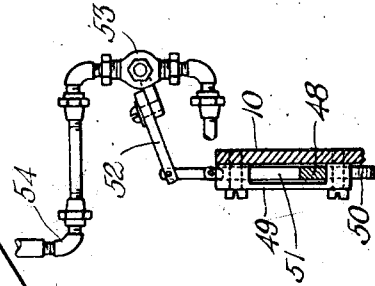
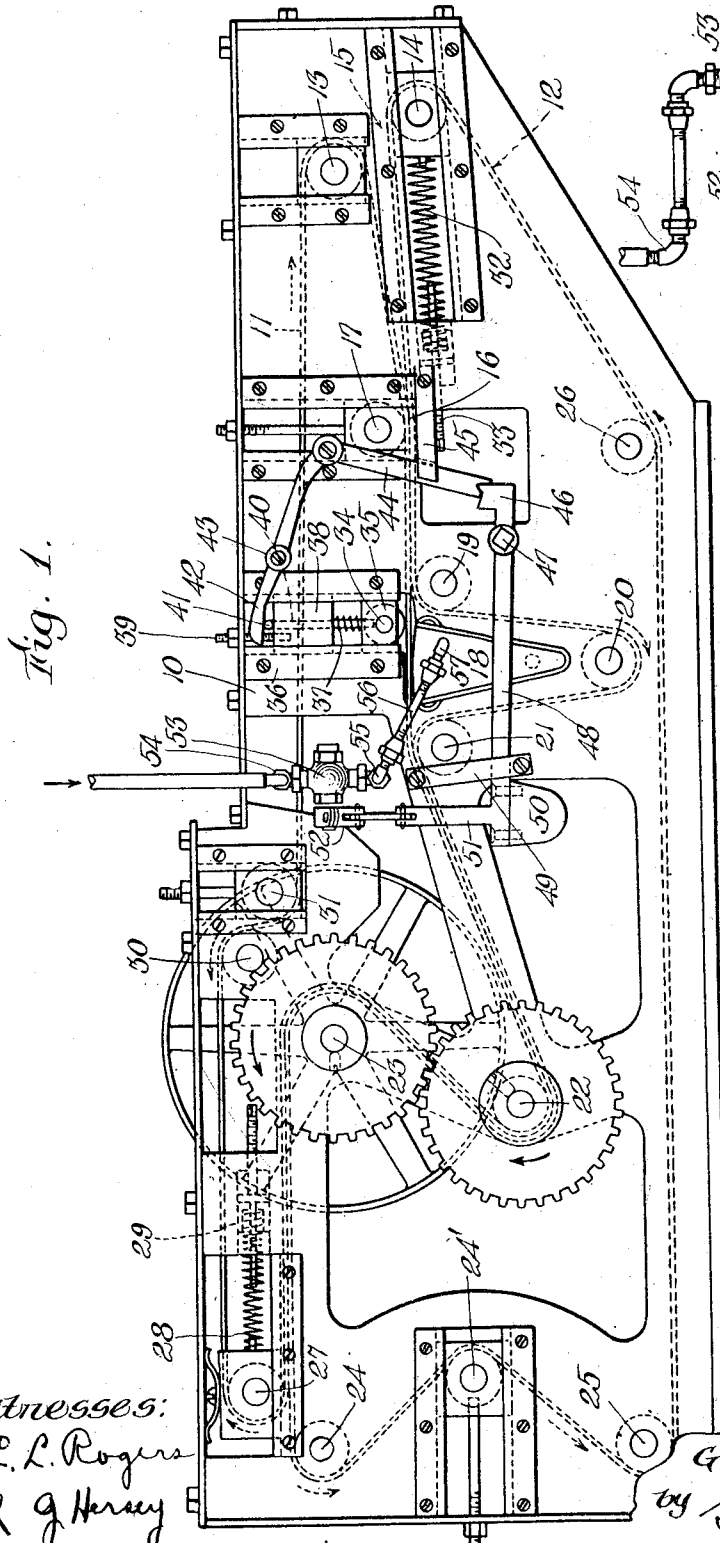


G. BASLER:
PROCESS OF MAKING LEATHER FLEXIBLE.
APPLICATION FILED MAR. 28, 1912.

1,062,947.

Patented May 27, 1913

2 SHEETS-SHEET 1.



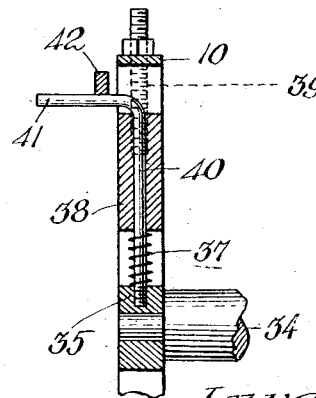
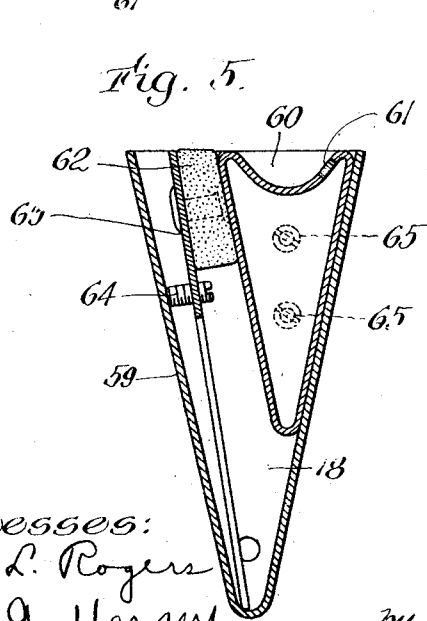
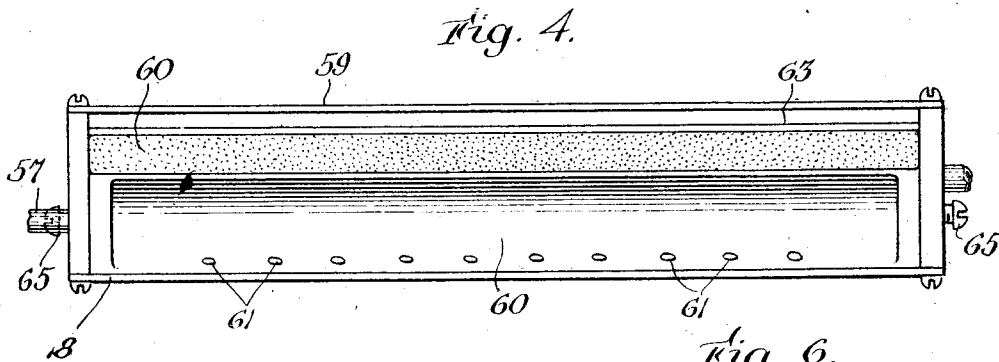
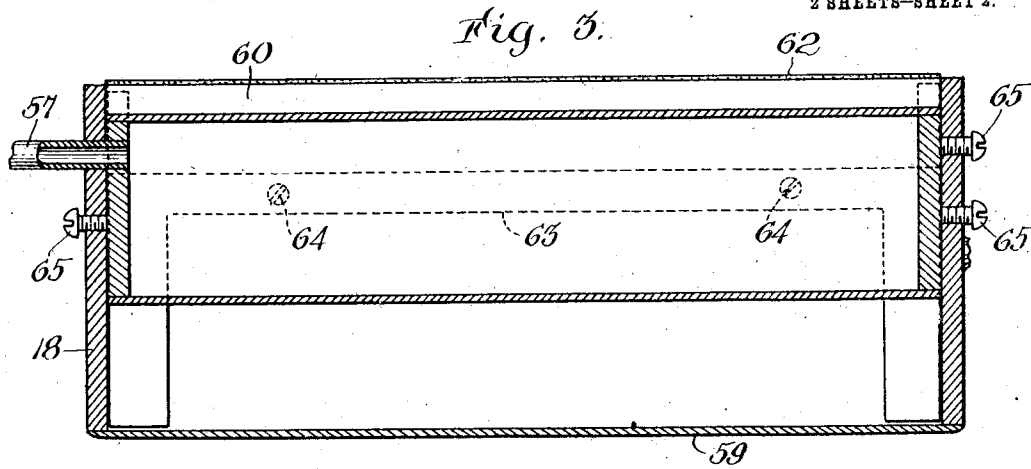
Witnesses:
C. L. Rogers
R. G. Hervey

Inventor:
George Basler;
by Geo. F. Marshall
Attorney.

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Witnesses:
C. L. Rogers
R. G. Hersey

Inventor
George Basler
by Geo. H. Maxwell,
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE BASLER, OF LYNN, MASSACHUSETTS, ASSIGNOR TO BASLER MACHINERY COMPANY, OF LYNN, MASSACHUSETTS, A CORPORATION OF MAINE.

PROCESS OF MAKING LEATHER FLEXIBLE.

1,062,947.

Specification of Letters Patent.

Patented May 27, 1913.

Original application filed March 15, 1912, Serial No. 694,069. Divided and this application filed March 28, 1912. Serial No. 686,873.

To all whom it may concern:

Be it known that I, GEORGE BASLER, a citizen of the United States, and resident of Lynn, county of Essex, State of Massachusetts, have invented an Improvement in Processes of Making Leather Flexible, of which the following description is a specification.

My invention is a process of making leather flexible, and relates particularly to such heavy leather as is used in the manufacture of shoes, particularly sole leather, taps, and the like.

Many inventions have been made and suggested for flexing leather and otherwise rendering the same flexible and pliable, but most of these result in either making the leather spongy or porous, or treating both sides alike so that if one side becomes water absorbent as a result of the treatment, the other side becomes so likewise. It is often advisable, however, to have the flexibility provided largely by the treatment of one side only. Accordingly, my invention aims to meet all the usual requirements of the most exacting shoe trade in the above and other respects.

In carrying out my invention I combine mechanical chemical treatment in such co-operative relation to each other that the leather is rendered highly flexible without, however, destroying the filling material or unevenly bleaching the leather, or in any way injuring or deteriorating the leather, either in appearance or quality.

I first provide a suitable bath, which may be simply of an aqueous character or it may be of a more penetrating character, containing soapy substances, alkalis, and other cleaning, penetrating, opening, softening, bleaching, and preservative ingredients. The particular ingredients used for the tempering fluid with which the leather is treated may vary widely for different kinds of leather and conditions thereof, and the invention is to be understood as not limited to any particular ingredients, though I have found in practice that, along with a soapy substance and bleaching ingredients, the salts of the alkali and alkaline earth metals are effective, such as the sulfates and borates thereof. The particular substances and their proportions are in any given case selected with reference to the special quality of the leather to be treated.

An illustrative composition and formula well adapted for use in the present process is disclosed in my co-pending application, Serial No. 694,559, filed May 1, 1912.

My present invention is not limited to the use of any specific formula, but the tempering fluid used preferably contains suitable relatively small quantities of borax, Epsom salts, some mild acid adapted to bleach and clean, and soap, all in an aqueous solution. This fluid has among its other properties a cleansing and bleaching action and by such cleansing as used in the present description and claims, I mean a cleansing more especially of the grain surface of the leather, not in the sense that there is anything removed from the surface by the fluid compound, but the latter including the cleansing ingredients, by striking into the stock leaves the grain surface clean and bleached. Having prepared this bath, I apply the same thereto either with or without simultaneous manipulation of the leather.

Preferably the leather is flexed backward to a degree so that its convex surface is placed under tension sufficient to open the pores and by the term "flexing" as used in the present description and the claims, I mean a bending of the leather in a curve of small enough radius relative to the thickness of the stock so that the convex tensioned surface is stretched to a degree sufficient to loosen the fiber and open the pores; the penetrating tempering fluid is applied to said surface of the leather at near the time this tensioning from the flexing takes place so that the striking in of the fluid is greatly accelerated and thus the flexing of the stock coöperates with the tempering fluid application to complete the tempering operation. This application of the liquid to the leather is copious enough thoroughly to impregnate said surface, but preferably not so as to penetrate to the opposite side of the leather piece. Then the leather is rapidly flexed with such movement as to bring said impregnated side of the leather under repeated tension or stretching until the liquid has thus been caused to permeate all the fibers of that side of the leather.

My object is to churn, as it were, the cleansing and loosening, opening liquid back and forth through the pores and grain of the leather until all the minute particles

of the leather on the side being stretched have been loosened and agitated in direct contact with and under the permanent permeating influence of the bath with which said surface is soaked. If, for instance, the leather were simply dipped in a pail of the fluid, the leather would be soaked more or less, but the fluid would not be evenly distributed and would not come into thorough softening influence and relation to each grain as it were, but instead thereof the fluid would be very unevenly distributed, as it would gain ready access to those spots or portions of the leather where the pores happened to be coarse, and would not enter at all where the grain was close. My process, however, produces absolute uniformity. Besides this, the mechanical stretching and tensioning of the leather surface in the presence of the softening fluid produces a permanence of flexibility so that the leather thereafter does not harden when the fluid has dried out, but maintains a permanent flexibility or extreme pliability.

No specific mechanism is necessary for carrying out my process in its broader aspects, but I have herein shown an illustrative form of apparatus well adapted for carrying out the more specific steps of the process, this apparatus being similar to that shown and claimed in my copending application Serial No. 684,069 filed March 15, 1912, of which this case is a division, and the present invention being first shown in my earlier copending application Serial No. 659,739 filed November 1, 1911, of which the subject matter claimed in the present case is a continuation.

Referring to the drawings, Figure 1 is a side elevation of a machine wherein my improvements are embodied; Fig. 2 is an elevation partly in section, showing a portion of the valve controlling mechanism; Fig. 3 is a longitudinal vertical section through my improved tank for supplying the tempering fluid; Fig. 4 is a plan view thereof; Fig. 5 is a transverse section through said tank; and Fig. 6 is a fragmentary sectional view, showing a part of the connection for automatically controlling the supply of tempering fluid.

The general construction of the machine is similar to that of my aforesaid application, and comprises a frame 10 having journaled therein a series of rollers, around which are passed two taut belts 11, 12 for feeding the soles to the tempering station, and thereafter holding the soles gripped between them as they are bent around the flexing rolls. These belts at the forward end of the machine are passed around rollers 13, 14 respectively, spaced apart to provide a receiving mouth 15 to receive the soles, this mouth converging to a point 16, where the two belts are pressed together for feeding

the soles forward by pressure exerted on the upper one by the roll 17. Thence the soles are led to the tempering station 18 between the two belts, and just before reaching said station, the lower belt is looped over rollers 19, 20, 21 around the receptacle for the tempering fluid, the top of this receptacle being in position so that the soles, as fed thereto by the two belts, are moved thereover in contact with the receptacle top by the pressure and tractive impulse of the upper belt. The roller 21 is in such position beyond the upper portion of the tempering fluid receptacle that the two belts are brought together thereover and again catch the soles after they have passed over the receptacle and carry them around a lower flexing roller 22 to bend them in one direction and thence over an upper flexing roller 23 in the opposite direction, so as to bend them reversely. Thence the lower belt 12 passes around roller 24, take-up roll 24', rollers 25 and 26 back to the feeding mouth 15, and the upper belt passes around a tension roller 27 in position to keep the upper belt pressed against the soles and the lower belt, this roller being pressed outward by a spring 28, the tension of which is determined by an adjusting backing 29, so that the belt is kept under proper tension. Thence the upper belt passes around roller 30 and take-up roller 31, back over the roller 13 to the feeding mouth. The roller 14 of the lower belt is shown as a tension roller for tensioning the lower belt in like manner as the roller 27 does the upper belt, it being for this purpose pressed outward by a spring 32 having an adjustable backing 33. Thus the soles, while held tightly and uniformly gripped between the belts and just after they are treated to the tempering fluid at the station 18, are tensioned and stretched in a manner to open the pores thereof and effect a permanent relative give to the fibrous texture of the material by bending around the lower flexing roller 22 which especially opens the pores at the side of the stock to which the tempering fluid was just previously applied, and then around the upper flexing roller 23 which further works and loosens up the fiber of the stock by bending it in the opposite direction. The soles are thus stretched and rendered permanently pliable to a very marked degree by the combined and coöperative tempering and stretching or pore opening treatment, so that a very much improved product results and soles of ordinary or common grades of leather attain a permanent flexibility and pliability equal to or greater than that of much higher priced stock without any offsetting deterioration or injury of any kind.

My invention provides means whereby the supply of tempering fluid is admitted to the receptacle of the tempering station 18 only

while a sole is passing thereover, and for this purpose a roller 34 is journaled in slide blocks 35, guided in vertical bearings 36 of the frame, and normally pressed downward by a coil spring 37 interposed between it and backing blocks 38, held in adjusted position by screw bolts 39, threaded through the frame and engaged therewith. The sliding journal blocks 35 have fixed thereto rods 40, vertically slidable through the backing blocks 38 and with horizontal extensions 41 at their upper ends engaged from above by an extremity of lever 42, fulcrumed at 43 on the frame, and having its other end in pivotal connection with a link 44, which extends down through guides 45 for engagement with the short end 46 of a lever fulcrumed at 47, the longer arm 48 of which moves in guides 49 and is counterweighted, as at 50. The lever end 48 has link connection 51 with a lever arm 52, which is connected to operate a controlling valve 53 in a pipe connection 54 supplying tempering fluid under pressure to the tempering station from any suitable source by gravity or otherwise. A pipe connection 55 extends from the valve to the tempering station 18 and has a detachable connection 57 with an auxiliary tank 58 adapted to hold the tempering fluid. This auxiliary tank is of generally triangular cross section with an acute angle at its bottom conforming to the cross section of the exterior tank 59 and fitting against one side of the upper portion thereof as best seen in Fig. 5. The auxiliary tank 58 has a concave top 60 forming a trough into which the tempering fluid empties from the inside of the auxiliary tank through a passage 61, so that when the valve 53 is opened the tempering fluid fills the auxiliary tank 58 and flows through the passage 61 to fill the shallow trough 60, and keep a continuous bubble of liquid at the top of the tank, in position to be contacted by the soles as they are fed thereover, so that they are thoroughly impregnated with the fluid. The trough portion 60 merges into the side walls of the auxiliary tank at either side in rounded edges, as shown, so that the soles are adapted to slide smoothly thereover. A block of felt or like absorbent material 62 is secured at the side of the auxiliary tank from which the soles are delivered, the top of this felt piece extending slightly above the top of the auxiliary tank. This felt piece or block is held spaced away from the adjacent wall of the main tank 59 by a spacing plate 63, of U-form, the sides of this plate extending down to the bottom of the main tank and cooperating to hold the parts in operative position. This spacing plate is held away from the wall of the main tank, so as to provide a water passage by adjusting screws 64 threaded therethrough and engaging the

main tank wall. The auxiliary tank 58 is shown as held in the main tank or receptacle by screw bolts 65 and may be readily taken out as required by removing these screw bolts.

In operation, as a sole approaches the tempering station, it contacts with the roller 34 and presses the same upward against the spring 37, thus, through the rods 40, lever 42, link 44, lever 48, and link 51, operating the valve 53 to admit the tempering fluid to the tank. The fluid thereupon flows through the passage 61 and makes a bubble over the shallow trough 60 during the interval that the sole is passing thereover, the valve being operated to instantly shut off the flow of fluid as soon as the sole has completely passed under the roller 34, and thus been exposed over its entire surface to the bubble projected up from the trough 60. It is to be observed that the surface of the sole, as it passes over the trough 60, is thus treated to all the fluid that it can absorb, this fluid being even forced into the sole under some little pressure, since the sole substantially closes the top of the trough as it passes thereover; thus the stock is thoroughly impregnated with the tempering fluid, and as it passes along, the felt block 62 fulfils the combined function of further promoting the even spreading of the fluid to every part of the sole, and wipes off any superfluous fluid that may adhere to the sole surface beyond the amount capable of being absorbed thereby. Any excess liquid is caught by the adjacent wall 59 of the outer tank and flows down between it and the spacing plate 63 to the lower portion of the main tank, where it may be drained off in any suitable manner.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The herein described process, which consists in treating one side only of leather stock with a penetrating, opening surface cleaning fluid, and immediately thereafter mechanically flexing and working the same side of the stock to loosen and open the fibers and pores thereof.

2. The herein described process, which consists in treating leather stock on its grain side only with a penetrating fiber-opening fluid, and stretching and working the stock by flexing the same to loosen and open the fibers thereof on the grain side, said steps being carried out as substantially component parts of a single operation.

3. The herein described process, which consists in applying to one side only of the leather stock a copious bath of penetrating fluid in a body of such amount as to impregnate the leather on said side to an appreciable extent inwardly beneath the surface, continuing said application progres-

sively lengthwise of the piece of leather, and then immediately placing the impregnated side under flexing tension to facilitate the thorough inward and lateral distribution of the liquid.

4. The herein described process, which consists in applying to one side of the leather stock a copious bath of penetrating and cleansing fluid in a body of such amount as to impregnate the leather on said side to an appreciable extent inwardly beneath the surface, continuing said application progressively lengthwise of the piece of leather, and then immediately placing the impregnated side under flexing tension to facilitate the thorough inward and lateral distribution of the liquid.

5. The herein described process, which consists in applying to one side of the leather stock a copious bath of penetrating, cleansing and bleaching fluid in a body of such amount as to impregnate the leather on said side to an appreciable extent inwardly beneath the surface, continuing said application progressively lengthwise of the piece of leather, and then immediately placing the impregnated side under flexing tension to facilitate the thorough inward and lateral distribution of the liquid.

6. The herein described process, which consists in applying to one side of the leather stock a copious bath of penetrating fluid in a body of such amount as to impregnate the leather on said side to an appreciable extent inwardly beneath the surface, continuing said application progressively lengthwise of the piece of leather, then immediately sharply bending said leather back on itself so as to place the im-

pregnated side under strong tension, and progressively moving said sharp bend lengthwise of the leather.

7. The herein described process which consists in applying to leather stock a penetrating tempering fluid and flexing the stock while held strongly and evenly pressed and gripped over all parts of the surface thereof.

8. The herein described process which consists in applying a penetrating tempering fluid to leather stock and immediately thereafter flexing the stock in a manner to stretch and open the pores of the stock while held strongly and evenly pressed upon all the flexed portions of the surface thereof.

9. The process of treating leather soles, which consists in applying a penetrating cleansing tempering fluid thereto and flexing the soles transversely of the length thereof while held strongly and evenly pressed over all of the flexed portions thereof to complete the tempering operation and render them permanently pliable.

10. The herein described process, which consists in applying a penetrating cleansing tempering fluid to one side of leather soles and thereafter progressively flexing the soles transversely of the length thereof while held strongly and evenly pressed over all of the flexed portions thereof to complete the tempering operation and to render the soles permanently pliable.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GEORGE BASLER.

Witnesses:

ABBIE F. TWOMEY,

WALLACE C. WRIGHT.