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(54) **Machine for roller finishing skin, fake skin, fabrics and synthetic material**

Maschine zur Walzennachbehandlung von Leder, Kunstleder, Webwaren und künstlichen Geweben

Machine pour le corroyage par rouleau de cuir, moleskine, tissu et matériau synthétique

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EP-A1- 0 484 740
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EP-A2- 0 997 538

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Description

[0001] The present finding regards the manufacture of a machine for roller finishing skin, fake skin, fabrics, synthetic material and the like, according to the general part of claim 1.

[0002] As it is known, for carrying out the finishing operation on skins in tanning, roller spreading machines are particularly used, commonly called "coating machines", or "spreading machines", in which the skin is preferably conveyed by a pair of feeding belts and deposited onto a lower cylinder or onto a rubber belt and where a countering upper spreading gravure cylinder, pressing down onto the skin surface, contrasted by the underlying cylinder or rubber belt, deposits a film of liquid product, previously distributed on the surface of the aforementioned gravure cylinder through a doctor blade, onto the aforementioned surface.

[0003] The gravure cylinder can rotate in "synchro" mode, i.e., in a direction in agreement with the advancing of the skin, or in "reverse", i.e., in the opposite direction to the advancing of the skin.

[0004] Generally, in "reverse" mode coating treatments, in particular with soft skin, a rubber conveyor belt is used, the wide surface of which ensures the skin to be stuck and pulled along, whereas in "synchro" mode printing operations with drawings and millepunti effects, a rubber conveying and contrast cylinder is preferably used, in order to have a more precise contact between the gravure cylinder and the skin.

[0005] A perfect outcome of the finishing operation of skins, apart from depending on a regular and constant pulling of the product in the spreading area, i.e. the area between the upper gravure cylinder and the underlying lower cylinder or conveyer belt, mainly depends on the spreading or "coating" action, i.e. the depositing action of liquid product on the entire surface of the material to be treated, by part of the gravure cylinder.

[0006] Such processing is problematic because the skins apart from not having a constant thickness, have folds on their surface due to previous processes as well as numerous defects such as scratches, scars, pinholes, brandmarks, etc; since all these imperfections are not covered by the chemical product, there is not a uniform distribution of the aforementioned over the entire surface of the skin itself.

[0007] Moreover, the rubber conveyer belt deforms with time and needs continual stops by the machine in order to straighten its surface as well as frequent replacement.

[0008] The most relevant documents of the state of the art consist in EP 0484740, EP 1441037 and EP 0997538. In particular this last cited document regards a European Patent Application (now European Patent) having the same applicant and the same inventor of this application.

[0009] EP 0 484 740 discloses a machine according to the preamble of present claim 1.

[0010] The purpose of the present finding is to make a machine for roller finishing skins and the like, which is able to carry out in an optimal way both the roller spreading operation and the design printing operation on any type of skins or the like, as well as eliminating the folds in the skins themselves.

[0011] Such a purpose is obtained with a roller spreading machine in which the ratio between the diameter of the lower rubber conveyer and contrast cylinder and the diameter of the upper gravure cylinder is equal to or more than 1.5. With such a constructive solution in the narrowed area between the two cylinders, a skin advancement channel is made, in which the base is defined by a radius of curvature of the pulling rubber-coated cylinder which is substantially greater than the radius of curvature of the overlying gravure cylinder, for which reason a wide contact area is obtained between the skin and the rubber conveyer cylinder which therefore functions, as well as with the precision of a cylinder, with the efficiency of the surface of a rubber belt, as far as the adhesion of the skin on the surface of the rubber-coated cylinder itself is concerned.

[0012] Moreover, the perfect stretching of the skins, by eliminating possible folds, is obtained by positioning the front edge of the upper feeding belt immediately upstream of the narrowed area, under the tangent of the contact line between the gravure cylinder and the rubber-coated cylinder and by actuating the feeding belts at a lower speed than the peripheral speed of the rubber-coated cylinder itself.

[0013] Laboratory tests and practical activities carried out in-house on machines with a diameter ratio between the lower rubber-coated cylinder and the upper gravure cylinder equal to or more than 1.5, have confirmed that also working in "reverse" mode, in which it is necessary for the force of friction value, which appears along the contact area between the gravure cylinder and the upper surface of the material to be treated, to be as low as possible and in any case to be less than the friction force value generated between the lower surface of the material and the lower rubber conveyer and contrast cylinder, the aforementioned material, be it skin, leather or the like, advances smoothly, without curling and without suffering any damage.

[0014] Moreover, positioning the edge of the upper feeding belt immediately upstream of the contact point between the gravure cylinder and the rubber-coated cylinder, under the tangent of the contact line between the two cylinders, apart from slowing down the speed of the two feeding belts compared to the peripheral speed of the rubber-coated cylinder itself, the skin is also slightly curved and in tension, without folds and with open pores. In this way a consequent greater penetration of the dye and a uniform coating over the whole surface, is obtained.

[0015] The finding shall be understood better from the description of a possible embodiment, given only as an example and not for limiting purposes, with the help of the attached drawing tables, where:

- Fig.1 represents a perspective schematic view of the machine for finishing according to the finding:

- Fig.2 represents a detailed view of the narrowed area, located between the two cylinders.

[0016] As can be seen from the figures, the roller machine, also called "coating machine" or "spreading machine", comprises two opposite skin feeding belts, indicated with the references "Ts" and "Ti", a conveying and contrasting member consisting of a lower rubber-coated cylinder 1, arranged facing towards an upper spreading gravure cylinder 2 to define a narrowed passage area "K", so as to allow a uniform film of liquid product "C", previously distributed on the gravure surface "S" of the upper gravure cylinder, through a doctor blade "R", to be deposited on the surface "Pz" of the skin "P".

[0017] In figure 1, V_1 indicates the speed of the feeding belts Ts and Ti, whereas V_2 indicates the peripheral speed of the lower rubber-coated cylinder 1. Advantageously, the speed V_1 is lower than V_2.

[0018] Moreover, the front edge of the upper feeding belt Ts will advantageously be positioned below the tangent contact line between gravure cylinder 2 and rubber-coated cylinder 1.

[0019] Moreover, the two feeding belts "Ts" and "Ti" are able to be pressed against each other so as to be able to exert an adjustable pressure on the skin P.

[0020] As can be seen in the figures, the diameter "D" of the lower cylinder 1 is substantially greater than the diameter "d" of the upper gravure cylinder 2, for which reason the portion of skin which passes in the narrowed area "K" comes into tangent contact with the upper gravure cylinder 2 for the depositing of liquid dye product "C".

[0021] At the same time, thanks to the wide radius of curvature of the lower cylinder 1, the portion of skin is adherent for a substantial angular opening "X", at the aforementioned lower rubber-coated cylinder, which makes up the conveying and contrast member, and can simultaneously be stretched by the braking action of the two feeding belts "Ts" and "Ti", by effect of their speed V_1, lower than the peripheral speed of the rubber conveying and contrast cylinder V_2.

Claims

1. MACHINE FOR ROLLER FINISHING SKINS, FAKE SKIN, FABRIC, AND SYNTHETIC MATERIAL, also called "coating machine" or "spreading machine", in which the skins (P) are fed by a pair of feeding belts (Ts, Ti) that are opposite one another, and are deposited onto a lower rubber-coated cylinder (1) for conveying and contrasting and where an upper spreading cylinder, consisting of a gravure cylinder (2), pressing down on the surface (Pz) of the skin (P), countered by the underlying rubber-coated cylinder (1) deposits a film of liquid product (C), previously distributed on the surface (S) of the aforementioned upper gravure cylinder through a doctor blade (R), onto the aforementioned surface,
said machine being **characterized in that**:

   the ratio between the diameter (D) of the lower rubber-coated cylinder (1) and the diameter (d) of the upper gravure cylinder (2) has a value equal to or more than 1.5 (or rather D/d >= 1.5).

2. MACHINE, according to claim 1, **characterized in that** the front edge of the upper feeding belt (Ts) is positioned under the tangent of the contact line between the gravure cylinder (2) and the rubber-coated cylinder (1)

3. MACHINE, according to claim 1 or 2, **characterized in that** the opposite feeding belts (Ts, Ti) have a feeding speed (V_1) which is lower than the peripheral speed (V_2) of the lower rubber-coated cylinder (1).

4. MACHINE, according to claim 3 **characterized in that** the two feeding belts (Ts, Ti) are able to be pressed against each other, so as to be able to exert an adjustable pressure on the skin (P).

Patentansprüche

1. MASCHINE ZUR WALZENNACHBEHANDLUNG VON LEDER, KUNSTLEDER, WEBWAREN UND KÜNSTLICHEN GEWEBEN, die auch als "Auftragmaschine" oder "Streichmaschine" bezeichnet wird, bei der die Häute (P) von einem Paar einander entgegengesetzter Zuführbänder (Ts, Ti) zugeführt und auf eine untere gummibeschichtete Walze (1) zum Fördern und Gegenhalten gelegt werden, und bei der eine obere Auftragwalze, die aus einer Tiefdruckwalze (2) besteht, auf die Oberfläche (Pz) der Haut (P) niederdrückt und der die darunter liegende gummibeschichtete Walze (1) entgegenwirkt, eine dünne Schicht aus einem flüssigen Produkt (C) auf die oben genannte Oberfläche aufträgt, das zuvor durch eine Rakel (R) auf der Oberfläche (S) der oben genannten oberen Tiefdruckwalze verteilt wurde,
wobei diese Maschine **dadurch gekennzeichnet ist, dass**:

   das Verhältnis zwischen dem Durchmesser (D) der unteren gummibeschichteten Walze (1) und dem Durchmesser (d) der oberen Tiefdruckwalze (2) einen Wert hat, der größer oder gleich 1,5 ist (oder besser gesagt D/d >= 1,5).

2. MASCHINE nach Anspruch 1, **dadurch gekennzeichnet, dass** die Vorderkante des oberen Zuführbands (Ts) unter der Tangente der Berührungslinie zwischen der Tiefdruckwalze (2) und der gummibe-

schichteten Walze (1) angeordnet ist.

3. MASCHINE nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die entgegengesetzten Zuführbänder (Ts, Ti) eine Zuführgeschwindigkeit (V_1) haben, die geringer als die Umfangsgeschwindigkeit (V_2) der unteren gummibeschichteten Walze (1) ist.

4. MASCHINE nach Anspruch 3, **dadurch gekennzeichnet, dass** die zwei Zuführbänder (Ts, Ti) gegeneinander gepresst werden können, so dass sie imstande sind, einen einstellbaren Druck auf die Haut (P) auszuüben.

Revendications

1. Machine pour le finissage au rouleau de cuir, moleskine, tissu et matière synthétique, également appelée « machine apprêteuse » ou « machine à enduire », dans laquelle les cuirs (P) sont alimentés par une paire de bandes d'alimentation (Ts, Ti) qui sont opposées l'une à l'autre, et sont déposés sur un cylindre caoutchouté inférieur (1) pour le transport et le contraste et où un cylindre d'enduction supérieur, consistant en un cylindre de gravure (2), appuyant vers le bas sur la surface (Pz) du cuir (P), en opposition contre le cylindre caoutchouté sous-jacent (1), dépose un film de produit liquide (C), précédemment distribué sur la surface (S) du cylindre de gravure supérieur précité par l'intermédiaire d'une racle (R), sur la surface précitée,
ladite machine étant **caractérisée en ce que** :

   le rapport entre le diamètre (D) du cylindre caoutchouté inférieur (1) et le diamètre (d) du cylindre de gravure supérieur (2) a une valeur égale ou supérieure à 1,5 (c'est-à-dire D/d >= 1,5).

2. Machine selon la revendication 1, **caractérisée en ce que** le bord avant de la bande d'alimentation supérieure (Ts) est positionné sous la tangente de la ligne de contact entre le cylindre de gravure (2) et le cylindre caoutchouté inférieur (1).

3. Machine selon la revendication 1 ou 2, **caractérisée en ce que** les bandes d'alimentation opposées (Ts, Ti) ont une vitesse d'alimentation (V_1) qui est inférieure à la vitesse périphérique (V_2) du cylindre caoutchouté inférieur (1).

4. Machine selon la revendication 3, **caractérisée en ce que** les deux bandes d'alimentation (Ts, Ti) peuvent être pressées l'une contre l'autre, de manière à pouvoir exercer une pression réglable sur le cuir (P).

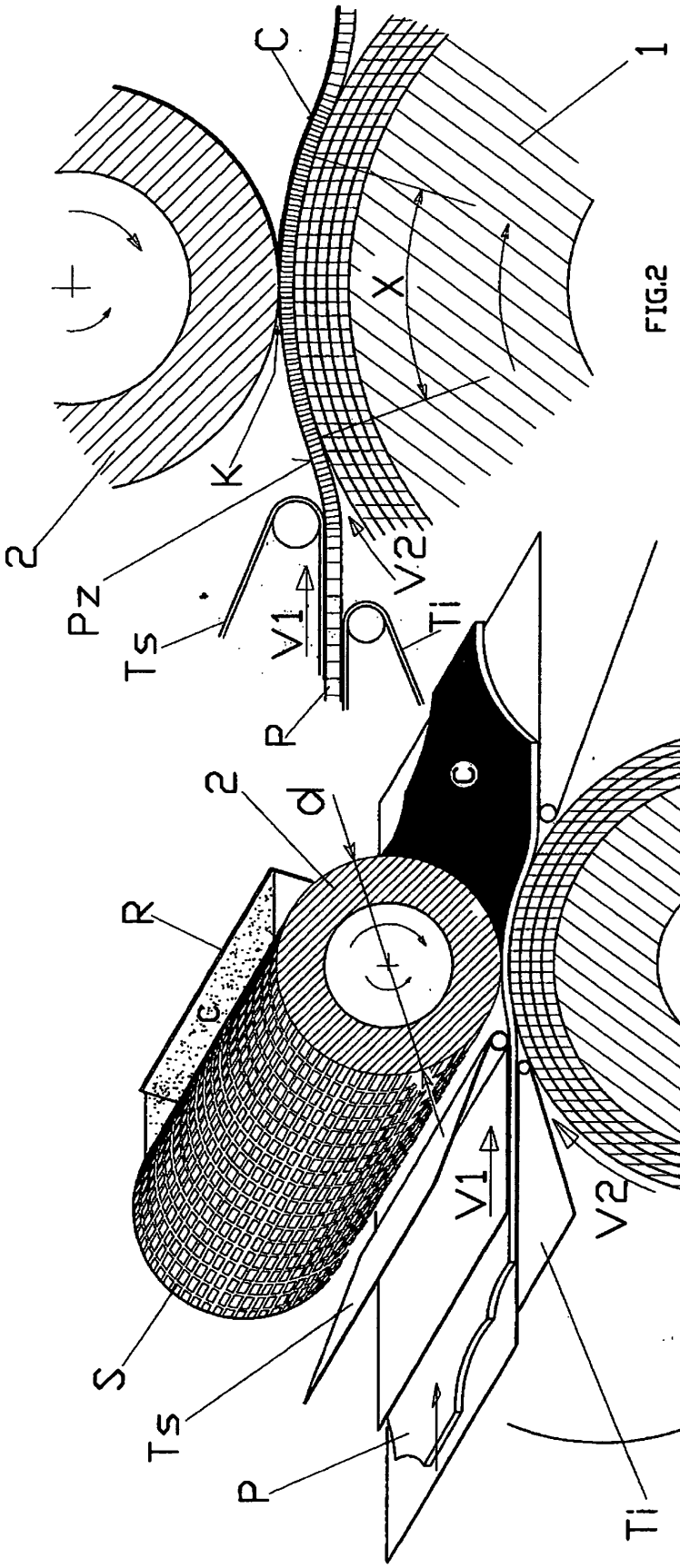


FIG.2

FIG.1

$$V1 < V2$$

$$\frac{D}{d} \geq 1.5$$

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0484740 A **[0008] [0009]**
- EP 1441037 A **[0008]**
- EP 0997538 A **[0008]**