

Dec. 13, 1949

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PNEUMATIC THREAD HOLDER FOR
WEFT REPLENISHING LOOMS
Filed Nov. 6, 1948

2,491,142

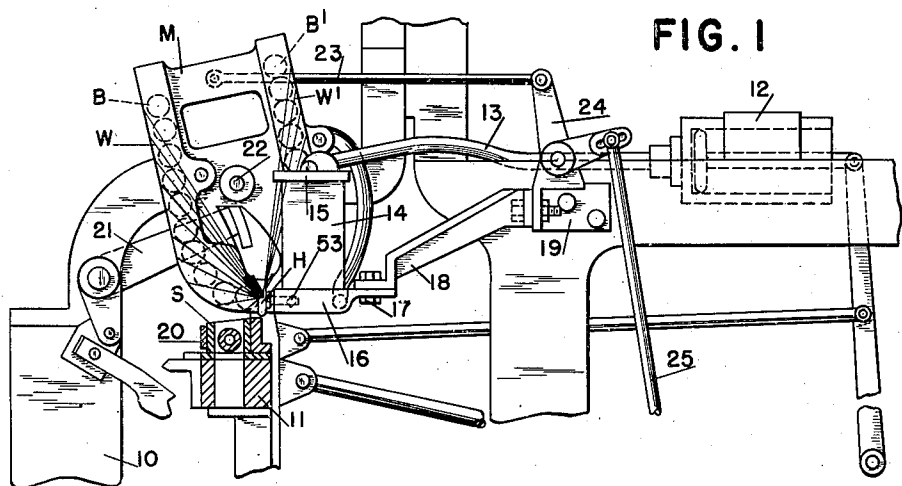


FIG. 1

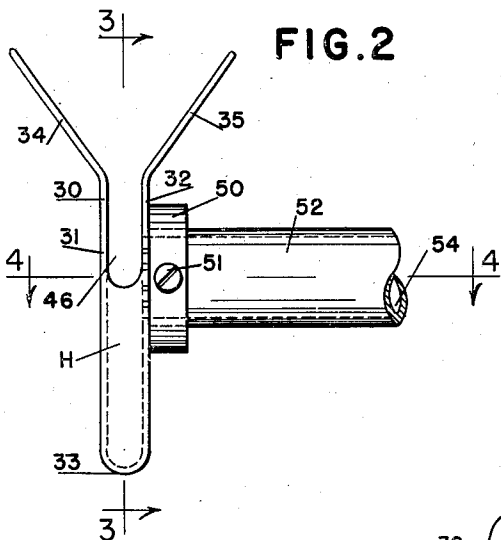


FIG. 2

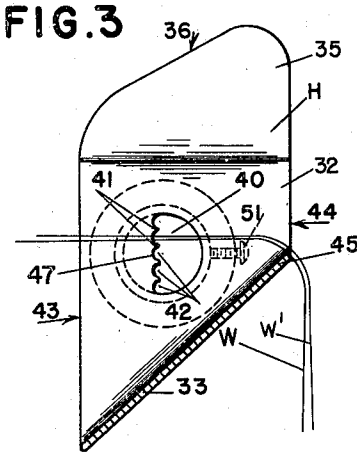


FIG. 3

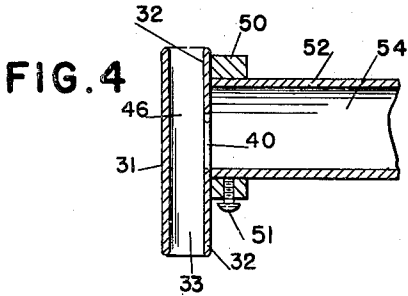


FIG. 4

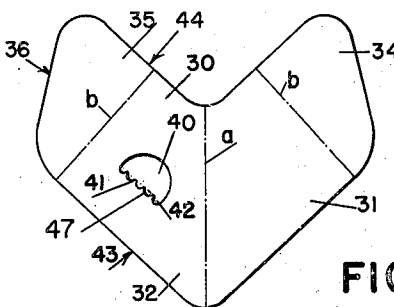


FIG. 5

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2,491,142

PNEUMATIC THREAD HOLDER FOR
WEFT REPLENISHING LOOMS

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Application November 6, 1948, Serial No. 58,668

6 Claims. (Cl. 139-247)

1

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 thread holder which will separate the threads or weft ends into small groups.

In weft replenishing looms more particularly of the multicolor type weft ends extend from the reserve bobbins in the bobbin magazine toward a thread holder near the end of the lay. The weft ends should be kept taut and provision should also be made for removing the weft end of a transferred bobbin. In the past it has been proposed to accomplish these results pneumatically by a form of holder having an intake mouth for the weft ends and in pneumatic communication with a source of subatmospheric pressures. Such thread holders as made heretofore, however, have shown a tendency to draw the threads into a bunch which interferes with the removal of individual threads.

It is an important object of the present invention to make the thread holder of a piece of sheet metal bent so as to provide a thread compartment at one side of which is a thread intake mouth extending through the sheet metal. One side of the mouth is preferably formed with thread separating notches between teeth which are formed integrally with the sheet metal.

Reserve bobbins may be placed in the magazines while the pneumatic system is inactive, and under these conditions the weft ends will be laid in the weft compartment. Some provision should be made, however, so that these weft ends can later be drawn into the intake mouth. It is a further object of the present invention to provide a thread holder with a thread compartment having the bottom thereof inclined upwardly and away from the magazine to a point such that threads or weft ends hanging by their weight on the bottom of the thread compartment will lie across the mouth in the path of air which is drawn into the latter.

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

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

Fig. 1 is a side elevation of a loom partly in section showing the invention applied thereto,

Fig. 2 is an enlarged end elevation of the thread holder detached from the loom, parts being broken away,

Fig. 3 is a vertical section on line 3-3 of Fig. 2,

2

Fig. 4 is a horizontal section on line 4-4, Fig. 2, and

Fig. 5 is a diagrammatic view showing a form of the blank from which the thread holder is made prior to bending operations.

Referring more particularly to Fig. 1, the loom frame 10 supports a magazine M which in the present instance is provided with front and back reserve bobbins B and B', respectively, which feed downwardly by gravity toward two different transfer positions, one for each group of bobbins. The weft ends W and W' which extend from the bobbins B and B' converge toward a thread holder which is designated herein generally at H.

The lay 11 is reciprocated backwardly and forwardly in usual manner and operates a pneumatic pump 12, which on its rearward stroke, that is to the right as viewed in Fig. 1, creates a partial vacuum or subatmospheric pressures within hose 13 the forward end of which is pneumatically connected to a hollow thread collector 14. The latter has a top 15 to which the hose 13 is attached and has also a bottom or base 16 connected as at 17 to a bracket 18 which is supported by a stand 19 secured to the loom frame.

The lay has a shuttle box 20 to hold a shuttle S which when exhausted of weft receives a fresh bobbin from the magazine through operation of a transfer arm 21. The magazine is pivoted on a pivot stud 22 and is connected by a rod 23 to a lever 24 which is connected to another rod 25 under control of mechanism not shown. The magazine can be rocked about its center to either of two transfer positions so that bobbins can be transferred from one or the other of the aforesaid transfer positions.

Whenever a weft replenishing operation occurs a bobbin moves downwardly from the magazine M into the shuttle S and at the same time its weft end also descends. At a subsequent time in the loom operation this thread end is cut adjacent to the cloth selvage and should be removed from the loom to avoid being drawn into the warp shed. This function is generally performed by the pneumatic thread holder H, and the latter also serves to keep all of the weft ends taut.

The matter thus far described except for the details of the holder H may be of common construction and operate in the usual manner. The invention is not necessarily limited in its use to the particular type of magazine set forth herein, but has been found satisfactory in operation with a two-stack rocking magazine.

In carrying the present invention into effect a

3

thread holder is made substantially as shown in Figs. 2, 3 and 4. That part of the holder which engages the weft threads is preferably made of a single piece of sheet metal, such as steel or the like, and designated herein generally at 30. This piece of sheet metal is folded so that it has parallel spaced vertical front and back walls 31 and 32 which are joined at their lower ends by a curved bottom 33 which is inclined upwardly and in a direction away from the magazine, as indicated more particularly in Fig. 3. The upper ends of the side walls are provided with divergent wings 34 and 35 the upper edges 36 of which may if desired be more or less parallel to the bottom 33.

An aperture 40 is struck in the sheet metal piece 30, more particularly the rear wall 32 thereof, and is formed with serrations or teeth 41 which provide thread receiving notches or recesses 42. The teeth are integral with the sheet metal and always maintain the same relation with respect to the inner and outer edges 43 and 44 of the walls 31 and 32 and also the bottom 33.

The aperture 40 which is the thread intake mouth of the thread holder, and the point 45 at the upper end of the bottom 33, will ordinarily bear the relationship with respect to each other such as that shown in Fig. 3. The thread notches, which are arranged along the side 47 of mouth 40 remote from point 45, are preferably in a substantially straight line and extend both above and below the level of point 45. A line drawn from point 45 perpendicular to the serrated edge 47 will fall between the ends of edge 47 whatever the angular position of the thread holder. The reason for this relationship is that whenever weft ends are moved downwardly between the wings 34 and 35, into the thread compartment 46 between the front and back wall 31 and 32, said threads will be supported by the upper end of the bottom 33 in such position that they will extend across the intake mouth and be drawn into the latter by subatmospheric pressures created by the pump 12.

Secured to the rear wall 32, preferably by brazing or welding, is a collar 50 having a set screw 51 tapped therein. A preferably metallic tube 52 fits into the collar 50 and the latter and the holder are held in adjusted angular position by the set screw 51. The tube 52 extends into the base 16 and may be held therein in any approved manner, as by a holding screw 53. The interior 54 of tube 52 is in pneumatic communication of the interior of the thread collector 14, so that whenever subatmospheric pressures exist within the thread collector a column of air will be moved into the thread intake mouth or aperture 40.

In ordinary use the thread holder will be more or less in the position shown in Fig. 3 with the notches 42 in vertical alignment, but under some conditions of loom operation it may be desirable to change the angle of the line of notches, and this adjustment can be accomplished by means of the set screw 51. Whenever this adjustment is made there will be a corresponding change in the elevation of the upper end 45 of the bottom 33. If, for instance, the thread holder is turned in a clockwise direction as viewed in Fig. 1 the recesses or notches 42 will be arranged in a line extending upwardly and to the right, and there will be a corresponding lowering of the point 45. Such a change will be made to accommodate threads which may come down to the thread holder at a comparatively steep angle, but when this adjust-

4

ment is made the point 45 will be so located that the threads will be drawn across the aperture 40. The downward inclination of the bottom 33 permits a considerable amount of angular adjustment around the axis of the tube 50 without interference with the weft ends or threads.

Fig. 5 shows the blank of sheet metal piece 30 before any of its bending operations have been performed. This blank is generally V-shaped with wide sides, and has the mouth 40 punched therethrough with the teeth 41 and notches 42 substantially parallel to one of the edges 43, but this is not a necessary relation although it is desirable. The blank is bent on itself along its vertical axis *a* to form the bottom 33, and then the wings are spread by bends along lines *b*. The blank shown in Fig. 5 may be struck out in a single operation, after which burrs and sharp edges are removed in any approved manner from the edges of the blank and also from the teeth 41.

From the foregoing it will be seen that the invention sets forth a simple form of pneumatic thread holder made of a single sheet of metal as suggested in Figs. 2 and 3 and having struck integral therewith the teeth 41 which define the notches 42. In the forming operation the bottom 33 is made inclined as shown in Fig. 3 and the upper end of the bottom as determined by point 45 will be located on a line perpendicular to edge 47. The purpose of having several notches is to permit a distribution of the various weft ends *W* and *W'* so that they will not all collect in one corner of the aperture, a condition which might interfere with the removal of a thread at the bottom of a group of threads. It will further be seen that the collar 50 is permanently fastened to the wall 32 in such a way as to prevent leakage of air and is fastened to the tube 52 by means which permit angular adjustment of the holder with respect to the tube.

Having thus described the invention it will be seen that changes and modifications of the foregoing specific disclosure may be made without departing from the spirit and scope of the invention.

What is claimed as new is:

1. In a pneumatic thread holder for the weft ends extending from reserve bobbins in a weft replenishing loom, a tubular member in which subatmospheric pressures exist, a sheet metal member bent on itself to form two spaced walls between which is located a thread compartment, one of said walls having a thread receiving aperture along one side of which are located teeth integral with the sheet metal member and defining thread receiving notches, and means securing the sheet metal member to said tubular member.

2. In a pneumatic thread holder for the weft ends extending from reserve bobbins in a weft replenishing loom provided with a pneumatic thread collector in which subatmospheric pressures exist, a tubular member supported by and communicating pneumatically with the interior of the collector, a sheet metal member supported by said tubular member and bent on itself to provide spaced walls forming a thread compartment, one of said walls having an aperture therein communicating with the interior of said tubular member, and teeth integral with said sheet metal member defining thread receiving notches along one side of said aperture.

3. In a pneumatic thread holder for the weft ends extending from reserve bobbins in a weft

5

replenishing loom provided with a pneumatic thread collector in which subatmospheric pressures exist, a tubular member supported by and communicating pneumatically with the interior of the collector, a sheet metal member bent on itself to form spaced walls joined at their lower ends by a bottom for the thread holder which is inclined upwardly and away from the reserve bobbins, one of said walls having an aperture therein extending above and below the level of the upper end of said bottom, teeth formed integral with said one wall having thread receiving notches therebetween located at the side of said aperture remote from said upper end of said bottom, and means mounting said sheet metal member on said tubular member with the interior of the latter communicating with said aperture and through the latter with said thread compartment.

4. A sheet metal member for a pneumatic thread holder, said member being formed from a flat V-shaped piece of metal bent on itself around the vertical axis thereof so that the sides of the V-shaped piece are parallel to and spaced from each other to form walls, one of said walls having a thread receiving aperture therein one side of which is formed with teeth integral with said piece of metal and defining thread receiving notches.

5. A sheet metal member for a pneumatic thread holder, said member being formed from a flat V-shaped piece of metal bent on itself around the vertical axis thereof so that the sides

6

of the V-shaped piece are parallel to and spaced from each other to form walls and are connected by a bottom which causes the lower ends of said walls to be inclined with respect to the sides of the walls, one of said walls having an aperture therein the side of which remote from the upper end of said bottom is provided with thread notches formed by teeth integral with said one wall.

6. In a pneumatic thread holder for the weft ends extending from reserve bobbins in a weft replenishing loom, a tubular member in which subatmospheric pressures exist, a sheet metal member bent on itself to form two spaced walls between which is located a thread compartment, one of said walls having a thread receiving aperture along one side of which are located teeth integral with the sheet metal member and defining thread receiving notches, a collar secured to said one wall surrounding part of said tubular member, and means securing said collar to said tubular member.

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REFERENCES CITED

The following references are of record in the file of this patent:

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