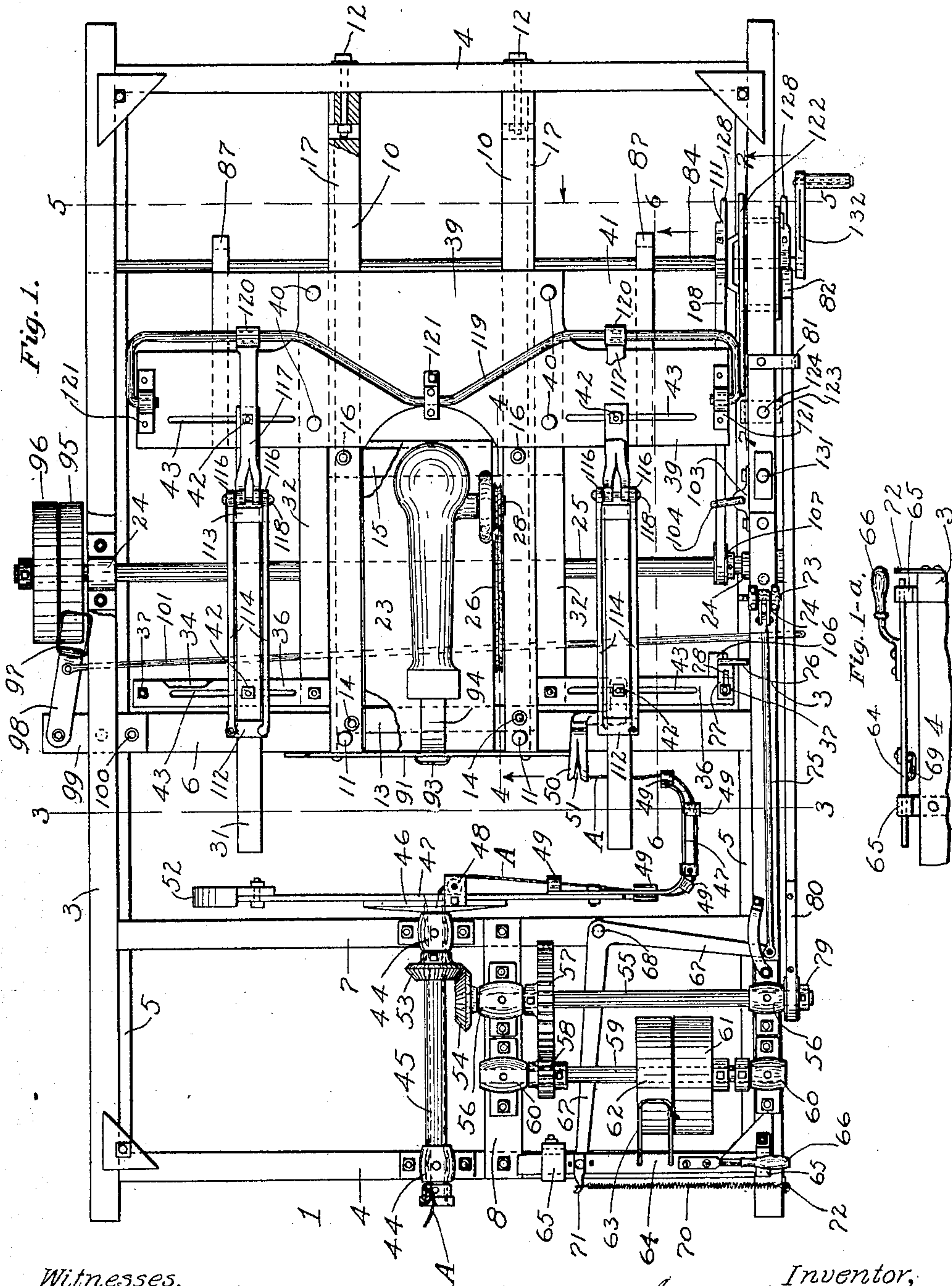


L. STOCKER.
MACHINE FOR MAKING MOP AND BRUSH FABRICS.
APPLICATION FILED OCT. 13, 1906.

913,318.

Patented Feb. 23, 1909.

4 SHEETS—SHEET 1.



Witnesses.

William Whaley
Carrie P. Dry

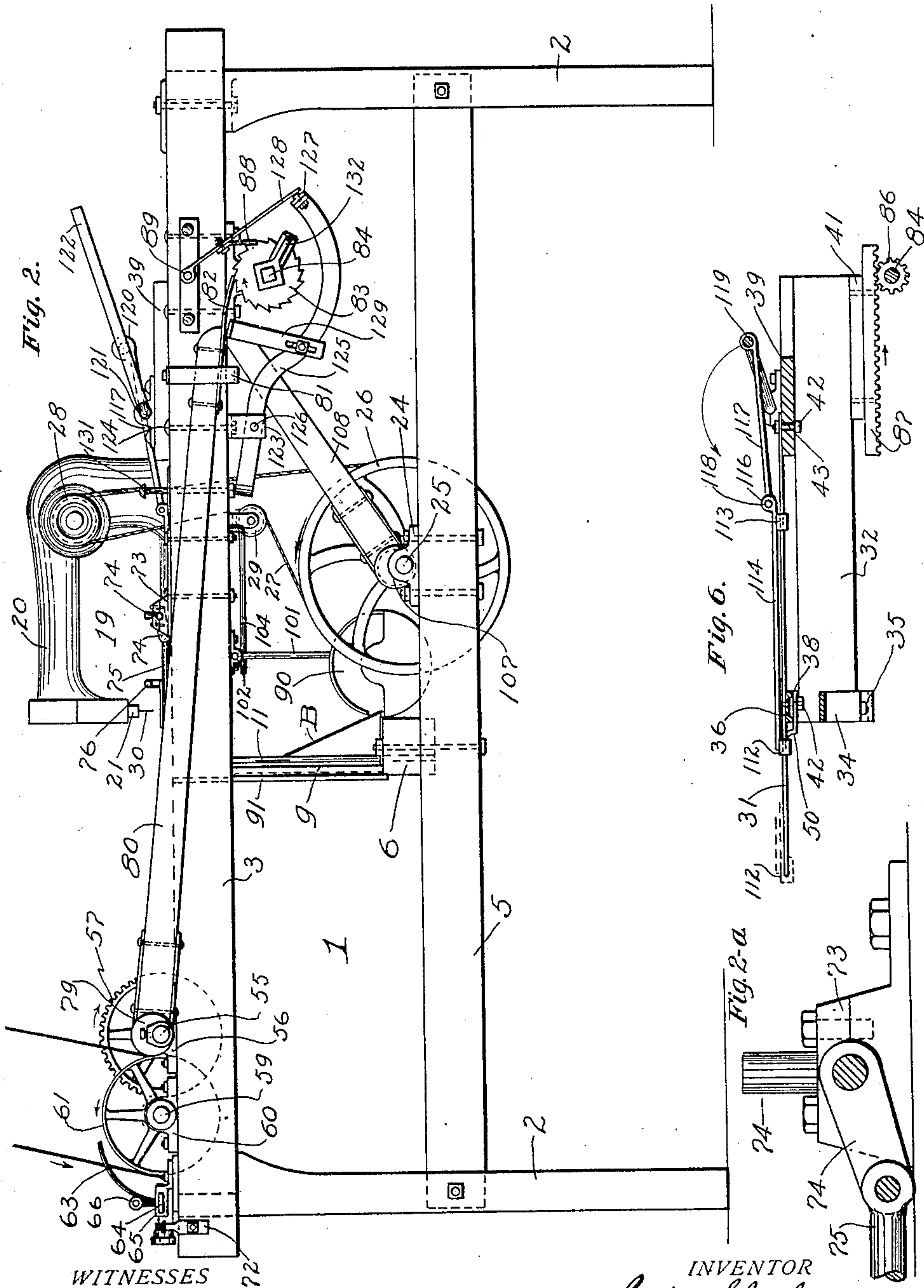
Inventor,
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4 SHEETS—SHEET 2.



WITNESSES
William Whaley
Carrie P. Dwyer

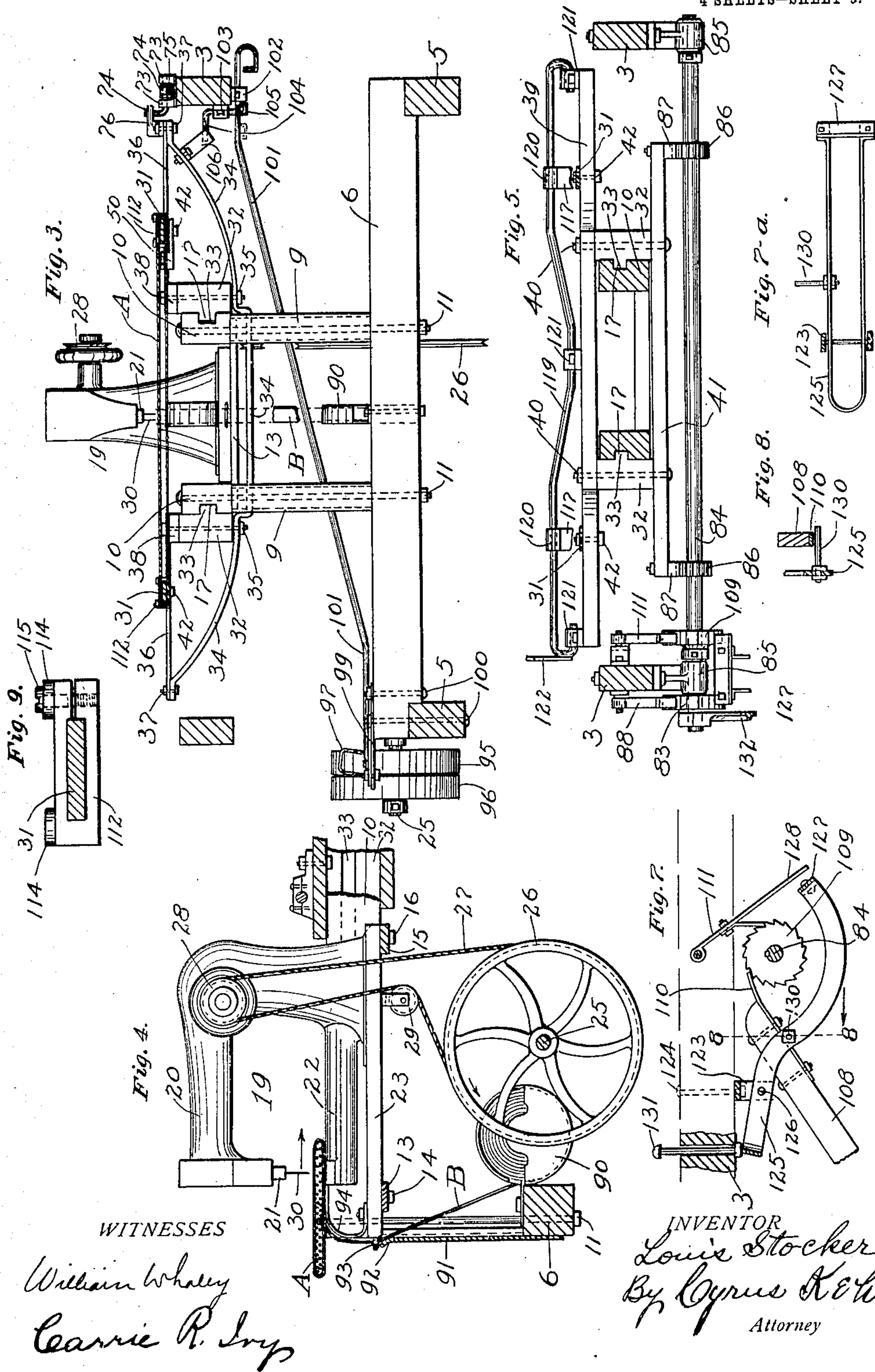
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Louis Stocker
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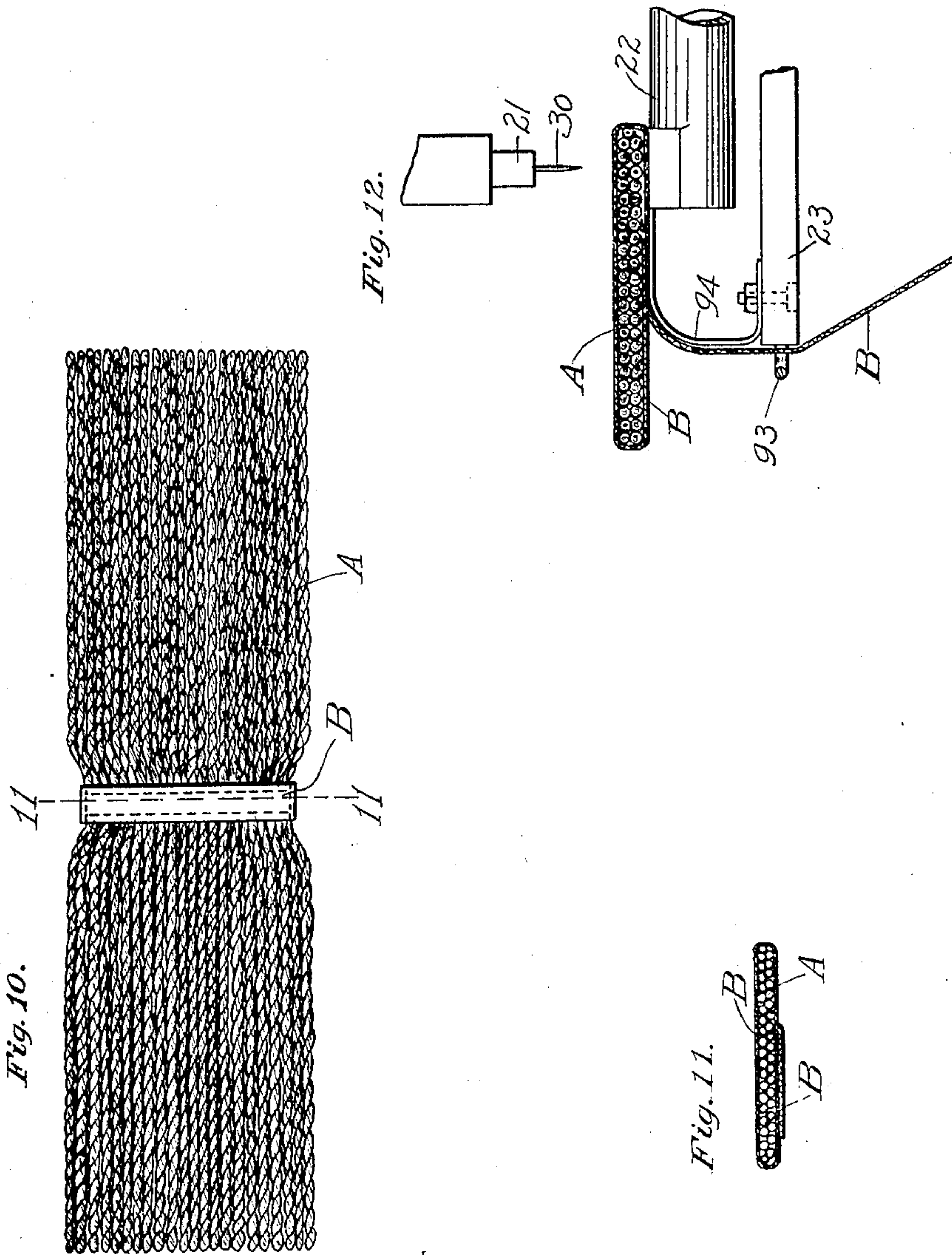
4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.



WITNESSES
William Whaley.
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UNITED STATES PATENT OFFICE.

LOUIS STOCKER, OF KNOXVILLE, TENNESSEE, ASSIGNOR TO MYER BRIDGES COMPANY, OF LOUISVILLE, KENTUCKY, A CORPORATION.

MACHINE FOR MAKING MOP AND BRUSH FABRICS.

No. 913,318.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed October 13, 1906. Serial No. 338,693.

To all whom it may concern:

Be it known that I, LOUIS STOCKER, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Improvement in Machines for Making Mop and Brush Fabrics, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to machines for making fabrics which are to constitute the heads of mops and similar articles, said fabrics being composed of cords or devices resembling cords; and the invention relates particularly to machines for making such fabrics of one or more long cords folded upon itself or each other to constitute a skein-form mass and secured to each other by transverse sewing, as by sewing a strip or band of fabric across said mass.

In the following description, the term, cord or cords, will be applied to cords, strings, yarns, wires, straps and any other similar devices or material suitable for forming the head of a mop or brush.

The object of the invention is to provide automatic mechanism for folding a long cord back and forth upon itself and securing the mass of folds thus formed to each other by sewing, as by sewing a strip or band of fabric transversely across said mass.

In the accompanying drawings, Figure 1 is a plan of a machine embodying my improvement; Fig. 1^a is a detail of one of the belt-shifting mechanisms; Fig. 2 is a front elevation of the machine; Fig. 2^a is a detail of a latch for the belt-shifting mechanism; Fig. 3 is a section on the line 3—3 of Fig. 1, looking toward the right; Fig. 4 is a section on the line, 4—4, of Fig. 1, looking in the direction of the arrow; Fig. 5 is a section on the line, 5—5, of Fig. 1, looking toward the left; Fig. 6 is a section on the line, 6—6, of Fig. 1, looking in the direction of the arrow; Fig. 7 is a section on the line, 7—7, of Fig. 1, looking in the direction of the arrow; Fig. 7^a is a detail plan of a ratchet-releasing mechanism; Fig. 8 is a section on the line, 8—8, of Fig. 7, looking in the direction of the arrow; Fig. 9 is a detail of one of the fabric-removing devices shown in Fig. 3, at each side of the upright middle line of the latter; Fig. 10 is a plan of the finished fabric; Fig. 11 is a section on the line, 11—11, of Fig. 10; Fig. 12 is a sec-

tional detail illustrating the sewing operation.

Referring to said drawings, 1 is the frame of the machine. Said frame comprises four upright legs, 2, two upper longitudinal side-bars or beams, 3, two upper end bars, 4, two lower side-bars, 5, each located below one of the upper side-bars, 3, and a cross-bar, 6, extending from one side-bar, 5, to the other approximately midway between the two ends of the machine. Near the left hand end of said frame, a cross-bar, 7, extends from one side-bar, 3, to the other; and from approximately the middle of said bar, 7, a bar, 8, extends to the adjacent end bar, 4. From two points located at opposite sides of the middle of the cross-bar, 6, rise posts, 9, to approximately the height of the under-faces of the upper side-bars, 3, 3; and upon each of said posts rests the left hand end of a horizontal bar, 10, the opposite end of said bar being secured to the right hand end bar, 4, said bars, 10, being parallel to each other. Bolts, 11, extend through the bar, 10, posts, 9, and cross-bar, 6, and bind said parts together. The right hand end of each of the bars, 10, is secured to the end bar, 4, by means of a bolt, 12. Adjacent the posts, 9, a cross-bar, 13, is applied to the lower faces of the bars, 10, and secured by means of bolts, 14. Nearly midway between the ends of the bars, 10, a similar cross-bar, 15, is similarly applied to said bars, 10, by means of bolts, 16. The rear face of the rear bar, 10, is provided with a groove, 17, and the front face of the front bar, 10, is provided with a similar groove, 17. To said frame the operative parts of the machine are applied.

The two chief functions of the machine are (1) folding the mop cord, A, back and forth upon itself to make a flat, skein-form mass of parallel folds in approximately the same plane, to the width of the mop fabric, and (2) sewing said mass cross-wise by a stitching joining the folds or by a band or strip of fabric, such as stout cloth or braid, laid cross-wise over said mass of folds. (See Figs. 9, 10, and 11.) Such sewing is accomplished by means of a sewing machine head, 19, having an upper arm, 20, bearing a needle bar, 21, and a lower or base arm, 22, containing a shuttle and mechanism for feeding the work toward the right (see Fig. 4). As said head may be of any well known type, I deem it

unnecessary to illustrate and describe the same in detail. Said head is mounted upon a horizontal stationary base plate, 23, which rests upon and is secured to the cross-bars, 13 and 15. Thus said head is stationary, and the work must be brought to it, as will be hereinafter described. Upon the lower side-bars, 5, are mounted bearings, 24, in which rests a horizontal transverse shaft, 25. Upon said shaft is secured a grooved band wheel, 26, which rotates contra-clockwise as viewed from the front of the machine. A band, 27, surrounds said wheel, 26, and a smaller band wheel, 28, on the head, 19, and a tightening wheel, 29, located between said wheels, 28 and 26. Said head, 19, is preferably provided with two needles, 30, in order that two lines of stitches may be simultaneously sewed through the fabric band, B, (see Fig. 3).

The group or mass of cord folds is made by winding the cord, A, in much the same manner as cord or yarn is wound upon a reel, excepting that in the present machine the winding is done upon two fingers which do not revolve like the fingers in a reel, the cord being led around said fingers by a rotary, crank-form guide arm mounted on an axis approximately midway between said two fingers. The group or mass of cords thus wound upon said fingers may be said to resemble a skein. But said cords are not bunched closely together as they are ordinarily in a skein, but are spread or arranged side by side in a plane, so that the skein or mass is flat. The said rotary guide arm is secured to a shaft which is rotary but not longitudinally reciprocable. Hence said guide arm does not travel horizontally toward and from the sewing machine head, 19. But said fingers are mounted upon a horizontal carriage arranged to travel automatically from the left toward the right, at a velocity suited to bring the folds against but not upon each other as the guide arm revolves around said two fingers. The carriage which supports said two fingers is arranged to continue to travel automatically toward the right after the mass of folds has been finished, whereby said skein is passed beneath the arm, 20, of the sewing machine head, 19, and such movement is automatically synchronized with the feed of the sewing machine head, so that the ends of the skein and the middle portion (which is being sewed) will travel evenly. Said carriage and said fingers together constitute a movable support for the flat skein-form mass, and the movement of said support is approximately twice the width of the skein-form mass. Before the sewing operation begins, the band, B, (if such band is to be used) is applied as will be hereinafter described.

The mechanism by which the fingers which support the mass or skein of cord folds are reciprocated, as above indicated, will be next de-

scribed. Said fingers are designated by the numeral, 31. (See Figs. 1, 3, 6, and 9.) To the front face of the front frame-bar, 10, and to the rear face of the rear frame-bar, 10, are applied sliding bars, 32, each of said bars, 32, having a tongue, 33, entering the groove, 17, in the adjacent face of the bar, 10. Near their left hand ends, said bars, 32, are joined to each other by a transverse metal bar, 34, said bar, 34, extending beneath said bars, 32, and being joined thereto by upright bolts, 35. (See Figs. 1, 3 and 6.) The ends of said transverse bar, 34, extend beyond the bars, 32, and upward a little above the level of the upper face of said bars, 32. A relatively short bar, 36, is applied upon the bar, 34, at each end of the latter and upon the adjacent bar, 32, one end of said bar, 36, resting upon the free end of the bar, 34, and secured thereto by a bolt, 37, while the other end of said bar, 36, is secured to the bar, 32, by the bolt, 35, which is used to join the bars, 35 and 32, as above mentioned. A filling block, 38, is placed between each bar, 32, and the bar, 36, so as to raise the bar, 36, above the bar, 32. The right hand ends of the sliding bars, 32, are joined by means of a plate, 39, extending over said bars and projecting beyond them almost to the side-bars, 3. Said plate is secured to said bars by means of bolts, 40. And below the plate, 39, another plate, 41, joins said bars, 32, said plate extending beneath said bars and being joined thereto by the bolts, 40, which extend through the plate 39, and bars, 32. Said sliding bars, 32, and the above mentioned parts joined thereto constitute a carriage for said skein fingers or bars, 31. One of said fingers is located at each side of the sewing machine head and rests upon said bar, 36, and the plate, 39, and is secured to said bar and said plate by means of bolts, 42. In order that said fingers may be adjustable in a horizontal plane toward and from the sewing machine head, slots, 43, are formed in said bars, 36, and plate, 39, and said bolts, 42, extended through said slots. As is now obvious, the reciprocation of said carriage upon the bars, 10, will move said fingers toward and from the guide arm, 47, which delivers the cord and toward and from the sewing machine head.

On the cross-bars, 4 and 7, of the frame are mounted two bearings, 44, in which is journaled a tubular shaft, 45. An attaching plate, 46, surrounds the right hand end of said tubular shaft. To said cross-head is applied a cord guide-arm, 47, one end of which is turned laterally so that the arm is crank-form producing a one arm flier. Said arm is open opposite the end of the tubular shaft, so that the mop cord, A, can enter the left hand end of said shaft and emerge at the right of said arm. Adjacent the point at which said cord emerges from said tubular shaft, is a guide roller, 48, and farther out

upon said arm are any desired number of guides, 49, through which said cord passes. Applied to the front bar, 36, is a bracket, 50, having a V-shape opening, 51, in which the
 5 end of the mop cord is secured before the winding of the cord upon the fingers, 31, begins. Said bracket extends beneath the bar, 36, and is secured by the bolt, 42, which secures the finger, 31, to said bar, 36. The
 10 guide arm, 47, may be extended in the direction opposite the guides and there provided with a counter-balance weight, 52.

Surrounding the tubular shaft, 45, is a bevel gear, 53, which meshes with a similar
 15 bevel gear, 54, on a shaft, 55, resting in bearings, 56. On said shaft, 55, is a spur gear wheel, 57, which meshes with a smaller spur gear wheel, 58, on the power shaft, 59, resting in bearings, 60. On said shaft, 59, is a
 20 loose belt pulley, 61, and a tight belt pulley, 62. Applied to said pulleys is a belt shifter comprising a yoke, 63, mounted on a horizontal bar, 64, resting slidably in guides, 65. To the upper face of said bar is applied a
 25 handle, 66, by means of which said bar may be manually shifted. Mechanism is also provided for automatically actuating said belt shifter. A horizontal bell-crank, 67, is pivoted to the frame-bar, 7, at 68. One arm of
 30 said bell-crank extends toward the left and through a stirrup, 69, applied to the lower face of the belt shifter bar, 64. A contracting coiled spring, 70, is secured by one end to a bracket, 71, projecting toward the left
 35 from the upper portion of the belt shifter bar, 64 (see Figs. 1 and 1^a) and by its other end to a bracket, 72, rising from the front frame-bar, 3. Said spring serves to draw said belt shifter bar, 64, and said arm of said
 40 bell-crank forward and move the other arm of said bell-crank to the right, when the bell-crank is free to undergo such movement. Such turning of the bell-crank is for the purpose of moving the belt shifter forward so
 45 that the driving belt is shifted from the fixed pulley to the loose pulley, in order that the action of the guide arm, 47, may be suspended when a sufficient number of cord folds have been applied to the fingers, 31, and
 50 the skein or group of folds is ready for the application of the band, B, preparatory to sewing. The bell-crank is held in its other or normal position by latch mechanism to be next described, and said latch mechanism
 55 may be automatically released by the carriage when the latter reaches a chosen point.

Upon the upper face of the front side-bar, 3, are placed two bearings, 73, in which is journaled a bell-crank, 74, having one arm
 60 extending toward the left and having another arm rising above said bearings. The first of said arms is forked and hinged to a connecting rod or bar, 75, and the opposite end of said rod or bar is hinged to the forward-
 65 directed arm of the bell-crank, 67. The

bearings, 73, of the bell-crank, 74, are raised somewhat above the side-bar, 3, so that the arm of the bell-crank, 74, which is directed toward the left may fall below the axial line of said bearings and rest upon the upper face
 70 of said side-bar, 3. When said bell-crank, 74, is in this position, the spring, 70, will cause the forward-directed arm of the bell-crank, 67, to press the connecting bar or rod, 75, toward the right against the lower arm of
 75 said bell-crank, 74, and inasmuch as the hinge between said bar and said lower arm is below the axial line of the bearings of said bell-crank, said lower arm will be pressed downward against the upper face of said side-
 80 bar, 3. Thus said connecting rod and bell-crank, 74, normally constitute a resistance or means for locking the bell-crank, 67, and the belt shifter against movement in response to the spring, 70. Such locking action is over-
 85 come by the tilting of the bell-crank, 74, toward the right. This is accomplished by the movement of the carriage which supports the fingers, 31. For this purpose, a tripper, 76, is mounted upon the front bar, 36, of the carriage frame. In the form
 90 shown in the drawings, said tripper has a horizontal base, 77, in which is a slot, 78, through which the aforesaid bolt, 37, passes. Said tripper is so located as to cause it to en-
 95 gage the upper arm of the bell-crank, 74, when the carriage has moved toward the right far enough to place a sufficient number of cord folds upon the fingers, 31. Such en-
 100 gagement causes the tilting of the bell-crank, 74, whereby the connecting rod or bar is moved to the right, such tilting being sufficient to raise the hinge joint between said bell-crank and said connecting rod above the
 105 axial line of the bearings, 73, so that said connecting rod is then free to move toward the right in response to the action of the spring, 70, thus affording a quick movement for the belt shifter.

The mechanism whereby movement is
 110 imparted to the carriage during the period for applying the cord to the fingers, 31, will be next described, it being noted now that during the period in which the sewing mechanism operates, the carriage is moved
 115 further by different mechanism.

On the forward end of the shaft, 55, is an eccentric, 79, and to said eccentric is applied an eccentric rod, 80, leading toward the right and approximately parallel to the
 120 front side-bar, 3. The right end of said rod is confined slidably in a stirrup, 81, secured to the front face of the side-bar, 3. To said end of said eccentric rod is applied a pawl, 82, adapted to engage a ratchet wheel, 83, 125
 mounted on a horizontal shaft, 84, supported in bearings, 85, applied to the lower faces of the side-bars, 3. On said shaft, 84, are two small spur gears, 86, which mesh with gear racks, 87, applied to the lower
 130

face of the plate, 41, which, as already stated, is applied to the lower faces of the sliding bars, 32, of the carriage.

From the foregoing, it will be understood that each rotation of the shaft, 55, will cause a rotation of the eccentric, 79, and a reciprocation of the eccentric rod, 80, and a fractional rotation of the shaft, 84, corresponding to the angle covered by one tooth of the ratchet wheel, 83. A gravity pawl, 88, is hinged at 89 to the front side-bar, 3, and normally rests upon the ratchet wheel, 83, to prevent reverse movement of said ratchet wheel. Said gravity pawl is thrown out of action by mechanism to be hereinafter described.

The skein or mass of cord folds is now ready to receive the band, B, (if said band is to be used) preparatory to sewing the latter to said skein. Said band is contained in a magazine or holder, 90, mounted upon the middle of the cross-bar, 6 (see Figs. 2, 3, and 4). In considering the application of said band preparatory to sewing, it is to be remembered that the sewing mechanism does not travel with the carriage.

To the front face of the frame-bars, 10, 10, and to the front face of the cross-bar, 6, is applied a guard plate, 91. At the middle portion of its upper edge said plate is provided with a notch, 92, through which the band, B, rises. On the left hand edge of the base plate, 23, is a staple, 93, through which said band also passes. Above said staple is a curved guide plate, 94, rising from the left hand edge of the plate, 23, to the upper face of the lower arm, 22, of the sewing machine head, 19. Said band is drawn upward by hand and around the right hand edge of the cord skein, and thence to the left over the top of said skein and thence around the left hand edge of said skein and a short distance beneath the latter (see Fig. 12). Then the sewing machine head and the carriage are simultaneously set into action, and the sewing mechanism sews through the portions of the band above and below the skein and through the skein, drawing more of the tape upward from the magazine, 90, as the skein is moved toward the right. While the sewing mechanism is in operation, the carriage is, as already herein stated, operated by mechanism distinct from the mechanism which operates the carriage while the cord is being wound upon the movable fingers, 31 by the guide arm traveling in a path inclosing the fingers to lay the cord thereon in parallel strands, to form the cord skein, and during such time the space through which the carriage moves is different from the space through which it moves when the winding mechanism is in operation. In other words, the carriage traverses a path approximately twice as long as the width of the skein-form mass, a portion of said path being traversed

while the winding mechanism is in operation and the other portion while the sewing mechanism is in operation. After the completion of the sewing operation, said carriage is returned to its initial position by a single movement as hereinafter described.

It has already been herein described that the sewing machine mechanism receives movement through the band, 27, wheel, 26, and shaft, 25, said shaft being mounted in bearings, 24, resting on the lower side-bars, 5. Said shaft is also used for transmitting movement to the carriage during the sewing period. To the rear end of said shaft is applied a fixed pulley, 95, and a loose pulley, 96. A belt shifter comprising a stirrup, 97, and an arm, 98, is hinged to a plate, 99, extending rearward from the upper face of the rear side-bar, 6, and secured to said bar by bolts, 100. A rod, 101, is hinged by its rear end to the belt shifter arm, 98, and at its front end extends through a guide, 102. Said rod can be reciprocated manually for moving said belt shifter. (See Fig. 3.) To the rear face of the front side-bar, 3, is applied a bearing, 103, the axis of said bearing being upright. In said bearing is supported a pivoted rod, 104, having an upper crank arm directed horizontally rearward and having a lower arm directed horizontally toward the left and through a stirrup, 105, applied to the lower face of the rod, 101. From the adjacent bar, 34, of the carriage, a bracket, 106, extends downward in proper position to strike the upper arm of said rod 104 when the carriage has reached the desired limit of movement toward the right. As will be readily understood, said rod 104 will then be turned, the lower arm thereof swinging rearward and forcing the rod, 101, and the stirrup of the belt shifter rearward and carrying the driving belt from the fixed pulley, 95, to the loose pulley, 96, leaving the shaft, 25, motionless.

On the shaft, 25, just behind the front bearings, 24, is an eccentric, 107, to which is applied an eccentric rod or bar, 108, which rises obliquely toward the shaft, 84, at the rear of the front side-bar, 3. On said shaft, 84, is a ratchet wheel, 109, (see Figs. 5 and 7) corresponding to the ratchet wheel, 83, upon which the eccentric rod, 80, acts. To the right hand end of said eccentric rod, 108, is applied a pawl, 110, which engages the teeth of the ratchet wheel, 109. At the right of said ratchet wheel is a gravity pawl, 111, hinged to the front side-bar, 3, and bearing normally against said ratchet wheel.

From the foregoing it will be understood that each rotation of the shaft, 25, by the action of a belt on the fixed pulley, 95, on said shaft, will cause a fractional rotation of the shaft, 84, clockwise as viewed in Figs. 2 and 7—the same direction as the movement imparted to said shaft by the eccentric rod,

80, whereby the spur gears, 86, on said shaft, 84, are partially rotated and caused to draw the carriage a little way toward the right. Such movement continues until the belt is shifted from said pulley, 95, to the pulley, 96, by the automatic mechanism already above described. As above stated, such movement of the carriage and the feed of the fabric by the sewing machine head are synchronized or made equal.

The band, B, having now been sewed to the skein or mass of cord folds, the structure or fabric is complete and ready to be doffed or removed from the fingers, 31. This is accomplished by mechanism to be next described. Surrounding each of said finger bars at the left of the bar, 36, supporting the forward portion of said finger bar is a split block, 112; and near the plate, 39, said finger bar is surrounded by a similar block, 113. Both of said blocks are slidable on said finger bar. Two bars, 114, connect said blocks, 112 and 113, in any suitable manner. The drawings show both of said bars resting upon said blocks and welded thereto. A cap-screw, 115, extends through the adjacent bar, 114, and is threaded into the lower arm of said block, and serves to adjust said block to said finger bar so as to slide without play. On the right hand end of each of the bars, 114, is an ear, 116, between which is the end of a connecting rod, 117. Said connecting rod and said ears are hinged to each other by means of a bolt, 118. The right hand end of said connecting rod surrounds a rock-shaft, 119, at 120. Said rock-shaft is journaled in three bearings, 121, on the plate, 39, which plate, it will be remembered, is a part of the carriage. Said connecting rods, 117, are slidable on said rock-shaft toward and from the front of the machine, so that when said finger bars, 31, are adjusted toward and from the sewing machine head, said connecting rods may partake of the same movement.

A handle, 122, is applied to the front portion of the rock-shaft, 119 (see Figs. 1, 2, and 5), by means of which said rock-shaft may be actuated. Throwing said handle toward the left will drive the connecting rods, 117, and the blocks, 113, the bars, 114, and the blocks, 112, toward the left until said blocks, 112, extend to or slightly beyond the left hand ends of the finger bars, 31, as shown in dotted lines in Fig. 6, such movement pushing the mop fabric entirely off from said finger bars. Then the handle, 122, is again thrown toward the right and the finger bars made ready for another skein. Then the carriage is again moved toward the left. This is accomplished by mechanism and in the manner next described. Preparatory to such return of the carriage, the pawls on the eccentric rods, 80 and 108, must be released, respectively, from the ratchet wheels, 83 and

109, and the gravity pawls, 88 and 111, must also be released from said ratchet wheels. An inverted U-shaped hanger, 123, is applied to the lower face of the front side-bar, 3, a short distance leftward of said ratchet wheels, and secured by a bolt, 124, extending downward through said side-bar, 3. Between the downward-directed arms of said hanger is hinged a rocking member, 125, by means of a pin or shaft, 126. Said rocking member is formed by folding a metal bar upon itself so as to bring the ends of said bar a little rightward of said ratchet wheels, said arms being curved downward to clear said ratchet wheels. Said ends are connected by a bridge piece, 127, and each of the gravity pawls, 88 and 111, has a downward extension 128, which normally stands near said bridge piece. From the front portion of said rocking member a finger, 129, rises almost against the pawl, 82, of the connecting rod, 80; and from the rear arm of the rocking member, 125, a finger, 130, extends rearward horizontally beneath the eccentric rod, 108, when the latter is in its normal position. Above the left hand end of said rocking member a plunger, 131, extends downward through the front side-bar, 3, and rests by its weight upon said rocking member. By pressing said plunger downward, the left hand end of said rocking member is moved downward and the right hand end is moved upward, the bridge piece, 127, lifting the gravity pawls, the finger, 129, lifting the eccentric rod, 80, and the finger, 130, lifting the eccentric rod, 108, so that the two ratchet wheels, 83 and 109, are free to rotate. Then, by means of a hand crank, 132, turned contra-clockwise, the shaft, 84, is rotated contra-clockwise sufficiently to return the carriage leftward into position for another operation.

I claim as my invention:

1. In a machine of the nature described, the combination of mechanism comprising a rigid member for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to one of said mechanisms a continuous one-way movement during said winding operation and a sewing mechanism adapted to connect the cord coils at substantially the midlength thereof.

2. In a machine of the nature described, the combination of mechanism comprising a rigid member for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to said supporting mechanism a continuous one-way movement during the winding operation and a sewing mechanism adapted to connect the cord coils at substantially the midlength thereof.

3. In a machine of the nature described, the combination of mechanism comprising a

rigid member for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to one of said mechanisms a continuous one-way movement during said winding operation, mechanism for removing said mass from said supporting mechanism and a sewing mechanism adapted to connect the cord coils at substantially the midlength thereof.

4. In a machine of the nature described, the combination of mechanism comprising a rigid member for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to said supporting mechanism a continuous one-way movement during the winding operation, mechanism for removing said mass from said supporting mechanism and a sewing mechanism adapted to connect the cord coils at substantially the midlength thereof.

5. In a machine of the nature described, the combination with a reciprocating cord support, means for winding cord thereon during a portion of the travel of said support, and means for sewing said wound cord during a further movement of said support.

6. In a machine of the nature described, a cord support, means for winding cord upon said support, a sewing mechanism cooperating with the wound cord, and means for reciprocating one of said parts relative to the other to wind during a portion of its travel and sew during a further travel thereof.

7. In a machine of the nature described, the combination of a reciprocating carriage having cord supporting arms, a winding mechanism comprising a cord guide arm mounted to wind upon supporting arms, and a sewing mechanism disposed intermediate of said arms to engage the cord in the travel thereof.

8. In a machine of the nature described, the combination of a reciprocating carriage having cord supporting arms, a winding mechanism comprising a cord guide arm mounted to wind upon the supporting arms, a sewing mechanism disposed intermediate of said arms to engage the cord in the travel thereof, and a cord removing device mounted upon said carriage to traverse the supporting arms thereon.

9. In a machine of the nature described, the combination of a winding mechanism comprising a rotary shaft and a crank-form arm applied to said shaft, mechanism for supporting a flat, skein-form mass of cord, mechanism for imparting to one of said mechanisms a continuous one-way movement during the operation of said winding mechanism, and a sewing mechanism adapted to connect the cord coils at substantially the midlength thereof and intermittently operating mechanism traversing the cord

support for removing said mass from said supporting mechanism.

10. In a machine of the nature described, the combination of a winding mechanism comprising a rotary shaft and a crank-form arm applied to said shaft, mechanism for supporting a flat, skein-form mass of cord, mechanism for imparting to said supporting mechanism a continuous one-way movement during the operation of said winding mechanism, and a sewing mechanism adapted to connect the cord coils at substantially the midlength thereof and intermittently operating mechanism traversing the cord support for removing said mass from said supporting mechanism.

11. In a machine of the nature described, the combination of mechanism comprising a rigid member for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to one of said mechanisms a continuous one-way movement during said winding operation, sewing mechanism in suitable relation to said supporting mechanism, and mechanism for imparting to one of said mechanisms a continuous one-way movement transversely of the cord coils during the operation of said sewing mechanism.

12. In a machine of the nature described, the combination of mechanism comprising a rigid member for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to one of said mechanisms a continuous one-way movement during said winding operation, sewing mechanism in suitable relation to said supporting mechanism, and mechanism for imparting to said supporting mechanism a continuous one-way movement transversely of the cord coils during the operation of the sewing mechanism.

13. In a machine of the nature described, the combination of mechanism comprising a rigid member for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to one of said mechanisms a continuous one-way movement during said winding operation, sewing mechanism in suitable relation to said supporting mechanism, mechanism for imparting to one of said mechanisms a continuous one-way movement transversely of the cord coils during the operation of said sewing mechanism, and mechanism for removing said skein-form mass.

14. In a machine of the nature described, the combination of mechanism comprising a rigid member for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to one of said

mechanisms a continuous one-way movement during said winding operation, sewing mechanism in suitable relation to said supporting mechanism, mechanism for imparting to said supporting mechanism a continuous one-way movement transversely of the cord coils during the operation of the sewing mechanism, and mechanism for removing said skein-form mass.

15. In a machine of the nature described, the combination of a rigid mechanism for supporting a flat, skein-form mass of cord, sewing mechanism disposed to stitch said cords in a single path transversely of the length of the mass, and mechanism for imparting to one of said mechanisms a movement parallel to the plane of said mass while the sewing mechanism is in operation.

16. In a machine of the nature described, the combination of a rigid mechanism for supporting a flat, skein-form mass of cord, sewing mechanism, mechanism for imparting to one of said mechanisms a movement parallel to the plane of said mass while the sewing mechanism is in operation, and mechanism for removing said mass after the sewing operation.

17. In a machine of the nature described, the combination of mechanism for supporting a flat cord mass, sewing mechanism disposed to stitch said cords in a single path transversely of the length of the mass, and means for moving said mechanisms relative to each other.

18. In a machine of the nature described, the combination of a rigid mechanism for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to one of said mechanisms a continuous one-way movement during said winding operation, sewing mechanism in suitable relation to said supporting mechanism, mechanism for imparting to one of said mechanisms a continuous one-way movement relative to the operation of said sewing mechanism, and mechanism for restoring said supporting mechanism, said winding mechanism and said sewing mechanism to their relative initial positions.

19. In a machine of the nature described, the combination of a rigid mechanism for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to said supporting mechanism a continuous one-way movement during said winding operation, and sewing mechanism in suitable relation to said supporting mechanism, and mechanism for imparting to said supporting mechanism a continuous one-way movement relative to the operation of said sewing mechanism, and mechanism for returning said supporting mechanism to its initial position.

20. In a machine of the nature described, the combination of a rigid mechanism for supporting a flat, skein-form mass of cord, mechanism for winding a cord around said supporting mechanism, mechanism for imparting to said supporting mechanism a continuous one-way movement during said winding operation, sewing mechanism in suitable relation to said supporting mechanism, mechanism for imparting to said supporting mechanism a continuous one-way movement relative to the operation of said sewing mechanism, mechanism for returning said supporting mechanism to its initial position, and mechanism for removing said skein-form mass.

21. In a machine of the nature described, the combination of a stationary sewing mechanism, a reciprocating carriage, a cord mass supporting mechanism located upon said carriage, mechanism for actuating said sewing mechanism and shifting said carriage during the sewing operation.

22. In a machine of the nature described, the combination of a stationary sewing mechanism, a relatively stationary winding mechanism, a reciprocating carriage, skein-form mass supporting mechanism located upon said carriage, mechanism for actuating said carriage during the winding operation, and mechanism for actuating said sewing mechanism and shifting said carriage during the sewing operation.

23. In a machine of the nature described, the combination of mechanism for supporting a skein-form mass, mechanism for winding cord upon said support, and mechanism for sewing said skein-form mass, said support, on the one hand, and said winding mechanism and said sewing mechanism, on the other hand, being relatively reciprocable transversely of the cord mass approximately twice as far as the width of the skein-form mass.

24. In a machine of the nature described, the combination of mechanism for supporting a skein-form mass, mechanism for winding cord upon said support, and mechanism for sewing said skein-form mass, said supporting mechanism being reciprocable transversely of the cord mass through a path approximately twice as long as the width of the skein-form mass.

25. In a machine of the nature described, the combination of mechanism for winding a continuous cord into a skein-form mass, mechanism for supporting said mass, and mechanism for sewing a band upon said mass at substantially the center of the folded length thereof to provide opposite folded free ends.

26. In a machine of the nature described, a stationary sewing mechanism, a relatively stationary winding mechanism, a carriage, mechanism upon said carriage for supporting a skein-form mass of cord, power mech-

anism for actuating said winding mechanism and shifting said carriage during the winding operation, automatic mechanism for putting said power mechanism out of
 5 action, and power mechanism for actuating said sewing mechanism and shifting said carriage during the sewing operation, and automatic mechanism for putting said power mechanism out of action, substantially as
 10 described.

27. In a machine of the nature described, a stationary sewing mechanism, a relatively stationary winding mechanism, a carriage, mechanism upon said carriage for support-
 15 ing a skein-form mass of cord, power mechanism for actuating said winding mechanism and shifting said carriage during the winding operation, automatic mechanism for putting said power mechanism out of action,
 20 power mechanism for actuating said sewing mechanism and shifting said carriage during the sewing operation, automatic mechanism for putting said power mechanism out of action, and mechanism for removing said
 25 mass from said supporting mechanism, substantially as described.

28. In a machine of the nature described, a stationary sewing mechanism, a relatively stationary winding mechanism, a carriage, mechanism upon said carriage for support-
 30 ing a skein-form mass of cord, power mechanism for actuating said winding mechanism and shifting said carriage during the winding operation, automatic mechanism for putting said power mechanism out of action, power
 35 mechanism for actuating said sewing mechanism and shifting said carriage during the sewing operation, automatic mechanism for putting said power mechanism out of action,
 40 and manual mechanism for returning said carriage, substantially as described.

29. In a machine of the nature described, mechanism for winding a continuous cord into a skein-form mass, mechanism for sup-
 45 porting said mass, and mechanism for sewing a band to said mass, and mechanism for guiding a band to said sewing mechanism, substantially as described.

30. In a machine of the nature described, mechanism for winding a continuous cord into a skein-form mass, mechanism for sup-
 50 porting said mass, mechanism for sewing a band to said mass at substantially the center of the folded length thereof to provide opposite folded free ends, mechanism
 55 for holding a roll of a band, and mechanism for guiding said band to said sewing mechanism, substantially as described.

31. In a machine of the nature described, the combination with cord supporting mem-
 60 bers for holding a flat cord mass comprising a series of parallel strands, of mechanism for sewing said cord mass disposed in a line substantially central intermediate the sup-
 65 porting members.

32. In a machine of the nature described, a carriage provided with cord supporting fingers, mechanism for winding cord thereon, sliding doffers mounted upon said fingers, a rock shaft mounted upon said carriage and
 70 provided with crank portions, and a connection from the crank portions to said doffers.

33. In a machine of the nature described, a carriage provided with cord supporting
 75 fingers, mechanism for winding cord thereon, sliding doffers mounted upon said fingers, a rock shaft mounted upon said carriage and provided with crank portions, a connection from the crank portions to said doffers, and
 80 means for intermittently feeding said carriage relative to said winding mechanism.

34. In a machine of the nature described, a cord supporting carriage and feeding mechanism therefor, rotatably mounted
 85 winding mechanism disposed relative to said carriage, driving mechanism for said winder, and a stop device disposed in the path of travel of the carriage and connected to the carriage feed and winding driving
 90 mechanism to automatically control them.

35. In a machine of the nature described, a cord supporting carriage and feeding mechanism therefor, rotatably mounted winding mechanism disposed relative to
 95 said carriage, driving mechanism for said winder, means automatically actuated in the travel of the carriage to stop the carriage and winding mechanism, a sewing mechanism disposed in the path of travel of said car-
 100 riage, and independent driving means for said sewing mechanism and carriage operable subsequent to the winding action.

36. In a machine of the nature described, a cord supporting carriage and feeding mech-
 105 anism therefor, rotatably mounted winding mechanism disposed relative to said carriage, driving mechanism for said winder, means automatically actuated in the travel of the carriage to stop the carriage and winding
 110 mechanism, a sewing mechanism disposed in the path of travel of said carriage, independent driving means for said sewing mechanism and carriage operable subsequent to the winding action, and means for releasing
 115 each driving mechanism from said carriage to permit the return thereof.

37. In a machine of the nature described, a cord supporting carriage provided with means for receiving the cord in a wound
 120 mass, a winding mechanism disposed adjacent thereto, and a driving shaft geared to continuously move the winding mechanism and intermittently move said carriage in one direction.
 125

38. In a machine of the nature described, a cord supporting carriage provided with means for receiving the cord in a wound mass, a winding mechanism disposed ad-
 130 jacent thereto, a driving shaft geared to

continuously move said winding mechanism and intermittently move said carriage, a power controlling mechanism connected to said driving shaft, and a connection extending from said controlling mechanism into the path of said carriage in one direction.

39. In a machine of the nature described, a cord supporting carriage, a winding mechanism disposed adjacent thereto, a driving shaft for said winding mechanism and provided with an eccentric, an eccentric bar extended from said driving shaft and provided with a pawl at its free end, a rack bar upon said carriage, a shaft having pinions meshing with said bar, and a ratchet wheel upon said shaft cooperating with said pawl.

40. In a machine of the nature described, a cord supporting carriage, a winding mechanism disposed adjacent thereto, a driving shaft for said winding mechanism and provided with an eccentric, an eccentric bar extended from said driving shaft and provided with a pawl at its free end, a rack bar upon said carriage, a shaft having pinions meshing with said bar, a ratchet wheel upon said shaft cooperating with said pawl, and a pivoted holding pawl disposed to engage said ratchet.

41. In a machine of the nature described, a cord supporting carriage, a winding mechanism disposed adjacent thereto, a driving shaft provided with an eccentric, an eccentric bar extended from said driving shaft and provided with a pawl at its free end, a rack bar upon said carriage, a shaft having pinions meshing with said bar, a ratchet wheel upon said shaft cooperating with said pawl, a pivoted holding pawl disposed to engage said ratchet, and a releasing lever having an arm to engage the bar pawl and holding pawl.

42. In a machine of the nature described, a cord supporting carriage, a winding mechanism disposed adjacent thereto, a driving shaft provided with an eccentric, an eccentric bar extended from said driving shaft and provided with a pawl at its free end, a rack bar upon said carriage, a shaft having pinions meshing with said bar, a ratchet wheel upon said shaft cooperating with said pawl, a pivoted holding pawl disposed to engage said ratchet, a releasing lever having an arm to engage the bar pawl and holding pawl, and a plunger mounted upon the frame to engage one end of the releasing lever.

43. In a machine of the nature described, a carriage provided with a driving rack, a shaft having a pinion engaging said rack, a winding mechanism disposed at one end of said carriage and provided with driving connections, a sewing mechanism disposed in the path of travel of said carriage, an independent driving shaft for said sewing mechanism, and a separate connection from each of the driving mechanisms to the pinion shaft of said carriage.

44. In a machine of the nature described, a carriage provided with a driving rack, a shaft having a pinion engaging said rack, a winding mechanism disposed at one end of said carriage and provided with driving connections, a sewing mechanism disposed in the path of travel of said carriage, an independent driving shaft for said sewing mechanism, and separate connections from each of said driving mechanisms for intermittently and successively rotating the pinion shaft of said carriage.

45. In a machine of the nature described, a carriage provided with a driving rack, a shaft having a pinion engaging said rack, a winding mechanism disposed at one end of said carriage and provided with driving connections, a sewing mechanism disposed in the path of travel of said carriage, an independent driving shaft of said sewing mechanism, separate connections from each of said driving mechanisms for successively rotating the pinion shaft of said carriage, and means upon said carriage for stopping the driving connection from said winding mechanism.

46. In a machine of the nature described, a carriage provided with a driving rack, a shaft having a pinion engaging said rack, a winding mechanism disposed at one end of said carriage and provided with driving connections, a sewing mechanism disposed in the path of travel of said carriage, an independent driving shaft for said sewing mechanism, separate connections from each of said driving mechanisms for successively rotating the pinion shaft of said carriage, means upon said carriage for stopping the driving connection from said winding mechanism, and means upon said carriage for stopping the driving connection from said sewing mechanism.

47. In a machine of the nature described, a carriage provided with a driving rack, a shaft having a pinion engaging said rack, a winding mechanism disposed at one end of said carriage and provided with driving connections, a sewing mechanism disposed in the path of travel of said carriage, an independent driving shaft for said sewing mechanism, separate connections from each of said driving mechanisms for successively rotating the pinion shaft of said carriage, means upon said carriage for stopping the driving connection from said winding mechanism, means upon said carriage for stopping the driving connection from said sewing mechanism, and means for disconnecting each of the driving mechanisms from said pinion shaft to permit a reverse movement thereof.

48. In a machine of the nature described, a winding mechanism, a cooperating cord holder provided with supporting fingers, doffers cooperating with said fingers, a carriage for said fingers and doffers, means upon the carriage to operate said doffers, and

means for adjusting the fingers and doffers laterally toward and from each other.

49. In a machine of the nature described, a winding mechanism, a cooperating cord
5 holder provided with supporting fingers mounted for adjustment laterally toward and from each other, doffers slidably mounted on said fingers, and a crankshaft for actuating said doffers and having a straight portion
10 tion to permit lateral adjustment of the doffer connections thereon.

50. In a machine of the nature described, a cord supporting carriage, a sewing mechanism, means for moving said carriage relative

to said sewing mechanism, a tape magazine, 15 and tape guides extending therefrom to the sewing mechanism, for supplying a tape from said magazine to surround the cord upon said carriage.

In testimony whereof I have signed my 20 name, in presence of two witnesses, this 10th day of October, in the year one thousand nine hundred and six.

LOUIS STOCKER.

Witnesses:

CYRUS KEHR,
C. A. MORSE.