

Aug. 25, 1964

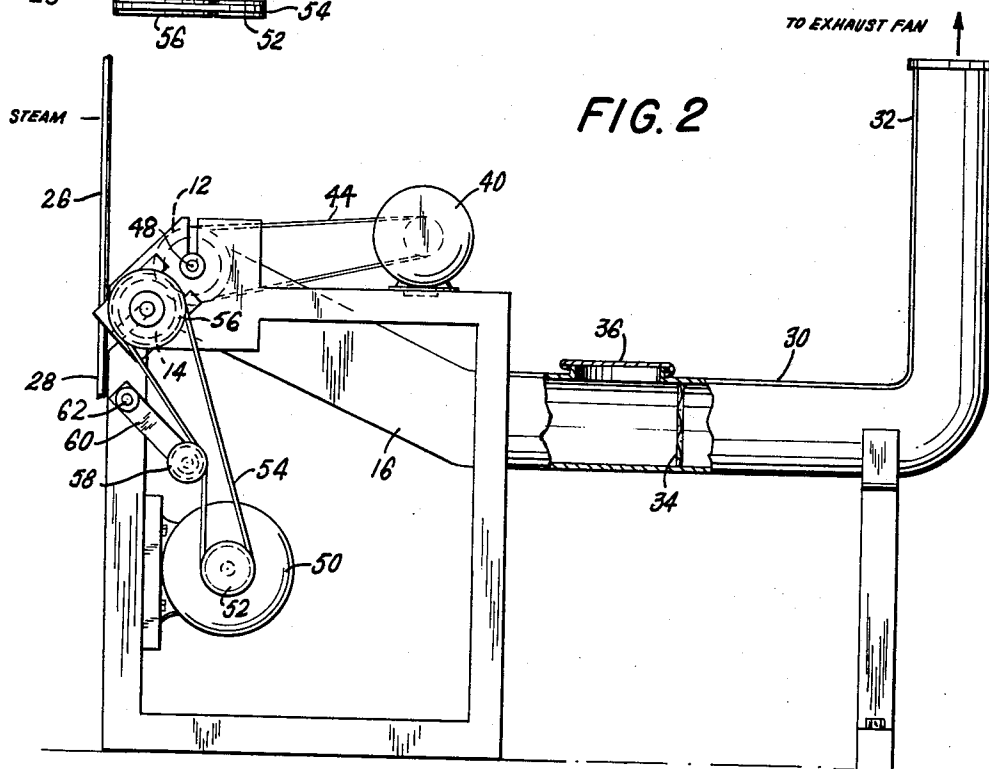
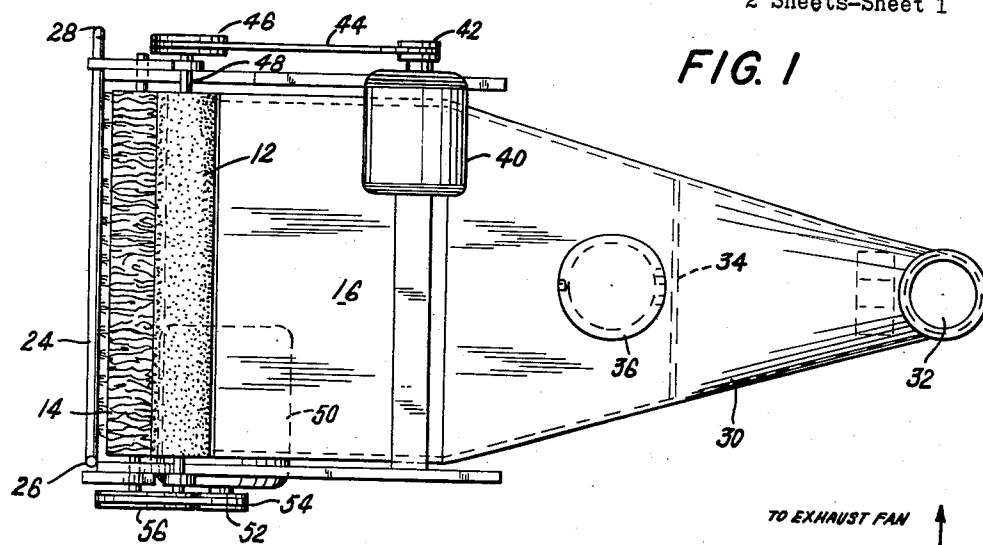
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3,145,556

MACHINE FOR THE TREATMENT OF LEATHER

Filed Dec. 18, 1962

2 Sheets-Sheet 1



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FIG. 3

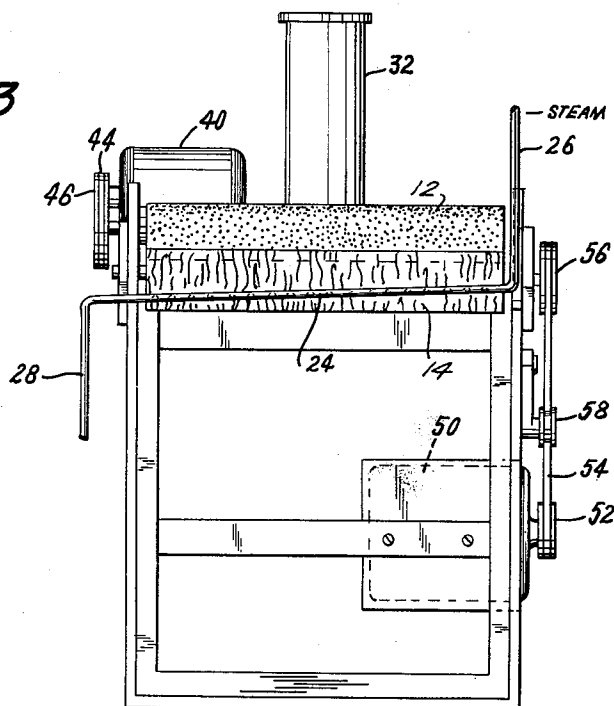


FIG. 4

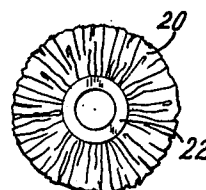


FIG. 5

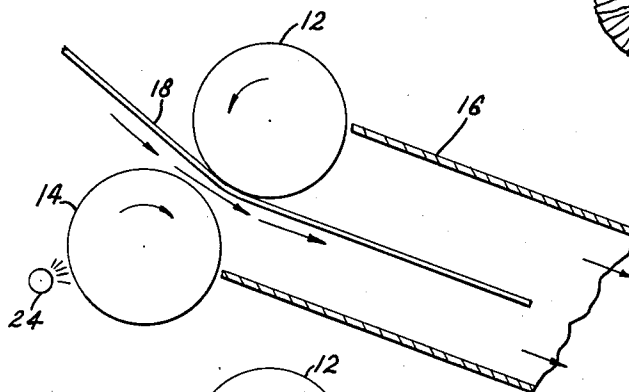
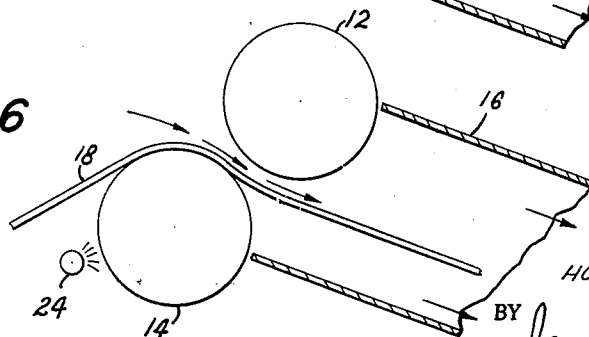


FIG. 6



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MACHINE FOR THE TREATMENT OF LEATHER
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11 Claims. (Cl. 69—37)

This invention relates to leather working machinery, and more particularly to machines for treating skins for cleaning and dust removal.

In leather manufacture the skins are often split, shaved and/or abraded, in various combinations of steps. These operations load the skin with leather dust, and the general object of the present invention is to provide an improved machine for cleaning and dust removal. A more specific object is to provide a machine which affords better dust removal, without damage to the skin, and which may be operated expeditiously by the operator.

Another object is to provide a machine for the treatment of both the flesh side and the grain side of a skin, with the treatment of each being independent, so that if desired the treatments may be different in character for optimum results. Each side may be treated by the operator at will, and in any desired sequence and to any desired extent, all at a single station in front of the machine. The shift from one side to the other requires only a slight change in the position of the hands of the operator.

Still another object is to minimize the effect of static in causing adherence of dust, and to do this without the addition of high-voltage electrical means sometimes proposed. Still another object is to facilitate the retrieval of a lost skin, in the event that the operator accidentally lets go of a skin being treated.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, my invention resides in the skin treating machine elements and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings in which:

FIG. 1 is a plan view of a machine embodying features of my invention;

FIG. 2 is a side elevation of the same with portions in section;

FIG. 3 is a front elevation of the same;

FIG. 4 is explanatory of a constructional detail; and

FIGS. 5 and 6 are fragmentary schematic views explanatory of the operation of the machine.

Referring to the drawing, and more particularly to FIGS. 5 and 6, the machine comprises an upper cleaning roll 12, and a lower cleaning roll 14 disposed collaterally of the upper cleaning roll, with a substantial space between said rolls. A suction chamber 16 extends rearwardly of the rolls, preferably for a distance greater than the length of the skins to be cleaned. The rolls are driven in opposite direction, with their adjacent surfaces moving rearwardly toward the suction chamber, as shown by the arrows. The arrangement is such that an operator holding the trailing edge of a skin 18 located between the rolls 12 and 14 may raise the skin against the upper roll, as shown in FIG. 5, or may lower the skin against the lower roll 14, as shown in FIG. 6. The space between the rolls is much greater than the thickness of a skin, and air flows freely between the rolls into the suction chamber. The air flows predominantly beneath the skin in FIG. 5, and flows predominantly above the skin in FIG. 6. However, some air flows above roll 12 and below roll 14. The disposition of the parts is such that the skin does not rub simultaneously against both rolls.

The upper roll 12 is preferably surfaced with carpet. It may be a wood roll around which a carpet covering

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is secured. The lower roll is preferably built up of discs of so-called "compressed cloth." The skin is fed between the rolls with its flesh side on top and its grain side on bottom, it being found that a carpet roll operates very successfully on the flesh side, and that the compressed cloth operates very successfully on the grain side.

Referring to FIG. 4, a stack of discs of cloth 20 is securely compressed and bound by a heavy sheet metal hub 22. The resulting unit may have a thickness of say one-half inch, this unit being built up of many layers of cloth. Enough such units are mounted on the lower shaft (or on a mandrel carried by the lower shaft) to build up the desired roll 14, which in the typical case here illustrated, has a diameter of say eight inches, and a length of say forty inches, requiring say eighty units.

Referring now to FIGS. 1, 2 and 3 of the drawing, a steam pipe 24 is preferably provided, this extending collaterally of the lower roll 14. The pipe has a series of discharge openings to emit a blanket of steam beneath the skin being treated. The steam is preferably directed inwardly toward the roll 14, but is drawn or flows upwardly beneath the skin. The steam is supplied to pipe 24 by means of a supply pipe 26, and the pipe 24 preferably slopes downwardly somewhat for escape of condensate, the discharge of which is carried through a drain pipe 28.

The steam is helpful not only in softening and cleaning the skin, but also in minimizing the effect of static, thereby helping free the dust particles for removal by suction.

The suction chamber 16 is as wide as the rolls 12 and 14, and preferably is long enough to accommodate the skins which are to be treated. There is a suction duct 30, 32 which leads to a suitable exhaust fan or blower. If the plant in which the machine is used has a main suction line or flue, the duct 32 may lead into such main line. The generally horizontal portion 30 converges (see FIG. 1) from the width of the rolls to that of the duct 32. If there is no main suction system the duct 32 may have its own fan or blower, preferably followed by a suitable dust bag or filter.

To prevent loss of a skin which might be accidentally let go by the operator, the conduit 30 preferably has a suitable baffle or screen 34, and it preferably is provided with an openable cover or lid 36 just ahead of the screen 34. If a skin is lost it is readily retrieved by opening the lid 36.

In preferred form, the axis of the lower roll 14 preferably is located somewhat forward of the axis of the upper roll, and in such case, the suction chamber 16 preferably slopes downward from the rolls. The flow of air tends to position the skin generally parallel to the top and bottom walls of the chamber, and if the chamber were horizontal, with the rolls relatively offset or disposed as here shown, a skin, when moved down to the lower roll, might tend to simultaneously rub against the upper roll, which I wish to avoid.

One advantage of the present machine is that the operator, after treating say the upper side of the skin with several passes in and out of the machine, may inspect the progress and result of the work up to that point, over substantially the entire area of the skin, while treating the lower side of the skin against the lower roller. Conversely, after several passes in and out of the machine while working on the lower surface of the skin, the result of that treatment may be inspected by the operator while the upper side of the skin is being treated, so that inspection does not require a loss of working time, and frequent or even constant inspection may be had.

It is largely because of this procedure that it is convenient to offset the upper and lower rolls as here shown, because with the rolls in an offset position, and with the suction chamber in a downwardly sloping position, it is

easier for the operator to inspect either side of the skin while working on the opposite side.

The rolls 12 and 14 are driven by suitable motor means, preferably an electric motor. A single motor may be used to drive both rolls, but as here disclosed the upper roll is driven completely independently of the lower roll. The roll 12 is driven by a motor 40 which has a pulley 42 driving a belt 44 which in turn drives a pulley 46 on one end of a shaft 48 carrying the upper roll 12. The belt may be run rather loosely, this constituting a safety feature in that the belt slips in the event the rolls are jammed.

The lower roll 14 is driven by a second motor 50 which drives a pulley 52 and a belt 54 engaging a pulley 56 on one end of a shaft carrying the lower roll. While not essential, if desired the belt may be deflected by means of an idler 58 carried on an arm 60 pivoted at 62 and urged in tightening direction by conventional means such as a torsion spring, not shown. The idler pressure is kept light for the reason previously mentioned, namely to afford slippage of the belt in the event of jamming of the rolls.

By using separate motors each roll may be driven at a speed independent of that of the other. In fact they could be operated in alternation, but in order to save time it is customary to operate both simultaneously, so that both sides of the skin may be treated by simple hand manipulation of the skin.

In the particular case here shown the rolls are about eight inches in diameter and have a length of forty inches. The space between rolls is about a half inch, and the angular displacement of one roll relative to the other is about 45 degrees. I have also used rolls which are six inches in diameter.

The rolls revolve at a speed of say 800 r.p.m., and their rotation, combined with the high velocity air flow, tends to draw the skin into the suction chamber, with most of the air entering between the rolls. Some air enters at the top of the upper roll 12, and some at the bottom of the lower roll 14, because there is some clearance between the forward edges of the suction chamber and the rolls. The admission of some air at these points is not undesirable, because air then flows on both sides of the skin being treated.

The high velocity air flows in such direction that the skin, if held downward, rubs on only the lower roll, and if held upward rubs on only the upper roll. The flow of air causes some flutter or agitation of the skin which aids the removal of dust from the material, and of course any dislodged particles are carried away. The skin may be pulled back and forth a number of times in contact with either roll, and one side of the skin may be treated for a different length of time than the other. The two sides may be treated in alternation and in any desired sequence, until the operator feels that the skin has been adequately cleaned.

The blanket of steam helps ground static electricity and so helps release leather dust from the skin. The generation of new static electricity is minimized because this machine does not employ brushes running in contact with one another.

One reason carpeting and compressed cloth are found superior to the use of brushes is that the skins are irregular and sometimes have holes in which brushes may catch, with resultant damage to the skin, and sometimes injury to the operator. In the present machine, because of the large space between the rolls, and because of the texture of the rolls, there is no pull or jerk on the skin, and the cleaning operation is safe and expeditious.

It is believed that the construction and operation of my improved machine for the treatment of leather, as well as the advantages thereof, will be apparent from the foregoing detailed description. It will also be apparent that while I have shown and described the invention in a preferred form, changes may be made without de-

parting from the scope of the invention, as sought to be defined in the following claims.

I claim:

1. A cleaning and dusting machine for an individual skin held in the hands of an operator, said machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls, a suction chamber extending rearwardly of said rolls, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator standing in front of the machine and holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll, or may lower the skin against the lower roll.

2. A cleaning and dusting machine for an individual skin held in the hands of an operator, said machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls for free flow of air, a suction chamber extending rearwardly of said rolls for a distance greater than the length of the skins to be cleaned, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll with air flowing beneath the skin, or may lower the skin against the lower roll with air flowing above the skin, the axis of said lower roll being located forward of the axis of said upper roll, and said suction chamber sloping downwardly and rearwardly, to facilitate inspection of the lower side of the skin while cleaning the upper side.

3. A cleaning and dusting machine for an individual skin held in the hands of an operator, said machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls, a suction chamber extending rearwardly of said rolls, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll, or may lower the skin against the lower roll, a steam pipe extending collaterally of the lower roll in front of said roll, said pipe having a series of discharge openings to emit a blanket of steam beneath the skin being treated, the axis of said lower roll being located forward of the axis of said upper roll, and said suction chamber sloping downwardly and rearwardly, to facilitate inspection of the lower side of the skin while cleaning the upper side.

4. A skin cleaning and dusting machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls, a suction chamber extending rearwardly of said rolls, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll, or may lower the skin against the lower roll, one of said rolls being surfaced with carpet, and the other roll being built up of discs of compressed cloth.

5. A skin cleaning and dusting machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls, a suction chamber extending rearwardly of said rolls, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward

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the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll, or may lower the skin against the lower roll, a steam pipe extending collaterally of the lower roll in front of said roll, said pipe having a series of discharge openings to emit a blanket of steam beneath the skin being treated, one of said rolls being surfaced with carpet, and the other roll being built up of discs of compressed cloth.

6. A cleaning and dusting machine for an individual skin held in the hands of an operator, said machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls, a suction chamber extending rearwardly of said rolls, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll, or may lower the skin against the lower roll, the axis of said lower roll being located somewhat forward of the axis of said upper roll, and said suction chamber sloping downwardly and rearwardly, to facilitate inspection of the lower side of the skin while cleaning the upper side.

7. A cleaning and dusting machine for an individual skin held in the hands of an operator, said machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls, a suction chamber extending rearwardly of said rolls for a distance greater than the length of the skins to be cleaned, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll, or may lower the skin against the lower roll, one of said rolls being surfaced with carpet, and the other roll being built up of discs of compressed cloth, an openable cover on the aforesaid duct, and a screen in said duct behind said cover to block the passage of a skin accidentally released by the operator, said cover being openable to retrieve a skin blocked by said screen.

8. A cleaning and dusting machine for an individual skin held in the hands of an operator, said machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls, a suction chamber extending rearwardly of said rolls for a distance greater than the length of the skins to be cleaned, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin may raise the skin against the upper roll, or may lower the skin against the lower roll, the axis of said lower roll being located somewhat forward of the axis of said upper roll, and said suction chamber sloping downwardly and rearwardly, to facilitate inspection of the lower side of the skin while cleaning the upper side, an openable cover on the aforesaid duct, and a screen in said duct behind said cover to block the passage of a skin

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accidentally released by the operator, said cover being openable to retrieve a skin blocked by said screen.

9. A cleaning and dusting machine for an individual skin held in the hands of an operator, said machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls, a suction chamber extending rearwardly of said rolls for a distance greater than the length of the skins to be cleaned, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll, or may lower the skin against the lower roll, said motor means including an electric motor with a pulley and belt for driving the upper roll, and a second electric motor with a pulley and belt for driving the lower roll independently of the upper roll, the axis of said lower roll being located forward of the axis of said upper roll, and said suction chamber sloping downwardly and rearwardly, to facilitate inspection of the lower side of the skin while cleaning the upper side.

10. A skin cleaning and dusting machine comprising an upper cleaning roll, a lower cleaning roll disposed collaterally of the upper cleaning roll with a substantial space between said rolls for free flow of air, a suction chamber extending rearwardly of said rolls for a distance greater than the length of the skins to be cleaned, a suction duct extending from said chamber, motor means to rotate the rolls in opposite direction such that the adjacent surfaces move rearwardly toward the suction chamber, the arrangement being such that an operator holding the trailing edge of a skin located between the rolls may raise the skin against the upper roll with air flowing beneath the skin, or may lower the skin against the lower roll with air flowing above the skin, a steam pipe extending collaterally of the lower roll in front of said roll, said pipe having a series of discharge openings to emit a blanket of steam beneath the skin being treated, one of said rolls being surfaced with carpet and the other roll being built up of discs of compressed cloth, the axis of said lower roll being located somewhat forward of the axis of said upper roll, said suction chamber sloping downwardly and rearwardly, an openable cover on the aforesaid duct, and a screen in said duct behind said cover to block the passage of a skin accidentally released by the operator, said cover being openable to retrieve a skin blocked by said screen.

11. A skin cleaning and dusting machine comprising a first cleaning roll, a second cleaning roll disposed collaterally of the first cleaning roll, a suction chamber extending rearwardly of said rolls, motor means to rotate the rolls, one of said rolls being surfaced with carpet, and the other roll being built up of discs of compressed cloth.

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