

Oct. 8, 1968

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3,404,794

ROLLED CARPET HANDLING TRUCK

Filed June 26, 1967

3 Sheets-Sheet 2

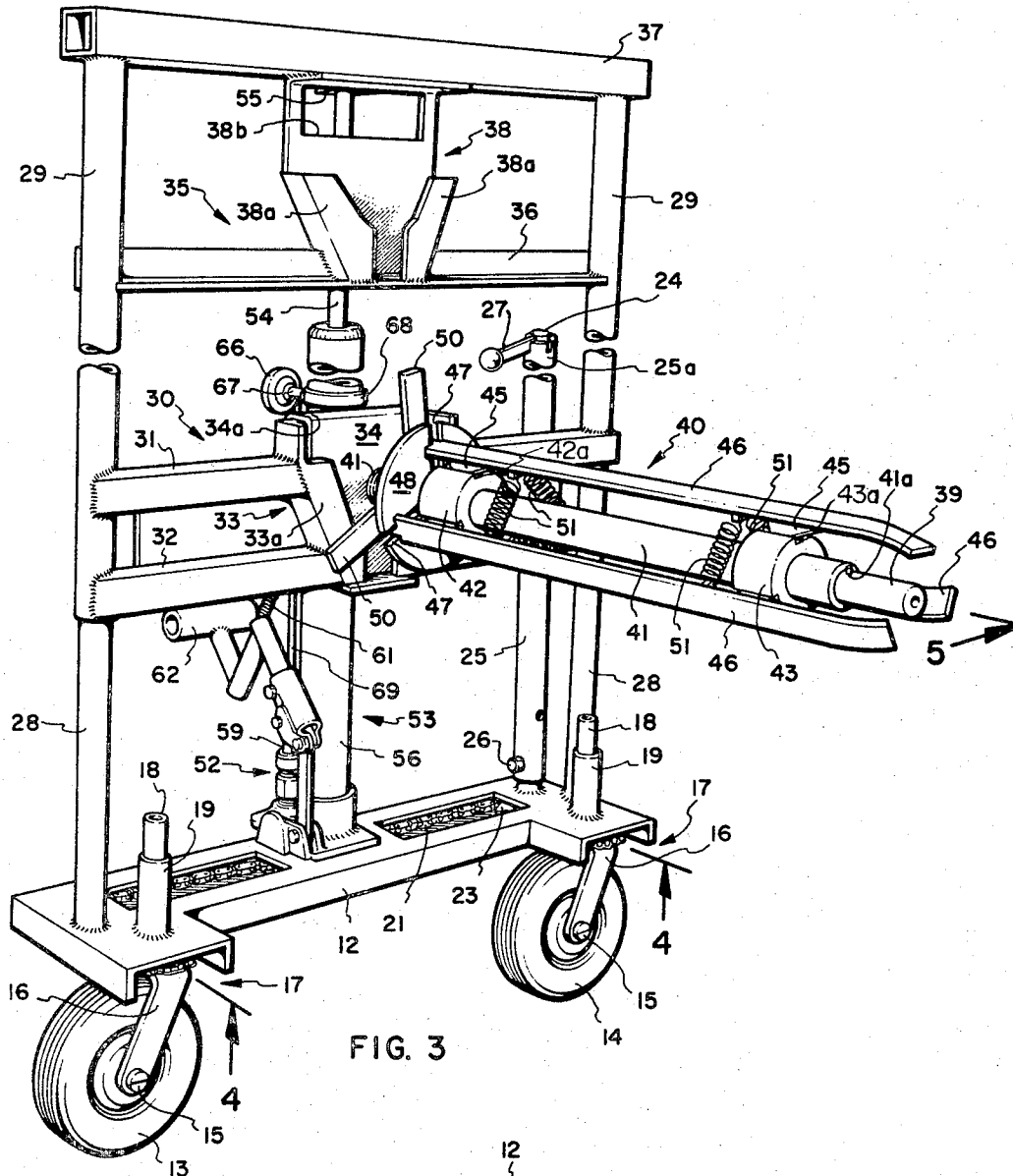


FIG. 3

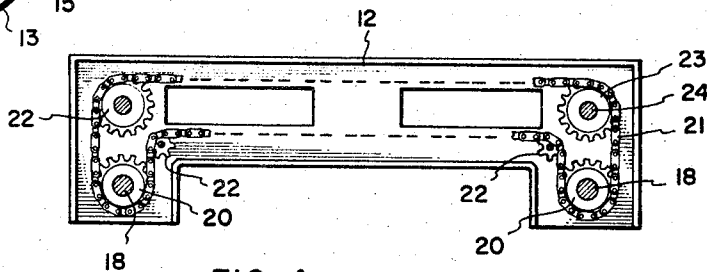


FIG. 4

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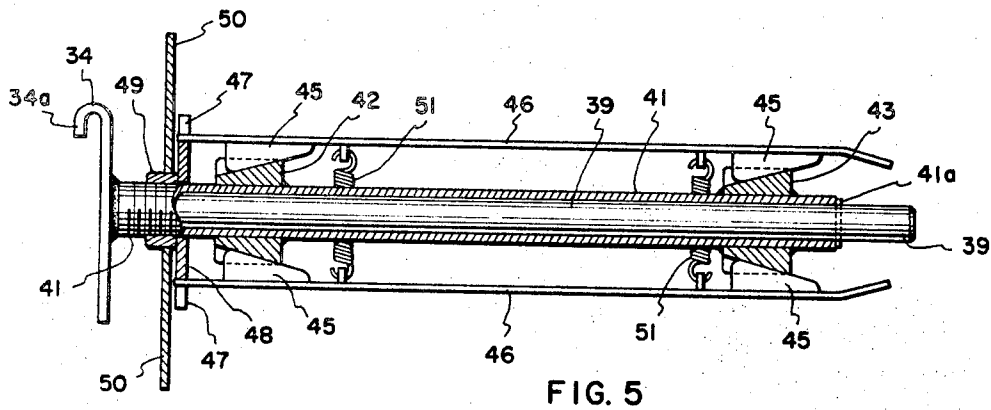
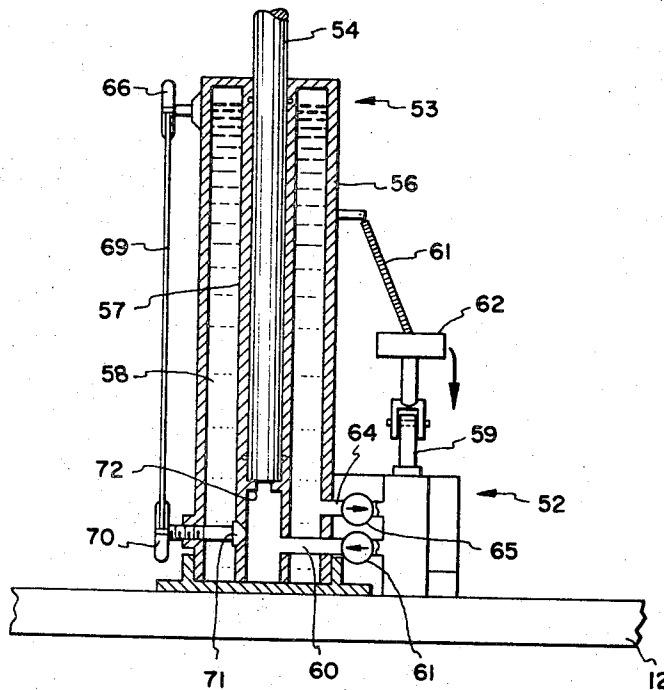
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ROLLED CARPET HANDLING TRUCK
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Filed June 26, 1967, Ser. No. 648,770
8 Claims. (Cl. 214—653)

ABSTRACT OF THE DISCLOSURE

A truck for handling rolled carpet and the like including a pump for elevating the carpet and upper and lower crossheads adapted to have an expander arm selectively affixed thereto. The expander arm is adapted to fit tightly within the tube on which the carpet is rolled. A pair of the trucks are used together, one at each end of the rolled carpet, and with their adapter arms affixed to the lower crossheads the carpet roll can be raised to a predetermined height by operating their pumps. While using independent means to support the roll at the predetermined height, the adapter arms can be removed by lowering the crossheads and can be re-affixed to the upper crosshead, so that the carpet roll will be raised to a greater height when the pumps are again operated.

Brief description

Carpet manufacturers usually provide carpeting to distributors and dealers in rolls weighing about 500 pounds each, and these rolls must be moved during shipping and for proper display by the dealer. The principal reason that larger rolls are not used is that in the past it has not been practical to attempt to handle rolls of such bulk and weight. As a result, as many as three or more carpet end pieces may be left after an installation using three or more separate rolls, whereas only one would have resulted had the plurality of rolls been combined into one larger roll.

There is, therefore, a need for equipment capable of easily handling such large rolled carpets, as well as the smaller size rolls more commonly available.

Because of the limited storage and display space available to most distributors and dealers and also because of the desire to make maximum use of such space, it is necessary that the equipment used for handling the carpet be arranged to elevate it for storage on racks provided for the purpose and for display. Also because of the limited storage and display space usually available, the equipment used must be compact so that it does not take up valuable space, and it should be available at a cost within the reach of the distributors and dealers who need it.

A principal object of the present invention is to provide a relatively low cost, compact truck, that can be used in pairs by virtually anyone, to easily move and elevate rolls of carpet and the like, weighing as much as 2000 pounds or more.

Another object is to provide such a truck from which carpet can be unrolled and displayed.

A principal feature of the invention is the telescoping support frame which has upper and lower crossheads, each adapted to support an expander arm. The arm is adapted to extend into a roll of carpet and can be expanded to fit therewithin. It can be removably secured to one of the crossheads and used to move the carpet and can then be positioned on the other crosshead to continue carpet travel. The arm is arranged to freely rotate as carpet is unrolled therefrom for display or is rolled up for storage or movement from one site to another.

The telescoping support frame is mounted on a base having wheels that can be easily steered as the roll of carpet, supported by two of the trucks, is maneuvered.

A foot-operated hydraulic pump, mounted on the base

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cooperates with a long hydraulic cylinder to telescope the support frame.

Additional objects and features of the invention will become apparent from the following detailed description and drawings, disclosing what is presently contemplated as being the best mode of the invention.

The drawings

FIG. 1 is a front elevation view of a pair of the trucks of the invention supporting a rolled carpet, the carpet shown being slightly raised by expander arms affixed to the lower crossheads of the trucks;

FIG. 2, a similar view, but with the carpet shown in phantom raised to the maximum elevation of the lower crosshead and in solid lines raised to the maximum elevation of the upper crosshead;

FIG. 3, a pictorial view of a unit of the invention, drawn to a larger scale;

FIG. 4, a horizontal section taken on the line 4—4 of FIG. 3;

FIG. 5, a vertical section taken on the line 5—5 of FIG. 3, through the expander arm; and

FIG. 6, a schematic drawing, showing the hydraulic system of the invention.

Detailed description

Referring now to the drawings;

In FIGS. 1 and 2 a pair of trucks, each shown generally at 10, are supporting a roll of carpet 11.

The trucks 10 each include a base 12 that is supported above a pair of wheels 13 and 14. The wheels are each journaled on an axle 15 that extends between the legs 16 of a bifurcated fork 17 and a stub shaft 18 extends upwardly from the fork 17 to be journaled in an upstanding tube 19 on the base 12 and to form a swivel axis for the wheel.

A sprocket 20 is fixed to each shaft 18, beneath the base 12 and a chain 21 is passed around the sprocket 20, idler sprockets 22 carried by the base and a control sprocket 23, such that the wheels must turn in unison about the axes formed by their shafts 12.

Control sprocket 23 is fixed to the lower end of a shaft 24 that is journaled through base 12 and a tubular, upright housing 25 that is fixed to an upstanding boss on base 12 by a set screw 26.

A control handle 27 is pivotally connected to the top of shaft 24 and is pivotable between an upright position, wherein shaft 24 is freely rotatable within housing 25 and a lowered position wherein it rests in one of a plurality of spaced slots 25a in the top of housing 25 and prevents rotation of shaft 24 with respect to housing 25. Thus, when handle 27 is in its upright position shaft 24 and sprocket 23 are free to turn and the wheels 13 and 14 are free to pivot about the axes formed by stub shafts 18, although they must pivot together, since they are coupled by chain 21.

By holding and turning handle 27, the rotation of shaft 24 and control sprocket 21 can be controlled and the wheels can be steered in any desired direction. An operator can push a roll of carpet supported by the trucks, while manipulating handle 27 to guide movement, or, the handle can be used to position the wheels most advantageously for picking up or displaying carpet or other such rolled material. While both wheels are shown and described herein as being steerable, it is possible to make one of the wheels a castor wheel with only one then being steerable. While this latter arrangement is satisfactory, the steering and locking arrangement for both wheels is preferable, to insure better control.

A pair of upstanding posts 28 are fixed to the top of base 12 and a sleeve member 29, forming part of a travel-

ling frame telescopes down over each upstanding post.

The sleeve members 29 are connected at their lower ends by a lower crosshead 30, made up of a pair of spaced bars 31 and 32 that have a receiving member 33 with V-shaped, inturned edges 33a to slidably receive a generally V-shaped adapter plate 34, to be further described.

The travelling frame also includes an upper crosshead 35 that comprises a cross bar 36 interconnecting the sleeve member, a box-member 37 on the top of the sleeve members and a receiving member 38 having inturned edges 38a, connecting cross-bar 36 and box-member 37 intermediate their lengths.

Adapter plate 34 is bent at its upper edge 34a to hook over the upper edge of receiving member 33 when the plate is slid downwardly beneath the inturned edges 33a of the receiving member and that will similarly hook over an edge 38b defining an elongate hole in the receiving member 38, when the adapter plate is slid downwardly beneath the inturned edges 38a.

A shaft 39, FIG. 5, projects from adapter plate 34 to form part of an expander arm, shown generally at 40. A sleeve 41 is fixed by a pin 41a against axial movement on shaft 39, but is freely rotatable thereabout. A pair of collars 42 and 43 are fixed to sleeve 41, one at each end thereof to provide cam surfaces for cam followers 45. Spaced slots 42a and 43a in the collars 42 and 43, respectively, have inclined bottom surfaces and provide grooves in which the cam followers can travel.

A cam follower 45 is fixed adjacent each end of each bar 46 and the bars extend through radial slots 47 in a flange 48 slidably mounted on the sleeve 41. Sleeve 41 is threaded for a portion of its length, at the end adjacent to adapter plate 34, and a nut 49, having spoke-type handles 50 radiating therefrom, is threaded onto the sleeve, between the adapter plate 34 and the flange 48.

Movement of nut 49 in the direction of flange 48 pushes the flange axially along sleeve 41 and moves cam followers 45 up the inclined surfaces of the cam grooves 42a and 43a to expand the bars 46.

Springs 51, at each end of the bars 46, interconnect the bars and bias them towards the sleeve 41, contracting the bars as the nut 49 is moved away from flange 48, by sliding the cam followers 45 down the inclined surfaces of cam grooves 42a and 43a.

Bars 46 are curved inwardly toward one another at 46a to better facilitate insertion of arm 40 into the center of a roll of carpet, or the like.

Nut 49 is turned by an operator grasping handles 50 and the slots 47 hold the bars in their spaced relationship as they are expanded or contracted.

A hydraulic pump 52 is mounted on base 12, adjacent to a hydraulic cylinder 53, the rod 54 of which is connected to upper crosshead 35, at 55. While other types of pump and cylinder arrangements could as well be used, that shown schematically in FIG. 6, has proven very satisfactory. In this illustrated arrangement, the cylinder includes a housing 56 having an inner tube 57 that slidably, but sealingly, receives the rod 54. The space between tube 57 and housing 56 serves as a fluid reservoir 58 and when plunger 59 of pump 52 is depressed, liquid is forced from the pump through port 60 containing a check valve 61 that allows one way flow to the cylinder and into tube 57 beneath rod 54 to raise the rod. As the spring 61, connected between the foot operated pump handle 62 and the cylinder housing, raises the handle and plunger 59 to draw additional fluid from reservoir 58 into the pump through port 64 and one way check valve 65. Repeated pumping on the handle will thus force fluid into the tube 57 to raise the rod 54, the sleeve members 29, and the upper and lower crossheads affixed thereto.

A handle 66, rotatably mounted on a shaft 67 that is carried by a band 68 wrapped around cylinder housing 56, has one end of a rod 69 eccentrically connected thereto. The other end of rod 69 is eccentrically connected to a handle 70 of a valve 71 that controls flow from inside

tube 57 into reservoir 58. Thus, proper rotation of handle 66 will open the valve and allow fluid to exhaust from tube 57 and will allow the cylinder rod 54, sleeve members 29, and the upper and lower crossheads to drop under their own weight, as well as the weight of the expander arm and any roll of carpet, or the like, carried thereby. A shoulder 72, inside tube 57, limits downward travel of rod 54 and insures proper pressure application beneath the rod.

In use, a truck is moved to the end of a roll of carpet; the adapter plate 34 of the expander arm is positioned on the lower crosshead 30; the arm 40 is positioned as far as it will reach into the tube about which the carpet is rolled; and handles 50 are grasped and turned to expand bars 46 tightly against the inside of the tube.

Another truck is similarly positioned at the other end of the carpet roll and the carpet can then be moved, or raised, as desired. If it is to be moved, the handle 27 of one truck will be moved to its raised position so that the wheels of that truck can castor in unison and the handle 27 of the other truck can be positioned to allow its wheels to castor or, if desired, it can be used to guide the movement of the two trucks and the carpet supported between them in the manner previously described.

In lifting the roll of carpet it is preferred to have one person available to operate the pump of each truck, but a single individual can operate both by moving back and forth from one to the other.

When the carpet has been raised as high as possible with the expander arms fixed to the lower crosshead 30, a temporary support (not shown) can be placed beneath the carpet, the lower crossheads can then be lowered to separate the adapter plates 34 from the lower crossheads and can be further lowered until the adapter plates can be reconnected to the upper crosshead 35. This, of course, can be done without withdrawing the expander arms from the carpet roll.

Once the adapter arms are connected to the upper crosshead the pumps 52 can again be operated to further elevate the roll.

Since the trucks are at the end of the roll they do not provide any obstruction to placement of the roll on cantilever arms protruding from racks (not shown) provided for the purpose and adapted to support the roll intermediate its length. In this connection, it has been found advantageous from a safety standpoint and from the standpoint of maneuverability, to move the roll of carpet to a position in front of the rack on which it is to be placed while the roll is in a lowered position and to thereafter lock the wheels of both trucks to the position of FIG. 3, before elevating the carpet to its uppermost position. Thereafter the trucks and the carpet they support can be pushed in a straight line until the carpet can be lowered onto the arms of the rack. Because the wheels are locked, the elevated carpet, which may be ten feet high, or more, at its center, is safely moved for the short distance necessary to place it on the rack arms.

To remove and lower a roll of carpet from a rack, a reverse procedure is followed. The trucks are positioned at the ends of the roll, with their expander arms fixed to the upper crossheads 35 and inserted tightly into the tube around which the carpet is wrapped. The carpet is moved from the rack and is lowered by turning handles 66, in the manner previously described. A temporary support is used to hold the roll while the adapter plates 34 are connected to the lower crossheads and the pumps are operated to raise the lower crossheads into position. Control handles 66 are again operated to further lower the carpet by exhausting fluid from tubes 57 to reservoirs 58.

While in any desired raised position, the carpet can be unrolled for display, with the bars 46, cams 42 and 43 and sleeves 41 freely rotating on shafts 39 to allow for free turning of the roll as the carpet is pulled out for display and for winding or rewinding. During unwinding and winding up of the carpet the wheels are preferably locked

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in the position of FIGS. 1 and 2, so that they will not roll in the direction of pull on the carpet and to effectively serve as brakes against the movement of the trucks.

With the present invention, the trucks form a stable structural unit with the roll of carpet and no additional cross member is needed between them. The arms 40 extend sufficiently far into the tube on which the carpet is rolled and expand into sufficiently tight engagement with the tube that the tube and the arms serve as a rigid support for the heavy carpet.

Although a preferred form of my invention has been herein disclosed, it is understood that the present disclosure is made by way of example and that variations are possible without departing from the subject matter encompassed within the scope of the following claims, which subject matter I regard as my invention.

I claim:

1. A truck for handling rolls of carpet and the like, comprising
 - a base;
 - a plurality of wheels;
 - means mounting said wheels beneath the base for movement of the base;
 - a pair of posts extending upwardly from said base;
 - a travelling frame having sleeve members extending downwardly over the posts and a lower crosshead interconnecting the sleeve members at their lower ends and an upper crosshead interconnecting the sleeve members at their upper ends;
 - means for moving said traveling frame axially with respect to said posts;
 - an expander arm; and
 - means for selectively and releasably affixing said arm to each of said crossheads.
2. A truck according to claim 1, wherein the means mounting the wheels includes
 - a stub shaft forming a swivel axis for each wheel;
 - a boss carried by the base and in which the stub shaft is journaled; and
 - means for turning at least one of said wheels about the swivel axis to thereby guide movement of the truck.
3. A truck according to claim 2, wherein the means for turning at least one of the wheels includes
 - a sprocket fixed to the stub shaft of the wheel mounting means;
 - a shaft extending upwardly and journaled through the base;
 - a sprocket fixed to the shaft beneath the base;
 - a handle on top of the shaft; and
 - a chain beneath the base and in driving engagement with the sprocket fixed to the stub shaft and the sprocket fixed to the shaft.
4. A truck according to claim 2, wherein the means for turning at least one of the wheels includes
 - a sprocket fixed to the stub shaft of each wheel mounting means;
 - a shaft extending upwardly and journaled through the base;
 - a sprocket fixed to the shaft, beneath the base;
 - a handle on top of the shaft; and

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a chain in driving engagement with each of the sprockets.

5. A truck according to claim 3, wherein the handle is pivotally connected to the top of the shaft; and

the boss is extended upwardly to a point adjacent the top of the shaft and has spaced slots therein, adapted to receive the handle and to thereby lock the sprocket on the shaft against rotation.

6. A truck according to claim 1, wherein the means for moving said travelling frame includes

a hydraulic cylinder having its housing fixed to the base and its cylinder rod fixed to the travelling frame;

pump means for supplying liquid to the cylinder housing at the bottom of the cylinder rod to extend it and to raise the telescoping frame; and

valve means arranged to exhaust liquid from the bottom of the cylinder rod to allow it to retract under its weight, the weight of the telescoping frame and any load carried thereby.

7. A truck according to claim 6, wherein the hydraulic cylinder includes a tube in which the cylinder rod reciprocates; and a reservoir surrounding the tube.

8. A truck according to claim 1, wherein the expander arm comprises

a shaft fixed to and projecting from the means for selectively and releasably affixing said arm to each of the crossheads;

a sleeve rotatably surrounding the shaft;

means preventing axial movement of the sleeve along the shaft;

threads on the sleeve;

a collar on each end of the sleeve, each said collar having grooves formed therein as cam surfaces;

a flange, journaled about the sleeve, and having spaced grooves extending inwardly from its peripheral edge;

a member threaded onto the sleeve between the flange and the affixing means;

handle means radiating outwardly from the member threaded onto the shaft;

a plurality of bars each having cam followers with inclined surfaces adapted to ride on the cam surfaces of the collars and each extending through a groove in the flange; and

means interconnecting the bars to resiliently bias them towards the shaft, as the member threaded onto the sleeve is moved away from the flange.

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GEORGE F. ABRAHAM, *Assistant Examiner.*