Oct. 6, 1964 L. TURATO 3,151,952

PROCESS AND APPARATUS FOR SPREADING OUT AND VACUUM DRYING OF WET DRESSED AND/OR COLORED HIDES

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Fig. 1

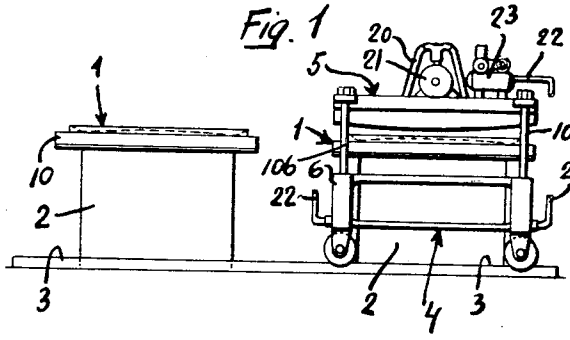


Fig. 2

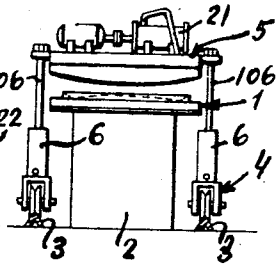


Fig. 4

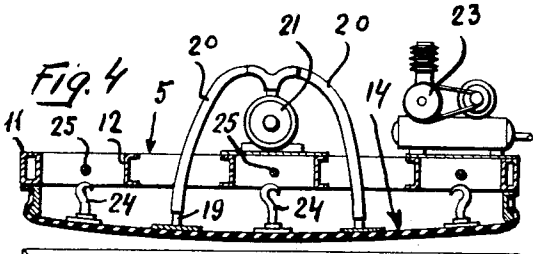
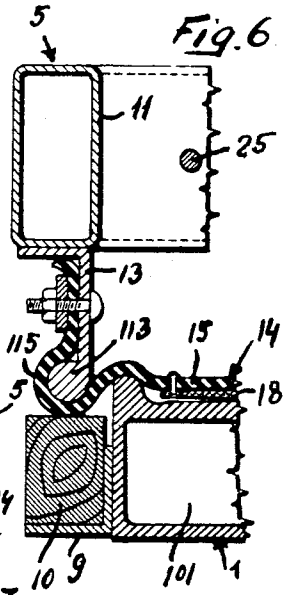


Fig. 6



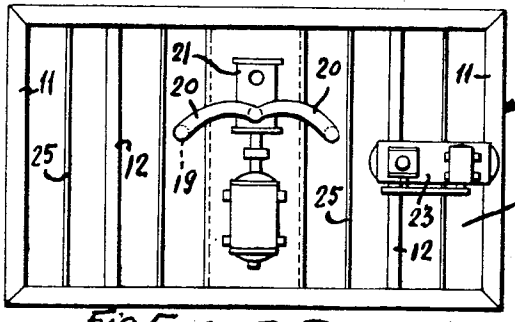


Fig. 5

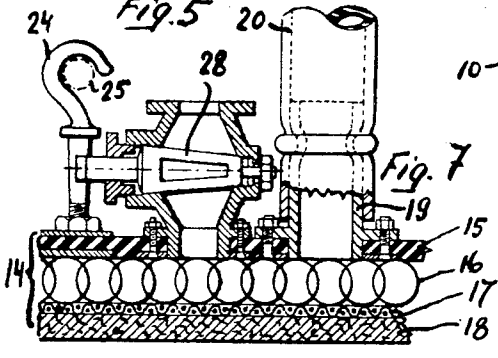


Fig. 7

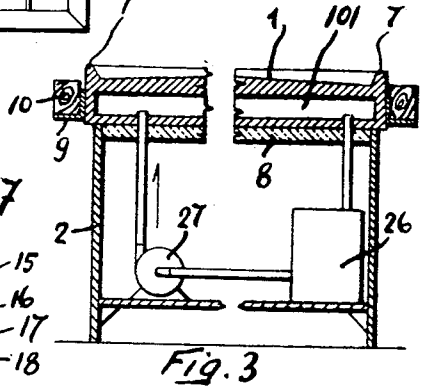


Fig. 3

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# PROCESS AND APPARATUS FOR SPREADING OUT AND VACUUM DRYING OF WET DRESSED AND/OR COLORED HIDES

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10 Claims. (Cl. 34—92)

This invention relates to the spreading out and vacuum-drying of wet hides, after their dressing and tanning and/or coloring.

The object of the invention is to provide a method and apparatus for rapidly spreading out and drying wet hides by employing moderate pressure and heat and subjecting the moderately pressed and heated hides to the action of vacuum.

In order to attain the above ends, the hides are spread out upon a moderately warmed table or plate by pressing same by means of a composite pad comprising a lower flexible sheet made of felt or other porous material having an even surface and designed for pressing the hide upon said table, an upper flexible sheet made of impervious material, distance means being preferably inserted between said sheets in order to provide a vacuum- and air-distributing chamber in communication with suction means or a vacuum source, means being also provided for establishing an air-tight connection between the edge portions of said impervious sheet and the edges of said table upon which the hide is spread out.

The apparatus for performing the above outlined process by the use of said composite pad comprises means for suspending said composite pad by its brim, so as to cause the pad proper to freely hang and assume a convex shape; means for lowering said composite pad upon a hide or plurality of hides, laid upon said heated table and tubular connections for putting said distributing chamber of the pad in communication with a source of vacuum, so that the hide spread out upon the table is subjected, on the table side, to the action of heat and on the pad side to a suction evenly distributed throughout its surface by which the vapors developed by the heating are sucked across the porous sheet and thus the hide is spread out and vacuum-dried in a very short time.

Due to the fact that when the composite pad is lowered it comes into contact with, and is pressed on, the hides first by its bulging center position and then gradually with the peripheral parts, the spreading-out of the hides takes place gradually from the center to the periphery and thus the formation of wrinkles upon the hides is avoided.

The invention further provides an arrangement by which a single pad mounted on a truck may be employed for drying hides spread out upon a plurality of tables, so that the efficiency of the installation is multiplied by multiplying but one—the most simple—of the elements of the installation.

Further objects and advantages of the invention will be better understood from the following specification taken with reference to the attached drawing, in which:

FIGURES 1 and 2 show diagrammatically in side and front elevation an apparatus for performing the above outlined process;

FIGURE 3 is an enlarged vertical section through one of the heated tables and shows the means for gently heating same;

FIGURES 4 and 5 show in vertical section and plan view the so-called "cover," viz. the frame to which the composite pad is suspended, together with the pad and subsidiary means;

FIGURE 6 is an enlarged cross section through a side of the cover and hide-spreading table, the said cover being shown in lowered or hide-spreading position; and



FIGURE 7 is an enlarged vertical section through the composite pad, in correspondence of one of the tubular connections and of a vent cock.

With reference to the drawing, 1 is the table for spreading out the hide and which is preferably hollow and has a preferably metallic convex or bulged top, as shown in FIGURE 3. Said table may be heated by means of a fluid which is pumped from a tank 26 by means of a circulation pump 27 and is circulated through jacket 101. The fluid is heated within the tank 26 by conventional means, for example, by an electric resistance, not shown. The lower wall of the jacket is insulated by means of a heat-insulating layer 8, in order to avoid heat dispersions. The table 1, together wtih the tank 26, pump 27, circulation pipes, insulation 8 and other fittings, as will be described hereinafter, are supported by a base 2.

The top 7 of the table 1 is provided with a projecting rounded edge 7'. The table is also encircled by an angle iron 9 to which a preferably wooden joist is fastened, so as to constitute a continuous non-metallic frame 10 surrounding the said table 1.

The above-outlined unit comprising the table 1, base 2 and annexed parts is preferably mounted between a pair of rails 3 along which may roll the wheels of a truck-like unit 4 comprising four upright hydraulic or pneumatic cylinders 6 in which conventional pistons (not shown) are mounted which are provided with upright rods 106 to the ends of which a so-called "cover" 5 is mounted.

Said cover 5 comprises a preferably rectangular frame 11 (FIGURES 4, 5 and 6) having the same outline as the non-metallic table frame 10 and provided with reinforcing cross beams 12 and with pad-suspending means such as the rods 25.

Under the cover frame 11 an angle iron 13 is fastened provided at the end of the depending vertical wing with a rounded edge 113. From said wing is suspended by its brim 115 (FIGURES 4 and 6) a hide-spreading-out and suction-applying pad 14 which, in its middle area, that is just a little inside the part shown in FIGURE 6, is preferably formed as shown in FIGURE 7 and comprises an impervious top sheet 15 made of India rubber or like material, a porous lower sheet, which is preferably a felt sheet 18 and one or more intermediate spacing members 16 and 17 which serve for keeping the sheets 15 and 18 a little apart so as to leave between them a chamber, which may act as air- and vacuum-distributing chamber as will be better seen hereinafter.

In the embodiment as shown the spacing member 16 is made of a large-meshed wire network, while the member 17 is a fine wire cloth and serves for avoiding that the network 16 makes imprints in the underlying felt 18 and renders the lower surface thereof uneven.

The top sheet 15 of the pad 14 is provided wtih tubular members or nipples 19 opening in the underlying air chamber and connected by means of flexible hoses 20 (FIGURES 4, 5 and 7) to a motor-driven suction pump 21. Both the pump 21 with its motor as well as a motor compressor 23 connected by means of flexible hoses 22 to the bottom of the cylinders 6 (FIGURES 1 and 2) are mounted upon the cross beams 12 of the frame 11. Due to the pad 14 being suspended by its brim 115, it assumes, when freely suspended (in preworking position, see particularly FIGURE 4, but also FIGURES 1 and 2), a convex or bulging shape so that when it is lowered upon the table 1, it comes gradually into contact therewith by starting from the center portion and proceeding towards the periphery, thus avoiding formation of wrinkles upon the hides spread out upon the table. The pad 14 is further provided in intermediate positions with hooks 24 or equivalent suspending means, which may be hooked to rods 25 or connected to equivalent means of the frame 11

and serve for hanging the pad **14** in non-working position. A vent cock **28** is further provided, for admitting air under the sheet **15** after the completion of the drying of the hide.

The operation of the above-described apparatus is as follows:

The hide to be dried in spread-out condition is laid upon a table **1** while the truck **4** is shifted away therefrom.

The top of this table is heated by circulating a hot fluid—usually oil—through its jacket **101** (FIGURE 3). Then the cover-carrying truck **4** is shifted thereupon while the pad **14** is suspended by its brim **115** and the hooks **24** are hooked to the hanging rods **25** while the rods **106** of the fluid-driven pistons are lifted.

When the frame **11** comes to be just above the non-metallic frame **10**, the hooks **24** are unhooked from the rods **25**, the cover **5** is lowered by discharging the fluid under pressure from the cylinders **6** and thus the part **14** bears gradually from its center portion towards its periphery upon the wet hides laid upon the table **1**, and thus gradually spreads the hides from their center outwardly without forming wrinkles until the brim **115** of the pad **14** bears upon the edge **7'** of the table top **7** and is clamped between the bulged edge **113** of the angle iron **13** and the non-metallic table frame **10**, thus forming a substantially air-tight closure all around the pad **14**. Then the cock **28** is closed and the vacuum pump **21** is operated, so that the vacuum is applied upon the whole top surface of the hide laid upon the heated plate through the pores of the felt sheet **18**. When the hide is conveniently dried (which may be detected by an increase of the vacuum generated by the pump **21**) the operation of the vacuum pump **21** is stopped and the cock **28** is opened so as to admit air under the sheet **15**. Then the pad **14** is suspended by its hooks **24** to the rods **25**, the whole cover **5** is lifted by feeding fluid under pressure in the cylinders **6** and the truck **4** is shifted away from the table **1** from which the smoothed and dried hide may be taken away and replaced by another wet hide.

In practice, as shown in FIGURE 1, two tables **1** are mounted spaced between the rails **3** so that when the truck **4** is shifted in correspondence of one of the tables (the right-hand one, in FIGURE 1) in order to dry and spread a hide laid thereon, the other table (at the left of FIGURE 1) is accessible for taking away a smoothed and dried hide and replacing same by another hide to be smoothed and dried. Thus the working of the apparatus is practically continuous.

I claim:

1. An apparatus for spreading or smoothing and drying hides, comprising an impervious metallic supporting table upon which a hide may be laid, means for heating said table, a composite pad including an impervious flexible top sheet and a spaced porous flexible lower sheet, the brim of the impervious top sheet extending beyond the edges of the porous sheet; a rigid frame, means mounting the frame for reciprocatory movement vertically with respect to said table for applying and releasing pressure, means suspending said pad by its brim from said rigid frame to overlie the table in a convex surface so that upon lowering of said frame the pad center portion initially contacts a hide upon the table and presses gradually outwardly to spread and smooth the hide as the pad is lowered further, means including said impervious top sheet for forming all around said pad an air-tight closure against the table when the pad is completely lowered; a source of vacuum, flexible tubular means for putting said source of vacuum into communication with the space between said top and lower sheets of the pad, and means for putting said space between the pad sheets into communication with the atmosphere after shutting off said vacuum source, said means mounting the frame including a truck having wheels to permit lateral movement of the means mounting the frame.



2. An apparatus according to claim 1, in which between the impervious sheet and the porous sheet spacing members are positioned to form between said sheets a vacuum and air distributing chamber.

3. An apparatus according to claim 2, in which said spacing members comprise a large-meshed wire network and an underlying fine-meshed wire net, whereby the large-meshed network forms a vacuum distributing chamber while the fine meshed netting, being substantially undeformable, evenly supports said first named network.

4. An apparatus according to claim 1, wherein said metallic supporting table is provided with an integral upstanding edge extending around its periphery, a non-metallic frame encircling said table and having its top below said upstanding edge, said rigid pad-carrying frame being also provided with a peripheral continuous depending frame member having the same dimensions as said non-metallic frame of said table, the lowering of said pad-carrying frame causing said impervious pad brim to tightly adhere against said upstanding table edge and to be clamped between the edge of said depending pad-carrying frame member and the non-metallic frame of said table, so as to form all around said pad an air-tight closure.

5. An apparatus according to claim 4 wherein is additionally provided a jacket formed at the underside of said table, a tank provided with heating means and filled with a liquid, and a pump and pipes connecting said jacket and tank for circulating said liquid through said jacket for heating said table, said truck being provided with vertical power cylinders, piston rods slidable through the top bores of said cylinders and carrying at their top ends said pad-carrying frame, a source of pressure fluid, and means connecting the pressure end of said source to said power cylinders for driving said piston rods upwardly so as to bring said pad clear of said table and for lowering said rods until the pad bears upon the table and the pad brim comes into close contact with said upstanding table edge to be clamped therebetween and said table encircling frame.

6. An apparatus according to claim 5, in which said source of pressure fluid is a motor-compressor mounted upon said pad-carrying frame.

7. An apparatus according to claim 6, in which said source of vacuum is a motor-driven vacuum pump also mounted upon said pad-carrying frame.

8. An apparatus according to claim 5, in which the said pad-carrying frame is provided with suspension means and the said pad is provided, in intermediate positions inside of its brim, with complementary suspending means adapted to co-act with said suspension means for suspending thereto intermediate parts of said pad.

9. An apparatus according to claim 1, wherein the said rigid frame has at its periphery, downwardly projecting members and the said brim of the pad is suspended from said projecting frame members, the whole being so arranged that said brim comes to be tightly clamped between said frame members and said table upon lowering of said pad into working position.

10. An apparatus according to claim 1 wherein said table has a convex upper surface.

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