

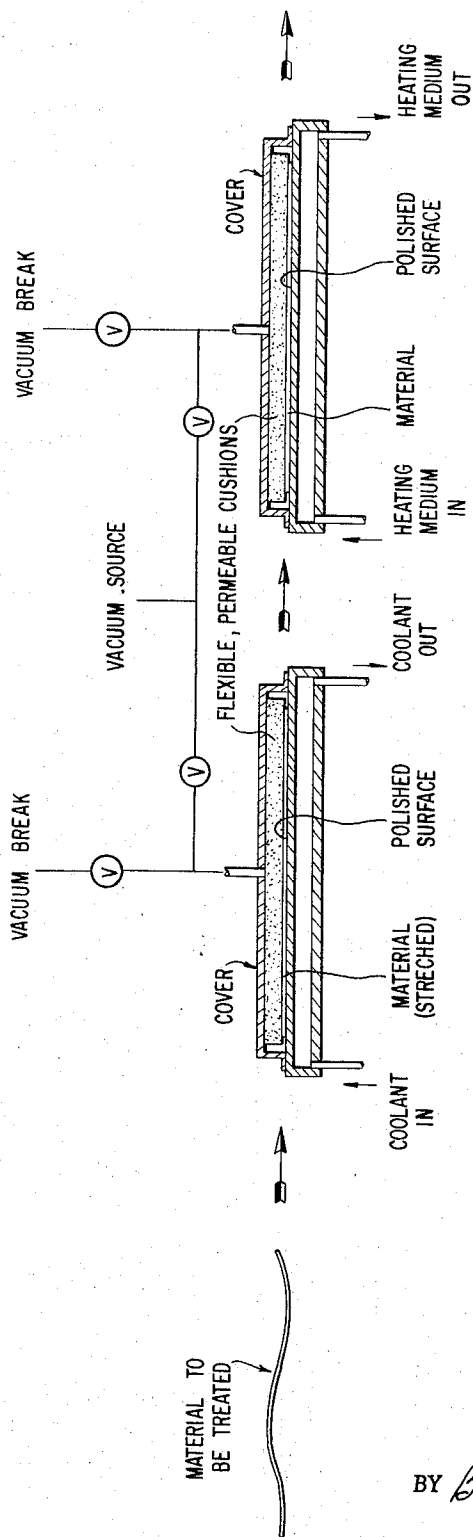
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DRYING TANNED LEATHERS

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DRYING TANNED LEATHERS

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This invention relates to a method of drying tanned leathers and skins, and the dried skins produced thereby.

A method is already known for drying skins and leathers, which method consists of stretching the wet leathers or skins over a heated polished surface and applying thereover a fluid-tight cover provided on the inside with a flexible cushion which is permeable both to air and to water vapour. A vacuum is then created by drawing off through said permeable cushion the air contained between the cover and the polished surface and also the water vapour driven off from the leather or skin by the heated surface. Leathers and skins dried in this manner are stiff and hard and must subsequently be treated to render them supple, the treatments being lengthy, intricate and expensive.

A process called lyophilisation is also known for drying various materials which comprises freezing in vacuo the material to be dried, then rapidly transferring it to a heated container, likewise under vacuum, so as to effect by sublimation the direct passage to the vapour state of the ice resulting from the freezing of the water in the material to be dried, without passing through the intermediate liquid phase. The drying of leathers and skins by a lyophilisation process of this type cannot be immediately carried out without taking special steps.

The present invention has as its main object a method of drying tanned leathers and skins by lyophilisation.

The method according to the invention comprises stretching the leathers or skins to be dried over a first polished surface, enclosing said surface and leather of skin with a first fluid-tight cover, creating a vacuum in the enclosure thus formed while cooling the polished surface to a temperature substantially lower than 0° C. in order to effect rapid freezing of the water contained in the leather or skin, breaking the vacuum in said enclosure and uncovering the leather or skin, rapidly transporting the frozen leather or skin in the form of a stiff sheet, at a rate such that it is not essentially heated, to a second polished surface, enclosing the latter by a second fluid-tight cover, creating a vacuum in the enclosure thus formed and heating said second surface, for example to a temperature of from 65 to 90° C., in order to sublime the frozen water in the leather or skin, breaking the vacuum, uncovering the leather or skin, and removing the dried leather or skin from said second surface.

Preferably, each of the fluid-tight covers has on the inside a flexible cushion permeable both to air and to water vapour and the vacuum is created in each enclosure formed between a respective polished surface and fluid-tight cover by suction through said cushion.

As a result of this treatment on two successive surfaces, the first of which is cooled and the second heated, rapid drying of the skins and leathers is effected. The respective cooling and heating times depend on the initial water content of the material and the degree of final drying which it is desired to obtain.

Furthermore, it is surprisingly found that leathers and skins dried in this manner obtain directly the flexibility suitable for their final use. This flexibility depends only on the quantity and nature of fatty material incorporated in the skins during treatments preceding the drying, and on the nature of such treatments.

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The method according to the present invention therefore makes it possible to eliminate subsequent treatments normally required by previously known drying methods, whether with or without the application of a vacuum. Such treatments comprise preliminary conditioning, mechanical methods of suppling such as stretching on softening irons or treatment with a paring knife, or subsequent additional drying, and are therefore particularly lengthy, intricate, and expensive.

For the execution of the method according to the present invention use may be made of an assembly of two vacuum driers of any known type, the first of which is modified to effect vigorous refrigeration instead of the usual heating.

The single figure of the accompanying drawing is a flow sheet depicting the progress of material being treated in accordance with the invention through apparatus shown schematically. The elements \odot represent valves.

It is particularly advantageous to utilise two devices of the type forming the subject of French patent application No. 32,495 filed on Sept. 23, 1965, entitled, "Method of and Apparatus for Vacuum Drying of Leathers and Skins." Said devices essentially comprise a frame carrying two bearings in which journals are adapted to rotate, the journals being fixed on the lateral sides of a double-walled box provided with means for circulating a refrigerating or heating fluid. The outer faces of said box are polished and two frames are provided which are articulated one on each side of the box.

Each frame supports a sheet of rubber or flexible plastics material lined on the inside with a cushion composed of a stack of grids of plastics filaments of increasing fineness of mesh, each grid being separated from the next by a thin sheet of flexible plastics material pierced with a large number of small holes, so as to form two covers capable of being folded over the two polished outer faces of the heating box. Flexible tubes connect a double pipe situated on the top side of the box, or in certain cases on two or three sides of the box, to a vacuum line in order to enable a vacuum to be formed by suction through the cushion.

Devices of this type permit substantial speeding-up of production and provide better conditions for elimination of water.

In order that the invention may be clearly understood a preferred embodiment in accordance therewith will now be described by way of example.

Example

A half-skin or strip of an adult bovid, previously chrome tanned, retanned, dyed, and nourished, was allowed to stand in a pile with other similar skins for at least 12 hours after the last treatment in the retanning mill.

This skin, which weighed 8 kg. without being wrung or drawn out, was used in that condition by scraping with its hair side against the polished, refrigerated surface of a first apparatus of the type described in the aforesaid French patent application No. 32,495 but modified to effect a circulation of refrigerating fluid in the double wall of the polished surface.

The apparatus was closed by applying the cover to the skin, and a vacuum was immediately produced in the enclosure formed between the cover and the polished surface, which was cooled to -25° C.

After a time of 7 minutes, the skin was completely frozen. The cover was raised to uncover the skin which had become as stiff as a plywood board through the freezing. The skin was easily removed and handled for the purpose of rapid application, by its hair side, against the heated polished surface of an unmodified apparatus of the above-mentioned type, constituting the actual vacuum drying

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apparatus, in which a vacuum was produced by suction after closing the cover.

After a time of 8 minutes the drying operation was completed, the residual humidity in the skin amounting to between 12 and 18%. The skin then weighed 3 kg.

The method according to the invention may be applied equally well to any type of skin, for example calf skins for box-calf, sheep and goat skins for numerous purposes, skins of animals of the equidae family, by-products known as flesh-splits resulting from the splitting of skins in their thickness, and so on, this list being illustrative and not exhaustive.

The example for which figures are given above relates to the treatment of bovine cattle skins, which are generally the thickest. Treatment times are considerably reduced for thinner skins, such as calf skins for box-calf, and still more so for sheep and goat skins and flesh-splits. Simple experience will enable optimum freezing and final drying times and temperatures to be determined.

What is claimed is:

1. A method of drying a material selected from the group consisting of tanned leathers and skins, comprising stretching the material to be dried over a first polished surface, enclosing said surface and material with a first fluid-tight cover, creating a vacuum in the enclosure thus formed while cooling the polished surface to a temperature lower than 0° C. in order to effect freezing of the water contained in the material, breaking the vacuum in

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said enclosure and uncovering the material, transporting the frozen material in the form of a stiff sheet, at a rate such that it is not essentially heated, to a second polished surface, enclosing the latter and the material by a second fluid-tight cover, creating a vacuum in the enclosure thus formed and heating said second surface in order to sublime the frozen water in the material, breaking the vacuum, uncovering the material, and removing the dried material from said second surface.

2. A method according to claim 1 wherein each of said fluid-tight covers is provided on the inside with a flexible cushion permeable both to air and to water vapour and the vacuum is created in the respective enclosures by suction through the cushions.

3. A method according to claim 2 wherein the second surface is heated to a temperature of from 65 to 90° C.

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