No. 725,059. PATENTED APR. 14, 1903.

P. H. ERTHEILER.

MACHINE FOR PREPARING TOBACCO LEAVES FOR MANUFACTURE INTO CIGARS, &c.

APPLICATION FILED AUG. 16, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

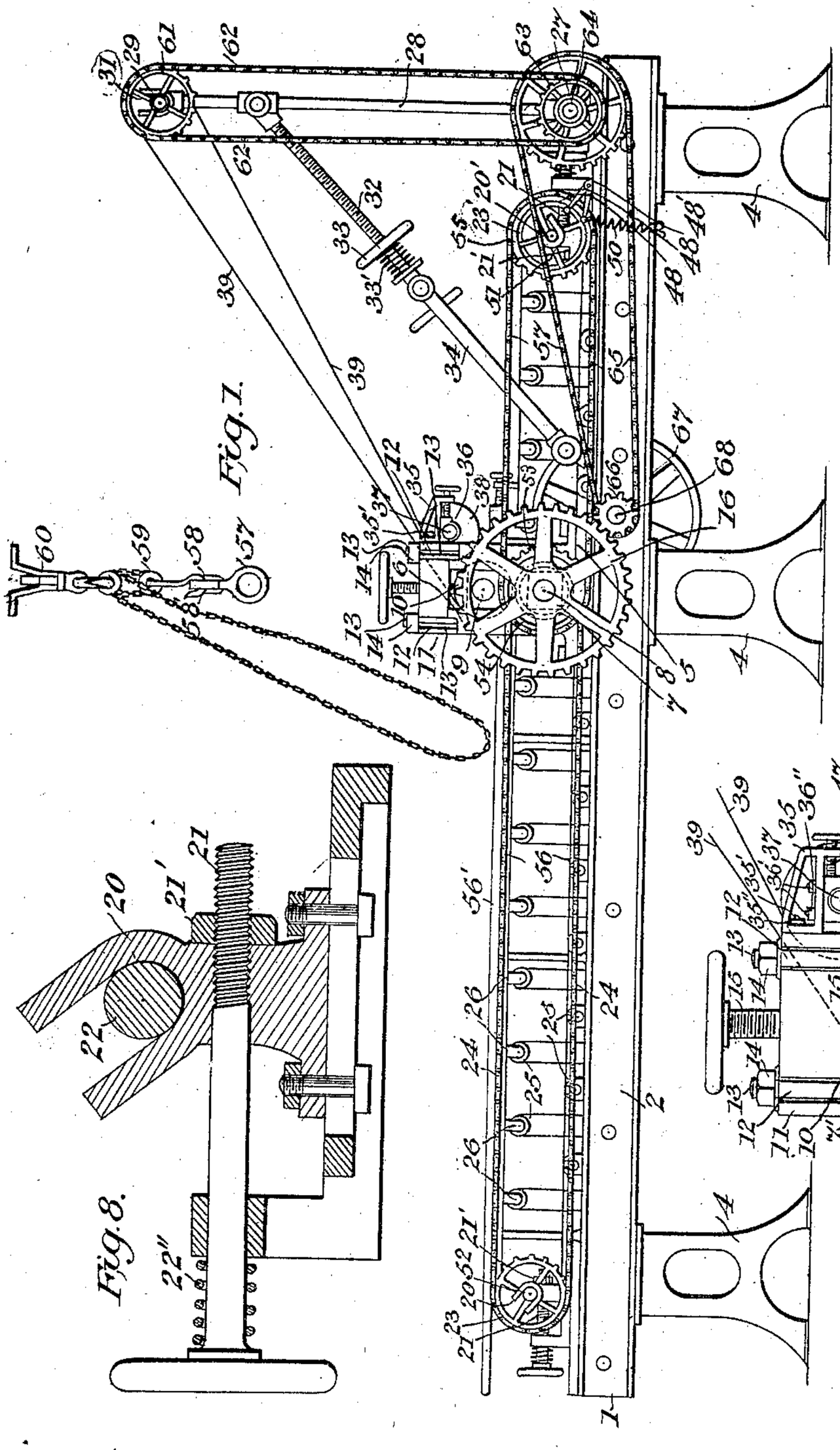

Fig. 1.

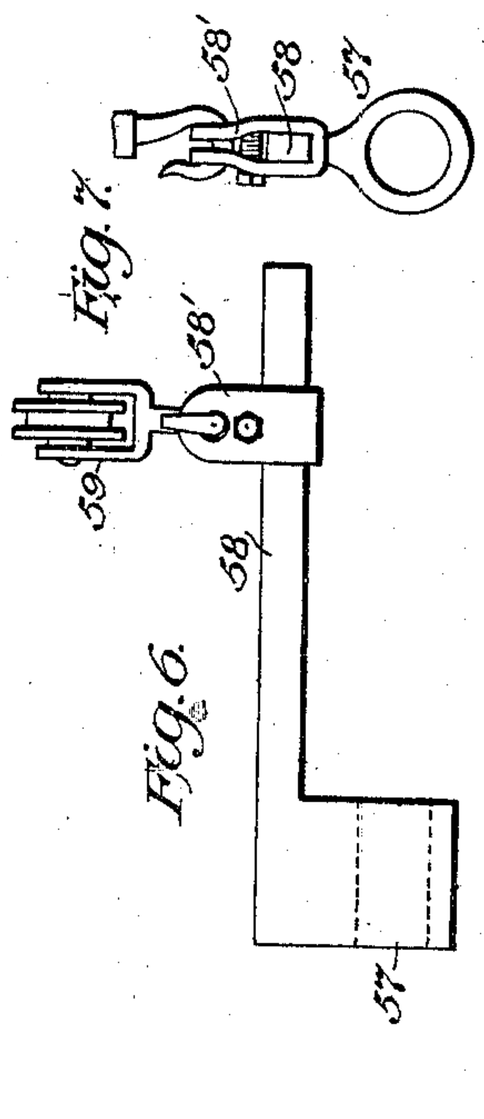

Fig. 7.

Fig. 6.

Fig. 8.

Fig. 5.

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NO MODEL. 8 SHEETS—SHEET 2.

Fig. 2.

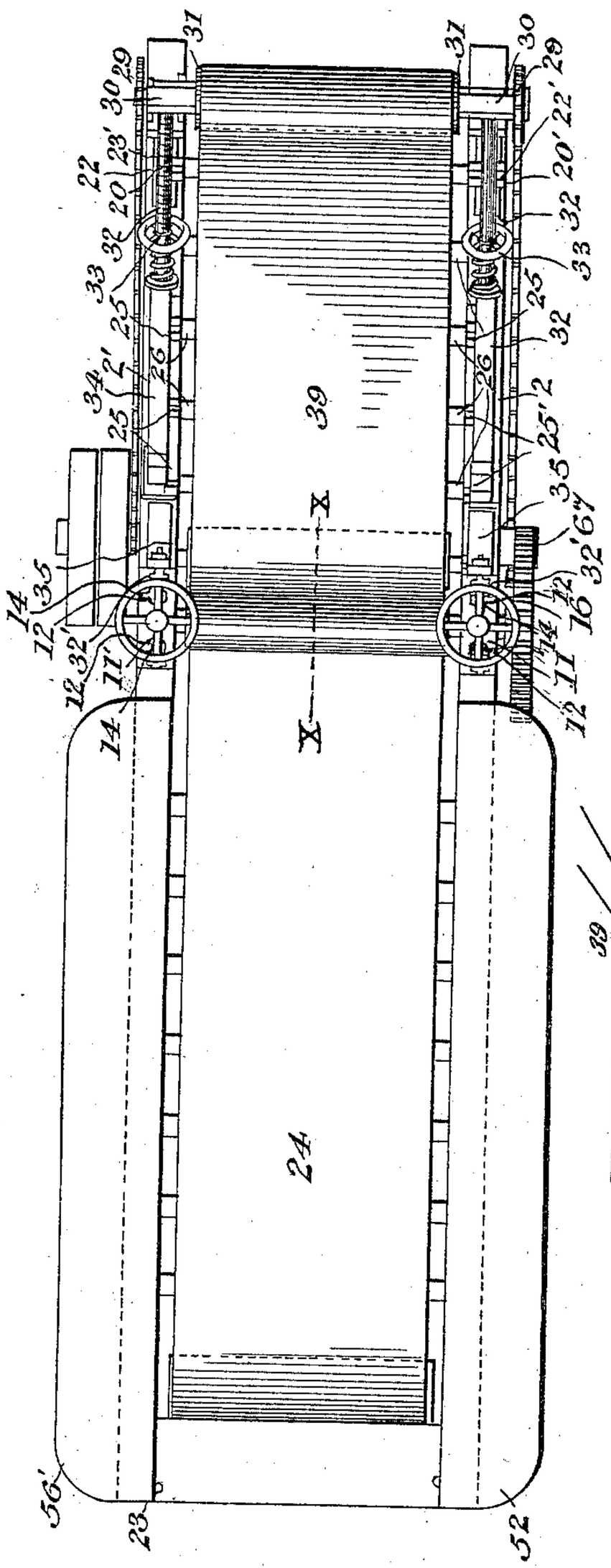


Fig. 11.

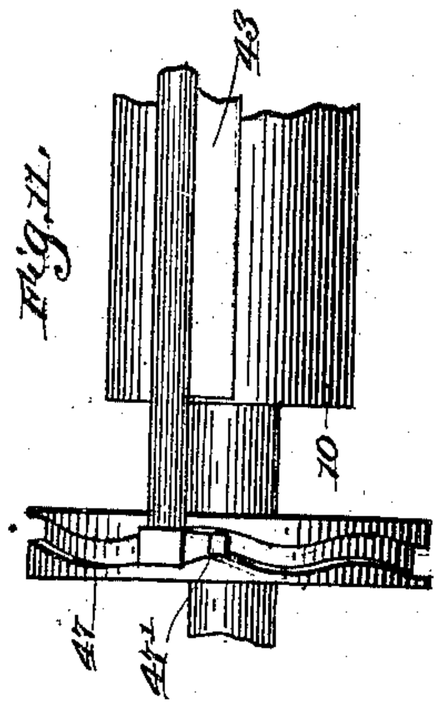
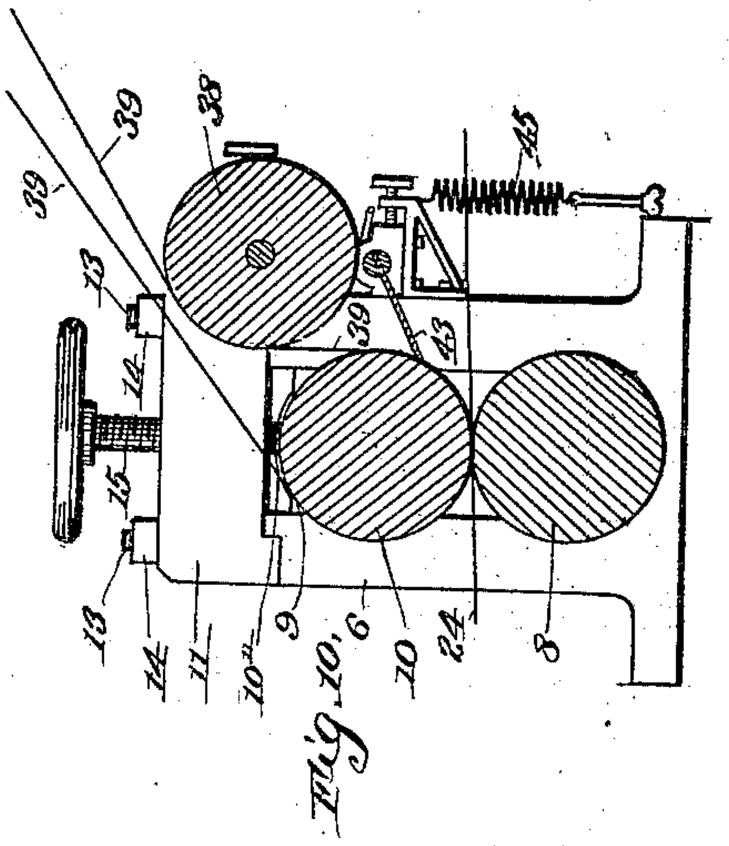


Fig. 10.



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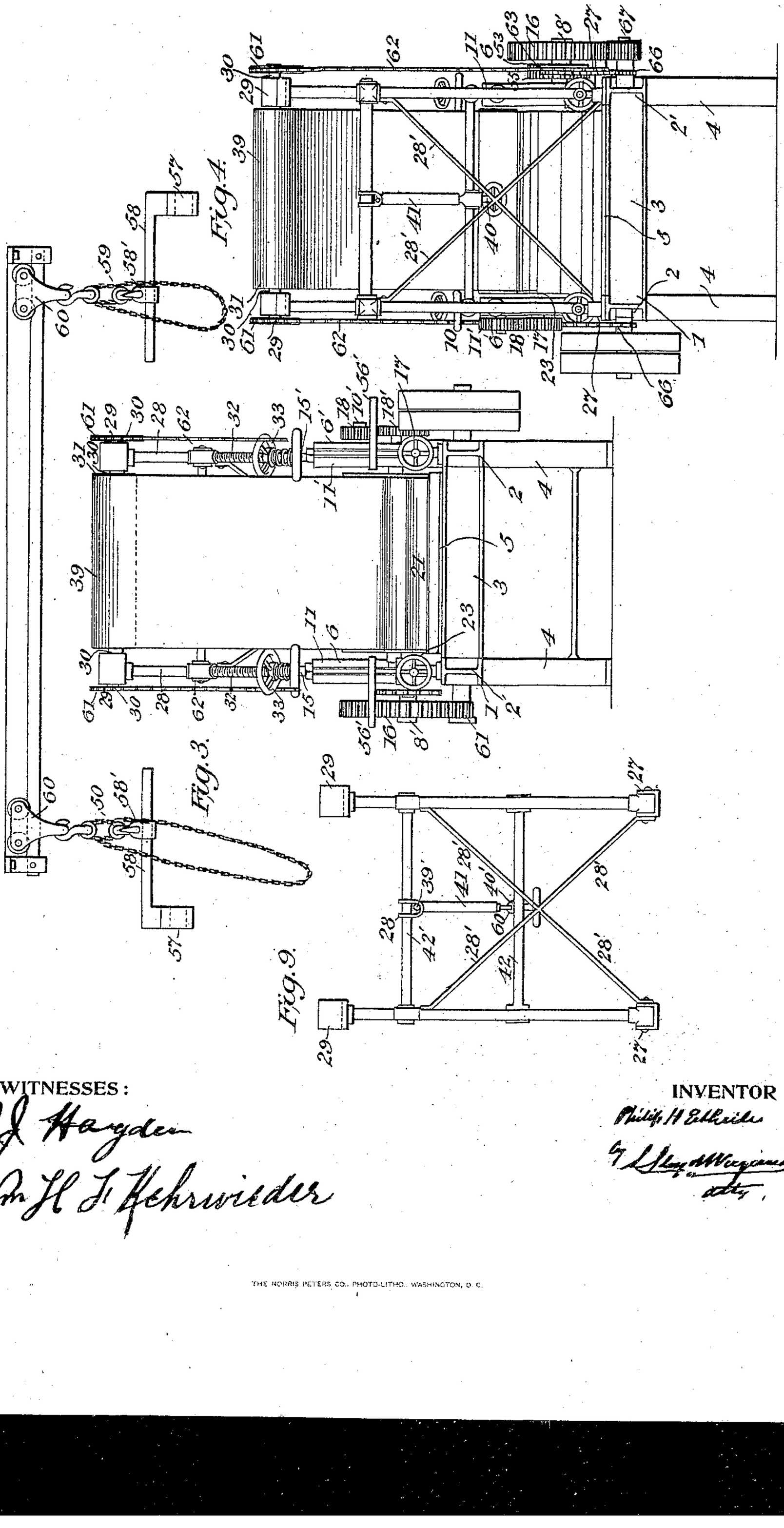
NO MODEL. 3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

PHILIP H. ERTHEILER, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR PREPARING TOBACCO-LEAVES FOR MANUFACTURE INTO CIGARS, &c.

SPECIFICATION forming part of Letters Patent No. 725,059, dated April 14, 1903.

Application filed August 16, 1902. Serial No. 119,869. (No model.)

To all whom it may concern:

Be it known that I, PHILIP H. ERTHEILER, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented new and useful Improvements in Machines for Preparing Tobacco-Leaves for Manufacture into Cigars or other Tobacco Products, of which the following is a specification.

The object of the invention is to reduce the thickness of the stems and veins of the leaves of tobacco to the thickness of the web without disintegrating the leaves, and thus render the entire material of the leaf availably valuable for manufacture.

My present invention is an improvement upon the inventions set forth in my applications for Letters Patent, Serial No. 69,599, filed July 26, 1901, and Serial No. 92,169, filed February 1, 1902, both of like title with the present application; and it consists in improvements in means of guiding, driving, and adjusting the endless aprons, in arrangements for facilitating the feeding of leaves to the machine, and in improved construction of the scrapers or doctors for removing the leaves, and improvement in the means of removing and replacing the rollers and aprons in said machine.

The drawings annexed show a machine embodying these improvements.

Figure 1 shows a side elevation of the machine. Fig. 2 is a top view or ground plan. Fig. 3 is a front elevation. Fig. 4 is a rear elevation. Fig. 5 is an enlarged detached side view showing the supporting mechanism for a guiding-roll and doctor. Fig. 6 is a detached front view of the device for raising, removing, and replacing the rolls. Fig. 7 is an enlarged end or side view of the same. Fig. 8 is an enlarged section of one of the bearings. Fig. 9 is an enlarged view of a part of the frame supporting the roll for stretching the upper endless apron. Fig. 10 is a vertical section through the rolls in the plane indicated by the line $x\ x$ in Fig. 2, and Fig. 11 shows an enlarged view of the cam for vibrating the doctor.

Referring to the drawings, 1 represents the frame of the machine, consisting of two parallel sills or bars 2 and 2′, held together by transverse braces 3 and supported on leg-frames 4. On the sills 2 and 2′ is firmly fixed a bed-plate 5, having rigidly attached to it housings 6 and 6′. In the housings 6 and 6′ are fitted bearing-boxes 7 and 7′, in which turn the journals of the lower roll 8. A second pair of bearing-boxes 9 and 9′ are fitted in the housings 6 and 6′ above the boxes 7 and 7′, in which boxes 9 and 9′ are fitted to turn journals of an upper roller 10.

The housings 6 and 6′ are closed at the top by removable caps 11 and 11′, held down by bolts 13 and nuts 14. The caps 11 and 11′ are provided with slots 12, open to the sides of the caps, so as to facilitate their removal without removing the nuts 14 from the bolts 13. Screws 15 and 15′ are fitted to nuts formed in the caps 11 and 11′, which screws press springs 10″, placed beneath them, pressing on the boxes 9 and 9′, downwardly, so as to force the upper roll 10 with an elastic pressure downwardly toward the lower roll 8 and by yielding to any inequalities in the apron avoid breaking the apron. A gear-wheel 16, propelled by a pinion 67 and secured upon the arbor 8′ of the lower roll 8, turns it and a pinion 17 on the opposite end of the arbor 8′ communicates motion through a like pinion 18, on the arbor 10′ of the upper roll, turns the upper roll 10 with the same velocity as the lower roll. The rolls 8 and 10 are preferably made of chilled iron and should be of such diameter as not to bow or spring apart in the center when being used and not to bend the endless aprons, hereinafter described, beyond their safe limits of elastic flexibility.

Upon the sills 2 and 2′ are secured bearings 20 and 20′, with cleft or open tops, so as to permit of the easy lifting out and replacing of the rollers 23 and 23′, having journals 22 and 22′ fitted to turn in bearings 20 and 20′. The bearings 20 and 20′ are adjustable lengthwise with the direction of the frame 2 and 2′ by means of screws 21 and nuts 21′, and elastic washers or springs 22″ are placed upon the screws 21, so as by yielding to accommodate any irregularities in tension of an endless apron 24, of non-corrodible sheet metal, which is passed around the rollers 23 and 23′ and above and below the roller 8.

Bearings 25 and 25′, having open clefts, are fixed upon the sills 2 and 2′ and support rollers 26, which sustain the apron 24 in hori-

zontal planes and from which bearings the rollers 26 are easily removed and replaced.

To the sills 2 and 2′ are fixed hinged bearings 27, supporting a frame 28, having open-cleft bearings 29, in which turn the journals 30 of a roller 31. The frame 28 is raised and lowered toward and from a vertical position by screws 32, pivotally attached thereto, and nuts 33, supported elastically by springs 33′, resting upon tubular sleeves 34, into which the screws 32 telescope, pivotally attached to the sills 2 and 2′.

To the housings 6 and 6′ are attached vertically-adjustable brackets 35, supporting horizontally-adjustable bearings 36, in which turn the journals 37 of an idle roller 38. The brackets 35 are secured to the housings 6 and 6′ by bolts 35′, having heads fitted in vertical T-headed slots 32′ in the housings 6 and 6′, and nuts 35″. The bearings 36 are secured to the horizontal arms of the brackets 35 by bolts 36′ passing through slots in the bracket 35 and nuts 36″ and are adjusted by fine-threaded screws, fitted in the brackets 35 and the bearings 36.

An endless apron 39, of non-corrodible metal, passes around the roller 31, above the roller 38, and around the roll 10. The roller 31 is rotated by sprocket-wheels 61, driven by chain 62, receiving motion from sprocket-wheels 63, turning on an axis coincident with the bearings 27 and driven by sprocket-wheels 64 and chains 65 from sprocket-wheels 66 on the arbor 68 of the driving-pinion 67, so that the transmission of rotary motion shall not be interrupted by changing the adjustment of position of the roller 31 and the bearings supporting the same.

The frame 28 is stiffened laterally by diagonal braces 28′ and to facilitate adjustment is provided with a coarse or quick threaded screw 40 and nut 41, connected by pivots 39′ and 40′, centrally located in the cross-bars 42 and 42′, so that the roller 31 can be quickly raised into position and afterward adjusted as to tension in the endless apron 39 by the nuts 33.

A doctor 43, supported pivotally in bearings 44, is pressed elastically against the apron 39 by means of springs 45 and serves to remove any particles of leaves adhering to the apron 39. The bearings 44 of the doctor 43 are adjustably attached to horizontal arms or brackets 46, which are secured adjustably as to height to the housings 6 and 6′.

The efficiency of the doctor in detaching particles of leaf from the apron is increased by imparting a vibratory motion to it in the direction of the axis of its pivots, such motion being derived from a cam 47 on the arbor of the upper roller 10 operating an arm 47′, attached to the doctor 43.

A doctor 48 is pivotally supported in bearings 48′ and is elastically pressed against the apron 24, so as to detach any leaves adhering to the apron. The doctor 48 is pressed into contact with the apron 24 by means of springs 50 and derives a rapid vibratory motion in a direction parallel with its length from a cam 51, attached to the arbor of the roller 23′.

The rollers 23 and 23′ are driven by sprocket-wheels 52 and 53 and 54 and 55 and endless chains 56 and 57, motion to the wheels 53 and 55 being imparted from the arbor 8′ of the roll 8, to which arbor they are attached.

The apron 24 extends a sufficient length in horizontal position in front of the rollers 8 and 10 to afford spac e for several attendants to place leaves upon it, and thus enables the machine to be run with such velocity as to treat a large amount of leaves. The leaves requiring to be opened by hand as they are placed upon the apron, the feeding by a single attendent is in consequence too slow to work the machine to a commercial paying capacity, and for this purpose long feeding-boards 56′ are provided upon each side of the apron 24, enabling the attendants to place leaves upon it at several points simultaneously.

The grapnel shown in Figs. 6 and 7 consists of a sleeve 57, fitting upon the arbors 8′ and 10′ of the rolls 8 and 10, having a bar 58, attached parallel with the axis of the roll to which it is applied, and on the bar 58 is fitted a clevis 58′, into which is hooked a tackle-block 59, suspended from a trolley 60, located over the housing 6 and 6′ and of such length as to travel with the rolls clear of the aprons 24 and 39 for the purpose of removing the rolls and replacing them in position with the aprons.

The operation of the machine is as follows: The several attendants stand on each outer side of the feeding-boards and open the leaves of tobacco, lay them upon the apron 24 with the stems at right angles to the length of the apron, and the machine being put in motion by the gear 16 the leaves are conveyed between aprons 24 and 39 and pressed thereon between the rolls 8 and 10, so as to spread the stems in width and to reduce their thickness approximately to that of the web portion of the leaves. The leaves meeting the doctor 43 are removed from the apron and delivered ready for use. To remove the rolls from the housings, the pinion 18′ is removed from the arbor 10′ of the upper roll, and the grapnel-sleeve 57 is placed on the arbor 10′, and the caps 11 and 11′ are removed and the roller raised by the tackle 59 and withdrawn in a horizontal direction from the apron 39, and the wheel 16′ is detached from the arbor 8′ and the grapnel-sleeve 57 applied in like manner and the roll 8 raised and withdrawn.

By straining the aprons by elastically-supported rollers I am enabled to promote the durability of the aprons and to run with less friction, and by propelling the aprons by supporting and driving rollers from both ends I am enabled to guide them more accurately in straight lines and avoid buckling of them.

Having described my invention, what I claim is—

1. In a machine for preparing tobacco-leaves for manufacture, a pair of rolls, endless aprons of non-corrosive material, arranged to convey leaves to said rolls, in combination with adjustable bearings and an idle roller supported therein applied to the under side of the upper apron and arranged to operate as and for the purpose set forth.

2. In a machine for preparing tobacco-leaves for manufacture a pair of rolls, endless aprons of non-corrosive material arranged to feed said rolls, in combination with adjustable bearings and with means for elastically applying tension to said aprons as and for the purpose set forth.

3. In a machine for preparing tobacco-leaves for manufacture the combination of endless aprons of non-corrosive material with scrapers or doctors and means for elastically pressing the said doctors against said aprons and means for vibrating said doctors in contact with said aprons as and for the purpose set forth.

4. In a machine of the class specified, a pair of rolls, a pair of endless metallic aprons arranged to pass between said rolls, a pair of housings and bearings supporting said rolls, removable slotted caps on said housings and bolts and nuts securing the same to said housings in combination with grapnels constructed to fit on the arbors of said rolls, and suspended trolleys and tackles arranged to retract said rolls and replace the same within the loops of said aprons substantially as set forth.

5. In a machine of the class specified a pair of rolls, means for elastically forcing said rolls toward each other and an apron arranged to convey tobacco-leaves between said rolls in combination with rollers having springs applied to the bearings thereof and sprocket-wheels and endless chains arranged to elastically stretch said aprons and drive the same with a velocity equal to that of the pair of rolls as and for the purpose set forth.

6. In a machine of the class specified a pair of rolls, an endless feeding-apron arranged to convey tobacco-leaves between said rolls, an upper roller and a second endless apron embracing the upper roll of said pair and the upper roller and means for adjusting and elastically supporting said upper roller in combination with endless chains and sprocket-wheels arranged to rotate said upper roll in varied position of adjustment as and for the purpose set forth.

PHILIP H. ERTHEILER.

Witnesses:
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MELTON WOLF.