April 25, 1950 R. G. TURNER 2,505,443

PNEUMATIC THREAD HOLDER FOR WEFT REPLENISHING LOOMS

Filed Nov. 8, 1947

FIG. 1

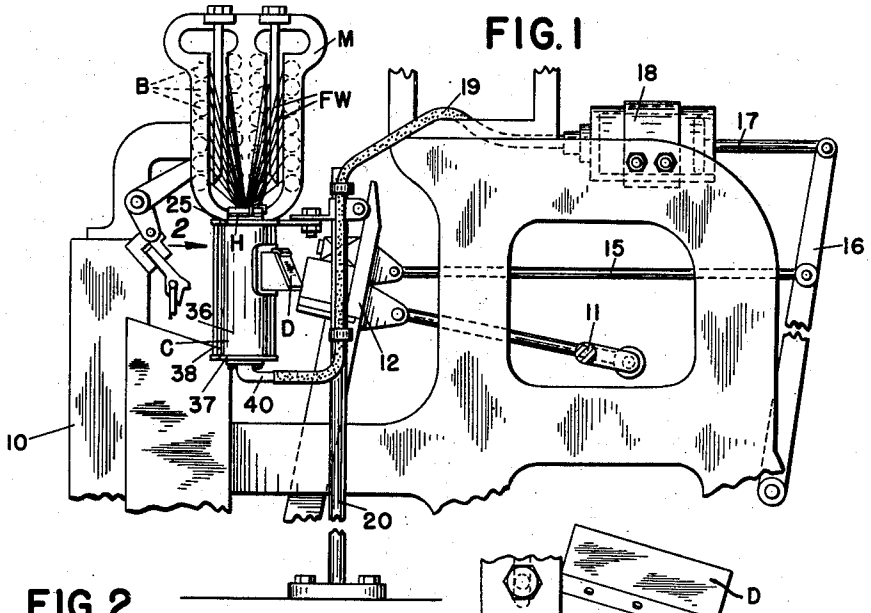


FIG. 2

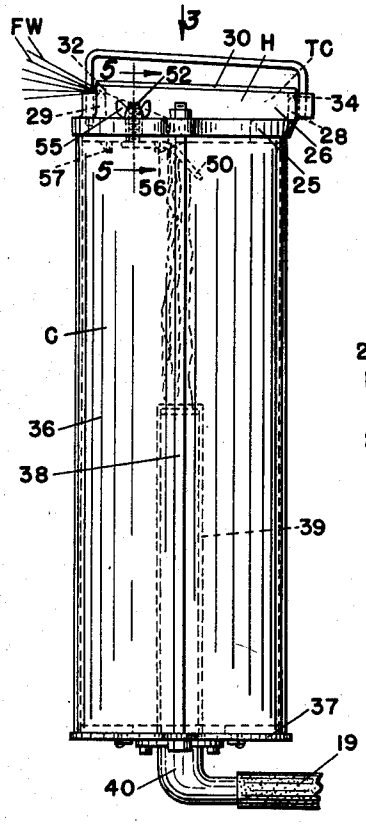


FIG. 3

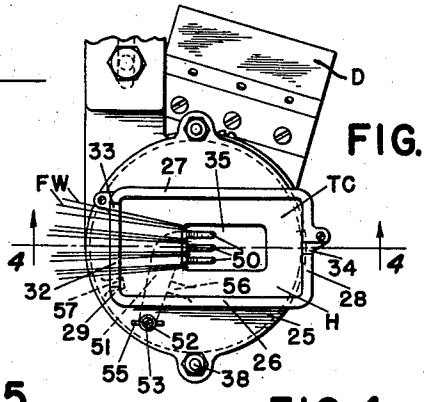


FIG. 5

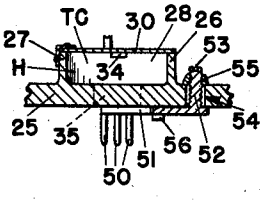
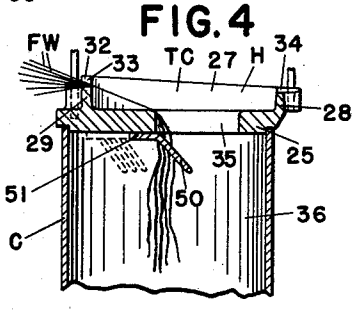


FIG. 4



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PNEUMATIC THREAD HOLDER FOR WEFT REPLENISHING LOOMS

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7 Claims. (Cl. 139—247)

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This is a continuation in part of my co-pending application Serial No. 702,197 filed October 9, 1946, now Patent No. 2,460,611, issued February 1, 1949.

This invention relates to improvements in weft replenishing looms and it is the general object of the invention to provide improved pneumatic thread holder means adapted for use with a variety of types of weft.

Weft replenishing looms ordinarily operate with a magazine containing reserve bobbins from the tip ends of which extend weft ends which should be kept taut as the bobbins await transfer and should also be removed from the loom when their corresponding bobbins are moved from the magazine into a depleted shuttle incident to a weft replenishing operation of the loom. Heretofore I have proposed pneumatic means for tensioning and removing the weft threads including a pneumatic thread holder and a thread accumulator or collector into which the threads are driven pneumatically from the thread holder. The weft ends tend to mat together in the accumulator into a mass of entangled threads which serves as an anchorage for the weft end of a freshly transferred bobbin.

Some types of weft, such as artificial yarns, are smooth and do not mat together to any considerable extent. It is desirable to provide means to hold such yarns in the accumulator to prevent them from being drawn back through the thread holder. Other types of yarns are coarse and hairy and mat together closely enough to serve as anchorages for each other. Such yarns, however, operate best when they are free to hang from the holder into the accumulator without interference by the supplementary holding means.

A pneumatic thread control system should be able to take care of both types of weft and it is an important object of the present invention to provide holding means, such as fingers or prongs, preferably located intermediate the thread holder and the thread accumulator and movable to either of two positions, one for engagement with fine smooth yarns and the other for non-engagement with coarse yarns.

In the form of the invention illustrated hereinafter the thread collector or accumulator comprises a relatively large hollow cylindrical member on the top of which is mounted a casting having the hollow thread holder formed as part thereof and having also a floor provided with an opening which affords pneumatic communication between the thread holder and the accumulator. It is a further object of the invention to

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mount the aforesaid prongs or fingers on the under side of the floor of the casting so that it can be swung either to holding or non-holding position. Since it is desirable that the shift of the fingers be accomplished without disturbing the pneumatic system it is still another object of the invention to have them controllable from a point outside the thread holder and accumulator.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth.

In the accompanying drawings, wherein a convenient embodiment of my invention is set forth,

Fig. 1 is a side elevation of a loom showing a pneumatic thread control system having my invention applied thereto,

Fig. 2 is an enlarged front elevation looking in the direction of arrow 2, Fig. 1,

Fig. 3 is a plan view looking in the direction of arrow 3, Fig. 2, with the cover of the thread holder removed,

Fig. 4 is a vertical section on line 4—4 of Fig. 3 showing the thread holder and upper part of the thread accumulator with the aforesaid prongs indicated in weft end holding position in full lines and in non-holding position in dotted lines, and

Fig. 5 is a vertical section on line 5—5 of Fig. 2.

Referring to the drawings, the loom frame 10 supports a crank shaft 11 which drives the lay 12 back and forth in usual manner. A driving rod 15 extends rearwardly from the lay and is connected to an upright lever 16 which operates the piston 17 of a stationary air pump 18 from the forward end of which extends a pipe or hose 19. The loom supports a reserve bobbin magazine M containing stacks of reserve bobbins B from which extend weft ends that may be either coarse hairy yarns or fine smooth yarns. In Fig. 1 the yarns are indicated as being fine and are designated at FW. These ends extend to a thread holder H which is supported on an upright support 20.

As shown more particularly in Figs. 2 and 3, the holder comprises a floor plate 25 formed integral with vertical front and back walls 26 and 27 and right and left hand walls 28 and 29, respectively, as viewed in Fig. 3. A cover 30 preferably of transparent material is hinged to one of the walls so that it can be swung upwardly to permit weft ends to pass thereunder and enter a hollow thread compartment TC between the walls and above the floor. Wall 29 is provided

with a recess 32 under the cover which with the latter defines an intake mouth 33 for the weft ends. The opposite wall 28 may be provided with a similar but shorter recess 34 through which the outer ends of the weft threads pass when they are first placed in the holder. The floor 25 has an opening 35 therein through which weft ends can extend downwardly from the holder.

A thread accumulator or collector C comprises a cylinder 36 preferably of thin transparent material to provide a relatively large inclosure or hollow space for the weft ends below the thread holder. If desired the cylinder may be equipped with a door D to afford manual access to the interior of the cylinder 36. The bottom of the cylinder 36 is closed by a bottom plate 37 which is suspended from floor 25 by rods 38 and supports a porous tube 39 pneumatically communicating with the interior of a fitting 40 connected to hose 19.

In the operation of the matter thus far described the pump will create subatmospheric pressures within the cylinder 36 during backward strokes of the lay and because of the pneumatic communication between the interior of the cylinder 36 and the thread compartment TC afforded by opening 35 air will be drawn into the intake mouth 33 and also through the mouth 34. When weft ends extend into the intake mouth and across the compartment TC, downward pneumatic pressure will draw them through the opening or passage 35 and they will hang into the cylinder 36. The threads are generally entangled to some extent, although coarse hairy yarns are more subject to entanglement than are the finer smooth yarns.

The matter thus far described may be substantially the same as that shown in the copending application referred to except that the floor 25 of the holder and the walls of the compartment TC are somewhat different from similar parts shown in that application.

In carrying the present invention into effect I provide one or more thread holding fingers or prongs 50 which may be struck integrally from a sheet metal plate 51 and bent downwardly as indicated in Fig. 4. The plate 51 is under floor 25 and may have secured thereto a threaded screw 52 formed with a screwdriver slot 53 and passing upwardly through a clear hole 54 in the floor. The screw 52 is provided with a wing nut 55 above the floor by which the plate 51 can be drawn tightly up against the under side of the floor. The wing nut 55 is accessible from outside the accumulator C and by means of a screwdriver the plate 51 may be swung to two angular positions. Lugs 56 and 57 depending from floor 25 determine the thread holding and non-holding positions of fingers 50.

When the loom is operating with fine yarns FW as shown in Figs. 1 and 4 the fingers 50 will be in their active yarn engaging holding position shown in full lines in Fig. 4. When the loom is operating with coarse hairy yarn the fingers will be swung to their inactive non-holding position shown in dotted lines in Fig. 4 where they will not engage the coarse wefts. The fingers will be held in either of their positions by the wing nut and adjustment from one position to the other can be made readily because of the screwdriver slot 53 and without opening the pneumatic system.

From the foregoing it will be seen that I have provided a simple means by which a pneumatic thread holder and thread accumulator may be adapted for use with both fine and coarse wefts. This means comprises a series of fingers which can be projected into the path of fine wefts as they enter cylinder 36 from opening 35, or can be moved to inactive position when coarse weft is being woven. In either position the fingers are held stationary with respect to the thread holder, and the wing nut shown as a convenient means to clamp or hold the setting of the fingers is accessible from outside the holder H and accumulator C.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In pneumatic thread control means for the weft ends of a weft replenishing loom, a pneumatic thread holder having an intake mouth for the weft ends and having hollow means communicating pneumatically with said mouth and having a floor in which a thread receiving opening is formed, a hollow thread accumulator in which subatmospheric pressures exist depending from the hollow means communicating pneumatically with the interior of said hollow means through said opening, and thread engaging prongs extending downwardly from said floor adjacent to the edge of said opening to engage the weft ends leading from said mouth through the opening into said accumulator.

2. In pneumatic thread control means for the weft ends of a weft replenishing loom, a hollow thread accumulator in which subatmospheric pressures exist, a hollow pneumatic thread holder for the weft ends having an opening therein pneumatically connecting the interior of the thread holder and the interior of the accumulator, movable thread engaging means adjacent to the opening, and means capable of holding said thread engaging means either adjacent to the opening in position to engage fine weft ends passing through the opening or spaced from the opening in a position to be incapable of engaging coarse weft ends passing through the opening.

3. In pneumatic thread control means for the weft ends of a weft replenishing loom, a hollow thread accumulator in which subatmospheric pressures exist, a hollow thread holder for the weft ends, the interior of the holder and the accumulator being in pneumatic communication through a thread passage for the weft ends between the holder and accumulator, thread engaging means for the weft ends, and means capable of holding the thread engaging means adjacent to said passage when fine weft ends are in said passage or spaced from said passage when coarse weft ends are in said passage.

4. In a pneumatic thread control system for the weft ends of a weft replenishing loom, a hollow thread accumulator in which subatmospheric pressures exist, thread holder means formed with a hollow thread compartment the interior of which is in pneumatic communication with the interior of the accumulator through a passage for the weft ends in the thread holder means, finger means for engaging the weft ends movably mounted on the thread holder means, and clamping means for said finger means capable of holding the latter either in one position to engage weft ends of one type in the passage or in another position to be incapable of engaging weft ends of a different type in the passage.

5. In a pneumatic thread control system for the weft ends of a weft replenishng loom, a pneumatic thread accumulator in which subatmospheric pressures exist, a hollow thread holder having an opening therein pneumatically connecting the interior of the holder and accumulator and through which the weft ends pass from the holder to the accumulator, finger means pivotally mounted with respect to the thread holder and capable of occupying one position for engagement of weft ends of one type extending through the opening and capable of occupying a second position in which the finger means is incapable of engaging weft ends of a different type extending through the opening, and means to clamp the finger means in either of said positions thereof.

6. In a pneumatic thread control system for the weft ends of a weft replenishing loom, a pneumatic thread accumulator in which subatmospheric pressures exist, a hollow thread holder for weft ends having an opening therein pneumatically connecting the interior of the holder and accumulator and through which weft ends pass from the holder to the accumulator, finger means pivotally mounted on the thread holder

and capable of being either adjacent to the opening or spaced therefrom, and clamp means accessible from the outside of the holder and accumulator to clamp said finger means in either of said positions thereof.

7. In pneumatic thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a hollow thread accumulator in which subatmospheric pressures exist and into which the weft ends extend, and finger means projecting into said accumulator in the direction in which the weft ends extend into the accumulator and engaging the weft ends and preventing the latter from being drawn out of the accumulator in a direction toward the reserve bobbins.

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