

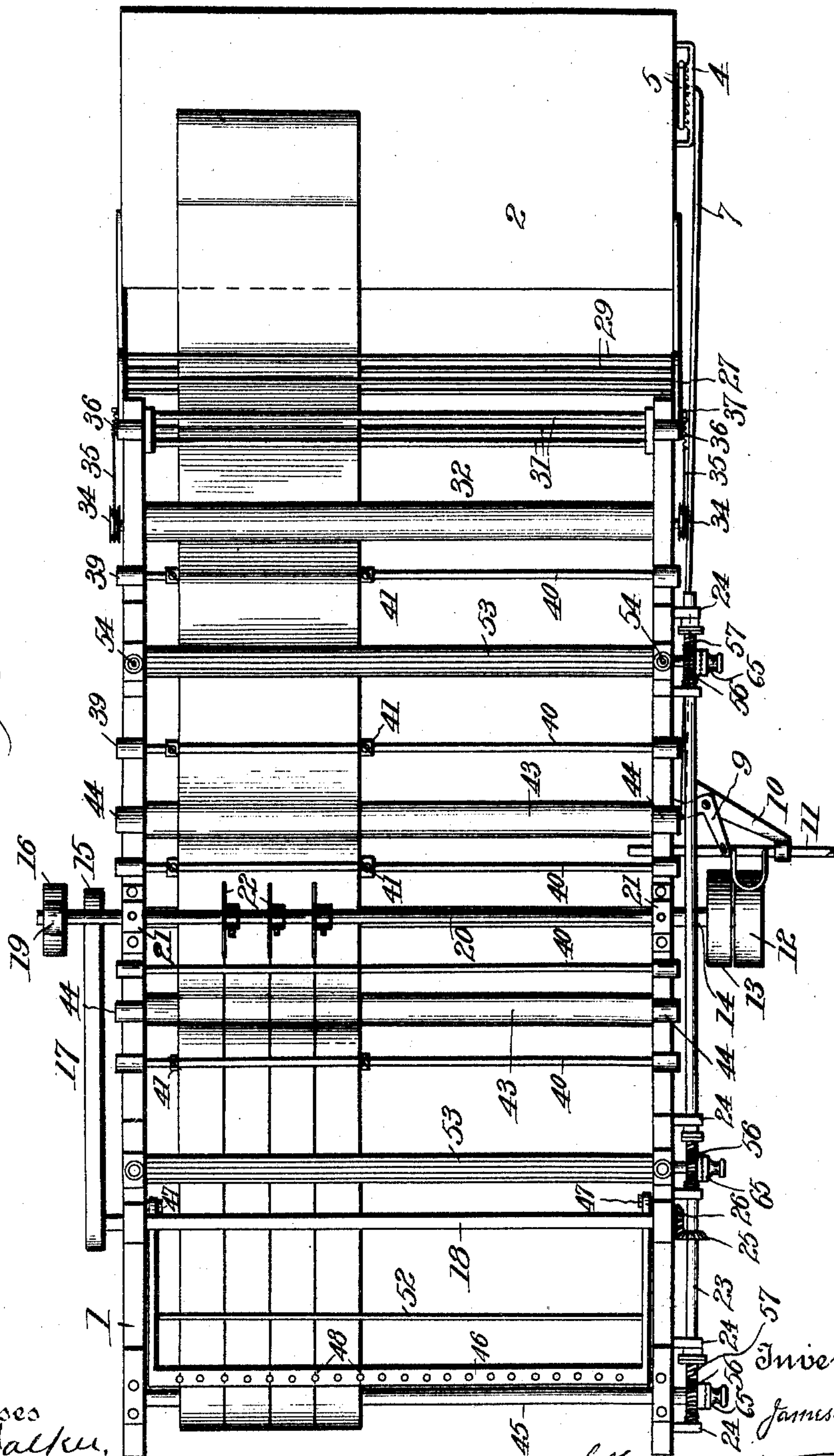
J. H. VINCENT.

MACHINE FOR CUTTING WOVEN OR KNITTED FABRICS.

APPLICATION FILED DEC. 14, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



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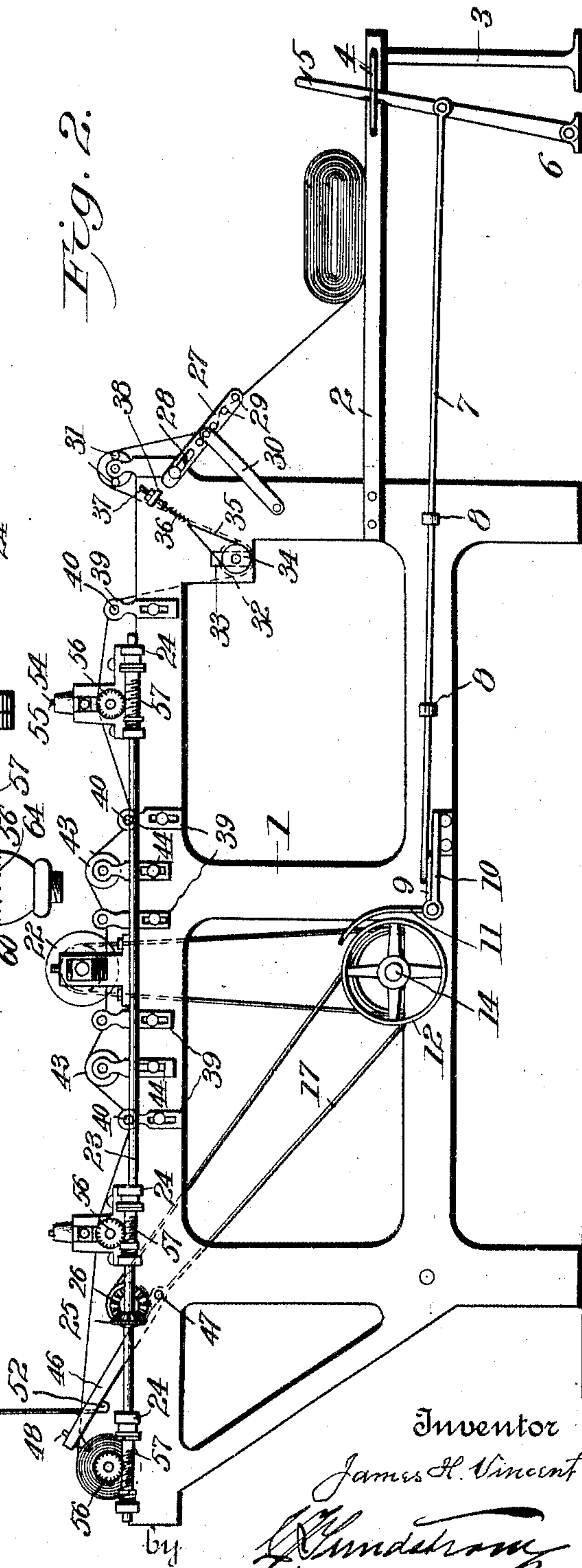
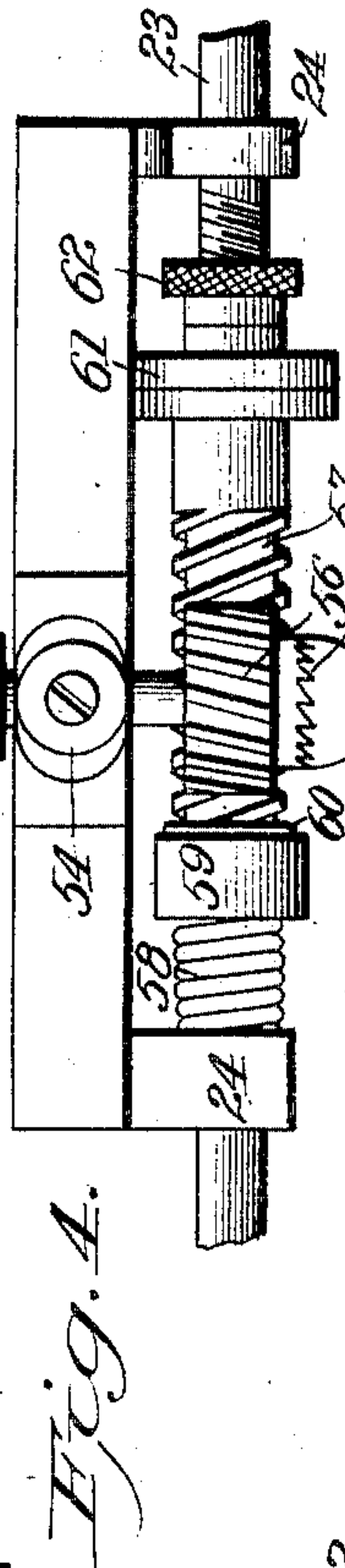
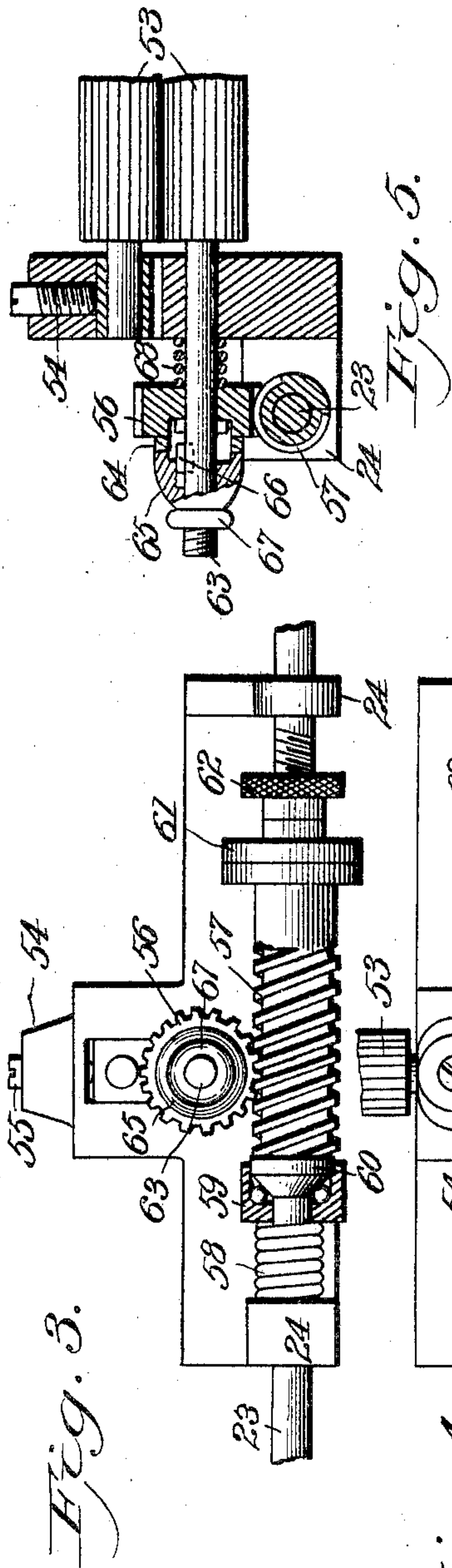
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR CUTTING WOVEN OR KNITTED FABRICS.

SPECIFICATION forming part of Letters Patent No. 784,086, dated March 7, 1905.

Application filed December 14, 1904. Serial No. 236,807.

*To all whom it may concern:*

Be it known that I, JAMES H. VINCENT, a citizen of the United States, residing at Littlefalls, in the county of Herkimer and State of New York, have invented a new and useful Improvement in Machines for Cutting Woven or Knitted Fabrics, of which the following is a specification.

This invention relates to a machine for cutting woven or knitted fabric.

One of the objects of the present invention is to provide a machine which will feed the material uniformly and maintain an even tension thereon. This is particularly desirable where the material is of a knitted and consequent elastic character, inasmuch as any undue stretching of the fabric will result in a discrepancy of the width of the strips, and in the present device the material is not only maintained at a uniform tension while being fed through the machine, but is prevented from being subjected to undue tensile strain, which would reduce the width of the cut strips.

A further object resides in means whereby the cut strips are wound upon an arbor and held in separated relation, so that the cut edges of one strip will not overlap the cut edges of an adjacent strip.

A still further object is to provide a variable rotary motion for the take-up arbor and for the guiding-rollers of the fabric, whereby the material will move through the machine at a uniform rate of speed.

For a full understanding of the construction, merits, and advantages of my invention reference is to be had to the following description and the accompanying drawings, in which—

Figure 1 is a plan view of the machine embodying all the features of the present invention and showing a bolt of fabric therein. Fig. 2 is a side elevation of Fig. 1. Fig. 3 is a front elevation of the friction worm-gear associated with the driving-shaft and the take-up and feed rollers. Fig. 4 is a plan view of Fig. 3, and Fig. 5 is a transverse section through the friction worm-gearing and the journals of the feed-rollers.

Making renewed reference to the drawings, wherein similar characters of notation indi-

cate corresponding parts appearing in the several illustrations, 1 designates the frame of the machine, which is provided at its front end with a shelf or platform 2, on which a bolt of the material to be cut is placed. This shelf is supported at its outer end by suitable legs 3, and on one side thereof is a notched keeper 4, in which the shipping-lever 5, pivoted to the floor at 6, is held. Secured to the shipping-lever is a push-rod 7, that passes through guides 8 on the frame and has at its rear end a pivotal connection with a bell-crank lever 9, which is in turn pivoted on a bracket 10, extending from the side of the frame. The other arm of the bell-crank lever is connected to a belt-shifter 11, that slides transversely of the machine to shift the belt from the fast pulley 12 to the loose pulley 13 on the driving-shaft 14. This driving-shaft is journaled near the bottom of the frame and extends across the same and has on its opposite end two pulleys 15 and 16, the former of which is connected by a belt 17 to a pulley on the counter-shaft 18, which extends transversely across the machine at the top of the frame. The other pulley, 16, is connected by a belt to a pulley 19 on the cutter-shaft 20, which is journaled in adjustable bearings 21 at the top of the frame and on which are mounted adjustable cutters 22, which are preferably of disk shape and have collars provided with set-screws to secure them upon the shaft 20.

Extending longitudinally of the frame and upon one side thereof is a shaft 23, which is provided with bearings at suitable points, as at 24, and on which is fixed a bevel-gear 25, that meshes with a bevel-gear 26 on the end of the counter-shaft 18, whereby the shaft 23 is continuously driven through the counter-shaft 18 by the driving-shaft 14. This shaft 23 is geared to each feed-roller and to the take-up arbor, and therefore constitutes a common driving-shaft for said arbor and rollers, as will be explained farther on.

In order to maintain a uniform tension on the fabric and at the same time prevent undue stretching thereof, a plurality of feed-rollers, guide-rollers, and guide-rods are arranged at suitable points in the path of the fabric. At the front of the machine is se-



cured a frame 27, preferably supported at an incline and capable of being adjusted in and out by means of a bolt-and-slot connection 28. This frame has a plurality of transverse bars 5 29, between which the fabric is guided preliminary to being fed into the machine to remove all wrinkles or undulations therefrom. This frame is supported at each end by a bar 30. On the front end of the machine is mounted a similar set of evening-bars 31, through 10 which the fabric is twisted in and out or under and over alternately, as shown in Fig. 1. From these evening-bars the fabric extends down and around a tension-roller 32, which is 15 journaled in bearings 33. On each end of this tension-roll is a pulley-wheel 34, on which is a brake-strap 35, that connects with one end of a coil-spring 36, the other end of the spring being attached to a threaded bolt 37, let into 20 a lug 38 on the side of the frame. By screwing a nut on the bolt and against the lug the tension on the spring and pressure of the brake-strap upon the pulley may be regulated, and thus the roller 32 is restrained against 25 free rotation in its bearings, preventing the fabric from sagging and maintaining it in frictional contact with the periphery of the roll to create a tension thereon. This tension-roller 32 is preferably journaled below the top 30 of the frame and the fabric passed around and under the same. At the top of the frame and upon each side thereof are a plurality of vertically-adjustable brackets 39, in which are mounted guide-rods 40. On these guide-rods 35 are adjustable spacing guide-blocks 41, which engage the edges of the fabric to hold it against lateral or edgewise movement, as shown in Fig. 1. These rods 40 are preferably non-rotatable, and the fabric is disposed alternately 40 above and below the same, so as to drag therearound, there preferably being a rod upon each side of the cutters and arranged so as to hold the fabric in a true horizontal position where the cut is made, as shown in Fig. 2, 45 the fabric preferably passing beneath the rods opposite the cutters and the cutters preferably rotating in a direction to make an upward cut, so that the tendency of the cutters to force the fabric up will be overcome by 50 these guide-rods 40 upon each side of the cutter-shaft. In front and behind the cutters and beyond the guide-rods last mentioned are journaled two rollers 43, over which the fabric passes as it is fed to and from the cutters, 55 these rollers being mounted in vertically-adjustable bearings 44 at each side of the frame.

45 designates the take-up arbor, which is preferably detachably mounted in its bearings at the rear end of the frame, so as to permit the cut strips to be slid off the same. 60

In order to prevent the cut edges of the strips from overlapping as they are wound upon the take-up arbor, a frame 46, pivoted in the main frame at 47, is provided with a 65 plurality of pins 48, which have knife-edges

that project between the cut edges of the strips, and in order to prevent this frame from bearing too hard upon the roll and retarding the rotation thereof it is counterbalanced by weights 49, attached to a flexible connection 50, which is supported upon a pulley 51, with one end attached to a cross-rod 52 of the frame 46. Upon each side of the cutter-shaft, near each end of the frame, are journaled a pair of feed-rollers 53, the periph- 75 eries of which are fluted. Each pair of fluted rollers is arranged in vertical alinement, and the bearing of the upper roll of each pair may be adjusted vertically by means of a nut 54, that screws upon a threaded shank 55 of the bearing, and thus the rollers may be brought into and out of contact with each other; but during the operation of the machine it is preferable to have the fluted peripheries interlock and the fabric pass therebetween, so 85 as to insure against any possible pull or stretch of the latter as it is fed to and delivered from the cutters. On the arbor of the lower roll of each pair of rollers is a worm-gear 56, that meshes with a frictional worm 90 57, mounted on the common driving-shaft 23, that extends longitudinally of the frame on one side thereof. The end of the take-up arbor is also provided with a similar worm-gear 56, which meshes with a similar worm 95 57, upon the end of the drive-shaft 23. This friction worm-gear for the feed-rollers and the take-up arbor is illustrated in detail in Figs. 3, 4, and 5, in which the shaft 23 is provided with a coil-spring 58, confined between 100 the bearing-blocks 24 and a ball-bearing cup 59, that fits over the ball-bearing cone 60 on the worm-sleeve 57. The worm-sleeve 57 is loose upon the shaft 23, but is held from free rotation thereon by means of a friction-disk 61, which is 105 screwed on the shaft 23 and bears against the end of the worm-sleeve, there being a jam-nut 62 to hold it in frictional engagement with the end of the sleeve. The worm-gear 56 is loosely mounted on the arbor 63 of the 110 lower feed-roll and has on its outer face a ratchet 64, with which a ratchet-nut 65 engages. The ratchet-nut 65 is normally keyed to the arbor of the feed-roll by means of a feather 66, and therefore rotates with the said 115 arbor, which is threaded at its outer end to receive a jam-nut 67. A coil-spring 68, located between the main frame 1 and the worm-gear 56, holds the latter in engagement with the ratchet-nut 65, and thus when the worm-sleeve 57 is rotated it will in turn rotate the 120 worm-gear 56, and through the medium of the ratchet-nut 65, which is locked to the gear, the lower fluted feed-roll will be also rotated to feed the material through the machine. 125

The operation may be stated as follows: The belt on the pulley 12 of the power-shaft 14 drives said shaft, which in turn drives the cutter-shaft 20 and the counter-shaft 18 130



through the belt connections 17 and 16, as before stated. The shaft 23 is continuously driven from the counter-shaft 18 through the bevel-gearing 25 and 26, and through the medium of the worm-gearing the fluted feed-rollers 53 53 and the take-up arbor 45 are rotated to feed the material through the machine to wind the cut strips upon the take-up arbor. In adjusting the material around the several rollers and guide-bars it may be necessary to prevent the feed-rollers and the take-up arbor from being rotated, and this may be accomplished by loosening the jam-nut 67 on the end of the arbor 63 and unclutching the clutch-nut 65 from the loose worm-gear 56, which will then freely rotate upon the arbor of the feed-rolls without imparting motion to the latter or to the take-up arbor. After the material has been adjusted in the machine and the proper cut determined by the adjustment of the cutter the clutch-nut 65 may then be engaged with the ratchet-face of the worm-gears and the material will be fed and wound upon the take-up arbor. As the feed of the material must be uniform, so as to prevent the fabric from stretching or sagging and prevent the take-up roll from stretching the material as it increases in diameter, the friction worm-gearing on the shaft 23 is so adjusted as to permit the worm-sleeve to slide loosely around the shaft 23 and impart a variable rotation to the take-up arbor as the roller thereon increases in diameter. The same action will take place with respect to the feed-rollers if the shaft 23 be rotated faster than the material is wound upon the take-up roll, and thus a uniform tension is maintained on the fabric. The fluted surfaces of the feed-rolls also act to positively feed the material through the machine and prevent the latter slipping around the feed-rollers.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine of the class described, a rotating cutter-shaft provided with a plurality of rotary cutters, a plurality of guide-rods arranged in the path of the material, adjustable guide-blocks upon the guide-rods, guide-rollers upon each side of the cutter-shaft, a tension-roller journaled near the front end of the machine and provided with a brake, a pair of fluted feed-rollers journaled near each end of the machine upon opposite sides of the cutters, a take-up arbor journaled in the rear end of the machine, a continuously-rotated shaft journaled at one side of the machine, and friction worm-gearing connecting the said shaft

with the feed-rollers and with the take-up arbor, substantially as specified. 60

2. In a machine of the class described, a frame having a plurality of guide-rollers mounted therein, a cutter-shaft having a plurality of adjustable cutters thereon, a pair of fluted feed-rollers journaled upon each side of the cutter-shaft, a take-up arbor journaled near the rear end of the machine, a common driving-shaft for the feed-rollers and take-up arbor, and means associated with the common driving-shaft and the feed-rollers and take-up arbor for imparting a variable speed to the latter. 65

3. In a machine of the class described, the combination with a frame having a cutter-shaft provided with a plurality of rotary cutters, and a plurality of guide-rods mounted in the frame in the path of the fabric, of a pair of feed-rollers mounted in the front and in the rear of the cutters, a take-up arbor journaled in the frame, a common driving-shaft 23 journaled at one side of the machine and having worm-sleeves frictionally mounted thereon, a worm-gear loose upon the arbor of the feed-rollers and upon the take-up arbor, and a clutch upon said arbors to clutch the worm-wheel to its arbor, substantially as specified. 75 80 85

4. In a machine of the class described, a frame having a plurality of guide-rods and guide-rollers mounted therein in the path of the fabric and around which the fabric is passed, a take-up arbor journaled in the end of the machine, a cutter-shaft having a plurality of rotary cutters thereon, a pair of feed-rollers journaled upon each side of the cutter-shaft, a tension-roller journaled near the front of the machine and provided with a friction-brake, a continuously-driven shaft, means for imparting a variable speed to the feed-rollers and the take-up arbor, comprising a worm-sleeve loosely mounted on the continuously-driven shaft, a friction-disk upon the shaft in engagement with one end of the worm-sleeve, a spring on the shaft to hold the worm-sleeve in frictional engagement with the friction-disk, a worm-wheel loosely mounted upon the arbors of the feed-rollers and the take-up arbor, a clutch-nut on said arbors in engagement with the worm-wheel, and a spring to hold the worm-wheel in engagement with the clutch-nut, substantially as specified. 90 95 100 105 110

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