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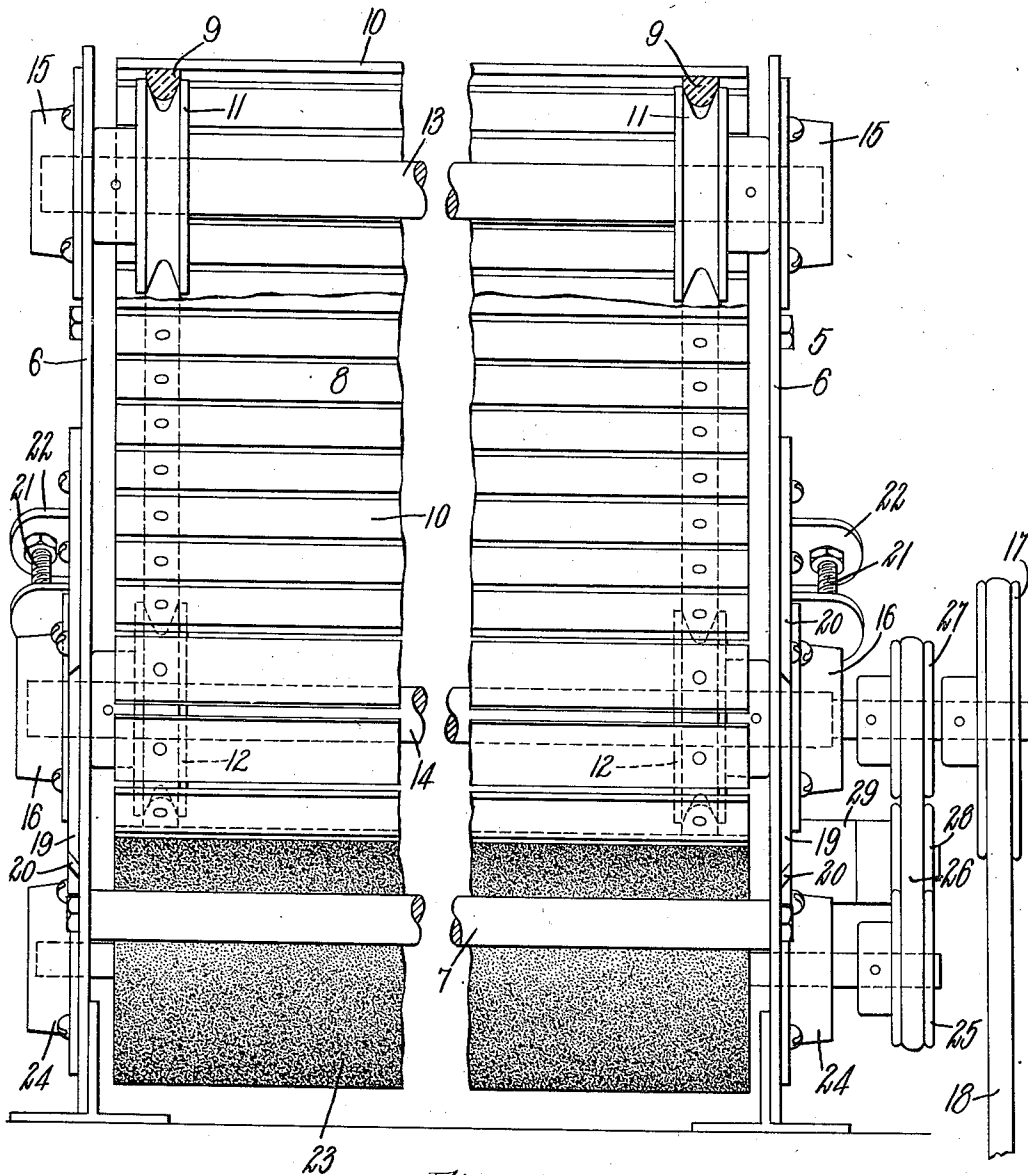
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APPARATUS FOR CLEANING SHEET MATERIAL

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2 Sheets-Sheet 1



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APPARATUS FOR CLEANING SHEET MATERIAL

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This invention relates to an apparatus for cleaning sheet material such, for example, as suede or flesh finished leather, and other materials having similar characteristics.

In preparing suede or flesh finished leather for the market it is customary to subject the leather to a final cleaning operation for the purpose of removing therefrom fibrous dust and dirt much of which has been created by a preceding buffing operation. Heretofore this operation has been performed by passing the leather between revolving brushes, but this method is unsatisfactory because of the sponge-like nature of the leather, as there is a tendency for the pores thereof to close and entrap a considerable number of these foreign particles therein.

The object of this invention is to provide an improved apparatus for cleaning suede or flesh finished leather, or other sheet materials having similar characteristics and which are capable of co-operating with a dielectric member in generating static electricity in order that the principle of electro-static attraction and repulsion may be utilized.

The invention consists in an apparatus for cleaning sheet material as set forth in the following specification and particularly as pointed out in the claims thereof.

Referring to the drawings:

Fig. 1 represents a front elevation of an apparatus embodying my invention, portions of the apparatus being broken away to save space in the drawings and also for the purpose of more clearly illustrating parts located therebeneath.

Fig. 2 is a side elevation of the apparatus, portions thereof being broken away and illustrated in section.

Fig. 3 is a detail sectional view illustrating a modified embodiment of the dielectric member.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 5 represents a frame embodying therein side members 6 constructed of non-magnetic material and positioned in parallel relation one to another and spaced apart by means of a plurality of tie rods 7. Mounted upon the frame 5 between the side members 6 thereof is an endless dielectric member 8 embodying therein a pair of endless belts 9 constructed of suitable insulating material to which a plurality of

strips 10 of hard rubber are secured in any suitable manner. The belts 9 are positioned parallel to each other and are mounted upon upper and lower grooved pulleys 11 and 12 respectively. The pulleys 11 and 12 are rigidly fastened to shafts 13 and 14 respectively, in turn mounted to rotate in bearing members 15 and 16 respectively.

The strips 10 constitute separate dielectric members and are resilient in character and are positioned in parallel relation to each other and extend for approximately the entire width of the frame 5 between the side members 6 thereof, being spaced sufficiently far apart upon the belts 9 so as not to conflict one with another during the movement of said belts. The shafts 13 and 14 and their respective pulleys 11 and 12 are so positioned upon the frame 5 that the working surface of the endless dielectric member 8 as it passes from the pulley 11 to the pulley 12 will be inclined at an angle to a horizontal plane in order that a hide of leather A may rest lightly thereagainst as illustrated in Fig. 2. The upper surface of each strip 10 is arcuate in cross sectional contour.

The dielectric member 8 is driven from the shaft 14 by means of a pulley 17 fast to said shaft, and a belt 18 extends around said pulley and is driven by any suitable source of power as, for example, an electric motor. The bearing members 16 for the shaft 14 are mounted upon blocks 19 which are in turn adjustably supported between guideways 20 located upon the outer sides of the frame members 6. The position of the blocks 19 may be varied to increase or decrease the tension upon the belts 9 by manipulating adjusting screws 21 mounted in brackets 22 fastened to the side frames 6.

Mounted directly beneath the shaft 14 and pulleys 12 is a brush 23, the periphery of which is adapted to engage the outer surface of the strips 10 of the dielectric member 8 as it passes around said pulleys. The brush 23 is mounted to rotate in bearings 24 in turn mounted upon the exterior of the side frames 6 and a rotary motion is imparted to said brush by means of a pulley 25, belt 26 and pulley 27, the pulley 25 being rigidly fastened to the spindle of said brush and the pulley 27 being rigidly fastened to the shaft 14. A proper tension is always maintained upon the

belt 26 by means of an idler pulley 28 mounted upon a bracket 29 which is adjustably secured to a side frame 6 by means of a bolt 30, said bracket being slidably mounted between guideways 31 provided upon the side frame.

In the operation of the machine the operative stands at the rear of the machine and approximately one-half of a hide of leather A is placed upon the moving surface of the endless dielectric member 8, which is travelling at a relatively fast rate of speed in the direction of the arrows a, Fig. 2. As the strips 10 are resilient in character and the entire dielectric member 8 is vibratable in character, the rapid motion at which the dielectric member is travelling will cause said member to vibrate rapidly and thereby rapidly agitate the hide A which is resting lightly thereon, and the rapid vibrating movement of the dielectric member and the rapid rubbing and frictional action which takes place between the upper surface of the strips 10 and under surface of the hide A will cause the hide to be agitated to loosen foreign particles that may be clinging to the under surface thereof and at the same time an electro-static charge will be imposed upon the upper surfaces of the strips 10 of the dielectric member 8 and the under surface of the hide, which will cause the foreign particles clinging to the hide to be attracted to the dielectric member, to which they will in turn cling until they come in contact with the rotating brush 23, which will engage the surface of the strips 10 in a manner to remove the foreign particles therefrom.

During the interval that the under surface of the hide A is being subjected to the action of the travelling dielectric member 8, the hide is subjected to a constant rubbing and vibrating movement which causes it to be continually moving up and down upon the surface of the dielectric member and the agitation that it receives tends to loosen the foreign particles and continuous action of the electro-static charge thereon causes the foreign particles to be effectively transferred from the under surface of the hide A to that portion of the upper surface of the several strips 10, which is located adjacent to the edges of the strips and which does not actually contact with the hide. After approximately half of the under surface of the hide has been subjected to the cleaning operation the hide is reversed and the operation is repeated upon the remainder of said under or flesh side of the hide.

In Fig. 3 I have illustrated a modified embodiment of my invention in which 32 represents an endless belt constructed of insulating material which extends for the approximate width of the frame between the side members 6 thereof, and if it is desired this type of belt may be substituted for the belts 9 previously described, in which event the belt will travel around drums which will be substituted for the pulleys 11 and 12. When this type of belt is used the strips 10 are secured in any suitable manner to the outer surface of the belt and it is evident that said belt 32 and strips 10 will function as a dielectric member and have all of the characteristics of the dielectric member 8 previously described.

While I have described the sheet material treated by the apparatus of this invention as consisting of suede or flesh finished leather, it is evident that certain other types of sheet material such as, for example, pile fabrics having certain characteristics which are similar to the characteristics possessed by suede leather may be successfully cleaned of foreign particles which may have a

tendency to cling thereto by the apparatus and process of this invention. I do not therefore wish to be limited in the use of the apparatus and process of this invention to any particular class of sheet material as it is evident that any material that will co-operate with a dielectric member in creating an electro-static charge may be successfully operated upon to remove foreign particles therefrom.

I claim:

1. An apparatus for cleaning suede leather and like sheet material comprising a movable dielectric member adapted to contact with and vibrate said material and create an electro-static charge thereon, whereby foreign particles are loosened and removed from the material.

2. An apparatus for cleaning suede leather and like sheet material comprising a movable dielectric member adapted to have intermittent frictional contact with said material and create an electro-static charge, whereby foreign particles are loosened and transferred from said material to the dielectric member.

3. An apparatus for cleaning suede leather and like sheet material comprising a movable dielectric member adapted to frictionally contact with said material and create an electro-static charge, whereby foreign particles are transferred from said material to the dielectric member, and means to remove said foreign particles from the dielectric member.

4. An apparatus for cleaning suede leather and like sheet material comprising an endless vibratable dielectric member adapted to having intermittent frictional contact with said material and create an electro-static charge, whereby foreign particles are removed from the material.

5. An apparatus for cleaning suede leather and like sheet material comprising a movable member embodying therein a plurality of strips of dielectric material adapted to frictionally contact with and cause a vibration of said sheet material and create an electro-static charge on said strips, whereby foreign particles are loosened and removed from the sheet material.

6. An apparatus for cleaning suede leather and like sheet material comprising a travelling vibratable dielectric member adapted to contact with and agitate said material and create an electro-static charge, whereby foreign particles on the material will be loosened and attracted to the dielectric member.

7. An apparatus for cleaning suede leather and like sheet material comprising a travelling vibratable member embodying therein a plurality of strips of resilient dielectric material adapted to beat and agitate said sheet material and create an electro-static charge, whereby foreign particles on the sheet material will be loosened and attracted to said strips.

8. An apparatus for cleaning suede leather and like sheet material comprising a travelling member embodying therein a plurality of strips of resilient dielectric material adapted to agitate said sheet material and create an electro-static charge, whereby foreign particles on the sheet material will be loosened and attracted to said strips, and means to remove the foreign particles from the strips.

9. An apparatus for cleaning suede leather and like sheet material comprising a travelling member embodying therein a plurality of strips of resilient dielectric material adapted to agitate said sheet material and create an electro-static charge, whereby foreign particles on the sheet

material will be loosened and attracted to said strips, and a brush engaging said strips and adapted to remove the foreign particles therefrom.

5 10. An apparatus for cleaning suede leather and like sheet material comprising an endless belt, a plurality of strips of dielectric material fast thereto, the outer surface of each strip being

arcuate in cross-sectional contour and being adapted upon engagement with said material to create an electro-static charge, whereby foreign particles will be removed from the material and attracted to the strips, and means to remove said 5 foreign particles from the strips.

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