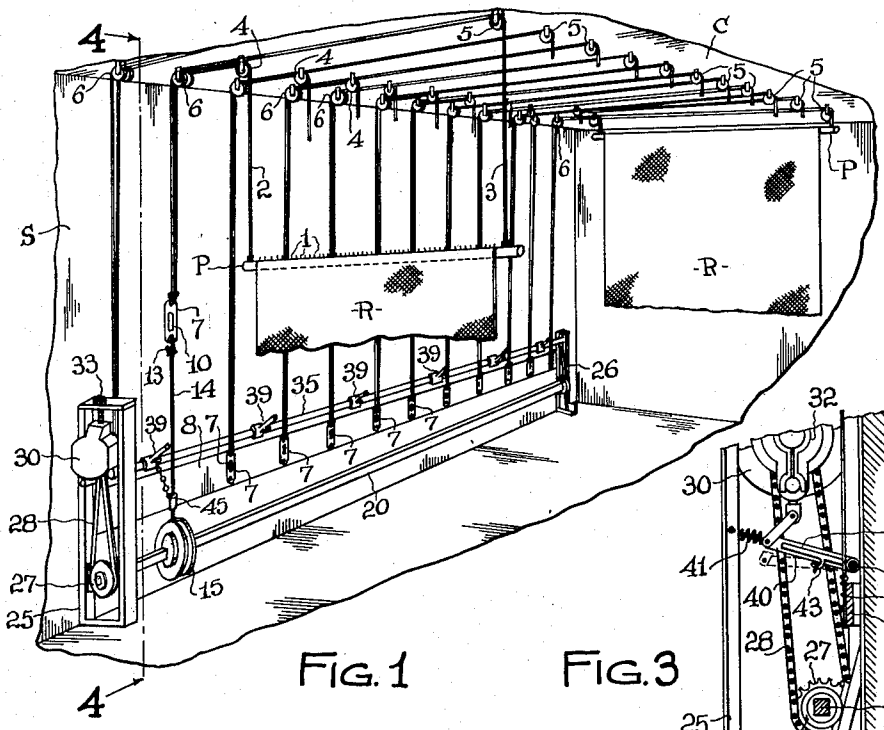


FIG. 1

FIG. 3

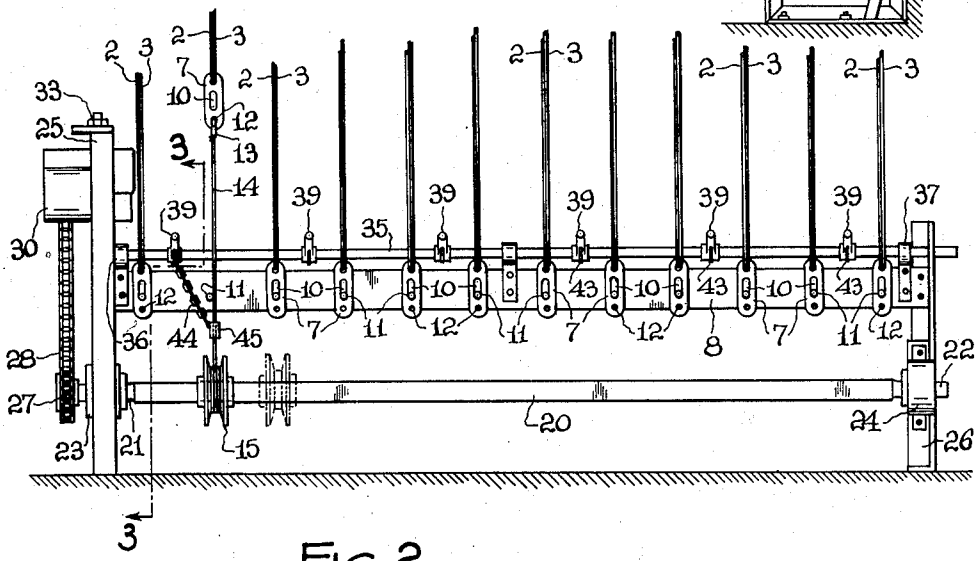


FIG. 2

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RUG HANDLING MECHANISM

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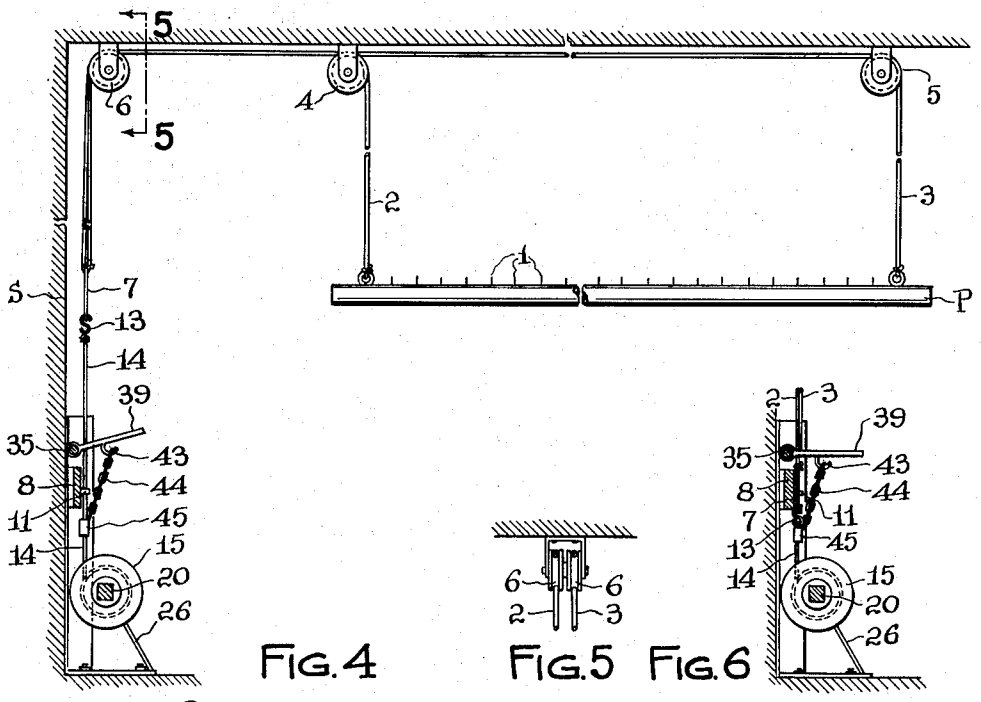


FIG. 4

FIG. 5

FIG. 6

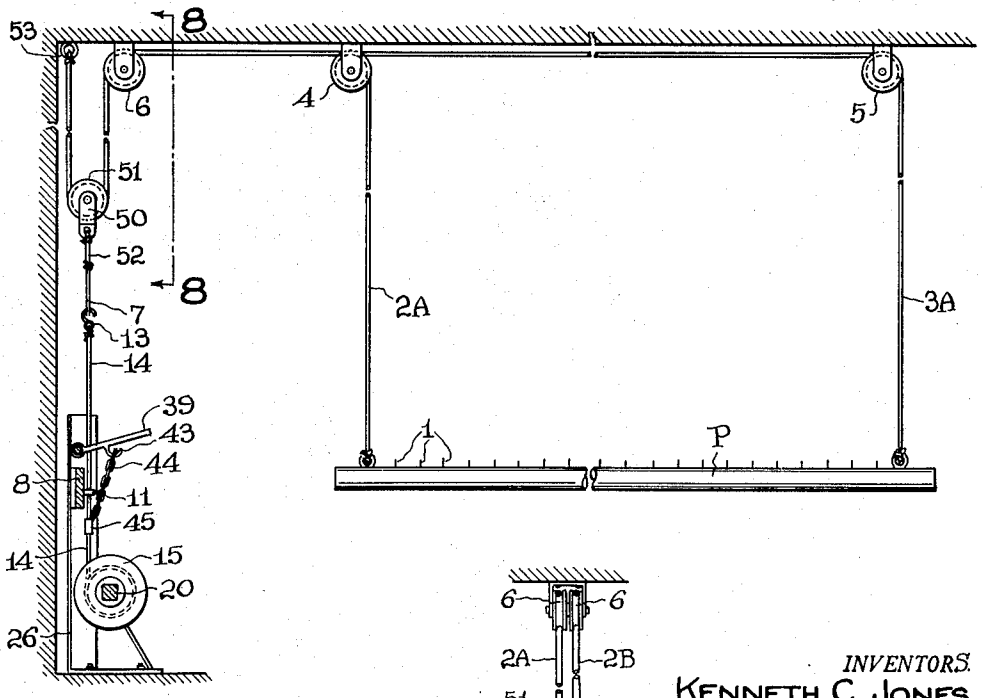


FIG. 7

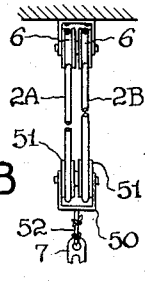


FIG. 8

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2,649,279

RUG HANDLING MECHANISM

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Application September 29, 1948, Serial No. 51,716

10 Claims. (Cl. 254—144)

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This invention relates to means to facilitate the handling and drying of rugs or like articles and more particularly to means for selectively raising, suspending and lowering a plurality of rugs in a drying room or chamber.

It is among the objects of our invention to facilitate the handling of rugs and the like for the purpose of drying the same after they have been cleaned as by scrubbing or washing. Another object is to provide means for selectively raising and lowering rugs in a drying room with the minimum manual effort and maximum safety and convenience for the persons carrying out the work. Another object is to facilitate the handling of wet and heavy rugs or fabrics for the purpose of drying the same while preserving them against injury or soilage during the handling and drying operations. Another object of our invention is to provide means for a rug drying room by which any desirable number of rugs or objects to be dried may be suspended from one of its edges near the ceiling of the room and secured in its suspended position or raised and lowered therefrom independently of all the other rugs similarly suspended with the aid of a single source of power and by the selective application of the source of power to the raising or lowering and suspending means. Another object is to provide mechanism to protect the operator and the apparatus and rugs or objects being handled from injury. Another object of our invention is to provide power actuated rug handling mechanism of simple and rugged construction, facile and efficient in operation and economical to make and use.

Other objects and advantages will appear from the following description of a preferred and modified form of our invention, reference being had to the accompanying drawings in which Figure 1 is a perspective and partly diagrammatic and fragmentary view of a drying room having our rug hoisting and handling apparatus, parts of which are broken away to facilitate disclosure of like parts shown in full; Figure 2 is an elevation of the lower parts of our hoisting mechanism, the hoisting cables being broken away at about mid-height; Figure 3 is a broken partial transverse sectional view taken along the lines 3—3 of Figure 2; Figure 4 is a transverse sectional view in the opposite direction taken along the line 4—4 of Figure 1, reaching to and including the full height of the hoisting mechanism including the portion at the ceiling of the drying room; Figure 5 is a sectional view taken in the plane of the line 5—5 of Figure 4; Figure 6 is a partial transverse section similar to Figure 4 but

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showing only the lower parts of the mechanism with the hoisting cable in its lowermost position; Figure 7 is a view similar to Figure 4 but showing a modified form of our invention with a different arrangement of hoisting cable and sheaves, and Figure 8 is a sectional view taken in the plane of the line 8—8 of Figure 7.

In the art of cleaning rugs, after they have been scrubbed and rinsed, they are heavy and awkward to handle and it is beneficial to a successful operation of a rug cleaning enterprise that the rugs be dried without soilage and in a position to facilitate their smooth unwrinkled even contour and appearance. To bring about efficient drying of rugs in the condition above suggested it is desirable that they be suspended vertically adjacent the ceiling of a drying room in which sufficient heat and circulation of air is provided. Since the rugs to be dried in a commercial rug cleaning establishment will vary widely in size and shape and also in respect to their ability to retain moisture it is eminently desirable that provision be made for raising or lowering any selected one of a plurality of rugs in the order of their drying rather than in the order in which they have been raised to drying position. To carry out the objects of our invention with a preferred form of apparatus shown and suggested in Figures 1 to 6, we provide poles P, see Figures 1 and 4, upon which the end of a rug R may be secured as by the penetration of a plurality of pins 1 so that the rug may be suspended from one end as shown in Figure 1. To facilitate the attachment and detachment of the rugs R to the poles P it is advantageous that the poles be lowered close to the floor of the drying room where the rugs are conveniently brought to and from the room on trucks or dollies at or about floor level. After a rug is attached to a pole, the pole is raised while being retained in its desirable horizontal position to an elevation closely adjacent the ceiling C of the room where the drying may be effected by known means such as heaters, fans and ventilators, not shown. It is also recognized as being desirable that the height of the ceiling of the room be such that when the largest size rug to be dried has been raised to its uppermost position that the lower edge of the rug will not be substantially less than "head height" above the floor of the room so that operators may walk beneath the suspended rugs wherewith to attach and detach other rugs to and from various poles and raise and lower them to and from their drying positions. In a drying room there will or may be provided as many of

the poles P as is desired consistent with sufficient spacing therebetween to facilitate air movement and drying of the rugs suspended therefrom. Although in Figure 1 only two of the poles P and rugs R are shown it will be understood that the other poles and part of the suspending cables therefor have been omitted from the drawing merely for the sake of clarity.

To raise and lower, i. e. to suspend, each of the poles P cables, preferably rustless wire ropes, are provided to be attached to each end of the poles, such as the cable 2 at the near end and the cable 3 at the far end of each pole, which cables pass over sheaves 4 and 5 respectively, vertically aligned with the ends of the poles, and then pass parallel with the ceiling C or the room where they pass together over pairs of sheaves 6, see Fig. 5, and thence downwardly adjacent the side wall S of the room where each pair of cables 2 and 3 are secured to terminal plates or straps 7. The blocks for the sheaves 4, 5 and 6 are well secured to the ceiling C or to joists thereof or such structurally sufficient means as may be necessary to support the loads imposed thereon. The straps 7 are releasably secured to a longitudinally and horizontally extending panel and anchor member 8 adjacent the walls to hold the poles and/or their load in their uppermost raised position. As shown in Figure 1 a plurality of strap members 7 are shown secured to the anchor panel 8 whilst one of them, leftwardly in Figure 1, is shown in an intermediate position whilst its corresponding pole P is also in an intermediate position. Thus as shown in Figs. 1 and 2 there are provided twelve pairs of cables 2 and 3 and twelve sets of sheaves 4, 5 and 6 with the corresponding twelve terminal plates or straps 7, the latter all releasably secured or securable to the anchor member 8. This is, of course, illustrative of any desirable number of suspending systems comprising pairs of cables, poles, straps, etc., depending upon the size of the room and the spacing desired between rugs when they are raised to their drying position.

We turn now more particularly to the means wherewith power is made available to facilitate the raising and lowering of the rugs that have been loaded on one or another of the poles P. As shown more particularly in Figs. 2 and 4, each of the terminal straps 7 has an upper eyelet where a pair of the cables 2 and 3 are attached, a central elongated opening or eyelet 10 which is adapted to receive a corresponding anchor pin 11 secured in and protruding from the anchor member 8, and each of the terminal strap plates 7 also has a lower eyelet 12 which is adapted to removably receive a hook member 13, see Figure 4, attached to the upper end of a cable 14, the body of which is wound onto a winding reel 15. In the operation of our invention the cable 14 of the winding reel 15 is attached to the lower eyelet 12 of any one of the straps 7 and upon the reel 15 being turned in a direction to induce tension in the cable 14 the strap 7 is moved downwardly a little with respect to the pin 11 so that it may be freely removed from the pin and thereafter upon reversal of the movement of the winding reel 15 the strap 7 along with the lower end of the cables 2 and 3 may be raised with the lowering of the pole P of the corresponding system. Conversely when it is desired to raise one of the poles P with its burden of the suspended rug the winding reel is rotated in a direction to wind in the cable 14 thereby drawing the corresponding strap 7 and adjacent cable ends downwardly and raising the pole and its burden. When the plate 7 has come down to approximately the same level as the corresponding pin 11 in the member 8 the winding reel is stopped and the strap 7 moved over into engagement with the corresponding pin 11 whereupon backing the reel 15 permits the strap to be engaged by the pin thereby securing the load in its uppermost position. The pins 11 are sloped downwardly or notched enough to insure retention of the straps 7 thereon while the cables 2 and 3 are stressed in tension.

The reel 15 is non-rotatably and longitudinally slidably mounted on a shaft 20 which extends the full length of the panel 8 and hence the full longitudinal distance occupied by all of the cables, straps and poles of the several rug raising and lowering systems. By this means the reel 15 along with its cable 14 may be selectively positioned longitudinally of the whole mechanism wherewith to be connected with any one of the several straps 7 and raise or lower that strap from its lowermost secured position, lower and raise any of the poles P or any of the rugs carried thereby at any time. The shaft 20 has its ends 21 and 22 journalled in appropriate bearings 23 and 24 respectively which in turn are supported in frame structures 25 and 26 (see also Figures 3 and 4) whereby to dispose the shaft 20 substantially parallel with the adjacent wall and floor of the drying room and parallel with the panel 8 and parallel with the horizontal plane in which the pins 11 are disposed. The frames 25 and 26 are preferably firmly secured to the adjacent wall and floor. The shaft 20 has secured to its ends 21 a driving sprocket 27 which is engaged by a driving chain 28 driven through hoist gearing and motor 30, the latter being carried in the upper portion of the frame structure 25. Preferably the hoist and motor are adjustably suspended by and from a bolt and nut 33 wherewith to facilitate adjustment of the tautness of the driving chain 28. The motor 30 is preferably of the reversible type whereby torque may be applied to the shaft 20 in either direction. Associated with the motor 30 is preferably an automatic spring actuated solenoid releasable brake 32 by virtue of which the motor shaft and the shaft 20 will automatically be secured against rotation except under the influence of motor torque when the motor is excited and caused to drive the shaft positively in the direction chosen for its rotation. The brake solenoid is connected on the motor side of the starting switch.

To control the motor 30 we provide a rotatably supported shaft 35 which preferably extends the whole length of the mechanism having its ends journalled respectively in the upper portions of the frame structures 25 and 26 as at 36 and 37, see Figures 4 and 3 respectively, so that the motor may be conveniently controlled by the operator wherever he may be working between the frames 25 and 26 of the machine, i. e. anywhere longitudinally of the shaft 20 and the panel 8. For this purpose we also provide a number of shaft actuating lever handles 39 spaced conveniently along the whole length of the shaft 35 and preferably located between alternate pairs of straps 7 and cables 14, as shown, but in all events so located that each cable is adjacent a lever 39.

The leftward end of the shaft 35, as viewed in Figure 2, is connected with linkage 40 to the starting switch of the motor 30. Preferably a

spring 41 interconnected between one of the members of the frame 25 and the linkage 40 tends to hold the shaft 35 in a neutral position holding the motor switch open and the motor brake applied except during such times as the shaft is forcibly rotated by the handles 39 to one position or another against the stress of the spring 41. Preferably the switch connections of the motor are such that moving any of the handles 39 upwardly as viewed in all the figures will cause the motor to rotate the shaft 20 and the reel 15 counterclockwise, as viewed in Figure 4, whereby to pay on the cable 14 and raise a pole P and/or the pole with its load. Conversely depressing any one of the handles 39 below its neutral position, shown approximately in Figure 4, will energize the motor 30 to rotate the shaft 20 in a clockwise direction, as viewed in Figure 4, whereby to pay out cable 14 thereby lowering the corresponding pole P and/or the pole and its load.

To prevent the shaft 20 and reel 15 from raising any one of the poles P to a greater height than is desired and/or to bring the pole or pole and rug into interference or harmful contacts with the sheaves 4 and 5 or to over-stress or damage any one of the systems or rugs, we have provided a safety device through which any one of the handles 39 will be forcibly drawn downwardly to a position stopping rotation of the shaft 20 in the event any one of the straps 7 tends to be drawn substantially below the level at which it may be conveniently hooked on to one of the pins 11. To this end each of the handles 39 has on its lower side an open hook 43 which is capable of removably receiving one of the links at the end of a short chain 44 so that tension exerted through the chain 44 will tend to draw the lever or handle 39 downwardly regardless of the intention or inattention of the operator. The other end of the chain 44 is connected to a sleeve 45 which freely and slidably receives the cable 14 and through which the cable is free to pass. Thus when the cable 14 is being payed on or off the reel 15 it passes freely through the sleeve 45 exerting substantially no effect on the chain 44, but when the cable 14 has been reeled in to the point where a strap 7, or the cable connection directly below the strap 7, contacts the sleeve 45 then the chain 44 is placed in tension and further downward movement of the cable pulls down the corresponding handle 39 thereby stopping the motor and preserving the system and load. The chain 44 along with the sleeve 45 being slidably but permanently connected with the end of the cable 14, the chain must be removed from the hook 43 of the handle 39 of the next preceding operation when the operator elects to slide the reel 15 along the shaft 20 to engage the strap 7 of that system of cables and sheaves which supports whichever pole P he next desires to lower. The operator then removably connects the upper link of the chain 44 to the hook 43 of that one of the levers 39 adjacent the system and strap he wants to use for lowering a pole or pole and rug.

In this form of our invention the anchor panel 8 preferably stands about waist high of the operator so that the straps 7 may be conveniently reached for detachment from or attachment to the corresponding pin 11 and so that the shaft 35 and the operating handles 39 will be conveniently within the reach and grasp of the operator regardless of his position longitudinally of the whole apparatus. This disposition of the panel 8 requires that the poles P of each system of sheaves and cables can only be lowered to a distance above the floor of the drying room not substantially lower than the height of the panel 8. In practice this height is generally conveniently sufficient to admit an easy attachment to and detachment of the rugs R to or from the pins 1 of the poles P as the same are loaded or unloaded with respect thereto. X frames or other floor borne supports or steady-rests for the poles may advantageously be provided to receive the ends of the poles in their loading and unloading positions.

To give greater facility and latitude of operation both with respect to the height of the panel 8 and with respect to the proximity with which the poles P or any of them may be lowered to the floor level we have provided a modified cable and sheave system as shown in Figures 7 and 8. In these figures all of the parts designated by like reference numerals are the same as those mentioned above, the difference comprising essentially the disposition of the cables 2A and 3A which correspond otherwise to the cables 2 and 3 mentioned in reference to the preceding figures. In the modified form shown in Figures 7 and 8 both of the cables 2A and 3A are anchored at their ends remote from the pole P as at 53 to or adjacent the ceiling of the room and adjacent the sheaves 6. Between the anchors 53 and the sheaves 6 the cables 2A and 3A pass under and around a pair of sheaves 51 carried in a sheave block 50 which block in turn is connected by a link or cable 52 with a strap 7 which strap in turn is connected to the cable 14 by the removable hook member 13 as heretofore described. The result of this connection is that one unit of movement of the cable 14 is reflected in two units of movement of the ends of the cables 2A and 3A which are connected with the pole P whereby to permit a greater relative movement of the pole with respect to the cable 14 and necessarily with respect to the rotation of the shaft 20 and the reel 15. This form of connection facilitates the wider range and choice of disposition of the panel 8 and pins 11 with respect to the height of the operator; it being practicable to raise the height of the panel 8 approximately to shoulder height if that be desirable and at the same time retain as great or greater range of movement of the pole P particularly with respect to the floor of the drying room. Especially where very large rugs are to be attached to the poles P and raised to ceiling height in their drying position it is advantageous that the poles may be lowered approximately to the level of the floor of the room where the wet rug may well be brought into the room on a low dolly. Similarly in unloading a large heavy rug from one of the poles P it is often advantageous both from the point of view of the operators and from the point of view of preservation of the rug to have the pole P in a very low position wherewith to facilitate the attachment of the end of the rug to or removal of the end of the rug from the pins 1 of the pole while all of the parts are free or relatively free from tension and strain. In using the systems shown in Figs. 7 and 8 the poles will tend to travel twice as fast as in the direct connected systems of Figs. 1–6, and where this might tend to overload the motor 30 a larger sprocket 27 may be employed to restore the mechanical advantage if that be desired.

In the operation of our invention in either of its forms it is eminently practicable that the

heavy wet rugs may be brought into the drying room under any of the rugs R that may theretofore have been suspended therein as suggested in Figure 1 and thereupon the operator need merely slide the reel 15 along with the cable 14 and chain 44 to that one of the systems of cables, etc., that are free to receive the rug to be dried. The operator first connects the cable 14 to the straps 7 of the chosen system of cables and sheaves, and by depressing the proximate handle 39 causes the reel 15 to unwind and the corresponding pole P to descend until the pole reaches its lowermost position or such a lowered position as to be conveniently adjacent the end of the rug to be dried. Thereupon the end of the rug is pierced with the several pins 1 of the pole and when the rug has been securely attached to the pole the operator by raising the handle 39 will thereupon cause the reel to wind in the cable 14 and raise the pole and the rug attached thereto to its desired elevated position substantially as shown in Figure 1. If the operator's attention should be diverted or if for any reason he failed to lower the handle to limit the upward movement of the pole and rug, the safety chain 44 first having been attached to the hook 43 of the handle will stop the upward progress of the pole and insure that the rug is positioned in its desired uppermost safe position relative to the sheaves 4 and 5 and to the ceiling of the drying room. Thereafter unloading a dried rug requires essentially a reversal of procedure. Particularly during the lowering movement of the rug the operator is able to retain accurate and complete control of every increment of movement thereof so that if he or his companions have any difficulty in causing the rug to take a position on the dolly or truck upon which it is being lowered the operator may always stop the lowering movement or reverse it whichever is most advantageous to the careful, clean and efficient handling of the rug.

While we have shown a unitary mechanism with twelve systems of cables, sheaves, etc., employed with the anchor panel and shafts between the end frames 25 and 26 and have mentioned that more or less cable systems may be employed in any single unitary mechanism with a single motor and control, we also contemplate that supplemental or extension units may be added on and connected at either end to any primary power driven unit, such as the unit herein illustrated, as by coupling extensions on the driving and control shafts, extending the anchor panel and providing outboard or remote bearings and supports therefor as by frames similar to the frame 26. Such extension units would preferably also comprise a second reel for the extension shaft with its own cable corresponding to the cable 14 for coaction with such additional, cable sheave and pole systems as would be associated therewith.

While we have illustrated and described a preferred and a modified form of our invention, changes, modifications and improvements will occur to those skilled in the art who come to be acquainted with the advantages thereof and the precepts of this specification and we do not care to be limited to the particular and preferred forms of our invention herein illustrated and described nor in any manner other than by the claims appended hereto.

We claim:

1. Selective hoisting mechanism having a plurality of hoisting systems with parallel spaced vertically disposed independently operable cables, comprising terminals secured to each cable, a plurality of anchors disposed in vertical alignment with said cables and releasably engageable with said terminals, a horizontally extending driving shaft disposed below said anchors, means for driving said shaft rotatably, a control shaft extending coextensively of and adjacent said anchors and connected with said means through which the latter may be caused to rotate said shaft, a plurality of operating levers on said control shaft spaced throughout the length thereof, a reel longitudinally slidably and non-rotatably mounted on said driving shaft and a cable attached on said reel and having a free end removably attachable to any one of said terminals.

2. Mechanism according to claim 1 with automatic brake means for holding said driving shaft against rotation except when said first named means is activated to rotate said shaft.

3. Mechanism according to claim 2 with yielding means tending to hold said control shaft in a neutral position and cause said brake means to hold said driving shaft against rotation.

4. Mechanism according to claim 1 with end frames supporting bearings in which said shafts are journalled and supporting said anchors.

5. Mechanism according to claim 1 with a chain removably attachable to said operating levers and having a sliding attachment with said cable, said attachment permitting said cable to pass therethrough but preventing the passing therethrough of said terminals whereby movement of terminals beyond the length of said chain induces movement of said operating lever.

6. Mechanism according to claim 1 with means detachably connectable with any one of said operating levers and having a free sliding connection with said cable and having a non-sliding relation to any one of said terminals.

7. Selective hoisting mechanism comprising a plurality of cable systems including parallel spaced vertically disposed independently operable parts, terminal straps secured to the end of each cable and having apertures therein, a horizontally disposed anchor member having a plurality of anchor pins horizontally aligned and disposed respectively in spaced vertical alignment with said systems and releasably engageable with said terminal straps respectively, a horizontally extending driving shaft disposed below said pins, means for driving said shaft rotatably in either direction of rotation, brake means for holding said shaft against rotation, a control shaft disposed parallel with and coextensive of said anchor pins and connected with said driving means, a plurality of operating levers on said control shaft spaced throughout the length thereof, a reel longitudinally slidably and non-rotatably mounted on said driving shaft and a cable attached on said reel and having a free end removably attachable to any one of said terminal straps.

8. Mechanism according to claim 7 which includes means detachably connected to one of said levers and responsive to movement of a corresponding strap beyond a predetermined point to actuate said lever.

9. Mechanism according to claim 7 in which at least one of said systems includes a floating block and sheave connected to said operable part and a cable anchored at one end thereabove and passing under and around said sheave.

10. In a rug drying room, rug hoisting mechanism comprising horizontally suspended rug car-

rying poles, cables connected to the ends of said poles, sheaves over which said cables pass guiding said cables to vertical paths beyond the ends of said poles, terminal members for said cables, anchors for said members, a driving shaft below said anchors, a reel non-rotatably and slidably mounted on said shaft, a cable secured to said reel and detachably connectable with any one of said members, means for selectively driving and braking said shaft, and a control shaft for said driving and braking means extending longitudinally of said anchors, operating levers on said control shaft adjacent the path of each said terminal members and means actuable upon movement of any one of said cables beyond a predetermined point for actuating said control shaft.

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