(No Model.) 2 Sheets—Sheet 1.

J. F. HARTIGAN.

MACHINE FOR SPLITTING CIGARETTES.

No. 553,583. Patented Jan. 28, 1896.

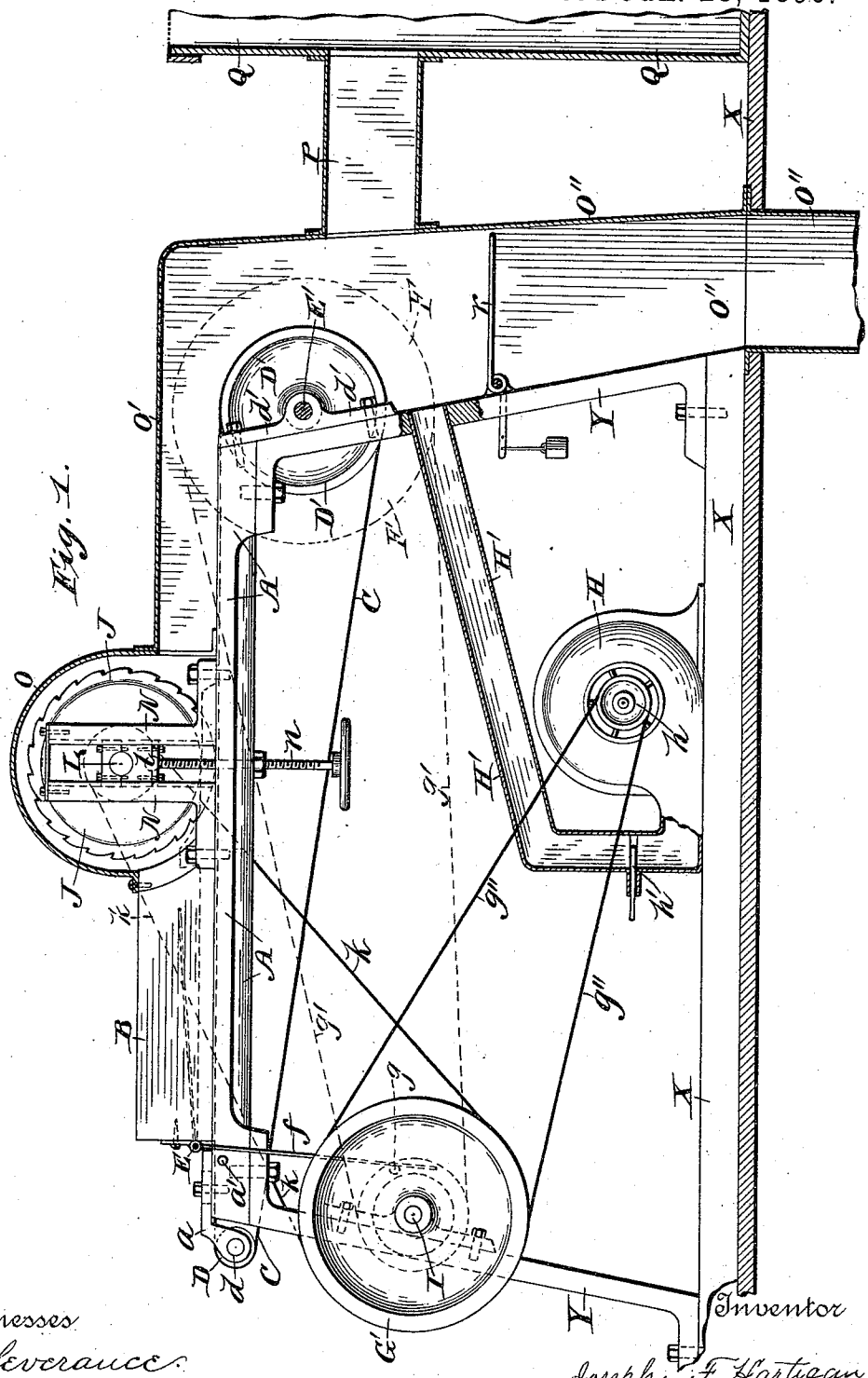

Fig. 1.

Witnesses
Severance.
M. R. M. Frayser.

Inventor
Joseph F. Hartigan
By E. F. Clark
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(No Model.) 2 Sheets—Sheet 2.

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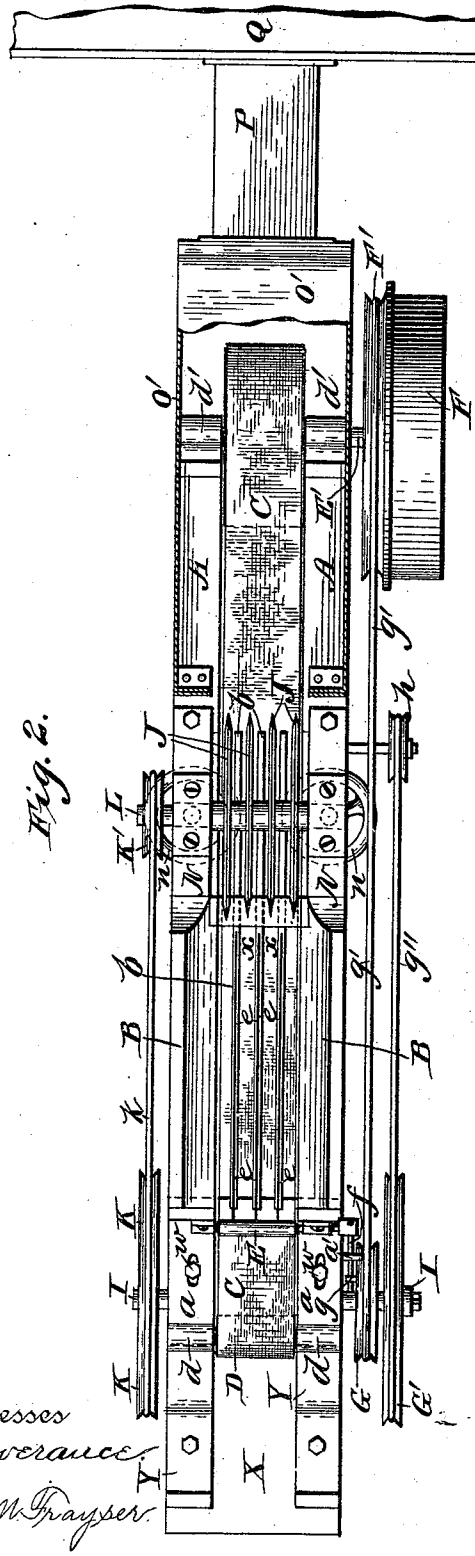

Fig. 2.

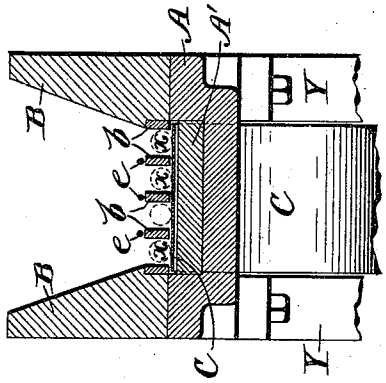

Fig. 3.

Witnesses
Severance.
M. A. M. Frayser.

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By E. B. Clark
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UNITED STATES PATENT OFFICE.

JOSEPH FRANCOIS HARTIGAN, OF SALEM, VIRGINIA, ASSIGNOR OF ONE-HALF TO HENRY C. ELLIOT, OF NEW YORK, N. Y.

MACHINE FOR SPLITTING CIGARETTES.

SPECIFICATION forming part of Letters Patent No. 553,583, dated January 28, 1896.

Application filed December 9, 1892. Serial No. 454,623. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH FRANCOIS HARTIGAN, a citizen of the United States, residing at Salem, in the county of Roanoke and State of Virginia, have invented certain new and useful Improvements in Machines for Splitting Cigarettes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a cigarette-splitting machine adapted for splitting or opening the wrappers of defective cigarettes in order to recover the tobacco and separate it from the paper or other wrappers.

The object of the invention is to provide for rapidly feeding large numbers of cigarettes which may be thrown promiscuously into a hopper and by means of suitable devices straightened and arranged in parallel channels and then subjected to revolving knives or cutting-disks, by means of which the wrappers are split longitudinally, thus releasing the tobacco, after which the loose tobacco and wrappers are conducted forward and separated by a current of air.

In the manufacture of cigarettes by machinery as now usually practiced a part of the product is unmerchantable, being either too light or too heavy or of uneven size, so that they are rejected by the packer. In order to recover the tobacco the wrappers must be split open and separated therefrom, and this operation is rapidly and effectively accomplished by my machine.

The matter constituting my invention will be defined in the claims.

My machine is illustrated in detail in the accompanying drawings, in which—

Figure 1 represents a side elevation partly in vertical section. Fig. 2 represents a top plan view with the hood removed. Fig. 3 represents a transverse section, on enlarged scale, through the hopper and feeding devices.

The working parts of my machine are suitably mounted upon the frame A, which is supported by the legs Y upon the base X, and within the top frame A is secured the belt-supporting table A′, preferably of hard wood. The frame A and legs Y may be of cast metal.

On top of frame A near its front end is mounted the hopper B, having outwardly-flaring walls, which converge to the feeding and regulating devices at the bottom, arranged just above the belt C and its supporting-table A′. In the bottom of the hopper, a short distance above the table A′, I secure a series of hard-wood strips or fingers *b*, extending longitudinally from the front end thereof forward between the cutting-disks, as shown in Fig. 2, providing intervening spaces or channels *x* between them of about the same width as the cigarette. These channels, however, are preferably a little wider than the diameter of a cigarette, so that cigarettes may pass freely through them between the parallel fingers *b*. A sufficient space is left between the lower edges of the strips *b* and the table A′ for passage of the conveying-belt C. For the purpose of illustration, I have shown but four guide-channels *x* between the longitudinal strips *b;* but in practice I may use from five to twenty of such guide-channels and a corresponding number of cutting-disks.

Within the hopper I arrange an agitating and regulating device for straightening the cigarettes and arranging them in the parallel channels, and such device is composed of the longitudinal wires or rods *e*, resting loosely just above the top edges of the strips *b* and connecting at their rear ends with the transverse rock-shaft E, which is supported in suitable journals on the top frame. With one end of rock-shaft E, which projects beyond the machine, there is rigidly connected a lever-arm *f*, projecting downward and slightly forward to or below the level of shaft I of the belt-wheel G, which is provided with a side pin *g* adapted to strike against arm *f* as the wheel revolves, thereby oscillating rock-shaft E and raising and lowering the agitating-rods *e* in the hopper. To the top of the side frames A, at the front end of the machine, are adjustably secured two brackets or hangers *a*, provided with bearings *d*, in which are mounted the shaft of the belt-roller D. The horizontal arms of the hangers are provided with longitudinal slots, whereby the belt-roller D may be adjusted out or in and secured in place by the set-screws *w*, as shown in Fig. 2. The other belt-wheel D′ is

mounted upon the shaft E′ in bearings in the brackets *d′*, secured to the legs Y at the rear end of the machine.

The conveying-belt C may be made of canvas, leather, or rubber, and is passed over the wheels D and D′ and is supported by the table A′, which is set in the frame with its top surface slightly below the top surfaces of the side frames A, so as to provide a channel for the passage of the belt below the guide-fingers *b*, as shown in Fig. 3. The guide-fingers *b* are secured to the front end of the hopper and may be held at their forward end by a cross-bar adjacent to the cutting-disks, as shown in Fig. 2.

The cutting-disks J, in any desired number from four, as shown, up to twenty, are mounted upon a transverse shaft L, which is supported in the adjustable journal-boxes *l*, fitted in the supporting-standards N on each side of the machine, as shown in Figs. 1 and 2. The journal-boxes *l* are adjustable in suitable position by means of the vertical screws *n* on each side of the machine for suitably regulating the height of the knives above the channels *x*. The cutting-disks J may be formed either with plain or serrated peripheral edges, which should be made sharp for cleanly cutting the cigarette-wrappers. The main driving-pulley or belt-wheel F having a groove F′ is mounted upon the transverse shaft E′, which also carries the belt-wheel D′, and a round belt *g′* passes from the groove F′ to the pulley G, secured upon the transverse shaft I, which is mounted in suitable bearings in brackets secured to the legs Y at the front of the machine.

A large belt-wheel K is secured to the opposite end of shaft I, and is provided with a belt *k*, passing over the pulley K′ upon the shaft L, which carries the cutting-disks J. A large belt-pulley G′ is also secured on shaft I and is provided with a belt *g″*, which passes over the pulley *h* on the shaft of the fan-blower H. An air-pipe H′ having a valve *h′* connects the blower with the delivery-hood O′ and its chute O″. The main driving-pulley and its belt *g′* are shown in full lines in the plan view, Fig. 2, and are indicated by dotted lines in Fig. 1.

A semicircular hood O is preferably placed over the cutting-disks, and a hood O′ incloses the rear end of the machine and has projecting downward from it the tobacco-chute O″. A pipe P, of any desired length, connects the front of hood O′ with a box or chamber Q for receiving the separated paper wrappers, and which in practice is covered by wire-netting or other material having an open mesh, which will permit the escape of air, but retain the wrappers.

As shown in Fig. 2, the escape-pipe P is arranged in line with the air-pipe H′, so that the wrappers may be blown directly through pipe P into box Q, while the tobacco, being of greater gravity, will fall down through the chute. I preferably arrange in the chute O″, a short distance below the mouth of air-pipe H′, a counterbalanced valve *r*, which is adapted to sustain a certain weight of tobacco and which when overweighted will be tripped or depressed, thereby permitting the tobacco to slide through the chute O″ into a receptacle below.

The machine having been constructed and the belts adjusted as above described and as shown in the drawings, the operation of splitting cigarette-wrappers is very simple and is almost automatic in action. The cigarettes in bulk, or in a comparatively large quantity, may be deposited in the hopper B, where the vibrating rods *e* will quickly regulate and arrange them longitudinally and in parallel rows in the channels between the guide-fingers, so that the traveling belt C carries them forward under the series of revolving cutting-disks J, by means of which the wrappers are split longitudinally, thereby releasing the tobacco. The loose tobacco and wrappers are now carried forward by the belt and deposited into the hood or chamber O′ at the end of the machine, where a suitably-regulated current of air admitted by a pipe H′ impinges upon the opened wrappers as they fall from the belt and carries them through the outlet-pipe P into the receiving-chamber Q, where the air is permitted to escape through suitable interstices in the open-mesh cover. The tobacco, being of greater gravity than the paper wrappers and also presenting less surface to the air-current, drops down upon the counterbalanced valves *r*, where it accumulates till of sufficient weight to trip the valve, when it is dumped into the chute O″, and thence into a receptacle below. It is important to control the strength of the air-current by a valve, as *h′*, so as to avoid blowing the tobacco into chamber Q.

It is evident that the defective cigarettes may be fed by hand and arranged in the longitudinal channels *x* between the guide-fingers *b* without using the vibrating rods in the hopper, and very good results be secured; but I have found in practice that the vibrating rods aid materially in regulating and arranging the cigarettes and make the machine more nearly automatic in action, but I do not wish to be confined to the use of the vibrating rods in connection with the guide-fingers. I propose also to construct and operate the machine without the guide-fingers *b*, but use only in the hopper the vibrating rods *e* above the carrier-belt C, and this may be accomplished with fairly-good results, for the reason that the vibrating rods, acting alone, will arrange a large proportion of the cigarettes in longitudinal position and nearly parallel rows, so that the wrappers will be mostly split by the revolving cutting-disks and even if the wrappers are not all split exactly lengthwise still they will be opened so as to separate the tobacco therefrom. I do not wish to be confined, therefore, to the use of the guide-fingers *b* in connection with the vibrating

rods *e*, since advantageous results may be secured with the vibrating rods operating in the hopper above the carrier-belt.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for splitting cigarettes, the combination with a conveying or feed belt and guide strips or fingers forming longitudinal channels above said belt, of cutting devices, working longitudinally in said channels, and suitable operating mechanism.

2. The combination with a hopper and traveling feed belt therein, of longitudinal agitating rods above the belt for regulating and straightening cigarettes into parallel rows, rotary cutting disks above the belt and operating in connection therewith for splitting the cigarettes, and suitable operating mechanism.

3. The combination with a feed belt and guide strips or fingers forming longitudinal channels above said belt, of agitating rods above said strips, means for giving said rods a vibrating motion, rotary cutting disks between said strips, and suitable operating mechanism.

4. The combination with the feed belt and guide strips or fingers above the same, of a transverse rock-shaft having agitating rods above the belt, cutting devices working longitudinally between said guide strips, and suitable operating mechanism.

5. In a cigarette splitting machine, the combination with a traveling belt and means for straightening and guiding cigarettes longitudinally above said belt, of a transverse shaft having a series of rotary cutting disks, said shaft being arranged above the belt in adjustable journal boxes in guide ways, and means for vertically adjusting said boxes,—the edges of said disks working adjacent to said belt for splitting cigarettes, and suitable operating mechanism.

6. In a machine for splitting cigarettes, the combination with a hopper or box and a traveling feed belt therein, of means for straightening and guiding cigarettes longitudinally above said belt, cutting devices working longitudinally, with their edges above and adjacent to said belt, for splitting cigarettes, and suitable operating mechanism.

7. In a machine for splitting cigarettes, the combination with means for feeding cigarettes, means for straightening and guiding them longitudinally and cutting devices adapted for splitting the wrappers, of a hood or chamber at the delivery end of the machine, having a downwardly extending tobacco chute, an outlet pipe, P, for wrappers, extending horizontally from said hood and chute, and a blower and pipe provided with a valve for controlling the strength of the air current, connecting said blower with the side of said chute opposite the outlet pipe.

8. In a cigarette splitting machine, the combination with means for feeding cigarettes, means for straightening and guiding them longitudinally and suitable cutting devices, of a hood or chamber and a downwardly extending chute at the delivery end of the machine, a counterbalanced valve, *r*, in said chute, a discharge pipe for wrappers above said valve, a blower and a pipe connecting it with the chamber or chute above said valve, and means for regulating the air current for blowing out the wrappers.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH FRANCOIS HARTIGAN.

Witnesses:
THOMAS H. URICKLES,
ALBERT G. LUM.