

No. 760,137.

PATENTED MAY 17, 1904.

J. MORRISON.
BRUSH MACHINE.

APPLICATION FILED MAY 20, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

FIG 2

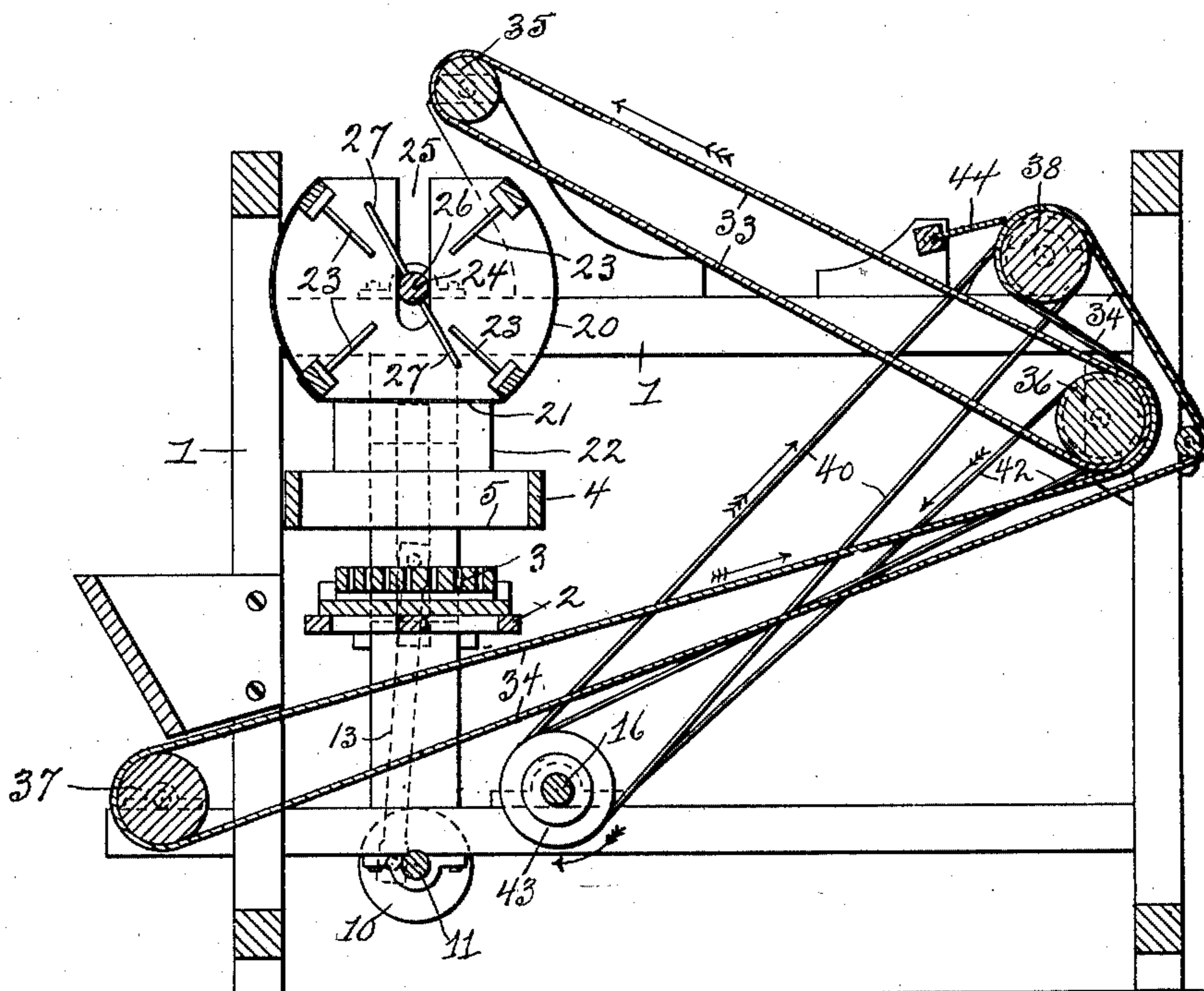
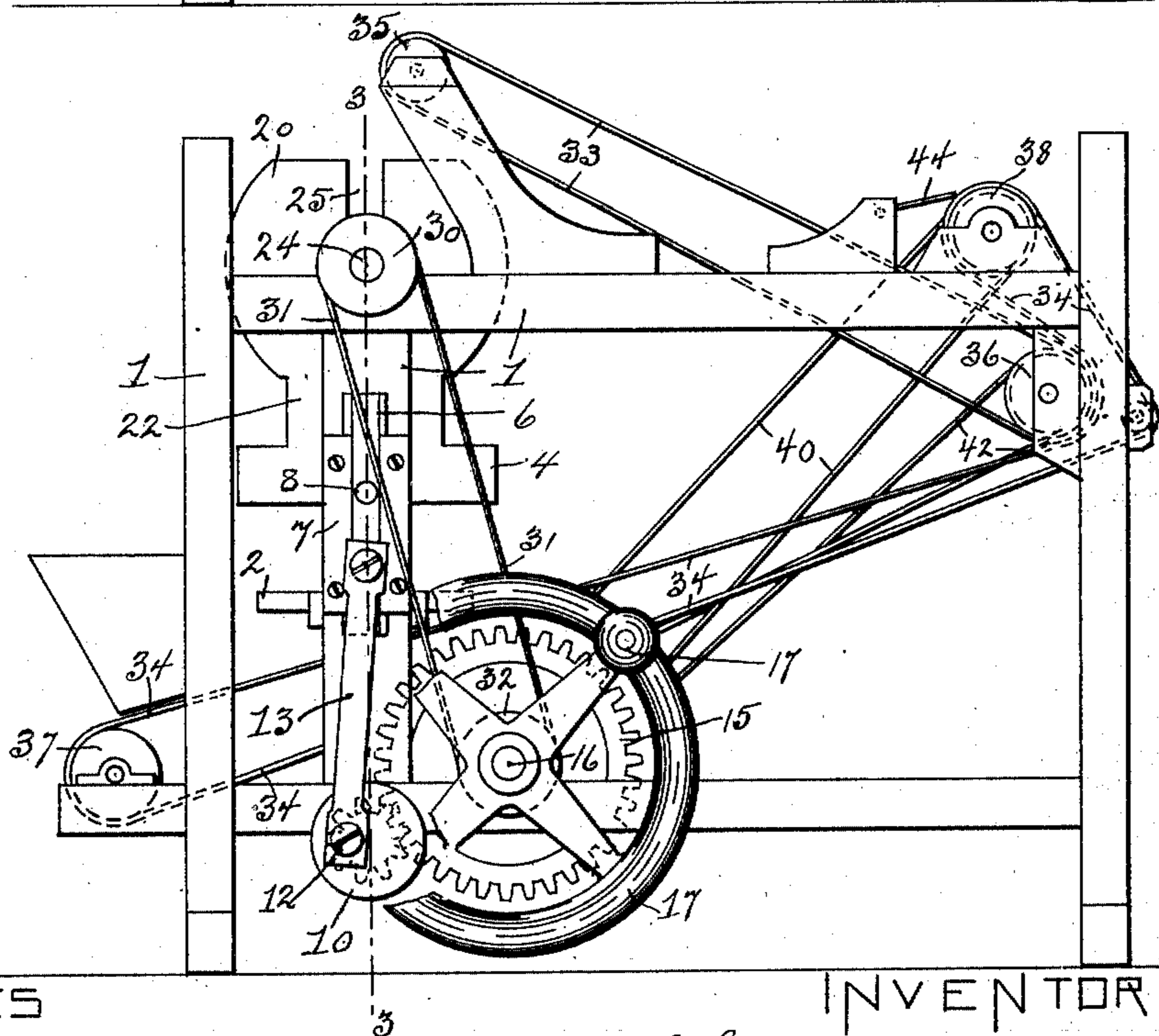


FIG 1



WITNESSES

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E. M. O'Reilly

INVENTOR

John Morrison,
By Mosher & Curtis,
attys

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2 SHEETS—SHEET 2.

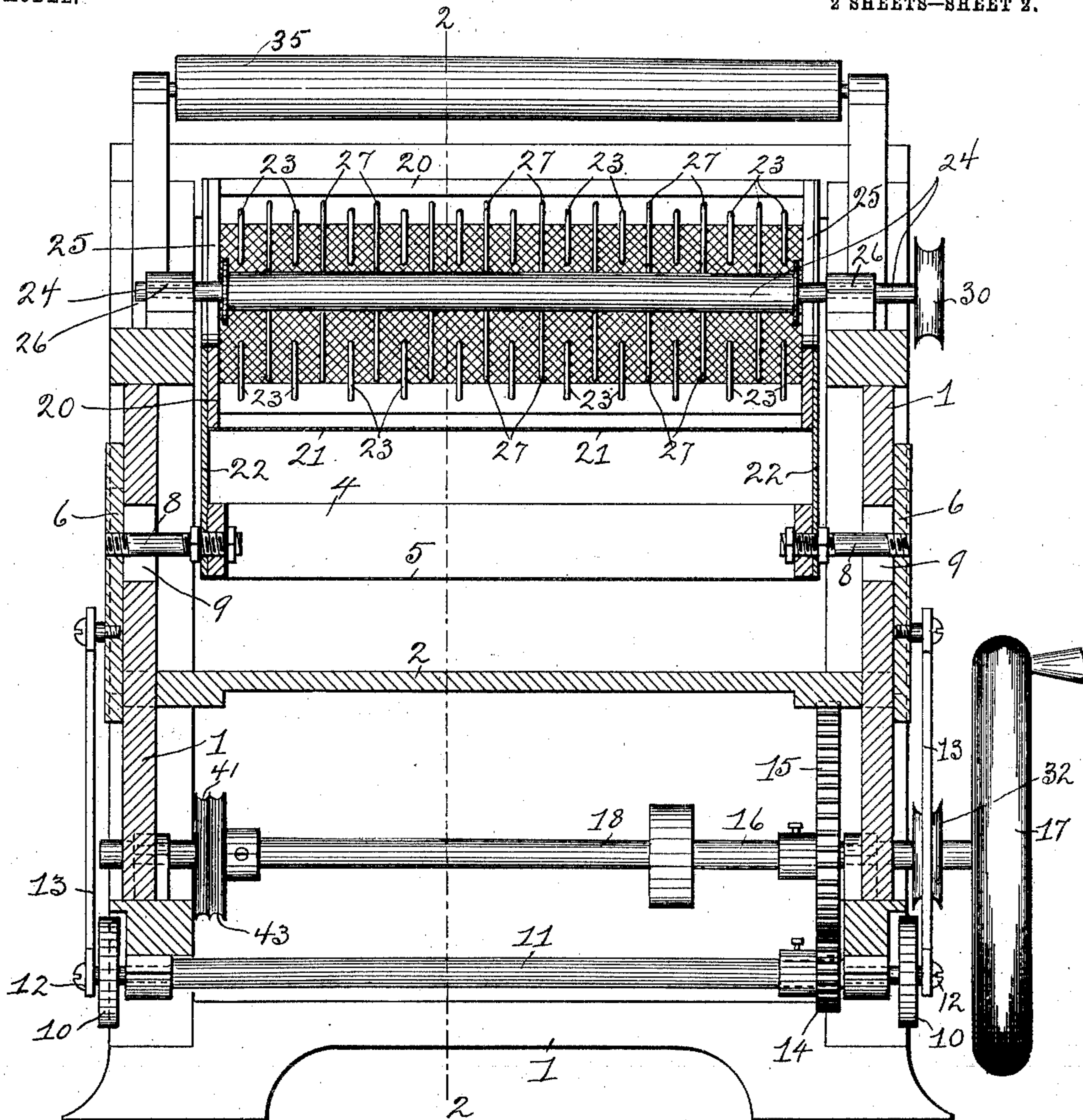


FIG 3

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN MORRISON, OF TROY, NEW YORK, ASSIGNOR TO UNIVERSAL BRUSH COMPANY, OF TROY, NEW YORK, A CORPORATION OF NEW YORK.

BRUSH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 760,137, dated May 17, 1904.

Application filed May 20, 1903. Serial No. 157,976. (No model.)

To all whom it may concern:

Be it known that I, JOHN MORRISON, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Brush-Machines, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described, and subsequently claimed.

Reference may be had to the accompanying drawings and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures.

Figure 1 of the drawings is a view in side elevation of the improved brush-making machine. Fig. 2 is a central vertical longitudinal section of the same, taken on the broken line 2 2 in Fig. 3. Fig. 3 is a vertical cross-section of the same, taken on the broken line 3 3 in Fig. 1, the aprons and belts being removed for convenience of illustration. Fig. 3 is drawn on an enlarged scale.

This invention relates to brush-making machines of the type shown in United States Letters Patent No. 570,604, dated November 3, 1896, granted to William Morrison for improvements in brush-machines, to which patent reference may be had for a more complete understanding of the present invention. In using machines of this type it is found that the bristles tend to become bunched together in the hopper, so as to interfere with the feeding operation of the hopper, and an important object of this invention is to prevent such bunching of the bristles and to supply to the feeding-hopper bristles in such quantities that the tendency to accumulate in bunches therein shall be overcome.

Other objects of the invention will appear in connection with the following description.

Referring to the drawings, wherein the invention is shown in its preferred form, 1 represents the framework of the machine provided with a horizontal shelf 2, which forms a support for the bristle-receiving plate 3,

formed with apertures in the usual manner, into which bristles of short length are inserted in the operation of making a brush. This bristle-receiving plate may be a part of the brush itself, as a face-plate for a brush-back or a plate forming only a temporary support for the bristles, as is well understood in the art.

Located above the plate-support 2 is the bristle-feeding hopper 4, having a reticulated bottom 5, through which the bristles pass from the hopper when agitated downwardly into the apertures in the bristle-receiving plate beneath. The hopper 4 is rigidly connected with and supported by the slide-plates 6, vertically movable in slideways 7 on opposite sides of the frame of the machine, the hopper being connected with said slide-plates by means of the horizontal bolts 8, which pass through vertically-elongated slots 9 in the frame of the machine. The hopper 4 is reciprocated to agitate the bristles contained therein and cause the same to pass down through the reticulated bottom 5 by means of the crank-disks 10, fixed upon opposite ends of the shaft 11, the crank-pin 12 of each of said disks being connected by a pitman 13 with one of the slide-plates 6. Rapid rotary movement is imparted to the shaft 11 through the pinion 14, fixed thereon in position to engage the gear 15 on the main drive-shaft 16, which may be operated by means of the hand-wheel 17, fixed thereon, or by a belt (not shown) applied to the pulley 18, fixed thereon. By operating the shaft 16 a jarring movement can be imparted to the hopper 4, which will cause bristles therein to be agitated, the bristles assuming various positions in the hopper, in some of which positions the bristles will be presented to the reticulated bottom 5 in an endwise position, such that they will freely pass down there-through into the apertures in the subjacent plate 3.

As a means for supplying the feeding-hopper 4 with bristles a bristle-supplying hopper 20, having a reticulated bottom 21, is supported above the hopper 4, preferably by means of uprights 22, erected from the hopper 4, whereby the two hoppers are rigidly connected together, and the supply-hopper is

adapted to partake of the reciprocating jarring movements of the feeding-hopper. The supply-hopper is preferably provided with one or more combs 23, the teeth of which project interiorly thereof in lines approximately radial to the stirrer-shaft 24, which extends longitudinally through the supply-hopper, passing out through the opposite ends thereof through vertically-elongated slots 25, formed therein, to stationary bearings 26 on the frame of the machine. The stirrer-shaft is provided with teeth 27, alternating with the teeth of the combs, so that the stirrer-teeth move freely through the spaces between the comb-teeth as the shaft 24 is rotated by means of the pulley 30, fixed thereon, and connected by belt 31 with the pulley 32, fixed on the drive-shaft 16. Bristles placed in the supply-hopper will be constantly agitated by the jarring movement thereof, which causes them to pass down through the reticulated bottom 21 in the same manner that the bristles pass down through the bottom of the feeding-hopper, while at the same time the bunches into which the bristles tend to form themselves when placed in quantities in a hopper and agitated are broken up and disintegrated by the frequent passage therethrough of the teeth on the stirrer-shaft, which force the bunches of bristles against the combs. The bristles are thus supplied to the subjacent feeding-hopper so dissociated and in such quantities that they do not interfere with the feeding operation thereof.

As a means for returning to the supply-hopper bristles which fall from the feeding-hopper down past or through the support 2, as well as bristles which fall upon the plate 3, without entering the holes therein and which are brushed off from said plate by the operator as the plate is removed from the machine a pair of endless belts is provided, one of which, 33, is adapted to deposit bristles placed thereon into the supply-hopper which it overhangs and the other, 34, extends beneath the support 2 and is adapted to deliver bristles deposited thereon to the apron 33. The apron 33 is supported on a pair of guide-rollers 35 and 36 and the apron 34 on a similar pair of rollers 37 and 38. To enable the apron 34 to deliver bristles to the apron 33, the guide-rollers are arranged those of each apron in a plane passing between those of the other apron, and the apron 33 is applied so as to extend directly from one of its rollers to the other, while the apron 34 is applied to extend intermediately of its rollers around the roller 36 of apron 33 more remote from the supply-hopper and in engagement with the apron 33, where the same passes around said roller 36. Bristles deposited upon the apron 34 are thus carried by the movement of the apron in an inclined direction upwardly between the two aprons, where the same are in engagement with each other upon the roller 36, after pass-

ing which roller the bristles will be deposited upon the apron 33, and thereby conveyed to the supply-hopper, into which they fall from the apron as the same passes around the roller 35. Rotary movements are imparted to the roller 38 to operate the apron 34 by means of a belt 40, connecting said roller with a pulley 41, fixed on the drive-shaft 16, and rotary movements are in like manner imparted to the roller 36 to operate the apron 33 by means of a belt 42, connecting said roller with a pulley 43, fixed on said drive-shaft.

A stripper 44 is provided to remove bristles adhering to the apron 34 after the same passes out of contact with the apron 33. The stripper may be omitted, if desired.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a brush-machine, the combination with a bristle-feeding hopper having a reticulated bottom; and a support for a bristle-receiving plate beneath said hopper; of a bristle-supplying hopper above the bristle-feeding hopper; and means for causing agitation of the bristles in the respective hoppers.

2. In a brush-machine, the combination with a bristle-feeding hopper having a reticulated bottom; and a support for a bristle-receiving plate beneath said hopper; of a bristle-supplying hopper supported in fixed relation to the bristle-feeding hopper at a distance above the latter sufficient to enable the bristles to fall freely thereinto from the supplying-hopper, and means for agitating the hoppers.

3. In a brush-machine, the combination with a bristle-feeding hopper having a reticulated bottom; means for agitating said hopper; and a support for a bristle-receiving plate beneath said hopper; of a bristle-supplying hopper above the bristle-feeding hopper; and a bristle-stirrer working within the bristle-supplying hopper.

4. In a brush-machine, the combination with a bristle-feeding hopper having a reticulated bottom; and a support for a bristle-receiving plate beneath said hopper; of a bristle-supplying hopper above the bristle-feeding hopper; means for agitating said hoppers; and a bristle-stirrer working within the supplying-hopper.

5. In a brush-machine, the combination with a hopper having a reticulated bottom; of a comb projecting interiorly of the hopper; and a toothed bristle-stirrer working within the hopper with its teeth in line with the spaces between the teeth of said comb.

6. In a brush-machine, the combination with a hopper having a reticulated bottom; of a comb projecting interiorly of the hopper; a shaft extending through the hopper; means for rotating said shaft; and teeth projecting from said shaft alternating in position with the teeth of said comb.

7. In a brush-machine, the combination with a hopper having a reticulated bottom; of a

comb projecting interiorly of the hopper; a shaft extending through the hopper; means for rotating said shaft; teeth projecting from said shaft alternating in position with the teeth of said comb; and means for agitating the hopper.

8. In a brush-machine, the combination with a bristle-feeding hopper having a reticulated bottom; a support for a bristle-receiving plate beneath said hopper; means for agitating said hopper; and a bristle-supplying hopper having a reticulated bottom arranged above said bristle-feeding hopper; of a comb projecting interiorly of the bristle-supplying hopper; and a toothed bristle-stirrer working within said bristle-supplying hopper with its teeth in line with the spaces between the teeth of said comb.

9. In a brush-machine, the combination with a bristle-feeding hopper having a reticulated bottom; and a support for a bristle-receiving plate beneath said hopper; of a bristle-supplying hopper having a reticulated bottom supported above said bristle-feeding hopper; a comb projecting interiorly of the bristle-supplying hopper; a toothed bristle-stirrer working within said bristle-supplying hopper with its teeth in line with the spaces between the teeth of said comb; and means for agitating said hoppers.

10. In a brush-machine, the combination with a support for a bristle-receiving plate, and mechanism for inserting bristles into a

plate located on said support; of an endless traveling apron extending beneath said support transversely of the path of loose bristles falling therefrom, adapted to receive said bristles and remove the same from beneath said support by a continuous operation, without rearrangement, in the position in which they are deposited upon said apron; and means for returning to the bristle-inserting mechanism the bristles so deposited upon said apron.

11. In a brush-machine, the combination with a support for a bristle-receiving plate, and mechanism for inserting bristles in a plate deposited on said support; of an endless apron adapted to deposit bristles in said bristle-inserting mechanism; a pair of guide-rollers for said apron; an endless apron extending beneath said plate-support adapted to receive loose bristles falling therefrom; and guide-rollers for the latter apron arranged in a plane passing between said other guide-rollers, whereby the latter apron is forced into contact with the first-mentioned apron where the same passes around the guide-roller more remote from the bristle-inserting mechanism.

In testimony whereof I have hereunto set my hand this 7th day of May, 1903.

JOHN MORRISON.

Witnesses:

FRANK C. CURTIS,
E. M. O'REILLY.