July 9, 1940. O. V. PAYNE 2,207,105

PNEUMATIC THREAD HOLDER FOR WEFT REPLENISHING LOOMS

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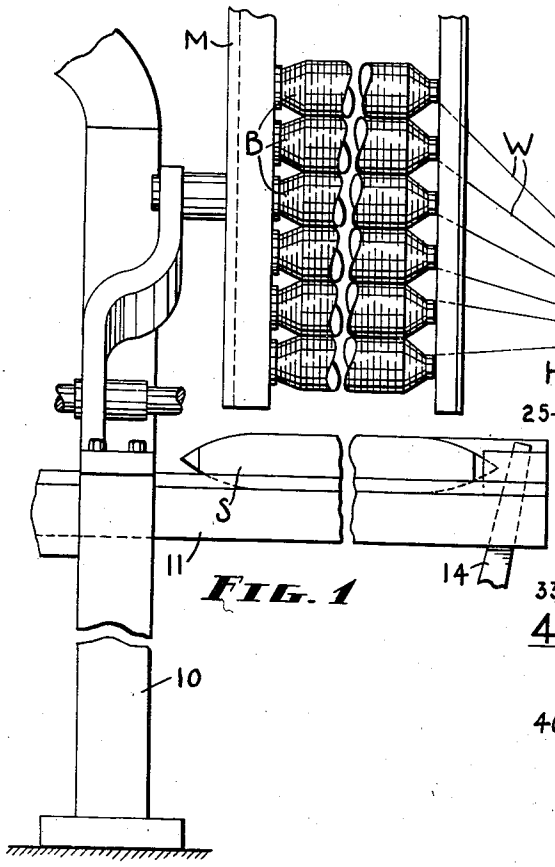


FIG. 1

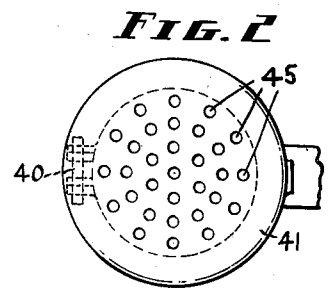
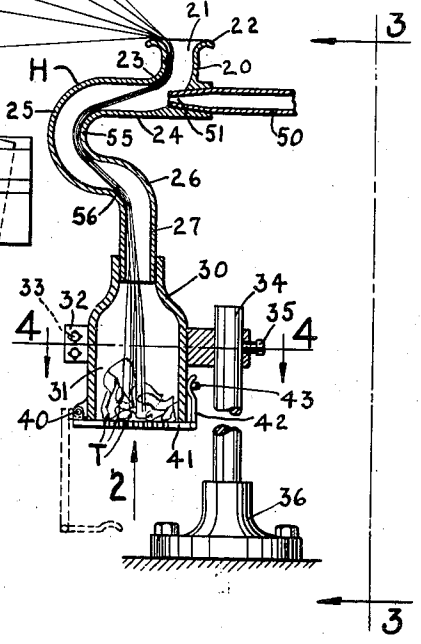


FIG. 2



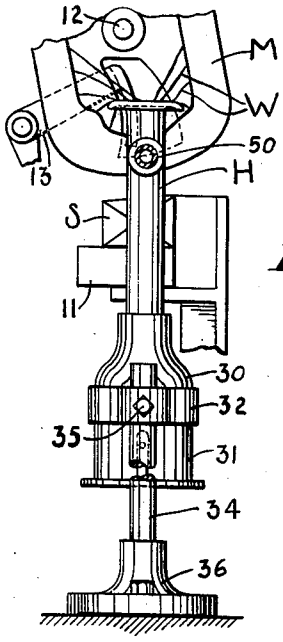


FIG. 3

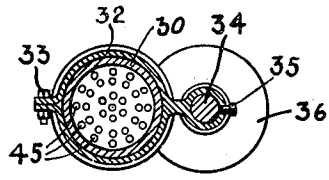


FIG. 4

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PNEUMATIC THREAD HOLDER FOR WEFT REPLENISHING LOOMS

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11 Claims. (Cl. 139—247)

This invention relates to improvements in pneumatic thread holders for weft replenishing looms and it is the general object of the invention to provide an improved thread holder of this type more particularly adapted for use with air under super-atmospheric pressure.

In my prior Patent No. 1,703,898 I have shown a pneumatic thread holder comprising a tube into which is inserted an air injector so located as to draw the weft ends into the tube by a sub-atmospheric pressure and then subject the threads to a super-atmospheric pressure beyond the injector. I have found it desirable to form the tube in such a way that the injector will direct a blast of air positively across the group of threads in the holder for the purpose of being able to separate the thread of the freshly transferred bobbin from the threads of the other reserve bobbins and it is accordingly an important object of my present invention to provide a thread holder the interior of which is so constructed as to require the threads to extend across the travelling column of air.

In order that the thread ends as they are cut at the time of a replenishing operation shall not fly around loosely with danger of being drawn into the warp shed it is desirable to provide some form of holder or collector to receive the cut threads. Since the air is under a super-atmospheric pressure it is necessary to provide for its escape from the collector and it is a further object of my present invention to provide a thread collector having a foraminous surface through which the air under pressure may escape, thereby preventing the building-up of a back pressure which would interfere with the proper control of the thread ends. In this connection it is desirable that the collector be so constructed that it can be cleaned and it is a further object of my invention to provide the collector with a removable part which can be temporarily detached from normal position to permit the accumulated thread ends to be taken out of the collector.

It is a further object of my invention to construct the collector so that the thread ends from the reserve bobbins can be blown against and become entangled with the mass of threads which accumulate in the collector.

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 drawing, wherein a convenient embodiment of my invention is set forth,

Fig. 1 is a front elevation of a weft replenishing mechanism equipped with my present invention, the latter being shown in vertical section,

Fig. 2 is a bottom plan in the direction of arrow 2, Fig. 1,

Fig. 3 is an end elevation looking in the direction of arrow 3, Fig. 1, the injector tube being in section, and

Fig. 4 is a detailed horizontal section on line 4—4 of Fig. 1.

Referring to the drawing, I have shown a loom frame 10 having a lay 11 along which travels a shuttle S. Supported by the loom frame in any approved manner is a magazine M having a series of reserve bobbins B from which extend weft ends W. The magazine may if desired rock about the horizontal axis 12 to present the bobbins in the magazine in transfer position by mechanism not shown herein but set forth in prior Patent No. 2,128,974. A transferrer arm 13 may be provided to move a reserve bobbin from the magazine into the shuttle after which the latter will be picked to the opposite side of the loom by a picker stick 14.

The matter thus far described of itself forms no part of my present invention and may be constructed as set forth in the last named patent. I have shown a rocking magazine for purposes of illustrating my invention but I do not wish to be limited to a weft replenishing mechanism employing this type of magazine. It is thought sufficient to state that at the time of a weft replenishing operation the transferrer arm will descend and move a bobbin in low position in the magazine downwardly and into the shuttle, the latter being constructed to hold the fresh bobbin, and it will also be apparent that the thread end W of the transferred bobbin will descend with the latter and that all of the other bobbins at least in the stack from which transfer has been made will also descend to produce a slackness in the weft ends which should be tightened to prevent entanglement.

In carrying my present invention into effect I provide a thread holder H comprising a tube 20 having a preferably upwardly opening intake mouth 21 the orifice of which may be defined by a flared round edge 22 of the tube. The latter extends downwardly as indicated in Fig. 1 and is then bent as at 23 toward the magazine and extends horizontally as at 24 to a vertical semi-circular bend 25 leading to another bend 26 terminating in a vertical part 27. From an inspection of Fig. 1 it will be seen that the interior of the tube or pipe forming an important part of the holder is provided with reverse bends the advantages of which will be pointed out hereinafter.

Secured to the lower end 27 of the tube is a thread collector 30 having an enlarged lower body 31 in the form of a hollow bell around which extends a strap 32 held tightly to the collector by a bolt 33. The strap is vertically adjustable on an upright support 34 by means of a set screw 35, and the support 34 is shown herein as held

by a base 36 held to the floor which supports the loom. I do not wish to be limited to this particular construction for supporting the thread holder.

The lower end of the bell is provided with a pin 40 on which is pivotally mounted a bottom plate 41 the right end of which as viewed in Fig. 1 may be provided with a catch 42 to engage a snap 43 on the bell 31. The catch and snap cooperate normally to hold the bottom plate 41 in the normal position shown in Fig. 1. This plate is constructed so that air from above can pass downwardly therethrough and as shown herein I provide the plate with a series of perforations 45, although I do not wish to be limited to this particular type of plate nor the method shown herein for the method of making it permeable to air. It is sufficient if the plate is held normally in position on the bottom of the bell and is so constructed that air can pass through it.

In order to create a column of air which will move through the thread holder I provide an injector tube 50 having a reduced nozzle 51 and supply the injector with compressed air at superatmospheric pressures derived from any desired source. I do not deem it necessary to illustrate the source of compressed air and wish further to state that the air issuing from the nozzle 51 may be under either constant or intermittent pressure, but it is desirable to have the air pressure on during a picking operation subsequent to transfer. As shown in Fig. 1 the nozzle extends in a direction so that the air issuing from it extends along the horizontal part 24 of the pipe or tube 20.

In operation, the injector will be connected to a source of compressed air and during normal loom operation will direct a blast of air horizontally into part 24 of tube 20 and draw a column of air down through the orifice 21. When the bobbins are placed in the magazine their weft ends will be laid across the intake mouth of the tube 20 and will be drawn into the latter by the sub-atmospheric pressure created at the mouth by the injector. The thread ends will then wrap around a part of curve 23 and extend across the straight part 24 to have contact with the right side of the semi-circular bend 25 along a curved line designated at 55 in Fig. 1. The weft ends then extend across the tube again to have contact with the bend 26 along a line 56 in Fig. 1, after which the ends project down into the bell 31. The perforations 45 permit the air under pressure in the bell to escape downwardly through the plate 41 without building up any appreciable back pressure in the tube 20.

Located in the bell is preferably a mass of threads T which may be inserted at the beginning of loom operation or may collect as the result of successive transferring operations of the loom. This mass of threads will be somewhat loosely held together by entanglement of its individual threads, and also is entangled with the weft ends W which are blown against the mass. There is thus provided an anchorage for the threads extending from the reserve bobbins.

As air issues from the nozzle 51 under superatmospheric pressure it will be directed toward a part of the group of weft threads W which is oblique with respect to the straight part 24 of the tube 20 and will therefore effect a sufficient separation of the threads so that the thread of a transferred bobbin, when cut at the selvage, will be immediately drawn into the orifice 21 and be directed downwardly along the tube and into the bell 31. In order to prevent holding of an individual thread, such as that of a transferred bobbin, the group of weft ends which are still connected to the reserve bobbins, said threads extend across the air stream a second time between the bends 25 and 26. The thread which is separated from the group is therefore directed into the bell to become a part of the mass of threads which hold the thread ends W still in contact with their reserve bobbins.

When the accumulation of threads in the bell becomes sufficient to interfere with proper control of the weft ends the bottom plate 41 can be swung downwardly to the dotted position shown in Fig. 1 by releasing the catch and snap, after which the plate can be restored to its normal position.

From the foregoing it will be seen that I have provided a simple form of pneumatic thread holder so constructed that the moving column of air is directed across the group of weft threads extending from the reserve bobbins and located within the thread holder. As shown herein I effect this result by providing the thread holder with reverse bends, although I do not wish to be limited to the exact form of the holder as shown in Fig. 1. It will also be seen that the thread collector or bell contains a mass of threads to become entangled with the ends of weft extending from the reserve bobbins in the magazine to provide an anchorage which will hold the threads even though the pneumatic system should fail temporarily. It will further be seen that the bottom plate 41 is constructed so that air can pass through it to prevent creation of back pressure, but the perforations 45 are sufficiently small to prevent the threads from passing through them. Also, the bottom plate can be lowered to permit cleaning of the bell.

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 a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a thread holder for the weft ends including a hollow member the interior of which is formed with reverse bends, the hollow member having an intake mouth and the weft ends extending into the mouth and across the interior of the hollow member from one bend to another bend, and means to create a blast of air within said hollow member directed transversely of the weft ends toward a point between the bends between which the weft ends extend.

2. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a hollow member having an intake mouth and constructed to have an interior formed with reverse bends beyond the intake mouth with respect to the reserve bobbins, the weft ends extending into the mouth and across a portion of the hollow interior of the member from one bend to an adjacent bend, and means to introduce a blast of air into the hollow member directed toward a point between said bends and laterally of the weft ends in a direction away from the intake mouth.

3. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a pneumatic thread holder having a hollow member provided with an intake mouth and hav-

ing a plurality of oppositely directed turns, the weft ends extending through the mouth and from one of said turns across a portion of the hollow interior to another of said turns, and means to direct air under super-atmospheric pressures into the hollow member in a direction away from the mouth toward a point between said turns and across the thread ends extending between said turns, the intake mouth being located between said turns and the reserve bobbins.

4. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a hollow member having a thread receiving opening and a hollow interior communicating therewith into which the thread ends extend, a part of the hollow interior lying beyond the intake opening with respect to the reserve bobbins being constructed to cause parts of the weft ends to extend across a portion of the hollow interior from one side to the other side thereof when said weft ends are taut, and means to direct air under super-atmospheric pressure into the hollow member transversely of said parts of the weft ends.

5. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a pneumatic thread holder having an upwardly opening intake mouth communicating with a downwardly extending hollow chamber of sinuous form, the weft ends extending into the intake opening and extending from one portion to another portion of the sinuously formed interior to lie across a part of said interior, and means to direct a blast of air under super-atmospheric pressures away from said mouth and against those portions of the thread which extend across said hollow interior at a point beyond the intake opening with respect to the reserve bobbins.

6. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a hollow thread holder having an intake mouth to receive the weft ends at one end thereof, a hollow thread collector at the other end of said holder, means to introduce a blast of air at super-atmospheric pressures between the ends of the holder and directed toward the thread collector, and a perforated closure for the collector through which air moving into the collector may escape, said perforated closure preventing escape of weft ends from the collector.

7. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a hollow thread holder having an intake mouth at one end thereof adjacent to the reserve bobbins to receive the weft ends, a hollow thread collector at the other end of the holder communicating with the interior of the latter, means to introduce a blast of air into said holder at super-atmospheric pressures between the ends of the holder and directed toward the collector, and a removable foraminous closure for the collector to retain the weft ends within the collector and through which air entering the collector may escape.

8. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a pneumatic thread holder having an intake mouth at one end thereof adjacent to the reserve bobbins to receive the weft ends, a hollow thread collector the interior of which communicates with the interior of the other end of the thread holder, the collector containing a mass of threads entangled with the weft ends extending from the reserve bobbins, means to inject air into said holder at a point between the intake mouth and the thread collector under super-atmospheric pressures directed toward the collector to create sub-atmospheric pressures at the mouth to draw the weft ends into the latter and thereafter subject said weft ends to super-atmospheric pressures to entangle said weft ends with the mass of threads in the thread collector, and said collector having a part so constructed as to permit the escape of air entering the collector at super-atmospheric pressures but retain the threads blown into said collector.

9. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a pneumatic thread holder having an intake mouth at one end adjacent to the reserve bobbins to receive the weft ends, a hollow thread collector the interior of which communicates with the interior of the other end of the thread holder, the collector containing a mass of threads entangled with the weft ends extending from the reserve bobbins, means to inject air into said holder at a point between the intake mouth and the thread collector under super-atmospheric pressures directed toward the collector to create sub-atmospheric pressures at the mouth to draw the weft ends into the latter and thereafter subject said weft ends to super-atmospheric pressure to entangle said weft ends with the mass of threads in the thread collector, a part of said collector being so constructed as to permit the escape of air entering the collector at super-atmospheric pressures but retain the threads blown into said collector, and means to mount said part for movement relatively to the collector to afford access to the interior of said collector for the removal of accumulated thread ends.

10. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a pneumatic thread holder having an intake mouth and a cavity therein communicating with the mouth, opposite sides of the cavity being so formed that taut threads extending through the cavity will engage opposite sides of and extend diagonally across said cavity, and means to direct a blast of air under super-atmospheric pressures transversely against the threads extending diagonally across the cavity and away from the intake mouth.

11. In a weft replenishing loom having a plurality of reserve bobbins from which extend weft ends, a hollow member having an intake mouth and constructed to have the interior thereof communicate with the mouth and formed with reverse bends beyond the intake mouth with respect to the reserve bobbins, the weft ends extending into the mouth and across a portion of the hollow interior of the member from one bend to an adjacent bend, means to inject a blast of air into the hollow member at a point between adjacent bends and transversely of the weft ends in a direction toward the end of the hollow member opposite the intake mouth, and a hollow thread collector having an interior communicating with the hollow interior of the tube member and provided with means to permit the escape of air while retaining weft ends.

OSCAR V. PAYNE.