No. 697,985. Patented Apr. 22, 1902.

W. B. CONRAD & J. A. CAMERON.

MACHINE FOR SLITTING FABRICS.

(Application filed June 29, 1901.)

(No Model.) 3 Sheets—Sheet 1.

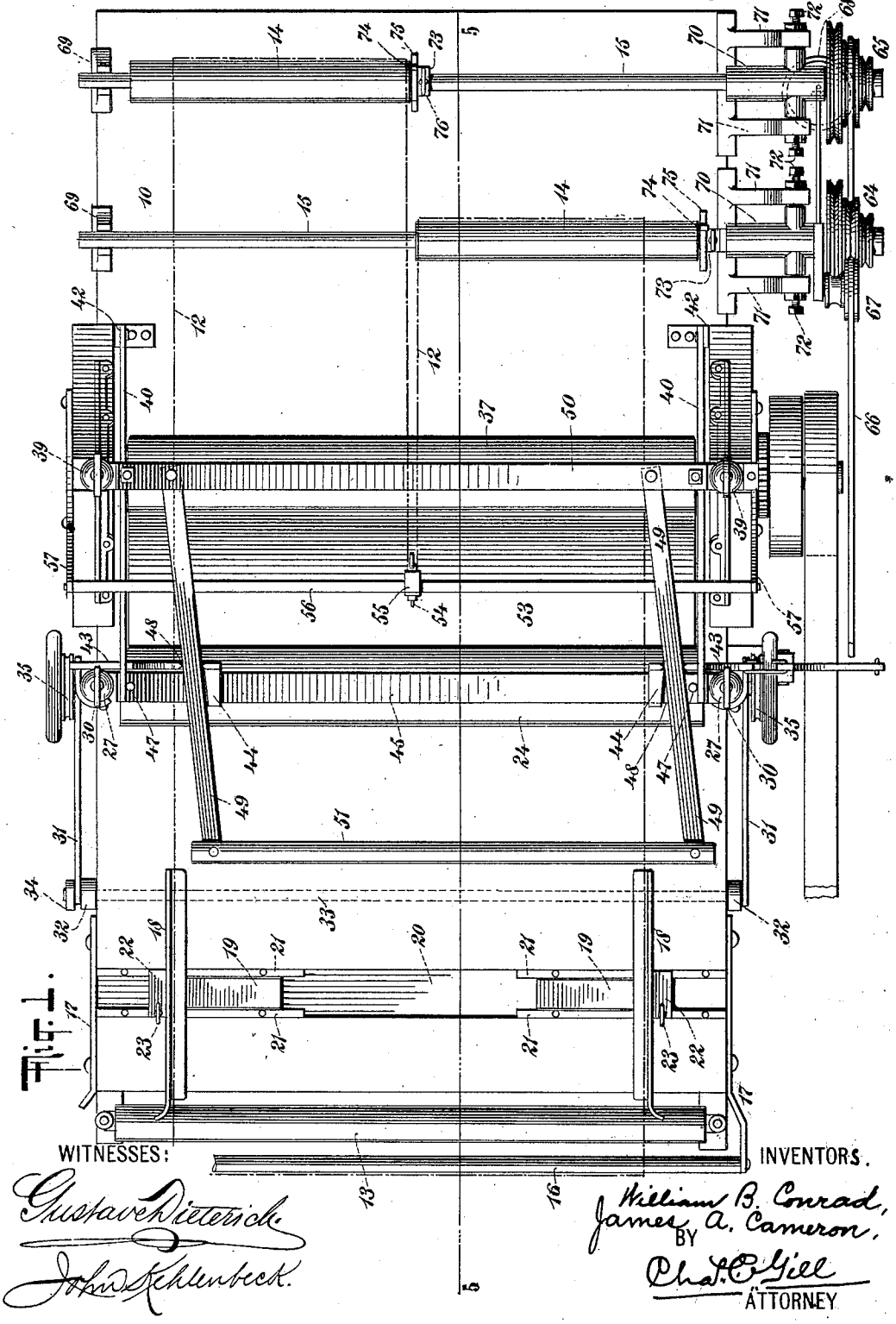


Fig. 1.

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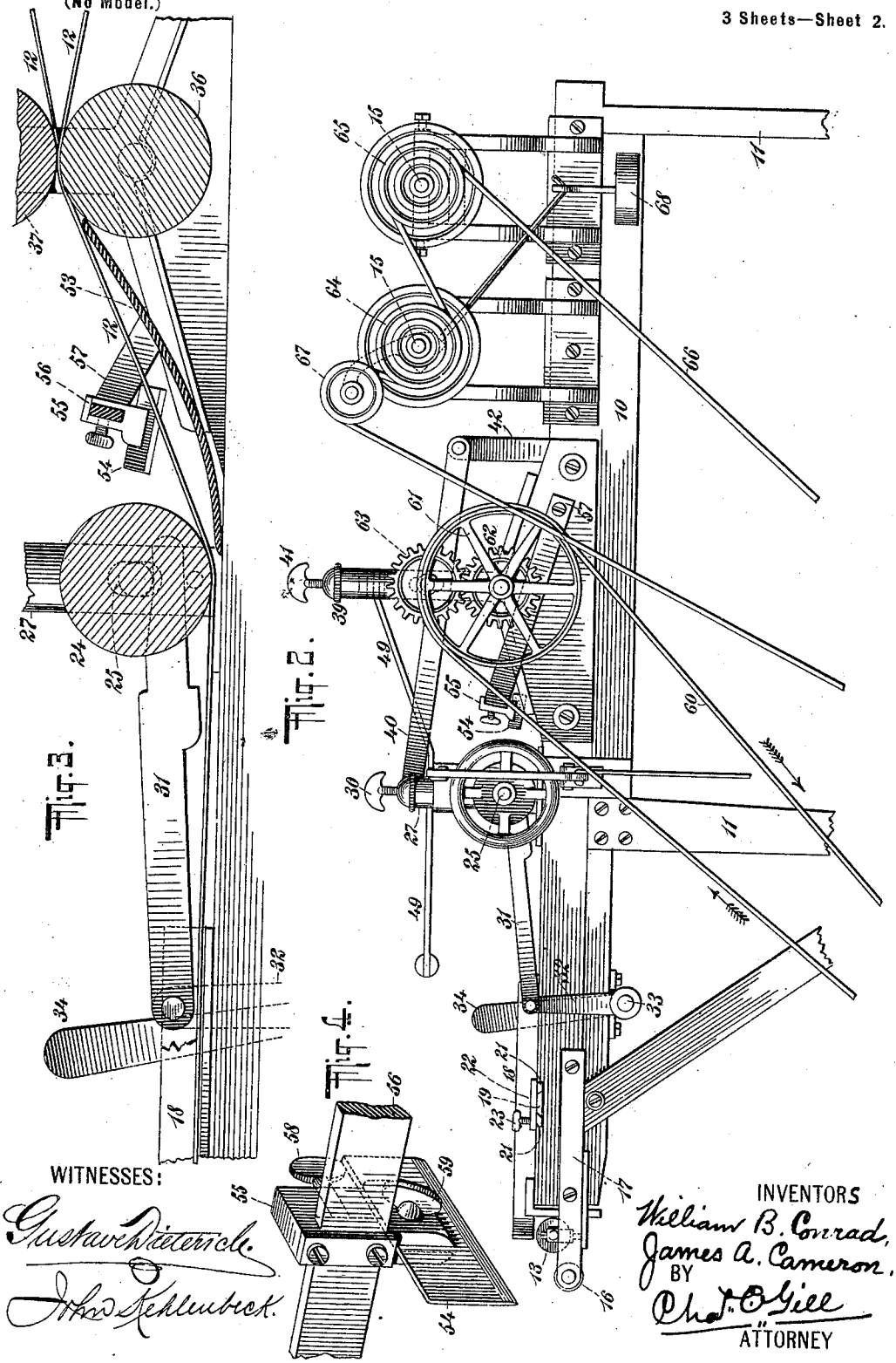


Fig. 2.

Fig. 3.

Fig. 4.

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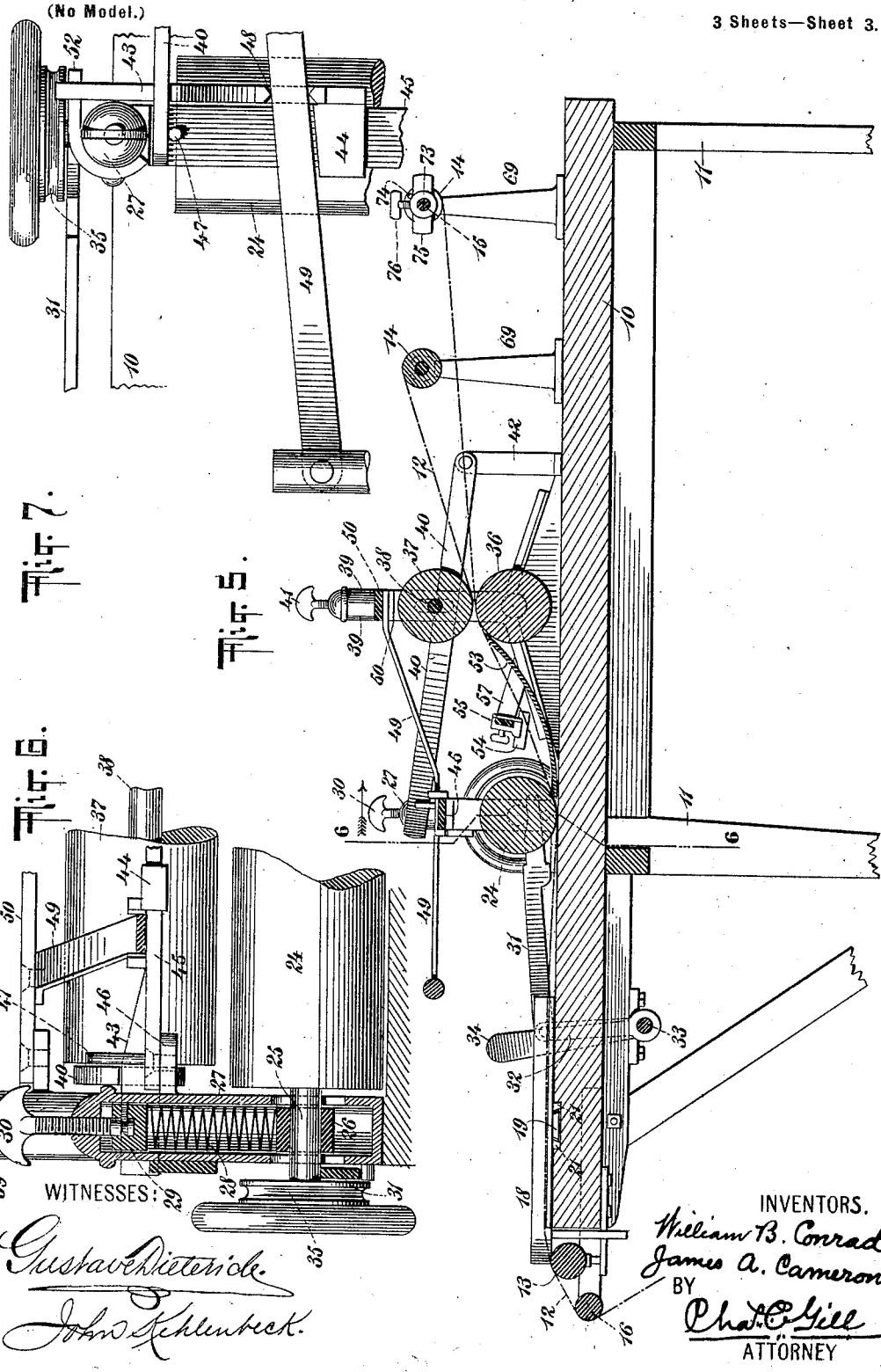


Fig. 7.

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM B. CONRAD, OF NYACK, AND JAMES A. CAMERON, OF BROOKLYN, NEW YORK.

MACHINE FOR SLITTING FABRICS.

SPECIFICATION forming part of Letters Patent No. 697,985, dated April 22, 1902.

Application filed June 29, 1901. Serial No. 66,468. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM B. CONRAD, residing at Nyack, in the county of Rockland, and JAMES A. CAMERON, residing at Brooklyn, in the county of Kings, State of New York, citizens of the United States, have jointly invented certain new and useful Improvements in Machines for Slitting Fabrics, of which the following is a specification.

The invention relates to improvements in machines for slitting fabrics in a lengthwise direction, so that a fabric feeding from a roll or bolt may be passed through the machine and during its travel therethrough be subdivided lengthwise into proper widths, the latter being wound into the form of rolls.

We have utilized this invention in the production of suitable widths of fabric for the manufacture of hemstitched handkerchiefs, the fabric fed through the machine being slit into widths of suitable dimensions for handkerchiefs and being thereafter subdivided transversely into blanks or sections for the individual handkerchiefs.

Great difficulty has heretofore been experienced in accurately and economically subdividing fabrics into lengths of suitable width for handkerchiefs; and the present invention has for its purpose to provide a machine in which by a continuous operation the fabric may be accurately subdivided in a lengthwise direction into proper widths for use in the manufacture of handkerchiefs, the machine being adjustable in its parts to receive fabrics varying in width and also to subdivide such fabrics into such predetermined widths as may be suitable for the purposes for which they are intended.

The invention and satisfactory means for carrying the same into effect will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a top view, partly broken away, of a machine constructed in accordance with and embodying the invention, the fabric being indicated by dotted lines. Fig. 2 is a side elevation, partly broken away, of same. Fig. 3 is an enlarged vertical section through a portion of the machine, taken at one side of the longitudinal center thereof. Fig. 4 is a detached perspective view of a portion of the machine and illustrates more particularly the knife by which the subdividing of the fabric is effected. Fig. 5 is a vertical longitudinal section through the machine on the dotted line 5 5 of Fig. 1. Fig. 6 is an enlarged vertical section through a portion of the machine on the dotted line 6 6 of Fig. 5, and Fig. 7 is an enlarged top view of that portion of the machine more especially illustrated in Fig. 6.

In the drawings, 10 designates an elongated table mounted upon suitable legs 11.

The fabric to be slitted lengthwise while traveling through the machine is designated by the numeral 12, and this fabric will be drawn from a reel or bolt which may be conveniently disposed below the table 10. The fabric to be treated is fed over the roller 13, mounted at the front end of the table 10, and the subdivided portions or widths of said fabric are at the rear end of the machine wound upon rolls 14, mounted upon transverse shafts 15, the latter being supported in suitable standards or brackets from the table 10. The roller 13 is simply a plain cylindrical roller supported at the front end of the table 10, and to the front of this roller 13 is secured a guard-rod 16, the latter being supported in the outer ends of the arms 17, secured to the sides of the table 10.

Upon the front portion of the table 10 are provided the pair of longitudinal guides 18, which serve to take the edges of the fabric 12 and guide said fabric into the machine. The guides 18 are secured upon the transverse followers 19, having dovetail edges and mounted within the transverse groove 20 between the metal edgings 21 21, which are beveled to correspond with the edges of the followers 18, so as to guide said followers and hold the guides 18 down upon the upper surface of the table 10. Each follower 19 at its outer end is formed with the plate 22, which laps over the upper surface of the metal edgings 21 and carries the set-screw 23, the purpose of the latter being to secure the follower in any predetermined position to which it may be moved. The guides 18 may when the set-screws 23 are loosened be moved laterally toward and from one another to suit the width of the fabric 12 to be fed to the machine, and

after the guides 18 have been moved to their proper position they may be there secured by tightening the set-screws 23. The turning inward of the set-screws 23 causes the lower ends of the said screws to press against the metal edgings 21 and the followers 19 to bind against the edgings 21, the turning inward and downward of the set-screws 23 tending to elevate the followers 19 from between said edgings. The fabric 12, passing between the guides 18, next travels below the pressure-roller 24, having at its ends the short shafts 25, mounted within followers 26, Fig. 6, disposed within the vertical cylindrical casings 27, containing the coiled springs 28, which exert a downward pressure against the followers 26 and short shafts 25, and thereby yieldingly press the roller 24 against the fabric 12 being fed inward over the table 10. The tension of the springs 28 within the casings 27 may be regulated at will by means of the followers 29, disposed within the upper end of said casings, and the set-screws 30, which engage threaded apertures in the upper ends of the casings 27 and are keyed to the followers 29. The turning of the screws 30 effects the movement of the followers 29 toward or from the springs 28, and hence it will be obvious that said springs 28 may be compressed as much or as little as may be required and in accordance with the pressure it is desired the roller 24 shall exert against the fabric 12.

It is necessary that the roller 24 may be conveniently raised from the table 10 in order to permit the first entrance of the fabric below said roller, and for this purpose we provide the sliding arms 31, whose rear ends are below the short shafts 25 for said roller 24 and whose front ends are pivotally secured to links 32, which extend downward at the opposite edges of the table 10 and are rigidly secured to the rock-shaft 33, the latter being mounted below the table 10 and provided with a hand-lever 34, by which at the proper time the operator may turn said rock-shaft. When the hand-lever 34 is pushed toward the roller 24, it will actuate the rock-shaft 33 and links 32 to drive the arms 31 to a further extent below the short shafts 25 for the roller 24, and since the upper surfaces of the arms 31 are inclined said arms when pushed below the short shafts 25 will operate as cams or wedges to elevate the roller 24 from contact with the surfaces of the table 10. After the fabric 12 has been suitably introduced below the roller 24 the hand-lever 34 may be moved toward the front for the purpose of withdrawing the elevated or inclined surfaces of the arms 31 from below the short shafts 25 of the roller 24, thereby permitting said roller 24 to descend into contact with the fabric then below it. The short shafts 25 are equipped with suitable pulley-wheels 35, by which in connection with the ordinary character of belts the roller 24 may be driven by power, if desired. The roller 24 is of considerable weight, and while the fabric is passing below said roller the latter will act upon the same to smooth and flatten it and prepare it for the action of the slitting-knife, it being desirable that all of the creases or other irregularities in the fabric shall be removed before the fabric is slitted lengthwise. The roller 24 not only smooths out the fabric, but also serves as a tension device, allowing the fabric to feed outward through the machine, but preventing an undue feed thereof, it being necessary that the fabric be under a tension in that part of its length between said roller 24 and the rollers 36 and 37, hereinafter referred to, so that the slitting-knife may have effective action. The invention is not, however, limited to the specific roller 24 for creating the tension in the fabric.

In the rear of the pressure-roller 24 (or to the right thereof looking at Figs. 1 and 5) are mounted the feeding-rollers 36 37, between which the slitted fabric passes to the rolls 14 14. The roller 36 is mounted in stationary brackets, and while capable of rotating is not capable of vertical movement. The roller 37 has the ends of its shaft 38 extended through slots in the cylindrical casings 39 and above the upper edges of the lever-arms 40. The ends of the shaft 38 of the roller 37 correspond exactly with the short shafts 25 of the roller 24, and the cylindrical casings 39 correspond exactly with the cylindrical casings 27 for the short shafts 25 of the roller 24, and hence the construction of the cylindrical casings 39 may be fully understood by reference to the casings 27 in Fig. 6. The cylindrical casings 39 will contain coiled springs corresponding with coiled springs 28 (shown in Fig. 6) for exerting a downward pressure against the shaft of the roller 37, and these springs may be adjusted as to their tension by means of the adjusting-screws 41. The lever-arms 40, disposed below the ends of the shaft of the roller 37, are for the purpose of conveniently effecting the raising and lowering of the roller 37 from and toward the roller 36, and the said lever-arms 40 are at their rear ends pivoted to the vertical standards 42, extending upward from the table 10, while the front ends of the said lever-arms 40 rest upon transversely-disposed sliding wedge-arms 43, said wedge-arms 43 being in the shape of bars and having at their adjoining ends the sleeves 44, encompassing the transverse bar 45, which is above the pressure-roller 24 and is secured at its ends to bracket-arms 46, extending inward toward one another from the cylindrical casings 27. The guide-bar 45 is a stationary bar, and the wedge-arms 43 are adapted to have a horizontal sliding motion for the purpose, as hereinafter explained, of effecting the raising and lowering of the lever-arms 40 and roller 37. The front ends of the lever-arms 40 extend over the wedge-arms 43 and above the ends of the bar 45, and the front ends of said lever-arms 40 are retained against lateral displacement by being confined between the upper ends of the cylin-

drical casings 27 and the vertical pins 47, secured to the bar 45. The wedge-bars 43 are provided in their upper edges with the recesses 48 to receive the lever-arms 49, which are parallel with one another and are pivoted at their rear ends to a stationary transverse bar 50, disposed above the roller 37, while at their front ends the said lever-arms 49 are pivotally connected with a handle-bar 51, by which the said arms 49 may be moved in a transverse direction for the purpose of actuating the wedge-arms 43 and causing said arms to either elevate or permit the lowering of the lever-arms 40 and upper roller 37. The wedge-arms 43 have inclined upper surfaces, which when moved in one direction below the lever-arms 40 will permit said arms to lower, and thus cause the roller 37 to lower upon the fabric 12 then between it and the roller 36, and when moved in the other direction will operate as wedges or cams to elevate the lever-arms 40 and with said arms the roller 37, the elevation of the roller 37 being to permit of the introduction between it and the roller 36 of the fabric 12, as well as to stop the feeding action of the machine when desired. In the drawings the upper roller 37 is shown as having been elevated from the roller 36, and the ends of the shaft 38 of said roller 37 are supported upon the lever-arms 40, whose front ends are at such time on the higher surfaces of the wedge-arms 43. In order to effect the lowering of the roller 37, it is simply necessary for the operator to push the handle-bar 51 toward the opposite side of the machine from which it is illustrated in Fig. 1, whereby the lever-arms 49, being in engagement with the wedge-arms 43, will move said wedge-arms below the front ends of the lever-arms 40 and permit the latter to ride down the inclined upper edges of said wedge-arms, this having the effect of permitting the lever-arms 40 and roller 37 to lower. The outer ends of the wedge-arms 43 rest upon short bracket-arms 52, Fig. 7, secured to the cylindrical casings 27, while at the other or adjoining ends the wedge-arms 43 are supported and guided by the stationary transverse bar 45.

The roller 36 is in rear of the pressure-roller 34, and intermediate the rollers 24 and 36 is provided the sheet-metal plate 53, over which the fabric 12 will travel and which is made concave, as shown in Fig. 3, so that during the travel of the fabric 12 the latter will not touch against the middle portions of said plate, but there will be formed between the lower surface of the fabric and the upper surface of the plate 53 an adequate space for permitting the successful operation of the knife 54 in slitting the fabric lengthwise. The fabric 12 will be under a tension intermediate the rollers 24 and 36 sufficient to keep the fabric taut and above the plate 53. The knife 54 is a longitudinal blade secured to a sleeve 55, mounted upon a transverse bar 56, extending across the machine and supported in the ends of the arms 57, fastened to the opposite sides of the machine. The sleeve 55 is adjustable upon the bar 56 and may be secured in any predetermined position by means of a set-screw 58. The knife 54 is secured within a slot in the lower end of the sleeve 55 by means of a set-screw 59. In the present instance we only illustrate one knife 54 for slitting the fabric 12; but it is to be understood that any desired number of knives 54 may be made use of at the same time in accordance with the number of widths into which it may be desired to slit the main width of fabric 12. The relation of the knife 54 to the fabric 12 during the operation of the machine is more clearly illustrated in Figs. 3 and 5, in which it will be seen that the lower edge of the knife 54 is at an angle to the plane of the fabric and that the fabric is carried against the knife 54, then held in stationary position, the lower end of the knife 54 being within the space intermediate the fabric 12 and plate 53 and the upper end of the knife 54 being above the fabric 12 and in advance of the point of severance.

The rollers 36 37 exert a pressure against the fabric 12 and feed said fabric against the knife 54, and said rollers 36 37 will preferably be operated by power applied to the lower roller 36 through the medium of the belt 60 and belt-wheel 61, Fig. 2. The motion of the lower roller 36 will be communicated to the upper roller 37 by means of the intermediate gear-wheels 62 63, these rollers 36 37 having a uniform motion. The shafts 15, receiving the rolls 14 for the several widths of fabric, will also be driven by power, and to this end we provide pulley-wheels 64 65 upon the ends of the said shafts to receive the usual belt 66. The belt 66 will preferably be equipped with a belt-tightener 67, the latter being under the pressure exerted by the weight 68, as shown in Fig. 2.

The shafts 15 are at one end mounted in the upper bifurcated ends of the standards 69, Fig. 1, and at their other end the said shafts 15 are mounted within the swiveled bearings 70, which are secured in position between the arms of the standards 71 by means of the horizontal pivot-screws 72, the latter permitting the tilting of the bearings 70 and shafts 15 from a horizontal position, the purpose of this part of the construction being to enable the operator to elevate the shafts 15 from the standards 69 when it is desired to slip the rolls 14, containing the fabric, off from said shafts. The rolls 14 are detachable from the shafts 15, and when they have been filled with the several widths of the fabric they will be slipped off from the shafts 15, and for this reason and in order to permit additional rolls 14 to be applied upon the shafts 15 the said shafts are pivotally mounted at one end in the swiveled bearings 70. The belt-tightener 67 acts to retain the belt 66 upon the wheels 64 65 during the tilting of the shafts 15 for the removal or re-

placement of the rolls 14. The rolls 14 should freely slip upon and off from the shafts 15; but when on the shafts 15 the said rolls must rotate therewith, and hence, as shown in Figs. 1 and 5, we provide sleeves 73 upon the shafts 15 and apply to the end of the rolls 14 a small pin 74, which will engage the upper surface of the plate 75, forming a part of said sleeves 73. The sleeves 73 may be adjusted to any position desired upon the shafts 15 and there secured by means of the thumb-screws 76. When the sleeves 73 are adjusted to their proper position upon the shafts 15, the rolls 14 will be moved up against them, with their pins 74 above the plates 75 of the said sleeves, the pins 74 and plates 75 serving simply as means for connecting the shafts 15 and rolls 14 together or compelling said rolls to rotate with said shafts, said shafts receiving their motion, as above described, from the belt 66 and then communicating their motion to the rolls 14, with the result that said rolls 14 will wind up the several widths of fabric fed rearward by the rollers 36 and 37.

The operation of the machine hereinbefore described has been pointed out in connection with the explanation of the structural features of the machine, and a further detailed description of the operation is therefore unnecessary. It may be briefly said, however, that the fabric 12 is fed over the front end of the machine, passing over the roller 13 and between the guides 18, whence passing below the pressure-roller 24 and upward and rearward between the rollers 36 37, whence the several widths of fabric are wound upon the rolls 14. During the travel of the fabric between the roller 24 and rollers 36 37 the knife 54 operates to slit the fabric longitudinally, said knife remaining stationary and the fabric being carried against its cutting edge. The knife 54 will be adjusted upon its supporting-bar 56 in accordance with the widths desired for the slitted portions of the main fabric. Handkerchiefs are made from blanks varying in width, say, from twelve inches to twenty-two inches, and hence in the slitting of the fabric 12 into widths suitable for handkerchiefs the knife 54 should be adjusted to obtain a width or widths of fabric ranging from twelve to twenty-two inches in extent. After the several widths of fabric have been formed by the machine made the subject hereof the said widths are subjected to the further operations necessary for the production therefrom of hemstitched handkerchiefs.

The machine illustrated has been designed more especially for use in the slitting of fabrics intended for employment in the manufacture of hemstitched handkerchiefs, and the said machine has in use proven to be entirely efficient and of great value. We do not limit the invention, however, solely for use in the manufacture of handkerchiefs, since the said machine may be employed with entire success in slitting fabrics for other arts. The machine as constructed and illustrated smooths out all the creases or wrinkles in the fabric, keeps the same under proper tension during the slitting operation, and effectually severs the fabric into the several widths on true lines parallel with the length of the fabric.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a machine for slitting a fabric into longitudinal widths, the supporting-table, the feed-rollers 36, 37, for drawing the fabric through the machine, and a tension device for engaging and acting on the entire width of fabric and maintaining a tension on that portion of the fabric between it, said tension device, and said rollers, a free space being provided beneath said portion of the fabric under tension, combined with the knife rigidly held in the path of said fabric intermediate said tension device and said rollers and adapted to engage and slit the fabric as the latter is moved onward against it; substantially as set forth.

2. In a machine for slitting a fabric into longitudinal widths, the supporting-table, the feed-rollers 36, 37, for drawing the fabric through the machine, and a tension device for acting upon the entire width of fabric and maintaining a tension on that portion of the fabric between it, said tension device, and said rollers, said fabric passing at an angle from said tension device to said rollers with a free space provided beneath the same, combined with a knife rigidly held in the path of said fabric and at an angle thereto intermediate said tension device and said rollers and adapted to engage and slit the fabric as the latter is moved onward against it; substantially as set forth.

3. In a machine for slitting a fabric into longitudinal widths, the supporting-table, the feed-rollers 36, 37, for drawing the fabric through the machine, and a tension device for engaging and acting on the entire width of fabric and maintaining a tension on that portion of the fabric between it, said tension device, and said rollers, a free space being provided beneath said portion of the fabric under tension, combined with the knife rigidly held in the path of said fabric intermediate said tension device and said rollers and adapted to engage and slit the fabric as the latter is moved onward against it, the transverse bar 56 from which said knife is supported, and means for securing said knife in predetermined positions along said bar in accordance with the widths of fabric to be formed; substantially as set forth.

4. In a machine for slitting a fabric into longitudinal widths, the supporting-table, the feed-rollers 36, 37, for drawing the fabric through the machine, and a tension device for engaging and acting on the entire width of fabric and maintaining a tension on that portion of the fabric between it, said tension de-

vice, and said rollers, a free space being provided beneath said portion of the fabric under tension, combined with the knife rigidly held in the path of said fabric intermediate said tension device and said rollers and adapted to engage and slit the fabric as the latter is moved onward against it, the roll to receive and wind up the severed width of fabric, the shaft upon which said roll is detachably mounted, means for rotating said shaft and roll, the swiveled bearing in which one end of said shaft is mounted, and a bearing for detachably holding the other end of said shaft; substantially as set forth.

5. In a machine for slitting a fabric into longitudinal widths, the tension device for acting on the fabric while the latter is fed through the machine, and the feed-rollers 36, 37, to which the fabric passes after leaving the said tension device, combined with the knife adapted to engage and slit the traveling fabric into widths, and the means for raising and permitting the lowering of said roller 37, said means comprising the wedge-bars adapted to engage the shaft portions of the said roller, and the lever mechanism for operating said wedge-bars; substantially as set forth.

6. In a machine for slitting a fabric into longitudinal widths, the tension device for acting on the fabric while the latter is fed through the machine, and the feed-rollers 36, 37, to which the fabric passes after leaving the said tension device, combined with the knife adapted to engage and slit the traveling fabric into widths, and the means for elevating and permitting the lowering of said roller 37, said means comprising the lever-arms disposed below the ends of the shaft for said roller 37, the wedge-bars below and adapted to engage said lever-arms, and the pivoted and laterally-movable frame for engaging and operating said wedge-arms; substantially as set forth.

Signed at New York, in the county and State of New York, this 27th day of June, 1901.

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