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(54) **METHOD FOR MAKING A MULTILAYER LAMINAR PRODUCT AND SYSTEM THERETO**

VERFAHREN ZUR HERSTELLUNG EINES MEHRLAGIGEN LAMINAR-PRODUKTS UND SYSTEM ZU DESSEN HERSTELLUNG

PROCÉDÉ DE FABRICATION D'UN PRODUIT LAMINAIRE MULTICOUCHES ET SYSTÈME POUR SA FABRICATION

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(56) References cited:
EP-A1- 1 731 658
WO-A1-2006/100055
WO-A1-2015/110953
GB-A- 1 268 763
US-A- 3 542 617

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Description

[0001] The present invention concerns a method for making a multilayer laminar product, particularly suitable for upgrading leather.

[0002] The present invention concerns also a system for implementing said method. As is known, in the leather processing sector the so-called "upgrading" processes are employed, which make it possible to increase the commercial value of low-quality leather.

[0003] In fact, one of the first steps of a leather processing cycle consists in separating the outer, more valuable layer, which is referred to as "grain" in technical jargon, from a lower, less valuable layer, which in turn can be divided in further layers. Here below, the term "leather" means not only leather as a whole, but also and especially any of the layers obtained from it, in particular the less valuable ones.

[0004] Substantially, an upgrading process of the known type consists in covering the surface of the hide which is intended to be visible during use with a layer of plastic material, generally polyurethane. The above mentioned layer makes it possible to cover any defects which may be present on the leather surface and to obtain an appearance similar to that of more valuable leather.

[0005] An analogous process can be used also to give a synthetic or non synthetic fabric an appearance similar to that of leather, in which case the product is referred to as "imitation leather". Obviously, the description provided below applies completely also to the latter process.

[0006] Generally, during the upgrading process, the surface of the product is also embossed for the purpose of obtaining special aesthetic effects that contribute to increasing the value of the product.

[0007] A known technique for upgrading leather, described in the Italian patent application VI2005A000080 in the name of the applicant of the present invention, includes the step of covering a laminar support, for example a hide to be upgraded, with a layer of polyurethane resin.

[0008] Successively, embossed paper is pressed against the layer of polyurethane resin, which has not been completely polymerized yet and therefore retains a soft consistency, in order to impress the pattern of the embossed paper on said layer.

[0009] According to this technique, the polyurethane resin is successively polymerized, in such a way as to make it adhere to the laminar support in a stable manner.

[0010] Once the resin has been polymerized, the embossed paper is removed from the laminar support in order to obtain the final product. In order to facilitate the removal of the paper and prevent it from adhering to the polyurethane resin, the embossed paper is previously covered with a protective film, also in polyurethane, which prevents any direct contact between the polyurethane resin and the embossed paper. This film becomes an integral part of the polyurethane resin during the polymerization process previously described. The above mentioned known technique poses some recognized drawbacks.

[0011] A first drawback derives from the fact that embossed paper is available on the market in predefined widths which usually do not exceed 1600 mm. Consequently, the technique described above cannot be used for processing hides whose width exceeds 1600 mm.

[0012] This aspect is a limitation, considering that some hides are much wider than 1600 mm and sometimes their width reaches and even exceeds 3400 mm. In order to be able to use the technique described above with hides that are so wide, it is necessary to cut the latter along their longitudinal direction in such a way as to obtain strips which are narrower than the paper and which are processed one after the other.

[0013] It is clear that the operation of cutting hides just described above poses the drawback of reducing the field of application of the leather processed in this way.

[0014] For hides whose width exceeds 1600 mm only slightly, it is preferred to cut their side portions, but this causes the inconvenience of producing raw material rejects.

[0015] Said drawbacks related to the fact that the hides need to be cut become more serious as the value of the original leather increases.

[0016] The known technique described above poses a further drawback, represented by the fact that the embossed paper available on the market is not provided with the protective film, which therefore must be produced in the leather upgrading system. In the leather upgrading systems of the known type, the film is produced by applying a thin layer of polyurethane resin to the paper, for example by spreading it with a blade or a roller, by spraying it with a spray gun, etc. The resin is then solidified in an oven in order to obtain the film.

[0017] It can be understood that the operation described above poses the drawback of affecting the cost of the process and the overall dimensions of the system.

[0018] A further drawback posed by the known technique described above is related to the cost of embossed paper, which is increased due to the fact that the pulp and basic weight of the paper must be suited to bear the mechanical, chemical and thermal stress produced during the processing cycle. Obviously, the cost of the embossed paper affects the cost of the processing cycle.

[0019] In order to limit the costs related to the embossed paper, a device is provided downstream of the polymerization process, said device being suited to remove the portion of film left on the embossed paper, so that the latter can be reused. However, the presence of this device increases the overall dimensions and the costs of the system, as well as process costs.

[0020] A further drawback posed by the known technique described above derives from the fact that the embossed paper needs to be periodically replaced, which increases process costs even further.

[0021] Document US3542617 describes a method for making a multilayer laminar product, comprising essen-

tially the steps of covering a first side of a laminar support with a covering layer made of a non-completely polymerized polymeric resin, preparing a laminar element provided with a first side chemically incompatible with said polymeric resin, pushing an embossed surface (for example embossed paper) against said covering layer after interposing said laminar element in order to impress the pattern of said embossed surface on said covering layer, polymerizing said covering layer in order to obtain a stabilized covering layer, and finally separating said laminar element from said stabilized covering layer.

[0022] Document EP1731658 describes a process for producing a leather-like sheet, wherein a skin-like layer composed of a resin composition is formed on top of a fibrous substrate.

[0023] Document GB1268763 describes a method of finishing leather comprising i) forming a laminate which comprises consecutively leather, a film of a coating composition and a release sheet comprising a support coated with a silicone oil or polytetrafluorethylene, and ii) removing the release sheet.

[0024] It is the object of the present invention to overcome all the drawbacks mentioned above, which are typical of the known upgrading technique described above and of the respective systems.

[0025] In particular, it is the object of the present invention to provide a method for making a multilayer laminar product, in particular upgraded leather, which allows the processing of products whose width exceeds the widths allowed by the known technique described above.

[0026] It is also the object of the present invention to avoid the use of embossed paper.

[0027] The objects illustrated above are achieved by a method for making a multilayer laminar product, in particular upgraded leather, in accordance with claim 1. The said objects are also achieved by a system for manufacturing said multilayer laminar product, in accordance with claim 6.

[0028] Further details and characteristics of the invention are illustrated in the dependent claims.

[0029] Advantageously, the technique which is the subject of the invention makes it possible to process very wide hides with no need to cut them.

[0030] This, advantageously, makes it possible to obtain products intended for fields of application for which the products obtained by means of the known technique are not suitable.

[0031] Furthermore, advantageously, the possibility to process the hides with no need to cut them avoids the production of raw material rejects.

[0032] Therefore, it can be understood that the technique of the invention is particularly suitable for processing valuable hides in large sizes.

[0033] Still advantageously, the fact that no embossed paper is used makes it possible to reduce the costs related to the latter.

[0034] In particular, the absence of the operations and devices needed to apply the protective film to the paper and to remove it makes it possible to reduce the costs and overall dimensions of the system, as well as the processing costs. The objects and advantages described above, together with others that are described below, are highlighted in the following description of a preferred embodiment of the invention, which is provided by way of non-limiting example and which makes reference to the attached drawings, wherein:

- Figures 1(a)-1(f) schematically illustrate different steps of the method that is the subject of the invention when applied to a laminar support;
- Figure 2 shows a side view of the system of the invention;
- Figure 3 shows a detail of the system shown in Figure 2;
- Figure 4 shows a further detail of the system shown in Figure 2;
- Figure 5 shows a detail of a variant embodiment of the system shown in Figure 2.

[0035] The method of the invention for making a multilayer laminar product, particularly suitable for upgrading leather, includes the preparation of a laminar support, indicated by **16** in Figure 1. Preferably, the laminar support **16** is a hide, but the method of the invention can be applied also to other laminar supports, in particular fabrics, be they synthetic or non synthetic.

[0036] Preferably but not necessarily, the laminar support **16** is moved forward along a direction of advance **X,** at a predefined speed of advance, by a first feeding device **2,** visible in Figure 2. Preferably, said first feeding device **2** comprises a flexible element closed as a ring around a series of rollers, on which the laminar support **16** is rested and which is moved forward according to said direction of advance **X.**

[0037] As shown in Figure 1(a), a first side **16a** of the laminar support **16** is covered with a covering layer **17** made of a polymeric resin, preferably but not necessarily comprising polyurethane.

[0038] The covering layer in polymeric resin **17** is deposited on the laminar support **16,** preferably by spraying it or spreading it with a blade or a roller on the first side **16a** by means of an applicator unit **3.** The applicator unit **3** may comprise a series of spraying nozzles arranged in a circle, which are rotated around the axis of the circle in such a way that they intersect, in succession, the trajectory of the laminar support **16,** or are moved with an alternative motion and crosswise with respect to the trajectory of the laminar support **16.** As an alternative to or in combination with said spraying nozzles, the applicator unit **3** may comprise a doctor blade for spreading the polymeric resin on the first side **16a.**

[0039] The covering layer **17** obtained in this way is not completely polymerized, that is, is not polymerized or is partially polymerized, so that it has a yielding consistency, for example soft, allowing it to be embossed through the exertion of a pressure sufficiently slight as

not to affect the integrity of the underlying laminar support **16.**

[0040] Preferably, the thickness of the covering layer **17** is included between 7 microns and 30 microns and, even more preferably, it is substantially equal to 12 microns.

[0041] Preferably, and as shown in Figure 1(b), before being embossed the covering layer **17** is hardened, for example through a slight polymerization process, in such a way as to give it a more compact consistency, similar to that of a gel, and to obtain a hardened covering layer.

[0042] Preferably, the hardening step is performed by heating the covering layer with a heating device **26,** for example a bank of infrared lamps or a ventilated dryer heated with diathermic oil, vapour or gas.

[0043] Before the covering layer **17** is embossed, a laminar element **18,** indicated in Figure 1(c), is prepared, which is provided with a first side **18a** chemically incompatible with the polymeric resin of the covering layer **17.** The expression "chemically incompatible" is used in the present application to mean that said first side **18a,** when placed in contact with the polymeric resin, does not create chemical bonds with the latter, that is, does not adhere to it in an irreversible manner, so that the laminar element **18** can be easily separated from the covering layer **17** also after the latter has been polymerized, without damaging the covering layer itself.

[0044] Preferably, the laminar element **18** is provided in the shape of a strip **20** and is moved forward in the direction of advance **X,** at a speed corresponding to said speed of advance, by a second feeding device **7,** visible in particular in the detailed view of Figure 3. Preferably, the second feeding device **7** comprises a series of rollers and a spreading element that maintain the laminar element **18** tensioned and guide it according to a predefined trajectory, in such a way as to bring it in contact with the laminar support **16.**

[0045] An embossed surface **6,** arranged downstream of the applicator unit **3** according to the direction of advance **X,** is pushed against the covering layer **17** in a pushing unit **5** after interposing said laminar element **18,** as schematically shown in Figure 1(d). The laminar element **18** is guided by the second feeding device **7** in such a way that it is arranged between the covering layer **17** and the embossed surface **6,** with its first side **18a** facing towards the covering layer **17.**

[0046] During said pushing operation, the pattern of the embossed surface **6** is impressed on the covering layer **17.**

[0047] Preferably, said pushing action is performed by exerting a pressure included between 20 atm and 120 atm, even more preferably included between 40 atm and 70 atm. Advantageously, said pressure is sufficiently limited as not to alter the properties of the laminar support **16** substantially, in particular its softness, which is very important in the case where the laminar support is made of leather.

[0048] Preferably, and as shown once again in Figure 3, the embossed surface **6** belongs to an embossing roller **14,** mounted in such a way that it revolves around its own axis. Advantageously, said embossing roller **14** can be kept constantly resting on the laminar element **18** and on the laminar support **16,** thus allowing a continuous process to be carried out. It is also evident that, in variant embodiments of the invention not illustrated in the figures, the embossed surface **6** may belong to a device different from said embossing roller, for example a tape, a die or a similar device.

[0049] Preferably, the embossing roller **14** is made of steel and its surface is chromium-plated, which gives it high chemical resistance.

[0050] Still preferably, opposite the embossed surface **6** there is a supporting surface which, during the pushing action, supports the laminar support **16** on the side opposite the first side **16a.** Preferably, the supporting surface belongs to a corresponding supporting roller **15,** mounted in such a way that it revolves around its own axis.

[0051] Preferably, the embossing roller **14** and the supporting roller **15** are arranged at a mutual distance which is shorter than the overall thickness of the laminar support **16,** the covering layer **17** and the laminar element **18,** in such a way that said elements are compressed following their passage through the two rollers **14, 15.**

[0052] Still preferably, an adjusting device is provided, which is suited to modify said distance according to the thickness of the laminar support **16** used and to the pressure required for the pushing action.

[0053] According to a variant embodiment of the invention, the system **1** comprises a plurality of interchangeable embossed surfaces **6,** featuring different surface patterns. According to a possible embodiment intended to obtain the characteristic just described above, shown in Figure 5, a plurality of embossing rollers **14,** each one having a respective embossed surface **6,** are mounted on a revolving device **27** in such a way that they can be easily and quickly exchanged when necessary. It is evident that in variant embodiments the number of embossing rollers can be different from that shown in Figure 5.

[0054] Regarding the laminar element **18,** this must be sufficiently yielding to allow the pattern to be transferred from the embossed surface **6** to the covering layer **17.** The feature just mentioned above can be obtained by selecting a material that is resistant enough to allow the thickness of the laminar element **18** to be very limited, while at the same time having mechanical and thermal resistance compatible with the use required for said process.

[0055] It has been found that nylon, polyesther and other equivalent materials are particularly suited to be used to make the laminar element **18,** these material having a relatively low cost and appropriate mechanical and thermal resistance even with very limited thicknesses, for example included between 0.05 mm (50 microns) and 0.1 mm (100 microns). It is also evident that, in variant embodiments of the invention, the laminar element **18**

can be made of any other material, provided that it has the properties described above.

[0056] As shown in Figure 1(e), after the embossed surface **6** has been pushed or while it is being pushed against the laminar support **16,** a treatment unit **4** causes the polymerization of the covering layer **17,** in such a way as to obtain a stabilized covering layer **19,** that is, a substantially solidified covering layer. Preferably, polymerization takes place through heating, still preferably at a temperature included between 60 °C and 190 °C. Advantageously, the temperature values just indicated above are sufficiently low not to alter considerably the structure of the laminar supports **16** commonly used in the process, in particular hides, which therefore preserve their softness.

[0057] Still preferably, said heating step starts when the covering layer comes into contact with the embossed surface **6,** which is associated with a heating device that can comprise, for example, a hollow space in contact with the embossed surface **6** and a circulation device that conveys a heat carrier fluid into the hollow space.

[0058] Preferably, the polymerization process is completed in a polymerization oven **25** arranged downstream of the pushing unit **5** according to the direction of advance **X,** as shown in Figure 2.

[0059] After said polymerization process, the laminar element **18** is separated from the stabilized covering layer **19** as shown in Figure 1(f), so as to obtain the multilayer laminar product **22.**

[0060] The operation just described above is preferably carried out by a recovery unit **11** arranged downstream of the treatment unit **4** according to the direction of advance **X,** which comprises, preferably and as shown in Figure 4, two winding rollers **12, 13,** one per each strip **20,** around which the respective portions of laminar element **18** removed from the laminar support **16** are wound.

[0061] From the description provided above, it can be understood that the embossed surface **6** is distinct from the laminar element **18,** which therefore is not subjected to the width restrictions typical of the embossed paper available on the market.

[0062] In particular, given that the pattern to be embossed is impressed on the covering layer **17** by the embossed surface **6,** while the laminar element **18** serves only to avoid any contact between the embossed surface **6** and the polyurethane resin, it is very advantageous to use a laminar element **18** with a smooth surface. In fact, a smooth laminar element **18** can be selected among a wide range of materials available on the market, including smooth nylon. This makes it also possible to select the laminar element **18** in such a way as to minimize costs and/or maximize the quality of the multilayer product **22.**

[0063] The possibility to use a smooth, or substantially smooth, laminar element **18,** makes it possible to obtain it by placing side by side two or more identical strips **20** overlapping at the level of their respective edges, in such a way as to multiply the obtainable operating width. In the latter case, the reduced thickness of the laminar element **18** is such that the overlapping area of the two laminar elements does not generate visible effects on the final product. Therefore, it can be understood that the method of the invention achieves the object of allowing laminar supports in any width to be processed. Furthermore, the possibility to use a low cost material for the laminar element **18** brings about the further advantage of making the elimination of the laminar element **18** after use economically advantageous, since there is no need to recover it for a successive use. This makes it possible to size the laminar element **18** so that it needs to resist just one processing step and therefore makes it possible to minimize its thickness, thus further limiting its cost and increasing processing quality.

[0064] The fact that there is no need to reuse the laminar element **18** avoids also the need to clean the latter, thus limiting the cost and the overall dimensions of the system compared to the systems of the known type.

[0065] Preferably, and as mentioned above, the laminar element **18** belongs to a strip **20** which comprises also a film **21,** indicated for example in Figure 1(c), made with a substance which is chemically compatible with the polymeric resin, meaning suited to adhere to the latter in a stable manner. The film **21** is coupled with the first side **18a** of the laminar element **18,** in such a way that it can be detached from it without damaging the laminar element itself. The film **21** is maintained in contact with the covering layer **17** while the embossed surface **6** is being pushed and the covering layer itself is being polymerized. Obviously, if the laminar element **18** is constituted by several elements placed side by side as described above, each one of said elements belongs to a respective strip **20** and the corresponding films **21** are all kept in contact with the covering layer **17** during said pushing action.

[0066] The removal of the film **21** from the laminar element **18** can be guaranteed by respectively selecting for the laminar element **18** and for the film **21** two materials which are chemically incompatible with each other, such as, for example, nylon and a polyurethane resin. The first side of the laminar element **18** can be properly treated in such a way as to prevent the film **21** from spontaneously coming off the laminar element **18.** For a laminar element **18** made of nylon, the result just described above can be achieved, for example, by subjecting the first side **18a** to a corona treatment.

[0067] The strip **20** may comprise further layers in addition to said film **21,** which are suited to create special aesthetic effects on the final product. For example, there may be a coloured layer, a layer with spots, or different types of layers. Preferably, each strip **20** belongs to a respective reel **8, 9** which is unwound as the strip **20** is used in the process.

[0068] Said reels **8, 9** can be mounted on a fixed support, as in the case illustrated in Figure 3, or on a movable support, for example a revolving support, as in the variant embodiment illustrated in Figure 5. It is evident that in further variant embodiments the number of reels can be

different from that shown in the above mentioned figures.

[0069] In the case of more strips placed side by side, an aligning unit **10,** preferably comprising a series of rollers, provides for guiding the strips in such a way as to overlap their respective side edges and thus define the laminar element **18.** In practice, the laminar support **16** is laid on the flexible element of the first feeding device **2** at the level of a loading area **23** indicated in Figure 2.

[0070] The first feeding device **2** then moves the laminar support **16** forward according to the direction of advance **X**, and at a predefined speed of advance, towards the applicator unit **3,** where it is covered with the covering layer **17.** Preferably, the laminar support **16** covered as described above is heated by the heating device **26** in order to harden the covering layer **17.**

[0071] In the meantime, the strips **20** are unwound from the respective reels **8, 9** at the speed of advance and are conveyed by the aligning unit **10** between the embossing roller **14** and the supporting roller **15,** wherein the film **21** is brought into contact with the non-completely polymerized covering layer **17** while the embossed surface **6** impresses the pattern on the latter.

[0072] The contact angle between the laminar support **16** and the embossing roller **14** can vary according to the diameter of the embossing roller, to the production speed, to the thickness of the support to be applied and to the quantity of resin applied, in such a way as to harden the embossed surface of the covering layer **17.**

[0073] The contact with the surface of the embossing roller **14** makes it possible to exploit also this surface, properly heated, in order to start the polymerization of the covering layer **17.**

[0074] Preferably, the contact angle between the laminar support **16** and the embossing roller **14** can be adjusted according to the needs, by means of an apposite adjusting device which, for example, acts modifying the position of the supporting roller **15** according to the direction of advance **X.** The variation of the above mentioned contact angle leads to the variation of the contact time between the laminar support **16** and the embossing roller **14.**

[0075] According to a variant embodiment illustrated in Figure 5, said adjustment is carried out by means of a secondary roller **28** which is arranged immediately downstream of the supporting roller **15** and whose position with respect to the latter can be adjusted. A conveyor belt **29** is wound around the supporting roller **15** and the secondary roller **28** and the laminar support **16** transits said conveyor belt. By varying the position of the secondary roller **28** with respect to the supporting roller **15** it is possible to modify the contact angle between the conveyor belt **29** and the embossing roller **14.**

[0076] Preferably, the polymerization process is completed in the polymerization oven **25** which is arranged downstream of the pushing unit **5.**

[0077] Preferably, during the polymerization process the film **21** associated with the laminar element **18** adheres to the covering layer **17,** giving origin to a stabilized layer **19** formed by a single body, indicated in Figure 1(f). Downstream of the polymerization process, the winding rollers **12, 13** visible in the Figures 2 and 4 recover the laminar element **18,** detaching it from the covering layer **17** and from the portion of film **21** which adhered to it. Therefore, based on the description provided above, it can be understood that the method and the system described above achieve all of the set objects.

[0078] In particular, using an embossed surface distinct from the laminar element to impress the pattern on the covering layer makes it possible to avoid the use of the embossed paper available on the market, which represents a restriction for the maximum width of the laminar supports that can be processed. Consequently, it is possible to obtain a system capable of processing laminar supports whose width exceeds the width allowed by the known technique.

Claims

1. Method for making a multilayer laminar product (22), comprising the following operations:

- preparing a laminar support (16);
- covering a first side (16a) of said laminar support (16) with a covering layer (17) made of a non-completely polymerized polymeric resin;
- preparing a laminar element (18) provided with a first side (18a) chemically incompatible with said polymeric resin;
- pushing an embossed surface (6) against said covering layer (17) after interposing said laminar element (18) in order to impress the pattern of said embossed surface (6) on said covering layer (17), the laminar element (18) being arranged in such a way that said first side (18a) is facing towards said covering layer (17);
- once said pattern has been impressed, polymerizing said covering layer (17) in order to obtain a stabilized covering layer (19);
- separating said laminar element (18) from said stabilized covering layer (19);

characterized in that it comprises the following further operations:

- creating said laminar element (18) by placing side by side two or more identical strips (20) overlapping at the level of their respective edges, each one of said strips (20) comprising a film (21) made of a substance which is chemically compatible with said polymeric resin, coupled with said first side (18a) of said laminar element (18) in such a way that it can be detached from said first side (18a);
- keeping the corresponding films (21) of said two or more strips (20) in contact with said cov-

ering layer (17) while said embossed surface (6) is pushed against said covering layer (17) and during the polymerization of said covering layer (17).

2. Method according to claim 1, **characterized in that** each strip (20) is in the form of a reel (8, 9).

3. Method according to any of the preceding claims, **characterized in that** said embossed surface (6) belongs to an embossing roller (14).

4. Method according to any of the preceding claims, **characterized in that** it comprises an operation intended to harden said covering layer (17) before pushing said embossed surface (6) against said covering layer (17).

5. Method according to any of the preceding claims, **characterized in that** said laminar support (16) comprises a hide and/or a stretch of fabric.

6. System (1) for making a multilayer laminar product (22), comprising:

- a first feeding device (2) suited to move a laminar support (16) forward according to a direction of advance (X), at a predefined speed of advance;
- an applicator unit (3) suited to cover a first side (16a) of said laminar support (16) with a covering layer (17) made of a non- completely polymerized polymeric resin;
- a second feeding device (7) suited to move a laminar element (18) forward at a speed corresponding to said speed of advance;
- a treatment unit (4) arranged downstream of said applicator unit (3) according to said direction of advance (X), configured so as to polymerize said covering layer (17) of said laminar support (16);
- a pushing unit (5) comprising an embossed surface (6) arranged downstream of said applicator unit (3) and upstream of said treatment unit (4) according to said direction of advance (X), configured to push said embossed surface (6) against said covering layer (17) in such a way as to impress the pattern of said embossed surface (6) on said covering layer (17), said second feeding device (7) being configured to guide said laminar element (18) so as to arrange it between said covering layer (17) and said embossed surface (6);

characterized in that said second feeding device (7) comprises two or more reels (8, 9) from each one of which a strip (20) is unwound, an aligning unit (10) being provided, which is suited to overlap said strips (20) at the level of their respective side edges, in such a way as to define said laminar element (18).

7. System (1) according to claim 6, **characterized in that** it comprises a recovery unit (11) arranged downstream of said treatment unit (4) according to said direction of advance (X), configured to remove said laminar element (18) from said laminar support (16).

8. System (1) according to claim 7, **characterized in that** said recovery unit (11) comprises a winding roller (12, 13) around which said laminar element (18), recovered after its removal from said laminar support (16), is wound.

9. System (1) according to any of the claims from 6 to 8, **characterized in that** said embossed surface (6) belongs to an embossing roller (14).

10. System (1) according to claim 9, **characterized in that** said treatment unit (4) comprises a heating device operatively associated with said embossing roller (14).

Patentansprüche

1. Verfahren zur Herstellung eines mehrschichtigen laminaren Produkts (22), folgende Vorgänge umfassend:

- Vorbereitung eines laminaren Trägers (16);
- Bedeckung einer ersten Seite (16a) des besagten laminaren Trägers (16) mit einer aus einem nicht vollständig polymerisierten Polymerharz bestehenden Abdeckschicht (17);
- Vorbereitung eines laminaren Elements (18) mit einer ersten, mit dem besagten Polymerharz chemisch inkompatiblen Seite (18a);
- Andrücken einer geprägten Oberfläche (6) an die besagte Abdeckschicht (17) nach Zwischenlegen des besagten laminaren Elements (18), um das Muster der besagten geprägten Oberfläche (6) in die besagte Abdeckschicht (17) einzudrücken, wobei das laminare Element (18) derart angeordnet ist, dass die besagte erste Seite (18a) zu der besagten Abdeckschicht (17) gerichtet ist;
- nach dem Einprägen des besagten Musters, Polymerisierung der besagten Abdeckschicht (17), um eine stabilisierte Abdeckschicht (19) zu erhalten;
- Trennung des besagten laminaren Elements (18) von der besagten stabilisierten Abdeckschicht (19);

dadurch gekennzeichnet, dass es die folgenden, weiteren Vorgänge umfasst:

- Kreierung des besagten laminaren Elements (18) durch Aneinanderlegen zweier oder mehrerer identischer Streifen (20), die sich auf Ebene ihrer jeweiligen Ränder überlappen, wobei jeder der besagten Streifen (20) einen Film (21) umfasst, der aus einer chemisch mit dem besagten Polymerharz kompatiblen Substanz besteht, derart mit der besagten ersten Seite (18a) des besagten laminaren Elements (18) gekoppelt, dass er von der besagten ersten Seite (18a) abgelöst werden kann;
- Halten der entsprechenden Filme (21) der besagten zwei oder mehreren Streifen (20) in Kontakt mit der besagten Abdeckschicht (17), während die besagte geprägte Oberfläche (6) gegen die besagte Abdeckschicht (17) gedrückt wird, und während der Polymerisierung der besagten Abdeckschicht (17).

2. Verfahren nach Patentanspruch 1, **dadurch gekennzeichnet, dass** jeder Streifen (20) die Form einer Spule (8, 9) aufweist.

3. Verfahren nach einem jeden der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** die besagte geprägte Oberfläche (6) zu einer Prägewalze (14) gehört.

4. Verfahren nach einem jeden der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** es einen Vorgang zur Härtung der besagten Abdeckschicht (17) umfasst, bevor die besagte geprägte Oberfläche (6) an die besagte Abdeckschicht (17) angedrückt wird.

5. Verfahren nach einem jeden der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** der besagte laminare Träger (16) ein Leder und/oder ein Stück Gewebe umfasst.

6. System (1) zur Herstellung eines mehrschichtigen laminaren Produkts (22), Folgendes umfassend:

- eine erste Zuführvorrichtung (2), dazu geeignet, einen laminaren Träger (16) mit einer vorbestimmten Vorschubgeschwindigkeit in eine Vorschubrichtung (X) vorwärts zu bewegen;
- eine Auftragseinheit (3), dazu geeignet, eine erste Seite (16a) des besagten laminaren Trägers (16) mit einer aus einem nicht vollständig polymerisierten Polymerharz bestehenden Abdeckschicht (17) zu bedecken;
- eine zweite Zuführvorrichtung (7), dazu geeignet, ein laminares Element (18) mit einer der besagten Vorschubgeschwindigkeit entsprechenden Geschwindigkeit vorwärts zu bewegen;
- eine entsprechend der besagten Vorschubrichtung (X) der besagten Auftragseinheit (3) nachgelagerte Behandlungseinheit (4), die so konfiguriert ist, dass sie die besagte Abdeckschicht (17) des besagten laminaren Trägers (16) polymerisiert;
- eine Andrückeinheit (5), eine geprägte Oberfläche (6) umfassend, die entsprechend der besagten Vorschubrichtung (X) der besagten Auftragseinheit (3) nachgelagert und der besagten Behandlungseinheit (4) vorgelagert ist, dazu konfiguriert, die besagte geprägte Oberfläche (6) derart an die besagte Abdeckschicht (17) anzudrücken, dass das Muster der besagten geprägten Oberfläche (6) in die besagte Abdeckschicht (17) eingedrückt wird, wobei die besagte zweite Zuführvorrichtung (7) dazu konfiguriert ist, das besagte laminare Element (18) zu führen, um es zwischen der besagten Abdeckschicht (17) und der besagten geprägten Oberfläche (6) anzuordnen;

dadurch gekennzeichnet, dass die besagte zweite Zuführvorrichtung (7) zwei oder mehr Spulen (8, 9) umfasst, von denen jeweils ein Streifen (20) abgewickelt wird, wobei eine Ausrichteinheit (10) vorhanden ist, welche dazu geeignet ist, die besagten Streifen (20) auf der Ebene ihrer jeweiligen Seitenränder zu überlappen, so dass das besagte laminare Element (18) definiert wird.

7. System (1) nach Patentanspruch 6, **dadurch gekennzeichnet, dass** es eine der besagten Vorschubrichtung (X) entsprechend der besagten Behandlungseinheit (4) nachgelagerte Rückgewinnungseinheit (11) umfasst, die dazu konfiguriert ist, das besagte laminare Element (18) von dem besagten laminaren Träger (16) abzunehmen.

8. System (1) nach Patentanspruch 7, **dadurch gekennzeichnet, dass** die besagte Rückgewinnungseinheit (11) eine Aufwickelrolle (12, 13) umfasst, um welche das besagte laminare Element (18) nach seiner Entfernung von dem besagten laminaren Träger (16) aufgewickelt wird.

9. System (1) nach einem jeglichen der Patentansprüche von 6 bis 8, **dadurch gekennzeichnet, dass** die besagte geprägte Oberfläche (6) zu einer Prägewalze (14) gehört.

10. System (1) nach Patentanspruch 9, **dadurch gekennzeichnet, dass** die besagte Behandlungseinheit (4) eine Heizvorrichtung umfasst, die operativ mit der besagten Prägewalze (14) verbunden ist.

Revendications

1. Méthode pour la réalisation d'un produit laminaire multicouche (22), comprenant les opérations suivantes:

   - prédisposition d'un support laminaire (16);
   - couverture d'une première face (16a) dudit support laminaire (16) avec une couche de couverture (17) constitué d'une résine polymérique non complètement polymérisée;
   - prédisposition d'un élément laminaire (18) pourvu d'une première face (18a) chimiquement incompatible avec ladite résine polymérique;
   - poussée d'une surface gaufrée (6) contre ladite couche de couverture (17) après avoir interposé ledit élément laminaire (18) de manière à imprimer le motif de ladite surface gaufrée (6) sur ladite couche de couverture (17), l'élément laminaire (18) étant disposé de manière à ce que ladite première face (18a) soit tournée vers ladite couche de couverture (17);
   - après l'impression dudit motif, polymérisation de ladite couche de couverture (17) afin d'obtenir une couche de couverture stabilisée (19);
   - séparation dudit élément laminaire (18) de ladite couche de couverture stabilisée (19);

   caractérisée en ce qu'elle comprend les opérations supplémentaires suivantes:

   - obtenir ledit élément laminaire (18) en disposant deux ou plusieurs bandes identiques (20) l'une à côté de l'autre se superposant à niveau de leurs bords correspondants, chacune desdites bandes (20) comprenant une pellicule (21) réalisée en une substance qui est chimiquement compatible avec ladite résine polymérique, accouplée à ladite première face (18a) dudit élément laminaire (18) de manière à ce qu'elle puisse être détachée de ladite première face (18a);
   - maintenir les pellicules correspondantes (21) desdits deux ou plusieurs bandes (20) en contact avec ladite couche de couverture (17) alors que ladite surface gaufrée (6) est poussée contre ladite couche de couverture (17) et durant la polymérisation de ladite couche de couverture (17).

2. Méthode selon la revendication 1, **caractérisée en ce que** chaque bande (20) présente la forme d'une bobine (8, 9).

3. Méthode selon l'une quelconque des revendications précédentes, **caractérisée en ce que** ladite surface gaufrée (6) appartient à un rouleau de gaufrage (14).

4. Méthode selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'**elle comprend une opération destinée à durcir ladite couche de couverture (17) avant de pousser ladite surface gaufrée (6) contre ladite couche de couverture (17).

5. Méthode selon l'une quelconque des revendications précédentes, **caractérisée en ce que** ledit support laminaire (16) comprend une peau et/ou un morceau de tissu.

6. Système (1) pour la réalisation d'un produit laminaire multicouche (22), comprenant:

   - un premier dispositif d'alimentation (2) indiqué pour faire avancer un support laminaire (16) selon une direction d'avance (X) à une vitesse d'avance prédéfinie;
   - un groupe applicateur (3) apte à couvrir une première face (16a) dudit support laminaire (16) avec une couche de couverture (17) constituée d'une résine polymérique non complètement polymérisée;
   - un deuxième dispositif d'alimentation (7) indiqué pour faire avancer un élément laminaire (18) à une vitesse correspondant à ladite vitesse d'avance;
   - un groupe de traitement (4) disposé en aval dudit groupe applicateur (3) selon ladite direction d'avance (X), configuré pour causer la polymérisation de ladite couche de couverture (17) dudit support laminaire (16);
   - un groupe de poussée (5) comprenant une surface gaufrée (6) disposée en aval dudit groupe applicateur (3) et en amont dudit groupe de traitement (4) selon ladite direction d'avance (X), configuré pour pousser ladite surface gaufrée (6) contre ladite couche de couverture (17) de manière à imprimer le motif de ladite surface gaufrée (6) sur ladite couche de couverture (17), ledit deuxième dispositif d'alimentation (7) étant configuré pour guider ledit élément laminaire (18) de manière à le disposer entre ladite couche de couverture (17) et ladite surface gaufrée (6);

   caractérisé en ce que ledit deuxième dispositif d'alimentation (7) comprend deux ou plusieurs bobines (8, 9) de chacune desquelles une bande (20) est déroulée, étant présent un groupe d'alignement (10) qui est apte à superposer lesdites bandes (20) à niveau des bords latéraux correspondants, de manière à définir ledit élément laminaire (18).

7. Système (1) selon la revendication 6, **caractérisé en ce qu'**il comprend un groupe de récupération (11) disposé en aval dudit groupe de traitement (4) selon ladite direction d'avance (X), configuré pour enlever ledit élément laminaire (18) dudit support laminaire (16).

8. Système (1) selon la revendication 7, **caractérisé en ce que** ledit groupe de récupération (11) comprend un rouleau d'enroulement (12, 13) autour duquel est enroulé ledit élément laminaire (18) récupéré après son enlèvement dudit support laminaire (16).

9. Système (1) selon l'une quelconque des revendications de 6 à 8, **caractérisé en ce que** ladite surface gaufrée (6) appartient à un rouleau de gaufrage (14).

10. Système (1) selon la revendication 9, **caractérisé en ce que** ledit groupe de traitement (4) comprend un dispositif de chauffage associé de manière opérationnelle audit rouleau de gaufrage (14).

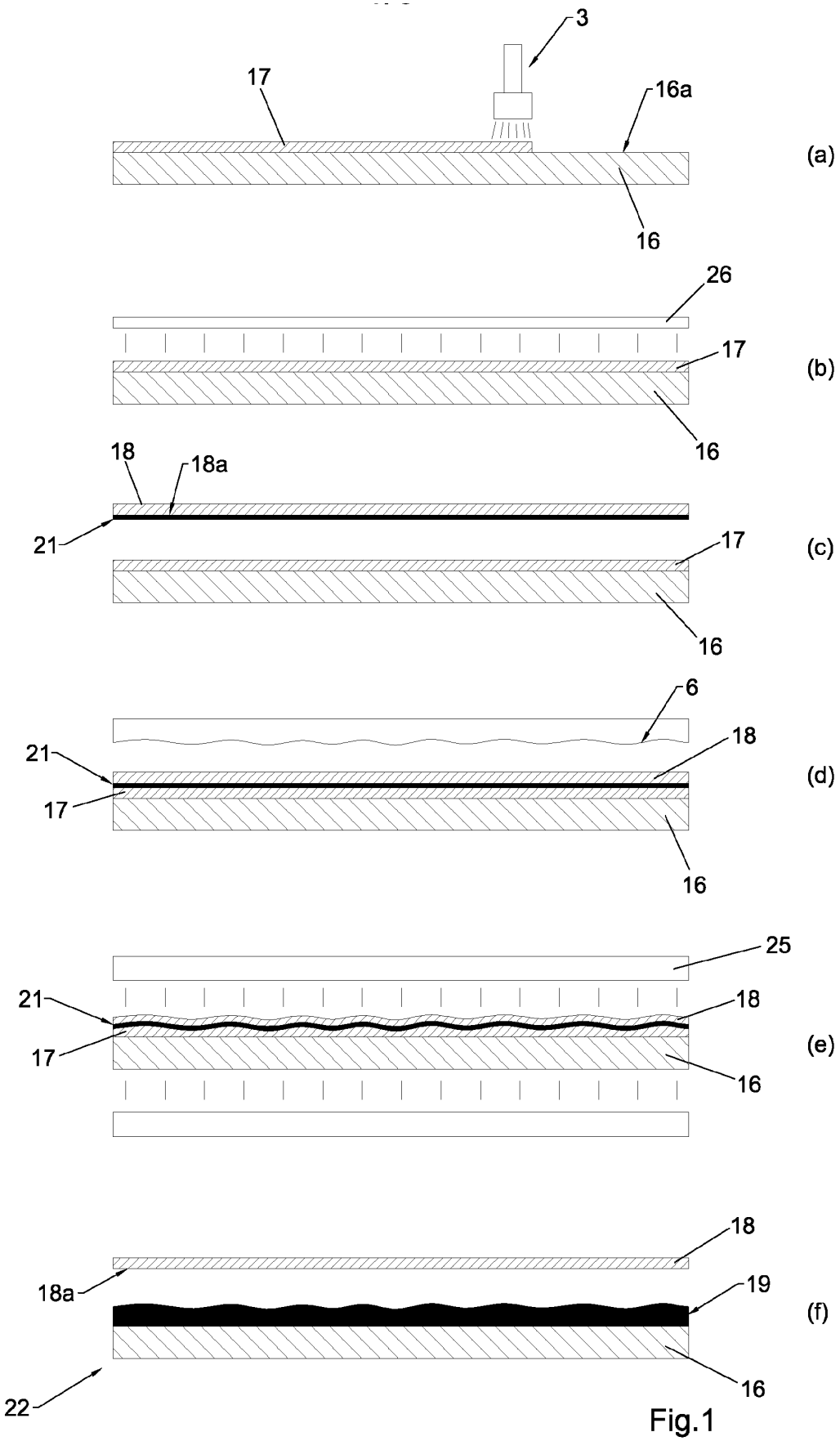
3
17
16a
(a)
16
26
17
(b)
16
18
18a
21
17
(c)
16
6
18
21
17
(d)
16
25
21
18
17
(e)
16
18
18a
19
(f)
16
22

Fig.1

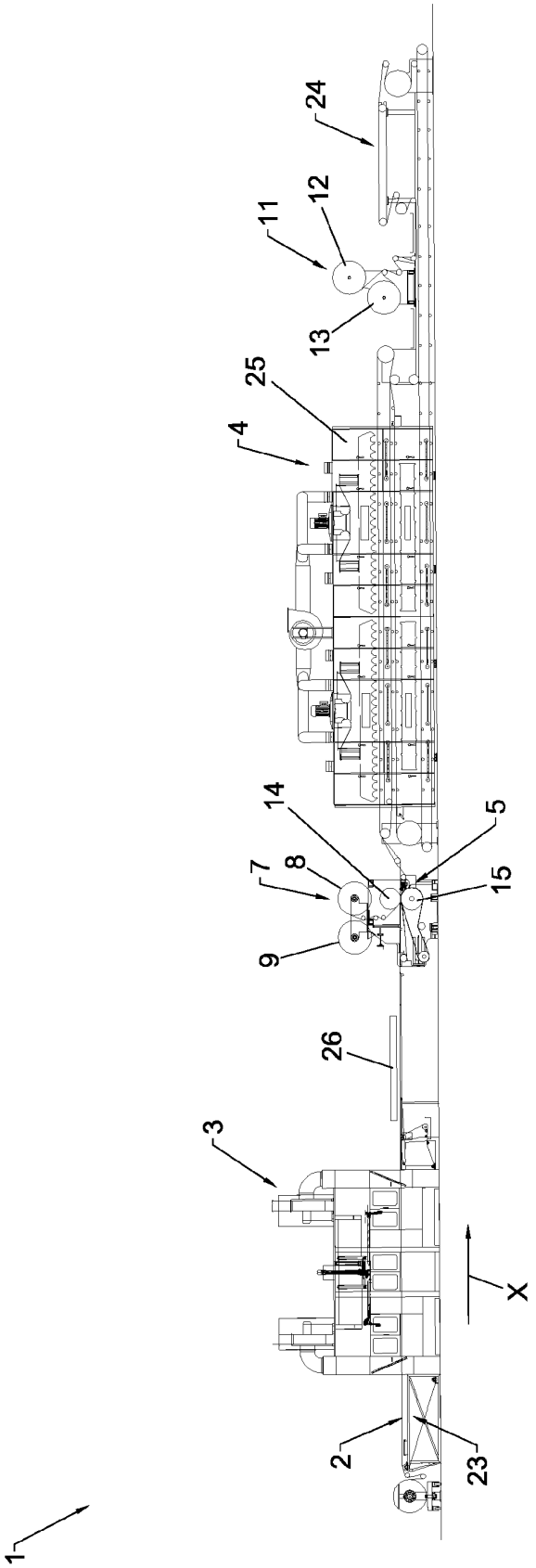

Fig.2

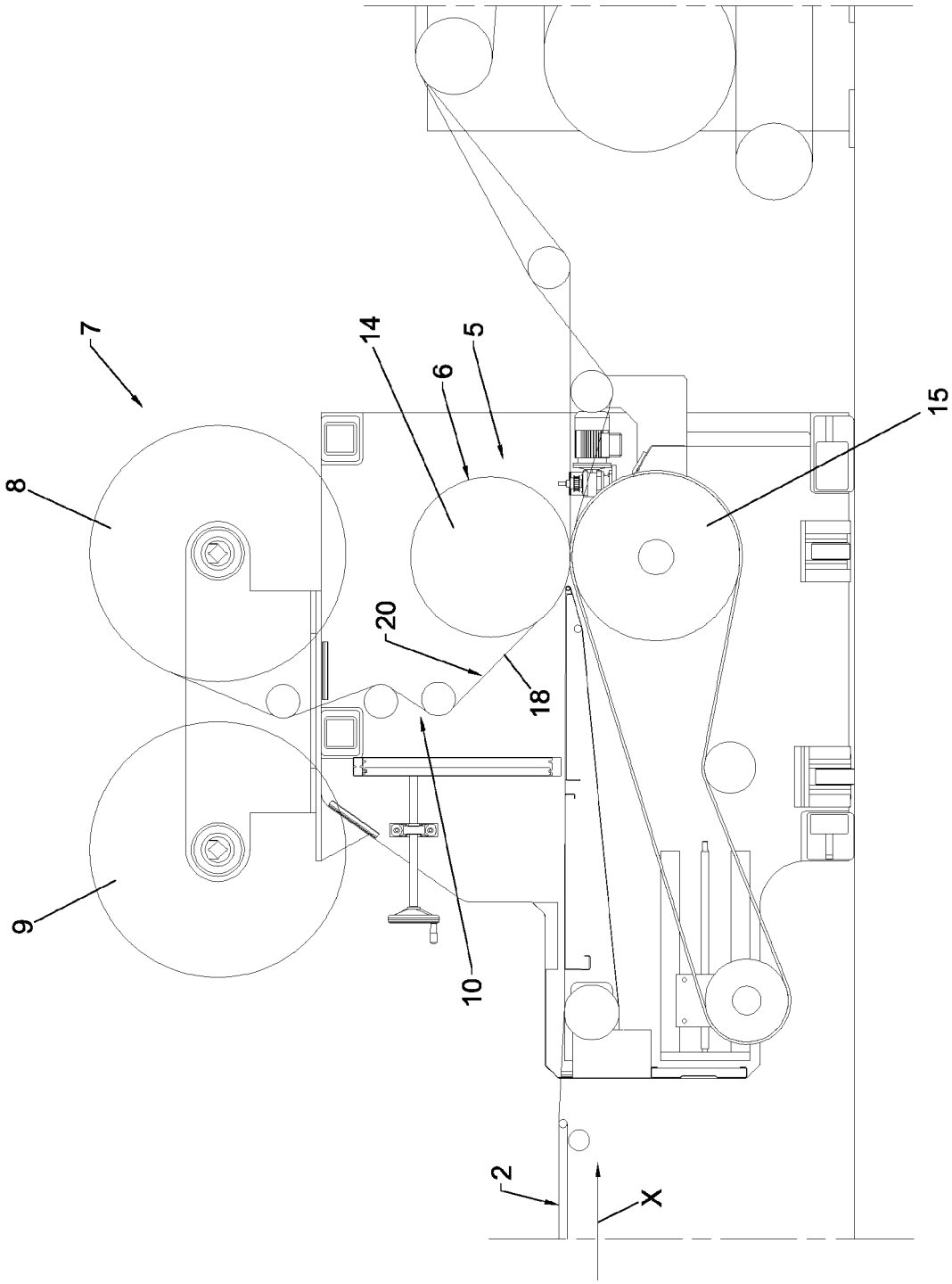

Fig.3

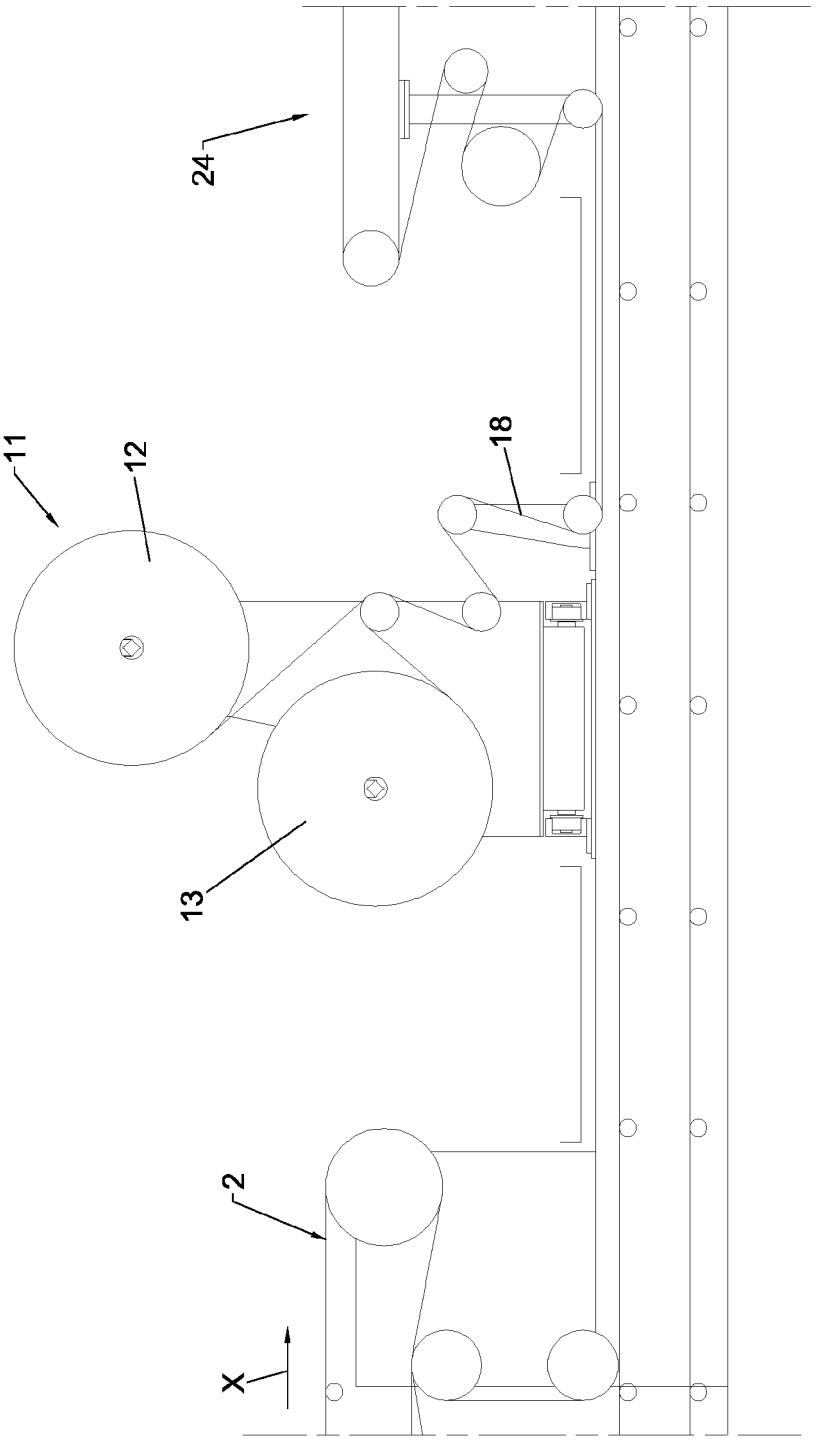

Fig.4

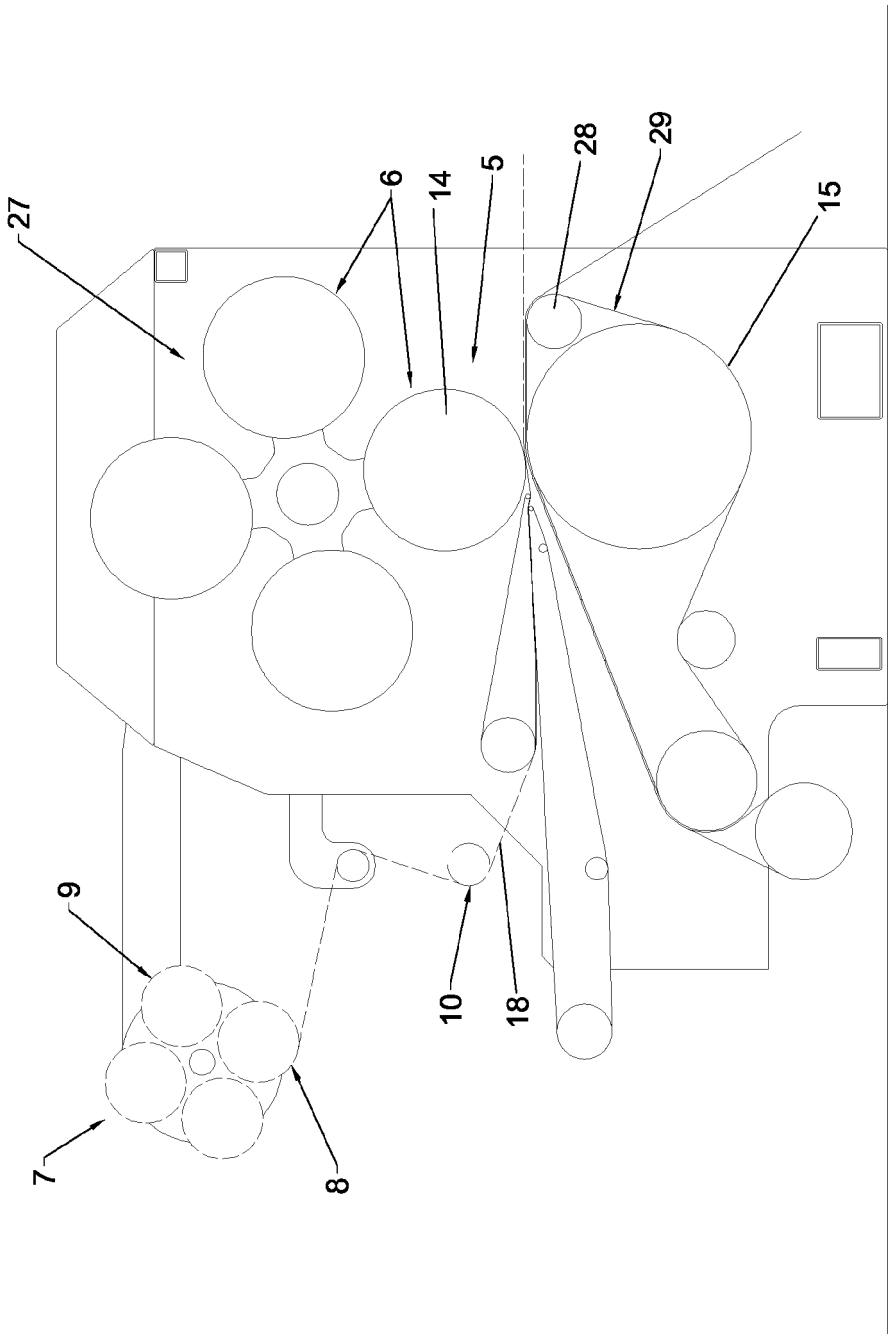

Fig.5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT VI20050080 A **[0007]**
- US 3542617 A **[0021]**
- EP 1731658 A **[0022]**
- GB 1268763 A **[0023]**