

(No Model.)

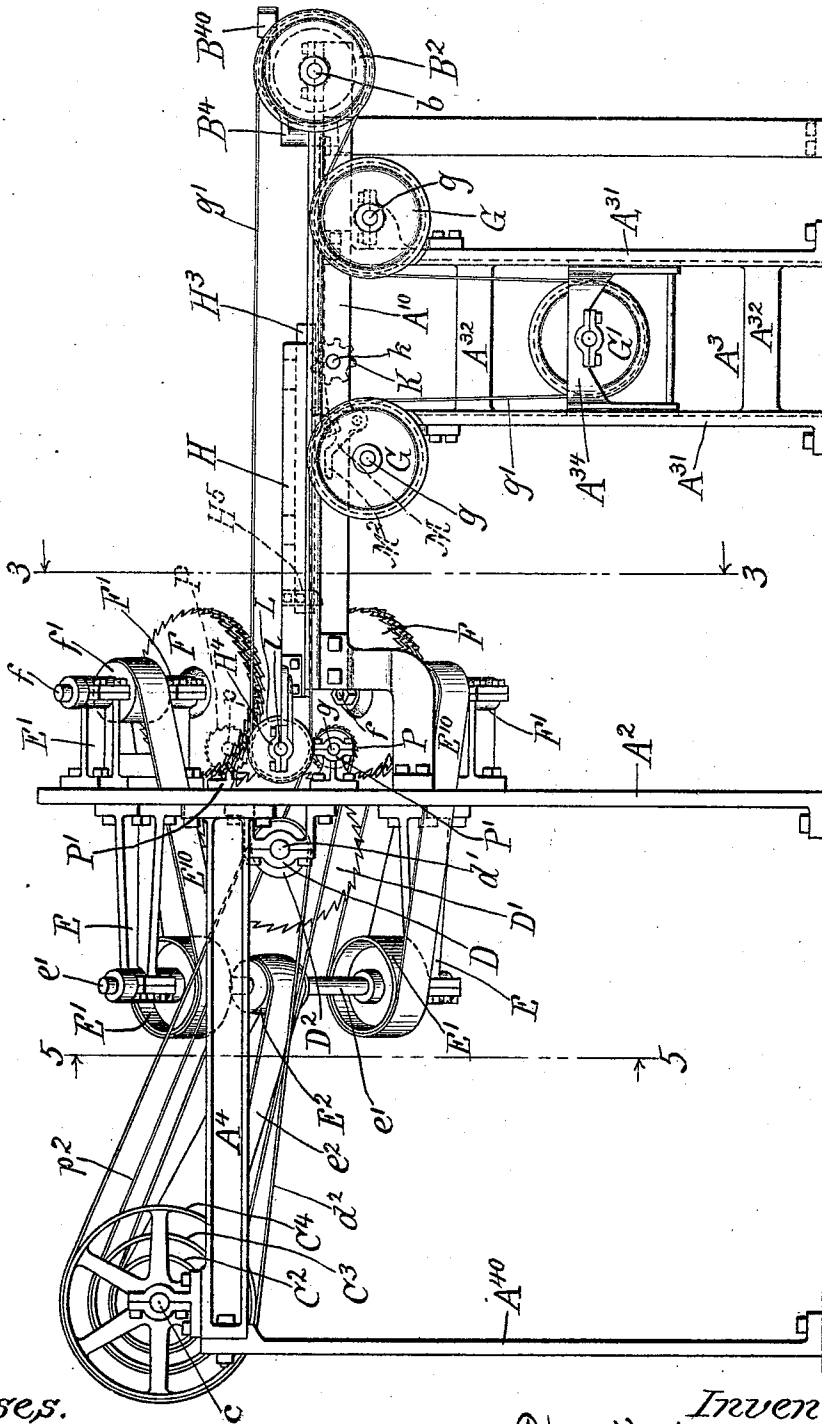
4 Sheets—Sheet 1.

E. HUBBARD.
MACHINE FOR TURNING SPOOLS.

No. 521,468.

Patented June 19, 1894.

Fig. 1.



Witnesses.

E. T. Wray.
Jean Elliott.

Inventor.

Eber Hubbard
by Ruyton & Bunker
his attys

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Fig. 6.

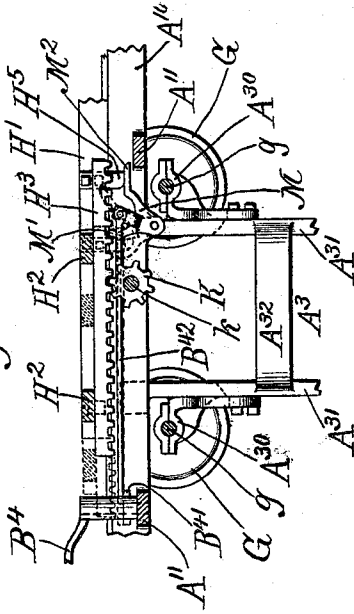
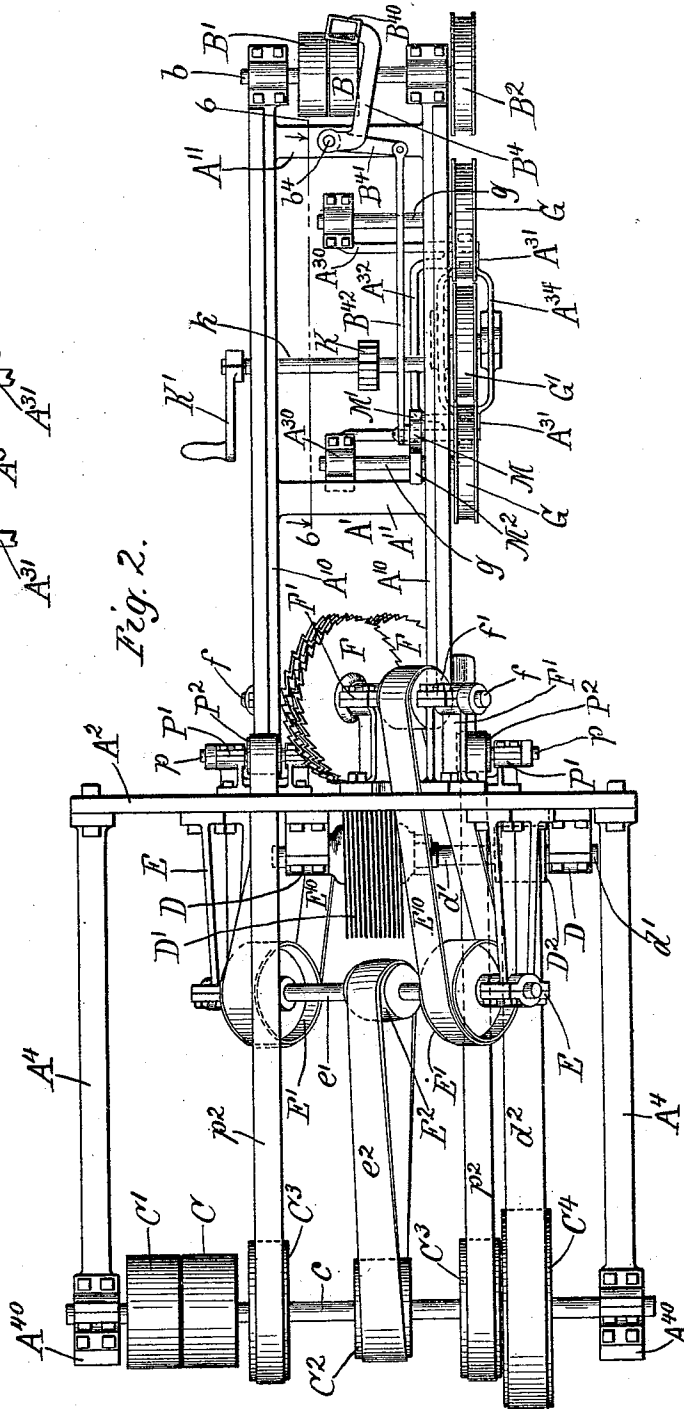


Fig. 2.



Witnesses.

E. T. Wray.
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Fig. 3.

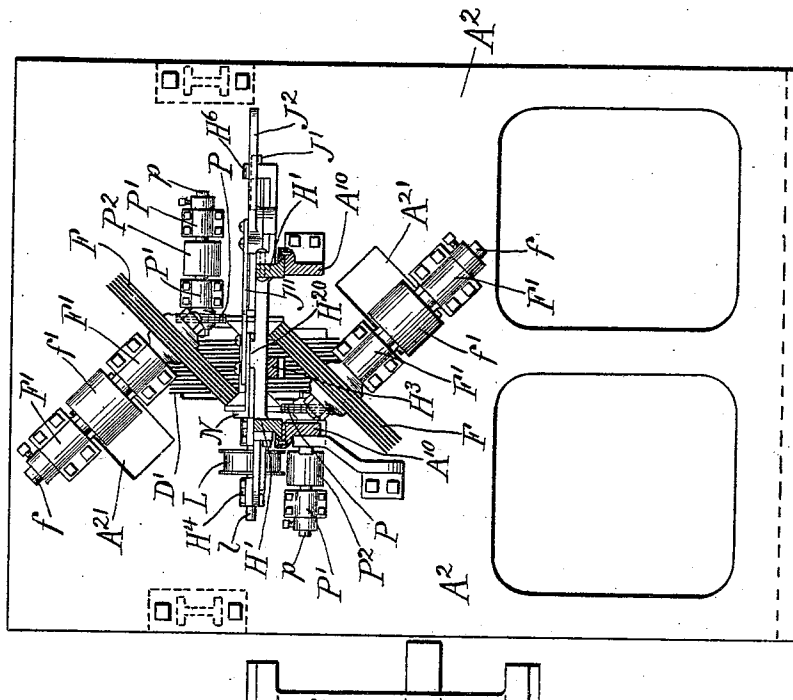
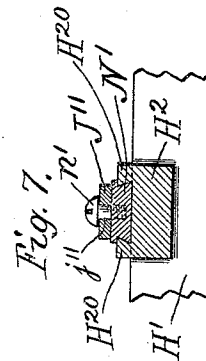
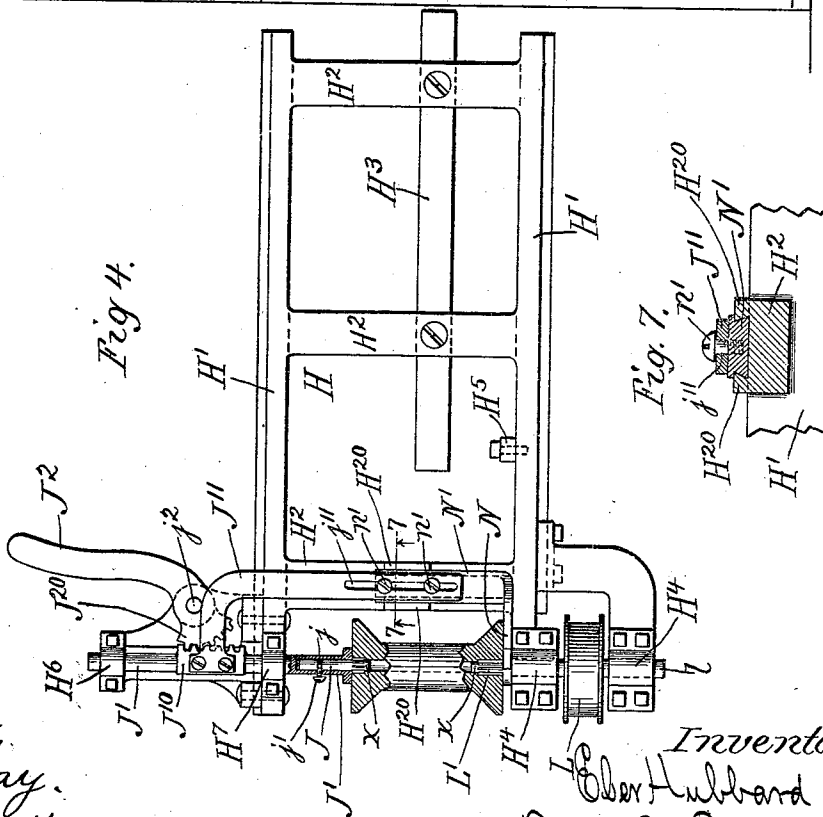


Fig. 4.



Witnesses.
E. T. Wray.
J. C. Elliott.

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(No Model.)

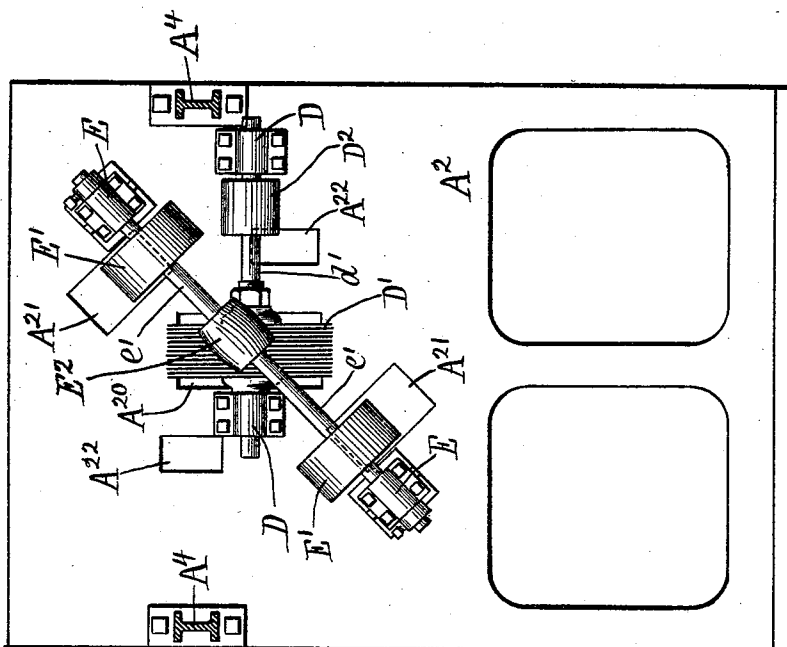
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Fig. 5.



Witnesses,
E. T. Wray.
Jean Elliott

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UNITED STATES PATENT OFFICE.

EBER HUBBARD, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WILLIMANTIC LINEN COMPANY, OF HARTFORD, CONNECTICUT.

MACHINE FOR TURNING SPOOLS.

SPECIFICATION forming part of Letters Patent No. 521,468, dated June 19, 1894.

Application filed August 7, 1893. Serial No. 482,572. (No model.)

To all whom it may concern:

Be it known that I, EBER HUBBARD, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Machines for Turning Spools, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this machine is to dress the curved surfaces of the large sized spools which are used in putting up thread and like material for manufacturers' use, as distinguished from the small spools for domestic use; and in its details it is particularly adapted to performing this process upon spools made of dried fibrous pulp, although it is applicable to wood or other material; but many expedients which are practicable in working with natural wood are impracticable or undesirable in working with fibrous pulp or wood pulp, and the means selected for the various processes in this machine are those which I have found serviceable in working with pulp where many familiar means were unserviceable.

In the drawings,—Figure 1 is a side elevation of my machine, showing the spool carrier in position for dressing the spool. Fig. 2 is a plan of the same with the spool carrier removed. Fig. 3 is a section at the line 3—3 on Fig. 1, looking in the direction of the arrow on the latter figure. Fig. 4 is a detail plan of a spool carrier and the spool in place in the carrier, the spool being cut axially at the end to show the bits which hold it. Fig. 5 is a vertical section at the plane of the line 5—5 on Fig. 1. Fig. 6 is a section at the line 6—6 on Fig. 2. Fig. 7 is a detail section at the line 7—7 on Fig. 4.

In general, the dressing of the curved surfaces of the spool in my machine is done by what I term "wabbling saws,"—that is to say, saws arranged in gangs or groups on the same shaft slightly oblique to said shaft, so that the path of their cutting peripheries is broader than the thickness of the saws to the amount of their obliquity with respect to the shaft, whereby they are made to dress a larger surface than they would cut if mounted at right angles on the shaft. Such gangs of saws are provided for each of the surfaces of the

spools,—to-wit, the shaft or cylindrical surface at the middle, the conical surfaces of the flanges at the ends, and the narrow cylindrical surface which constitute the edges of the flanges. The spool is carried in a frame wherein it is grasped by a revolving bit, after the manner of a lathe head, and thus revolving, is moved sidewise into the range of action of the saws, and to the point where that action dresses away the material to the requisite degree, and the spool carrier is then withdrawn and spool removed by the operator and another substituted.

In the drawings,—the frame comprises the horizontal bed A' , which is supported by the vertical frame A^2 at one end, which serves other purposes hereinafter set forth besides supporting the bed; and the vertical frame A^3 toward the other end of the bed, but not at the extreme end, which also serves certain other purposes besides assisting in supporting the bed. The frame comprises also the horizontal bars $A^4 A^4$, which are mounted bracketwise upon the upright frame A' , and extend outwardly from said upright frame,—that is, in a direction opposite that in which the bed extends from the said upright frame,—and for further rigidity are supported at the ends by the posts $A^{40} A^{40}$. The bed A' comprises two parallel side-bars $A^{10} A^{10}$ connected by cross-bars $A^{11} A^{11}$. At the extreme end of the bed,—that is, the end remote from the upright frame A^2 , the main driving shaft b is journaled, carrying a tight and a loose pulley, B and B' , by means of which power is communicated to rotate the spool, as hereinafter explained, and at the outer end of the horizontal bars $A^4 A^4$, there is journaled the horizontal shaft c , on which tight and loose pulleys C and C' are provided to accommodate a belt through which power is communicated to said shaft c , from which the several dressing mechanisms are operated.

The upright frame A^2 is substantially a metal plate, or is made of metal and has a web which is continuous except as to openings hereinafter described for the several mechanisms; and it constitutes a wall or partition on both sides of which brackets for supporting different mechanisms are mounted, the web or board being cut away at proper

places to allow the operating peripheries of the saws to protrude through it and to allow belts to pass from driving pulleys on one side to driven pulleys on the other. The detail construction of the mechanism mounted on this upright frame or board A² will now be described. Upon the side toward the shaft *c*, there is mounted in journal boxes D D the horizontal shaft *d'*, which carries the gang of saws D' and the pulley D², which is driven by the belt *d'*, which passes over the driving pulley C⁴ on the shaft *c*. The opening A²⁰ in the web of the frame A² permits a segment of the saws D' to protrude through said web to the other side for the purpose of operating upon the shaft of the spool when it is advanced in proper position upon the carrier as described. Upon the same side of the frame A²,—that is, toward the shaft *c*,—there are mounted brackets E E, in which are journaled the shaft *c'*, which extends obliquely between said brackets, one of which is lower than the other, as shown in the drawings, the shaft being parallel with the web of the frame A², but at an inclination of about forty-five degrees from front to rear. A pulley E² on this shaft receives power from the belt *e'*, driven by the pulley C² on the shaft *c*, and two pulleys E' E' on the shaft *c'*, by means of the belts E¹⁰ E¹⁰, drive the gangs of obliquely situated saws F F, whose peripheries are located properly to dress the conical surfaces of the spool flanges, said gangs of saws being mounted respectively on the shafts *f f*, which are journaled in the brackets F' F', respectively, which are secured upon the opposite side of the web of the frame A² from that on which the brackets D D are mounted, said web being provided with the openings A²¹ A²¹, through which the belts E¹⁰ E¹⁰ extend to reach the pulleys *f' f'* on the shaft *f*, and thereby drive said oblique gangs of saws respectively. Upon the same side of the upright frame A², on which the gangs of saws F F are located, there are located two other small groups of saws or single saws, as the case may require, P P, whose shafts *p* are journaled in brackets P' P' secured to the frame, said shafts being horizontal, and the peripheries of the saws being adapted to dress the narrow cylindrical periphery of the flange of the spools, and having on their shafts the pulleys, which are driven by the belts P² P², running to them from the pulleys C³ C³ on the shaft *c*, apertures A¹² A¹² being provided in the web of the frame A² to permit the belts to pass through.

It will be observed that the employment of the vertical frame A² with the web described, amounting to a partition wall between the two portions of the machine, affords facility for securing all the mechanisms readily and in such manner that each may have quite a range of possible positions, as may be desirable for adapting the mechanism to spools of various sizes and proportions.

H is a carriage, which has journal bearings

for the spool rotating spindle and center, and which is adapted to reciprocate back and forth on the bed A', the side-bars A¹⁰ A¹⁰ of the bed, and the side-bars H' H' of the carriage being adapted to each other for that purpose. To the side-bars H' H' of the carriage there is secured the rack-bar H³, and in the side-bars A¹⁰ A¹⁰ of the bed there is journaled the shaft *k*, having the pinion K, adapted to mesh with the rack H³, so that when the shaft *k* is rocked by the crank-handle K', the carriage will be reciprocated back and forward according to the direction of rotation.

At H⁴ H⁴ are journal bearings for the shaft *l* which constitutes the spool-carrying spindle, terminating in a suitable sharply toothed flange or bit L' adapted to engage the spool to rotate it. Between the two bearings H⁴ H⁴ the shaft has the pulley L, which is in the same vertical plane with the pulley B² on the end of the shaft *b*. In the same plane, also, with both these pulleys, I provide two pulleys G G, whose shafts *g g* are journaled in the bed A', having one bearing in one of the side bars and another bearing at the inner ends of the brackets A³⁰ A³⁰, which are secured to the sides of the upright frame A³ and project inward and extend upward sufficiently for that purpose.

The upright frame A³ comprises the two side-bars A³¹ A³¹ and suitable cross-bars A³², and the inner faces of the uprights A³¹ are channeled to provide guide-bearings for sliding the frame or block A³⁴, in which is journaled a pulley G' in the same vertical plane with the pulleys G G, and the pulleys B² and L. The belt *g'*, which passes over the pulley B² returns over one pulley G, down under the pulley G', up over the other pulley G, thence on to the pulley L, and over the same to the pulley B², the length of the belt being such that when the pulley G' and its frame A³⁴ are in their highest position in the upright frame A³², the carriage H may be advanced far enough toward the upright frame A² to bring the spool carried by the shaft *l* of the pulley L fully into the range of action of all the dressing devices. The weight of the frame A³⁴ and pulley G' therein is sufficient to retract the carriage H over the bed A', the pulley G' descending between the side-bars of the frame A³ and taking up the belt, causing the carriage to retreat. It will be understood, however, that this action may be assisted, if necessary, by the rotation of the shaft *k*.

B⁴ is a belt-shifting lever which has an eye B⁴⁰ for the belt, and is fulcrumed at *b*⁴ on the cross-bar A¹¹ of the bed, and has the lever arm B⁴¹ extending nearly at right angles to the general trend of the main arm, and connected to the link B⁴², which extends for a distance in a direction parallel with the sides of the bed between the latter, and at the free end is pivoted to the lever M, which is fulcrumed on the bed and has two projections M' and M², which are in the path of a projection H⁵, formed or secured on the carriage H,

in such position that as the carriage retreats it passes over the projection M², which then lies horizontal, and collides with the projection M', which is then upstanding, and rocks the lever M, and thereby, through the medium of the link B⁴², throws the belt-shifting lever B⁴ to shift the belt off from the tight pulley B onto the loose pulley B'. The position of the parts is such that this occurs as soon as possible after the spool has, by the retreating movement of the carriage, been carried clear of all the dressing devices, so that the spool is at rest by the time the carriage has brought it into position where it can be seized and removed by the operator without danger of encountering the saws. In the advancing movement which will be communicated by rotation of the shaft k, the projection H⁵ engages the projection M² of the lever M, which, at that position, stands in an inclined direction across the path of the projection H⁵, and rocking the lever M, shifts the belt on to the tight pulley, and holds it there during the remainder of the advancing movement, while the projection H⁵ moves along the projection M², which then stands horizontally, as seen in Fig. 1.

An idle center spindle J is provided for the spool, mounted in the shaft J' which slides in the bearings H⁶ and H⁷ on the carriage H. Said sliding shaft has a short rack J¹⁰ secured to it between its bearings. A lever arm J², fulcrumed at j² on the carriage, has a cogged segment J²⁰, which engages the rack J¹⁰, and affords means for sliding the shaft J' in its bearings. The spindle J, rotatable in the cylindrical socket provided for it in the end of the shaft J', is retained against longitudinal movement by a pin j' set through the shell protruding into the socket and engaging in the annular groove j in the spindle J.

N is a stripper, or device for stripping the spool off from the rotating spindle. It is provided with a dove-tailed sliding connection with one of the cross-bars H² of the carriage H, lugs H²⁰ being thrown up on said cross-bar between which said dove-tail bearing is provided, the arm N' of the stripper being adapted to slide in such bearing, as seen in Fig. 4; and the arm N being extended transversely to the spindle in such position that it may engage the end of the spool, will pull the latter off the spindle when the latter is caused to slide in its bearings on the carriage; and in order to give it this movement at proper time, I provide the arm J¹¹ rigid with the shaft J' and extended above the carriage cross-bar H² and onto the arm N' of the stripper, and provide the slot j¹¹, through which the headed bolts or screws n' are inserted and screwed into the arm N'. The length of the slot and the position of the screws are such that when longitudinal movement is given to the shaft J' by the lever arm J², after sufficient movement to withdraw the idle spindle from the spool, the end of the slot reaches the nearest of the screws n', and the further longitudinal move-

ment of the shaft causes the bar J¹¹ to draw with it the stripper N, which thereby withdraws the spool from the rotating spindle. The spool is put in place by the reverse of these movements, both the rotating and the idle spindle being provided with a smooth center point z, corresponding to the size of the axial aperture through the spool, whereby the spool may be centered and then forced into engagement by swinging the lever over to the position shown in Fig. 4.

I claim—

1. In a machine for dressing spools, in combination with the frame (A²), suitably secured in an upright position; the oblique shafts ff carrying dressing devices journaled out of line with each other upon one side of the upright frame, and an oblique counter-shaft e' journaled upon the opposite side of the frame; the pulleys on said shafts respectively, and the belts from the counter-shaft to the shafts ff, traversing the frame: substantially as set forth.

2. In a machine for dressing spools, in combination with the upright frame A², oblique shafts ff, journaled upon one side of the upright frame and carrying oblique dressing devices, and the horizontal shaft d' journaled upon the opposite side of the upright frame carrying the dressing devices D', whose operating periphery extends through the upright frame to the side at which the oblique devices are located; and the mechanism for driving said shafts and dressing devices respectively; and suitable mechanism for advancing the spool toward the upright frame from the side at which the oblique dressing devices are located; substantially as set forth.

3. In a spool-dressing machine, in combination substantially as set forth, the driving mechanism for the dressing devices; the dressing devices themselves; the spool spindle carriage and the spindle-driving mechanism; said four elements being arranged on their supporting frame in the order named, whereby the dressing mechanism and the spool spindle carriage are the proximate elements and intermediate the two driving mechanisms, said driving mechanisms being independently driven; as and for the purpose set forth.

4. In a spool dressing machine, in combination with a horizontal bed and the spool carriage adapted to reciprocate thereon; the upright frame A² located intermediate the ends of the bed and having vertical guide-ways; the pulley carriage A³⁴, adapted to slide in said guide-ways, and the pulley journaled thereon; the spool-rotating spindle on the spool carriage, and its driving shaft journaled on the bed; the guide pulleys G G, and the belt which communicates motion from the driving shaft to the spool spindle, passing over the guide pulleys G and under the pulley G' on a vertical sliding carriage: substantially as set forth.

5. In combination with the bed and the spool carriage adapted to reciprocate thereon,

a pulley-driving spindle journaled on the carriage and the pulley which drives it having its shaft journaled on the bed; means for reciprocating the carriage on the bed; the belt-shifting lever pivoted on the bed, and the cam lever M fulcrumed on the bed and connected to the belt-shifting lever, the carriage being adapted to engage said cam to tilt it as the carriage reciprocates to shift the belt: substantially as set forth.

6. In combination with the spool carriage, the spool carrying spindles journaled thereon; a shaft in which the idle spindle is journaled adapted to be reciprocated lengthwise of the carriage; the stripper having guide-bearings

on the carriage parallel with the spindle axis; an arm from said reciprocating shaft which has a slotted connection with the stripper, whereby the longitudinal movement of said shaft first disengages the idle spindle from the spool and then actuates the stripper to disengage the spool from the operating spindle: substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 24th day of July, 1893.

EBER HUBBARD.

Witnesses:

CHAS. S. BURTON,
JEAN ELLIOTT.