Aug. 8, 1961 T. P. MATTHEWS 2,994,939

APPARATUS FOR HANDLING WARP BEAMS

Filed May 15, 1957 2 Sheets-Sheet 1

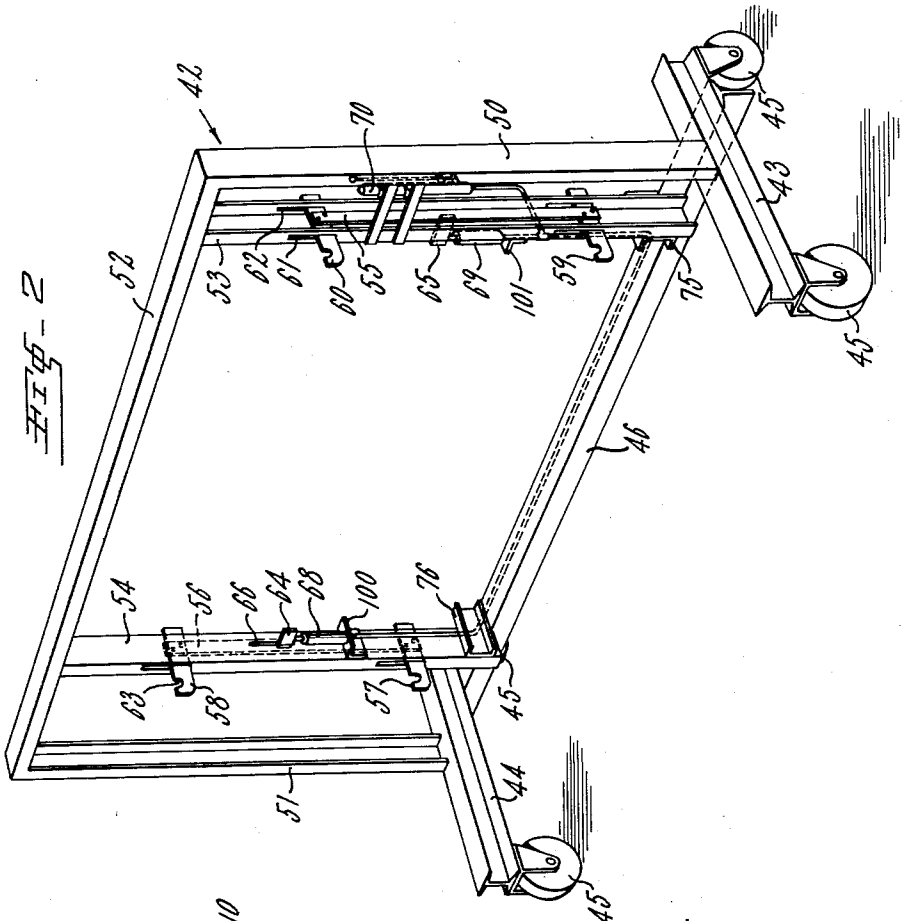

FIG. 2

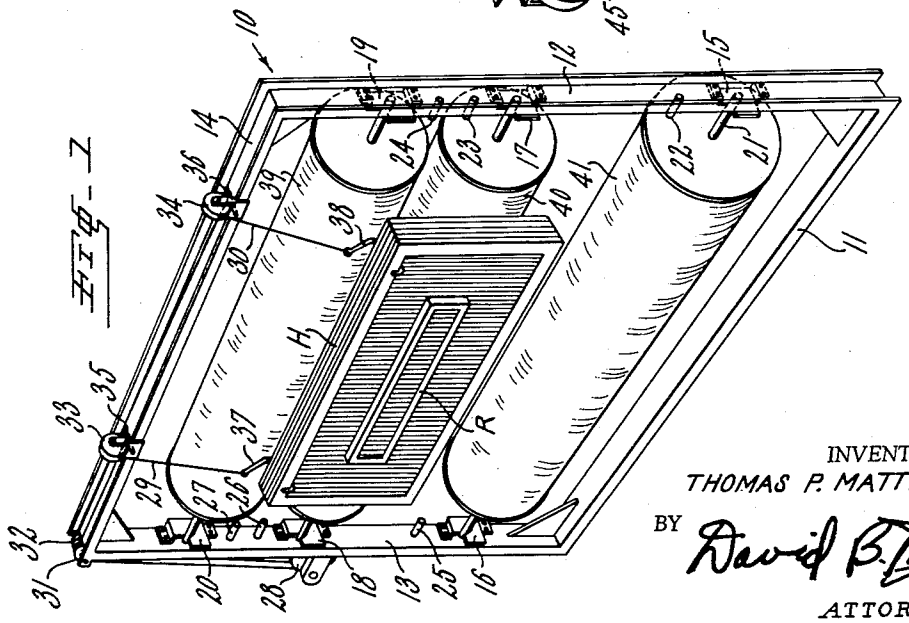

FIG. 1

INVENTOR.
THOMAS P. MATTHEWS
BY David B. Miller
ATTORNEY

Aug. 8, 1961 T. P. MATTHEWS 2,994,939

APPARATUS FOR HANDLING WARP BEAMS

Filed May 15, 1957 2 Sheets-Sheet 2

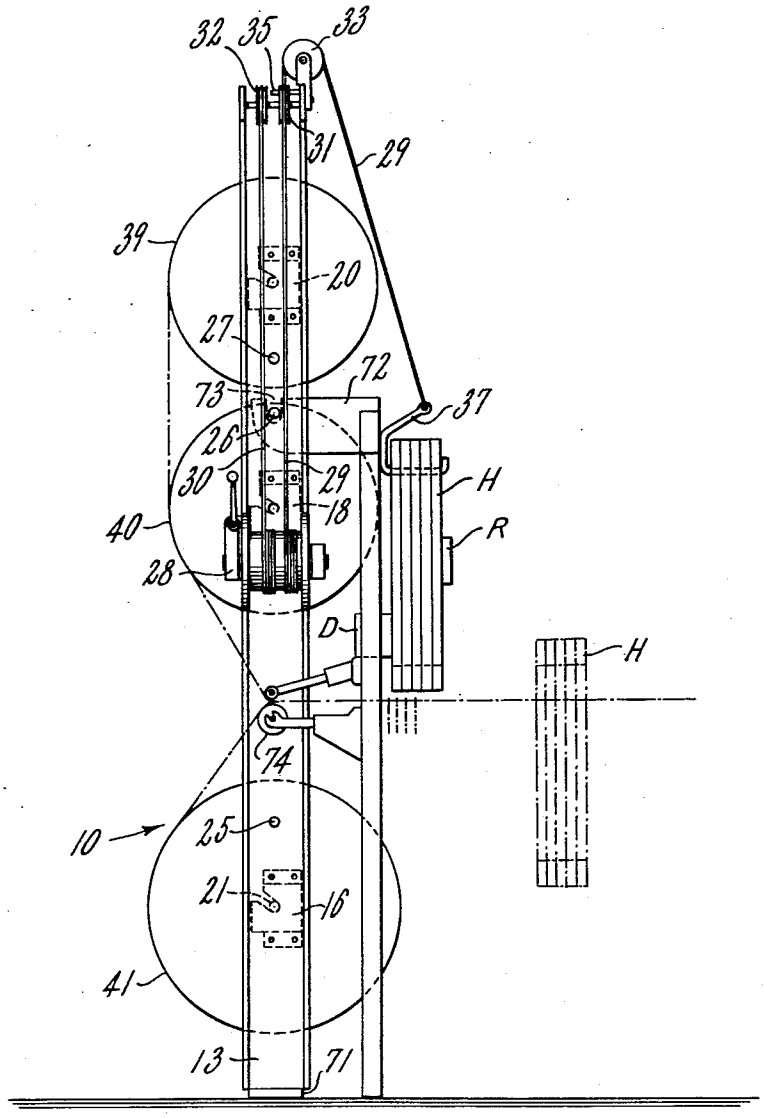

Fig. 3

INVENTOR.
THOMAS P. MATTHEWS
BY David B. Miller
ATTORNEY

United States Patent Office 2,994,939 Patented Aug. 8, 1961

2,994,939

APPARATUS FOR HANDLING WARP BEAMS

Thomas P. Matthews, Winnsboro, S.C., assignor to United States Rubber Company, New York, N.Y., a corporation of New Jersey

Filed May 15, 1957, Ser. No. 659,244
3 Claims. (Cl. 28—42)

This invention relates to apparatus and method for handling articles.

In weaving textile fabrics employing two or more systems of warp yarns, e.g., fabrics of the type disclosed in Foster Patent Re. 24,007, each system of warp yarns, hereinafter called a warp, generally is put up on a separate beam. Two or more such warp beams are used at each loom to weave these fabrics.

These warp beams have been placed one behind the other behind the loom when weaving these fabrics, but this arrangement occupies a large floor area in the weaving room. If the beams were suspended one above the other behind the loom, floor space would be conserved, but the beams are quite heavy when they contain a warp, and it would be difficult to load the beams onto their support at the loom.

This invention relates to an apparatus and method for handling multiple warp beams whereby the warp beams can be easily and quickly positioned at the loom.

In accordance with one embodiment of this invention a rectangular rack adapted to receive two or more warp beams one above the other is provided. This rack is mounted on a support in the warp preparation area, and two or more warp beams are loaded in the rack. The warps are drawn in, and the harness, reed and drop wires are hung from hooks carried by the rack.

A truck, designed to straddle the rack, is then moved in to pick up the rack carrying the beams, harness, etc., and this truck transports the rack to the rear of the loom where it deposits the rack on a support positioned to hold the beams in weaving position. The truck is removed, and the harness, etc. are lowered into the loom. When the warps have been woven, the harness, etc. are returned to the rack, and the truck again picks up the rack containing the empty warp beams and returns it to the warp preparation area for reloading.

For a better understanding of the nature of this invention, reference should be had to the following detailed description of a specific embodiment thereof when read in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a rack in accordance with this invention, loaded and ready for transportation to the loom,

FIG. 2 is a perspective view of a truck designed to carry the rack of FIG. 1, and

FIG. 3 is a side elevation view of the loaded rack mounted at the loom showing the loom ends; the harness is shown in broken lines in the working position.

Referring to FIG. 1, a rectangular rack **10** is shown made of channel iron. The rack has a horizontal bottom member **11**, two vertical side members **12**, **13** and a horizontal top member **14**, all welded or otherwise suitably joined together. The rack shown is designed to handle up to three warp beams, so three pairs of slotted brackets **15**, **16**, **17**, **18**, **19** and **20** are provided. One bracket of each pair is fixed on the inside surface of each side member with the two brackets in each pair aligned opposite each other, so a shaft **21** of a warp beam may be inserted in slots in the brackets. As shown, the three brackets on each side member are spaced one above the other, so that three warp beams may be suspended in the rack one above the other. The slots in

the brackets open upwardly and preferably away from the loom when the warp beams are in weaving position.

In the embodiment shown, three vertically spaced pins **22**, **23** and **24** project inwardly from side member **12** and three similar pins **25**, **26** and **27**, project inwardly from side member **13** opposite pins **22**, **23** and **24**.

One side member **12** carries a winch **28** exteriorly of the rectangular rack, and this winch has two cables **29**, **30**. A pair of rotatable pulleys **31**, **32** are carried by this side member **12** outside the rack near the juncture of the side member **12** with the top member **14**. Centrally of the top member **14**, two pulleys **33**, **34** are rotatably mounted spaced from each other on axes parallel to the longitudinal axes of the top member. Preferably these pulleys are spaced from each other a distance slightly less than the length of the harness with which the rack will be used.

The cables **29**, **30** extend up from winch **28** along side member **12**, thence through a right angle over pulleys **31**, **32** and along top member **14** to two pins **35**, **36** fixed in top member **14**. The cables are trained about pins **35**, **36** and onto pulleys **33**, **34** from whence they drop down in front of the rack **10**. Two hooks **37**, **38** are carried by the ends of cables **29**, **30**, and these hooks are designed to carry the loom harness H, reed R and the loom drop wires D.

It will be apparent that the harness, reed and drop wires may be raised or lowered onto the rack by means of the winch **28**, cables **29**, **30** and hooks **37**, **38**. Winch **28** can be locked to hold the cables **29**, **30** fixed at any desired position of hooks **37**, **38**.

To prepare the warp beams for weaving, the frame **10** is mounted in the warp preparation area, and the number of full warp beams needed for weaving the particular fabric are loaded into the slotted brackets **15**, **16**, etc., carried by the rack. In the embodiment shown, the rack is loaded with three warp beams **39**, **40** and **41**. The several warps are drawn in and the harness, reed, and drop wires are placed on the hooks **37**, **38** and suspended from the rack.

A truck **42** shown in FIG. 2 is provided to transport the loaded rack **10** to the loom.

This truck comprises two parallel I-beams, **43**, **44** each carrying a caster **45** at each end of the I-beam. Connecting the I-beams **43**, **44** and welded or otherwise suitably fixed thereto is the T-beam **46**. The T-beam **46** and other transverse elements of the truck are of such length that the truck **42** may straddle the rack **10**, and may straddle the loom while the rack **10** is being placed at the loom. Upstanding from I-beams **43**, **44** are side frames **50**, **51**. A top frame **52** is fixed between the side frames **50**, **51** at their tops. Two additional upstanding support frames **53**, **54** are welded to channel members **75**, **76**, resting on T-beam **46**, and support frames **53**, **54** are also welded to top frame **52**. Channel members **75**, **76** are welded to T-beam **46** to project forwardly therefrom, and frames **53**, **54** are welded to the projecting ends of channel members **75**, **76** forwardly of T-beam **46**. The support frames **53**, **54** are spaced from the side frames **50**, **51** a great enough distance so the distance between support frames **53**, **54** is approximately equal to the width between side members **12**, **13** of the warp beam rack **10**.

Elongated plates **55**, **56** are held adjacent support frames **53**, **54**, and each of these plates is arranged to slide vertically relative to the adjacent support frame. Each plate **55**, **56** has fixed thereto two vertically spaced carrying brackets **57**, **58** and **59**, **60**. In the embodiment shown, the support frames **53**, **54** are made of channel iron, and the plates **55**, **56** fit in the channel adjacent the base of the channel iron. Two elongated slots **61**, **62**

are cut through the legs of the channel members opposite each other for each carrying bracket, and the carrying bracket, e.g. bracket **60**, projects through both slots and is fixed to the elongated plate, e.g. plate **55**. As shown, each carrying bracket **57**, **58**, **59** and **60** has a notch **63** cut in its upper edge near the forward end thereof.

Plates **55**, **56** have inwardly projecting lugs **64**, **65** fixed thereto which project through elongated slots **66** cut in the base of each channel iron forming the support side frames **53**, **54**. Hydraulic rams **68**, **69**, resting on angles **100**, **101** fixed to support frames **53**, **54** are positioned under lugs **64**, **65**, and a hydraulic pump **70** is connected to the rams **68**, **69**. Upon actuation of the pump **70**, pistons of rams **68**, **69** will be driven up to engage lugs **64**, **65** and to raise these lugs and brackets **57**, **58**, **59** and **60** carried by the plates **55**, **56**. Hydraulic pump **70** can be actuated to raise rams **68**, **69** to any desired level and hold them at that level till the air pressure in the pump is released.

When the rack **10** has been loaded as described hereinabove, the truck **42** is brought into position adjacent the loaded frame **10** with the notched brackets **57**, **58** and **59** and **60** positioned beneath pins **25**, **27** and **22** and **24** respectively. The hydraulic pump **70** is then actuated to raise brackets **57**, **58**, **59** and **60** and lift the rack **10**. The truck then carries frame **10** to its position behind the loom shown in FIG. 3.

There is fixed to the floor of the weaving room behind the loom an elongated runner **71** which is adapted to fit into the channel of the inverted channel iron bottom member **11** to support and position rack **10** at the loom. On each side of the loom, the loom end carries a rearwardly extending steadying bracket **72** which has a notch **73** cut in its upper edge adapted to receive one of the pins **23**, **26**. Preferably the notches **73** are of such depth and their position relative to the runner **71** and the pins **23**, **26** is such that the pins **23**, **26** do not rest on the bottom of the slots **73**; rather the steadying brackets **72** stabilize the rack **10** against tipping, and the weight of the loaded rack is carried by the runner **71**.

With the rack **10** thus positioned, the loom harness is then lowered from the full line position shown in FIG. 3 by lowering hooks **37**, **38** through winch **28**, and the loom harness is simultaneously moved forward into the weaving position shown in broken lines in this figure. Preferably suitable guide rods **74** are provided for guiding the warps into the loom. The loom is made ready for weaving, and the warps contained on the rack **10** are woven into fabric.

When the warps are exhausted, the truck **42** moves in, again picks up the rack **10** and carries it back to the warp preparation area where the empty beams are removed. The rack **10** is then ready to be reloaded.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A warp beam holder comprising a moveable rack, means on said rack for supporting a multiplicity of vertically spaced warp beams for weaving on one loom, a multiplicity of drawn in warp beams carried by said rack, means on said rack adapted to cooperate with means at the loom to removably support said rack at the rear of the loom with the beams in weaving position, and means on said rack for supporting the loom harness for movement with said rack when said rack is transported to the loom.

2. A warp beam holder comprising a moveable rack, an inverted channel member on said rack adapted to rest on a runner behind the loom to position and support said rack, a pair of vertical side members upstanding from said channel member, means carried by said side members for supporting a plurality of warp beams one above the other in said rack, a winch carried by said rack, a hook on the free end of a cable of said winch, said winch, cable and hook being constructed and arranged to lift the loom harness and to hold the harness adjacent the warp beams in the rack when said rack is transported to the loom.

3. A warp beam holder, comprising a moveable rack, said rack having a pair of vertical side members, means carried by said side members for supporting a plurality of warp beams one above the other in said rack, a winch having a plurality of cables carried by one said side member, said rack having a top member, spaced means carried by said top member on which said cables are trained to depend therefrom in front of said rack, hooks carried by the free ends of said cables adapted to hold the loom harness, means carried by said rack adapted to cooperate with lifting means by which the rack may be lifted, and means on said rack adapted to cooperate with support means at the loom to hold said warp beams in weaving position at the rear of the loom.

References Cited in the file of this patent

UNITED STATES PATENTS

1,339,507	Hathaway et al.	May 11, 1920
1,436,171	Hirt	Nov. 21, 1922
1,684,945	Colman	Sept. 18, 1928
2,437,070	Bryant	Mar. 2, 1948
2,624,476	Schmidt	Jan. 6, 1953
2,833,487	Pletty	May 6, 1958

FOREIGN PATENTS

674,574	Great Britain	June 25, 1952
1,022,823	France	Dec. 24, 1952