

UNITED STATES PATENT OFFICE.

JOSEPH A. SAFFORD, OF MALDEN, MASSACHUSETTS.

LEATHER-SPLITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,457, dated June 21, 1892.

Application filed May 4, 1891. Serial No. 391,509. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. SAFFORD, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Leather-Splitting Machines, of which the following is a specification.

This invention relates to that class of leather-splitting machines in which a stationary splitting-knife is employed in co-operation with an adjustable feed-roll and an adjustable gage-roll, said rolls presenting the leather to the splitting-knife, while the gage-roll determines the thickness of the piece of leather by governing the amount cut or split from it by the knife. A type of leather-splitting machine of this class is shown in Letters Patent No. 305,240, granted to me September 16, 1884.

The present invention has for its object to provide an improvement in leather-splitting machines of the type above referred to, whereby the gage-roll may be automatically moved relatively to the knife and feed-roll to give regular or predetermined variations of thickness to the leather being split whenever the uses to which the leather is to be put require such variations.

An example of a leather article which my improvement is adapted to produce is an inner sole for boots or shoes, in which a part of the sole between the toe portion and the shank is made thinner than the other portions for the purpose of increasing the flexibility of the sole.

My invention consists, chiefly, in the combination, with a fixed knife, a feed-roll, and a gage-roll, said rolls being adjustable relatively to each other and to the knife, while the gage-roll is normally pressed away from the knife and feed-roll by spring or other yielding pressure, of an automatically-moving stop which limits the movement of the gage-roll away from the feed-roll and knife and automatically varies the extent of separation of said gage-roll from the feed-roll or knife, so as to produce the desired predetermined variations in the thickness of the leather being split.

The invention also consists in the combination, with the said fixed knife, adjustable feed and gage rolls, and automatically-moving stop,

of an automatic stop-motion which arrests the operation of the machine after the gage-roll has occupied the different positions required in producing the variations in the thickness of a given piece of work, so that the machine, after splitting or preparing one piece, such as a sole having the characteristics above mentioned, will stop in position to commence operation upon a succeeding sole and will not start until the operator sets it in motion, all of which I will now proceed to describe.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a leather-splitting machine embodying my invention. Fig. 2 represents a section on line 2 2, Fig. 1, looking toward the left. Fig. 3 is a detail sectional view showing the rolls, the knife, and the cam or pattern roller, said rolls being shown as mounted on swinging arms of the form shown in my patent referred to.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings, A represents the main frame of the machine, having suitable bearings, in which is mounted the driving-shaft C.

E represents the pressure or feed roll and F the gage-roll, said rolls being positively rotated in opposite directions by suitable gearing communicating motion from the driving-shaft.

D represents the knife, which is detachably secured to the frame and is located in the usual relation to the rolls E F. Said rolls have journals which are mounted in swinging arms or levers *a a b b*, the arms *a a* supporting the roll E, while the arms *b b* support the roll F, said arms being pivoted at their lower ends to the supporting-frame of the machine, as shown in said patent. The rolls E and F are adjustable with relation to the knife, as shown in said patent, and the means for adjusting and holding the feed-roll E may be the same as shown in said patent, or any other suitable means may be employed for this purpose, my present invention relating particularly to the automatic movement of the gage-roll relatively to the feed-roll and knife, as hereinafter described.

In carrying out my invention I interpose

between the swinging upper ends of the arms $b\ b$ and a fixed portion of the supporting-frame springs $c\ c$, which are of sufficient strength and exert force in the proper direction to normally force the gage-roll F away from the feed-roll E , said springs being here shown as mounted on rods c' , affixed to a cross-bar d on the supporting-frame and passing through enlarged openings in the swinging ends of the arms $b\ b$, the arms being adapted to swing independently on said rods. The springs $c\ c$ press the gage-roll F outwardly against an automatically-movable stop, which is here shown as a cam h , mounted upon a rotating shaft h' , which is journaled in suitable bearings on the supporting-frame of the machine and is rotated by a connection with the gage-roll thereof, said connection being here shown as a gear or pinion h^2 on the shaft h' , and a gear h^3 , Fig. 2, affixed to the shaft of the gage-roll and meshing with the gear h^2 . The cam h has a portion of its perimeter depressed, as at 2, the remaining portion of the cam being concentric with the shaft h' . The gage-roll F bears against the perimeter of the cam, and as the latter rotates the gage-roll is caused by the spring c to move backwardly into the recess 2 when the latter reaches the surface of the gage-roll, thus increasing the distance between the gage-roll and the feed-roll and knife, while the said recess is in contact with the gage-roll, said roll being forced forward toward the feed-roll and caused to remain in a fixed position, when the concentric portion of the perimeter of the cam comes to a bearing on the gage-roll and during the period of its bearing thereon.

It will be seen that the rotating cam constitutes an automatically-moving stop, a portion of which, comprising the concentric part of the perimeter of the cam, holds the gage-roll at a given position from the feed-roll, while another portion comprising the recess 2 holds or supports the gage-roll at a greater distance from the feed-roll. The gage-roll is thus caused to move automatically toward and from the feed-roll, and thus automatically vary the thickness of the material being split.

I prefer to provide the machine with an automatic stop-motion which arrests the rotation of the feed-roll, the gage-roll, and the shaft h' with its cam h after a given period of rotation of said parts, which is preferably after each complete rotation of the cam, so that after the gage-roll has occupied the successive positions which it is caused to occupy by the cam and has thus given the desired variations to the thickness of a piece of leather the machine will be stopped in position to start another piece, with the gage-roll in position to give the entering end of said piece the same thickness as the corresponding end of the pieces previously split and to vary the thickness of the piece at the same distance from the entering end, the machine being stopped when the desired length has been split.

The devices constituting the automatic stop-motion which I have shown in the present instance are as follows: The driving-shaft C has affixed to it a clutch member k . l represents a pulley, which is normally loose upon the driving-shaft and has upon its hub a clutch member m , adapted to engage the clutch member k when the pulley l is moved laterally in one direction. When the pulley is moved in the opposite direction, the two clutch members are separated, as shown in Fig. 1, so that the motion of the driving-shaft is arrested, the pulley l , which receives motion from the source of power through a belt, running loosely on the driving-shaft.

n represents a bell-crank lever pivoted at o to the supporting-frame and engaged at the outer end of one of its arms with a cam-groove p in the disk or wheel q on the shaft h' , said groove being formed to oscillate the lever n .

r represents a rod, which is connected in any suitable manner with the hub of the pulley l and is also connected with the lever n , the arrangement being such that the oscillating movements of the lever cause the clutch member m on the pulley l to alternately engage and recede from the clutch member k . The cam-groove p is formed to move the pulley l and clutch member m to the position shown in Fig. 1 after the allotted work has been performed by the rolls $E\ F$ and the knife D .

The lever n has one of its arms connected by a rod t with a treadle arranged to be depressed by the operator's foot, the depression of said treadle causing the lever n through the rod r to move the clutch m into engagement with the clutch k , so that the operator may start the operation of the machine at any time by pressing the treadle.

I do not limit myself to this particular form of automatic stop mechanism, but may use any other suitable mechanism whereby the operation of the machine may be automatically stopped at a predetermined point and started by the operator.

It will be seen that any desired variation may be given to a piece of material by giving a corresponding shape to the cams h , it being understood that there are preferably two cams located near opposite ends of the gage-roll F . The cams may be formed to give the gage-roll more than one movement in each direction toward and from the feed-roll during a complete rotation of the cam, so as to produce a plurality of thinner and thicker portions on the piece of leather. I do not limit myself to the described location of the cams or automatically-moving stops, but may arrange the same in any suitable way, so as to accomplish the automatic variation of the thickness of the work, this being a new feature in leather-splitting machines and intended to be covered by the following claims as broadly as possible within legal bounds.

The automatic stop-motion may be omitted

in some cases, particularly when the improvement is applied to hand operating-machines.
I claim—

1. In a leather-splitting machine, the combination of a fixed knife with two rolls adapted to bear on opposite sides of the piece of leather to be split, said rolls being laterally movable with relation to the knife-edge, and a pattern or cam for automatically changing the relative positions of the rolls and knife-edge to vary the thickness of the piece being split, according to the shape of the pattern or cam, substantially as and for the purpose set forth.

2. In a leather-splitting machine, the combination, substantially as hereinbefore set forth, with a fixed knife, a feed-roll, and a gage-roll which is movable toward and from the knife and feed-roll, of a cam moved by the power of the machine and arranged to auto-

matically vary the position of the feed-roll during the cutting operation.

3. In a leather-splitting machine, the combination, with a fixed knife, a feed-roll, and a gage-roll which is movable toward and from the knife and feed-roll, of a cam rotated by the power of the machine and arranged to constitute an automatically-movable stop to vary the position of the feed-roll, and automatic mechanism whereby the operation of the machine is stopped when the cam reaches a given point in its movement, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of April, A. D. 1891.

JOSEPH A. SAFFORD.

Witnesses:

C. F. BROWN,

EWING W. HAMLEN.