L. P. COHEN.

Machine for Cutting Paper.

No. 205,527. Patented July 2, 1878.

Fig. 1

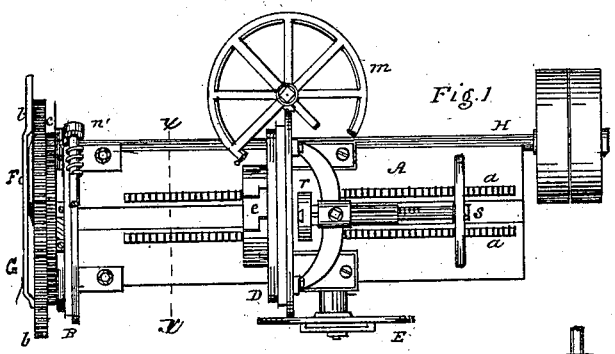


Fig. 4.

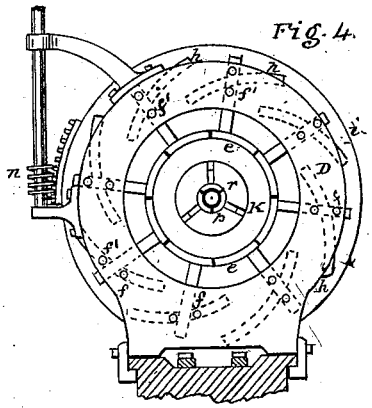


Fig. 2

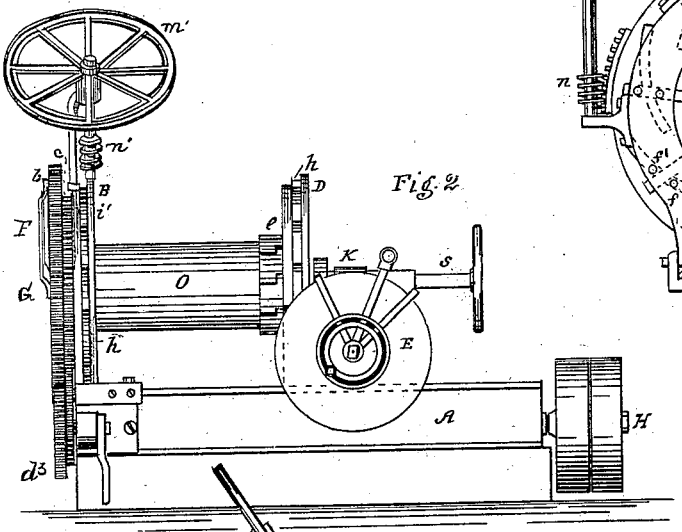


Fig. 5.

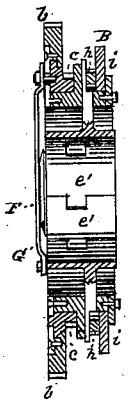


Fig. 3.

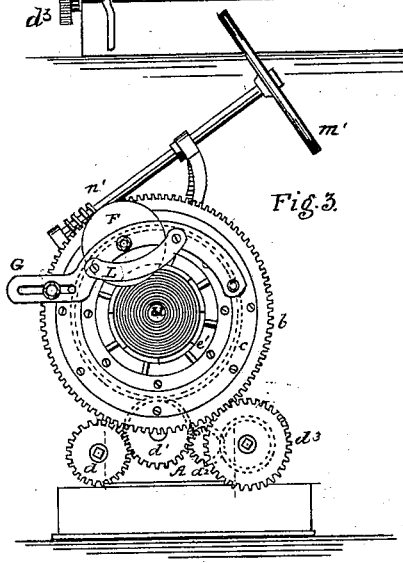
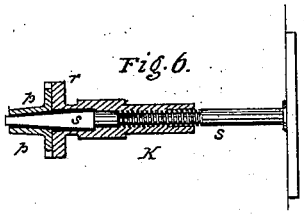


Fig. 6.



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UNITED STATES PATENT OFFICE.

LOUIS P. COHEN, OF NEW YORK, N. Y., ASSIGNOR TO JACOB COHEN, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR CUTTING PAPER.

Specification forming part of Letters Patent No. **205,527**, dated July 2, 1878; application filed November 10, 1877.

To all whom it may concern:

Be it known that I, LOUIS P. COHEN, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Machines for Cutting Paper Rolls; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming a part of this specification.

My said invention relates to improvements in a certain machine for cutting roll-paper invented by myself and one Ignatz Frank, and described in the specification of Letters Patent No. 167,645; and the object of my said improvements is to render the said machine more perfect and efficient in its operation by means of an improved construction and arrangement of the revolving knife and the appliances for clamping the paper or other material to be cut, and feeding the same to the knife.

My said improvements consist in constructing the knife in circular form, and in the means employed for causing the same to gradually approach nearer the center of the roll as it is revolved; also, in improved means for clamping the paper roll, and for holding the rear end of the same, so that there shall be no displacement by the pressure of the knife; also, in a novel device for preventing the binding of the knife within the cut, all of which is hereinafter particularly set forth.

In the accompanying drawing, Figure 1 represents a plan view of my improved machine; Fig. 2, an elevation of one side of the same; Fig. 3, a front elevation; Fig. 4, a vertical transverse section on the line *x x;* Fig. 5, a vertical transverse section of the cutter-head and stationary clamping-standard, and Fig. 6 a detail view, hereinafter explained. The three last-named figures are drawn to a larger scale than the others.

Similar letters of reference indicate the same parts in all the figures.

A represents the base or bed plate of the machine, which may be secured upon a frame or platform of suitable form and construction.

B is a stationary clamping-standard, attached to the cutter-head C at one end of the machine.

D is a movable clamping-standard, by which the rear end of the roll O is held, and which is attached to the base A by means of base guide-pieces, which fit upon guide-rails provided on each side of the said base, and is set by means of cog-wheels, which gear with the longitudinal racks *a* in the usual manner. This clamping-standard D is moved forward at regular intervals, according to the width of paper to be cut off, the extent of each forward movement being determined and regulated by means of any suitable gage, E, or by a ratchet movement.

F is the knife, which is of circular form, and is secured by means of a bolt and screw-nut to a curved bar, G, which latter is pivoted to a rim-wheel, *b*, at its forward end, (which has an elongated slot in which the pivot-pin works,) while the rear end of the said bar is pivoted to another rim-wheel, *c*. These two wheels *b* and *c* are driven by suitable gear-wheels *d* d^1 d^2 d^3 through the medium of the driving-shaft H, so that they both revolve in the same direction, but at different rates of speed, the outer wheel *b* making more revolutions per minute than the wheel *c*, and thereby causing the knife F to approach gradually nearer to the center of the roll held by the clamping-shells *e* as the said knife revolves around the said roll.

By means of the peculiar construction and movement of the knife, as above described, a perfectly clean cut is made, and any tearing or jagging of the edges is effectually obviated; and another advantage secured by this construction of the knife is that it can be used much longer without being sharpened, for the reason that, as it is rigidly fixed by the screw-nut to the bar G, only a small portion of its periphery is brought into contact with the paper, and when that part of the edge has become dulled, it can be shifted so as to bring a fresh portion of the edge into action, and so on, until each part of the periphery has in its turn been brought into use successively.

The wheel *b* has bearings upon flanges on the wheel *c*, while the latter has bearings upon a flange formed on the standard B, substantially as shown in Fig. 5; but I do not wish to be understood as confining my-

self to the exact construction therein shown, the object being to impart to the two ends of the bar G the unequal rates of speed above mentioned, so as to gradually bring the knife nearer to the center of the roll as the said knife revolves around the same.

The clamping-standards B and D are substantially similar in construction, except that the former is stationary and the latter movable, and that with the latter is combined a device, hereinafter described, for keeping the rear end of the roll in proper position as it is being operated upon by the knife.

The clamping-shells *e* and *e'* are provided with stems, which slide in corresponding grooves in the standard, and which have horizontal pins *f f f' f'* at their upper ends, which are operated by eccentric-cam pieces *h h* on the loose ring-plates *i i'* of the standards, so that the whole of the said clamping-shells are adjusted simultaneously to clamp or release the roll, such adjustment being effected by means of a worm and segment gear, *n n'*, and hand-wheel *m m'*.

K represents my improved device for holding the rear end of the roll to be cut, in which *p* are fingers standing lengthwise of the machine, and which are inserted into the usual opening at the center of the roll. At the rear end of each finger is a stem, which slides in a corresponding groove in a disk-plate, *r*, which is supported by a bracket attached to the standard D. On the said bracket is also a cylindrical sleeve, provided with screw-threads on its interior surface, which receives a screw-rod, *s*, at the rear end of which is a hand-wheel for operating the same, and the front end of which passes centrally between the fingers *p* and is cone-shaped, so that, when the said rod is projected by turning the hand-wheel, the said fingers are spread apart and bear firmly against the interior of the opening at the center of the roll. The rear end of the roll rests against the disk-plate *r*, so that, by the joint action of the latter and the said fingers, all possibility of displacement by reason of the pressure of the knife is effectually prevented. This device is shown most plainly in Fig. 6, which represents a vertical longitudinal section of the same.

For the purpose of clearing the knife and preventing its binding in the cut, I employ a plate, L, which gradually tapers to a thin edge, which I secure to the bar G alongside of the knife and outside of the same, with its thin edge toward the edge of the knife, so that, when the said plate is carried around with the bar and the knife, it pushes the cut paper away from the knife and prevents it binding within the cut.

A wooden plug is inserted in the opening at the outer end of the roll, as shown at *u*, Fig. 3, so that the inner folds of the roll are kept properly to the knife.

By means of the devices above described the paper may be cut with the utmost precision and uniformity of width. The cut comes off in conical form, and is afterward flattened by laying it on a table or board and striking it with a mallet or similar instrument.

Having thus described my improvements, what I claim as my invention is—

1. In a machine for cutting paper and similar material from a roll into disk-shaped lengths, a circular knife mounted upon a bar which is caused to revolve around the roll by suitable mechanism, substantially as described, so that the foremost end of the said bar shall revolve around the common center more rapidly than its rear end, as and for the purposes set forth.

2. The combination of the circular knife F, mounted upon a curved bar, G, the wheels *b* and *c*, carrying the said bar and rotated at different rates of speed by suitable mechanism, and the clearing-plate L, as and for the purpose set forth.

3. The clamping device herein described, consisting of the combination of the clamping-shells *e e*, having stems which slide in the grooves in the standard, the ring *i* provided with cam-pieces *h* and pins *f*, the worm and segment gearing *n*, the fingers *p*, the grooved disk-plate *r*, and the conical adjusting-rod *s*, substantially as shown and described.

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