H. CUNNINGHAM.

PROCESS AND MACHINERY FOR SOFTENING LEATHER.

No. 176,168. Patented April 18, 1876.

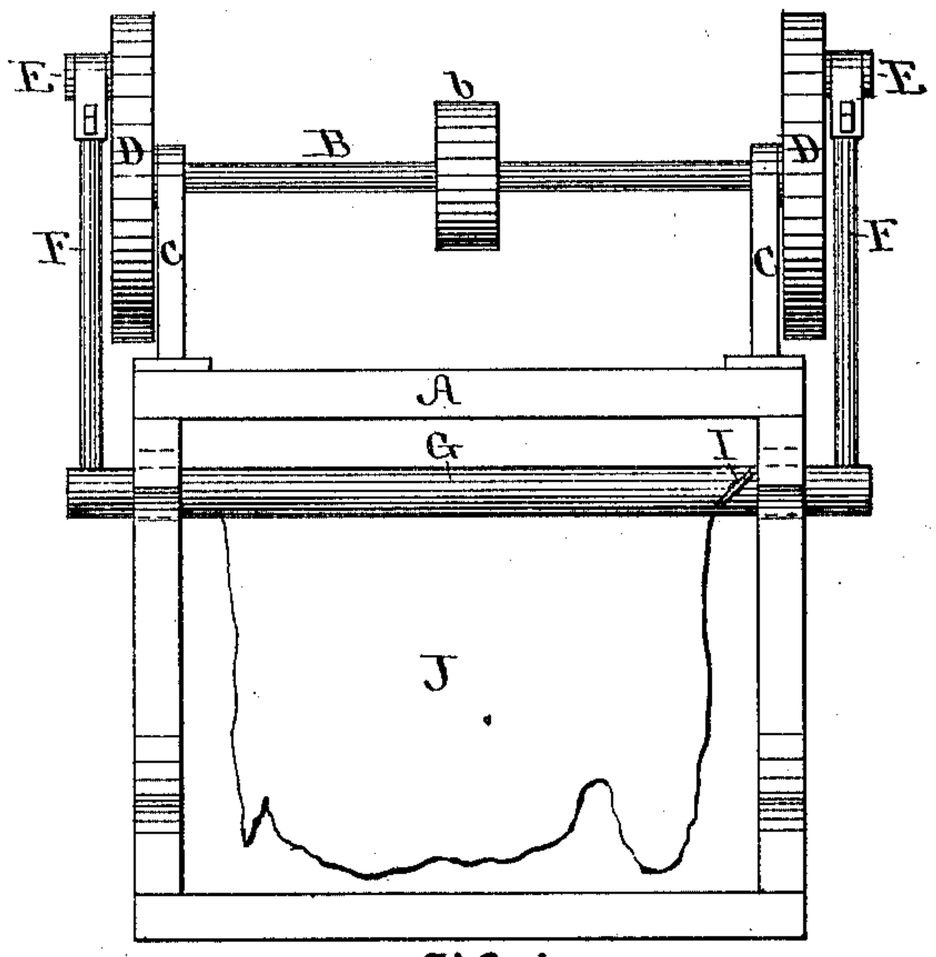

FIG. 1.

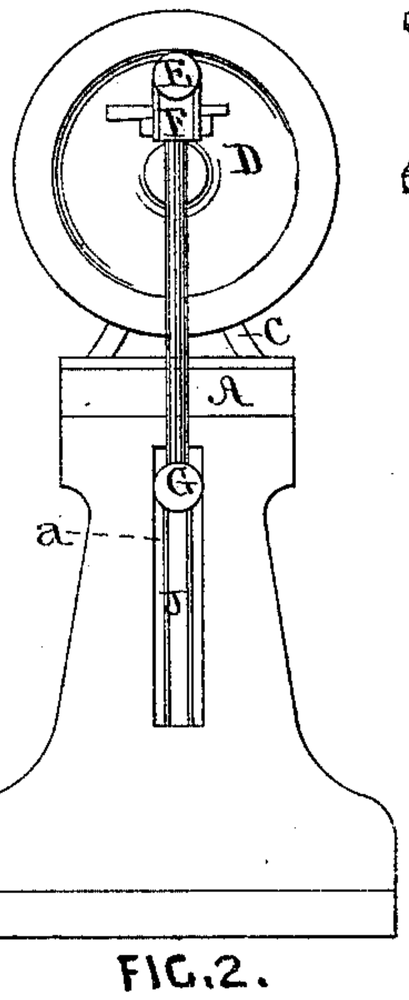

FIG. 2.

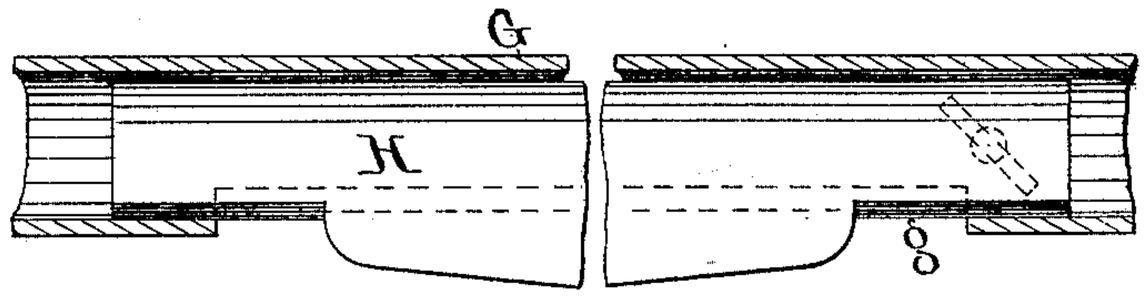

FIG. 3.

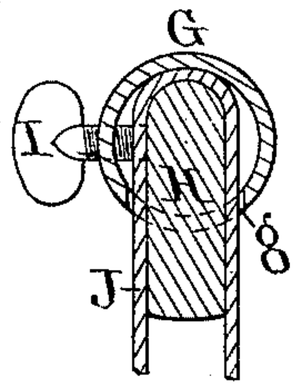

FIG. 4.

Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY CUNNINGHAM, OF ALBANY, NEW YORK.

IMPROVEMENT IN PROCESSES AND MACHINERY FOR SOFTENING LEATHER.

Specification forming part of Letters Patent No. **176,168**, dated April 18, 1876; application filed November 18, 1875.

To all whom it may concern:

Be it known that I, HENRY CUNNINGHAM, of the city and county of Albany and State of New York, have invented a new and useful Process for Softening Leather, of which the following is a full and exact description:

The nature of my invention consists in subjecting the leather to be softened to a series of rapid reciprocating or vibratory motions by the aid of machinery, in such manner that every part of it will, by the alternating folding, shaking, and snapping it receives, be rendered very soft and pliable. This effect I produce by means of the machine, herein shown and described, that I have invented for that purpose.

The object of my invention is to mechanically loosen up the fibers of the leather that have become matted down, compacted, and hardened in the process of currying, and by so doing greatly enhancing its market value by improving its quality and increasing its durability in wear when used for making the uppers of boots or shoes, or for any purpose where a soft and pliable, well-curried leather is required.

In the accompanying drawing, which forms a part of this specification, Figure 1 represents a front elevation of my softening machine; Fig. 2, a side elevation; and Figs. 3 and 4, enlarged sectional views of the tubular holder and fastening-bar.

As shown in the drawing, A is the frame-work of the machine; B, the shaft, provided with a pulley, *b*, and running in the brackets C, secured to the top of the frame-work. The crank-wheels D are secured to the shaft B, and are provided with the wrist-pins E, to which the pitmen F are connected. G is a tubular holder, having a slot, *g*, cut in its lower side, of sufficient length to receive the leather to be softened. At or near the ends of the holder the pitmen F are secured, as shown in the drawing, and it is guided during its reciprocations by the slots *a* in the side pieces of the frame-work A. H is the fastening-bar, which I preferably make of strong, elastic wood, of greater length than the slot *g*, having each end cut away, so as to allow for its being inserted in the tube, as shown in Fig. 3, and having an increased depth at its center, for the purpose of securing the greatest strength with the least weight. I is a set-screw in the tubular holder G, bearing against the fastening-bar H, for the purpose of securing it in its place.

The softening is effected in the following manner: The leather (which is represented in the drawing by the letter J) is folded and placed over the top edge of the fastening-bar H and inserted with it in the slot *g* of the tubular holder G, in the manner shown in Figs. 3 and 4, and secured therein by the set-screw I. A rapid rotatory motion is then given to the shaft B, which, through its crank-wheels D and pitmen F, imparts to the holder G a reciprocating motion, corresponding in speed with the revolutions of the shaft B. By this means the leather is violently agitated, and by the combined resistance offered by the atmosphere and its own weight, the leather is thrown into a rapid succession of folds and corrugations, the frequent bending and unbending of which soon reduces the fibers to a soft and pliable condition.

In effecting this process of softening leather, I do not confine myself to the particular construction of machine herein shown and described, as I am aware that the same effect may be produced by a machine moving the leather rapidly in a horizontal direction, or by one having a vibratory motion, in either of which the bending and unbending of the leather, to produce the loosening up of the fiber, can be accomplished in the same manner.

I do not claim softening leather by bending and unbending its texture, when such bending and unbending is effected by rubbing or rolling the sides of leather between the surfaces of solid or semi-elastic bodies, as I am aware that such means have heretofore been employed for this purpose. By my process the bending and unbending of the texture is effected solely by the combined action and reaction of the gravity of the leather and the resistance of the atmosphere when the sides are subjected to the rapid shaking or snapping motions hereinbefore described, and by this means the softening is effected in a much more rapid and perfect manner than has been heretofore accomplished.

I claim as my invention—

1. The process for softening leather herein described, consisting of bending and unbending its texture by mechanically imparting to the sides of leather a rapid shaking or snapping motion, by the means and in the manner herein specified.

2. The combination of the shaft B and crank-wheels D with the pitmen F and tubular holder G, when constructed and arranged to operate as and for the purpose set forth.

3. The tubular holder G, having a slotted opening, *g*, in combination with the fastening-bar H, as and for the purpose specified.

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Witnesses:

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