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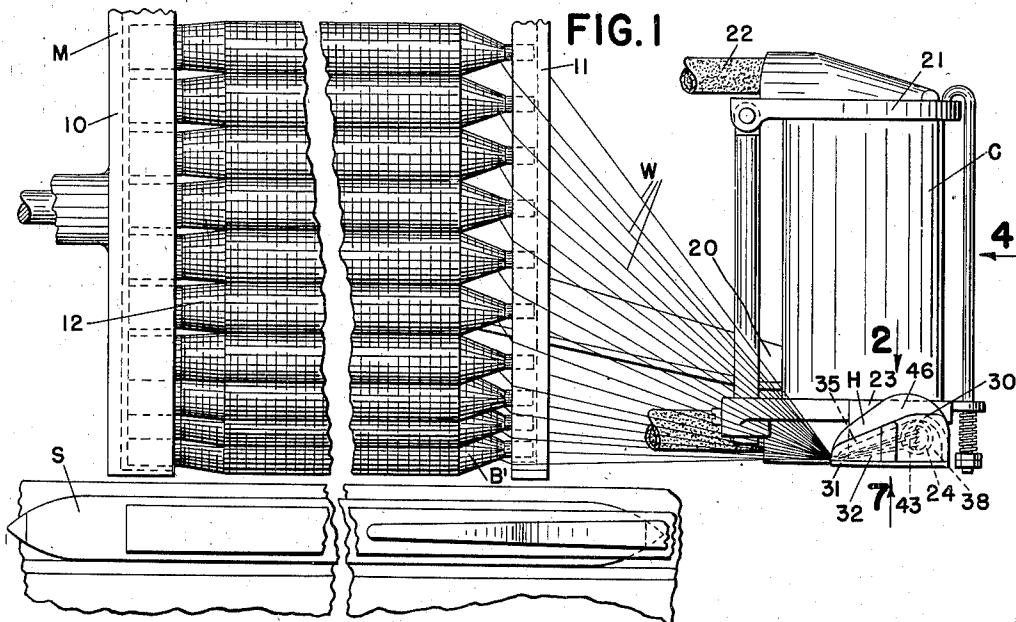
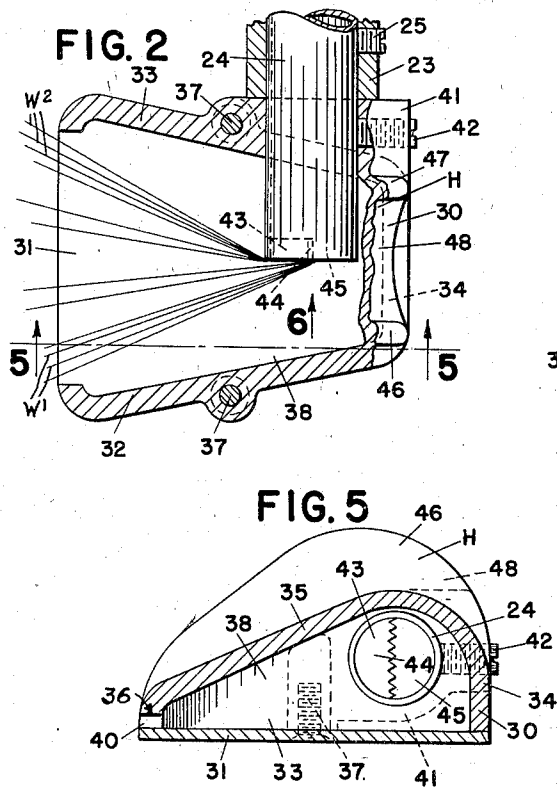
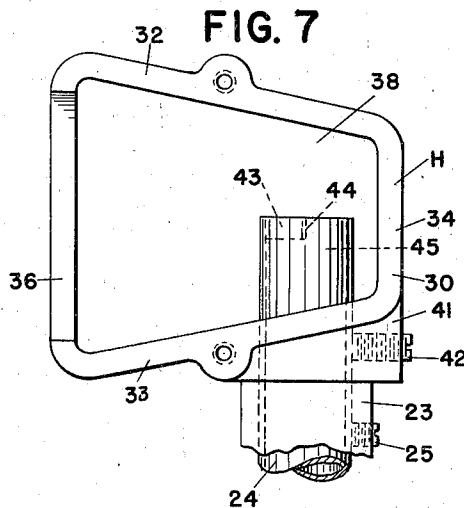
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PNEUMATIC THREAD HOLDER FOR WEFT REPLENISHING LOOMS

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2 Sheets-Sheet 1



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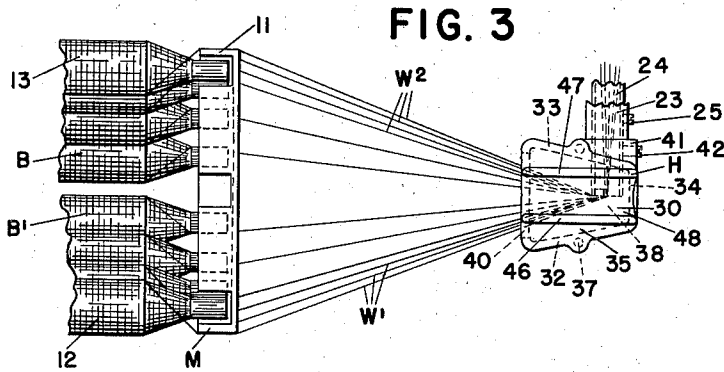
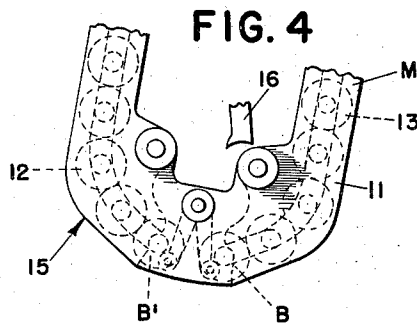
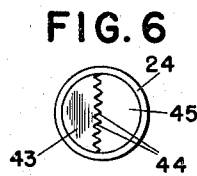
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PNEUMATIC THREAD HOLDER FOR WEFT
REPLENISHING LOOMS

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This invention relates to improvements in pneumatic thread holders for weft replenishing looms and it is the general object of the invention to provide a holder which will effect separation of the thread corresponding to a transferred bobbin from the other threads entering the intake mouth.

In weft replenishing looms more particularly of the multicolor type the reserve bobbins are arranged in stacks and their weft ends approach the thread holder in groups. At the time of transfer it is desirable to have the thread of the transferred bobbin separated from the other threads so that it can be pneumatically removed. Heretofore I have proposed to effect this separation by downward motion of the thread of the transferred bobbin away from the other threads in the intake mouth. As contrasted with these previous thread holders it is an important object of the present invention to effect horizontal separation of the threads. This result is obtained by providing the thread holder with a long narrow substantially horizontal intake mouth which permits grouping of the majority of the weft ends at the ends thereof but permits the thread of the transferred bobbin to move to the center of the slot where it is detached from the other threads.

It is another object of the invention to provide a pneumatic thread holder having a thread compartment communicating with the intake mouth and a tube projecting part way across the compartment to receive the threads which enter the mouth. The tube is connected to a source of subatmospheric pressures which causes air to enter the intake mouth in a thin sheet and then be drawn toward the tube in such manner as to create considerable air disturbance within the thread compartment to separate the threads and prevent them from becoming entangled.

It is a more specific object of the invention to provide the open end of the aforesaid tube with a transverse plate having a notched or saw-toothed guide edge which will cause the threads entering the tube to follow different paths and thus prevent them from being twisted into a cord or bundle.

It is another object of the invention to provide convenient adjusting means for the thread holder whereby the relation of the notched edge and mouth can be adjusted angularly with respect to each other and also the magazine.

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.

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

Fig. 1 is a front elevation of a weft replenishing mechanism having my invention applied thereto, Fig. 2 is an enlarged plan view of the thread holder and supporting tube, parts being shown in section, looking in the direction of arrow 2, Fig. 1,

Fig. 3 is a plan view showing the outer plate of the magazine, the weft ends leading from the reserve bobbins, and the thread holder, illustrating the manner in which the weft ends separate,

Fig. 4 is an end view looking in the direction of arrow 4, Fig. 1, parts being omitted,

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

Fig. 6 is a detail front elevation of the end of the tube which extends into the thread holder looking in the direction of arrow 6, Fig. 2, and

Fig. 7 is a bottom plan view of the thread holder looking in the direction of arrow 7, Fig. 1, with the bottom plate removed.

Referring particularly to Fig. 1, the magazine M is provided with inner and outer bobbin guiding plates 10 and 11 which support front and back stacks 12 and 13 of reserve bobbins. The weft ends of the bobbins, designated generally at W, lead downwardly to the right from the plate 11 as shown in Fig. 1 to a thread holder designated generally at H, and are divided into front and back groups W' and W2, see Fig. 2.

The outside magazine plate 11 is formed with a somewhat rounded bottom thread guiding edge 15 as shown in Fig. 4, and the bobbins are arranged in such manner that the lowest bobbin B in the rear stack is in position for transfer into shuttle S by a transferrer arm 16 when the magazine is in normal position. When a second shuttle not shown is to be replenished the magazine will be rocked so that the lowest bobbin B' of the front stack will be under the transferrer arm. Bobbins B and B' are near the center of the bottom of the magazine, and the bobbins next to them are at their sides. The other bobbins of each stack are preferably aligned more or less vertically as shown in Fig. 4.

The loom is provided with a stationary thread collector C which may be supported in any convenient manner, as by a support 20, and has a cover 21 connected to a hose 22 leading to a source of subatmospheric pressures not shown, such as a reciprocating pump operated by the loom lay. The collector includes a base 23 mounted on support 20, and a preferably metal-

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lic tube 24 is held in adjusted angular position on the base by a set screw 25.

In carrying the present invention into effect the holder H is made with an upper hollow casing 30 and a bottom plate 31. The casing has front and back walls 32 and 33 which are inclined toward each other as indicated in Fig. 7, and are joined by a side or end wall 34. As shown for instance in Figs. 1 and 5 the left end of the casing 30 is tapered downwardly toward the left and has a roof or top 35 extending over the front, back and side walls 32, 33 and 34.

Extending upwardly into the left end of the top 35 and between the front and back walls 32 and 33 is a narrow recess 36 the top of which is slightly above the level of the flat bottom of the casing 30 and plate 31. The latter is held against the bottom of the casing by means of screws 37, and together with the recess defines a long narrow substantially horizontal intake mouth 40 in the form of a slit. Bottom plate 31 and the walls and top of casing 30 define a thread compartment 38 which increases in height from mouth 40 to side wall 34. As shown in Fig. 7 the compartment decreases in width from mouth 40 to wall 34, but the larger cubic content of the compartment is near tube 24.

The rear wall 33 is formed with a hub 41 having an adjusting screw 42 by means of which the holder H can be held in angularly adjusted position on the forward end of tube 24. As shown in Fig. 2 the tube extends into and part way across the thread compartment, and its inner end is partly closed by a transverse plate 43 provided with notches or saw teeth 44 as shown more particularly in Fig. 6. A thread aperture 45 to the right of the notches affords a passageway for threads to enter tube 24. The saw teeth will ordinarily be arranged more or less vertically, although their adjustment as to angular position can be varied by means of set screw 25. Extending upwardly from the casing are front and back thread guide ribs 46 and 47 which define between them a trough 48 which leads downwardly to the top of the intake mouth 40.

The thread holder when in use will be located as shown in Figs. 1, 3 and 4, and subatmospheric pressures created within the thread collector C will by means of tube 24 create reduced pressures within the thread compartment 38, thereby inducing a flow of air inwardly through the narrow slit-like mouth 40. Threads in the trough 48 fall to points adjacent to the intake mouth and will be drawn into the latter and thence through the compartment 38 and aperture 45 into the collector.

An important feature of the invention will be evident from Fig. 3, where it will be seen that the greater part of the threads W' corresponding to the front stack of the bobbins enter the forward end of the mouth 40, while in similar manner most of the weft ends W2 enter the rear part of the mouth. Because of the shape of the bottom of the magazine plate 11, however, the weft ends of those bobbins which are at the bottom of their respective stacks will lead to the central part of mouth 40 and thence to the tube 24. These last named threads are therefore separated horizontally from the other threads, and it is for this reason that they can be readily removed when cut by mechanism not shown subsequent to transfer.

It is to be understood that the end of tube 24 is located in such a position within the compartment 38 as to cause the weft ends to dispose

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themselves more or less as shown in Figs. 2 and 3 with at least two threads, or possibly four, extending through that part of the intake mouth 40 more or less central of its length.

Prior to transfer the thread of a bobbin in transfer position may extend along the top of the mouth 40, but after transfer the thread may move downwardly with respect to the intake mouth and engage the bottom plate 31. This feature is incidental, however, and I rely primarily upon horizontal separation of the threads to aid removal of the thread of a transferred bobbin. If it is desired to effect vertical as well as horizontal thread separation the angular position of the holder H may be appropriately adjusted by means of screw 42.

From the foregoing it will be seen that I have provided a simple form of pneumatic thread holder having a long narrow preferably horizontally disposed intake mouth which permits the threads of the lowest bobbins in the magazine to be separated from the other threads. As shown in Figs. 2 and 5 the tube 24 preferably extends approximately to the mid point of the casing 30 somewhat above the bottom plate 31 and preferably a slight distance below the top 35. Compartment 38 is tapered away from mouth 40 and its greater cubic content is near tube 24. The rate of air travel into mouth 40 is greater than in regions near the tube, and the difference in rates creates a turbulence favorable to thread separation. The tube is substantially parallel to the length of the intake mouth so that its thread aperture 45 opens transversely of the mouth 40 and intermediate the ends of the mouth, as shown in Fig. 7. It is to be understood that because of the aforesaid turbulence the threads entering the intake mouth do not all behave in exactly the same manner, and some of them will be drawn into the upper part of the aperture, others into the lower part, while still others will be located centrally. The several threads are therefore distributed more or less along the notched edge 44 in a vertical direction. I do not wish however to be limited in the practice of my invention to the notches, since I have found that threads will distribute themselves along a smooth vertical edge on plate 43. Furthermore, the adjustments provided by the screws 25 and 42 permit a variety of settings of the holder and tube with respect to each other and also with respect to the magazine.

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 a weft replenishing mechanism having a magazine provided with a stack of reserve bobbins the lowest one of which is nearer the horizontal center of the magazine than are the other bobbins of the stack, a hollow pneumatic thread holder having a long narrow substantially horizontal intake mouth into which extend weft ends attached to the bobbins, and a tube extending into the holder having a thread aperture spaced from the mouth and into which the weft ends are drawn pneumatically, said aperture being so located relatively to the mouth as to cause the weft end of said lowest bobbin to enter the mouth near the longitudinal center thereof and cause the remaining weft ends to enter said mouth at points horizontally spaced from said weft end.

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2. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder containing an inclosed hollow thread compartment and having a long narrow intake mouth connecting the compartment with the atmosphere and into which the weft ends extend, and a tube in which subatmospheric pressures exist entering the compartment and having a thread aperture opening in a direction parallel to the length of the mouth and into which the weft ends are pneumatically drawn, said tube extending part way across said compartment to locate said aperture intermediate the ends of said intake mouth.

3. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder containing an inclosed hollow thread compartment and having a long narrow intake mouth connecting the compartment with the atmosphere and into which the weft ends extend, and a tube parallel to the length of the mouth entering the compartment and extending part way across the latter and having a thread aperture opening in a direction parallel to the length of the mouth and intermediate the ends of the latter, the existence of subatmospheric pressure within the tube causing the weft ends to enter the mouth and extend through the central parts of said compartment and into said aperture.

4. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder having a long narrow intake mouth for said weft ends and formed with an inclosed hollow thread compartment the cross sectional area of which measured parallel to the length of the mouth increases progressively in a direction away from the mouth, and hollow means having a thread aperture within the compartment spaced from said mouth and effective when subatmospheric pressures exist therein to draw said weft ends into the mouth and along the compartment to said aperture.

5. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder formed with an internal thread compartment tapering from one end thereof toward a long narrow intake mouth at the other end thereof, and hollow means entering said compartment adjacent to said one end thereof having a thread aperture, creation of subatmospheric pressures in said means causing the weft ends to be drawn pneumatically into said mouth and along said compartment to said aperture.

6. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder having a long narrow intake mouth at one end thereof and inclosing a thread compartment communicating with said mouth and extending to the other end of said holder, said compartment having a larger cubic content at said other end than at said one end, and hollow means having a thread aperture within the compartment adjacent to said other end thereof, creation of subatmospheric pressures in said means causing said weft ends to be drawn pneumatically into said mouth and along said compartment to said aperture.

7. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder having a long narrow intake mouth at one end thereof and inclosing a thread compartment communicating with said mouth and extending to the other end of said holder, said compartment having a larger cubic content at said other end than at said one end, and a tube

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entering the compartment and terminating in a thread aperture located adjacent to said other end and intermediate the sides of the compartment measured in a direction parallel to the length of said mouth, creation of subatmospheric pressures within said tube causing the weft ends to be drawn pneumatically into said mouth and along the intermediate parts of said compartment to said aperture.

8. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder having a long narrow intake mouth at one end thereof and inclosing a hollow thread compartment which tapers in a horizontal direction from said mouth toward the other end of the holder and tapers in a vertical direction from said other end toward said mouth, and hollow means having a thread aperture in the compartment located adjacent to said other end of the holder intermediate the horizontally spaced sides of the compartment, creation of subatmospheric pressures within said hollow means causing said weft ends to be drawn pneumatically into said mouth and along paths in the compartment spaced from said horizontally spaced sides to said aperture.

9. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder having a substantially horizontal elongated narrow intake mouth leading to a thread compartment inclosed within the holder, and a tube entering said compartment having a thread aperture one side of which is substantially vertical, creation of subatmospheric pressures within the tube drawing said weft ends into the mouth to dispose them horizontally at the mouth and then into the aperture to dispose said weft ends vertically along said one side.

10. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder having at one end thereof an elongated narrow substantially horizontal intake mouth communicating with a thread compartment which extends interiorly of and toward the other end of the holder, a tube entering said compartment adjacent to said other end of the holder, and means closing part of the end of said tube and defining with the latter a thread aperture one edge of which is substantially vertical, creation of subatmospheric pressures within the tube causing the weft ends to enter said mouth in horizontally spaced relationship and enter said aperture in vertically spaced relationship along said edge.

11. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder having at one end thereof a long narrow horizontal intake mouth communicating with a thread compartment inclosed within the holder and extending toward the other end thereof, a tube entering said compartment adjacent to said other end of the holder, a plate extending across and closing part of the tube and having thread holding notches therein, the unclosed part of said tube defining a thread aperture, and means holding the tube on said holder with said notches arranged vertically and with said aperture on that side of the notches opposite to said intake mouth, creation of subatmospheric pressures within the tube causing said weft threads to enter the mouth in horizontally spaced relationship and engage in said notches in vertically spaced relationship.

12. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom,

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support means, a tube mounted on said support means, a thread holder having a thread compartment into which one end of the tube extends and having also an elongated narrow substantially horizontal intake mouth for the weft ends, means on said end of the tube within the compartment defining a thread aperture one edge of which is substantially straight, means to adjust the angular position of the tube to vary the angular disposition of said edge, and means to adjust the angular position of the holder relatively to the tube to vary the angular disposition of the mouth relatively to said edge.

13. A pneumatic thread holder for the weft ends of reserve bobbins in a weft replenishing mechanism, said holder comprising a casing having a solid top formed with depending front and back walls and a side wall at one end thereof and a recess at the other end thereof extending between the front and back walls and opening downwardly, a plate secured to the bottom of said walls and extending along said recess to define with the latter an intake mouth for the weft ends, said plate and casing inclosing a thread compartment for the weft ends, and means on said casing exterior of said compartment to provide for support of said holder.

14. A thread holder for the weft ends extending from reserve bobbins in a weft replenishing mechanism provided with a stationary tube, said holder comprising a casing having a solid top and depending front and back walls and a wall joining said walls at one end thereof, said casing having an elongated narrow recess between said

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front and back walls at the other end thereof, a plate secured to the bottoms of said walls extending along said recess and forming therewith a long narrow intake mouth, said casing and plate defining a thread compartment inclosed within the holder and communicating with said intake mouth, and means on the casing affording entry of the tube into said compartment and by which said casing may be supported by said tube.

15. In thread control means for the weft ends of reserve bobbins in a weft replenishing loom, a thread holder having an elongated narrow intake mouth at one end thereof for the weft ends and inclosing a thread compartment, a tube entering the compartment adjacent to the other end of the holder, means extending across the end of the tube presenting a thread engaging edge adjacent to a thread aperture in the tube, and means holding the tube with said edge transverse of a straight line passing through the intake mouth and said aperture.

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