No. 847,800. PATENTED MAR. 19, 1907.

F. A. MILLS.

MEANS FOR HANGING KNITTED LEASED HARNESS FOR LOOMS.

APPLICATION FILED MAR. 24, 1905.

Fig. 1.

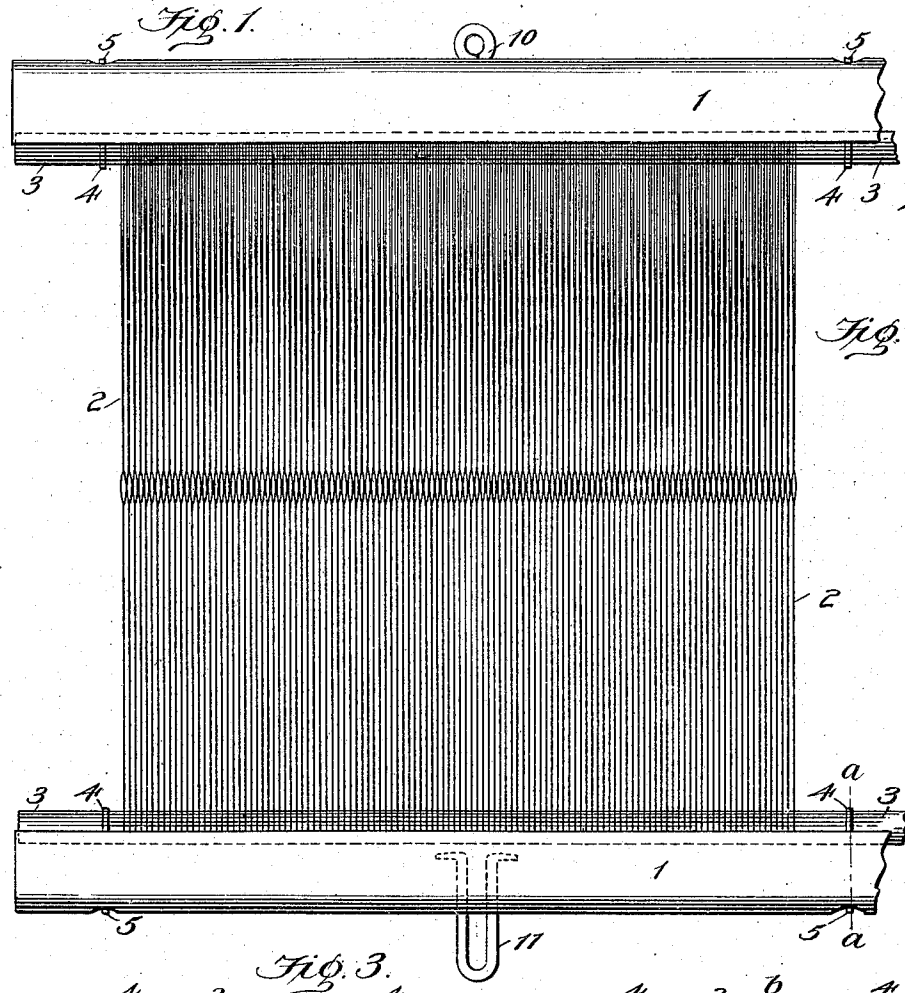


Fig. 2.



Fig. 3.

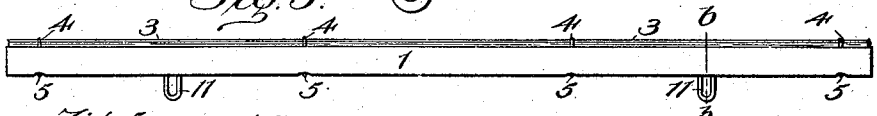


Fig. 5.

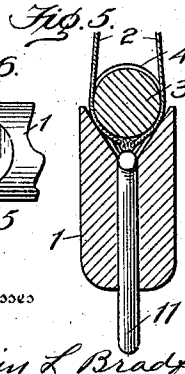


Fig. 4.

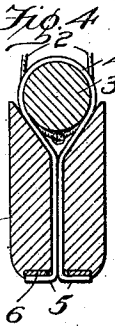


Fig. 7.

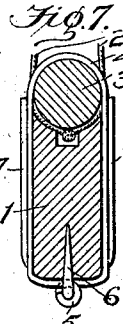


Fig. 8.

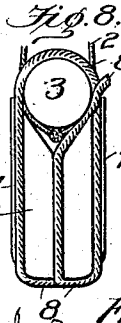


Fig. 9.

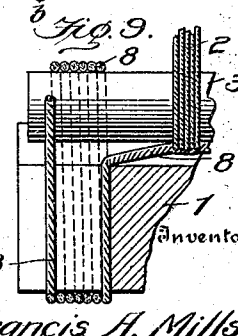
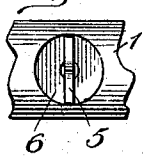


Fig. 6.



Witnesses

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MEANS FOR HANGING KNITTED LEASED HARNESS FOR LOOMS.

No. 847,800. Specification of Letters Patent. Patented March 19, 1907.

Application filed March 24, 1905. Serial No. 251,787.

To all whom it may concern:

Be it known that I, FRANCIS ARTHUR MILLS, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Means for Hanging Knitted Leased Harness for Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention herein is directed to the production of a knitted lease harness for looms and novel means whereby the harness-holding rods are secured to shafts, the object being to render the work of constructing the harness quick and comparatively inexpensive and of greater wearing life to the harness, and in the claims appended hereto I will point out the matter which constitutes my invention.

The following description, read in connection with the accompanying drawings, will enable any person skilled in the art to which my invention relates to understand and to practice my invention in the form in which I prefer to employ it; but it will be understood that my invention is not limited to the precise form and details of construction herein illustrated and described, as the same may be changed or modified in various particulars without departing from the spirit of my invention and the scope of the claims.

Referring to these drawings, Figure 1 shows in side view a portion of the left-hand end of a knitted harness for looms embodying my invention. Fig. 2 is an end view of the same. Fig. 3 shows a side view of a complete harness-shaft embodying my invention. Fig. 4 is a cross-section on the line *a a* of Fig. 1, showing the construction and means for securing the harness-shaft parts together for holding the harness. Fig. 5 is a like section taken on the line *b b* of Fig. 3, showing the manner of holding the harness. Fig. 6 shows the clenching of the means for holding the shaft parts together as in Fig. 4. Fig. 7 shows a modified construction of the means for holding the shaft parts together. Fig. 8 shows the holding of the shaft parts together at their ends by the back-band of the harness. Fig. 9 shows the same in sectional side view.

A pair of shaft-bars 1 carries what is known as a "knitted leased harness" 2, and the inner edge of each bar has preferably a **V** or concave transverse formation throughout its length, whereby to form a space for the harness-holding rods. These harness-holding rods 3 are preferably of a cylindrical form or of any form which will provide a surface and be adapted to be easily and quickly placed side by side their entire length. These harness-holding rods being cylindrical allows them to be easily placed in the lease of the harness, as they have no hooks or eyes to interfere and become entangled with the harness. These harness-holding rods are secured to their respective shafts at intervals by fastenings which are adapted to be passed around said rods and fastened at the outer edge of each shaft, and thus provide a firm and secure fastening for connecting the harness to the shafts. I have shown several forms of this fastening means, all of which provide for quick work in the operation of assembling the harness parts and greatly reducing the expense of manufacturing the harness. The essential and advantageous feature of this fastening is the convenience it affords for securing the rod and shaft to each other outside of the latter, where it can be quickly secured by hand. In Fig. 4 this fastening is shown in the form of a strap or wire 4, passed around the rod, the ends brought together, doubled between the shaft and the rod, and passed through a bore in the shaft, and their ends 5 clenched over a washer or staple 6 at the outer edge of the shaft. In Fig. 7 I have shown substantially the same fastening-strap passed around the rod and shaft and clenched around a staple 6 at the outer edge of the shaft. In this construction the sides of the shaft has saw-cut grooves 7 to receive the strap, so that the strap is countersunk flush with the shaft sides, and thereby prevent the chafing of the adjacent harness. Knitted harness has what is known as a "back-band" 8, around which the harness is knitted, and I may utilize the ends of this back-band as the means for holding the rod and shaft together at their ends, while serving to draw the back-band

tight, as shown in Figs. 8 and 9. The ends of the shaft have a saw cut 9, through which the back-band is pulled and then wrapped around both the rod and the shaft and then pulled into the said saw cut in the shaft and the end tightly squeezed between the rod and the shaft, as in Fig. 8.

The shafts may have the usual screw-eyes 10 for hanging the harness; but I prefer to use staples 11, having a form that will not become entangled with the knitted harness and that may be seated in the bottom of the hollow of the shaft or fastened to the shaft in any suitable manner.

An important feature of my invention is the strapping of the shaft members to each other, and thereby greatly increase its stiffness and its capacity to cause a more equal strain upon all the strands and eyes of the harness and prevent their breaking.

It is also important to note that the strap-fastenings have each a supporting function for the harness-bar in which the resisting-point of such support is along the outer edges or sides of the shaft, and so far as I know and can find I am the first to support the harness-rods by connections pulling directly from the outer edges or sides of the shafts, thereby rendering the shaft members a unitary structure in its capacity to render the harness-strands more durable and which is a matter of the last importance in a loom-harness.

It will be further noted that the means for strapping the harness rod and shaft to each other to connect said parts as to straddle the back-band of the knitted harness, and thus protects the back-band and the harness-strands having the eyes for the warp from being cut, worn, or injured.

It will be understood that the passing of the straps between the shaft and the rod provides a space between them their entire length for keeping them apart, so that when any of the eyes or heddles are broken a new one can be substituted by sewing or fastening it to the back-band of the harness, and this space provides for the passage of a needle between the shaft and the rod, so that the new heddle can be sewed to the back-band.

I claim—

1. In a harness, the heddles whereof are composed of a continuous cord, a rib or back-band to which it is fastened, a shaft and a rod for holding said harness, means straddling said rod and said rib or back-band of said harness, and fastened to said shaft.

2. In a knitted harness for looms and in combination a shaft having a groove in its inner edge, a rod in said groove and holding the harness and means for securing the rod and shaft together consisting of a strap passed around the rod and secured to the outside of the shaft.

3. In a knitted harness for looms and in combination a shaft having a groove in its inner edge, a rod in said groove and holding the harness, and means for securing the rod and shaft together consisting of a strap passed around said rod, and through a bore in the shaft and fastened to the outer part of said shaft.

4. In a knitted harness for looms, a shaft having a groove in its inner edge, a rod holding the harness, a strap passed around said rod and through a bore in the shaft, a metallic plate upon the outer edge of the shaft the ends of said strap being passed through and clenched over said metallic plate.

5. In a knitted harness for looms, a shaft having a groove in its inner edge and slotted at its ends, a rod holding the harness, the back-band the ends of which are secured within said shaft-slots and fastened to the rod substantially as described for the purpose stated.

6. In a harness all the heddles whereof are composed of one continuous cord, a shaft, a rod holding the harness, and means for securing said rod to said shaft consisting of a strap passed around said rod and secured to the shaft.

7. In a harness all the heddles whereof are composed of one continuous cord, a shaft, a rod holding the harness, and means securing said rod to said shaft at its outer edge and in line with the strain of the harness.

8. In a knitted harness for looms, a shaft, a rod holding the harness, and means securing said rod to said shaft, straddling the back-band of the harness and fastened to said shaft, whereby the back-band and its connected harness-threads are prevented from being cut or worn.

9. In a harness, all the heddles whereof are composed of one continuous cord, a shaft, a rod parallel with the inner edge thereof spaced slightly therefrom, and means for securing the rod and shaft together, consisting of a strap passed around the rod and secured to the shaft.

10. In a harness, the heddles whereof are composed of a continuous cord, rods and shafts, means for uniting the rods, the shafts, and said harness together, substantially as shown and described.

11. In a harness, the heddles whereof are composed of a continuous cord united to a back or rib band, a shaft, a rod to hold said harness parallel with said shaft, and spaced therefrom, and means passing between the heddles of said harness, and fastened to said rod and said shaft.

12. In a harness for looms, the heddles whereof are composed of a continuous cord knitted to a back or rib band, a shaft, a rod to hold said harness parallel with said shaft, and spaced slightly therefrom and means passing around said rod and fastened to said shaft.

13. In a harness for looms, the heddles whereof are composed of a continuous cord knitted to a back or rib band, a shaft, and a rod to hold said harness means passing between the heddles and crossing said rod to hold the rod and the harness to said shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS ARTHUR MILLS.

Witnesses:
A. E. H. JOHNSON,
ANNE B. JOHNSON.