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(54) The machine for bleaching and changing the color of wool using the UV light

(57) The invention is the UV bleaching machine used to bleach and change the color of the wools and/or fibers located on the raw leather characterized in that it comprises at least one UV lamp (5) that delivers said bleaching process via at least one reflector (4) onto said wool by means of the UV rays it emits, at least one conveyor and/or fixed platform (3), which carries the raw leather where said wool is located, and is mobile and/or stationary according to its field of use.

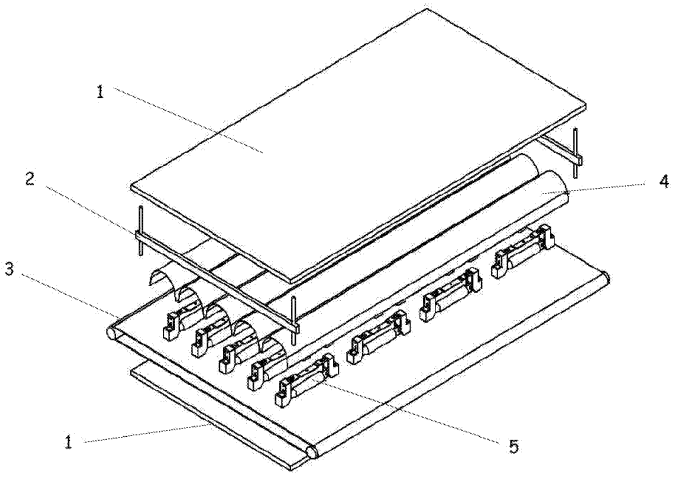

Figure - 1

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Description

Technical Field

[0001] The invention relates to the machine used to bleach and change the color of the wools and the fabric fibers located on the raw leather.

[0002] The invention relates in particular to the bleaching and color changing machine, which enables said wools and fibers to be bleached at a lower cost with maximum efficiency.

Background of the Invention

[0003] 1,3 million tons of wool is produced worldwide on the annual basis. From said wool production, 816.000 tons of products are obtained annually. The initial and most important processes in the wool sector are the cleaning and bleaching processes that are applied to provide the wool with characteristic features enabling it to be dyed in different colors and to be converted into a finished product.

[0004] Until the present, the methods employed predominantly for the bleaching processes have included the steam-bleaching method and the bleaching method with peroxide derivatives.

[0005] In the method of bleaching applied by the use of the peroxide derivatives, the bleaching is achieved by the oxidation and disintegration of the pigment molecules as a result of the peroxides releasing oxygen at high pH values. The bleaching applied with peroxides, which is a difficult to control method, is employed to bleach the cellulosic fibers. However, due to their requirement for high pH and their denaturing effects on the proteinic fibers, it is not possible to use said processes in bleaching the wool fibers in an efficient manner.

[0006] In the steam-bleaching method, the chemical substances applied to the fiber exhibit the bleaching effect upon encountering the steam. On the other hand, this method may only be used in bleaching the wools and fibers, which are dyed with dispersed dyes.

[0007] Said process is employed in cases where the product is to be put on the market in a white color. Since the product is released to the market in white color, it is subjected to a very good bleaching process. Such a better bleaching process is achieved via combined bleaching by using a more effective bleaching agent and employing more severe bleaching time and conditions.

[0008] In this bleaching process, the wool is occasionally observed to turn into a shade tending towards green without being completely whitened, and a clear whiteness is not possible to obtain at all the times. In addition, a whole steam boiler must be operated to meet the steam demand for carrying out said process, meaning a rather high cost and time loss. Besides, a long time is needed even after the boiler is turned on, in order to obtain the steam in an efficient manner, which in turn leads to the irreversible material losses resulting from the technicians tending to perform the production without carrying out the necessary trials.

[0009] Moreover, it is likely for the wools to turn pale because of the mechanical and heat treatments applied together with various chemicals during the processing of the wool. Said paling makes it necessary to make the color choice for dyeing the fiber based on the structure of the wool, rather than the preference, hence numerous limitations emerge with respect to marketing and fashion.

[0010] In the European patent application with no. EP1390574 in the register of the Turkish Patent Institute, the following phrase is included about the subject: "A dyeing or bleaching mechanism, which comprises the mobile spool holder shafts for the threads wound around the spools or similar packages, said holder shafts being also removable for the water filtering and drying processes, and a dyeing tank having a circular cross-section suitable for the inlet of a single circular load, being able to run with a lower amount of liquid and also being able to be used for partial capacities according to a fixed impregnation ratio."

[0011] In said application, the fabric, which is subjected to a chemical reaction, is dyed and bleached inside the dyeing tank.

[0012] Also, in the utility model application with no. TR 2005 03686 U in the register of Turkish Patent Institute, the following phrases are included relevant to the subject: "Our invention relates to the apparatus used in the textile finishing sector for lightening the colors (bleaching) of the sewn textile merchandise or providing a fibrous structure (wearing) for the same characterized in that the apparatus comprises an angular structure and is made by pressing Polyester, Quartz, Cobalt, Methylethyl Ketone Peroxide. Apparatus comprises the wearing tips and the body."

[0013] In said application, a mechanical apparatus is used to bleach said fabrics.

[0014] Also, in the utility model application with no. TR 2005 01322 U in the register of Turkish Patent Institute, the following phrases are included relevant to the subject: "The proposed invention is a machine, which enables the color lightening and bleaching processes performed either as a necessity of production or for decorative purposes on the indigo carmen dyed fabric, also called denim in the textile sector, and on the cloths produced from said fabric, to be carried out in a rapid, economic and environment-friendly manner. Our machine allows the use also in the acid- and reactive-dyed products. The machine comprises the cylindrical inner and outer cabin, which are arranged one within the other, ozone generator and the control panel. Located on the outer cabin are the ozone gas inlet, air inlet and outlet holes, and the filling and discharge cover. The inner cabin is made with a perforated structure, and the part of the shaft that surrounds the cabin which passes through the outer cabin is manufactured in a way that it will not leak the pressurized ozone. Also, there are the vanes inside the inner cabin."

[0015] In said application, a machine is developed for

bleaching the dyed fabrics.

[0016] In the aforementioned applications, the bleaching process may not be used in bleaching the cotton structure on the raw leather.

[0017] As a result of said disadvantages, an innovation has been sought regarding the bleaching of the wools.

Description of the Invention

[0018] Based on the mentioned state of the art, the object of the invention is to enable the wools and the fibers to be bleached by means of electrical energy, without the need for steam energy.

[0019] Another object of the invention is to provide a much more efficient bleaching.

[0020] Another object of the invention is to avoid the health problems encountered both in the workers and the users as a result of the chemicals used for bleaching said wools and fibers.

[0021] Another object of the invention is to minimize the costs, owing to the fact that bleaching process is performed without the use of chemicals and the steam.

[0022] Another object of the invention is to provide the whitening for all kinds of fabric owing to the bleaching process performed with UV rays.

[0023] Another object of the invention is to enable also the wools dyed with non-dispersed dyes to be clearly whitened owing to the application of UV.

[0024] Another object of the invention is to enable the recovery of an enormous economical value and to make it possible to obtain the effects, which have not been possible so far in the textile and leather sectors.

Description of the Figures

[0025]

Figure - 1: Perspective view of the UV bleaching machine
Figure - 2: Side view of the UV bleaching machine
Figure - 3: Side sectional view of the UV bleaching machine

Reference Numbers

[0026]

1. Protective Layer
2. Height Adjustment Apparatus
3. Conveyor and/or Fixed Platform
4. Reflector
5. UV Lamp

Detailed Description of the Invention

[0027] In Figure - 1, the perspective view of the UV bleaching machine according to the invention is illustrated.

[0028] Said UV bleaching machine consists of the protective layer (1), height adjustment apparatus (2), conveyor and/or fixed platform (3), reflector (4) and UV lamp (5).

[0029] Application is based on focusing and intensifying the UV light on the material. When the UV (bronzer), which is normally used at a distance of e.g. 1 m, is provided in a more intensive manner by way of reflection with the aid of the reflector (4) from a close distance, it enables a rapid whitening or lightening in the shades of the colors applied with different dyeing processes.

[0030] Said protective layer (1) is positioned at the lower and/or upper parts of the machine, in order to protect the employees from the hazardous effects of the UV radiation emitted from said UV bleaching machine.

[0031] The height adjustment apparatus (2) is positioned below said top protective layer (1), in order to adjust the distance of UV light to the application surface. Owing to said height adjustment apparatus (2), it is possible to carry out applications at different heights. Different effects and results may be obtained by virtue of the application at different heights. Consequently, it becomes possible to carry out a more flexible and diversified production.

[0032] The reflectors (4) positioned below said height adjustment apparatus (2) are used to direct the UV light onto the application surface in a homogeneous manner. The reflectors (4) may be used in a state coated with different reflective materials and bent according to different shapes, in an effort to benefit from the UV light to the maximum possible extent.

[0033] Conveyor (3) is used as the carrying means for a continuous feed of the surface, where the application is to be made, into the machine, according to the industrial-scale production. Said conveyor (3) is used as the fixed platform (3) in the trial machines and/or for the trials per lot.

[0034] The UV lamp (5), positioned as the lamp that provides the UV radiation, is connected onto said conveyor and/or fixed platform (3).

[0035] In order to achieve the desired production capacity, said UV lamp (5) may be arranged as a single unit or a plurality of units placed side by side depending on the machine size, the width of the application and the desired production capacity, and the units may be used in a single array or as many rows of arrays arranged successively, depending on the desired width of application and the desired production capacity.

[0036] The raw leather on which the wool desired to be bleached is located is placed on said conveyor and/or fixed platform (3) such that the wool will be at the top. The height adjustment is made by means of the height adjustment apparatus (2), depending on the amount of wool, duration of treatment and the desired effect. The UV rays emitted from the UV lamp (5) are reflected by the reflectors (4) to hit said surface. Said wools are bleached by means of the influence of the UV rays on the wool.

[0037] According to an embodiment of the invention, it is possible to perform the bleaching process with UV for the wools to which formic acid and sodium formaldehyde sulfoxylate are applied.

[0038] According to a different embodiment of the invention, the effects like color lightening, etc. may be obtained in the dyed wools to which formic acid and zinc formaldehyde sulfoxylate are applied.

[0039] These products are the formulations which are most abundant and most widely used in the market, but it is also possible to obtain similar effects using other chemicals with similar structure.

[0040] The invention may not be limited to the representative embodiments provided in this section. The alternative embodiments that may be realized by the persons skilled in the art based on the fundamental elements within the protective scope as set forth in the claims will mean the violation of the invention.

Claims

1. The invention is an UV bleaching machine used to bleach and change the color of the wools and/or fibers located on the raw leather **characterized in that** it comprises

   - at least one UV lamp (5) that delivers said bleaching process via at least one reflector (4) onto said wool by means of the UV rays it emits,
   - at least one conveyor and/or fixed platform (3), which carries the raw leather where said wool is located, and is mobile and/or stationary according to its field of use.

2. An UV bleaching machine according to Claim 1 **characterized in that** said machine comprises on the lower and/or upper regions thereof at least one protective layer (1), in order to prevent said UV rays from reflecting onto the surroundings and from damaging the living beings in the ambience.

3. An UV bleaching machine according to Claims 1 and 2 **characterized in that** it comprises at least one height adjustment apparatus (2) positioned below said protective layer (1), enabling the height adjustment to be made according to the amount of wool, duration of treatment and the desired effect.

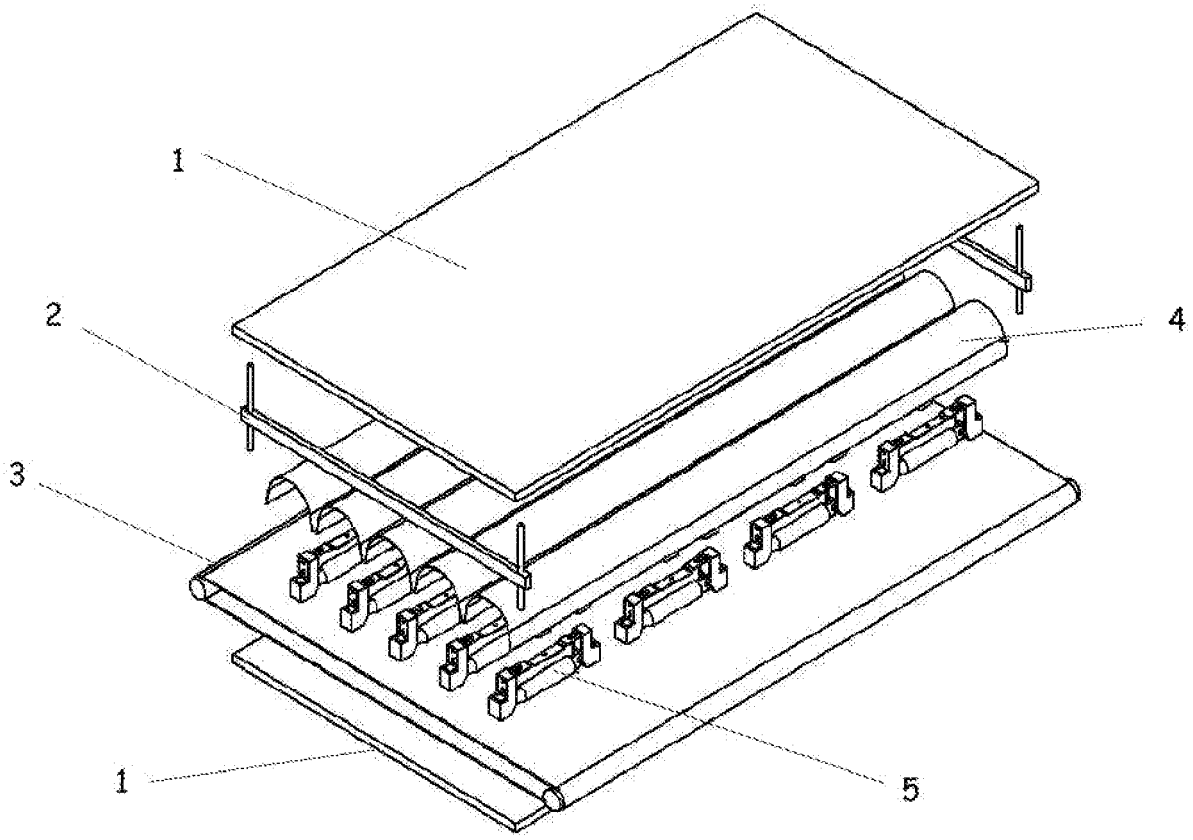

Figure – 1

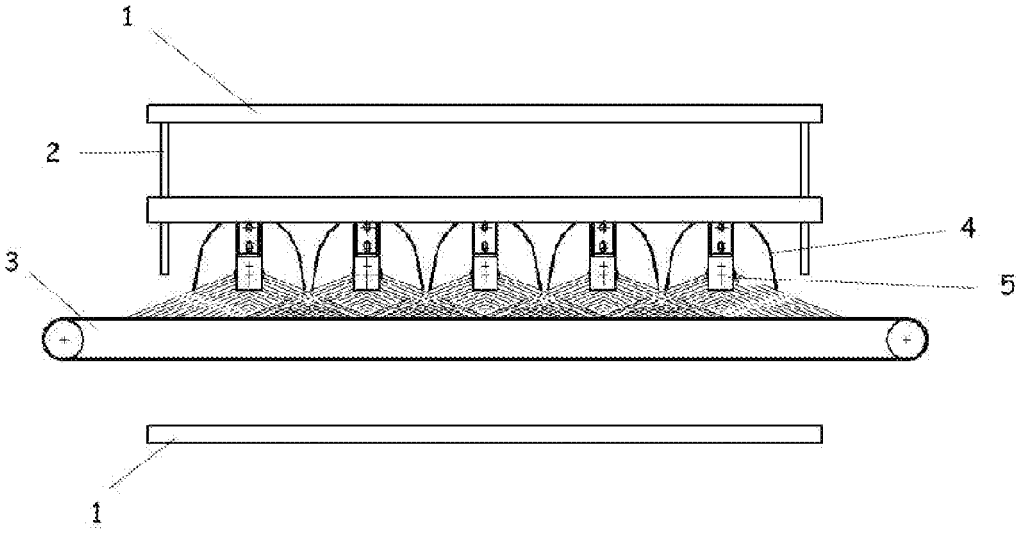

Figure – 2

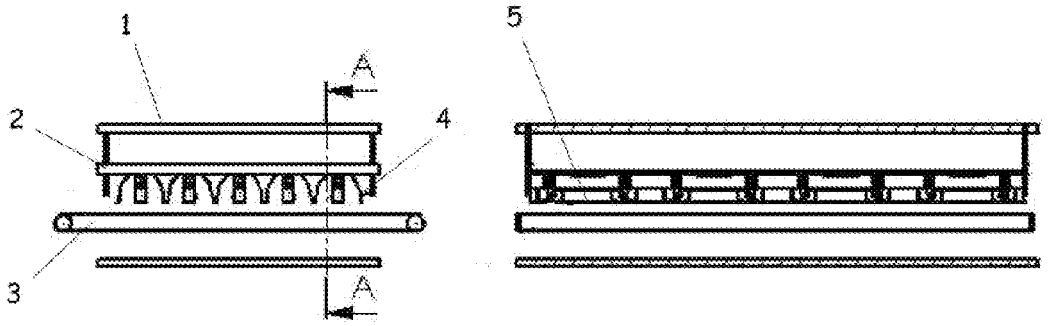

Figure – 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 10 3803

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 811 702 A (HARRISON & COMPANY FINISHERS L; DEREK REGINALD MOORE) 8 April 1959 (1959-04-08) * page 1, lines 47-67 * * page 3, lines 25-73; figures 1-4 *	1	INV. D06M10/00
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 September 2008	Bichi, Marco

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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