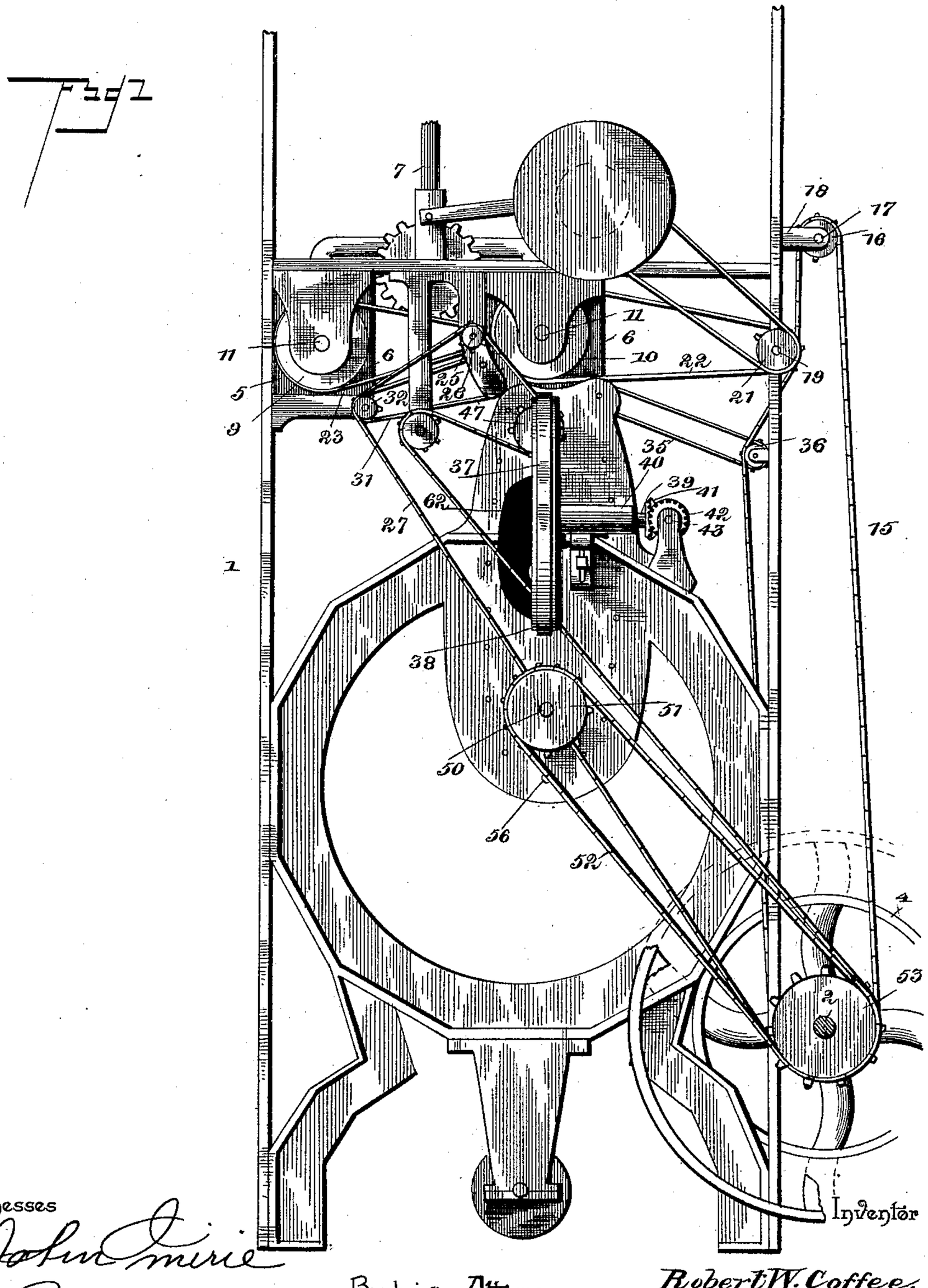
(No Model.) 4 Sheets—Sheet 1.

R. W. COFFEE.

MACHINE FOR REMOVING STEMS FROM TOBACCO LEAVES.

No. 446,811. Patented Feb. 17, 1891.



Witnesses
John C. Purie
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By his Attorneys,
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(No Model.) 4 Sheets—Sheet 2.

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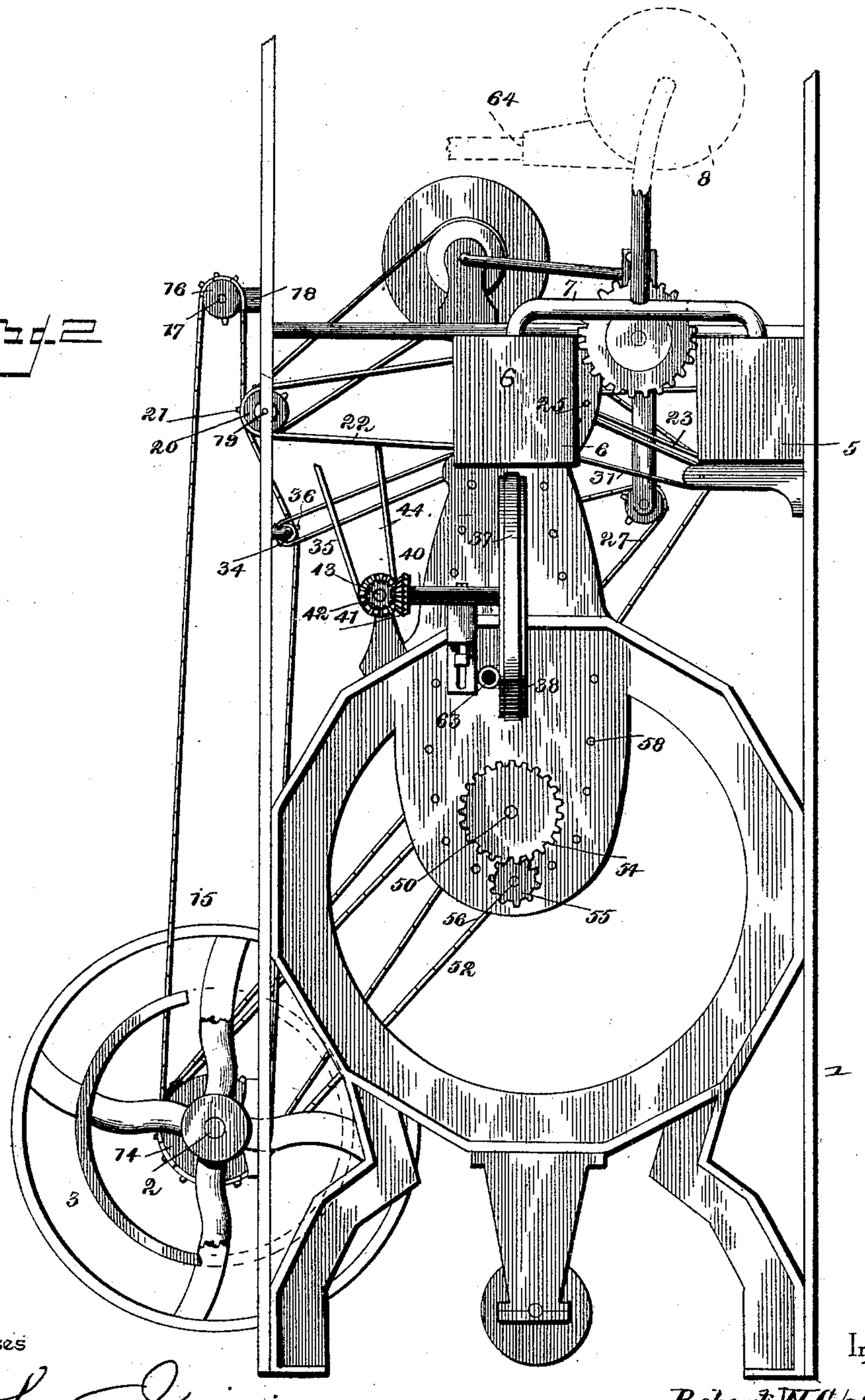
Fig. 2.



Witnesses

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(No Model.) 4 Sheets—Sheet 3.

R. W. COFFEE.

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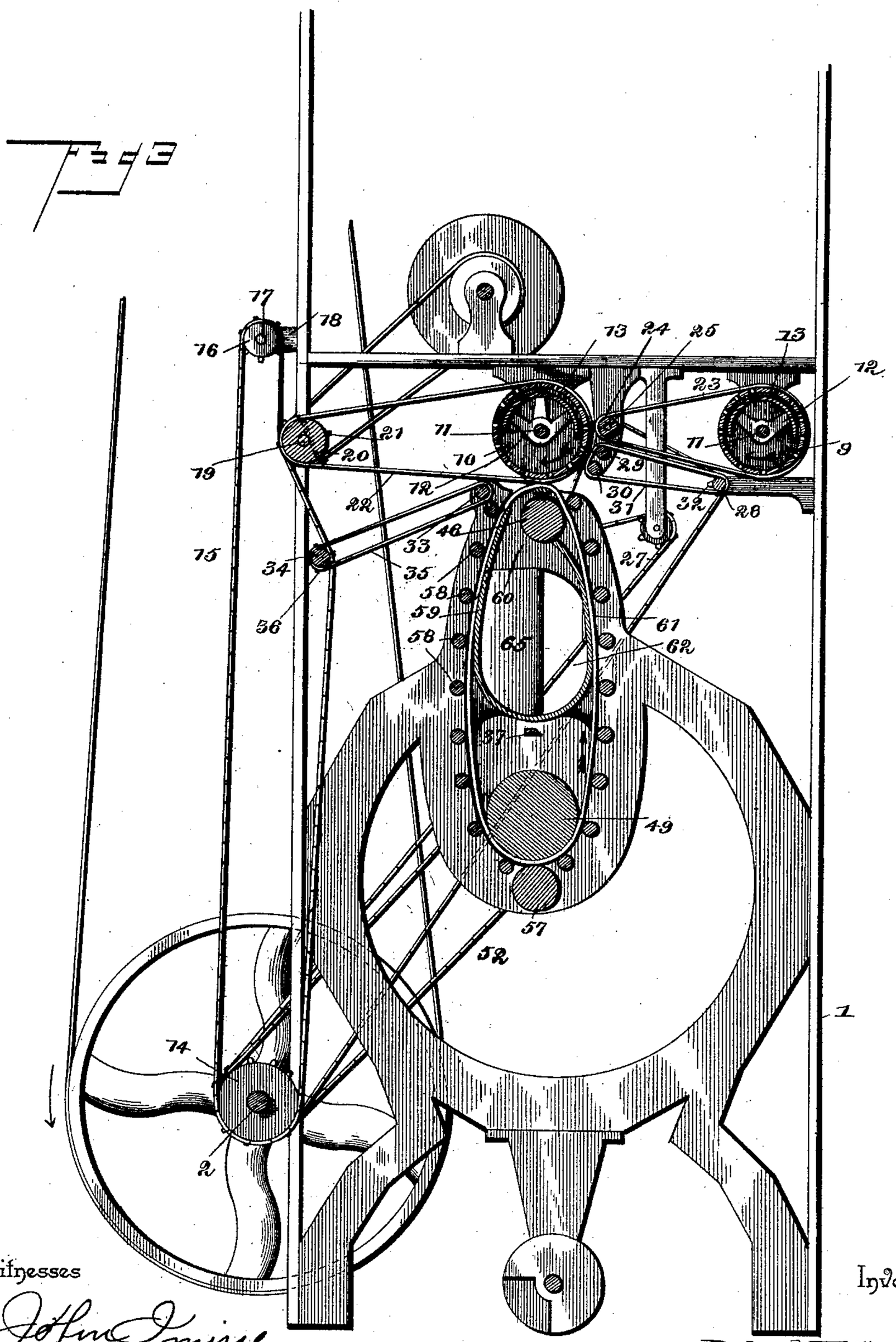
Fig 3



Witnesses

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(No Model.) 4 Sheets—Sheet 4.

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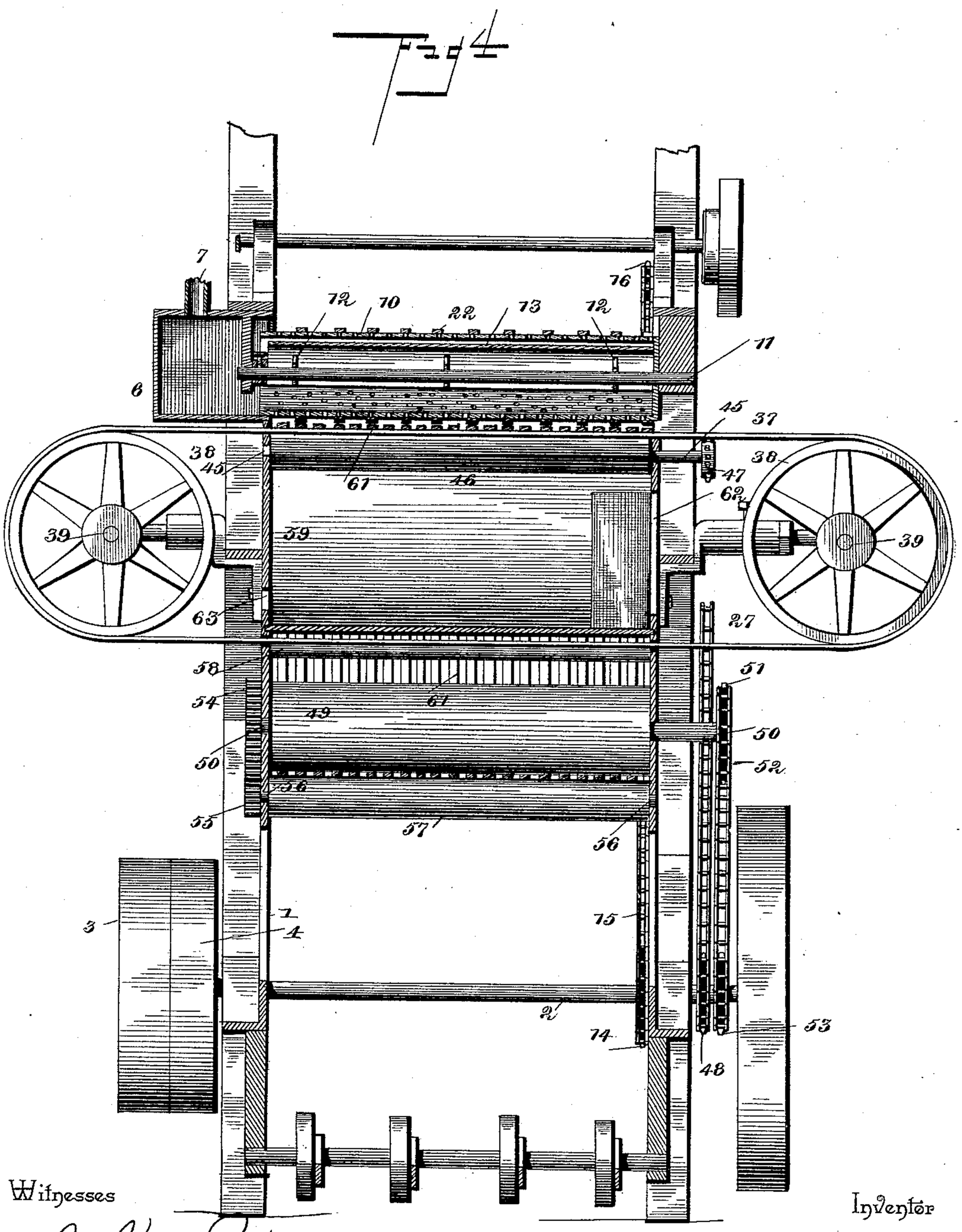

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UNITED STATES PATENT OFFICE.

ROBERT W. COFFEE, OF BEDFORD CITY, VIRGINIA.

MACHINE FOR REMOVING STEMS FROM TOBACCO-LEAVES.

SPECIFICATION forming part of Letters Patent No. 446,811, dated February 17, 1891.

Application filed August 20, 1890. Serial No. 362,523. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. COFFEE, a citizen of the United States, residing at Bedford City, in the county of Bedford and State of Virginia, have invented a new and useful Machine for Removing the Stems from Tobacco-Leaves, of which the following is a specification.

This invention relates to machines for removing the stems from tobacco-leaves and is an improvement on the machine of this class for which application for Letters Patent of the United States, Serial No. 344,491, was filed by me on the 18th day of March, 1890, and allowed on the 12th day of July, 1890.

In the machine covered by the application above referred to were combined devices for carrying the tobacco-leaves through the machine and past an endless knife or cutter, devices for feeding the tobacco-leaves to the said carrying mechanism, and a revolving cylinder having oppositely-reciprocating devices for grasping stems of the tobacco-leaves and pulling the said stems apart from the leaves. The carrying mechanism in the said application was composed, essentially, of a pair of perforated revolving suction-cylinders combined with suitable driving-belts, which latter also constituted a part of the carrying mechanism.

In the machine which is the subject of my present invention I have for an object to dispense with the revolving-stemming "cylinder," as I term the revolving cylinder having the oppositely-reciprocating stem-grasping devices. To accomplish this I avail myself of a series of endless bands or wires placed closely together and serving to guide the stems of the tobacco-leaves past the endless knife or cutter in such a manner as to cause them to be separated from the leaves in a rapid, efficient, and accurate manner. Except for such details of construction as it becomes necessary to change by this modified form of the machine, the general construction is identical with that shown in my former appplication above referred to and will in the present application only be described as incidental to my present improvements.

The details of my invention will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a side view showing as much of a tobacco-stemming machine as is deemed necessary to illustrate the construction and operation of my present invention. Fig. 2 is a side elevation showing the opposite side of the machine. Fig. 3 is a longitudinal vertical sectional view. Fig. 4 is a vertical transverse sectional view.

Like numerals of reference indicate like parts in all the figures of the drawings.

The frame of the machine is designated by 1 and is provided with bearings for the main shaft 2, which is provided with the fast and loose pulleys 3 4 for receiving motion from any suitable source of power.

Suitably mounted on one side of the frame of the machine are the suction-boxes 5 and 6, which are connected by means of the pipes 7 with the casing of an exhaust-fan 8, which may be driven by any suitable power, and which serves to exhaust air from the said box. The boxes 5 and 6 are provided in their inner walls with bearings for the open ends of the suction-cylinders 9 and 10, the opposite ends of which are closed, as will be seen in Fig. 4 of the drawings. The shafts 11, which extend through the said suction-cylinders, are provided with bearings in one side of the frame and in the inner walls of the suction-boxes. The suction-cylinders consist simply of metallic tubes of suitable dimensions provided with numerous perforations through which the air may be exhausted, so that the tobacco-leaves shall be caused to adhere by suction to the said cylinders. The shafts 11 are provided with radial arms 12, carrying segmental shields 13 to partially cover the inner sides of the perforated cylinders, so as to cause the suction to take place only at the points where it is desired that the tobacco-leaves shall adhere.

The main shaft 2 of the machine is provided near one end with a sprocket-wheel 14, from which a chain 15 passes over a sprocket-wheel 16, journaled upon a stud 17, attached to a bracket 18, which projects rearwardly from the frame.

19 designates a shaft carrying a roller 20

and a sprocket-wheel 21, which latter engages and receives motion from the chain 15. The roller 20 is connected by a series of belts or bands 22 with the rear suction-cylinder 10, to which a rotary motion is thus transmitted. The front suction-cylinder 9 is driven by a series of belts or bands 23, passing over a roller 24 upon a shaft 25, which is provided with a sprocket-wheel 26, over which passes a chain 27.

28, 29, and 30 are a series of guide-rollers, over which passes a series of endless belts 31, the upper sides of which are located a short distance below and parallel to the under sides of the belts or bands 23. The shaft of the guide-holder 28 is provided with a sprocket-wheel 32, engaging and receiving motion from the chain 27, by means of which the endless bands 31 are thus driven.

33 and 34 are guide-rollers, over which passes a series of bands 35. The shaft of the roller 34 has a sprocket-wheel 36, engaging and receiving motion from the endless chain 15, from which motion is thus transmitted to the bands 35.

The suction-cylinders 9 and 10, the belts 23 and 22, the endless bands 31, and the bands 35 constitute the leaf-carrying mechanism of the machine, which is practically identical with the leaf-carrying mechanism shown in my former application, and which has been thus minutely described only to illustrate its co-operation with my present invention.

The endless knife or cutter, which is designated by 37, is mounted upon the supporting-wheels 38, the shafts of which 39 have adjustable bearings 40. One of said shafts 39 has at its rear end a pinion 41, meshing with a pinion 42 upon a shaft 43, to which motion is transmitted by a belt 44 from a suitably-arranged counter-shaft, which has not been shown in the drawings, but which is intended to be driven from the main shaft of the machine. The endless knife or cutter passes through suitable openings or slots in the sides of the frame, and the upper side of said endless knife is located directly beneath the rear suction-cylinder 10.

45 designates a shaft journaled in suitable bearings in the sides of the frame and carrying a roller 46, which is located a short distance below the suction-cylinder 10 and directly under the upper portion of the endless knife 37. The shaft of the roller 46 is provided at one end with a sprocket-wheel 47, engaging and receiving motion from the endless chain 27, the course of which latter will be readily seen by reference to Fig. 1 of the drawings. Said endless chain 27 receives motion from a sprocket-wheel 48 upon the main shaft of the machine.

49 designates a roller, the shaft of which 50 is journaled in the sides of the casing and is provided at one end with a sprocket-wheel 51, connected by a chain 52 with a sprocket-wheel 53 upon the main shaft, from which it receives motion. The opposite end of the shaft 50 carries a spur-wheel 54, meshing with a pinion 55 upon the end of a shaft 56, carrying a roller 57, which is located directly below the roller 49.

The sides of the frame of the machine are provided with bearings for the shafts of a series of rollers 58, which are arranged in the form of an ellipse, as will be clearly seen by reference to Figs. 1, 2, and 3 of the drawings. One of the rollers 58 is located closely adjoining the roller 46, directly in front of the latter.

59 designates an approximately elliptical casing, the upper side of which has an opening 60, in which the roller 46 is located and through which the tobacco-stems are admitted into the casing between the rear wall of the latter and the roller 46.

A series of endless bands or wires 61 are mounted upon the rollers 46 and 49, as will be clearly seen in Fig. 3 of the drawings. These bands or wires are made of spring metal and are of such length as to be in frictional contact with the elliptically-arranged series of rollers 58, said bands or wires being held in this position partly by their own resiliency and partly by contact with the outer walls of the approximately elliptical casing 59. These wires or bands receive motion from the rollers 49 and 57 and from the rollers 46 and 58, between which they pass, and the slack portion of the said wires is projected upwardly above the endless cutter 37, over which they pass.

The bands or wires 61 may consist either of ordinary round wires about one-sixteenth of an inch in diameter or they may consist of narrow flat metallic ribbons or tapes of suitable dimensions. The latter form has been illustrated in Fig. 4 of the drawings hereto annexed; but I would have it distinctly understood that I do not limit myself to this construction.

One end of the casing 59 is open, as will be seen at 62, and to the other end of the said casing is connected a pipe 63, which communicates with the discharge 64 of the fan 8. Within the casing 59, near the open end of the latter, is arranged a deflector 65, serving to direct the blast to one side of the endless knife or cutter. This mechanism is for the purpose of blowing the tobacco-stems out through the open end of the casing without interfering with the operation of the endless knife or cutter.

Certain mechanism shown mounted upon the top of the frame-work is a part of the feeding devices not herein claimed, and therefore not specifically mentioned, said mechanism forming a portion of the subject-matter of the application hereinbefore referred to.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains.

The tobacco-leaves are fed by the feeding

mechanism described and claimed in my former application, Serial No. 344,391, to the front suction-cylinder 9, to which the leaves are caused to adhere by suction. The leaves pass between the endless bands or carriers 23 and 31, the former of which serve to strip them from the suction-cylinder 9 and are conveyed to the suction-cylinder 10, to which they will adhere. The suction-cylinder 10, conjointly with that portion of the belts 31 which is between the rollers 29 and 30, serves to carry the leaves in a downward direction toward the endless knife or cutter. On approaching the latter the butt-ends of the stems will pass between the endless bands or wires 61, which are placed so closely together that the pair of wires engaging the opposite sides of the stem will crowd the latter in a downward direction and into engagement with the endless knife or cutter, which latter severs the stem from the leaf. The tobacco-leaves which are stripped from the suction-cylinder 10 by the bands 22 pass between the latter and the roller 23 onto the endless bands 35, by which the said leaves are carried to the tail end of the machine, where a receptacle may be provided into which they may be discharged. The stems passing under the upper portion of the endless knife, between the latter and the roller 46, are carried through the slot 60 into the casing 59. The blast of air from the fan 8 serves to blow the stems out through the open end of the casing.

It will be seen that by my present invention devices for positively grasping the stems of the tobacco-leaves are entirely dispensed with. The endless metallic bands or wires 61 are more in the nature of guides, whereby the stems are guided in the proper direction. The portion of the said bands or wires above the roller 46, which I have described as being the slack portion of said bands or wires, is capable of yielding laterally as well as vertically, and the said bands or wires will therefore readily adjust themselves to the tobacco-stems. Those wires which do not engage the tobacco-stems serve to bear against the under surface of the leaf, which is thereby held smooth and free from wrinkles, which is highly important in order to prevent injury to the leaf by the endless knife or cutter.

If desired, the shafts of the guide-rollers 58 may be provided with pinions geared together by intermediate idlers, one of said roller-shafts being driven from the main shaft either direct or through intermediate gearing, and other features may be changed to suit the fancy and necessities without departing from my invention.

Having described my invention, what I claim is—

1. In a tobacco-stemming machine, the stem-guiding mechanism consisting of a series of endless bands or wires mounted upon suitable rollers and adapted to engage opposite sides of the stems, in combination with leaf-carrying mechanism and means for severing the stems from the leaf, substantially as set forth.

2. In a tobacco-stemming machine, the stem-guiding device comprising a series of endless resilient bands or wires mounted upon suitable rollers and adapted to engage opposite sides of the stems, in combination with leaf-carrying mechanism and means for severing the stems from the leaf, substantially as set forth.

3. In a tobacco-stemming machine, the stem-guiding device comprising a series of endless bands or wires mounted upon suitable rollers, in combination with rollers arranged outside the said endless bands or wires and pressing them against the supporting-rollers, suitable driving mechanism, leaf-carrying mechanism, and means for severing the stems from the leaf, substantially as set forth.

4. In a tobacco-stemming machine, the stem-guiding mechanism comprising a series of endless resilient bands or wires mounted upon suitable rollers, in combination with a series of guide-rollers arranged approximately in the form of an ellipse and bearing against the outsides of said bands or wires, leaf-carrying mechanism, and means for severing the stem from the leaf, substantially as set forth.

5. In a tobacco-stemming machine, the stem-guiding device comprising a series of endless resilient bands or wires mounted upon suitable supporting-rollers, in combination with rollers arranged to press the said bands or wires into frictional contact with the supporting-rollers, the guide-rollers arranged to bear against the outside of the resilient bands or wires, suitable driving mechanism, leaf-carrying mechanism, and means for severing the stem from the leaf, substantially as set forth.

6. In a tobacco-stemming machine, the endless resilient stem-guiding bands or wires mounted upon suitable supporting-rollers, in combination with the casing arranged between the supporting-rollers, the guide-rollers arranged to bear against the outside of the bands or wires, suitable driving mechanism therefor, leaf-carrying mechanism, and means for severing the stem from the leaf, substantially as set forth.

7. In a tobacco-stemming machine, the endless resilient stem-guiding wires mounted upon suitable supporting-rollers, in combination with the guide-rollers arranged to bear against the outside of said resilient wires, thereby forcing the slack portion of the latter in an upward direction above the upper supporting-roller, leaf-carrying mechanism, and means for severing the stem from the leaf, substantially as set forth.

8. In a tobacco-stemming machine, the combination, with the endless resilient guide-wires, the supporting-rollers, the stem-receiving casing arranged between said supporting-rollers, guide-rollers bearing against the outside of the endless resilient wires, rollers arranged to press the resilient wires into frictional contact with the supporting-rollers, and

suitable operating mechanism, of leaf-carrying mechanism and means for severing the stem from the leaf, substantially as set forth.

9. In a tobacco-stemming machine, the combination of the endless resilient guide-wires, the supporting-rollers, the guide-rollers arranged to bear against the outside of the resilient wires and to force the slack of the latter in an upward direction above the upper supporting-roller, the endless knife or cutter, and leaf-carrying mechanism, substantially as set forth.

10. In a tobacco-stemming machine, the combination of leaf-carrying mechanism, endless resilient stem-guiding bands or wires mounted upon suitable supporting-rollers and serving to guide the stems and to force the leaves into contact with the carrying mechanism, and a knife or cutter adapted to sever the stems from the leaves, substantially as set forth.

11. In a tobacco-stemming machine, the combination of the leaf-carrying mechanism, the endless resilient stem-guiding bands or wires mounted upon suitable supporting-rollers, the guide-rollers arranged to bear against the outside of bands or wires and to force the slack of the same in an upward direction above the upper supporting-roller and into contact with the leaf-carrying mechanism, the endless knife or cutter, and suitable operating mechanism, substantially as set forth.

12. In a tobacco-stemming machine, the combination of the leaf-carrying mechanism having the revolving perforated suction-cylinders, the endless resilient stem-guiding bands or wires mounted upon suitable supporting-rollers, the guide-rollers arranged to bear against the outside of said resilient bands or wires and to force the slack of the latter in an upward direction above the upper supporting-roller and into contact with a revolving suction-cylinder, the rollers arranged to press the resilient bands or wires into frictional contact with the supporting-rollers, suitable driving mechanism, and an endless knife or cutter located under the upper portion of the stem-guiding bands, substantially as set forth.

13. In a tobacco-stemming machine, the combination of the leaf-carrying mechanism, the endless resilient stem-guiding bands or wires mounted upon suitable supporting-rollers, the transverse approximately elliptical casing inclosed by said endless bands or wires and having at its upper end a slot to accommodate the upper supporting-roller and to admit the stems, the guide-rollers arranged to bear against the outside of said bands or wires, and the transversely-arranged endless knife or cutter, the upper portion of which is arranged above the upper supporting-roller in the bight or slack of the endless resilient bands or wires, substantially as set forth.

14. In a tobacco-stemming machine, the combination of the endless resilient stem-guiding bands or wires, the supporting-rollers, the guide-rollers, the leaf-carrying mechanism, the endless knife or cutter, the stem-receiving casing open at one end and connected at its opposite end with a blast-fan, and the deflector arranged near one end of said casing, substantially as set forth.

15. In a tobacco-stemming machine, the combination of the supporting-rollers, the endless resilient bands or wires, the guide-rollers bearing against the outside of said bands or wires, a roller geared to the lower supporting-roller and pressing the said bands or wires into frictional contact therewith, the leaf-carrying mechanism, the endless knife or cutter, and suitable driving mechanism, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

ROBERT W. COFFEE.

Witnesses:
J. H. SIGGERS,
E. G. SIGGERS.