F. CHATFIELD.

MACHINE FOR SLITTING KNIT FABRIC.

APPLICATION FILED JAN. 18, 1916.

1,298,005.

Patented Mar. 25, 1919.

3 SHEETS—SHEET 1.

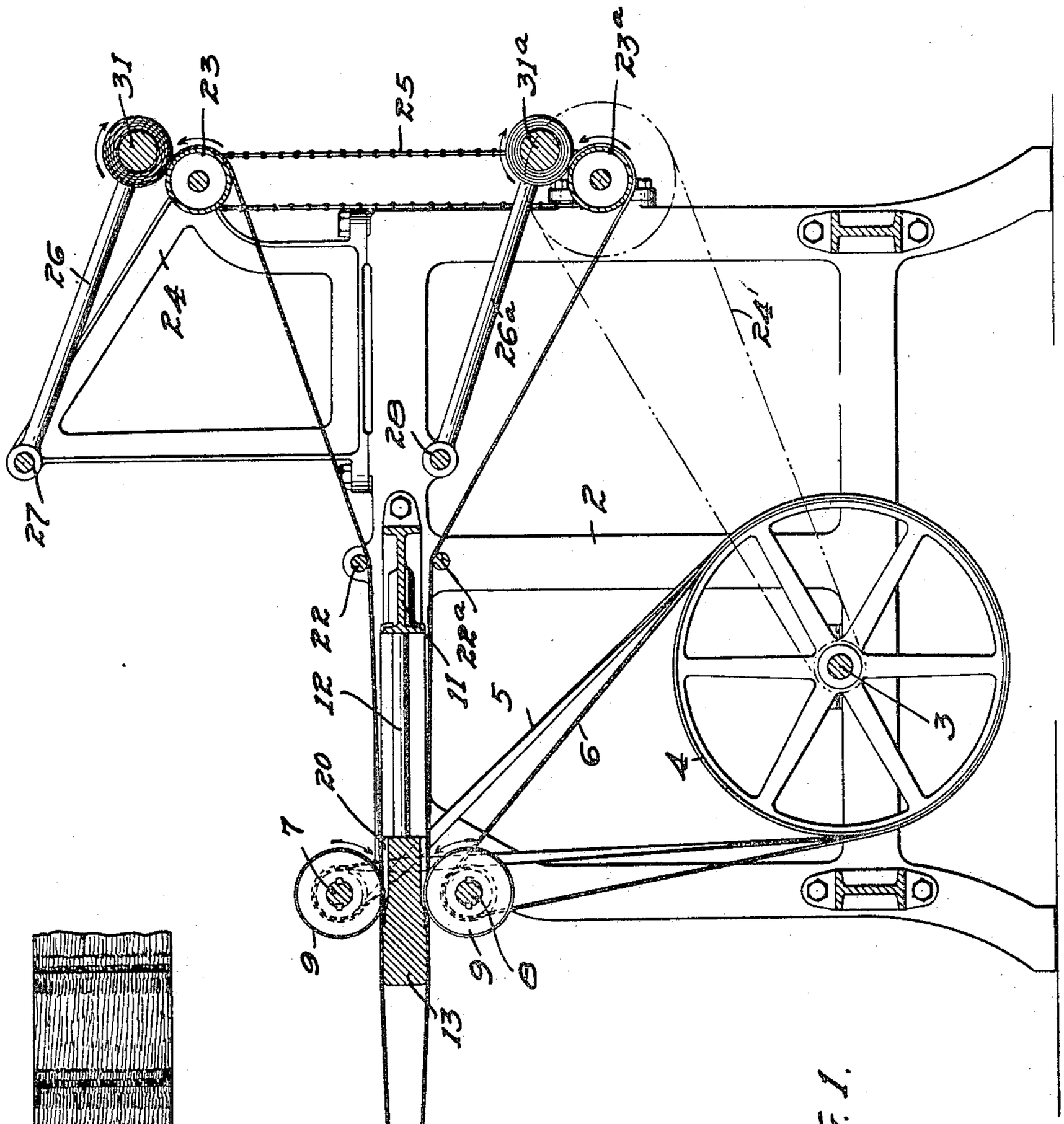

FIG. 1.

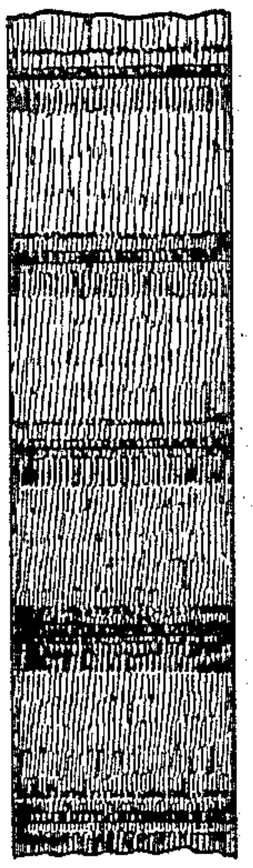

FIG. 8.

WITNESSES

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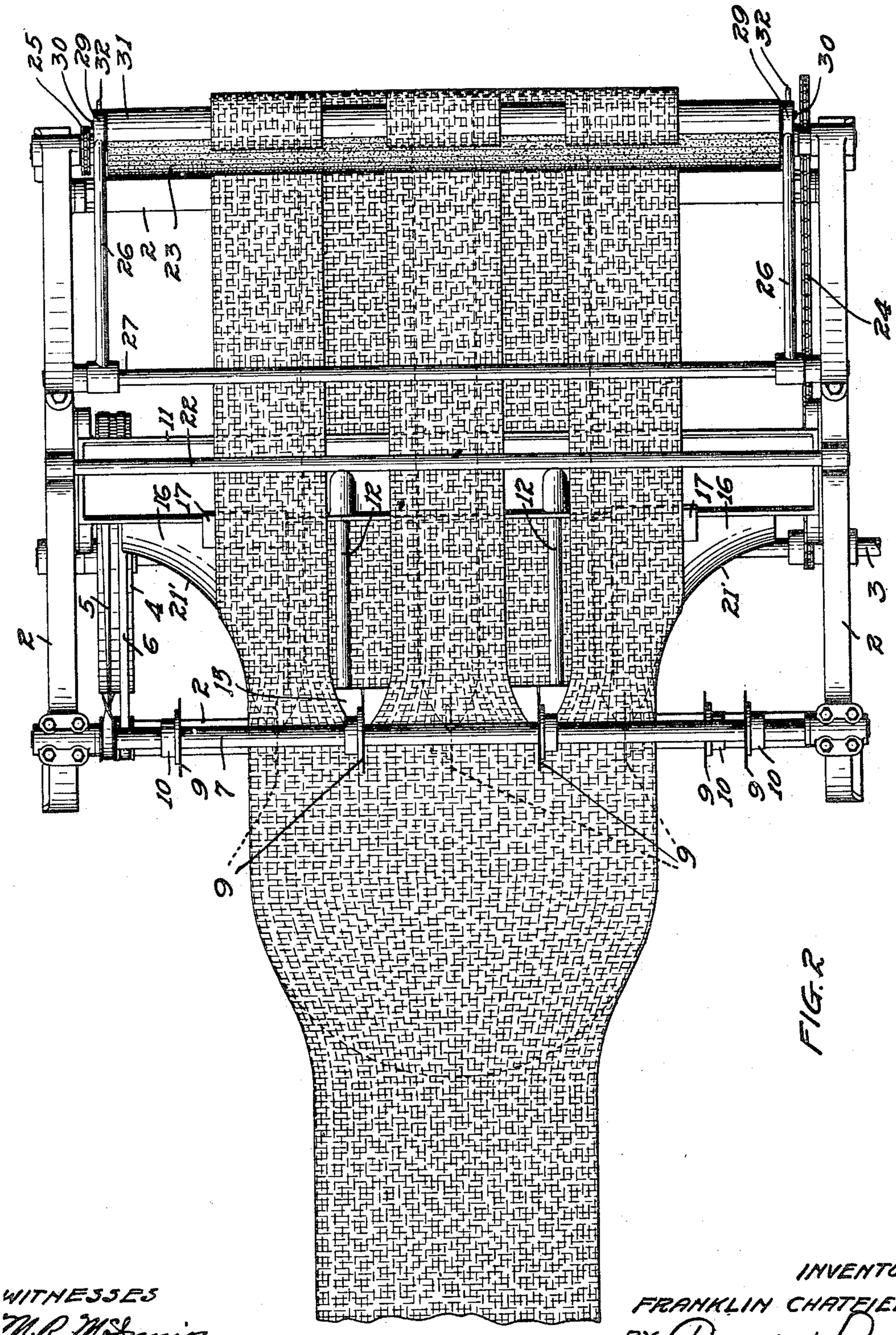

FIG. 2

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3 SHEETS—SHEET 3.

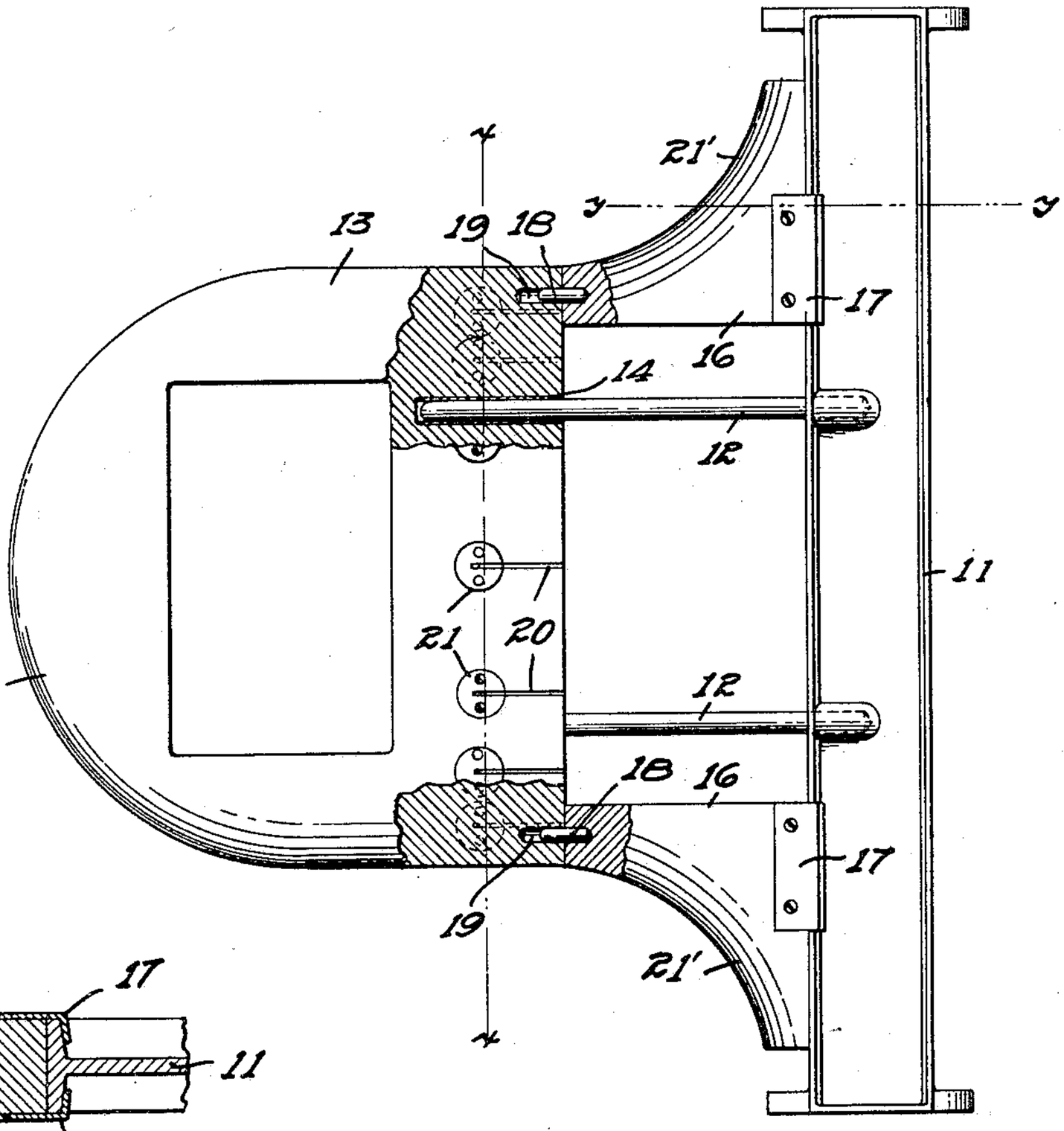

FIG. 3.

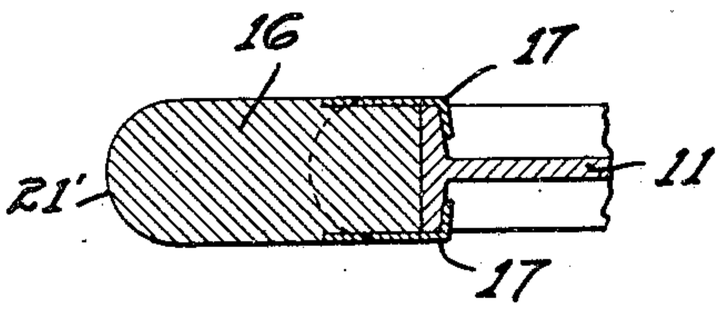

FIG. 5.

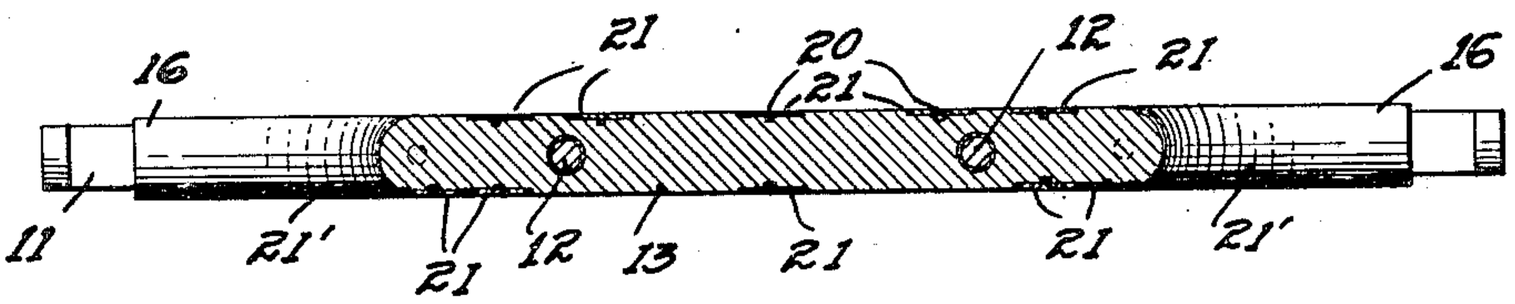

FIG. 4.

FIG. 6.

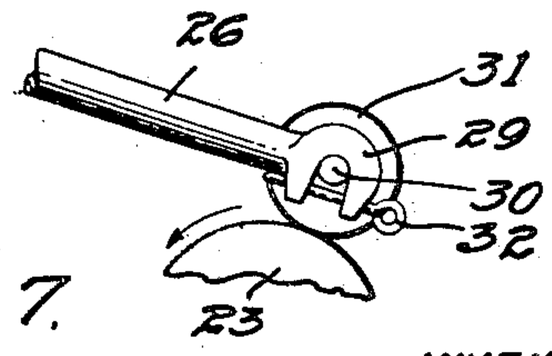

FIG. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

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MACHINE FOR SLITTING KNIT FABRIC.

1,298,005. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed January 18, 1916. Serial No. 72,733.

To all whom it may concern:

Be it known that I, FRANKLIN CHATFIELD, citizen of the United States, resident of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Machines for Slitting Knit Fabric, of which the following is a specification.

The object of my invention is to provide a machine in which a knit fabric tube can be rapidly and accurately slit into a plurality of flat bands from which the cuffs of an undergarment may be made.

A further object is to provide a machine that is adapted for slitting tubes of varying size.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification,

Figure 1 is a vertical sectional view through a fabric tube slitting machine, embodying my invention,

Fig. 2 is a plan view of the machine,

Fig. 3 is a plan view, partially in section, showing the form over which the fabric is drawn preliminary to the slitting operation,

Fig. 4 is a sectional view on the line *x*—*x* of Fig. 3,

Fig. 5 is a sectional view on the line *y*—*y* of Fig. 3,

Fig. 6 is a detail sectional view, showing the working position of the slitting knives, in the surface of the tube stretcher,

Fig. 7 is a detail view, showing the manner of mounting the rolls on which the fabric bands are wrapped,

Fig. 8 is a detail view, showing the fabric on which the machine works.

In the drawing, 2 represents the frame of the machine, in which the slitting mechanism is mounted. 3 is a drive shaft, operated from a suitable source of power (not shown). 4 is a wide faced pulley, mounted on this shaft and provided with narrow belts 5 and 6 for operating shafts 7 and 8 mounted one above another in the frame 2. The upper belt 5 is twisted to operate the upper shaft in the opposite direction from the lower one. Upon these shafts a series of knife disks 9 are mounted, upon suitable hubs 10 which are adjustable back and forth on the shafts toward and from one another to increase or decrease the distance between the knives, and vary the width of the knit bands which are slit out of the tubular fabric.

A bar 11 is mounted transversely in the frame of the machine and is provided with forwardly projecting rods 12 arranged parallel with one another. A stretcher block 13 is provided, having sockets 14 to receive the ends of the rods 12 and a curved or rounded forward end 15 which is inserted into the fabric tube. This stretcher is made preferably of wood, having a polished surface, the upper and under surfaces being substantially parallel with one another and merging into the rounded outer end of the stretcher to present a smooth surface for the passage of the fabric tube thereover. This stretcher is readily removable from the rods 12 for the purpose of substituting another of different width to adapt the machine for tubes of varying sizes

In the rear of the stretcher I prefer to provide brackets 16 having plates 17 mounted thereon which are slidable back and forth on the bar 11 and dowel pins 18 are mounted in these brackets to enter sockets 19 in the stretcher and aid in holding it in its proper position with respect to the slitting saws. The saws are so mounted that the inner end of the stretcher will be inserted between them, as indicated in Fig. 1, and the upper and under surfaces of the stretcher are provided with slits 20 therein to receive the cutting edges of the saws, and plates 21 are mounted in the surface of the stretcher at the inner ends of the slits. These saw slits are arranged in staggered relation to one another, as indicated in Fig. 4, there being a group in the upper surface of the stretcher and a group in the under surface, slits being provided in the under surface near the outer edges of the stretcher. Each bracket 16 has a curved surface 21′ forming a flaring guide for the fabric band as it is slit from each side of the tube. The slitting operation is performed as follows: The two upper slitting knives cut a band out of the center of the fabric as it passes over the top of the stretcher and coöperate with the two lower outer knives of the under side of the stretcher to cut the outer bands, that portion of the tube which passes around the

curved edge of the stretcher being turned outwardly and laid flat by contact with the curved edges of the bracket 16, so that when the outer edges of the bands have passed over these brackets they will lie perfectly flat and the bands will be substantially the width of the band in the middle, as indicated in Fig. 2. The middle lower knife enters the slit in the center of the stretcher on the underside and divides the tube centrally, coöperating with the corresponding knife on the top of the stretcher.

As indicated in Fig. 3, the groups of saw slits in the top and bottom thereof are differently spaced apart, so that the stretcher can be used with varying adjustments of the cutters for slitting bands of different width. The distance between these saw slits may be marked or indicated on the stretcher so that the operator of the machine in moving the cutters back and forth on the supporting shafts to adapt them for varying widths of the bands can easily and quickly determine the proper position of the cutters for slitting the tube to form bands of the desired width.

The upper bands, after leaving the slitting knives, pass under a rod 22 in the upper part of the frame and from thence to a roller 23 having bearings in brackets 24 mounted on said frame. A similar roller 23^a is mounted in bearings on the frame 2 beneath the roller 23 and is driven by a belt 24′ from the shaft 3 and a belt 25 connects the roller 23^a with the roller 23 for driving them simultaneously and at the same speed. The lower bands of fabric pass over a rod 22^a in the machine frame and from thence to the roller 23^a. Yokes 26 and 26^a are pivoted respectively at 27 in the bracket 24 and at 28 in the frame 2 and overhang the rollers 23 and 23^a and are provided with forks 29 to receive bearing gudgeons 30 provided in the ends of rollers 31 and 31^a, preferably of wood, around which the bands of fabric are wrapped through the movement of the driven rollers 23 and 23^a. The gudgeons 30 are locked in the forks 29 by means of pins 32 which, when removed, allow the roller with the fabric bands wrapped thereon to be taken out of the machine and the bands removed.

I claim as my invention:

1. The combination, with the upper and lower slitting knives, of a fabric stretcher fitting between said knives, the upper and under surfaces of said stretcher having slits therein, those in the upper surface being in staggered relation to those in the under surface, and said slits being positioned to receive said knives, some of the slits in one surface being near the edges of the stretcher and the corresponding slits in the other surface being spaced from said edges, and means for guiding those portions of the fabric which pass around the edges of the stretcher to a flattened form after leaving the slitting knives.

2. The combination, with the upper and lower fabric slitting knives, of a fabric stretcher mounted between said knives and having a rounded outer end to enter a fabric tube, and means at the inner end of said stretcher and provided with a curved surface forming a flaring continuation of the edges of said stretcher, for the purpose specified.

3. The combination, with the upper and lower fabric slitting knives, of a fabric stretcher mounted between them and adapted to enter and stretch a fabric tube, and brackets provided in the rear of said stretcher and forming a flaring continuation of the edges of said stretcher.

4. The combination, with the upper and lower groups of revolving slitting knives, of a fabric stretcher inserted between them and having slits therein to receive the edges of the knives, the fabric being divided into flat bands by said knives as the tube is drawn between them, and rolls whereon said bands are wound, the revolution of the rolls drawing the tube between the knives.

5. The combination, with the upper and lower groups of slitting knives, the knives of each group being mounted for adjustment toward or from one another, of a stretcher mounted between said knives, said stretcher having slits formed therein at intervals to receive said knives, the distance between said slits determining the width of the bands cut from the fabric tube.

6. The combination, with the upper and lower fabric revolving slitting knives, of a fabric stretcher mounted between the upper and lower knives and having a rounded outer end to insert into a fabric tube and comparatively flat upper and lower surfaces on which the fabric lies, the edges of said stretcher being rounded and substantially parallel with one another.

7. The combination, with the upper and lower groups of slitting knives, of a fabric stretcher inserted between them and having longitudinal slits therein to receive the edges of the knives, the fabric being divided into a series of flat bands by said knives as the tube is drawn between them and on the upper and under surfaces of said stretcher.

8. The combination, with the upper and lower groups of slitting knives and the shafts whereon said knives are mounted to revolve and for adjustment lengthwise of said shafts, of a fabric stretcher comprising a plate having a rounded outer end to receive the fabric tube and fitting between said upper and lower groups of knives, the surfaces of said stretcher having longitudinal slits therein to receive said knives.

9. The combination, with the upper and lower groups of slitting knives, of a stretcher

mounted between said knives and having longitudinal slits formed in its upper and under surfaces, said slits being irregularly arranged in the surfaces of said stretcher, and said slitting knives being mounted for transverse adjustment to adapt them for the varying positions of said slits.

10. The combination, with the upper and lower slitting knives, of a fabric stretcher fitting between said knives, the upper and under surfaces of said stretcher having slits therein, those in the upper surface being in staggered relation to those in the under surface and said slits being positioned to receive said knives, some of the slits in one surface being near the edges of the stretcher and the corresponding slits in the other surface being spaced from said edges.

11. The combination, with the upper and lower groups of slitting knives, of a fabric stretcher inserted between them and having slits therein to receive the edges of said knives, the outer end of said stretcher being rounded and said stretcher gradually increasing in depth from its outer toward its inner end.

In witness whereof, I have hereunto set my hand this 14th day of January, 1916.

FRANKLIN CHATFIELD.