March 25, 1930. W. A. BECK 1,751,464

METHOD OF MANUFACTURING LEATHER

Filed July 2, 1923 2 Sheets-Sheet 1

Fig. 1.

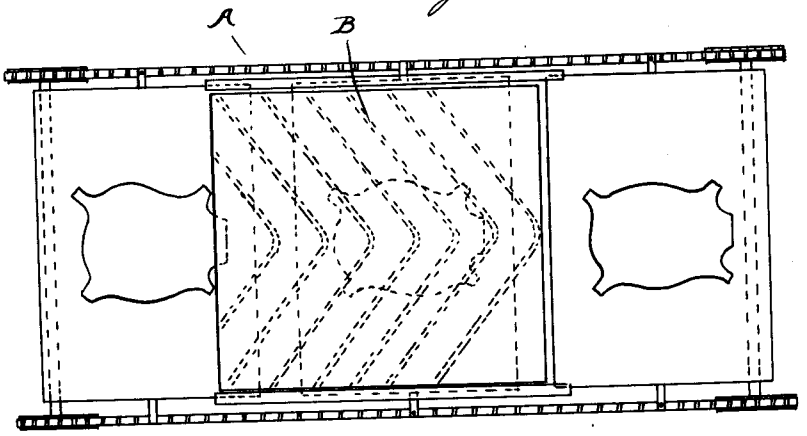
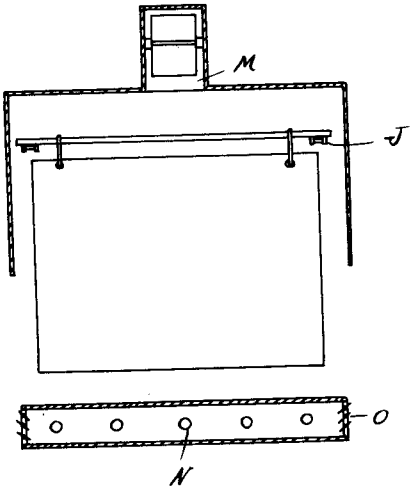


Fig. 7



Inventor

Walter A. Beck

By Whittemore Hulbert Whittemore & Belknap Attorneys

March 25, 1930. W. A. BECK 1,751,464

METHOD OF MANUFACTURING LEATHER

Filed July 2, 1923 2 Sheets-Sheet 2

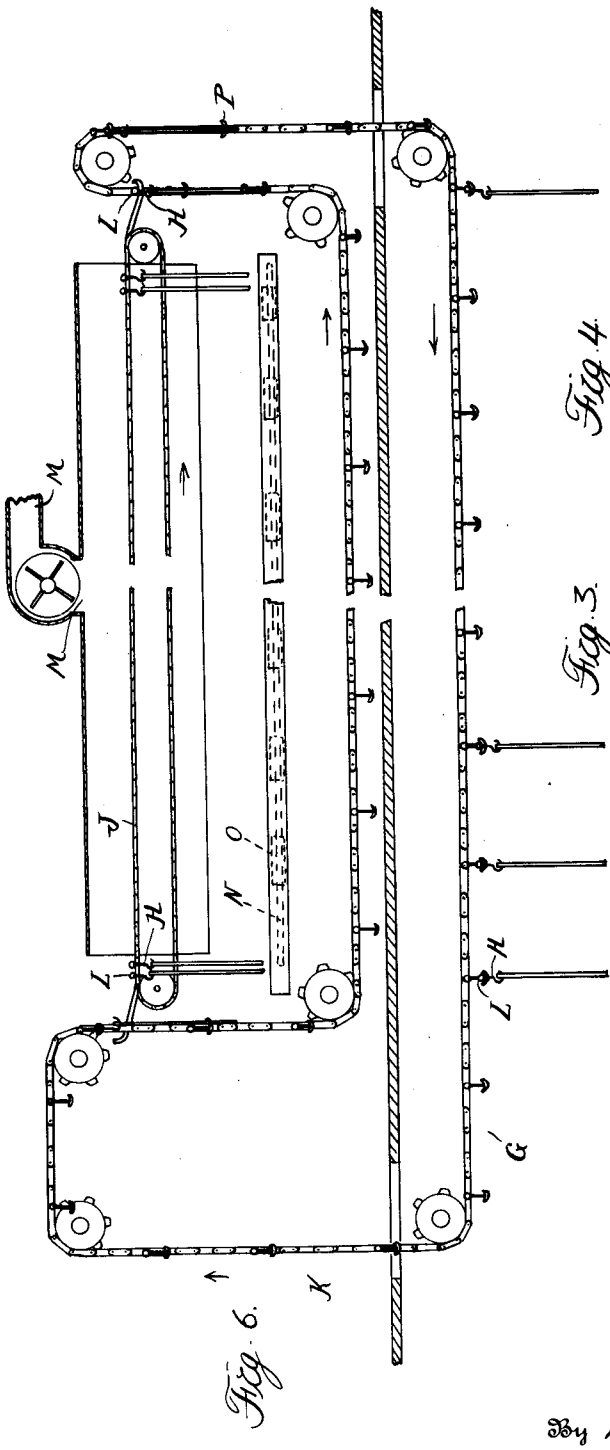


Fig. 6.

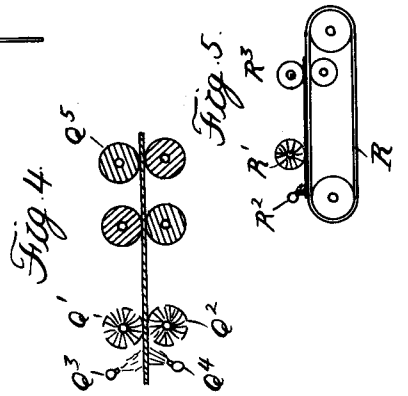


Fig. 4.

Fig. 5.

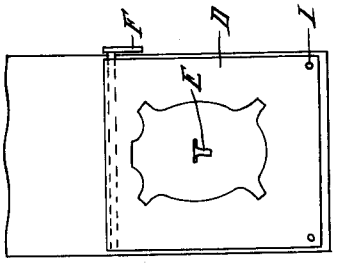


Fig. 3.

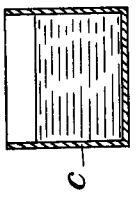


Fig. 2.

Inventor
Walter A. Beck

By Whittemore Hulbert Whittemore
& Belknap Attorneys

Patented Mar. 25, 1930 1,751,464

UNITED STATES PATENT OFFICE

WALTER A. BECK, OF DETROIT, MICHIGAN, ASSIGNOR TO LEATHER MAKERS' PROCESS COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN

METHOD OF MANUFACTURING LEATHER

Application filed July 2, 1923. Serial No. 649,152.

The invention relates to the manufacture of leather and more particularly to that portion of the process including the stretching and drying of the wet skins, the present application being related in subject-matter to my pending application, Serial No. 646,222, filed June 18, 1923. In the present state of the art one method of effecting this result is to tack the wet skins to boards on which they are permitted to dry. Another method is to paste the skins to the surface of a board and after drying to strip the skins from the board. Inasmuch as the drying requires a considerable period of time, it is obvious that where there is a large output, a great deal of space is required for accommodating the drying boards. Also, to secure uniformity in results, there should be a circulation of the atmosphere contacting with the wet skins and this atmosphere should be maintained at a predetermined temperature and humidity.

It is the object of the present invention to carry out this process with economy of space and labor under conditions which insure uniformity of results and high quality of product. It is a further object to obtain an increase in area of the dried skins over that which would be produced upon the same skins by processes heretofore used. With these objects in view the invention consists in the invention as hereinafter set forth.

In the drawings:

Figures 1 to 5 are diagrammatic views illustrating successive steps in the process;

Figure 6 is a diagrammatic view illustrating the conveyor for carrying the work through the endless cycle;

Figure 7 is a cross section of Fig. 6,

Where the skins are tacked to the drying boards, it is usual to form the latter out of lumber including a plurality of spaced boards attached to cross cleats. The total thickness of the structure is therefore at least double that of the lumber of which it is made and where a large number of skins are to be stored, a very considerable space is occupied by the boards. In the pasting process, as heretofore carried out, the skins are attached to only one surface of the board and the latter must be of sufficient thickness to maintain rigidity under the stresses due to the drying and shrinking of the skins. Therefore, with this process also a very considerable amount of space is occupied by the boards. With my improved process I substitute for relatively thick boards, heretofore used, plates formed of paper board or equivalent material of greatly reduced thickness. The opposite sides of these boards are provided with a glazed finish and in use skins are affixed to each side, thereby doubling the capacity, and by opposing the stresses on one side to those on the other, avoiding any tendency to warp the boards.

Another feature of my process is the cycle of operations, which includes; first, the squeezing of the surplus water from the wet skins; second, coating the grain side of the skins with an adhesive; third, affixing and setting out a skin upon one face of a drying board, reversing said board and affixing and setting out a skin on the reverse side thereof; fourth, conveying the boards in endless series to the drying chamber in which they are arranged in closely spaced relation for the necessary length of time; fifth, circulating the air between the boards during this drying process and regulating the temperature and humidity of the air thus circulated; sixth, stripping the dried skins from the boards; seventh, removing the film of adhesive from the surface of the stripped skins; eighth, washing and scrubbing the drying boards and returning the same to the starting point for again passing through the same cycle. The above cycle facilitates the necessary manual operations, while other necessary operations are entirely automatic. Also, the space required by this process for a given quantity of product is much less than that necessary for methods heretofore used.

In detail, the wet skins A are first preferably passed through a squeegee or other device, indicated at B, (Fig. 1) for removing surplus water and the moist skins are then preferably immersed in a vat or receptacle C containing the mucilage or adhesive material. This material is so compounded as to have; first, a predetermined viscosity which limits the amount absorbed by the pores of the skins

and also acts as a lubricant facilitating the setting out of the skin on the board; second, a mild adhesive quality such as to retain the skin upon the board until dry, but to permit of easily stripping from the board without injury to the grain surface; third, a softening ingredient which prevents that portion of the material which is absorbed by the skin from hardening the latter.

After the skins have been immersed in the mucilage, they are successively set out upon the drying boards D, each board being first placed upon a suitable supporting table and a skin laid thereon and set out by manual operation. This setting out process is accomplished by the use of a suitable tool E which is scraped or rubbed over the skin from the center to the periphery to work out the surplus mucilage and to stretch out the thick portions of the hide. Thus the operation is first upon the bone portion of the skin which is of greatest thickness and which is stretched out longitudinally. The skin is then rubbed laterally from the center towards the periphery, which also thins the thick portions and increases the thickness of the thin portions.

When a skin is set out on one side of the board, the board is reversed, preferably by the use of a reversing frame F which swings the board about one edge onto an adjacent table. A second skin is then set out upon the reverse side, after which the board is preferably engaged with an automatic conveyor which carries it through the rest of the cycle. As shown, this automatic conveyor includes a conveyor section G having depending hooks H on which the boards may be suspended by engagement with eyelets I. The speed of the conveyor G and the spacing of the hooks H thereof is such that the boards are removed as rapidly as they are prepared by the workman, or, where there are a number of workmen simultaneously setting out skins, the conveyor is timed to the capacity of the entire group. The boards attached to the hooks H are sufficiently spaced from each other to provide room for the workmen, but during the drying process the boards must be closely stacked to economize space. Therefore, the boards are preferably automatically transferred from the conveyor G to a slow moving conveyor J which passes through the drying chamber. As shown, the transfer means comprises a vertical portion K of the conveyor G which lifts the rods L together with the boards suspended therefrom to the level of the conveyor J. It is not, however, necessary that these two conveyors G and L should be at different levels as any convenient arrangement may be used.

The timing of the conveyor J is such that the rods L when deposited thereon will be closely spaced, leaving between the adjacent suspended boards D only sufficient space for the passage of the air current. Preferably the conveyor J is arranged in a tunnel or housing and connecting with the top of this tunnel at suitable intervals are exhaust conduits M, through which the air is drawn by suction fans. Beneath the conveyor J and boards suspended therefrom are heaters N, preferably steam coils within an enclosing casing having doors or dampers O at intervals, which may be variably opened for the passage of the heated air. Thus by regulating these dampers O, the proper temperature may be imparted to the air, which is drawn up between the plates D and by returning a portion of the air exhausted through the conduits J and blending the same with the hot and the cold air, the humidity of the atmosphere may be regulated.

Before the boards have traversed the entire length of the conveyor J, the skins will be thoroughly dried and may be stripped off from the boards by the attendant. The boards are then removed from the conveyor J by a second vertical portion P of the conveyor G or other means of transportation by which they are conveyed to the point for washing and scrubbing. Such treatment is rendered necessary as there is always some adhesive left on the board as well as small particles of solid material, which would interfere with the smooth finish of a skin subsequently mounted thereon. The washing and scrubbing is effected by a suitable machine, as Q, having revolving brushes Q' and Q^2 above and below the plate and a series of water jets Q^3, Q^4, which are directed respectively against the upper face and lower face of the plate adjacent to the brushes. Squeegee rolls Q^5 of rubber or other suitable material will remove water from the surface so that the board, when delivered, is ready for use in mounting other skins.

The dried skins when stripped from the boards are passed through a surface washing machine, which, as indicated in Figure 5, consists of an endless belt conveyor R over which the skin is passed, a rotary scrubbing brush R', water jets R^2 and a squeegee roll R^3. This will remove the film of adhesive from the surface of the skin without wetting the same to any great extent.

One of the important advantages of my improved process is that I am enabled to obtain a greater area in the dried skin than by any of the known processes heretofore used, such as tacking, toggling, etc. This is due to the fact that the thick portions of the skin are so stretched out in the setting-out process as to materially increase the area, and while a portion of this increase is offset by the thickening up of the thin portions of the skin, there is nevertheless a net gain. Heretofore skins have been set out on drying plates in such a manner as to thicken up the thin portions. The fact that each portion of the skin is firmly held in position by the

adhesive until the drying is complete prevents the contraction and consequent loss of the increased area and without exerting any detrimental stress upon any other portion of the skin.

What I claim as my invention is:

1. In a process for manufacturing leather, the mounting of pairs of separate adhesive coated skins on opposite faces of thin mounting boards to balance the stresses exerted on said boards when drying the skins.

2. In a process for manufacturing leather, the mounting of pairs of separate skins upon opposite faces of thin mounting boards to balance the stresses exerted on said boards in drying, and the arrangement of said boards in closely spaced parallel series during the drying.

3. In a process for manufacturing leather, the advancing of a series of mounting boards through an orbit in a portion of which said boards are in closely spaced parallel relation and advancing at a low rate of speed and in another portion of which said boards are more widely spaced and advancing at a higher rate of speed, the removal and replacement of said boards in the widely spaced portion of the orbit, the mounting of adhesive coated skins upon said boards while removed from the orbit, stripping the dried skins from said boards while advancing through the orbit, and the washing and scrubbing of said boards after removal from the orbit and before the mounting of skins thereon.

4. In a process for manufacturing leather, the advancement of a series of mounting boards through an orbit including a portion in which the boards are in closely spaced parallel relation and slowly advancing and a portion in which said boards are more widely spaced and advancing at a higher rate of speed, removing and replacing said boards in the widely spaced portion of the orbit, washing and scrubbing the opposite surfaces of said boards after removal from the orbit, mounting an adhesive coated skin on one side of the scrubbed board, mounting of a separate adhesive coated skin on the opposite sides of said board and the stripping of the dried skin from said boards while advancing through the closely spaced portion of the orbit.

In testimony whereof I affix my signature.

WALTER A. BECK.