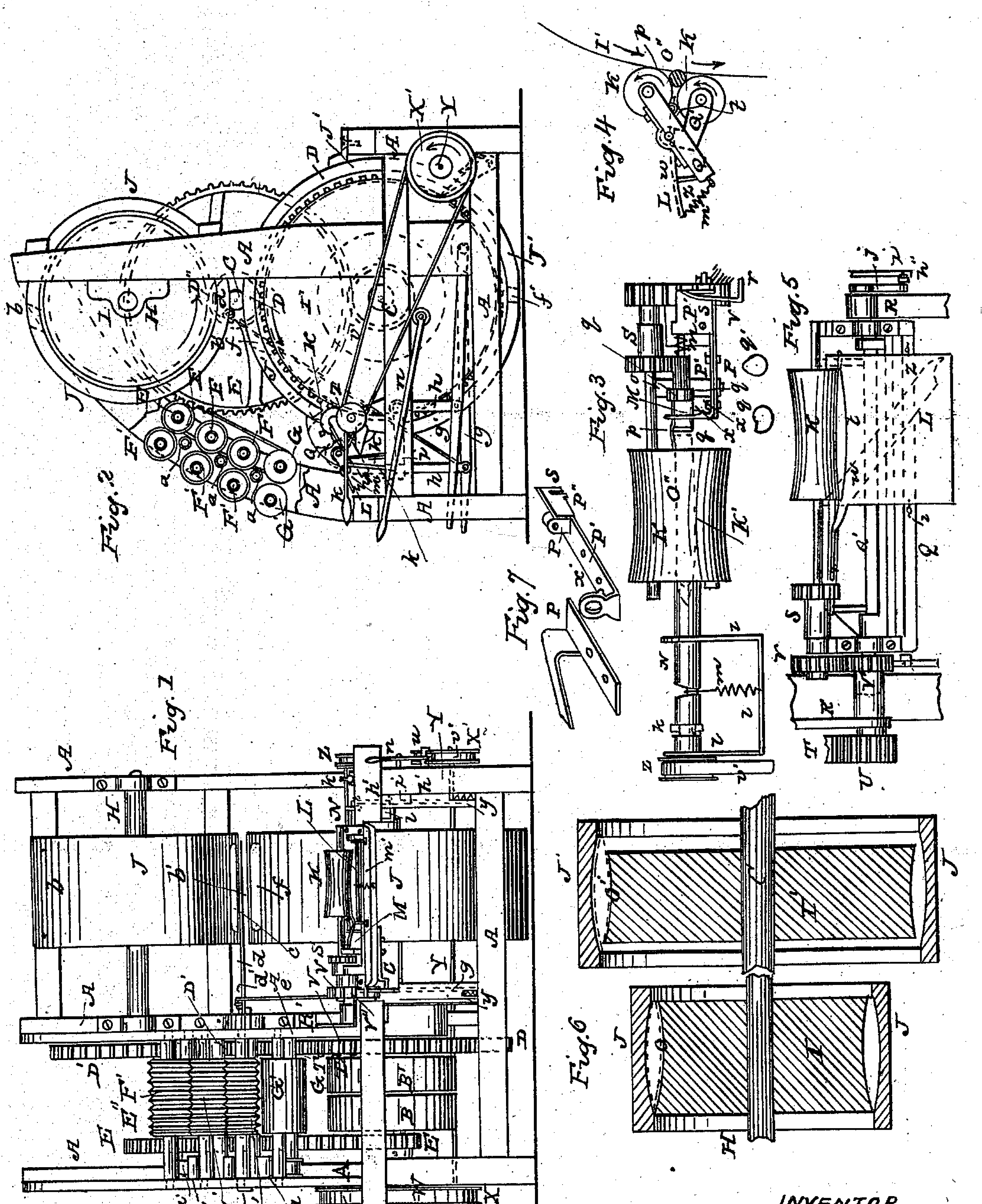
I. A. HEALD.

Cigar Machine.

No. 35,442. Patented June 3, 1862.



WITNESSES

INVENTOR

UNITED STATES PATENT OFFICE

I. A. HEALD, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN MACHINES FOR MAKING CIGARS.

Specification forming part of Letters Patent No. **35,442**, dated June 3, 1862.

To all whom it may concern:

Be it known that I, I. A. HEALD, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Machines for Making Cigars; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In the drawings, Figure 1 is a front elevation, a portion of the frame A being broken off to show the frame Q. Fig. 2 is a view in side elevation. Fig. 3 is a rear elevation showing detached from the frame-work rollers K K′, sleeve M, &c. Fig. 4 is an end elevation showing rollers K K′, frame Q Q′, &c. Fig. 5 is a plan view in detail, showing roller K, apron L, frame Q, &c. Fig. 6 is a vertical cross-section through the cylinders I I′ and cylindrical casings J J′. Fig. 7 is a view showing sliding frames P P′.

The nature of my invention consists in, first, the use of grooved rollers F F′, the grooves and ridges of which fit into each other by pairs, but gradually lessen in depth from the pair between which the leaf or wrapper is first inserted to the last pair, which are smooth, as seen at G′, Fig. 1; second, the use of cylinders and cylindrical casings so constructed that the space between the periphery of the cylinder and the inner surface of the casing shall, whenseen in cross-section, correspond to the longitudinal section of a cigar of any required shape or size, for the purpose of forming the "fillers" of cigars, (see Fig. 6;) third, the combination of two rolls with a cylinder, the peripheries of all of which correspond to the required shape of a cigar, and are made to revolve at a proper speed and in a proper direction to revolve the filler or core at a suitable point on the periphery of the cylinder during the wrapping or finishing process, the bearings of the two rolls being in a rock-frame, so that they may be thrown off from the cylinder to let the filler between them or the finished cigar fall out; fourth, the employment of a finger or its equivalent for the purpose of facilitating the wrapping process at that end of the filler around which the wrapper commences to wind by holding the end of the wrapper onto the filler during the first revolution of the filler, after which the wrapper binds itself; fifth, the revolving slidi
N, provided with a conical aperture
able size and shape to admit the poin
of a cigar, and having a slot the length
aperture, to admit the last end of the w
as it is wound around the pointed and i
end of the cigar, the object of which
inafter set forth; sixth, the use of an a
which to place the wrapper (see Fig.
paratory to its being rolled onto the f
combination with a friction-roller fo
tating the insertion of the wrapper,
structed that the said roller is made to
by pressing against the roll K, betwee
two the wrapper passes at a proper t
the finger to catch it and hold it onto
sure its certain winding around the fill
lastly, the general construction and a
ment of the other devices herein set f

I will now describe the constructi
operation of my invention, so that those
in the art may be enabled to make and

A A represent the general frame-
the machine.

B is the driving-pulley through
power is communicated to the machi
runs loose on shaft C, its hub extending t
gear E′ and pulley W, forming a bea
left end of shaft C, as seen in Fig. 1.

B′ is a loose pulley.

C is the main shaft, on which gear-
and cylinder I′ are fastened.

D is a large gear-wheel; D′, small gea
on shaft C′.

D² is a gear on shaft H, driven by g
and giving motion to cylinder I.

E is a large gear-wheel on shaft
small gear-wheel fastened on hub of
pulley B, and through which power
municated to shaft C and cylinder I′,
duced speed, by means of the arrange
gears D, D′, and E; E″, gear for driving
F and G by belt *a*′. (See Fig. 2.)

F is a series of corrugated rollers, the
of which gradually lessen in depth f
first one (to which gear E″ is attached
last one, next the smooth roller G. (S
1 and 2.) F′ and G′ are rollers similar i
and object to rollers F and G, and (w
tobacco-leaf is between the two series)
volved by friction, the bearings of r
and G′ being in slots grooved upward

series F and G, (see dotted lines, Fig. 2,) so that a leaf may be admitted between the two series, its resistance crowding them apart, while the required pressure of rollers F′ and G′ is produced by their own weight or other suitable means.

G and G′ are smooth rollers.

H is a shaft of gear D″ and cylinder I′.

I is a revolving cylinder or wheel having its slightly-concave periphery or edge coincident with the slightly-convex outline of a cigar when applied to it in a direction parallel to its axis. (See Figs. 1, 2, and 6.) I′ is a similar cylinder, but sufficiently thinner on the periphery or edge to admit of finishing the pointed end of the cigar projecting beyond it, by means hereinafter set forth.

J is cylindrical casing surrounding cylinder I, and slightly concave on its inner surface, so that the space between the casing and cylinder shall be fitted to receive and coincide in all points with a cigar parallel to their axes; J′, a similar casing around cylinder I′.

K is a roller, the concavity and length of which correspond with cylinder I′, and is driven by means of gears V V′ U and T T. It revolves in a direction indicated by the arrow, Fig. 4, and its periphery at a speed equal to that of cylinder I′, and having its bearings in rock-frame Q, it can be thrown up and from said cylinder at a proper time and distance to admit the rolled filler between it, cylinder I′, and roller K′, which is done by pressing the foot on the treadle *g*, connected with rock-frame Q by means of connecting-rod *h*.

K′ is a roller similar in size and shape to roller K, but having its bearings in rock-frame Q′, and is thrown down and from cylinder I′ to let out the finished cigar, which is done by pressing upon foot-treadle *g′*, connected to rock-shaft Q′ by means of connecting-rods *h′ h″*, lever *i*, and arm *j*, and is driven by means of gear V″ working into gear V′. (See Figs. 3 and 5.)

L is an apron or platform upon which the wrapper is laid preparatory to being rolled upon the filler, as seen in Fig. 5, and is hung on points Z Z, and has an arm projecting to spring-catch O.

M is a sleeve or hollow gear-shaft, made to revolve and slide on a stud (the head of which is cam *q*) by means of the toothed end, which works into gear S and pin *x* and projection *x′*, the center being on a line with the center of the cigar O″.

N is a sliding revolving shaft, for the purpose of finishing the pointed end of the cigar, the end next to rollers K K′ being provided with a conical aperture of a proper shape and size to admit the pointed end of a cigar, the side next the apron being provided (when the crank is down) with a slot (see dotted lines in Fig. 3) the length of the conical aperture, in order to admit the wrapper as it is wound around the filler.

O is the filler; O′, the cigar being finished.

P is a frame bolted onto and is a continuatiog of rock-frame Q, and forms a bearing for the sliding frame P′.

P′ is a frame sliding on frame P, in which the stud (of which cam *q* is the head) is made fast in hole *p′*.

P″ is a continuation of sliding frame P′.

Q is a frame rocking on rock-shaft Q′, and onto which frame P is attached, and into which rest bearings of roll K, the whole being operated and thrown up and from cylinder I′ by means of treadle *g*.

Q′ is a rock-shaft, into which rest bearings of roll K′, and one end of which rocks in the hollow gear-wheel V, the other in holder or box R, and is operated by means of treadle *g′* and its connections *h′ h″ i*, and arm *j*, throwing roll K′ down and from cylinder I′, to let out the finished cigar.

R is a box for the right-hand bearing of the rock-shaft Q′, and is attached to frame A; R′, box for the bearings of gears U and V′, and is secured to A.

S is a gear-wheel on shaft of roller K, and giving motion to sleeve M.

T is an intermediate gear-wheel connecting gear U with gear T′.

U is a gear-wheel, the bearing of which runs in box R′, and communicates motion to gears V and V′; V, gear on shaft of roller K from gear V′, receiving the motion it gives to said roller; V′, gear on hub of gear U, and giving motion to gears V and V″; V″, gear on shaft of roller K′, and giving it motion from gear V′; W, a pulley on hub of pulley B, and giving motion to pulley X by means of belt *v*; X, pulley on shaft Y; X′, pulley on other end of shaft Y.

Y is a shaft running the whole length of the machine, and giving motion and increased speed to the pulley Z by means of the belt V′.

Z is a pulley on the shaft N.

a represents friction-rollers operating on belt *a′* to give the requisite tension.

b′ is an aperture near the bottom of cylindrical casing J, of suitable size and shape to let out the filler after being rolled.

b is an aperture of suitable shape and size near the top of cylindrical casing J, to admit a sufficient quantity of tobacco to form the filler of a cigar.

c is a hinged door for closing the aperture *b′* while the filler is rolling, and of unclosing it when it is desired to drop it out.

d is a shaft which serves as the hinge-rivet of door *c*, being tight in those halves of the hinges attached to the door, and loose in the halves fastened to the casing.

d′ is an arm on shaft *d*, through which rod *e* passes; *e*, connecting-rod between arm *d′* and treadle *g*.

f is an aperture near the top of cylindrical casing J′, for receiving the rolled filler from aperture *b′*; *f′*, a similar aperture in bottom of casing J′, to let out the finished cigar.

g is a treadle operating at the same time door *c* and rock-frame Q; *g′*, a treadle operating

rock-shaft Q′ through connecting-rods *h′*, *h″*, and *i* and arm *j*; *h*, connecting-rod between treadle *g* and rock-frame Q; *h′*, connecting-rod between treadle *g′* and lever *i*; *h″*, connecting-rod between lever *i* and arm *j*; *i*, a lever imparting motion to rock-frame Q′ when the treadle *g′* is depressed; *j*, an arm rigidly attached to rock-frame Q′; *k*, a shipping-lever for sliding the revolving sliding shaft N to and from the pointed end of the cigar; *k′*, a stud attached to frame A, and serving as fulcrum for shipper *k*.

l is a frame, (attached to frame A,) in and through which revolving sliding shaft N plays.

m is a spiral spring attached at the bottom to frame *l* and at the top around the crank or eccentric formed in shaft N. The object of this device is to have shaft N always stop in its revolution with the crank down, thereby leaving the slot in its conical aperture at that point of revolution where the wrapper will meet and enter it while being wound around the filler over apron L. (See Fig. 3.)

m′ is a spiral spring, the lower end of which is attached to a stud in rock-frame Q, the upper end to apron L, so as to throw up that side of the apron next roller K as cam *q′* revolves against catch-spring *o*, detaching the arm of apron L from its notch, that friction-roll *t*, which is hung on points in apron L, and on which the wrapper of the cigar is laid, may be raised against roller K, the friction of which revolves roller *t*, thereby drawing in the wrapper at a suitable time; *m″*, a spiral spring for pressing sleeve M against cam *q*, and (consequently) the farther end of finger P near to the rollers K K′, except at that point of revolution when it is necessary that the said finger should clear the wrapper.

n is a lever (pivoted to frame A) in which the binder *u* revolves.

o is a spring, the bottom of which is fastened to frame P, the top resting against the arm of apron L. (See Fig. 5.) This arm, when depressed, catches into a notch in the spring, which holds it down until relieved by the contact of cam *q′* with the spring at the right time.

p is a finger attached to the sleeve M, revolving around the cigar, the object of which is to hold the wrapper onto the filler during its first revolution in order to insure the winding of the wrapper. This finger is drawn back by means of pin *x* and projection *x′*, and at the same time is raised up from the wrapper by riding over cam *q*, these motions occurring at the instant that the finger passes the edge of the wrapper, so as to clear and not tear the wrapper, the edge of which is in a line from the top of filler to the space between rollers K and *t*, as shown in blue in Fig. 4, together with the end of the finger where it first drops onto the wrapper to hold it onto the filler after it is relieved from the motions given it by cams *q*, pin *x*, and projection *x′*.

q is a fixed cam over which finger *p* rides, the longest projecting point being opposite the edge of the wrapper, as shown in Fig. 3.

q′ is a cam on sleeve M, for releasing the arm of apron L from the notch of spring *o* at the right time to draw in the wrapper to have the finger bear it onto the filler after the end of the wrapper runs between the filler and roller K and before it comes in contact with cylinder I′. (See Fig. 4.)

r is an arm (see Fig. 3) secured to frame A and passing through the slot *s* in frame P″, for the purpose of throwing back frame P′ and (consequently) finger *p* from rollers K K′ by means of treadle *g*, which raises P P′ P″ by means of rock-frame Q. The object of this arrangement is to keep the finger *p* from coming in contact with the end of the filler which projects beyond and outside of cylinder I′ and rollers K K′ as it rolls down between them.

s is the slot in which arm *r* plays.

t is a friction-roller for facilitating the insertion of the wrapping-leaf, and being made slightly convex, so as to coincide with the concavity of roller K′; *u*, roller in lever *n*, acting as binder to belt *v′*; *v*, loose belt connecting pulleys W and X; *v′*, belt on flanged pulleys X′ and Z.

w represents the wrapper of the cigar as laid at the proper angle on apron L.

x is a pin fitting tight into sleeve M. (See Fig. 3.)

x′ is a projection or cam on sliding frame P′, over which pin *x* revolves to throw back finger *p* from cylinder I′ and rollers K K′.

y y′ are spiral springs for throwing up foot-treadles *g* and *g′*.

z are points on which apron L rocks.

I will now describe the operation of my machine.

Power being applied to driving-pulley B, a tobacco leaf or wrapper is inserted between the first or deepest-grooved pair of rollers, F F′, which carry it between them and out from between the smooth rollers G G′, thus smoothing out the wrinkles. The proper shape, as seen in Fig. 5, is then given to it, and it is laid aside, ready to be wound around the filler. The hinged door being closed, a sufficient quantity of leaves to form the filler (or core) of a cigar is then put into the aperture *b* in top of cylindrical casing J. It is then, by means of cylinder I, carried around in the space between said cylinder and the casing, and at the same time rolled into a proper form to receive the wrapper. Treadle *g* is then depressed, opening door *c* and raising up roller K from cylinder I, thus permitting the filler to fall into aperture *f* of casing J′. Cylinder I′ then revolves it down between itself and casing J′ to roller K. The foot is then removed from treadle *g*, the hinged door closes, and roller K comes down on the filler, which is then revolved between rollers K K′ and cylinder I′. (See Fig. 4.) Here the wrapping and finishing are thus performed. A series of circular cutters (patented to me August 6, 1861) is then made to trim and shape the pointed end of the filler projecting beyond the cylinder I′. These cutters being removed, the shaft N is, by lever

k, slid toward cylinder I′ until the pointed end of the filler is inclosed within the conical aperture of the shaft N, the slot in said aperture being made to come opposite and next to the upper surface of apron L, in order to receive the last end of the wrapper as it is drawn off the apron. Apron L is now depressed until its arm catches into the notch of spring *o*. A wrapper is now laid on the apron at an angle, as shown in Fig. 5, the end next to roller K being between it and friction-roller *t*. Cam *q′* then releases apron L from the notch of spring *o*, when, by means of spring *m′*, roller *t* raises the wrapper into contact with roller K. Between these rollers the wrapper is then drawn in over the filler. (See Fig. 4.) The finger *p* then drops onto the wrapper, (see Fig. 4,) holding it onto the filler during the greater portion of the first revolution of the wrapper, after which it binds itself, and is drawn off the apron into slot of conical aperture of shaft N, which shaft is then made to revolve by pressing binder *u* against belt *v′*. The wrapper is thus smoothed down, and the point of the cigar is well finished. Shaft N is then slid back from the cigar, and the large end of the cigar is trimmed or squared by a device described in my patent above referred to. The finished cigar is then discharged at aperture *f′* by pressing upon treadle *g′*.

Having thus fully described the construction and operation of my machine, what I claim as new, and desire to secure by Letters Patent, is—

1. A series of grooved and smooth rollers, F F′ G G′, constructed and operating substantially as and for the purpose herein set forth and described.

2. The combination of cylinders I I′ and cylindrical casings J J′, constructed and operating substantially as and for the purpose herein set forth.

3. The combination of rollers K K′ with the cylinder I′, operating substantially as described, and for the purposes herein set forth.

4. Apron L and friction-roller *t*, in combition with rollers K K′, constructed and operating substantially as herein set forth.

5. Finger *p* or its equivalent, when operated substantially as described, and for the purpose set forth.

6. The revolving sliding shaft N, constructed and operating substantially as and for the purpose herein specified.

I. A. HEALD.

Witnesses:
T. H. ALEXANDER,
M. M. DOW.