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TUFT YARN CARRIER FOR LOOMS

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2 Sheets-Sheet 1

Fig. 1.

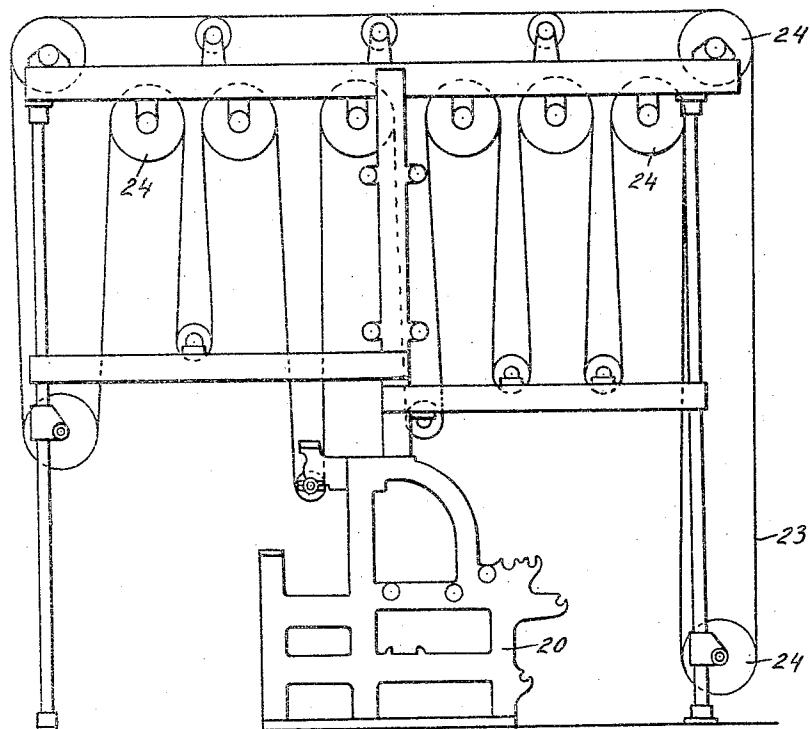
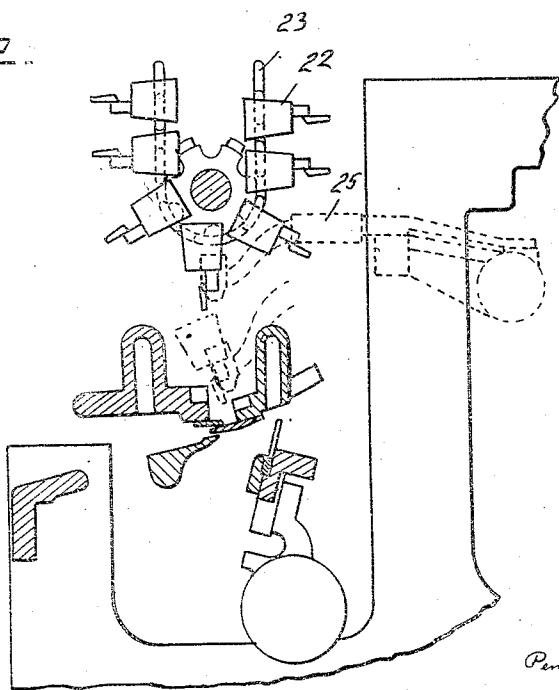


Fig. 2.



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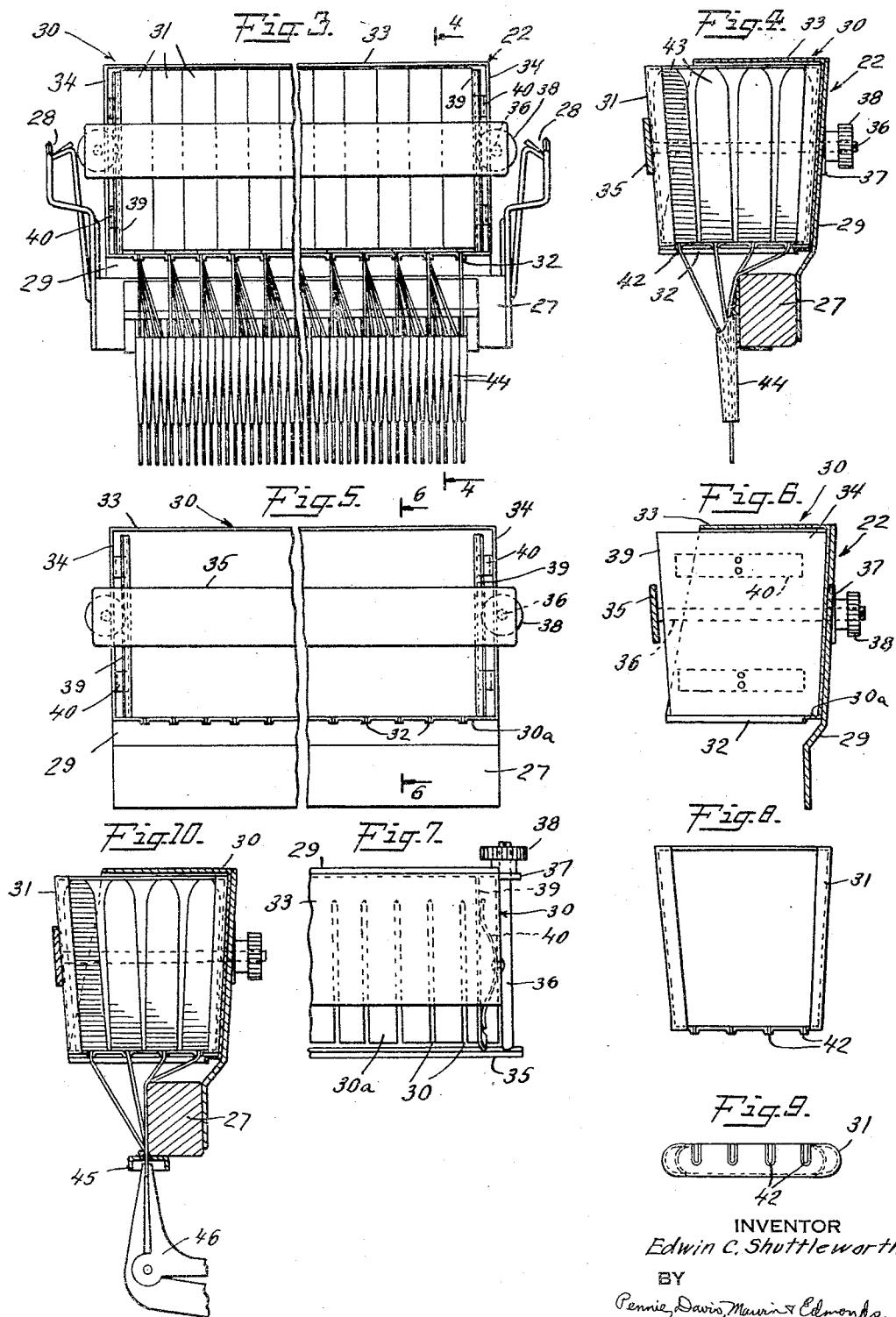
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## UNITED STATES PATENT OFFICE

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## TUFT YARN CARRIER FOR LOOMS

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This invention relates to looms of the type ordinarily used for weaving Axminster carpets and similar fabrics and is concerned more particularly with a new device for carrying the yarns to be used in making the pile tufts.

In looms of this type, as heretofore commonly constructed, the pile yarns are carried on a large number of spools, each of which is mounted in a frame slung between chains which pass over sprocket wheels supported in the frame of the loom. Each spool carries a plurality of yarns arranged to supply one row of tufts across the fabric and the 10 chains are moved to bring the spools one after another into a position above the weaving mechanism where yarn is drawn from the spools and incorporated in the fabric. When wide fabrics are being woven, each spool may 15 be replaced by several axially aligned spools all carried in the same frame. The frames which carry the spools are usually provided with brackets for supporting the spools, and have holes or tubes through which the yarns 20 are presented to the weaving point and brakes or tension devices to prevent the spools from rotating too freely and unwinding excess 25 yarn.

Difficulty is encountered with the construction described on account of the fact that a large number of yarns are carried on each spool and, if the brake on a spool gets out of order, the yarn overruns and a tangle involving a large number of yarns results. Also, 30 lack of proper tension on the yarn causes the fabric to be imperfect and unsatisfactory. Another objectionable feature of the former construction is that in order to remove or replace a single pile yarn, it is necessary to 35 remove a whole spool and all of the group of yarns carried by it, and replace it with a properly wound spool, and this involves threading all the yarns of the new spool through the holes or tubes of the carrier. 40 Since the yarns on a single spool are usually of several different colors in accordance with a pattern, a change in the pattern requires that all the spools be removed and completely 45 rewound.

50 The present invention is accordingly di-

rected to the provision of an improved pile yarn carrier for a loom, in which there are no spools, supporting brackets, or spool tensioning devices and in which the pile yarns are carried in separate packages so that a 55 single supply of yarn may be replenished or taken from the machine and replaced by another without disturbing the other yarn supplies in the carrier. The new construction also eliminates the necessity of winding 60 spools to conform to the design to be woven, and the yarn packages used in the new carrier hold more yarn than the spools and hence the loom may run longer without replenishing the yarn supply.

In one embodiment of the principles of the invention, the carrier mechanism includes a plurality of frames which carry magazines, each of which holds a plurality of yarn packages or cops which can be removed or replaced 70 without interfering with any other of the pile yarns. The carrier is suspended between chains as before. In withdrawing the yarn from the cops, the cops are not rotated and hence overrunning is not encountered.

75 For an illustration of the manner in which I prefer to build my improved carrier, reference may be had to the accompanying drawings, in which:

Figure 1 is a diagrammatic side elevation 80 of a loom frame without the weaving mechanism but showing the chains between which, the pile yarn carriers are suspended.

Figure 2 is an enlarged view of a part of Fig. 1 showing the weaving mechanism and 85 a few of the pile yarn carriers in place on the chains.

Figure 3 is a front elevation of the pile 90 yarn carrier according to this invention.

Figure 4 is a sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a front elevation of the carrier 95 without the magazines therein.

Figure 6 is a sectional view of Figure 5 on line 6—6.

Figure 7 is a top view of the carrier.

Figure 8 is a side elevation of a single yarn magazine.

Figure 9 is a top view of the same magazine.

Figure 10 is a view similar to Fig. 4 showing a modified construction.

The new tuft yarn carrier is illustrated as mounted in the usual type of Axminster loom 20 in which the yarn carriers 22 are suspended between chains 23 which pass over a series of sprocket wheels 24 on the frame of the loom. As the fabric is woven on this loom, the chains 24 are advanced step by step 10 so that the yarn carriers 22 are brought successively into position over the weaving mechanism of the fabric. The carrier in this position is then detached from the chain and lowered by the arm 25 so that its feed 15 tubes pass through the warp, and yarn from each tube forms a pile tuft in the fabric. The carrier is then returned and again suspended between the chains, the chains move to bring the next yarn carrier above the 20 weaving mechanism, and the operation is repeated.

The new pile yarn carrier 22, as illustrated in Figures 3 to 9, comprises a bar 27 carrying devices 28 at its ends which serve as a 25 means for suspending the bar between the carrier chains. These devices may be of any of the types now used for mounting yarn carriers to their carrier chains, but are preferably spring catches which may be readily 30 engaged and disengaged from the chains 23 by the arm 25. A supporting member 29 in the form of a heavy piece of sheet metal is secured to the bar 27 by welding or other means and extends upwardly therefrom to 35 form one side of a box 30 in which cop magazines 31 are carried.

The box 30 has a bottom 30a formed with a plurality of laterally extending slots 32, a plate 33 which partially covers the top, and 40 plates 34 which partially cover the ends. The box 30 is open opposite the side 29, and the magazines 31 are inserted into the box through the opening so that they extend across the box, each magazine lying above 45 one of the slots 32. A bar 35 extends longitudinally along the open side of the box and is held at its ends by bolts 36 which extend through lugs 37 projecting beyond the ends of the plate 29 and are fastened in the lug by 50 nuts 38. Guides 39, at the ends of the box 30, hold the magazines in proper transverse position within the box 30, the guides being pressed by springs 40 between the guides and the ends of the box.

The magazines are preferably formed of sheet metal, and, as shown, each one is of a size to hold four cops in parallel relation. Each magazine is in the form of a box with one side open and with four transverse slots 55 42 extending from the open side partway across the bottom of the box. When the magazine is in place in the carrier box 30, the slots 42 in the magazine cross the slots 32 in the carrier box in such a way that four 60 openings are formed through the bottom of

the magazine and carrier box. The yarns from the cops 43 are drawn through the slots 42 before the magazine is placed into the carrier box and then slipped into the slots 32 when the magazine is placed in the box 30, so that they pass through the bottom of the carrier box. Tubular guides 44, are fastened to the carrier bar 27 in position to receive the ends of the yarns and guide them, while they are being incorporated in the 75 fabric in the usual manner.

Instead of the tubes 44, a perforated plate 45 mounted on the carrier bar 27 may be employed, the yarns being threaded through the perforations in the plate. Plates 45 are 80 used in looms having grippers 46 which reach upward and pull the yarns down into place in the fabric.

The specific structure described may be modified by supporting the separate yarn packages in a different manner and by changing or completely eliminating the cop magazines and such changes are within the scope 85 of this invention.

When the yarn is carried, as above described, the loom operates much more efficiently because the supply of yarn contained in the separate packages is greater than that contained by the spools formerly used and hence less replenishing is necessary. The 90 fabric produced is smoother, and contains less imperfections, as trouble from the tension devices now in use is eliminated, and the pattern may be quickly and simply changed by changing the arrangement of 100 the packages in the carriers.

Having thus described my invention, what I claim is:

1. A tuft yarn carrier for looms comprising a carrier frame, means for carrying a plurality of separate packages of yarn upon the frame including a plurality of box-like magazines each having an open vertical side and a slotted bottom through which the yarns are drawn from the packages, each magazine containing a plurality of yarn packages and being removable independently of the other magazines, and means for feeding a yarn from each package to the tuft-forming mechanism of the loom.

2. A tuft yarn carrier for looms comprising a carrier frame, means for carrying a plurality of cops of yarn upon the frame including a plurality of magazines, each magazine containing a plurality of cops in a row and being in the form of a box with one vertical side open, and slots in the bottom thereof through which the yarns are drawn from the cops, each yarn being withdrawn through a separate slot, and means for feeding a yarn from each cop to the tuft-forming mechanism of the loom.

3. A tuft yarn carrier for looms comprising a carrier frame, means for carrying a plurality of packages of yarn upon the frame in-

cluding a plurality of magazines each having a slotted bottom through which the yarns are drawn from the packages, each yarn being withdrawn through a separate slot, a carrier box for said magazine and slots in the bottom of the carrier box crossing the slots in the magazines, the yarns from each magazine all being withdrawn through one slot in the carrier box, and means for feeding a yarn 10 from each package to the tuft-forming mechanism of the loom.

4. A tuft yarn carrier for looms comprising a carrier frame, means for carrying a plurality of separate packages of yarn upon the frame including a plurality of magazines, each containing a plurality of yarn packages, a carrier box supporting said magazines, means for retaining the magazines in the carrier box, said magazines being individually removable from said box, and a plurality of straight guide tubes mounted side by side in a row lengthwise of said frame, said tubes being mounted below and spaced from said box and having open upper ends 25 facing the bottom of the box.

5. A tuft yarn carrier for looms comprising a carrier frame, means for carrying a plurality of packages of yarn upon the frame including a plurality of magazines, each containing a plurality of yarn packages in a row transverse to the long axis of said frame, a carrier box supporting said magazines, means for retaining the magazines in the carrier box comprising a bar extending across the magazines, 35 said magazines being independently removable from said box, and means for feeding a yarn from each package to the tuft-forming mechanism of the loom, said means including straight feed tubes mounted on said frame 40 side by side in a row extending lengthwise thereof.

6. A tuft yarn carrier for looms comprising a carrier frame, a plurality of magazines removably mounted on said frame and each carrying a plurality of separate packages of yarn, and feed tubes for feeding a yarn from each package to the tuft-forming mechanism of the loom, said tubes being mounted on said frame below and independent of said 50 magazines.

7. A tuft yarn carrier for looms comprising a carrier frame, a plurality of magazines removably mounted on said frame and each carrying a plurality of separate packages of yarn upon the frame, openings in the bottom of each magazine, one for each yarn package therein, for passage of the yarn end from said package and a perforated plate on said frame below and independent of said 55 magazines, said plate having perforations through which a yarn from each package is fed to the tuft-forming mechanism of the loom.

8. A loom comprising a frame, weaving 65 mechanism, a pair of endless chains, sprocket

wheels supported from said frame and carrying said chains, carrier frames suspended removably between said chains, a plurality of magazines supported on each of said frames and having slots in the bottom thereof, a carrier box on each frame supporting said magazines and having slots in the bottom thereof crossing said first mentioned slots, a plurality of feed tubes on said carrier frame, a plurality of cops of yarn in each magazine, 70 each cop having a yarn therefrom extending through a slot in the magazine, a slot in the carrier box and a feed tube, and means on the loom for detaching the carrier frame from the chains and moving it to supply 80 yarn from the feed tubes to form pile tufts in the fabric being woven.

9. A tuft yarn carrier for looms which comprises a carrier frame, a support on said frame, a series of magazines on said support, each magazine having an open vertical side closed by the adjacent magazine except in the case of one end magazine in the series, means for holding said magazines on said support, a plurality of yarn packages in each 90 magazine, and means on said frame independent of said magazines for guiding yarn ends from said packages.

In testimony whereof I affix my signature.  
EDWIN C. SHUTTLEWORTH.

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