

977,166.

2 SHEETS—SHEET 1.

Fig.1

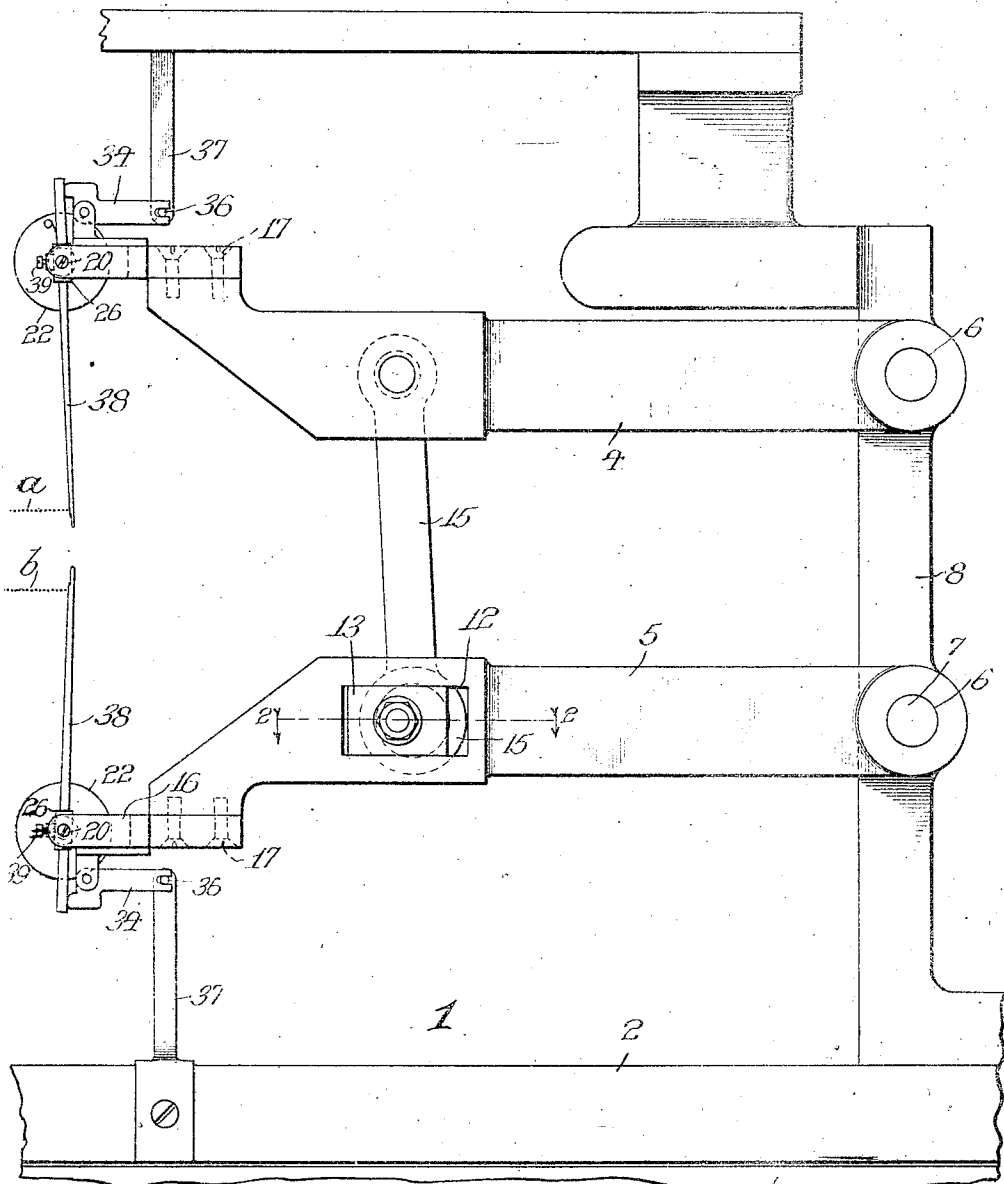
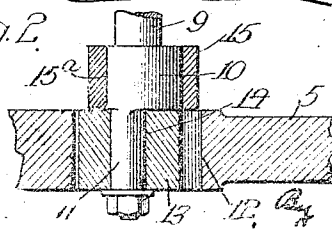


Fig. 2.



Edw. G. Barrett

Ernst Schindahl

Howard H. Colman

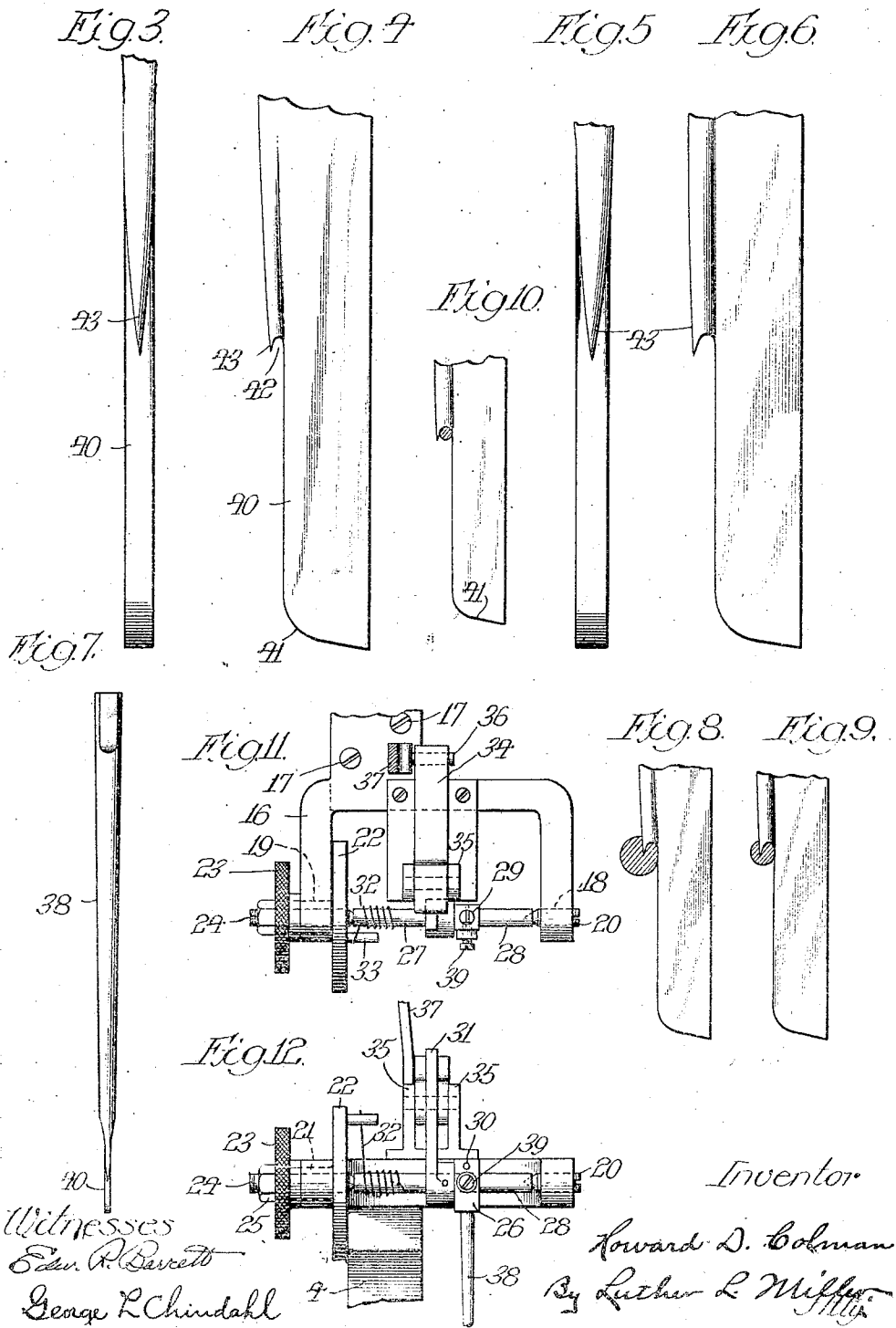
Arthur L. Miller, City

H. D. COLMAN.
 THREAD SELECTING DEVICE.
 APPLICATION FILED JAN. 15, 1906.

977,166.

Patented Nov. 29, 1910.

2 SHEETS-SHEET 2.



UNITED STATES PATENT OFFICE.

HOWARD D. COLMAN, OF ROCKFORD, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO BARBER-COLMAN COMPANY, OF ROCKFORD, ILLINOIS, A COPARTNERSHIP.

THREAD-SELECTING DEVICE.

977,166.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Application filed January 15, 1906. Serial No. 236,023.

To all whom it may concern:

Be it known that I, HOWARD D. COLMAN, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Thread-Selecting Devices, of which the following is a specification.

This invention relates to an improved means for taking a single thread from a plurality of threads, as, for instance, from a warp.

In the operation of many textile and other machines operating upon or handling threads, it is necessary successively to divide a single thread from a body of threads. In such machines the dividing action must be both certain and accurate, otherwise the product is likely to be defective.

Threads, though appearing to the unaided eye to be practically uniform in diameter, are not so in fact. For instance, threads in a common cotton warp, properly sized, often vary in the ratio of one to four, and each thread, throughout its length, has similar variations. In addition to this, threads often have "bunches" of a thickness many times the diameter of the normal thread. A thread-selecting member having a hook adapted to embrace or receive within it a single thread of normal size would not be large enough to receive the larger thread, and would be wholly ineffective in taking the bunches; and a thread-selecting member having a hook large enough to embrace one of the larger regular threads (disregarding for the moment the bunches) frequently would take two or more of the smaller threads.

To overcome the difficulties mentioned, and to divide with practical certainty, one thread from a body of threads at each operation, and, with as great a certainty, not more than one thread, is the object of this invention. This object I accomplish by forming the thread-taking device as a combined hook and spear, that is to say, I form the hook opening or pocket large enough to contain one of the threads of smaller diameter, and depend upon engaging the larger threads, not by receiving them into said hook opening, but by providing the hook with a point sufficiently sharp and tapering to penetrate into the substance of a thread which for any reason does not pass to the

inner side of the point and seat itself within the pocket. Thus by the mechanism herein shown and described, all threads excepting those that at the points in their lengths acted upon by the thread-taking device are small enough to enter the hook opening, are speared or impaled by the sharp point of the hook, and moved into position for the next succeeding step in the operation of the thread handling machine. In a similar manner, bunches upon the threads, in the line of operation of the thread-taking device are impaled upon the sharp point of the hook, and the threads carrying such bunches thereby engaged.

I have herein shown my said invention in its application to the warp-tying machine illustrated and described in my British Patent No. 10,484 of 1905. The drawings of the present application show only so much of said warp tying machine as is necessary to give an understanding of this invention.

In the accompanying drawings, Figure 1 is a fragmental side elevation of the main carriage of the warp-tying machine above alluded to. Fig. 2 is a sectional detail view taken on the plane of dotted line 2 2 of Fig. 1. Figs. 3 and 4 are respectively fragmental edge and side views, greatly enlarged, of that element of the thread-taking mechanism which directly engages the warp threads, which element will be hereafter referred to as the selector. Figs. 5 and 6 are similar views of a selector having a hook of slightly different form from that illustrated in Figs. 3 and 4. Fig. 7 is an edge view of a selector. Figs. 8 and 9 are detail views illustrating the spearing action of the selector and its adaptability for taking threads of different diameters. Fig. 10 is a view illustrating the action of the selector when taking a thread of small diameter. Fig. 11 is a top plan view of the means for operatively supporting the selector, and Fig. 12 is a front elevation of said supporting means.

In the warp-tying machine hereinbefore referred to, the two warps *a* and *b* to be tied together are supported in two substantially parallel planes, and the thread-taking mechanism is supported upon a carriage 1, the base 2 of which carriage is slidably mounted upon the bed 3 of the warp-tying machine. The carriage 1 is moved by suitable means (not herein shown) to move the thread-tak-

ing mechanism transversely of the length of the threads of the two warps *a* and *b*. Said thread-taking mechanism is adapted to take one thread from each warp and move toward each other the threads so taken.

5 The thread-taking mechanism comprises two selector levers 4 and 5 provided with bearing openings 6 in their rear ends, by means of which openings said levers are pivotally mounted upon studs 7 extending from a standard 8 fixed to the base 2 of the carriage 1. Each of the selector levers 4 and 5 carries a selector, to be hereinafter described, and said levers are pivotally moved toward and away from each other to reciprocate said selectors across the planes of the warps *a* and *b*. The means herein shown for thus moving the selector levers 4 and 5 comprises a shaft 9 driven by any suitable means, which shaft has two eccentrics 10 and 11 fixed with relation thereto.

10 An opening 12 is formed in the selector lever 5, and in said opening is slidably supported a block 13 having an opening 14 therein, in which opening 14 the eccentric 11 lies. The selector lever 4 is connected to the eccentric 10 by means of a link 15 pivotally connected at one end to said selector lever and having in its other end an opening 15^a within which lies the eccentric 10.

15 The eccentrics 10 and 11 being set with their throws 180° apart, the selector levers 4 and 5 will be caused alternately to approach and recede from each other by the rotation of the shaft 9.

At its outer end each selector lever is provided with a horizontally extending fork 16 secured to said lever by means of the screws 17. The outer ends of the arms of said fork are provided with alined openings 18 and 19, the former being screw-threaded to receive a cone bearing screw 20. The opening 19 is somewhat larger than the opening 18 and receives the stem 21 of a tension-adjusting disk 22, said stem being externally screw-threaded at its end and provided with a knurled thumb nut 23 for clamping said disk in its adjusted position upon the fork-arm. The stem 21 is axially perforated and internally screw-threaded to receive a cone bearing screw 24 similar to the screw 20, which screw 24 has a lock nut 25. Between the screws 20 and 24 is rotatably supported a socket member 26 provided with trunnions 27 and 28, said trunnions being cupped at their outer ends to receive the points of said screws. The socket member 26 has an opening 29 extending there-through and closed by a stop pin 30. Upon the trunnion 27 is fixed a stop arm 31. A spring 32 is coiled about said trunnion, one end of said spring engaging the stop arm 31 and the other end engaging a pin 33 on the tension-adjusting disk 22. The stop arm 31 is adapted to engage one end of an oscilla-

tory stop finger 34 pivotally mounted between the ears 35 secured to the fork 16. The other end of said stop finger is bifurcated to receive a pin 36 extending transversely from a piece 37 fixed with relation to the carriage 1.

A selector 38 is secured within each of the socket members 26 by means of a set-screw 39 lying in a threaded opening in said socket and bearing against a flattened portion of said selector. The selector 38 has a round body portion tapering slightly toward its operating end. At its smaller end the selector is cut away at two diametrically opposite sides to form a flattened, blade-like portion 40, the outer end of said flattened portion being rounded, as shown at 41, Figs. 3 to 6. In one edge of said flattened portion and between the ends of said portion, is formed a hook 42. The edge of the outer end of said flattened portion forms one side of said hook and is alined therewith. The other side 43 of the hook 42 is pointed or sharpened in the direction of its length and its breadth, so as to make said side of the hook conical or tapering. The size and form of the opening between the sides of the hook, as well as the degree of taper of said pointed end, are varied to adapt the selector to threads of different counts and qualities. The edge of the flattened portion 40 to the rear of the hook may be slightly inclined toward said hook, as shown in Fig. 4, the better to adapt it to handle threads under certain conditions.

In operation, the shaft 9 is rotated, pivotally moving the selector levers 4 and 5 alternately toward and away from each other, and reciprocating the selectors 38 across the planes of the warps *a* and *b*. The spring 32 holds each of said selectors yieldingly forward against the foremost thread of its warp. The force exerted by said spring is adjusted by means of the tension-adjusting disk 22, and the limit of the forward movement of said selector due to said spring is determined by the stop-finger 34, the forward end of which finger engages the stop arm 31 rigid with said selector. At the extremity of its outward movement, that is to say, at the end of its movement away from its warp, the selector lies with the edge of the blade-like portion 40, below the hook 42, in contact with the foremost thread of the warp. In its inward movement, the selector, sliding against said foremost thread and being guided by said lower portion, brings its hook into engagement with the thread. If the thread be small enough, it passes within the hook opening, as shown in Fig. 10. If it be too large to enter said opening, or if a bunch occur in the thread at the point of engagement of the selector, the sharp point 43 of the hook spears or impales the thread or bunch, as the case may be, as represented in

Figs. 8 and 9. Whatever the manner of engagement of the selector with the thread, the continuing inward movement of the selector moves said thread toward the opposite warp to an extent sufficient for another mechanism of the warp-tying machine to engage the thread. Being pivotally supported, and free to swing rearwardly, the selector is able to adjust its position to whatever tension the thread divided, as just described, from its warp, may have. Upon its outward movement the forward pivotal spring-actuated movement of the selector is restrained and governed by the engagement of the stop arm 31 with the pivotal stop finger 34, which stop finger is positively moved by reason of its connection with its selector lever and the fixed piece 37. Said stop finger also limits the pivotal movement of said selector, so as to prevent it from springing beyond the plane of its warp when no threads are present. As successive warp threads are taken by the selectors, the carriage 1 is fed toward the warps *a* and *b* by a sensitive feed mechanism, (not herein shown). Selectors having hooks of various sizes and forms are provided for warps of different counts and qualities.

It is clear that selectors might be fashioned in a different manner from that shown and described herein and be operated in different ways, without departing from the spirit and scope of my invention; wherefore I wish it understood that said form is merely illustrative of said invention and its application.

I claim as my invention:

1. A thread-selecting device adapted to impale a thread.
2. A thread-selecting device having an impaling member located at a point between the ends of said device.
3. A thread-selecting device provided with a hook having a sharp impaling end.
4. A thread-selecting device provided at a point between its ends with a hook having a sharp impaling point.
5. A thread-selecting device provided at a point between its ends with a hook, one edge of said device being alined with one side of said hook, the other side of said hook having an impaling point.
6. In a thread-selecting mechanism, in combination, a thread-engaging device provided with a hook in its side and having a rounded lower end, said hook having a closed rear end, said closed rear end being located in the side of said device, said hook pointing in the direction of movement of said device; and means for reciprocating said device.
7. In a thread-selecting mechanism, in combination, a thread-engaging device having a substantially straight blade-like lower

portion and a hook located between the ends of said blade-like portion, said hook having a closed rear end, said closed rear end being located between the ends of said blade-like portion, said hook pointing in the direction of movement of said device; and means for reciprocating said device.

8. In a thread-selecting mechanism, in combination, a thread-engaging device having a substantially straight blade-like lower portion and a hook formed in one edge of said blade-like portion between the ends of said portion, said hook having a closed rear end, said closed rear end being located between the ends of said blade-like portion, said hook pointing in the direction of movement of said device; and means for reciprocating said device.

9. A thread-selecting device having an impaling member and a guide-portion.

10. In a thread-selecting mechanism, in combination, means for impaling a thread, and means for guiding said impaling means into engagement with a thread.

11. In a thread-selecting mechanism, in combination, a selector having an impaling point and a guide portion, and means for reciprocating said selector.

12. A thread selector having means in virtue of which a thread will be connected to the selector preparatory to moving the thread in a transverse plane.

13. A thread selecting member having means spaced away from the body of said member for forming a connection between a thread and said member.

14. In a thread-selecting mechanism, in combination, a selector having means for positively holding a thread against displacement with respect to said selector during the movement of said selector; and means for moving said selector.

15. A member having means to displace a thread in a transverse direction; and means on said first named means for positively holding the thread against displacement with respect to the first-named means.

16. In a thread-selecting mechanism, a device having means for loosely engaging a thread and for impaling a thread; and means for moving said device.

17. A thread-selecting device having means to impale a thread when moving bodily in a direction at an angle to the length of the thread.

18. A thread-selecting device having an impaling point and means for causing said point to move transversely to the plane of the warp so as to impale a thread.

HOWARD D. COLMAN.

Witnesses:

RAYMOND E. FAIRMAN.
LOUIS F. GATES.

It is hereby certified that in Letters Patent No. 977,166, granted November 29, 1910, upon the application of Howard D. Colman, of Rockford, Illinois, for an improvement in "Thread-Selecting Devices," errors appear in the grant and in the heading to the printed specification requiring correction as follows: In the grant, strike out lines 9-11 and insert the following statement:

He having assigned his right, title, and interest in said improvement, by mesne assignments, to Howard D. Colman, Luther L. Miller, and Harry A. Severson, copartners, doing business as Barber-Colman Company, of Rockford, Illinois,

Strike out the first two lines of the granting clause and insert the following:

Now, therefore, these Letters Patent are to grant unto the said Howard D. Colman, Luther L. Miller, and Harry A. Severson, copartners, doing business as Barber-Colman Company, of Rockford, Illinois, their heirs or assigns.

In the heading to the printed specification, strike out the words "to Barber-Colman Company, of Rockford, Illinois, a copartnership." and insert the words *to Howard D. Colman, Luther L. Miller, and Harry A. Severson, copartners, doing business as Barber-Colman Company, of Rockford, Illinois.*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of March, A. D., 1913.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.