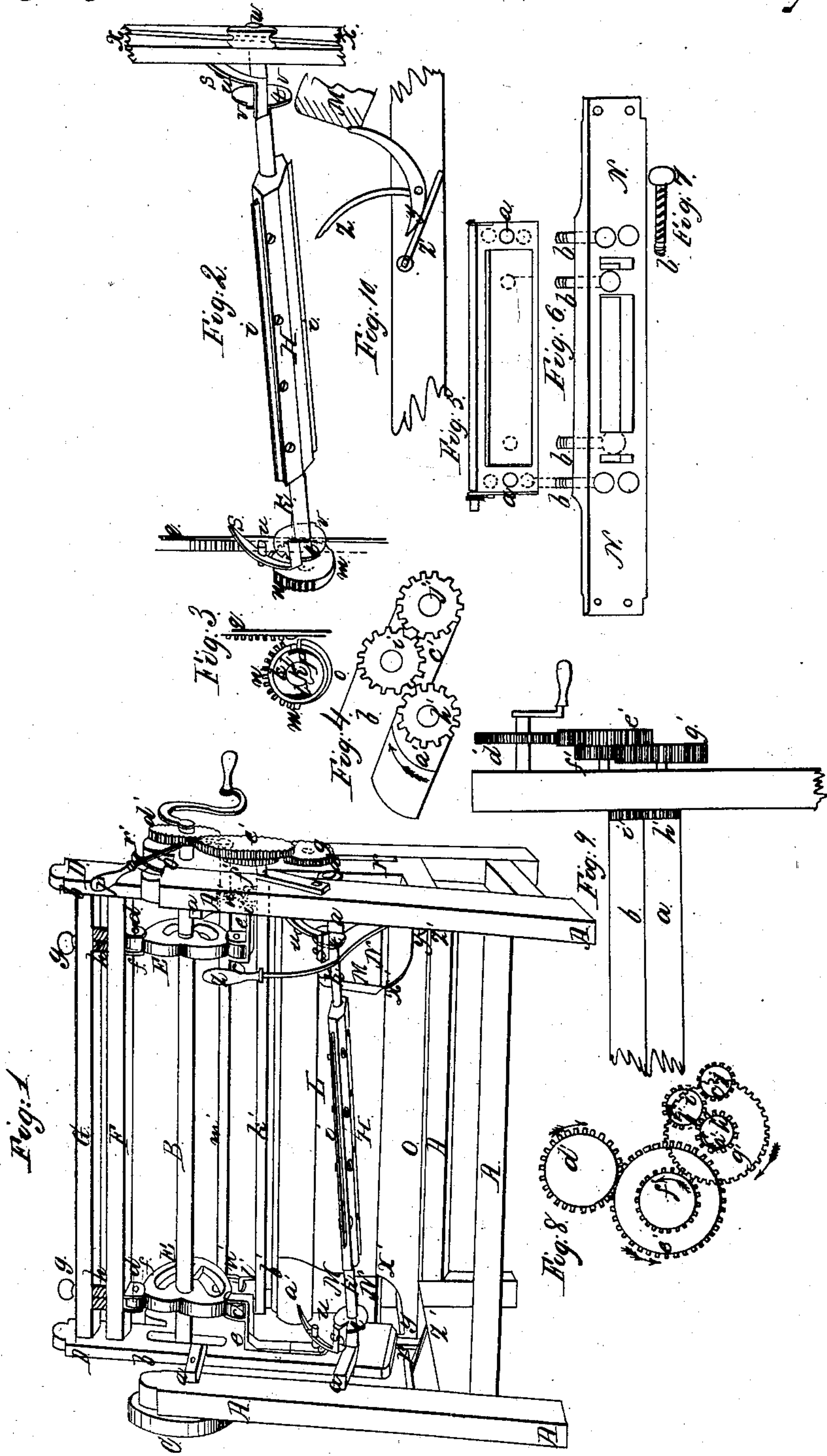


S. Graham,
Shaving Leather,
N^o 732. *Patented May 10, 1838.*



UNITED STATES PATENT OFFICE.

S. GRAHAM, OF ROXBURY, MASSACHUSETTS, ASSIGNOR TO BENJ. GILBRETH AND R. EATON.

MACHINE FOR SKIVING AND WHITENING LEATHER.

Specification of Letters Patent No. 732, dated May 10, 1838.

To all whom it may concern:

Be it known that I, SETH GRAHAM, of Roxbury, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Machinery for Skiving or Whitening Skins in the Process of Currying or Conversion of the Same into Leather.

The disposition, arrangement and use of the several parts of these improvements, the principle thereof, and manner in which I have contemplated the application of the same, together with such parts, inventions and combinations as I claim to be my discoveries and improvements, and hold to be original and new I have herein set forth and described, which description together with the accompanying drawings herein referred to compose my specification.

The object of my improvements is to shave and finish the outside surface of the skin prior to its being colored, which operation is denominated skiving and whitening and has been heretofore accomplished by manual labor.

A A A A, Figure 1, represents a strong frame of wood, iron or other suitable metal shaped as seen in the drawing or otherwise formed to answer the purpose of supporting the different parts of the machinery connected thereto.

B is a horizontal shaft revolving in suitable bearings or boxes near each extremity. On one end of this shaft is a pulley C over which the belt passes which drives the machinery.

D D D represents a frame of wood or metal constructed as seen in the figure or otherwise suitably shaped and formed. This frame D D vibrates up and down between checks or guides *a, a*, attached to the inner faces of the ends of the frame A, A. The checks *a, a*, if necessary may contain small rollers or wheels against which the edges *b, b* of the ends of the frame D D shall rest during its motions, the object of the above rollers being to diminish the friction.

E, E are two cams fixed on the horizontal driving shaft B. These cams may be shaped as seen in the drawing or may be otherwise properly formed to operate on the frame D, to raise and depress it at every revolution of the shaft. The surfaces of the cams bear against the circumferences of small

rollers *c, c—d, d* moving in bearings *e, e—f, f*, attached to the sides of the frame D D. The upper rollers *d, d*, are connected to a movable bar F, directly under the upper cross beam or tie G of the frame D D. By means of screws *g, g*, passing through the upper beam G and springs *h, h*, intervening between the beam G and bar F, the bar F may be set in a proper position with respect to the cams E, E.

The frame D carries the cutting knives or blades of steel *i, i*, Figs. 1 and 2, screwed to a piece of metal H, affixed to the shaft K.

In order that the cutting knives *i, i* shall operate in a proper manner upon the surface of the skin exposed to their action, it is necessary that they should have not only a downward motion but at the same time a slight motion sidewise. These motions are similar to those which the workman usually gives to the skiving knife in order to cause it more readily to remove the outer surface of the skin. These knives also act in succession on the skin, so that while the frame D is drawn upward, it becomes requisite that the shaft K should be turned around a half revolution to present each knife alternately to the surface of the skin L, stretched over the beam M, M, Fig. 1.

The contrivance for causing the shaft K to revolve is represented in Figs. 1, 2 and 3. Attached to the end of the shaft K is a circular plate *k* of the form represented in Fig. 3. The plate *k* is inclosed in a metallic box *m*, having teeth *n* formed on a semicircumference of the same. Around the opposite semicircumference, a spring *o*, Fig. 3, is laid, one of whose ends is secured by a rivet or in any other proper manner to the circumference, while the other is bent at right angles and passes into and extends a short distance through a slot *p*, in the edge of the clutch box *m*. The box *m* plays freely on the shaft K. The teeth *n* of the box engage with the teeth of a small rack *q, q*, Figs. 2 and 3, affixed to the side of one of the center standards *r, r*, Fig. 1.

From the above it will be seen, that as the frame D D, carrying the shaft K is raised by the cams E, E, the box *m* is caused by its teeth *n* acting with the teeth of the fixed rack *q* to turn around half a revolution. The alternate engagement and disengagement of the box *m* with the shaft K is effected in the following manner. As the

shaft K rises, the bent end of the spring *o* which passes through the slot *p*, acts against one of the shoulders *l*, *l* of the piece of metal *k*, and thus engages the box with the shaft so as to cause the shaft to revolve a half circle. Then as the shaft descends, the box *m* is turned back again to its former position, during which operation the bent end of the curved spring *o* is forced outward by the curved cam surface of the plate *k*, until the semirevolution is completed, when the end of the spring as it arrives at the other shoulder *l* is suddenly relieved, and flies inward, and engages with the other shoulder so as to operate again on the shaft K as it rises, and turn the same around a half revolution.

In order to prevent the shaft K from turning around during the downward motion of the frame D, two pawls *s*, *s*, Figs. 1, 2, moving on pins *u*, *u* drop into the notches or against shoulders *v*, *v*, Fig. 2, of plates *t*, *t* affixed to the shaft K, and thus hold the knife in a horizontal position while it performs its office on the surface of the side of leather L. As soon as the rotation of the shaft commences, the pawls are relieved, so that they move over the circular edges of the plates during the upward motion of the frame D, until they meet again with and drop against the other shoulders *r*, *r*.

Having described the machinery for causing the revolutions of the knives, I next proceed to that which gives them a lateral motion during their descending movement.

A small grooved wheel *w*, Fig. 2 is placed on the other end of the shaft K, and travels on an inclined rail *x* *x* affixed to the side of the upright standard *r*, Figs. 1 and 2. This rail may have just such an inclination from the perpendicular as may be desirable to give motion sidewise to the cutting knives *i*, *i*, which as the frame D descends are pushed laterally by the rim of the wheel W resting against the edge of the inclined rail *x* *x*.

I have now completed the description of that part of the machinery, which gives motion to the knives; but, in order to cause them to act on the skin or side of leather, it becomes necessary to stretch it over a beam M, as seen in Fig. 1. Figs. 5 and 6 represent the mode of constructing this beam. Some parts of the side of leather being thicker than others, it is requisite that the beam should be held up to the knives by means of springs which whenever any obstruction arises from one portion of the hide being thicker than another, allow that part of the beam against which the said thick part rests to fall back a little, so that the knife may cut one uniform shaving from the surface. Fig. 5 represents a back view of the beam M. Fig. 6 is the cross bar N which extends from one end of the frame to

the opposite as seen in Fig. 1. The beam M and cross bar N are connected by any convenient number of screws *b*, *b*, *b*, Figs. 6 and 7 which serve to regulate the distance of the face of the beam M from the cutting edges of the knives. On the ends of these screws, small wound wire springs *a*, *a*, *a*, Fig. 5 are fixed for the purpose of pressing the beam M from the bar N, and also to allow the beam to fall back a little whenever it shall become necessary.

In order that the operations of removing the outer surface of the skin brought under the action of the knives may be properly effected; that is to say so that any projecting irregularities in the thickness may be removed, in the degree in which the same have heretofore been done by the workman using a currying knife in the process of skiving or whitening the surface, the front of the beam M should be covered with leather, which may be stretched over the same in any convenient manner. Between this leather covering and the beam a layer of felting should be interposed which will form and serve the purpose of a cushion.

It will readily be perceived from the above, that should there be several projecting parts of the outer surface of the hide of unequal thicknesses this cushion of felt will allow the knife to take off thicker shavings from the most prominent parts of the surface than it does from the other or less projecting parts. Moreover it should be observed that it is advisable to make the knives a little longer than the beam and to form the upper and lower edges of the front of the beam rather inclined, so that the edges and corners of the knives may leave no marks upon the surface of the skin.

O is a wooden or metallic bar hung in bearings *y*, *y*, and having a thin edge *x'* *x'* which is pressed against the side of leather (to keep the same smooth on the face of the beam) either by the operations of the workman on the handle Z attached thereto or by suitable springs *Z'*, *Z'*.

On the extremity of the shaft B is a cogged pinion *d'* which by a suitable number of intervening wheels *e'*, *f'*, *g'*, acts on the cogged wheels *h'*, *i'*, *j'* of three draw rollers *a'*, *b'*, *c'* Figs. 1 and 4. These will serve to stretch and draw the hide over the face of the beam M. In order to pass the end of the side of leather between the rollers, the roller *b'* may be attached to a cross bar *k'* having loops *l'*, *l'* Fig. 1, on its upper edge. From a horizontal shaft *m'*, curved fingers or hooks of metal *n'* may proceed through the loops *l'*. To the end of the shaft *m'*, the end of a rod *o'* may be affixed. This rod has a handle *p'* which on grasping and pressing forward raises the roller *b'* sufficiently to enable the workman to pass the side of leather between the draw rollers.

On pulling back the rod o' , which may be latched into any of the spaces of an arched segment r' , the roller b' may be lowered upon the leather.

5 The length of the cutting knives together with the size of the various parts of the machine may be varied at pleasure, and the whole may be constructed of wood, iron or other suitable material. The operation of
10 the cogged pinion d' (on the extremity of the shaft B) on the cogged wheels e' , f' , g' , Figs. 1 and 4, may be more fully understood by reference to Figs. 8 and 9, in which d' represents the cogged pinion playing into
15 the cogged wheel e' —thus giving motion to the cogged pinion f' on the same axis with the cogged wheel e' . This latter pinion f' engages with the cogged wheel g' on the extremity of the axis of one of the draw rollers a' —turning in the direction represented
20 by the arrow on the same Fig. 8. These draw rollers a' , b' , c' are connected by the cogged wheels h' , i' , j' so that when the first (a') is turned by the action of the
25 cogged wheel g' , all the rest are caused to revolve. The spring Z' which holds the bar O against the beam M is shown in Fig. 10. Z' is the spring which acting on the foot y of the bar O presses it against the leather on
30 the lower edge of the beam.

I claim in the above described machinery—

1. The arrangement or combination of the different parts forming together a machine
35 for skiving and whitening leather, con-

structed substantially in the manner set forth.

2. I claim separately the machinery that effects the alternate revolutions and lateral motions of the shaft K, to which the cutting
40 knives i , i are attached.

3. I claim the machinery which raises and depresses the shaft K for the purposes herein set forth, in combination with the other
45 parts of the machine.

4. Forming the cushion on the face of the beam M of felt in manner and for the purposes herein above mentioned.

I am not aware that the knives used in the operation of skiving and whitening
50 leather have ever before been operated by machinery, the mode heretofore practised being by manual labor. My general claim in the above has therefore been to the arrangement and combination of the whole of
55 the above machinery that gives motion to the knives to be applied to the knives used for skiving and whitening or preparing leather or skins previous to the operation of
60 blackening or coloring the same.

In testimony that the above is a true specification of my said invention and improvement I have hereunto set my hand this third day of March in the year of our Lord eight-
een hundred and thirty eight.

SETH GRAHAM. [L. s.]

Witnesses:

R. H. EDDY,
JOHN NOBLE.