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(54) **Title:** REGENERATED BONDED LEATHER AND METHOD FOR MAKING IT

(57) **Abstract:** The present invention concerns finished bonded leather made up of a first layer comprising bonded leather, a second layer comprising finishing material, a third layer of adhesive material interposed between the first layer and the second layer. The invention also concerns a method for producing finished bonded leather.

REGENERATED BONDED LEATHER AND METHOD FOR MAKING IT

TECHNICAL FIELD OF APPLICATION OF THE INVENTION

The present invention concerns the technical field of production of bonded
5 leather.

In particular, the present invention refers to the surface finishing of bonded
leather and to the method for obtaining the latter.

DESCRIPTION OF THE STATE OF THE ART

It is known that bonded leather is used for making various products, in particular
10 for covering furniture items like chairs, sofas, writing desks and accessories, and
for making leather items like bags, belts and shoes.

Bonded leather is a material constituted by a majority percentage of leather fibres
mainly obtained from the processing of tannery and shoe factory waste, and by a
remaining part of natural latex.

15 The industrial process for the production of bonded leather is made up of several
steps, including a first step of grinding the above mentioned waste with the
addition of high quantities of water in order to obtain a paste, a successive
refining step and then a series of chemical treatments.

The paste is then processed in order to obtain a material in sheets or rolls that is
20 then subjected to a dehydrating process by draining water and extracting the
residual humidity.

Once said production cycle has been completed, the surface of the bonded leather
is subjected to a so-called buffing and finishing treatment.

In particular, the finishing step includes the step of painting the external surface
25 of the bonded leather, that is, the surface of the final product that at the end will
be visible.

The painting step consists in the application of a layer of a finishing material to
the external surface of the bonded leather, said finishing material making said
surface compact and homogeneous and, if necessary, suitable for a successive
30 dyeing or embossing step.

The finishing material generally consists of a film in polyurethane or a similar
material that is spread on the external side of the sheet of bonded leather
obtained from the process described above. The application is carried out by
laying, on the external surface of the bonded leather, said polyurethane or similar
35 material that penetrates the porous surface substrate of the leather.

Once said film has been laid, the successive drying step takes place, followed by the polymerization and reticulation of the film and the definitive adhesion of the same to the surface of the bonded leather.

5 However, this type of bonded leather treated on the surface according to the method described above poses some drawbacks.

A first drawback is represented by the fact that the external surface, that is, the treated surface of the bonded leather treated superficially according to said known techniques has non-homogeneous surface characteristics.

10 Said drawback is mainly caused by the fact that the surface characteristics of the bonded leather substantially depend on how the polymerization and reticulation of the applied film take place. This depends, on one side, on the characteristics of the underlying bonded leather and, on the other side, on the environmental and climatic conditions during the cooling step. Both said factors vary in the different points of the surface of the bonded leather and consequently the surface
15 characteristics of the finished product at the end of the treatment vary accordingly in the different points.

Another drawback is represented by the fact that the bonded leather to which the film is applied inevitably contains a residual quantity of humidity. Said residual humidity emerges through the substrate constituted by the film applied to the
20 surface, with the consequent generation of more or less localized mildew on the surface of the bonded leather.

This determines the presence of haloes on the finished product.

Therefore, this means that in many cases the finished product is rejected, or, however, that a low-quality product is obtained.

25 Thus, the main object of the present invention is to overcome the drawbacks described above.

In particular, it is a first object of the present invention to provide finished bonded leather with homogeneous surface characteristics on its entire surface area, and therefore to obtain a higher quality product.

30 It is another object of the invention to provide finished bonded leather with reduced production waste.

It is another object of the invention to provide finished bonded leather with improved mechanical resistance characteristics compared to the bonded leather belonging to the known art.

35 It is a further object of the invention to propose a method for producing finished

bonded leather eliminating the above mentioned drawbacks.

SUMMARY OF THE PRESENT INVENTION

The present invention is based on the general consideration that it is desirable to obtain homogeneous surface characteristics of finished bonded leather by
5 applying a finishing layer with consolidated and predetermined chemical-physical characteristics to the bonded leather layer.

According to a first embodiment, the subject of the invention is finished bonded leather according to claim 1, that is, finished bonded leather comprising:

- a first layer comprising bonded leather;
- 10 - a second layer comprising a finishing material;
- a third layer of adhesive material interposed between said first layer and said second layer.

Advantageously, the finished bonded leather has its external surface, corresponding to the finishing layer, with well defined homogeneous
15 characteristics, corresponding to the chemical-physical characteristics of the finishing layer itself.

The finishing material preferably comprises an extruded material.

Advantageously, said material has appropriate chemical-physical characteristics when associated with the layer of bonded leather.

20 According to a further embodiment of the present invention, a method for producing finished bonded leather is proposed, which comprises the following steps:

- preparation of a first layer comprising bonded leather;
- preparation of a second layer comprising a finishing material;
- 25 - combination of said first layer with said second layer through the interposition of a third layer of adhesive material.

Advantageously, the external surface of the finished bonded leather, corresponding to the finishing layer, has well defined homogeneous characteristics, corresponding to the chemical-physical characteristics of the
30 finishing layer itself before it is glued onto the bonded leather layer.

Further embodiments of the present invention are described in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Further advantages, objects and characteristics, as well as further embodiments of
35 the present invention, are defined in the claims and will be illustrated in the

following description, with reference to the enclosed drawings; in the drawings, corresponding or equivalent characteristics and/or components are identified by the same reference numbers. In particular:

- 5 - Figure 1 shows a view of a piece of bonded leather finished according to a first embodiment of the invention;
- Figure 2 shows the sectional view according to plane I-I of the piece of finished bonded leather shown in Figure 1;
- Figure 3 shows the sectional view of a second embodiment of the bonded leather finished according to the invention;
- 10 - Figures from 4 to 10 schematically show different methods for producing the finished bonded leather shown in Figure 1.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

Although the present invention is described below with reference to its embodiments illustrated in the drawings, the present invention is not limited to
15 the embodiments described below and illustrated in the drawings. On the contrary, the embodiments described and illustrated herein clarify some aspects of the present invention, the scope of which is defined in the claims.

Figure 1 shows a piece of finished bonded leather 1 according to a first preferred embodiment of the invention.

20 The finished bonded leather 1, as better shown in the sectional view of Figure 2, comprises a first base layer 2 of bonded leather, an external layer of finishing material 3 and an intermediate layer 4 of adhesive material that joins the bonded leather layer 2 and the finishing layer 3.

The figures are mere representations of the finished bonded leather 1 that is the
25 subject of the invention. In particular, the dimensions of the three layers 2, 3 and 4 shown therein are deliberately out of scale for the sake of clarity.

Examples of real values for the three layers 2, 3 and 4 can be, for example, 1,6 mm for the bonded leather layer 2, 15µm for the adhesive substance layer 4 and 20µm for the external layer of finishing material 3.

30 The bonded leather layer 2 is constituted, as is known, by a mixture made up by approximately 80% of leather fibres, generally obtained from processing waste, and 20% of natural latex.

The external layer of finishing material 3 that is applied to the layer 2 of bonded leather, preferably adopting one of the methods described below, preferably
35 comprises a film of polymeric material, more preferably a polyurethane resin-

based film. Even more preferably, said polymeric material is of the extruded type.

According to variant embodiments of the invention, the external layer of finishing material 3 can be constituted by other types of polymeric materials, preferably extruded, like polyamide, polyester, polyurethane, polyethylene, polypropylene, EVA, PVC and polyolefin materials in general. Other materials having substantially the same chemical-physical characteristics as the materials indicated above can however be used as finishing layer 3.

The intermediate layer 4 of adhesive material that joins the bonded leather layer 2 and the finishing layer 3 is made up of different adhesive substances, depending on the application method adopted to apply the substance to the film that constitutes the second layer, as is better described below with reference to the methods for producing the finished bonded leather that is the subject of the invention. For example, it is possible to use powder, liquid, extruded, thermoplastic and other adhesive substances.

Independently of the type of material used for the finishing layer 3 and of the intermediate layer of adhesive material 4, the finished bonded leather 1 of the invention advantageously has its external surface, corresponding to the finishing layer 3, with well defined homogeneous characteristics corresponding to the chemical-physical characteristics of the finishing layer 3 itself. In fact, the solution according to which the finishing layer 3 is applied to the base layer 2 constituted by the bonded leather through the adhesive substance of the intermediate layer 4 makes it possible to choose the finishing layer 3 with the desired and well defined chemical-physical characteristics, which are maintained even during and after the application of the film 3 to the base layer of bonded leather 2. The chemical-physical characteristics of the finishing layer 3 are not modified during its application to the bonded leather layer 2, differently from what happens, instead, in the known art, where the polymerization and reticulation, and therefore the definition of the chemical-physical characteristics of the finishing layer 3, are not easy to control, as they take place during the application of the polyurethane film and its subsequent drying stage.

Regarding the finishing layer 3, therefore, its chemical-physical characteristics are the same before and after its association with the bonded leather layer 2 through the adhesive material.

It is exactly the glueing solution that makes it possible to use films with stable

and pre-defined chemical-physical characteristics that will then correspond to the surface characteristics of the final product consisting of the finished bonded leather 1.

In particular, from the physical point of view, the achievement of a more or less smooth surface can be expected, or of a layer with suitable physical strength characteristics, advantageously higher than in the known art, said characteristics being furthermore homogeneous on the entire surface of the film.

From the chemical point of view, said film has a structure that is advantageously non breathable. Said characteristic causes the creation of a barrier for the bonded leather layer 2 against the residual humidity that is inevitably present in the bonded leather 2 following its production process.

Said barrier confines the humidity inside the layer of bonded leather 2 and prevents it from emerging towards the outside and from producing mildew on the visible external surface of the final product, thus actually avoiding the creation of undesired haloes on the finished product.

In addition to selecting the film with the desired chemical-physical characteristics, it is also possible to previously intervene on the desired aesthetic result, including for example the use of a coloured film that can be uniform or decorated with proper patterns.

Alternatively, and as shown in the variant embodiment of Figure 3, in addition to the three layers 2, 3 and 4 described above, it is possible to provide a further, more external decorative layer 5, obtained for example through spray painting or coating by means of a blade or cylinder.

Figures from 4 to 10 schematically show different methods for producing the finished bonded leather 1 that is the subject of the invention.

Figure 4 shows a first method for producing the finished bonded leather 1 that is the subject of the invention.

There are two adjacent rotating rollers R1, R2 between which a bonded leather layer 2, in the form of a sheet, is conveyed, together with a layer 3 consisting of a finishing film made of a material of the type described above.

Upstream of the rollers R1 and R2 there is a nozzle U for dispensing an adhesive substance that is laid on the surface 3a of the finishing film 3 that successively faces the upper layer 2 during the passage through the rollers R1 and R2.

The three layers 2, 3 and 4 pass through the two rotating rollers R1 and R2 to obtain as a result the finished bonded leather 1.

Optionally, a controlled temperature oven can be provided downstream of the two rollers R1 and R2, and the assembly of the three layers 2, 3 and 4 is made slide inside said oven in order to allow the adhesive substance of the intermediate layer 4 to be polymerized and reticulated more quickly. The temperature level and the time during which said assembly is treated must be such as not to modify the chemical-physical characteristics of the finishing layer 3.

Figure 5 shows another method for producing the finished bonded leather 1 that is the subject of the invention.

There are two adjacent rotating rollers R1, R2 between which a bonded leather layer 2, in the form of a sheet, is conveyed, together with a layer 3 consisting of a finishing film made of a material of the type described above.

Upstream of the rollers R1 and R2 there is a third roller R3 whose external surface is provided with cuts inside which there is the adhesive substance that is laid on the surface 3a of the finishing film 3 that successively faces the upper layer 2 during the passage through the rollers R1, R2. A blade T facilitates the application of the adhesive substance 4 to the external surface of the third roller R3.

The three layers 2, 3 and 4 pass through the two rotating rollers R1 and R2 to obtain as a result the finished bonded leather 1.

Optionally, a controlled temperature oven can be provided downstream of the two rollers R1 and R2, as explained above with regard to the method described making reference to Figure 4.

Figure 6 shows another method for producing the finished bonded leather 1 that is the subject of the invention.

There are two adjacent rotating rollers R1, R2 between which a bonded leather layer 2, in the form of a sheet, is conveyed, together with a layer 3 consisting of a finishing film made of a material of the type described above.

Upstream of the rollers R1 and R2 there is a third roller R3 on whose external surface the finishing film 3 rests and above which there is a nozzle U for spraying the adhesive substance that is laid on the surface 3a of the finishing film 3 that successively faces the upper layer 2 during the passage through the rollers R1, R2.

The three layers 2, 3 and 4 pass through the two rotating rollers R1 and R2 to obtain as a result the finished bonded leather 1.

Optionally, a controlled temperature oven can be provided downstream of the

two rollers R1 and R2, as explained above with regard to the method described making reference to Figure 4.

Figure 7 shows another method for producing the finished bonded leather 1 that is the subject of the invention.

5 There are two adjacent rotating rollers R1, R2 between which a bonded leather layer 2, in the form of a sheet, is conveyed, together with a layer 3 consisting of a finishing film made of a material of the type described above.

Upstream of the rollers R1 and R2 there are two rollers R3 and R4 whose surface is provided with the adhesive substance that is laid on the surface 3a of the finishing film 3 that successively faces the upper layer 2 during the passage through the rollers R1 and R2.

The three layers 2, 3 and 4 pass through the two rotating rollers R1 and R2 to obtain as a result the finished bonded leather 1.

Optionally, a controlled temperature oven can be provided downstream of the two rollers R1 and R2, as explained above with regard to the method described making reference to Figure 4.

Figure 8 shows another method for producing the finished bonded leather 1 that is the subject of the invention.

20 There are two adjacent rotating rollers R1, R2 between which a bonded leather layer 2, in the form of a sheet, is conveyed, together with a layer 3 consisting of a finishing film made of a material of the type described above.

Upstream of the rollers R1 and R2 there is a third roller R3 whose external surface is provided with cuts inside which there is the adhesive substance that is laid on the surface 3a of the finishing film 3 that successively faces the upper layer 2 during the passage through the rollers R1, R2. A blade T facilitates the application of the adhesive substance 4 to the external surface of the third roller R3. A fourth counter-planarity roller R4 is also arranged under the third roller R3.

30 The three layers 2, 3 and 4 pass through the two rotating rollers R1 and R2 to obtain as a result the finished bonded leather 1.

Optionally, a controlled temperature oven can be provided downstream of the two rollers R1 and R2, as explained above with regard to the method described making reference to Figure 4.

35 Figure 9 shows another method for producing the finished bonded leather 1 that is the subject of the invention.

There are two adjacent rotating rollers R1, R2 between which a bonded leather layer 2, in the form of a sheet, is conveyed, together with a layer 3 consisting of a finishing film made of a material of the type described above.

Upstream of the rollers R1 and R2 there is a third roller R3 on whose external surface the finishing film 3 rests and above which there is a fourth roller 4 whose external surface is provided with the adhesive substance that is laid on the surface 3a of the finishing film 3 that successively faces the upper layer 2 during the passage through the rollers R1, R2. A blade T facilitates the application of the adhesive substance 4 to the surface 3a of the finishing film 3.

The three layers 2, 3 and 4 pass through the two rotating rollers R1 and R2 to obtain as a result the finished bonded leather 1.

Upstream of the two rollers R1 and R2 there is an oven F that facilitates the evaporation of any excess solvent, for example water, present in the adhesive substance before the layers are coupled.

Optionally, a controlled temperature oven can be provided downstream of the two rollers R1 and R2, as explained above with regard to the method described making reference to Figure 4.

Figure 10 shows another method for producing the finished bonded leather 1 that is the subject of the invention.

There are two adjacent rotating rollers R1, R2 between which a bonded leather layer 2, in the form of a sheet, is conveyed, together with a layer 3 consisting of a finishing film made of a material of the type described above.

Upstream of the rollers R1 and R2 there is a third roller R3 on whose external surface the finishing film 3 rests and above which there is a fourth roller 4 associated with a container C for an adhesive powder, preferably a thermoplastic material, that is spread on the external surface of the fourth roller 4 in order to be laid on the surface 3a of the finishing film 3 that successively faces the upper layer 2 during the passage through the rollers R1, R2. A brush S adjusts the quantity of adhesive substance 4 that reaches the surface 3a of the finishing film 3.

The three layers 2, 3 and 4 pass through the two rotating rollers R1 and R2 to obtain as a result the finished bonded leather 1.

Optionally, a controlled temperature oven can be provided downstream of the two rollers R1 and R2, as explained above with regard to the method described making reference to Figure 4.

It has thus been shown that the present invention allows all the set objects to be achieved. In particular, it makes it possible to produce high-quality finished bonded leather with homogeneous surface characteristics.

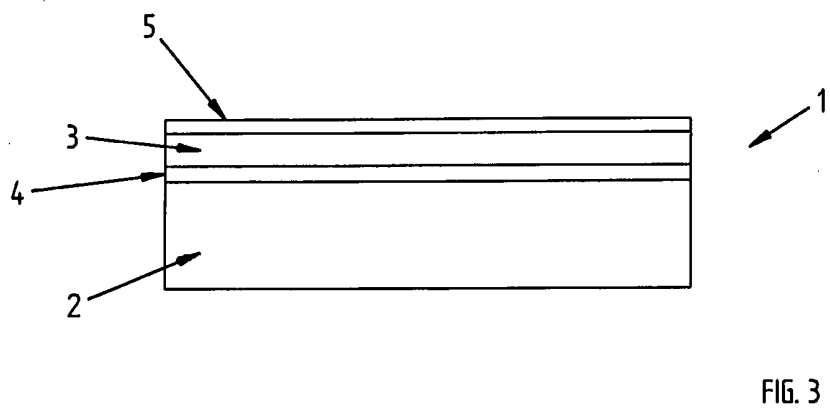
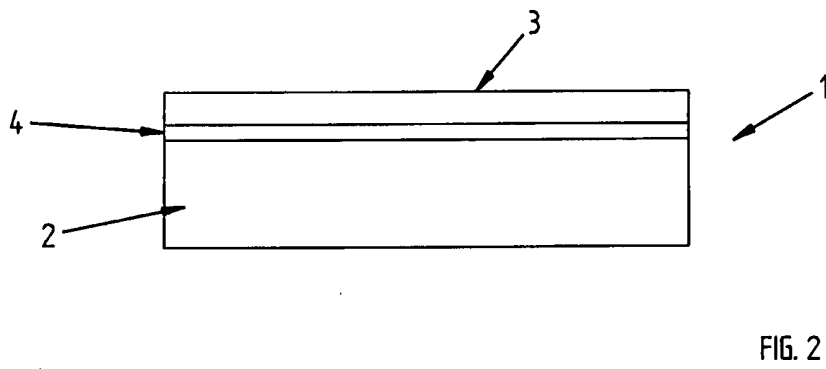
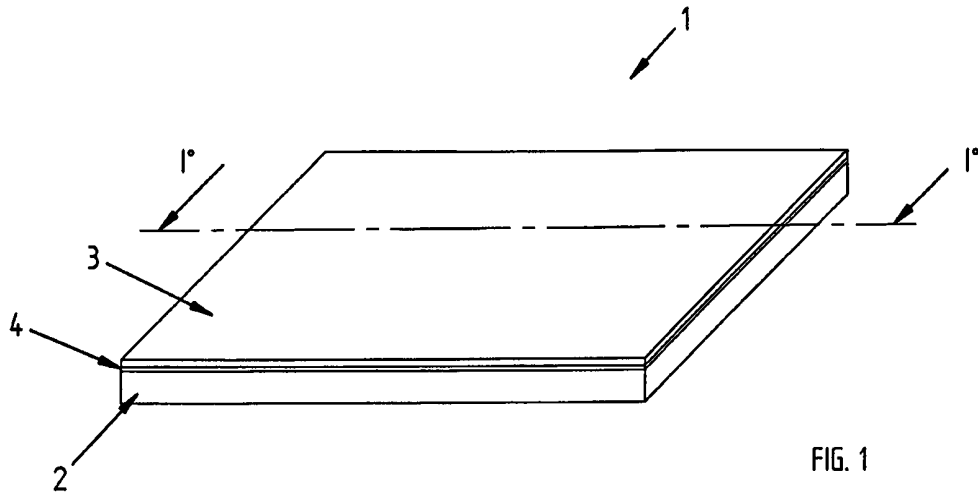
5 While the present invention has been described with reference to the particular embodiments shown in the figures, it should be noted that the present invention is not limited to the specific embodiments illustrated and described herein; on the contrary, further variants of the embodiments described herein fall within the scope of the present invention, which is defined in the claims.

CLAIMS

- 1) Finished bonded leather (1), **characterized in that** it comprises:
- a first layer (2) comprising bonded leather;
 - a second layer (3) comprising a finishing material;
 - 5 - a third layer (4) of adhesive material interposed between said first layer (2) and said second layer (3).
- 2) Leather (1) according to claim 1), **characterized in that** said finishing material (3) comprises an extruded material.
- 3) Leather (1) according to any of the preceding claims, **characterized in that** said finishing material (3) comprises a polymeric material.
- 10 4) Leather (1) according to any of the preceding claims, **characterized in that** said finishing material (3) comprises a material belonging to the group made up of polyamide, polyester, polyurethane, polyethylene, polypropylene, EVA, PVC, polyolefin materials.
- 15 5) Leather (1) according to any of the preceding claims, **characterized in that** said second layer (3) is in the form of a film having the same chemical-physical characteristics before and after being combined with said first layer (2) through said third layer of adhesive material (4).
- 6) Leather (1) according to any of the preceding claims, **characterized in that** said adhesive material (4) comprises a thermoplastic material.
- 20 7) Leather (1) according to any of the preceding claims, **characterized in that** said adhesive material (4) comprises a liquid or powder substance.
- 8) Leather (1) according to any of the preceding claims, **characterized in that** said bonded leather (2) comprises leather fibres and latex.
- 25 9) Leather (1) according to any of the preceding claims, **characterized in that** said second layer (3) comprises a dye.
- 10) Leather (1) according to any of the preceding claims, **characterized in that** it comprises a further layer (5) comprising a dye.
- 11) Method for making finished bonded leather (1), **characterized in that** it comprises the following steps:
- 30 - preparation of a first layer (2) comprising bonded leather;
- preparation of a second layer (3) comprising a finishing material;
- combination of said first layer (2) and said second layer (3) through the interposition of a third layer (4) of adhesive material.
- 35 12) Method according to claim 11), **characterized in that** said combination step

comprises a step in which said third layer of adhesive material (4) is applied to the surface of said second layer (3) and successively said second layer (3) and third layer (4) are associated with said first layer (2).

- 13) Method according to claim 11) or 12), **characterized in that** said first (2),
5 second (3) and third (4) layer are associated with each other by making them pass through rollers.
- 14) Method according to any of the claims from 11) to 13), **characterized in that** it comprises a step in which said adhesive material (4) is subjected to a heat treatment.



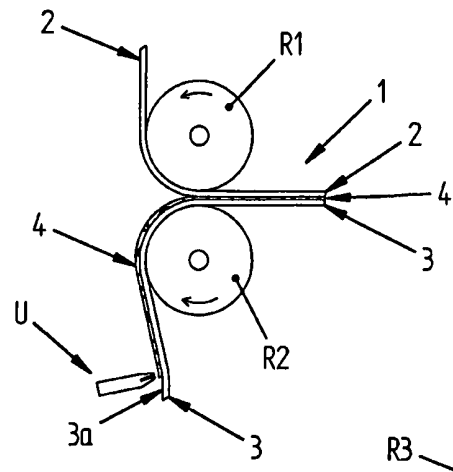


FIG. 4

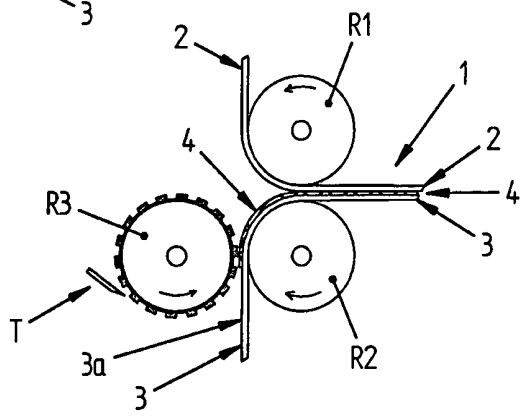


FIG. 5

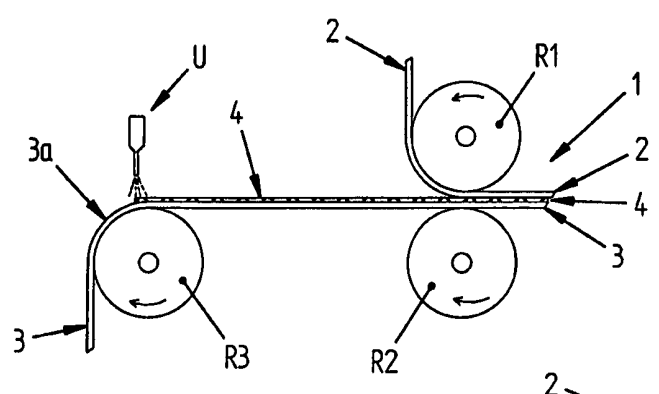


FIG. 6

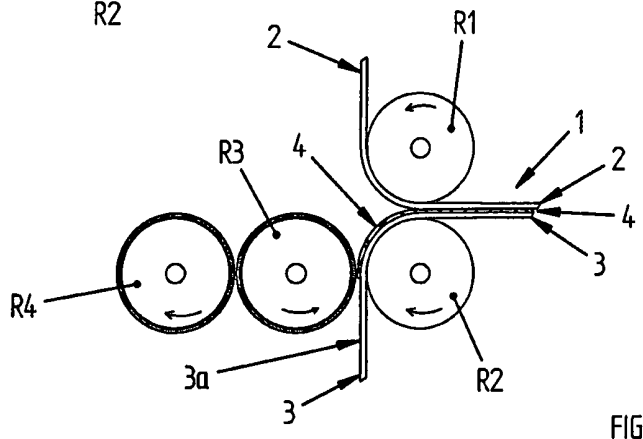
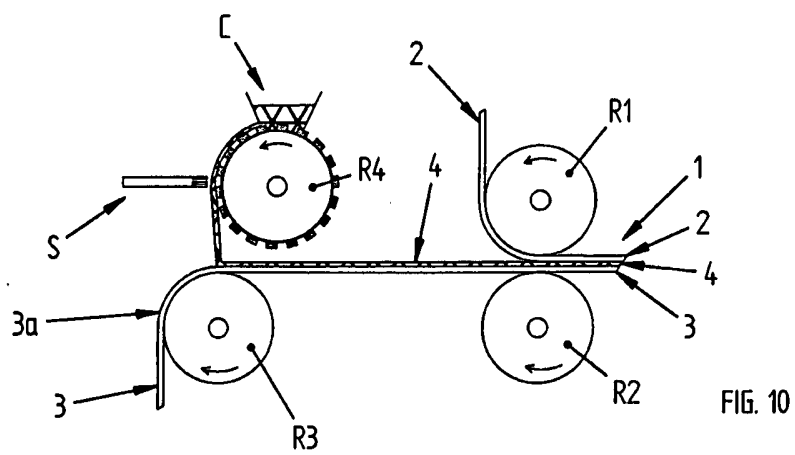
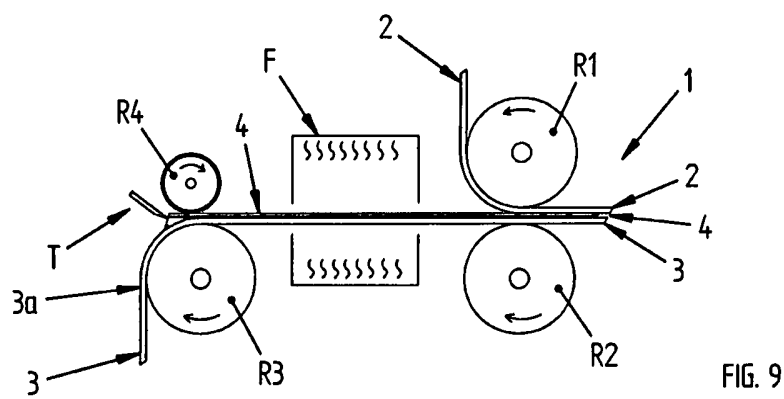
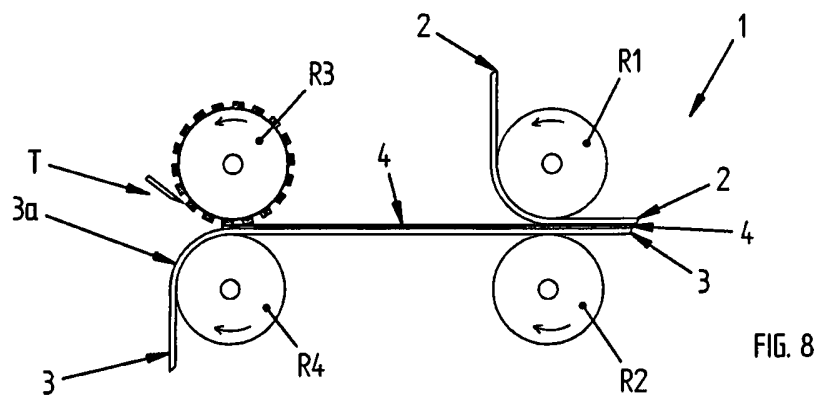


FIG. 7



INTERNATIONAL SEARCH REPORT

International application No PCT/IB2011/001509

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B32B7/12 B32B9/02 B32B27/06 C14B7/02
 ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 B32B C14B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 739 715 A2 (GIDUE S R L [IT]; GE MA TA SPA [IT]) 30 October 1996 (1996-10-30) column 1, lines 5-17,43-58; claim 1 column 5, lines 28-30	1-14
X	US 3 827 930 A (SUTTON R) 6 August 1974 (1974-08-06) column 1, lines 40-44; claims 1,2; examples column 2, lines 56-68 column 3, lines 15-34 column 3, line 56 - column 4, line 7 column 5, lines 12-33 column 7, lines 60-last	1-14
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

28 September 2011

Date of mailing of the international search report

10/10/2011

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Authorized officer
 Pamies Olle, Silvia

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2011/001509

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 1 581 307 A (FOAMADE INDUSTRIES) 12 September 1969 (1969-09-12) page 3, line 24 - page 4, line 25; figures page 5, lines 1-8 page 7, lines 18-19,36-39 page 8, lines 3,4 page 9, line 42 - page 10, line 10 -----	1-14
X	GB 1 329 786 A (BROWN M P) 12 September 1973 (1973-09-12) page 1, lines 35-45,73-75; claims 1,7,8,25 -----	1-14
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