Feb. 19, 1924. 1,484,294

J. S. BOYD

THREAD HOLDING MEANS FOR PILE CUTTING MACHINES

Original Filed April 10, 1923 2 Sheets-Sheet 1

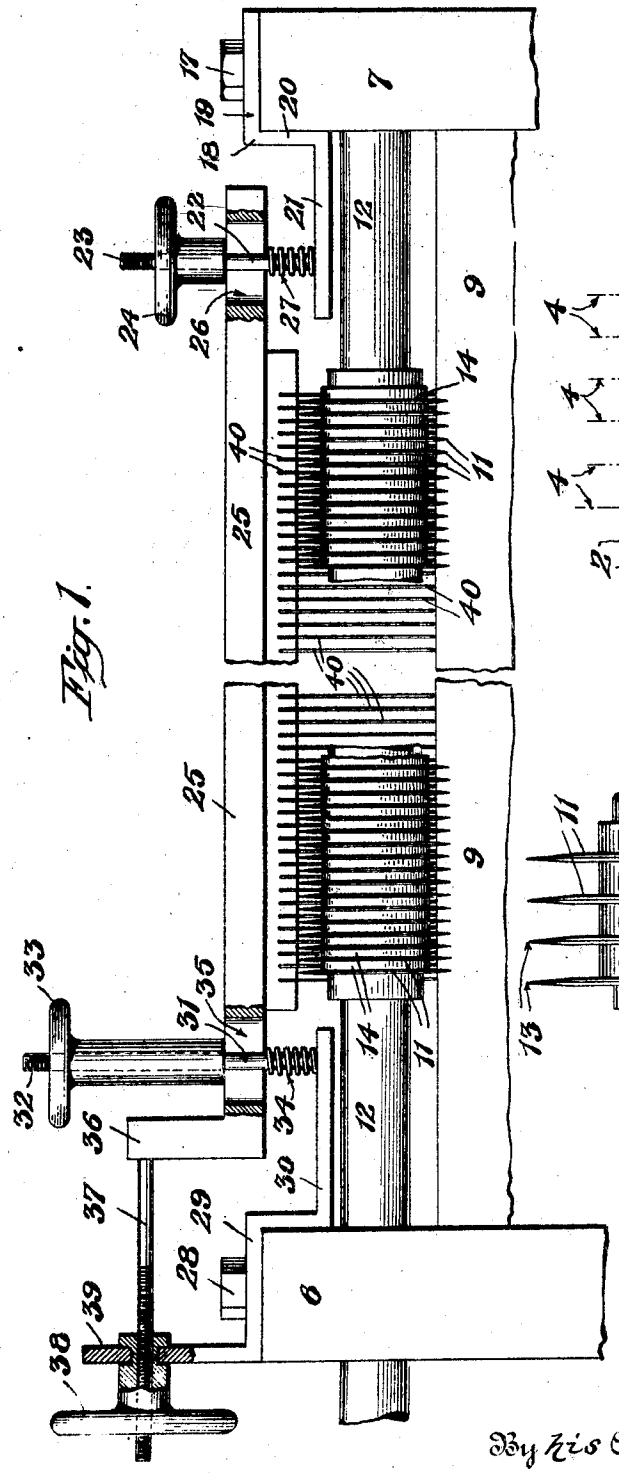


Fig. 1.

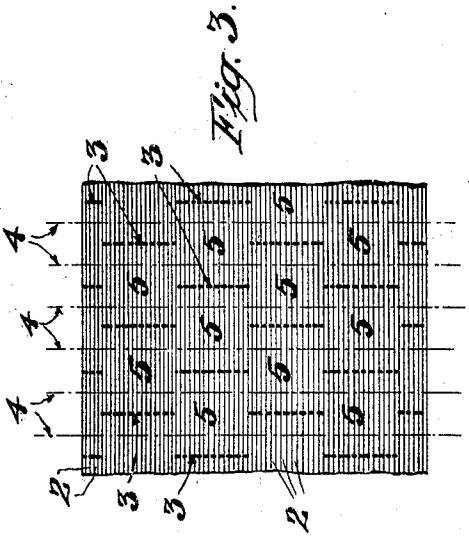


Fig. 3.

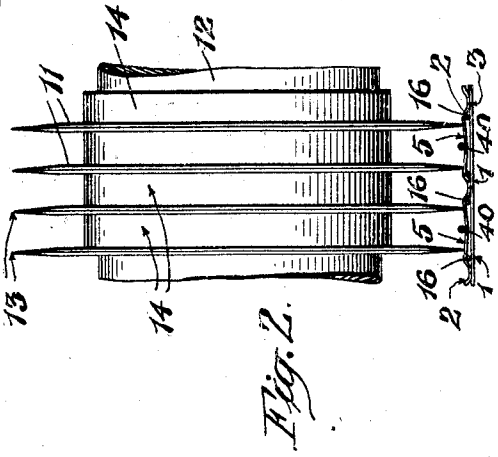


Fig. 2.

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THREAD HOLDING MEANS FOR PILE CUTTING MACHINES

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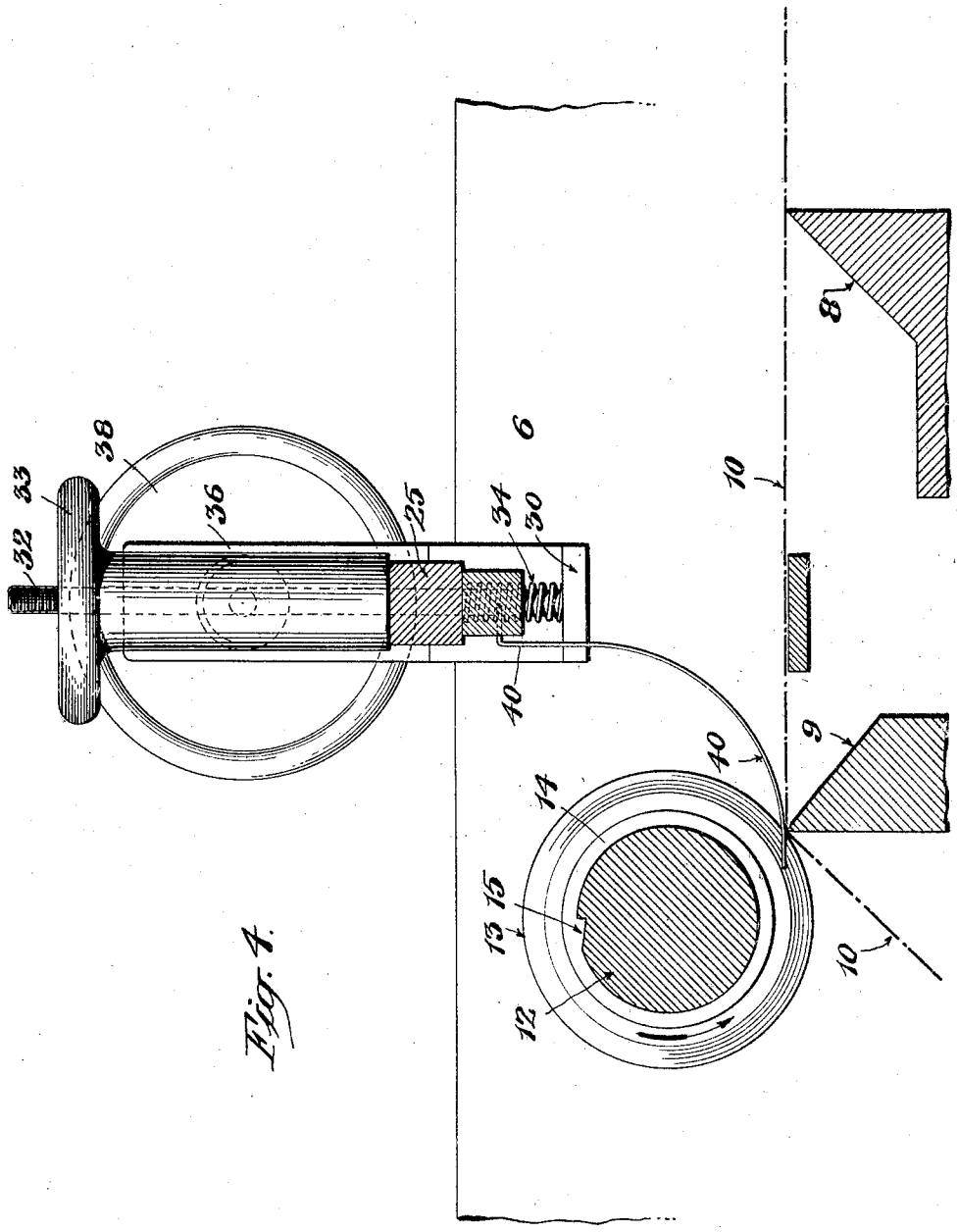


Fig. 4.

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Patented Feb. 19, 1924. 1,484,294

UNITED STATES PATENT OFFICE.

JOHN S. BOYD, OF WILLIAMSTOWN, MASSACHUSETTS, ASSIGNOR TO JOHN S. BOYD CO. INC., OF WILLIAMSTOWN, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

THREAD-HOLDING MEANS FOR PILE-CUTTING MACHINES.

Application filed April 10, 1923, Serial No. 631,179. Renewed January 12, 1924.

To all whom it may concern:

Be it known that I, JOHN S. BOYD, a citizen of the United States, and a resident of Williamstown, county of Berkshire and State of Massachusetts, have invented a certain new and useful Improvement in Thread-Holding Means for Pile-Cutting Machines, of which the following is a specification.

This invention relates to an improvement in a machine for cutting the pile threads of a fabric which after subsequent treatments becomes an ornamental pile fabric, and specifically relates to that part of the cutting machines which acts to prevent cut pile threads from clogging the cutting knives and consequently rendering the same inoperative or faulty in operation.

A further object of this invention is to provide a simple means for holding down cut pile threads during the cutting operation of such threads, whereby said threads are carried away from the knives and are consequently prevented from interfering with the proper cutting operation of the same.

With these objects, and other objects which may hereinafter appear, in view, I have devised the particular arrangement of parts hereinafter set forth and more particularly pointed out in the claims appended hereto.

Reference is to be had to the accompanying drawing, forming a part thereof, in which

Figure 1 is an elevation of a portion of a pile cutting machine, showing my improved thread-holding means, parts being broken away and also shown in section to clearly disclose construction;

Figure 2 is a front elevation of a portion of the cutting shaft, showing several of the rotary cutters or knives and the manner in which the same bear on and cut the pile threads;

Figure 3 is a diagrammatic view of the upper face of a section of a novel form of pile fabric, the lines on which the same is cut being shown in light dotted lines; and

Figure 4 is a transverse sectional view of the cutting shaft and attendant parts of the cutting machine and the improved thread-holding means.

Throughout the various views of the drawings, similar reference characters designate similar parts.

My improved thread-holding means is intended to be used when a novel form of a pile fabric is being made, the fabric in its primary state being diagrammatically shown in Figures 2 and 3, where it will be seen that the same consists of a woven base 1, the upper face of which is provided with a plurality of looped pile-forming threads 2. These threads 2 are secured at intervals to the base fabric 1 by interengagement therewith, as is diagrammatically illustrated at 3. The location of these points of engagement or interweave determines the pattern to be produced on the fabric, and in the fabric shown in Figure 3 the points of interengagement or "binder threads" 3 are "staggered" with relation to one another as shown. In the operation of producing the fabric, the pile-forming threads or loops 2 are cut along parallel lines 4 (Figure 3) and certain portions of said threads 2 become loose and free to be removed from the fabric. These portions which become loose after the cutting operation are shown at 5 in Figures 2 and 3. After the loosened threads are removed from the fabric the remaining threads 2 which are attached to the base 1 by the "binder stitches" 3, are worked up into areas of pile.

This invention therefore relates to a means for preventing the cut threads 5 from getting between the knives or under the same while the cutting operation is taking place, and also acts to properly direct these cut threads downward and away from the knives after the cutting operation.

At 6 is shown one of the side frame members of the cutting machine, and the opposite side frame member is shown at 7. These frame members are connected in the usual manner by a pair of straight bars 8 and 9 which form straight edges over which the fabric 10 to be cut is moved.

The fabric to be cut is moved forward to the cutters 11 and over the bars 8 and 9 by means of suitable rollers (not shown) or other conventional means.

At 12 is shown the cutting shaft which receives the knives or cutters 11. The shaft 12 is arranged to rotate in suitable bearings in the side frame members 6 and 7, and said shaft may be driven by any suitable

mechanism. The knives 11 are adapted to be secured on the shaft at any desired position with respect to one another to suit various requirements, and each knife is provided with an outer circumferential cutting edge 13 and a hub portion 14 provided with a key 15 which prevents the knife from rotating independently of its shaft 12.

As will be seen in Figure 4, the knives normally bear down upon the upper edge of the bar 9 so that when the fabric 10 is passed between the upper edge of the bar 9 and the knives 11 the pile-forming threads 2 on the upper face of the fabric are cut through. To prevent the knives from cutting through the base fabric 1, the pile-forming threads 2 are held up and away from the base fabric 1 by means of pairs of wires 16 (Figure 2) which are thrust under the threads 2.

The knives 11 are so positioned on the shaft 12 that they place parallel cuts through the pile threads 2 along the lines 4 in Figure 3. When the threads 2 are so cut, it will be apparent those threads which are indicated at 5 will become loose from the fabric and fall away therefrom. To prevent these loose threads 5 from clogging the knives 11 during the cutting operation, suitable means for holding down these threads during the cutting operation, are provided, as will now be explained.

Mounted on the side frame member 7, and secured thereto as by the bolt 17, is a bracket 18 provided with an upper horizontal portion 19 which rests upon the frame member 7, and which receives the bolt 17. The bracket 18 is also provided with a downwardly bent portion 20 and an outwardly extending flat supporting portion 21. Extending upwardly from the upper face of the portion 21 of the bracket is a stud 22, which has its upper end threaded as at 23 to receive an adjusting nut 24. At 25 is a cross bar which is provided at one of its ends with a slot 26 through which the stud 22 passes. A spring 27 surrounds the stud 22, and the end of the bar 25 rests upon said spring. It will be apparent from the foregoing that by manipulation of the adjusting nut 24 the bar 25 may be raised and lowered for a purpose to be hereinafter set forth.

On the opposite side frame member 6 is secured, as by the bolt 28, a bracket 29. This bracket 29 is provided with an inwardly extending supporting portion 30 which is provided with an upwardly projecting stud 31 having a threaded upper end 32 which receives an adjusting nut 33. A spring 34 surrounds the stud 31 below the bar 25. The bar 25 is provided with a slot 35 through which the stud passes.

The bar 25 is provided with an upwardly projecting end 36 from which extends a threaded rod 37 that passes through an adjusting nut 38 which is mounted to rotate in an upward extension 39 of the bracket 29.

From the foregoing, it will be apparent that the bar 25 may be raised and lowered by manipulation of the nuts 24 and 33, and that said bar may be adjusted longitudinally by manipulation of the nut 38, the slots 26 and 35 in the bar permitting such longitudinal adjustment without interference by their respective studs 22 and 31.

The bar 25 acts as a support for a plurality of spaced thread-holding resilient fingers 40 in the nature of resilient wires, which project downwardly from the bar 25 and rest with resilient pressure on top of the fabric 10 which is supported on the bar 9. These resilient wires are so positioned that one of each of said wires projects between each pair of knives and presses downwardly on the threads 5 which are detached by the cutting operation. Thus, during the cutting operation the threads which are freed are held down, and are carried downwardly on the fabric. Additionally the spaced wires form a comb through which the loosened threads cannot move backwardly and clog the spaces between the knives or force their way between the knives and the bar 9 to impede the cutting action of the knives.

The wires 40 are under tension and this tension is regulatable by the raising and lowering of the bar, which is done, as heretofore explained by the manipulation of the adjusting nuts 24 and 33. The wires 40 may also be positioned relative to the knives by longitudinal movement of the bar 25, and this is done, as heretofore explained by the manipulation of the nut 38. The last mentioned adjustment is required to adapt the device to the various patterns capable of being cut on the machine.

From the foregoing, it is obvious that my invention is not to be restricted to the exact embodiment shown and described, but is broad enough to cover all structures coming within the scope of the annexed claims.

Having described my invention, what I claim is:—

1. In a machine of the class described, a support over which the fabric is adapted to be moved, a plurality of spaced knives adapted to cut threads on the upper face of the fabric while said fabric is moved over the support, a bar, a plurality of spring members having free ends extending downwardly from said bar and projecting between the knives and bearing down on threads cut by the knive, means for regulating the pressure of said spring members, and means for adjusting the position of said members relative to the knives.

2. In a machine of the class described, a frame having a pair of side members, brackets secured to said side members, studs extending from said brackets, a bar extending

between said brackets and resiliently supported on said studs, a support for a fabric, a plurality of knives for cutting pile threads on said fabric while held upon said support, a plurality of resilient wires secured to the bar and extending between the knives and bearing down upon the cut threads, means for adjusting the position of said bar on said studs and means for shifting said bar longitudinally.

3. In a machine of the class described, a frame, spaced brackets secured thereon, vertical studs extending from said brackets, a bar connecting said brackets, said bar having a pair of slots through which said studs extend, springs surrounding said studs and supporting said bar, a support over which a fabric is moved, a plurality of knives for cutting pile threads on said fabric, and a plurality of flexible fingers on said bar extending between the knives and adapted to hold down cut threads.

4. In a machine of the class described, a frame, spaced brackets secured thereto, a vertically extending stud on each of said brackets, a bar having a pair of slots through which said studs extend, a spring placed between said bar and each of said brackets and surrounding the studs, means on said studs for adjusting the position of the bar thereon, a support for a moving fabric, a plurality of spaced cutters adapted to cut thread on one face of said fabric while the same is moved over said support, a plurality of spaced resilient wires secured to the bar and projecting therefrom and bearing downward with resilient pressure on the fabric moved over the fabric support, and means for shifting the bar in its longitudinal direction to adjust the position of said wires relative to the cutters.

5. In a machine of the class described, the combination with a support for a moving fabric, a plurality of spaced cutters and means for causing the same to sever threads on the face of the fabric moved on the support, a member secured adjacent to the support, a plurality of spring fingers having their ends fixed to the member and their opposite free ends projecting between the cutters and resting upon the fabric on the support, means for shifting the member to and from the support and means for shifting the fingers relative to the cutters.

Signed at Williamstown, county of Berkshire and State of Massachusetts, this 27th day of March, 1923.

JOHN S. BOYD.