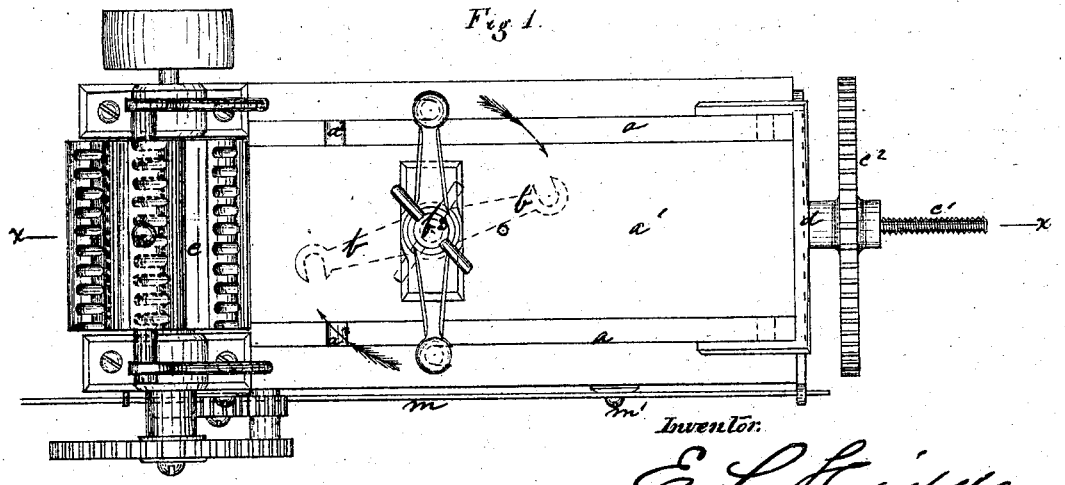
EDWARD S. HIDDEN.

Machines for Tearing up Leather.

No. 116,055. Patented June 20, 1871.

Fig 1.

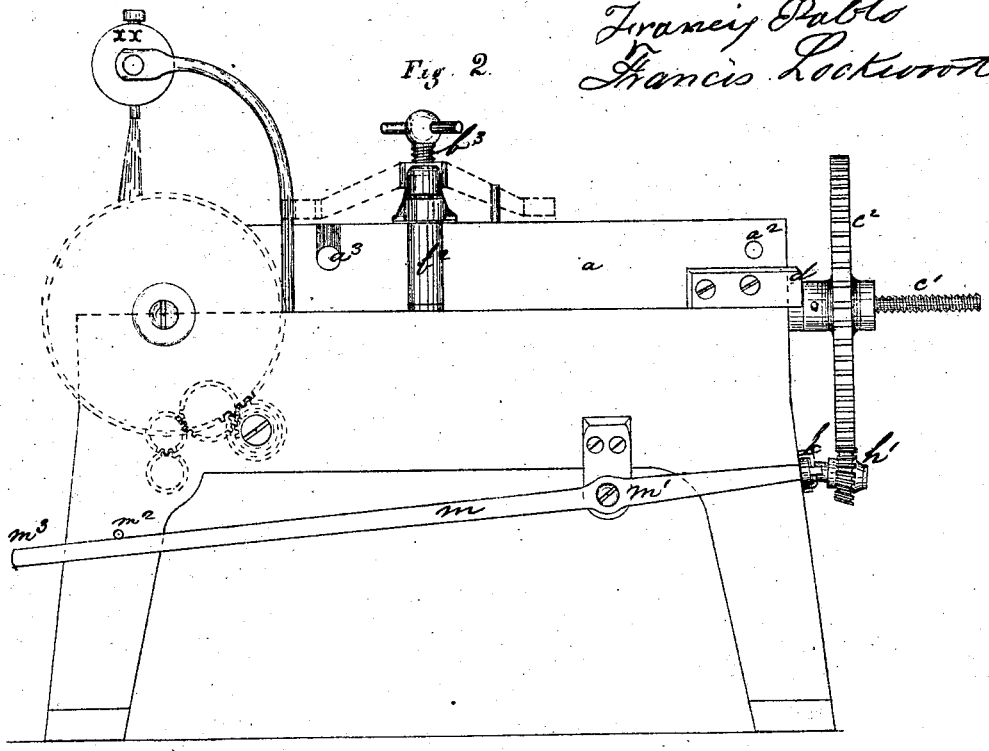


Inventor:

E. S. Hidden

Witness
Francis Pablo
Francis Lockwood

Fig 2.



UNITED STATES PATENT OFFICE.

EDWARD S. HIDDEN, OF MILLBURN, NEW JERSEY.

IMPROVEMENT IN MACHINES FOR TEARING UP LEATHER.

Specification forming part of Letters Patent No. 116,055, dated June 20, 1871.

To all whom it may concern:

Be it known that I, EDWARD S. HIDDEN, of Millburn, Essex county, State of New Jersey, have invented a Disintegrating-Engine, or a new and useful Machine for Tearing up Leather into Filaments or Shreds; and that the following, taken in connection with the drawing, is a full, clear, and exact description thereof.

In the drawing, Figure 1 is a plan of the machine; Fig. 2, a side elevation thereof. Fig. 3 is a front view of it; and Fig. 4 is a longitudinal central section through the same.

This machine was invented by me in the course of certain experiments in a process for making washers, in-soles, and heels for shoes, &c., from scraps of leather. Part of this process consists in reducing the leather to shreds by a tearing operation. Cutting does not appear to answer, and before the scraps can be torn it is necessary to form them into a compact mass, and so keep them while being acted upon by the tearing-teeth.

In order to make up this mass I first submit the scraps to the action of machinery, which rolls over and tumbles them about in a quantity of water until they are thoroughly soaked, softened, and become spongy. These wet scraps are then placed in a mold and subjected to heavy pressure, and afterward dried, so as to form a cake. This cake is then placed in the feeding-trough of the disintegrating-machine, in which it is tightly confined and fed so as to be acted upon by the revolving teeth.

The first requisite of my machine is, therefore, a feeding-box or trough capable of holding the cake of leather fragments firmly, and through which it may be fed to the revolving tearing-teeth. This box is shown at $a\ a\ a^1$, the sides and bottom at $a\ a$, and the top at a^1. It has no ends. The sides and bottom are either of wood or metal, firmly fastened together and to the frame-work of the machine. The top is movable. I prefer to hinge it to the rear ends of the sides, (see pivot a^2,) and to provide it with two pins, $a^3\ a^3$, which drop into notches cut in the sides of the box. Upon the cover is mounted a double hook, b. This hook can be put in the position shown by the dotted line, Fig. 1, when the box-cover can be lifted; or it can be turned into the position shown in full lines, when the hooks take into two grooves, each formed in one of the pillars $b^2\ b^2$, which are firmly attached either to the box or the bed-plate, or both. The axle upon which the hook turns is the screw b^3, which is free to revolve in a box, b^4, (see Fig. 4,) and which passes through a nut or female screw cut in the hook. When the hook is in the grooves this screw can be revolved so as to cause the cover to descend and compress forcibly the cake of leather contained in the box. In order to feed the cake forward this box is provided with a follower or piston, c. A screw, c^1, is attached to this piston, and passes out through a bar, d, firmly secured at the back of the box. A cog-wheel, c^2, is mounted upon a hub forming part of this bar, and prevented from moving rearward by a pin entering from the wheel into a groove in the hub. This wheel has a female screw cut in it, and when the wheel is revolved the screw, and consequently the follower, will be moved toward or away from the teeth, according to the direction in which the wheel is turned. In front of the box is a revolving toothed wheel, e, mounted in the frame. It is provided with teeth shaped much like those of wool-burring machines, but with a deeper gullet. These teeth I prefer to form either separately or in rows, and dovetail them into the wheel or stock.

By examining the drawing it will be perceived that the teeth in any one row are opposite the interstices between the teeth of the row before and behind them, so that the teeth may tear over the whole surface of the cake of leather exposed at the open end of the feeding-box. I sometimes intend to set these teeth spirally, so that the teeth of each row are not exactly opposite the interstices of the rows before and behind them, and at other times I intend to set the teeth behind one another, or make them upon disks, which are packed together upon a shaft with other disks having no teeth, and of a smaller diameter, between them; but in this latter case I have found it necessary to give a vibrating movement either to the shaft carrying the teeth or to the feeding-trough. This is easily done by a cam attached to or in connection with some shaft of the machine, the feeding-box being pivoted so as to oscillate horizontally or the shaft being

fitted so as to have end play. I have found, by actual trial in a working machine, that a stock which will support the teeth so that those on opposite ends of the same diameter are seven inches apart, and revolving at a speed of about two hundred revolutions per minute, produces good results.

The filaments of leather stick so closely between the teeth that a clearer is essential. This clearer is a shaft, *f*, provided, when the tearing-teeth or claws are arranged as shown in the drawing, with at least two sets of clearing-teeth. Those of one set are arranged opposite the spaces of the other set. The one set clears the tearing-teeth of one row, the other set those of the next row of claws, each clearing-tooth passing between two tearing-teeth, from their heels to their points. The clearer-shaft is so geared, substantially as shown in the drawing, to the shaft which carries the tearing-teeth, that the clearing-teeth will revolve with a greater surface speed than the tearing-teeth, and in such wise that one row of clearers clears one row of tearing-teeth, and the other row of clearers the next row of tearing-teeth. Another set of clearers, *g*, clears the first set. They are not essential, but often serve a good purpose. When the tearing-teeth are arranged on a cylinder in spirals, the clearers must be arranged in the same way, and upon a cylinder of larger diameter. When the tearing-teeth are arranged one behind the other, then one row of clearers will answer, although several rows, with the teeth of one behind the teeth of the other, may be used. When the tearing-teeth cylinder has a vibratory motion the clearing-teeth shaft must have the same motion. A shaft, *h*, provided at one end with a miter-wheel gearing into a miter-wheel upon some one of the cross-shafts of the machine, passes out rearward, and is in gear, by means of the spur-wheel h', with the wheel c^2. When the machine is at work this shaft will cause c^2 to revolve in such direction as to move the follower toward the tearing-teeth. The rear end of the shaft *h* is hung in a bearing, *k*, formed in a bar pivoted at one side of the rear of the machine. This bar is held up so that the wheel h' may engage with the wheel c^2 by means of a lever, *m*, pivoted at m^1, which catches under a pin, m^2. When one cake of scraps has been nearly torn into filaments the machine is stopped, the top of the box is opened after slacking the screw b^3, and the cog-wheel h' is dropped out of gear with c^2 by raising the end m^3 of the lever *m*. The wheel c^2 can then be turned by hand in the reverse direction, the follower being thus moved back to the rear of the box, and the box thus put in the proper state for the reception of a new cake of scraps. The box may also be opened and the follower run back, while the tearer-shaft and clearers are kept revolving.

In working my machine I have found it advisable to moisten the cake of leather slightly before depositing it in the feeding-box, and have also discovered the fact that small jets of water playing upon the cylinder of tearing-teeth not only keeps them cool but also facilitates the clearing of the teeth. I have, therefore, combined with the cylinder a pipe pierced with holes, through which jets of water may be thrown. This pipe may be supported in any convenient proper manner and position so long as its holes will direct the jets upon the teeth. It is shown in elevation and section on Figs. 2 and 4, only at *x x* as supported by rods fastened to the frame of the machine.

The tearing-teeth described and represented are like hooks or talons, and must of necessity have intervals between the teeth in the same row. They are not like cutters, and do not, like cutters, extend across the surface to be cut.

I wish it distinctly understood that I know that a box in which matter can be clamped and fed forward is not new with me. Such boxes are used in machines for cutting tobacco, &c. Neither are tearing-teeth new. Neither is the feed-box new in combination with cutters, as in tobacco and straw cutters. Neither are revolving clearers new, although I cannot recollect precisely where I have seen them; therefore I do not claim as new any of these parts separately; but

I do claim as of my invention—

1. The combination, substantially as herein set forth, of a feeding-box, a follower or piston, and a set of revolving tearing-teeth, such teeth having intervals between them in the direction of their axes of revolution, and the combination being such that the teeth tear over the whole exposed surface of the material acted upon, substantially as described.

2. In combination with a feeding-box, a follower and a set of revolving tearing-teeth, all constructed and operated substantially as specified, a set of revolving clearers, acting, as described, to clear out the tearing-teeth.

3. The combination of a feeding-box, a follower, a set of revolving tearing-teeth, and two sets of clearers, all operated and constructed substantially as set forth.

4. The combination of a feeding-box, a set of revolving tearing-teeth, a follower or piston, and a contrivance for jetting streams of water upon the teeth, all constructed and operating substantially as herein specified.

Witnesses: E. S. HIDDEN.

FRANCIS PABLO,
FRANCIS LOCKWOOD.