



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) **EP 1 593 748 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**09.11.2005 Bulletin 2005/45**

(51) Int Cl.7: **C14C 15/00**, B05B 9/03,  
B05B 1/00, B05B 13/02

(21) Application number: **05103779.4**

(22) Date of filing: **05.05.2005**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**  
Designated Extension States:  
**AL BA HR LV MK YU**

(72) Inventors:  
• **Bergozza, Giovanni**  
**36071, ARZIGNANO (VI) (IT)**  
• **Massignani, Maurizio**  
**36071, ARZIGNANO (VI) (IT)**

(30) Priority: **07.05.2004 IT UD20040090**

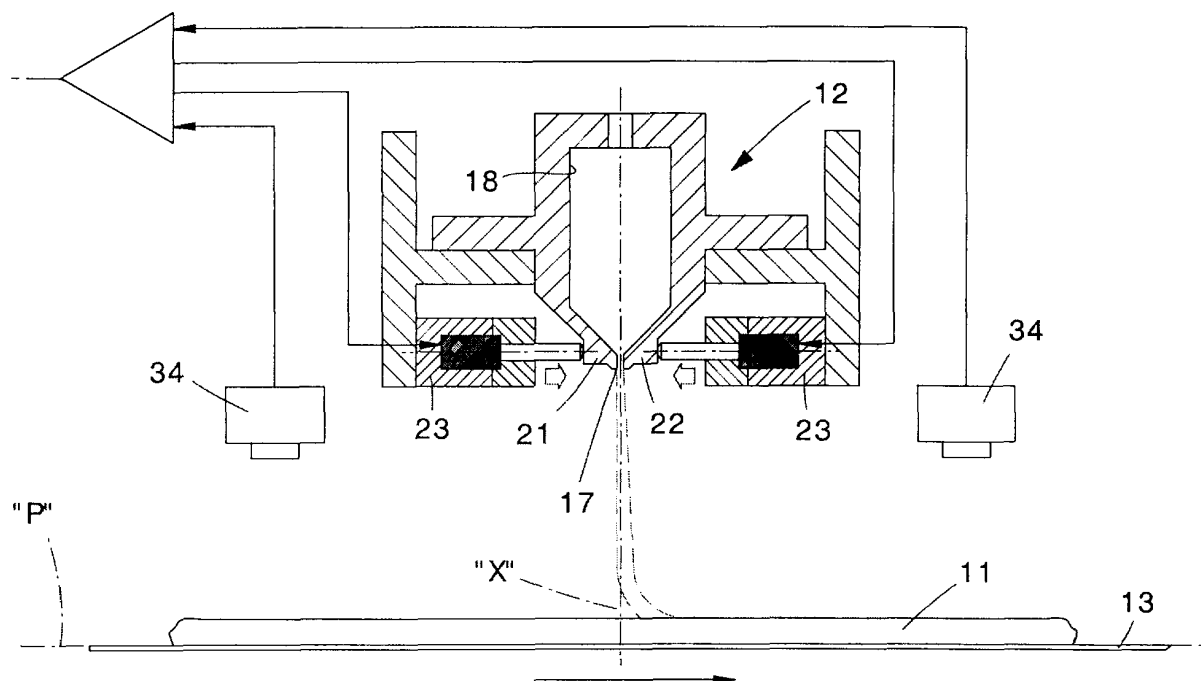
(74) Representative: **Petraz, Davide Luigi**  
**GLP Srl**  
**Piazzale Cavedalis, 6/2**  
**33100 Udine (IT)**

(71) Applicant: **Bergi S.p.A.**  
**36071 Arzignano (VI) (IT)**

(54) **Machine for finishing hides**

(57) Machine (10) for finishing hides (11) comprising a finishing chamber (16) inside which the hides (11) pass lying on a transit plane (P), and a depositing device (12) arranged inside the finishing chamber (16) in order to deposit on the hides (11) a desired quantity of a cov-

ering product. The depositing device (12) is substantially oblong in shape and comprises longitudinally a two-dimensional aperture (17) associated with means (23, 25, 31) that define a desired outlet section of the covering product.



**fig. 3**

## Description

### FIELD OF THE INVENTION

**[0001]** The present invention concerns a machine for finishing hides, used in the field of tanning. The machine serves to deposit covering products on a hide, such as for example pigments, resins, oils, paraffin, glues or other. To be more exact, the finishing machine according to the invention comprises one or more nozzles, substantially oblong in shape, whose outlet aperture has a gap with a selectively variable section, width and/or length, so as to precisely regulate the width of the spraying and the quantity of covering product to be deposited on the hide.

### BACKGROUND OF THE INVENTION

**[0002]** In the field of industrial tanning it is known to subject the hides to at least a step of surface covering, also known as the finishing step, wherein covering products such as for example pigments, resins, oils, paraffin, glues or other are deposited on one side of the hide.

**[0003]** This finishing step allows to improve the characteristics of the treated surface of the hide, giving it a first personalized appearance.

**[0004]** It is known that the finishing step is normally performed either with a first type of machine that uses spraying pistols or nozzles, mounted on a rotary turntable, or provided with alternate motion, or with a second type of machine that uses incised rollers.

**[0005]** The finishing machines of the first type, for example like those disclosed in DE-C-822060, GB-A-822,669 and DE-A-2522184 use a transport device that makes the hides pass under the spraying nozzles.

**[0006]** This first type of machine allows to obtain a satisfactory result in terms of quality, but with a great waste of the covering product since, indicatively, only about 60% of the product sprayed remains on the hide, whereas the remaining 40% is deposited not on the hide, or bounces off the hide and is then sucked in.

**[0007]** Moreover, due to the size of the rotary turntable, this first machine is very bulky, and requires a great deal of space available.

**[0008]** Another disadvantage of the first type of machine is the need for frequent maintenance interventions, which entails an increase in the management costs.

**[0009]** A further disadvantage of the first type of machine is that, due to the rotation of the nozzles, the covering product is deposited in a circular manner, with consequent superimposition of the product as the passes follow each other. This disadvantage causes an irregular distribution of the product on the hide.

**[0010]** Moreover, the large number of nozzles requires suction plants of a size and with characteristics which entail considerable costs of installation and maintenance.

**[0011]** The machine of the second type provides that the hide is arranged on a rubber carpet, to be transported into correspondence with an incised roller, which is impregnated with the covering product, and which deposits said product on the hide through contact.

**[0012]** However, the second type of machine does not allow to obtain optimum results in terms of quality since, if the thickness of the hide is not perfectly homogeneous, in some areas there is a greater deposit of product, whereas in other areas there may even be no product deposited at all. If the hides are very soft, there is then the considerable difficulty of introducing them into this machine because, in order to function, the roller has to rotate in the direction opposite the direction in which the hide advances, causing the hide to be rejected and causing it to curl or roll.

**[0013]** Another disadvantage of these second machines is that the roller in contact with the hide can be filled with particles of dust which the hides release. This causes zones without any covering product, which entails a non-optimum effect on the surface of the hide.

**[0014]** Also the coating apparatus disclosed in US-A-3,587,527 has the same disadvantage of the second machines.

**[0015]** Purpose of the present invention is to achieve a machine for finishing hides which allows to deposit on them a covering product in an optimum manner, that is, without great waste of product, and guaranteeing a uniform deposit over the whole surface of the hide.

**[0016]** Another purpose of the present invention is to achieve a machine for finishing hides that is of limited bulk, and that can deposit said covering product substantially on all types of hides, even very soft ones.

**[0017]** The present Applicant has devised, tested and embodied this invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

### SUMMARY OF THE INVENTION

**[0018]** The present invention is set forth and characterized in the main claim, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

**[0019]** In accordance with the above purposes, a machine for finishing hides according to the present invention comprises at least a finishing chamber inside which the hides are made to pass, in a lying position, and at least a depositing device arranged inside the finishing chamber. The depositing device is in a fixed position with respect to said finishing chamber and is able to deposit a desired quantity of a covering product on the hides.

**[0020]** According to the present invention, the depositing device is arranged above the hides. According to another feature of the present invention, said depositing device has a substantially oblong shape and comprises longitudinally a two-dimensional aperture associated

with means able to define a desired outlet section for the covering product.

**[0021]** According to a variant, said aperture can be linear, or have a shape with one or more radiuses of curvature, also with opposed focuses.

**[0022]** The depositing device according to a variant includes deformation means able to modify in a desired manner the width of the outlet section.

**[0023]** According to another variant, closing means are included which selectively condition the length of the outlet section. The closing means, according to another variant, are also suitable to divide said two-dimensional aperture into two or more outlet sections.

**[0024]** In this way, it is possible to optimize the depositing of the covering product on the hide, according to the shape and size of the latter. This optimization is obtained by acting on the deformation means and/or the closing means, thus varying the outlet section of the aperture, and allowing to always use the correct quantity of covering product.

**[0025]** In one form of embodiment of the present invention, the deformation means comprise one or more first actuator elements, such as for example mechanical, pneumatic or oil-dynamic means, arranged along the length of the aperture and able to act transversely with respect to the latter, in order to selectively bring at least a lateral edge of the aperture closer to the other edge, or distance it therefrom, so as to regulate the width of the outlet section, and hence the quantity of covering product.

**[0026]** With the present invention it is therefore possible to deposit on the hide a layer of covering product with a desired width and thickness, without substantial waste of product. Moreover, since there is no contact between the depositing device and the hide, there is no risk of the latter curling, or releasing dust onto the depositing device.

**[0027]** According to a variant, the closing means comprise at least a shutter element able to act longitudinally on the aperture, so as to define at least a desired length of the outlet section of the covering product, according to the size and shape of the hide.

**[0028]** This solution allows to correlate, on each occasion, the width of the layer of covering product to the width of the hide, and hence to further limit the waste of said product.

**[0029]** Advantageously, both the actuator elements, and also the shutter elements can be provided in a single form of embodiment, so as to obtain a complete regulation of the outlet section of the depositing device.

**[0030]** According to a variant, the actuator elements and/or the closing elements are associated with control means and are managed automatically.

**[0031]** According to another variant, detection means cooperating with the hide passing through serve said control means.

**[0032]** The finishing machine according to the present invention has the following advantages: it is static, that

is, it has no moving members; a very limited space is sufficient to install it; it does not need particular suction plants and relative filters; it guarantees a homogeneous deposit of the covering product even with hides of a non-uniform thickness; it does not entail any superimposition of the covering product on the hide; it has no disadvantages connected to dynamic effects of the deposition; it allows to work substantially any type of hide, even soft or very soft; and it has limited management costs.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0033]** These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a schematic lateral view of a finishing machine for hides according to the present invention;
- fig. 2 is a view from below of an enlarged detail of the finishing machine in fig. 1;
- fig. 3 is a transverse section from III to III in fig. 2;
- fig. 4 shows a variant of the section in fig. 3;
- fig. 5 is a transverse section from IV to IV in fig. 2;
- fig. 6 shows a variant of the section in fig. 5.

## DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF EMBODIMENT

**[0034]** With reference to fig. 1, a machine 10 for finishing hides 11 according to the present invention is of the type used in the field of tanning in order to deposit on a hide 11 a covering product, such as for example a pigment, a resin, an oil, a paraffin, a glue or other. The machine 10 comprises a finishing chamber 16, a depositing device 12, a feed belt 13 and a suction member 15, arranged below the finishing chamber 16 and the feed belt 13 in order to suck in the possible fumes of the covering product which are generated during the deposition step.

**[0035]** The finishing machine 10 according to the invention also comprises a filter device, of a known type and not shown in the drawings, for example a dry filter, positioned below the feed belt 13 between the finishing chamber 16 and the suction member 15.

**[0036]** The finishing chamber 16 comprises a box-like structure open downwards, inside which the depositing device 12 is arranged, advantageously in a fixed position. Moreover, the finishing chamber 16 comprises an inlet aperture 19, through which the hides 11 to be treated are fed, and an outlet aperture 20 through which the treated hides 11 are discharged.

**[0037]** The feed belt 13 is formed by a network or plurality of annular wires arranged parallel and separated from each other, and wound in a known manner around two movement cylinders 24 and 28, of which at least one is motorized, and defining a transit plane "P" for the

hide 11.

**[0038]** The suction member 15 comprises a suction chamber 27 communicating with the finishing chamber 16, and provided inside with two lateral suction collectors 29 and 30. The latter are able to suck in the fumes that are generated during the spraying step, and then discharge them outside the finishing chamber 16.

**[0039]** The depositing device 12 (figs. 2, 3, 4, 5 and 6) is substantially oblong in shape, is attached inside the finishing chamber 16, transverse to the direction of feed of the hides 11, and comprises a tank 18 inside.

**[0040]** The covering product is introduced under pressure inside the tank 18, by means of measuring pumps of a substantially known type and not shown in the drawings.

**[0041]** In this case, the depositing device 12 is substantially shaped like a parallelepiped, with maximum size of about 300 mm in width, 300 mm in height, and 3560 mm in length.

**[0042]** The depositing device 12 comprises longitudinally an aperture 17, two-dimensional, substantially rectilinear and communicating with the tank 18. The aperture 17 also faces towards the feed belt 13, so that its vertical median axis "X" is substantially orthogonal to the transit plane "P" of the hide 11, and has a determinate outlet section.

**[0043]** In this way, the pressure at which the covering product is introduced inside the tank 18 in fact entails that the covering product is extruded through the aperture 17, thus defining, over the whole length of the device 12, a layer of covering product which is deposited on the hides 11.

**[0044]** According to a variant, the aperture 17 can have a substantially curvilinear development, or mixed rectilinear and curvilinear.

**[0045]** According to another variant, the median axis "X" of the aperture 17 can be substantially inclined with respect to the transit plane "P" of the hide 11, for example about 30° towards the right, or towards the left, with respect to the orthogonal.

**[0046]** Simply to give a non-restrictive example, the depositing device 12 allows to deposit on the hide 11 a covering product with a basic weight varying from about 0 to about 5000 gr/m<sup>2</sup>.

**[0047]** To be more exact, the aperture 17 is defined laterally by two edges 21 and 22, elastically deformable, at the sides of which a plurality of fluid-dynamic actuators 23 are arranged (figs. 2 and 3).

**[0048]** The fluid-dynamic actuators 23 are arranged at regular distances from each other along the length of the respective edge 21 or 22, and are able to act transversely from opposite sides against the latter, so as to selectively vary the width of the outlet section of the aperture 17, and hence the quantity of covering product.

**[0049]** In this way, the thickness of the layer of covering product can be regulated dynamically, even during the deposition steps, according to the type of hide 11 to be finished, the desired effect to be obtained, or the par-

ticular technical specifications of the covering product used.

**[0050]** According to a variant shown in fig. 4, instead of the fluid-dynamic actuators 23, sliding pegs 25 can be provided, moved linearly by an eccentric shaft 26, rotary, and each one able to act transversely against the relative edge 21 or 22, in order to selectively regulate the width of the outlet section. In this way it is possible to regulate the thickness of the layer of covering product deposited. The eccentric shaft 26 is actuated by a drive member, of a known type and not shown in the drawings.

**[0051]** A determinate travel of the sliding peg 25 corresponds to every angle of rotation of the eccentric shaft 26, so as to reciprocally bring together or separate the edges 21 and 22.

**[0052]** The regulation of the width thus performed is very precise, and allows to define a determinate width of the outlet section, and hence the quantity of covering product.

**[0053]** Moreover, as shown schematically in fig. 2, two shutters 31 are provided longitudinally to the aperture 17, each one comprising a shutter blade 32 and a linear actuator 33. The shutters 31 are thus able to act longitudinally with respect to the aperture 17, so as to selectively vary the length of the outlet section, and hence the width of the layer of covering product deposited. The variation in length can also be performed dynamically during the deposition steps, so as to modify the lateral dimensions of the layer of covering product, according to the shape of the hide 11 to be worked. Or the shutters 31 can divide the aperture 17 into two or more outlet sections.

**[0054]** In this case, the shutters 31 can vary the length of the aperture 17 taking it from a minimum of about 300 mm to a maximum of about 3400 mm.

**[0055]** As shown in fig. 5, the blade 32 is elastic and assembled able to slide outside the tank 18. This sliding assembly of the blade 32 is achieved by means of a pair of sliding seatings 36 made on the respective edges 21 and 22, inside which the lateral ends of the blade 32 are able to slide. The elasticity of the blade 32 allows to close the aperture 17 in sealed manner.

**[0056]** According to the variant shown in fig. 6, the blade 32 is assembled able to slide inside the tank 18 and has a substantially V-shaped transverse section. This sliding assembly of the blade 32 is achieved by means of a pair of sliding seatings 37 made inside the tank 18, inside which the lateral ends of the blade 32 are able to slide. The sealed closure effected by the blade 32 is guaranteed by the pressure towards the aperture 17 exerted by the covering product present inside the tank 18.

**[0057]** The finishing machine 10 according to the invention also comprises a command and control unit 35 (fig. 1), able to manage the fluid-dynamic actuators 23, or the eccentric shafts 26, and the shutters 31, so as to coordinate automatically the variations in width and in length of the outlet section of the aperture 17.

[0058] Advantageously, the command and control unit 35 is served by a plurality of sensors 34 (figs. 1, 3 and 5), such as for example a TV camera, a presence sensor or others, arranged inside the finishing chamber 16 and able to detect, for example, the presence or absence of the hide 11, the shape thereof, its type, and other desired parameters.

[0059] With the machine 10 according to the present invention the covering product is therefore deposited on the hide 11 automatically, without excessive waste and uniformly over its whole surface.

[0060] The finishing machine 10 as described heretofore functions as follows.

[0061] First of all a first hide 11 to be treated is positioned on the feed belt 13, which makes it pass inside the finishing chamber 16.

[0062] Then the depositing device 12 is activated, so that the covering product is deposited on the hide 11.

[0063] At this point, the command and control unit 35 commands the fluid-dynamic actuators 23, or the eccentric shafts 26, and the shutters 31 so as to automatically vary the outlet section of the covering product.

[0064] Once the covering product has been deposited on the hide 11, the latter is discharged outside the finishing chamber 16, to be sent to subsequent drying and storage steps.

[0065] It is clear, however, that modifications and/or additions of parts may be made to the finishing machine 10 as described heretofore, without departing from the field and scope of the present invention.

[0066] For example, it comes within the field of the present invention that both the fluid-dynamic actuators 23, and the sliding pegs 25 with the relative eccentric shafts 26 are provided in a single embodiment.

[0067] It also comes within the field of the present invention that instead of the fluid-dynamic actuators 23 and/or the pegs 25 with relative eccentric shafts 26, magnetic deformation means can be provided, able to vary the width of the outlet section, and hence the quantity of product deposited on the hides 11.

[0068] It is also clear that, although the present invention has been described with reference to specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of machine for finishing hides, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

## Claims

1. Machine for finishing hides (11) comprising at least a finishing chamber (16) inside which said hides (11) are able to pass lying on a transit plane (P), and at least a depositing device (12) arranged inside said finishing chamber (16) and able to deposit on said hides (11) a desired quantity of a covering product, **characterized in that** said depositing de-

vice (12) is in a fixed position with respect to said finishing chamber (16), is substantially oblong in shape and comprises longitudinally a two-dimensional aperture (17) associated with means (23, 25, 31) able to define a desired outlet section of said covering product.

2. Machine as in claim 1, **characterized in that** said aperture (17) comprises a median axis (X) inclined by an angle as desired with respect to said transit plane (P).

3. Machine as in claim 2, **characterized in that** said median axis (X) is orthogonal with respect to said transit plane (P).

4. Machine as in any claim hereinbefore, **characterized in that** said depositing device (12) comprises deformation means (23, 25, 26), able to modify in a desired manner at least part of the width of said outlet section.

5. Machine as in any claim hereinbefore, **characterized in that** said depositing device (12) comprises closing means (31) able to define at least a length of said outlet section.

6. Machine as in claim 4, **characterized in that** the deformation means comprise one or more actuator elements (23, 25) arranged on at least a lateral edge (21, 22) of said aperture (17), and able to act transversely on at least said lateral edge (21, 22) of said aperture (17) with respect to the other lateral edge (22, 21), so as to selectively regulate the width of said outlet section.

7. Machine as in claim 5, **characterized in that** the closing means comprise at least a shutter element (31) able to act longitudinally on said aperture (17), so as to define at least a length of said outlet section, according to the width of said hides (11).

8. Machine as in any claim hereinbefore, **characterized in that** it comprises detection means (34) able to detect at least a datum relating to said hide (11) in transit.

9. Machine as in claims 6 and 8, **characterized in that** it comprises command and control means (35) able to command said actuator elements (23, 25), in order to selectively regulate the width of said outlet section according to the data detected by said detection means (34).

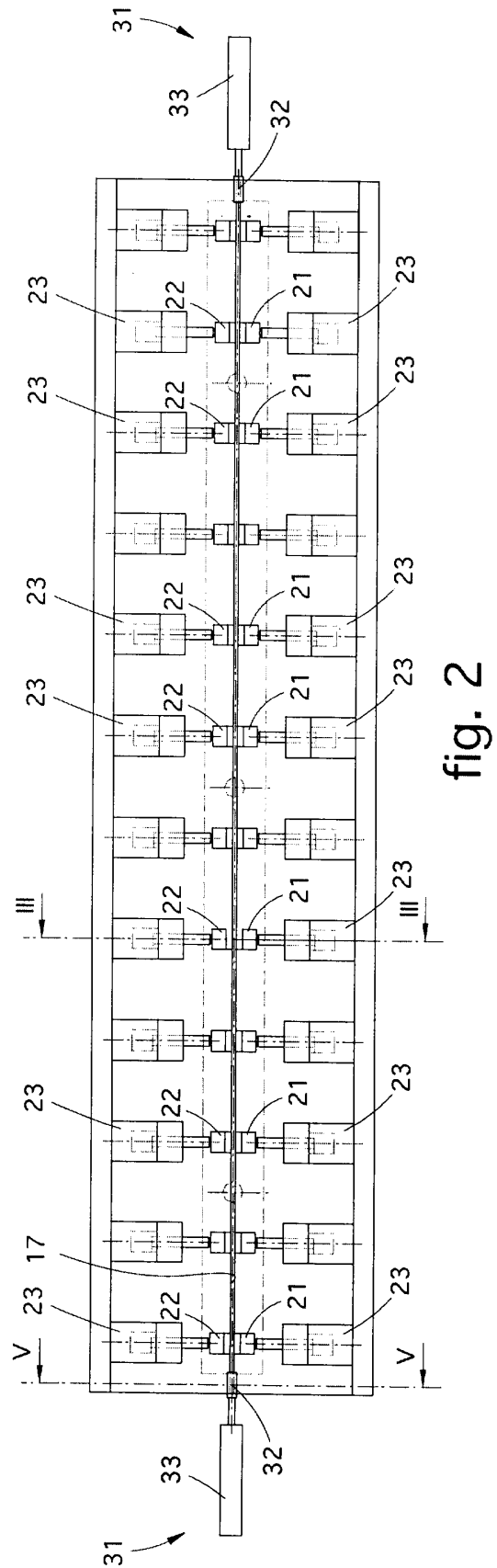
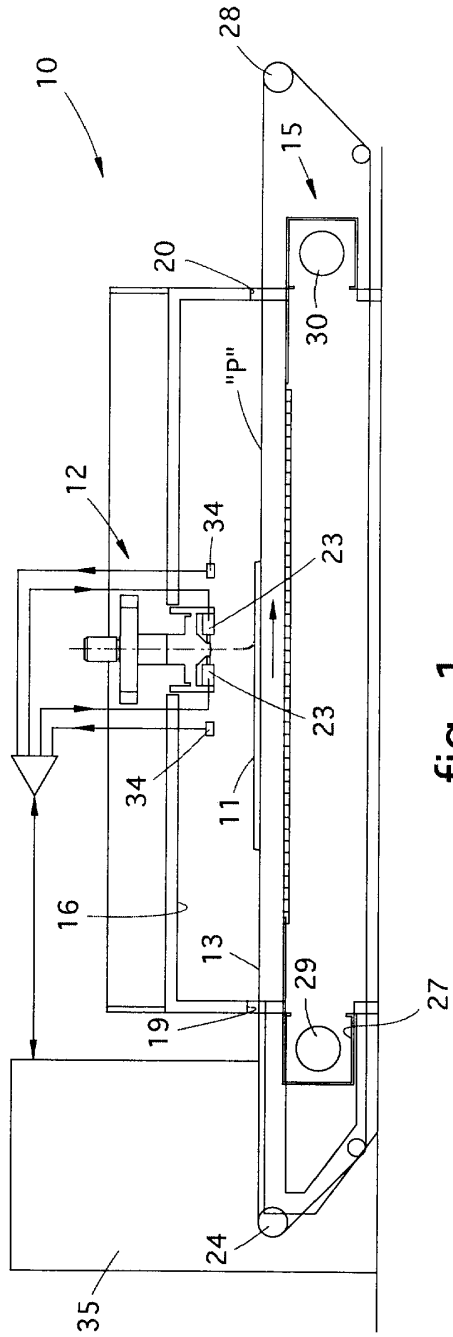
10. Machine as in claims 7 and 8, **characterized in that** it comprises command and control means (35) able to command said shutter element (31), in order to selectively regulate the length of said outlet section

according to the data detected by said detection means (34).

11. Machine as in claim 6, **characterized in that** each of said actuator elements comprises an actuator (23). 5
12. Machine as in claim 6, **characterized in that** each of said actuator elements comprises a sliding peg (25) associated with an eccentric shaft (26). 10
13. Machine as in claim 7, **characterized in that** said shutter element (31) comprises a shutter blade (32) and an actuator (33), able to act longitudinally to said aperture (17), so as to selectively define at least a length of said outlet section. 15
14. Machine as in any claim hereinbefore, **characterized in that** it comprises a feed belt (13) able to make said hides (11) transit along said transit plane (P), a suction member (15) arranged below said transit plane (P) and able to suck in the possible fumes generated by the covering product during the deposition steps, and a filter device positioned between said finishing chamber (16) and said suction member (15), and able to filter said fumes. 20 25
15. Machine as in any claim hereinbefore, **characterized in that** said depositing device (12) is attached inside said finishing chamber (16) transverse to a direction of feed of said hides (11), and comprises inside a tank (18) into which said covering product is introduced under pressure. 30
16. Machine as in claim 15, **characterized in that** said aperture (17) communicates with said tank (18), in order to make said covering product emerge through extrusion. 35
17. Machine as in claims 13 and 15, **characterized in that** said shutter blade (32) is at least partly elastic and is assembled able to slide outside said tank (18). 40
18. Machine as in claims 13 and 15, **characterized in that** said shutter blade (32) is assembled able to slide inside said tank (18). 45

50

55



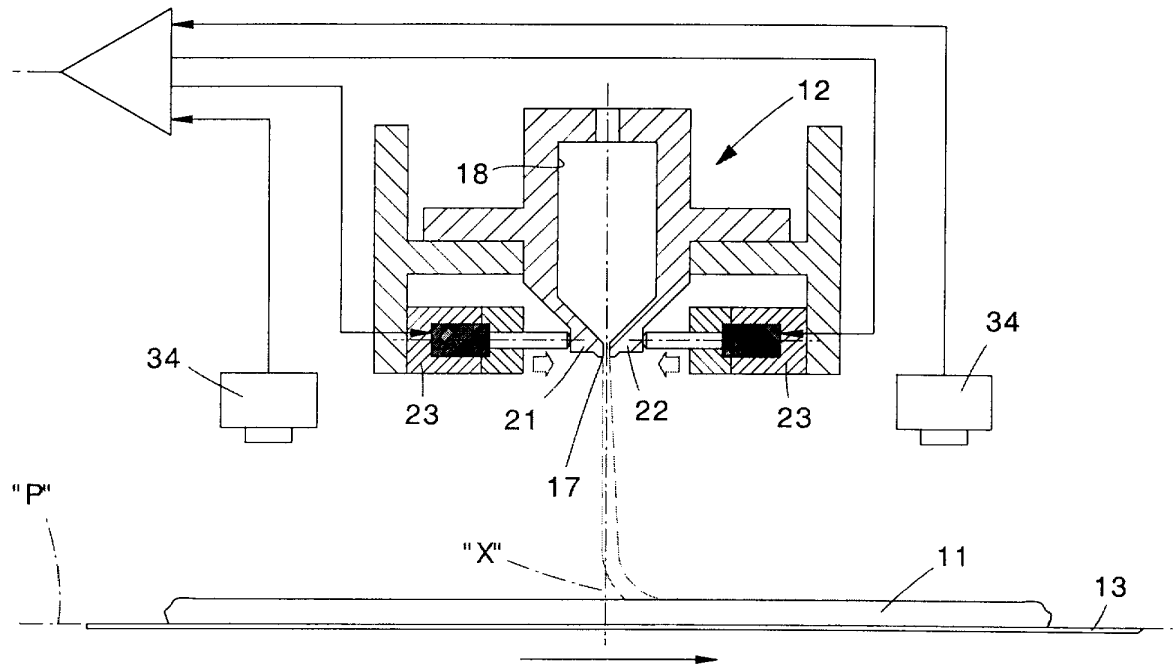


fig. 3

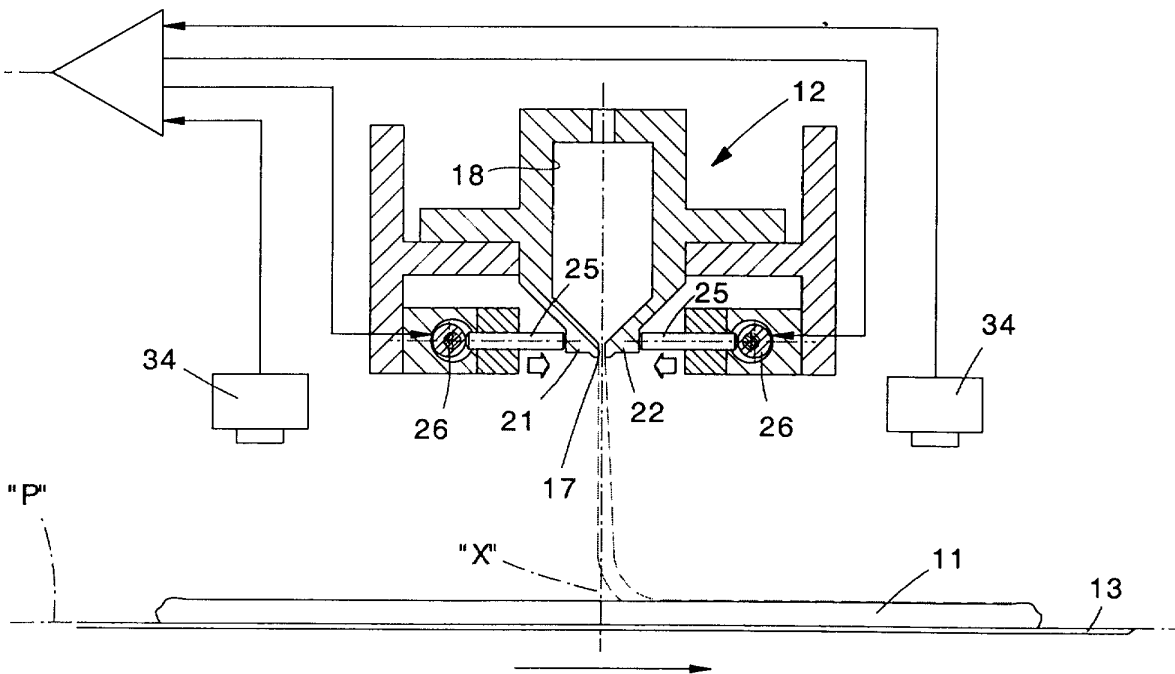
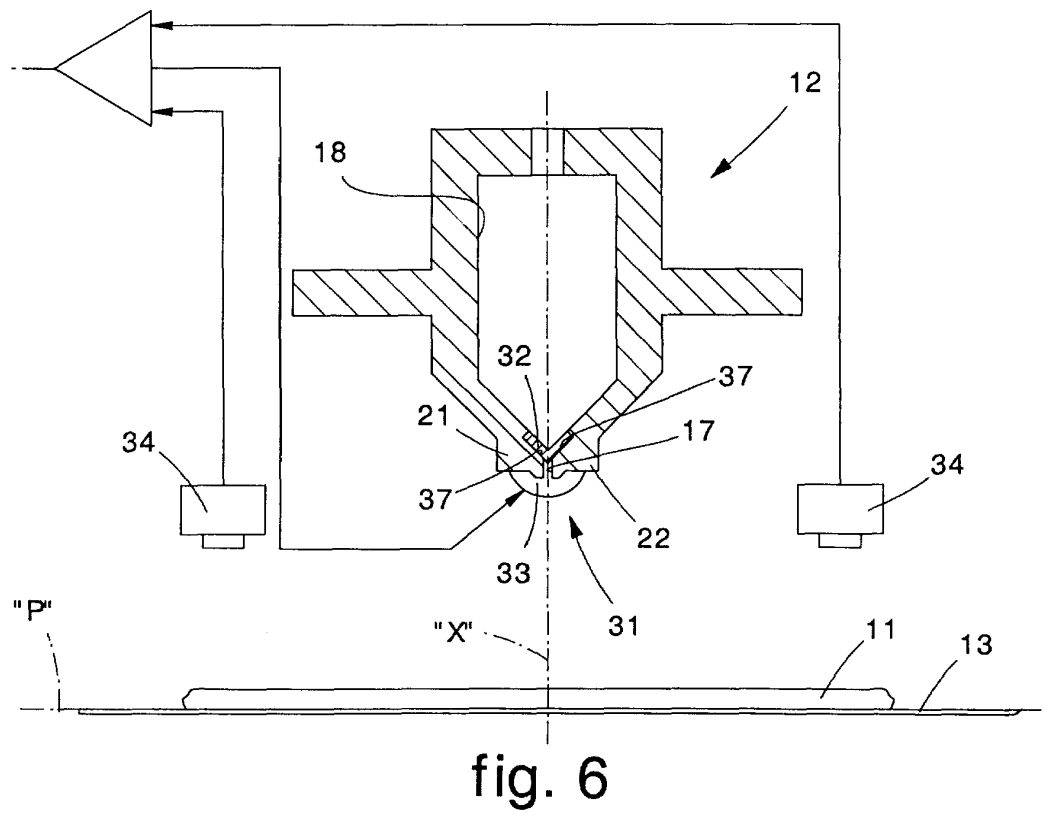
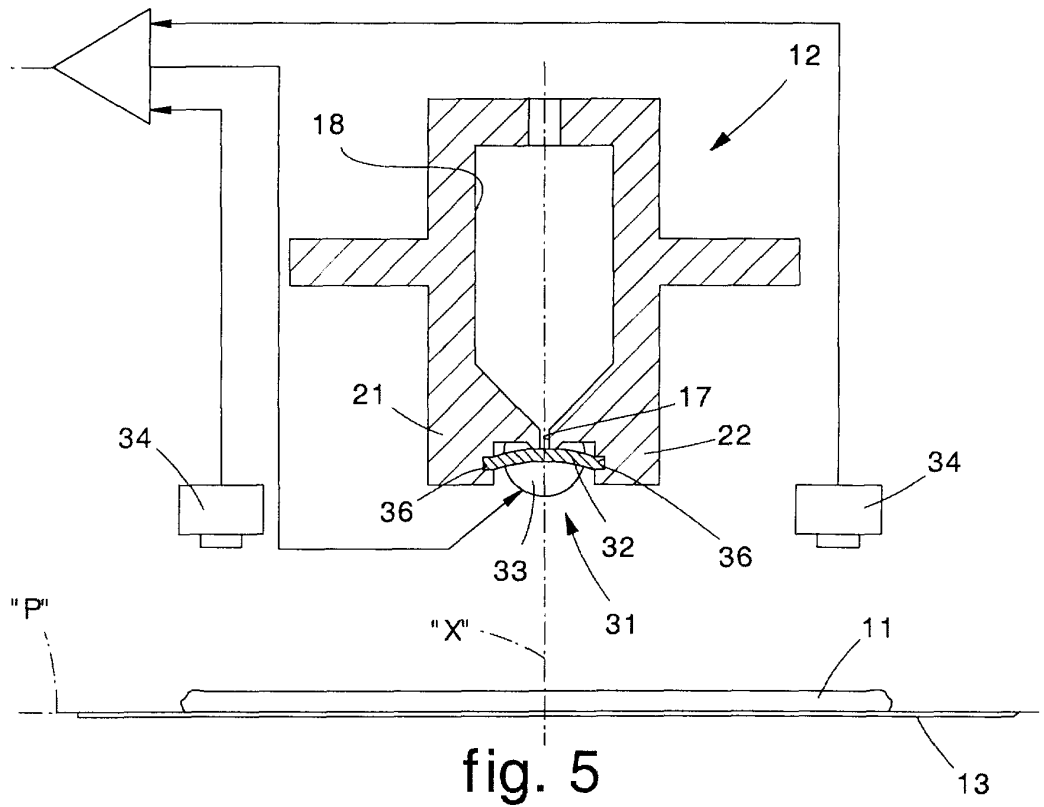


fig. 4







European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 05 10 3779

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
D,X	GB 822 669 A (ROBERT DOUGLAS PRICE) 28 October 1959 (1959-10-28) * page 1, line 13 - page 2, line 21 * * figures 1-3 * -----	1,2,4,5	C14C15/00 B05B9/03 B05B1/00 B05B13/02
X,D	US 3 587 527 A (PERRY FREDERIC F) 28 June 1971 (1971-06-28) * column 1, line 8 - column 3, line 60 * * figures 1-5 * -----	1,2,4,5	
X,D	DE 822 060 C (CHARVO SOC) 22 November 1951 (1951-11-22) * page 1, line 1 - page 2, line 68 * -----	1,14	
A,D	DE 25 22 184 A (CARPANESE S P A) 1 July 1976 (1976-07-01) * page 2, paragraph 1 - page 3, paragraph 3 * -----	1-18	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			C14C C14B B05B
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>17 August 2005</b>	Examiner <b>Neugebauer, U</b>
<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 ..... &amp; : member of the same patent family, corresponding document</p>			

3  
EPO FORM 1503 03/82 (P04C01)

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

EP 05 10 3779

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  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-08-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 822669	A	28-10-1959	NONE	
US 3587527	A	28-06-1971	DE 1677183 A1	25-11-1971
DE 822060	C	22-11-1951	NONE	
DE 2522184	A	01-07-1976	IT 1024314 B	20-06-1978
			BE 831373 A1	03-11-1975
			BR 7506442 A	08-09-1976
			DE 2522184 A1	01-07-1976
			DK 393875 A	20-06-1976
			ES 438226 A1	16-01-1977
			FR 2295125 A1	16-07-1976
			JP 51076402 A	02-07-1976
			LU 73898 A1	01-07-1976
			NL 7509358 A	22-06-1976
			RO 70417 A1	30-04-1981
			SE 7507788 A	21-06-1976