





# UNITED STATES PATENT OFFICE.

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## LEATHER-STRETCHING DEVICE.

SPECIFICATION forming part of Letters Patent No. 690,397, dated January 7, 1902.

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*To all whom it may concern:*

Be it known that I, JOHN CALDWELL, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Leather-Stretching Devices, of which the following is a specification.

My invention relates to devices for stretching strips or divisions of leather—such as backs, sides, centers, &c.—to prepare them for use in the manufacture of belting. The common practice in the preparation of leather for belting is to sever the hides transversely at the shoulder, trim the sides to straighten the edges, and cut the butts longitudinally into sides and backs or other divisions of desired widths, but leaving the rump ends of irregular shape. For holding such divisions during the operation of stretching the common practice is to clamp the ends to the proper members of a stretching-machine, and in order to prevent the slipping of the leather in the clamps under strong tension it is found necessary to provide the contact-surfaces of the clamps with ribs or other irregularities, with the result of producing corresponding creases or irregularities in the clamped portions of the leather, which portions are generally unfit for use in the manufacture of belting and are cut off as waste. Therefore the portions of leather at the rump ends lying outside the clamps are not subjected to the stretching operation and together with the creased portions are cut off as waste. Instead of such clamps nails have sometimes been employed for securing the ends of the leather; but whether clamps or nails were used it has uniformly been the practice, so far as I am aware, to secure both ends of the leather across its entire width before any part of the leather is subjected to tension, and when tension is then applied it is equal in degree and duration upon all parts of the leather—that is, the firmer and less yielding portions are stretched to the same degree or extent as the softer and less firm portions. The result of such operation usually is that the firmer portions (those nearer the middle of the hide) are stretched too much and the softer portions (those nearer the outer edges

of the hide) are not stretched enough. Such stretching does not serve to remove the warp or twist or buckle that has been produced by the preliminary process of wetting and greasing and partly drying the leather.

The principal objects of the present invention are to provide simple and convenient means for securing the ends of the strips of leather in a way that will avoid the formation of objectionable creases in it, lessen the proportion of waste material, and enable the softer and harder portions to be stretched successively and to a different extent, as their variations of fiber may require to bring all parts to substantially equal hardness in the finished product. Such devices are illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a leather-stretching apparatus embodying my improvements and showing a side of leather in place thereon. Fig. 2 is a vertical longitudinal section, enlarged, of the same on the line *x x* of Fig. 1. Fig. 3 is a detail view from beneath the sliding head and a portion of the stretching-frame. Fig. 4 is a plan view of the fixed head, showing the straight end of the leather secured by nails driven through it into the wooden surface of the head. Fig. 5 is a similar view showing the leather secured by pins provided on the outer clamp-plate, and Fig. 6 is a sectional view on the line *y y* of Fig. 5.

In such drawings the frame for supporting the leather-holding devices is composed of side bars 1 and cross-bars 2. The frame is provided with a fixed stretcher-head A and a slidable head B, to which the ends of the leather are secured. The latter head has suitable lateral extensions in ways 3 formed in the side bars for guiding its reciprocatory movements. In use the frame is placed on a table or other support 4 with the ends of the side bars abutting the ends of the frame 5, which supports the power mechanism. The latter may consist of any of the usual means employed in like machines, and, as illustrated, may comprise gears 6, a screw 7, revolvably connected to a cross-head 8, and rods 9, carried by the latter and provided with hooks 10 for making connections with eyes 11, provided on the slid-



ing head B. The operation of the screw in either direction or its stoppage when desired should be under the control of an operator by means of a lever, hand-wheel, or other well-known device, (not shown,) so that the degree of stretching of the leather may be regulated as desired by the operator.

The stationary and sliding stretcher-heads A and B are of similar construction and are formed of upper and lower boards 12 and 13, the grain of the former preferably running parallel with and of the latter transverse to the frame sides 1, and the boards are held in place between angular clamping-plates 14 and 15, the former plates being placed on the inner and the latter on the outer edges of the boards. The lower boards are clamped between the vertical portions of the plates by bolts 16, and the upper boards are held in place by the horizontal flanges 17 of the plates 15 and the inclined flanges 18 of the plates 14, the upper boards being shaped to fit the space between the flanges and the lower board. The upper boards may be removed and renewed when required by loosening the nuts on the bolts 16 and moving the clamping-plates outward. The fixed head A may be secured in place by lateral bolts 19, extending through the frame sides and into or through the board 13. The lower edges of the boards 13 seat on lips or flanges 20, extending inward from the lower edges of the clamp-plates.

Backward movement of the sliding head B, when tension of the draft-rods is relaxed, is prevented by the engagement of dogs 21, pivoted to ears on the plate 14, with teeth on bars 22, attached to the frame sides.

For securing the straight end of a side or other division of leather C to the fixed or sliding head there is provided a series of permanent pins or tines 23, extending across the head at right angles to the sides of the stretcher-frame. These tines may be provided on the top flange 17 of the clamp-plate 15. The straight end portion of the leather is laid on the tines and secured by pounding with a mallet or other tool to force the tines through the leather.

It is desirable that the face of the flange 17 that carries the tines be flush with the surface of the wood of the stretcher-head, so that when the leather has been secured to the tines its lower surface will be quite close to the wood of the head. The purpose of this is to enable nails to be driven through the leather into the wood near the tines, as indicated in Fig. 5, to supplement the tines in holding the leather whenever it is found that they are insufficient alone to properly hold the leather. It not infrequently occurs that a portion of the margin engaged by the tines is not tough enough to withstand the tension of the machine, and the tines begin to tear it, and when this is observed by the operator he is enabled to prevent further tearing by driving a few nails through the leather into the wood in advance of the tines. The tines may be made

to engage the leather quite close to its edge, and will usually be found sufficient to hold it against the severe tension of the machine. 70

To secure the rump end (or other irregular end) of the leather to the sliding head (or to the fixed head, if preferred, for the relative positions of the heads A and B are obviously a matter of choice) nails 25 alone are used, and they may be driven near the edge and in courses conformable to the irregularities of the outline of the leather. By so doing all portions of the leather may be subjected to the stretching operation, and the portion that would lie outside the straight line a clamp stretched and fitted for use for belting. In driving the nails their heads should be allowed to stand up from the leather sufficiently to enable them to be readily pulled out with a claw-hammer or like tool. 85

In securing the irregular end of the leather a portion of its margin at the shorter and softer side is first nailed to the head, and the longitudinal section thus secured is first stretched until it is thought to be of about the hardness of the next adjoining portion, and the latter is then nailed fast and stretched, along with the portion first engaged, until the two portions are thought to be equal in hardness to the next adjoining portion. The latter is then also secured and stretched along with the others, and so on, until each succeeding portion has been successively attached and stretched with preceding portions, and when all portions have been secured they may be stretched as a whole as much more as the nature of the body of leather may require. As the leather of different hides varies considerably in thickness, firmness, and capability of stretching, the width of the sectional portions to be successively engaged and stretched and the extent to which preceding portions should be stretched before succeeding portions are engaged must be left to be determined by observation and manipulation in the treatment of each body of leather. 105

In the operation of stretching the leather it is desirable to have its body portions lie on cross-bars 26, that rest and may be made to slide on the side pieces 1, and which the operator may shift from time to time toward or away from the ends or to inclined positions, as indicated by dotted lines in Fig. 1, as in his judgment may be desirable to compensate for unequal stretching of the edges or other portions of the leather. 110

Having described my invention, what I claim is— 125

1. The combination with a stretcher-frame, of a head having a body of wood held in place by clamp-plates, one of which plates is provided with a series of permanent tines in close arrangement and extending in a row transversely to the sides of the stretcher-frame, substantially as set forth. 130

2. In a leather-stretching machine, the combination with a stretcher-frame, of a stretcher-



head composed of clamping-plates having  
suitable flanges, a board secured between the  
lower portions of the plates by bolts, and a  
removable board held in the space between  
5 the lower board and the upper flanges of the  
plates, for the purpose set forth.

3. In a leather-stretching machine, the com-  
bination with a stretcher-frame, of a stretcher-  
head consisting of clamping-plates at front  
10 and rear and provided with flanges one of

which is at a right angle and the other at an  
obtuse angle to its plate, boards fitted be-  
tween such plates, and means for clamping  
the plates to them, substantially as set forth.

In testimony whereof I have hereunto set 15  
my hand this 27th day of November, 1899.

JOHN CALDWELL.

In presence of—

P. H. GUNCKEL,  
M. F. HARRISON.