J. R. GAMMETER.

SLAB FORMING ATTACHMENT FOR CALENDERS.

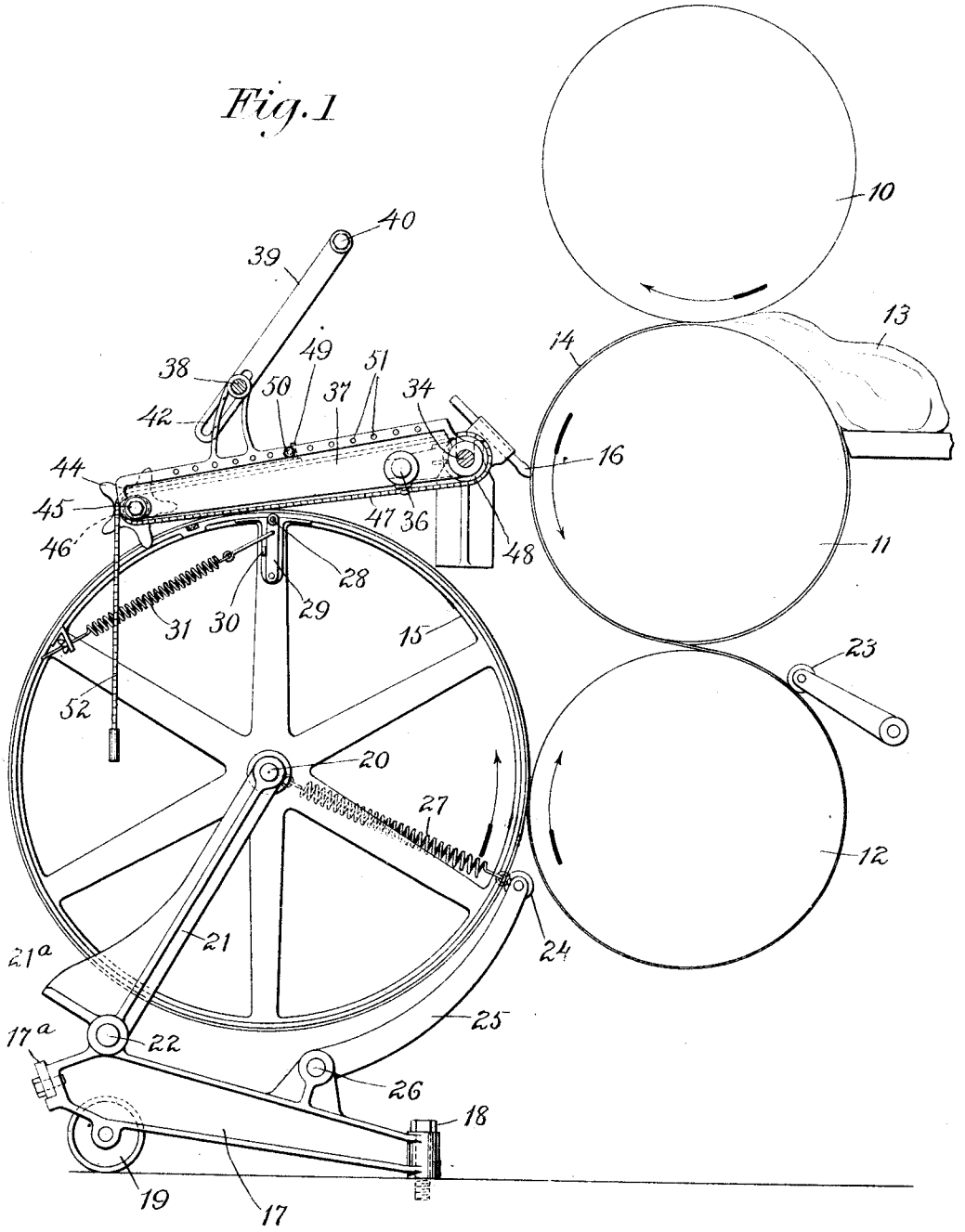
APPLICATION FILED AUG. 8, 1913.

1,089,467.

Patented Mar. 10, 1914.

4 SHEETS—SHEET 1.

Fig. 1



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H. C. Parton

Inventor

John R. Gammeter

By his Attorney

Robert M. Pierson

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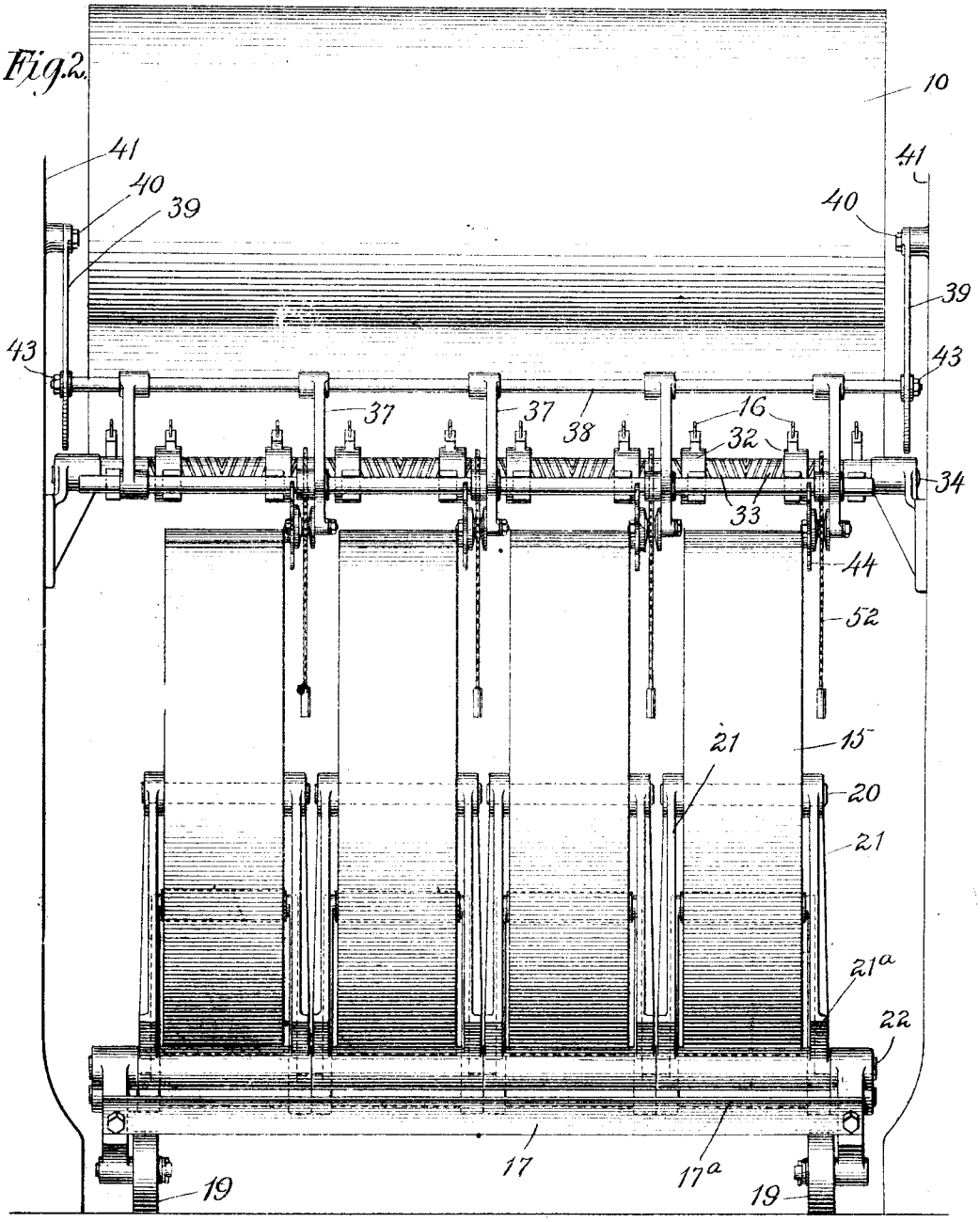
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

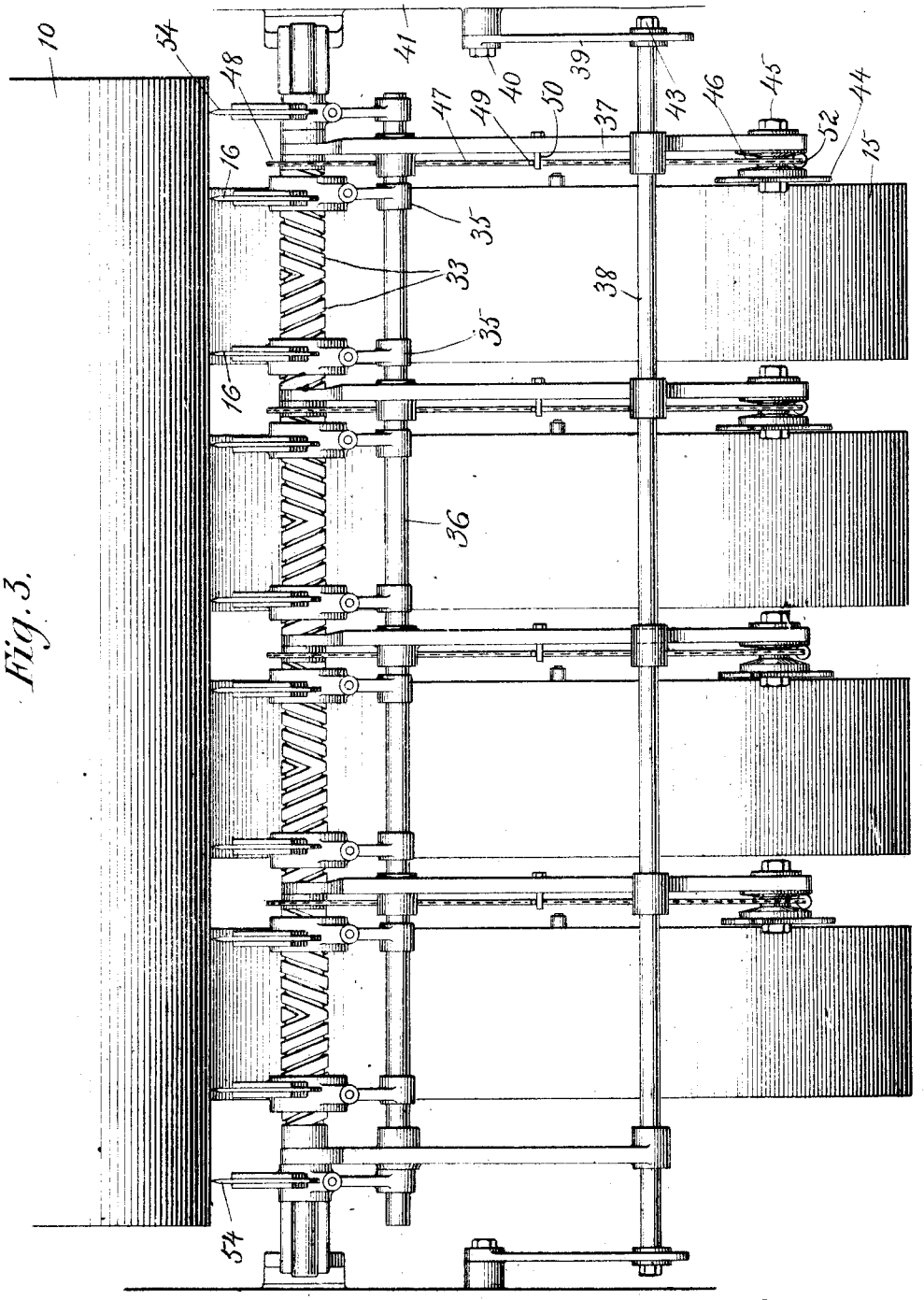


Fig. 3.

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4 SHEETS—SHEET 4

Fig. 4.

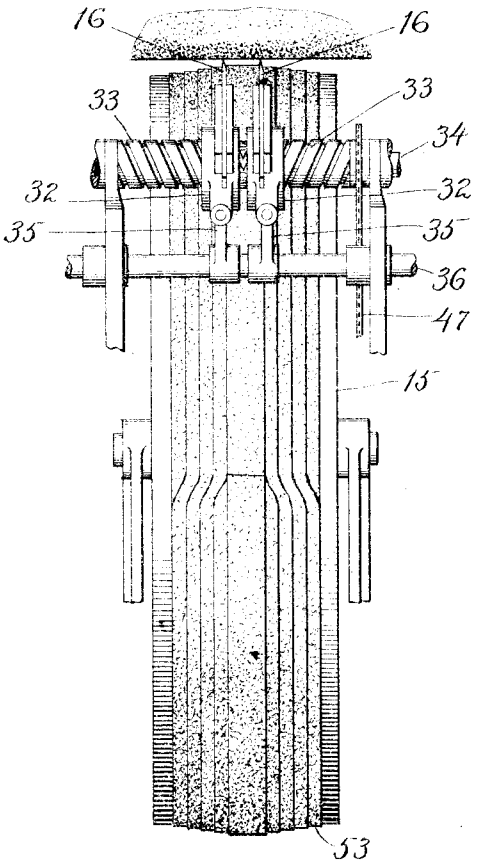


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SLAB-FORMING ATTACHMENT FOR CALENDERS.

1,089,467. Specification of Letters Patent. Patented Mar. 10, 1914.

Application filed August 8, 1913. Serial No. 783,736.

To all whom it may concern:

Be it known that I, JOHN R. GAMMETER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Slab-Forming Attachments for Calenders, of which the following is a specification.

My invention relates to means for automatically forming a laminated band from a continuous strip of material, with plies having non-coincident edges. It may be employed for example as a means for building up a stepped rubber tread-slab for pneumatic tire shoes, and may then be embodied in the form of an automatic attachment for calenders.

Of the accompanying drawings: Figure 1 represents a side elevation showing the rolls of a calendering machine having a preferred form of my invention applied thereto. Fig. 2 represents a front elevation. Fig. 3 represents a top plan view. Fig. 4 represents a plan view of one of the sets of cutters and a receiving drum with a completed slab. Fig. 5 represents a cross-section of the slab.

In the drawings 10, 11 and 12 are the top, middle and bottom rolls of the calender which operate in the well-known manner upon a batch of rubber 13 introduced between the top and middle rolls, which form the same into a sheet 14 encircling the middle roll 11, from which strips may be severed by means of the cutters and led off around the lower roll 12.

The slab-forming units are mounted in front of the calender, and there may be one or more of them used in conjunction with the same calender. In the present instance, I have shown four units, each of which comprises a drum 15 whose circumference is substantially equal to the length of the longest slab which it may be desired to form, a pair of knives or cutters 16 which bear against the surface of the middle calender roll 11, and suitable means for mounting the drum and automatically controlling the lateral position of the knives.

The four drums are mounted on a truck-frame 17 which is secured to the floor by means of bolts 18, and is provided with wheels 19 which end is it when unbolted to be rolled away from its normal position with relation to the calender. The drums 15 are loosely journaled on shafts 20, each carried by a pair of arms 21 hung on a pivot-shaft 22, the drums being adapted to swing independently on said pivot-shaft toward and from the lower calender roll 12, and being frictionally driven from said lower roll through the intervening strip or strips of rubber, the drums being held against the rolls by gravity. The arms 21 are formed with abutments 21^a which rest against a stop-rail 17^a on the truck-frame when the drum is swung away from the lower calender roll.

On the rear side of the roll 12 are a series of presser rolls 23 corresponding in number and position to the receiving drums (one of said presser rolls being shown in Fig. 1), and each of the drums 15 is provided with a presser roll 24, mounted on rocker-arms 25 pivoted at 26, and urged toward the drum surface by springs 27, these presser rolls being preferably cloth covered, and their purpose being to smooth out the rubber strips and prevent the formation of air blisters. Each drum is further provided with a trip-stud 28, mounted on a rock-arm 29 which is held against a stop 30 by a strong spring 31, the latter yielding only in case the tripping mechanism should jam.

The knives 16 of each pair are carried in holders on a pair of nuts 32 mounted on right and left screws 33, each pair of screws being formed on a sleeve which turns independently of the others on a shaft 34 common to the several sleeves. The nuts are provided with forked arms 35 having a sliding engagement with a guide-rod 36 which prevents the nuts from turning. This guide-rod is carried by a number of arms 37 which are loosely hung on the shaft 34 and supported by a rod 38 from a pair of arms 39 pivoted at 40 to the side frames 41 of the calender, the rod 38 passing through slots 42 in the arms 40 and being adjustably fixed by means of nuts 43 so that the outer ends of the arms 37 may be raised and lowered for the purpose of adjusting the trip wheels.

44 are star-wheels or trip-wheels, one for each drum 15, loosely mounted on studs 45 at the outer ends of the arms 37, each trip-

wheel having a sprocket-wheel 46 over which passes a chain 47 connecting it with a sprocket-wheel 48 on one of the sleeves which carries a pair of the screws 33.

49 is an upstanding pin on the top stretch of the chain 47 coöperating with a stop-pin 50 adapted to be inserted in any one of a number of holes 51 formed in the arm 37 whereby the amount of spread of the knives 16 and hence the maximum width of the slab-strip is determined, and 52 is a length of chain which is attached to and overlies the chain 47 and hangs down at the side of the drum 15, whereby the knives may be manually reset.

53 represents the completed slab.

54, 54 are fixed knives for trimming the outer edges of the rubber sheet on roll 11.

In operating any of the slab-forming units, the chain 52 is first pulled until the pin 49 on chain 47 comes against the stop-pin 50, and this turns the corresponding pair of right and left screws 33 in a direction to spread apart the knives 16. The drum 15 will at first be swung away from the lower calender roll 12 until the attendant at the rear of the calender has severed and pulled off an end of the strip cut by the knives 16 on the middle roll 11 and has applied it to the surface of the lower roll 12. The attendant at the front then applies this end to the surface of the drum 15 and moves the latter up against the roll 12 so as to cause the said drum to be rotated by the roll. The drum 15 is started in such an angular position that when its trip-stud 28 reaches the star-wheel 44 the drum will have been completely encircled by a strip of rubber. Thus the inner or widest ply of the slab is laid on the drum. The trip-stud then turns the star-wheel one step and this automatically sets the knives 16 a step nearer together so as to cut the next narrower ply, and so on until the narrowest or outermost ply has been laid, whereupon the attendant pulls the drum 15 away from the lower calender roll, cuts the last ply transversely at a suitable point, severs the slab transversely and removes it from the drum. Thereupon another slab may be immediately started. It is obvious that the operators of the different units may have their slabs in different stages, and the operation of the calender may be carried on continuously.

It will be apparent without special illustration that if, instead of employing right and left screws, 33, both knives of a pair were controlled by a single thread, they would both be stepped laterally in the same direction without changing their distance from each other. Such a mode of operation could be used for making beveled or stepped edges on a rubber slab to be made into a tube, such as an inner tube for a pneumatic tire. Other modifications could also be made without departing from my invention, and the principle of the latter applies to other materials than rubber.

I claim:

1. In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, devices for cutting a strip from said sheet, a drum for receiving the strip, and means for automatically displacing one or more of said cutting devices laterally at a predetermined point in the rotation of said drum.

2. In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, a pair of knives for cutting a strip from said sheet, a drum for receiving the strip, and means controlled by the rotation of said drum for automatically displacing said knives in a direction parallel to the axis of the drum.

3. In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, a pair of knives for cutting a strip from said sheet, a drum for receiving the strip, and means controlled by the rotation of said drum for relatively displacing said knives laterally at the end of successive rotations of the drum for varying the width of successive plies of the slab.

4. In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, a pair of knives for cutting a strip from said sheet, a drum for receiving said strip, screw mechanism for displacing said knives laterally toward and from each other, and tripping means controlled by the rotation of the drum and controlling said screw mechanism.

5. In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, a knife for slitting said sheet, a strip-receiving drum, means controlled by the rotation of the drum for automatically displacing said knife laterally, and means for manually resetting the knife.

6. In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, a pair of knives for cutting a strip from said sheet, a pair of nuts connected with said knives, a pair of right and left screws connected to turn together and meshed with the nuts, and trip mechanism controlled by the rotation of the drum for turning said screws.

In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, a knife for slitting said sheet, a strip-receiving drum, a trip-stud on the drum, a toothed wheel actuated by said stud, a screw geared

to said toothed wheel, and a nut on said screw connected with said knife.

8. In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, a knife for slitting said sheet, a strip-receiving drum, means controlled by the rotation of the drum for laterally displacing said knife, means for manually resetting the knife, and an adjustable stop for determining the initial position of said knife.

9. In a machine for forming laminated slabs, the combination of means for supporting and feeding a sheet of material, a pair of knives for cutting a strip from said sheet, a pair of nuts connected with said knives, a screw member having right and left threads engaged with the nuts and also having a sprocket, a second sprocket, a chain which gears with said sprockets, a pin on said chain, an adjustable stop for engagement by said pin, and a manual member connected with said chain for operating the latter to reset the knives.

10. The combination of a rubber calendering machine having a sheet-carrying roll, strip-cutting means coöperating with said roll and including a laterally-displaceable knife, a drum for receiving several turns of the rubber strip, and means controlled by the rotation of said drum and controlling the lateral position of said knife.

11. The combination of a rubber calendering machine having sheet-carrying and strip-carrying rolls, strip-cutting means cooperating with said sheet-carrying roll and including a laterally-displaceable knife, and a strip-receiving drum located on the same side of said rolls as the knife and controlling the position of the latter.

12. The combination of a rubber calendering machine having sheet-carrying and strip-carrying rolls, strip-cutting means including a shiftable knife, and a strip-receiving drum frictionally driven from said strip-carrying roll through the intervening rubber strip and controlling the position of said knife.

13. The combination of a rubber calendering machine having sheet-carrying and strip-carrying rolls, strip-cutting means including a shiftable knife, and a strip-receiving drum mounted for bodily movement toward and from said strip-carrying roll and controlling the position of said knife.

14. The combination of a rubber calendering machine having sheet-carrying and strip-carrying rolls, strip-cutting means including a shiftable knife, a strip-receiving drum frictionally driven from said strip-carrying roll through the intervening rubber strip and controlling the position of said knife, and a pivoted rock-frame on which said drum is journaled, whereby the latter may be guided for bodily movement into and out of operative position.

15. The combination of a rubber calendering machine having sheet-carrying and strip-carrying rolls, strip-cutting means including a shiftable knife, a strip-receiving drum frictionally driven from said strip-carrying roll through the intervening rubber strip and controlling the position of said knife, a roller truck-frame carrying the drum and movable toward and from the calendering machine, and means for guiding the drum for bodily movement on said truck-frame toward and from the strip-carrying roll.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses, this fifth day of August 1913.

JOHN R. GAMMETER.

Witnesses:

WALTER K. MEANS,

ILLA N. KIRN.