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J. A. MILLICAN

METHOD FOR TREATING LEATHER

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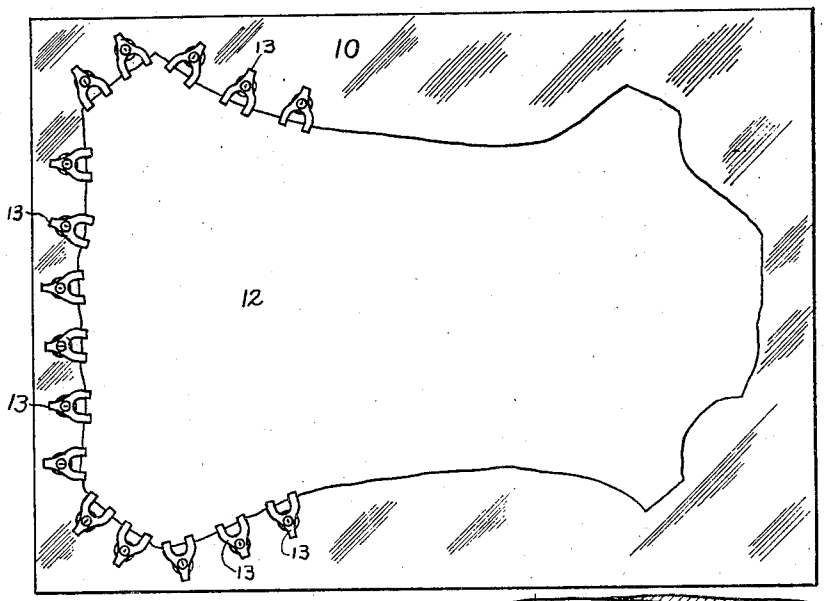


Fig. 1

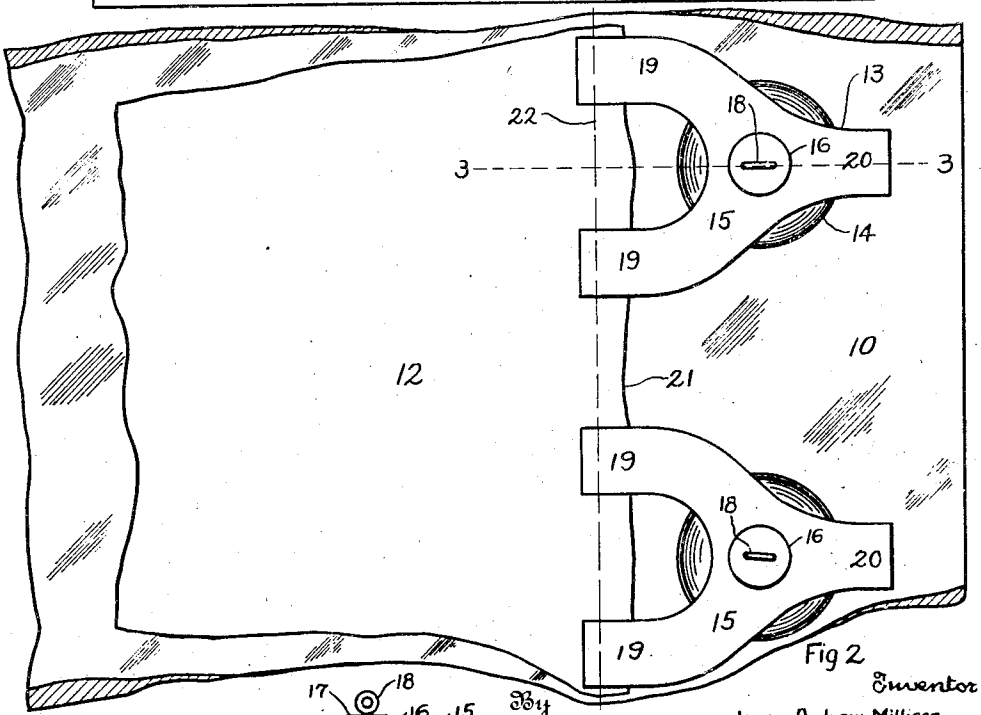


Fig 2

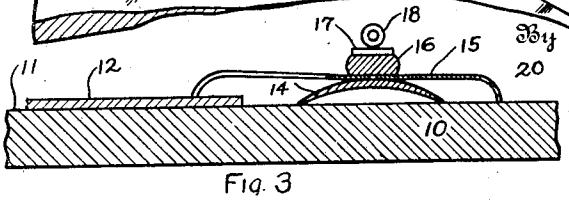


Fig. 3

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UNITED STATES PATENT OFFICE.

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METHOD FOR TREATING LEATHER.

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My present invention relates to the manufacture of leather.

The purpose of this invention is to point out a new and improved process in the treatment and particularly the setting-out and the drying of leather.

It has long been recognized that allowing leather to dry without holding it stretched out results in a great shrinkage of the leather and that allowing the leather to dry without its being in some way held flat allows the leather to become permanently wrinkled or curved. To obviate this shrinkage and wrinkling the pieces of leather were tacked or otherwise positively fastened to the setting-out board or another form and left in that position until dry. That method held the leather from shrinking at the holding tacks or nails, but allowed some shrinking between and often left wrinkles and always left nail holes which necessitated trimming the edges of the piece of leather.

Another method of treating leather at this stage of its manufacture contemplated the setting-out of the leather wet upon the setting-out board and relying upon the adhesion of the leather to the board to keep the leather stretched out and flat during the drying process. With many common forms of leather this method was not successful because the leather loosened from the setting-out board before the leather had dried past the shrinking and wrinkling state. To overcome that difficulty an adhesive was applied either to the setting-out board or other drying surface or to the hide itself so as to make the leather stick or adhere to the said surface without shifting or shrinking.

The use of an adhesive upon or in connection with the leather, however, has in many cases an injurious effect upon the leather and in practically all cases prevents the leather from being when dried of as good quality as would have been the case if no adhesive had been used. I have found also that in many cases when the leather was treated supposedly under the process of placing the leather wet upon the setting-out board and supposedly without using an adhesive, the efficacy of the process really resided in the fact that some of the oils or other materials previously used in the treatment of the hide were actually operative as an adhesive and that the use of such material was continued because it seemed to aid in the drying process.

It is one purpose of my invention to provide a process or processes that will overcome or obviate the objections and disadvantages incident to the manufacture of leather as above mentioned and to provide a process whereby practically any type of leather may be dried upon the setting-out board without the use of an adhesive and without utilizing any material in the leather that would act as an adhesive and without having to puncture the leather with nails or other holding devices.

Another purpose is to provide a process of treating leather wherein the capillary attraction of the water moistened leather is relied upon to hold the leather to the setting-out board as long as necessary to produce a drying of the leather without wrinkling and wherein steps or means are used to assist said capillary attraction or to continue the said capillary attraction at the edges of the leather until the whole piece of leather is evenly dried.

As a general average when leather comes to this stage ready for setting out and drying, fifty per cent of its gross weight is water. Of this fifty parts water, forty parts dry out without any noticeable tendency of the leather to shrink but then the contraction stage is reached and during the drying out of the next five parts of water, the leather, if dried in the open air and without restraint against shrinking, would shrink from fifteen per cent to eighteen per cent of its original area. The remaining five parts of water stay in the leather in its usual commercial form. For convenience of description herein I will refer to the part of the drying out when contraction of the leather is taking place as the final drying out or contraction period and will refer to the previous drying out as the primary drying period. I have found that the processes which hold the hide upon the setting out board or other form positively until the drying process is entirely complete and without allowing any shrinkage whatever produces a lower grade or an inferior quality of leather, but that allowing the leather to shrink somewhat, say three per cent of its area, retains or improves the quality of the leather so as to far outweigh the slight shrinkage allowed. Accordingly a further purpose of my invention is to provide a process of treating leather wherein the leather is allowed to contract such slight amount or small fractional

part of the normal shrinkage during the contraction period.

I have found that the failure of the process of taking wet leather without the use of an adhesive and drying it upon the setting-out board failed primarily because the edges of the leather dried out before the body of the leather and thus allowed the said edges to leave the surface of the setting-out board and curl up and so successively expose to premature drying successive portions of the leather in from the edge resulting in uneven drying and curling of the leather. One form of my invention consists in overcoming this trouble and in holding the edges of the leather against the setting-out board until the whole piece of leather is dried and thus preventing the admission of air to the space between the leather and the setting-out board and so preventing drying out from the grain side of the leather. This feature of my invention contemplates that the leather have its grain side held close enough to the setting-out board to prevent the leather curling up at the edge or drying out from the grain side.

It is a further purpose of my invention to provide steps in the process as will hold the leather and especially the edges thereof closely against the board during the entire drying period but will allow the leather to shrink somewhat but much less than the normal amount during the final drying period with the leather, however, still held flat and even during said final drying period.

Further purposes and advantages of my invention will appear from the specification and claims herein.

Fig. 1 of the drawings is a plan view of a setting-out board with a hide placed thereon and held upon the board by spring-armed, suction-cupped clips.

Fig. 2 is an enlarged detail of a portion of Fig. 1 showing two of said holding clips engaging an adjacent piece of the right hand edge of said hide.

Fig. 3 is a sectional view on line 3—3 of Fig. 2.

Referring to the drawings in a more particular description it will be seen that I am utilizing a setting-out board 10 having the usual hard and relatively impervious upper surface 11 necessary for such setting-out board to dry the hide 12 upon. The hide in a wet condition is set out in the usual manner upon the setting-out board 10 with the hide stretched out as is usual to the proper extent upon the board through the setting-out process. Incident to the wetness or moisture of the hide and the pressure used in setting-out the hide upon the board the hide sticks or adheres very closely to the setting-out board when first placed thereon. This sticking of the grain side of the leather to the setting out board I take care shall be due simply to the wetness of the hide and the pressure used in setting out the hide upon the board which two factors produce a form of capillary attraction and particularly I see to it that the leather and the board are free from any adhesive material. In order to be sure that the leather after it has been colored comes to this process free of adhesive material or at least free from any adhesive action of any adhesive in the leather I remoisten or wash the leather in warm water. This warm water removes any adhesive present in the leather or at least neutralizes any adhesive action of any adhesive material left in the leather. This washing in warm water is done immediately before setting out the leather upon the board and forms one step in the process of my invention as outlined in certain of the claims hereinafter set forth.

After the leather has been thus set out upon the board I employ apparatus to hold the edges of the leather closely to the setting-out board until the entire drying process is complete; that is until the leather has stayed upon the board long enough for that portion of the water which is to be extracted has dried out from the leather. The holding of the edges of the leather thus closely to the board prevents the said edges from curling up and prematurely drying and curling at the edge and especially prevents the leather from drying out at the edge and then curling and successively exposing other zones of the leather close to the edge to premature drying upon the grain side of the leather. In other words the holding of the edges of the leather closely to the board until the leather is entirely dry assists the holding action due to the wetness of the leather and the capillary attraction therein so that the whole area dries evenly.

Preferably also the means that I employ to hold the edges of the leather closely to the board also operate by a yielding tension and a yielding holding action upon the leather so as to hold the leather extended against the greater part of the shrinkage that would normally take place during the contraction stage of drying, but said resilient holding mechanism is of such form and arrangement as to allow a small part of the normal shrinkage to take place without the leather slipping from or becoming free of said holding mechanism.

Preferably also said holding mechanism should be simple and economical in construction and operation and constructed in small units and readily attachable to any part of the setting out board without puncturing or injuring the surface of said board. The preferred form of a holding means that will fill these requirements is a suction-based spring-armed clip generally denoted by the

numeral 13. A plan view of two of these clips is shown in Fig. 2 and a vertical sectional view of one of them is shown in Fig. 3. This clip has a conventionally formed suction-operating or vacuum-operating base 14 usually made of rubber or some similar material and is concavo-convex or saucer shape in cross section. To the top of this base is secured the metal frame 15 preferably with a rubber or other yielding boss 16 above the frame 15 and a metal washer 17 above said boss with the central metal connecting member of the device commonly terminating above the washer in an eye 18.

The frame 15 is conveniently formed of resilient sheet metal preferably having two spaced arms 19 adapted to extend past the base 14 over the edge of the adjacent piece of leather as will be apparent from Fig. 2. Towards their outer ends these arms are turned or curved downwardly more or less as shown in Fig. 3. Opposite the arms 19 the metal frame is provided with an anchoring arm 20 which extends beyond the edge of the suction base and is turned down to rest against the surface 11 of the setting out board to aid in the clip maintaining its resilient pressure upon the leather through the two arms 19. In practice the working arms 19 may be spaced about two inches apart from center to center and these holding clips may be placed along the edge of the leather at intervals so as to have the space from the center of one arm of one clip to the center of an arm on an adjacent clip about two inches. It will be understood that this suggestion of size of the clips and spacing of the clips along the side of the leather is simply illustrative and that the clips may be larger or smaller and of different shape and may be spaced closer together or farther apart according to the requirements of the different leather being treated.

In Fig. 1 I have shown a hide 12 set out upon the setting-out board 10 and upon the board has been placed a number of these holding devices. It will be understood of course that a sufficient number of these holding devices are employed to reach all the way around the outer edge of the hide. It will be particularly noticed that these holders or clips 13 are readily adjustable to any point upon the setting-out board so that they can be placed upon the board just outside the hide and thus adapt the process and apparatus to operate upon any size of hide and upon any shape or size of the piece of leather that may go upon the setting-out board. It will be understood further that the application of the suction-based clips to the setting-out board does not puncture or injure in any way the surface of the board and that the clips may be readily removed in a well-known manner after the leather is dry or for re-locating one of the clips if one has been applied to the board too near or too far from its edge of the leather.

The holding clips 13 are sufficiently attached to the setting-out board through their suction base 14 and the strength and resiliency of the holding arms 19 is such that the edges of the leather are held closely to the setting-out board during the entire process of drying. The tension of the holding arms 19 is also such that the usual large amount of shrinkage of the leather is largely restrained but not entirely prevented in that about a fifth or a sixth of the normal shrinkage is permitted; that is a shrinkage to the extent of about three per cent of the total area of the leather is allowed during the contraction period by reason of the leather sliding beneath the arms 19 but not sliding entirely from beneath said arms 19. In Fig. 2 in full lines is shown the outline of a piece of leather 12 with the outer edge 21 shown also in full lines in the position it occupies relative to the clips when the leather is first set out upon the board and the clips applied thereto. After the slight allowed shrinkage of the leather has taken place this outer edge 21 of the leather will have moved relative to the arms 19 and to the adjacent part of the surface of the setting-out board about to the dashed line 22—22. It will be understood of course that the other outer edges of the hide have shrunk in the same way to a greater or less extent according to the character of the hide and the location of the part in question upon the hide. It will be understood furthermore that the clips may if necessary be located at other than a direct right angle to the adjacent edge of the hide in order to hold in a most effective way against the shrinkage of the hide and also to allow of some sidewise motion of the leather past the clips if such sidewise motion is not sufficiently allowed for through the permitted pivotal action of the metal frame 15 upon the base 14.

What I claim as new and desire to secure by Letters Patent is:

1. The herein described method of treating leather which consists in setting out the leather upon a setting-out surface while wet and applying and maintaining pressure on the leather adjacent its edges sufficient to hold said edges of the leather closely to the setting-out surface during the entire drying period.

2. The herein described method of treating leather which consists in setting out the leather upon a setting-out surface while wet and applying and maintaining pressure on the leather adjacent its edges at closely spaced intervals sufficient to hold said edges of the leather closely to the setting-out surface during the entire drying period.

3. The herein described method of treating leather which consists in washing the leather in warm water to render it adhesive-free, setting out the leather upon a setting-out surface while wet and applying and maintaining pressure on the leather adjacent its edges sufficient to hold said edges of the leather closely to the setting-out surface during the entire drying period.

4. The herein described method of treating leather which consists in washing the leather in warm water to render it adhesive-free, setting out the leather upon a setting-out surface while wet and applying and maintaining pressure on the leather adjacent its edges at closely spaced intervals sufficient to hold said edges of the leather closely to the setting out surface during the entire drying period.

5. The herein described method of treating leather which consists in setting out the leather upon a setting out surface while wet and applying and maintaining pressure on the leather adjacent its edges sufficient to hold the leather from about eighty per cent of its normal shrinkage but allowing the leather to shrink slightly during the contraction period.

6. The herein described method of treating leather which consists in washing the leather in warm water to render it adhesive-free, setting out the leather upon a setting out surface while wet and applying and maintaining pressure on the leather adjacent its edges sufficient to hold the leather from about eighty per cent of its normal shrinkage but allowing the leather to shrink slightly during the contraction period.

In witness whereof I have affixed my signature, this 31st day of December, 1926.

JAMES ANDREW MILLICAN.