



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.02.2010 Bulletin 2010/07

(51) Int Cl.:
C14B 1/56 (2006.01)

(21) Application number: **09162652.3**

(22) Date of filing: **15.06.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

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(30) Priority: **05.08.2008 IT VI20080187**

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(54) **Machine for roller finishing natural skins, leather and the like, functioning with the so-called "synchro" method**

(57) The finding concerns a machine for roller finishing natural skins, leather and the like, also called "coating machine" or "spreading machine", in which the skins (P) are conveyed by a lower roller or by a belt (5) and where an upper spreading roller, made up of a gravure cylinder (1), pressing down on the surface (S2) of the skin, countered by the underlying cylinder or belt, deposits a film of liquid product (C), previously distributed on the surface

(S1) of the aforementioned upper roller, through a doctor blade (R), onto the aforementioned surface. Such a machine is **characterized in that** the spreading roller of the gravure cylinder (1), which operates with "synchro" mode, rotates in a direction in agreement with the advancing of the skin and comprises a metal cylindrical drum (2), covered, on the outer part, by a layer of elastic material (3) with high elasticity and deformability, the surface (4) of which is incised.

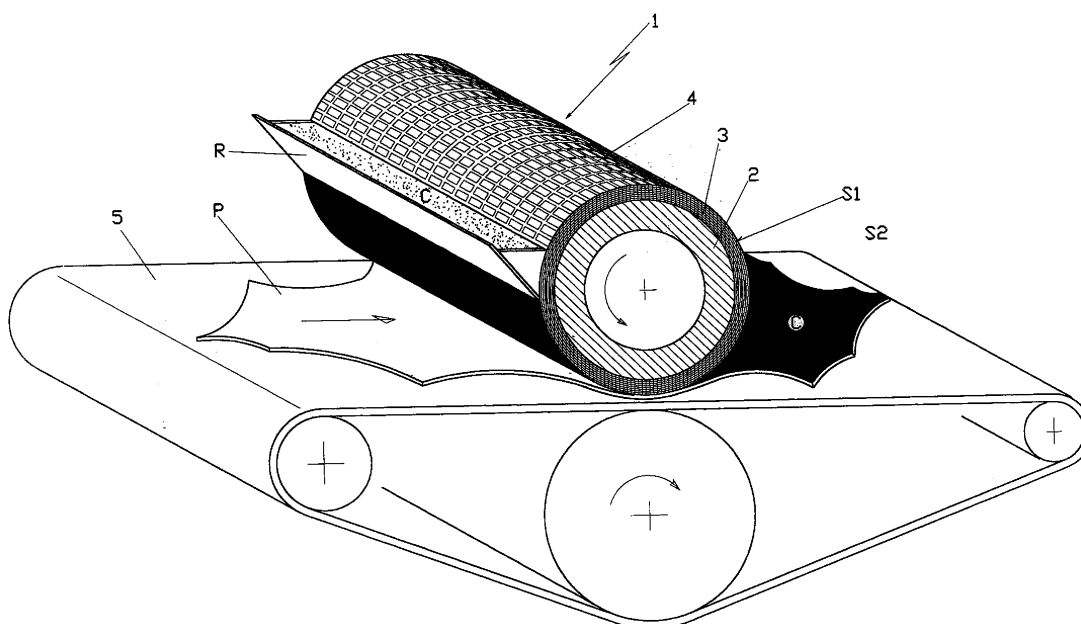


FIG.1

Description

[0001] The present finding concerns the manufacture of a machine for roller finishing natural skins, leather and the like, functioning with the so-called "synchro" method; the finding also concerns the use of a gravure cylinder, of the *per se* known type, to be used in the aforementioned machine.

[0002] As it is known, for carrying out the finishing operation in the field of tanning, roller spreading machines are particularly used, commonly called "coating machines", in which the skin is conveyed by a lower roller or belt and where an opposing upper spreading roller, made up of a steel gravure cylinder, pressing down on the surface of the skin, countered by the underlying cylinder or belt, deposits a film of liquid product, previously distributed on the surface of the aforementioned upper roller, through a doctor blade, onto the aforementioned surface.

[0003] A perfect outcome of the finishing operation of the skins, apart from depending on a regular and constant pulling of the product in the spreading area, i.e., the area comprised between the upper roller and the underlying lower roller 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.

[0004] Such processing is problematic, because the skins often have an irregular thickness and the surface is never perfectly flat, but has depressions and concavities and all of this prevents a total and uniform contact between the surface of the spreading roller and the surface of the material to be treated.

[0005] In practice, the chemical product, held inside the incisions, commonly called "pits" and formed on the surface of the spreading cylinder, is released either only at the surface areas of the skin, leaving out the cavities and the nicks of the skin itself, when a covering process is carried out or only on the incisions, depressions, cavities and scratches when a filling operation is carried out. Similarly, it is not possible to uniformly distribute small quantities of finishing product on the surface of printed skins (fake flower, dollar sign, crocodile), where the product deposits on the surface and not on the nicks ("millepunti" effect), for which reason it is necessary to use another finishing technology, that of spraying the chemical product on the skin through airbrush.

[0006] The purpose of the present finding is to make a machine for roller finishing skins, leather and the like, in which the gravure cylinder for spreading, which rotates in synchrony, or rather with a direction in agreement with the advancing of the skin, positioned above the lower roller or conveyer belt, uniformly deposits the chemical product on the entire surface of the skin, on both the ridges and depressions, and on the cavities and nicks.

[0007] Such a purpose is obtained by using an upper spreading roller, consisting of a metal cylinder, the surface of which is covered by a highly deformable elastic

material, such as an elastomer or natural or synthetic rubbers, which enters into contact with the entire surface of the skin, adapting to its entire profile, or rather with the flat part, with the possible protrusions and also with the depressions, the incisions, the nicks and concavities.

[0008] The finding shall be better understood through the description of one of its possible embodiments, given just for non-limiting purposes, with the help of the attached drawing tables, in which:

- fig. 1 (table I) represents a schematic perspective view of the finishing machine according to the finding;
- fig. 2 (table II) represents a front view of the spreading roller or gravure cylinder according to the finding;
- fig. 3 represents a side view of the gravure cylinder, sectioned according to the line III-III of fig. 2;
- fig. 4 represents a detailed view of the gravure cylinder/skin contact area.

[0009] As can be seen in the figures, the upper roller or gravure cylinder of the finishing machine, wholly indicated with the reference numeral 1 and which operates "synchro" or "direct" mode, comprises a metal drum 2 covered, on its outer part, by a layer of highly deformable elastic material 3, the incised surface 4 of which conveys the liquid covering product, such as dye or fixatives "C", from the doctor blade "R", up to the depositing on the surface "S2" of the skin "P", supported and pulled by an underlying belt 5 or roller 6.

[0010] As can be seen in the detailed view of fig. 4, by using the highly deformable elastic material 3, the surface "S1" of the gravure cylinder deforms and exactly covers the profile of the surface "S2" of the skin "P", or rather complete contact between the two aforementioned surfaces is obtained, in both the protruding areas "H", and the concavity areas "K", all to obtain a regular and homogeneous deposit of chemical product. It is also possible to foresee that the outer surface of the cylinder be only partially incised. Moreover, it is possible to foresee that the outer surface of the gravure cylinder prints a drawing.

Claims

1. MACHINE FOR ROLLER FINISHING NATURAL SKINS, LEATHER AND THE LIKE, also called "coating machine" or "spreading machine", in which the skins (P) are conveyed by a lower roller (6) or by a belt (5) and where an upper spreading roller, made up of a gravure cylinder (1), pressing down on the surface (S2) of the skin, countered by the underlying cylinder or belt, deposits a film of liquid product (C), previously distributed on the surface (S1) of the aforementioned upper roller through a doctor blade (R), onto the aforementioned surface, said machine being **characterized in that** the upper

spreading roller or gravure cylinder (1), which operates in "synchro" mode, i.e., with the aforementioned spreading roller rotating in a direction in agreement with the advancing of the skin, comprises a metal cylindrical drum (2), covered, on the outer part, by a layer of elastic material (3) with high elasticity and deformability, the surface (4) of which is incised.

made from natural rubber.

2. MACHINE FOR ROLLER FINISHING NATURAL SKINS, LEATHER AND THE LIKE, according to claim 1, **characterized in that** the highly deformable outer layer (3) of the gravure cylinder (1) has a Shore A hardness equal to or less than 40. 10
3. MACHINE FOR ROLLER FINISHING NATURAL SKINS, LEATHER AND THE LIKE, according to claim 1, **characterized in that** the outer layer (3) of the gravure cylinder (2) is made with an elastomer. 15
4. MACHINE FOR ROLLER FINISHING NATURAL SKINS, LEATHER AND THE LIKE, according to claim 1, **characterized in that** the outer layer (3) of the gravure cylinder (2) is made from natural rubber. 20
5. MACHINE FOR THE FINISHING OF NATURAL SKINS, LEATHER AND THE LIKE, according to claim 1, **characterized in that** the outer layer (3) of the gravure cylinder (2) is made from synthetic rubber. 25
6. MACHINE, ACCORDING TO CLAIM 1, **characterized in that** the outer surface of the cylinder is only partially incised. 30
7. MACHINE, ACCORDING TO CLAIM 6, **characterized in that** the outer surface of the cylinder prints a drawing. 35
8. USE OF A GRAVURE CYLINDER, made up of a metal cylindrical drum (2), covered, on its outer part, by a layer of material (3) with high elasticity and deformability, on which the incised portion (4) is located, in a machine for roller finishing natural skins, leather and the like, which operates in "synchro" conditions, according to one or more of claims 1 to 5. 40 45
9. USE, according to claim 8, **characterized in that** it foresees that the outer layer of highly elastic and deformable material (3), present on the outer part of the metal cylindrical drum (2), is made from a material with Shore A hardness equal to or less than 40. 50
10. USE, according to claim 9, **characterized in that** it foresees that the outer layer (3) of the cylinder is made with an elastomer. 55
11. USE, according to claim 9, **characterized in that** it foresees that the outer layer (3) of the cylinder (1) is
12. USE, according to claim 9, **characterized in that** it foresees that the outer layer (3) of the cylinder (1) is made from synthetic rubber.

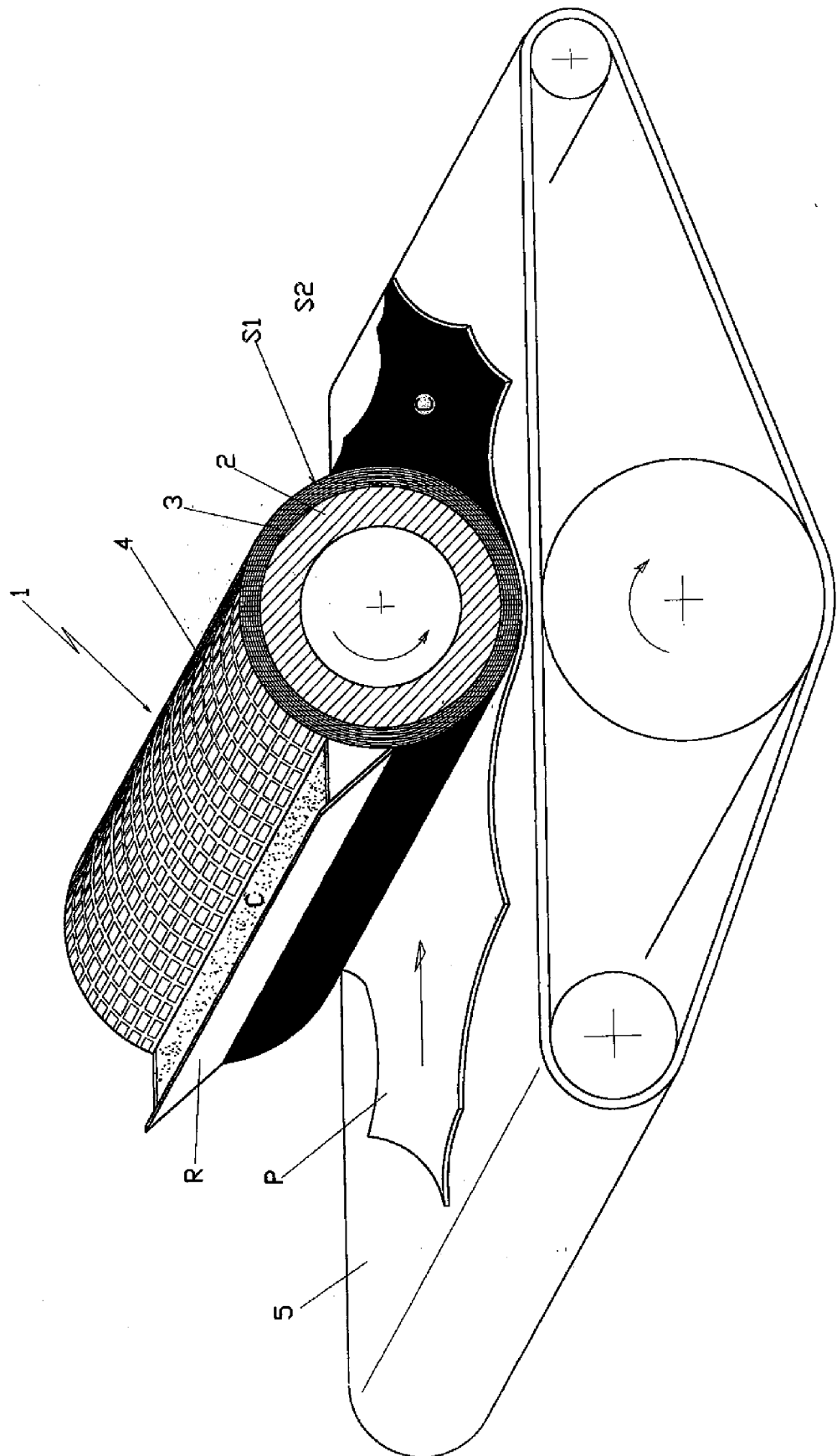
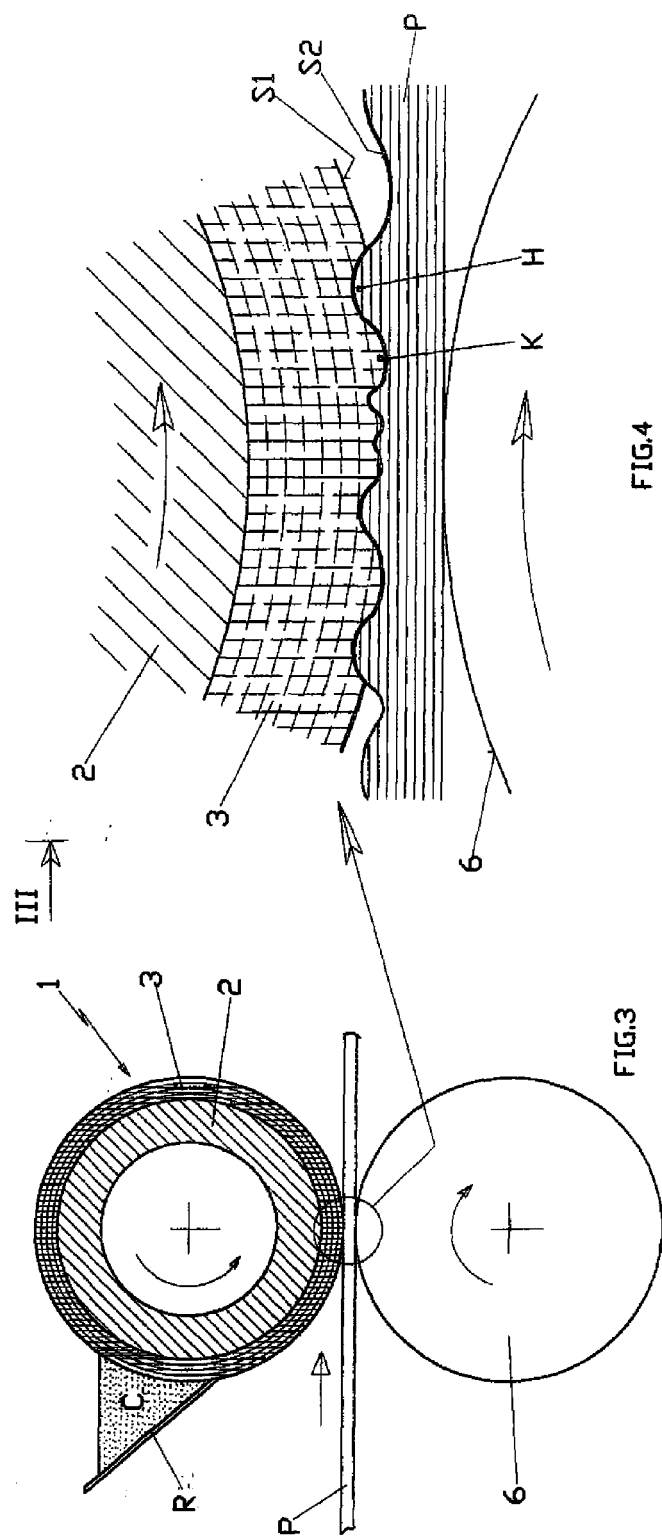
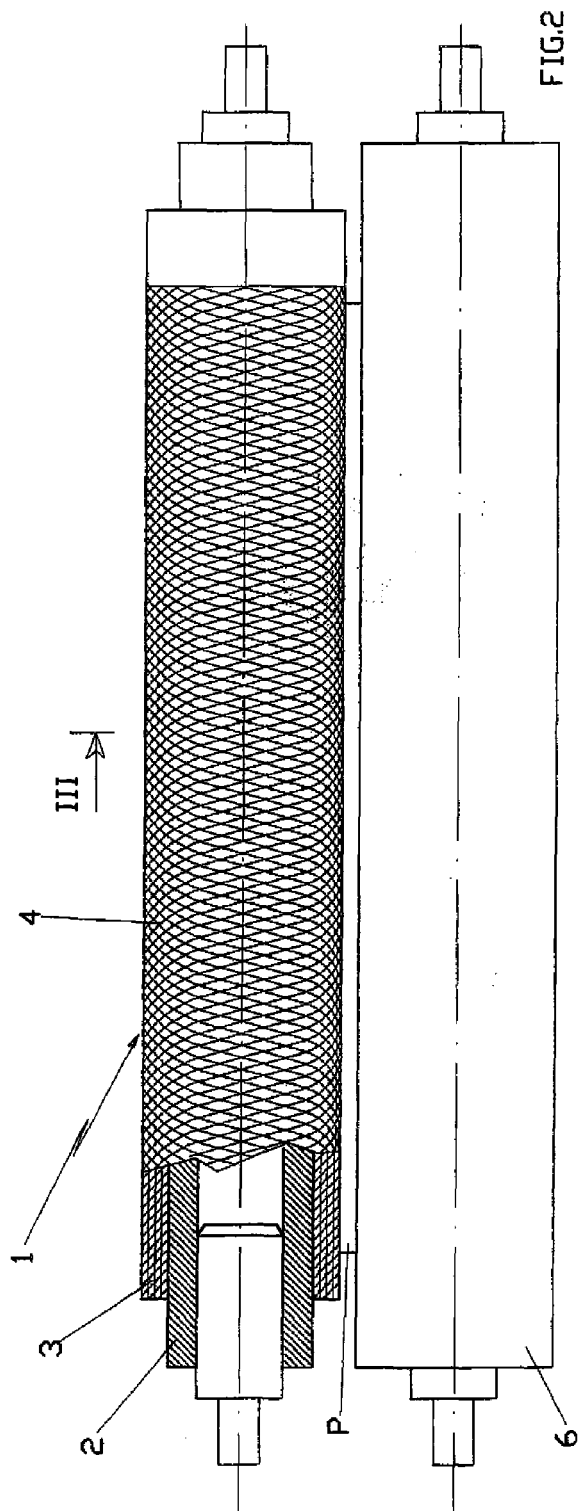


FIG. 1





EUROPEAN SEARCH REPORT

Application Number
EP 09 16 2652

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 20 2006 003489 U1 (SCHAEFER PHILIPP [DE]) 4 May 2006 (2006-05-04) * paragraph [0035]; figure 4 *	1,8	INV. C14B1/56
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			TECHNICAL FIELDS SEARCHED (IPC)
			C14B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 December 2009	Examiner Gast, Dietrich
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 16 2652

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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22-12-2009

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