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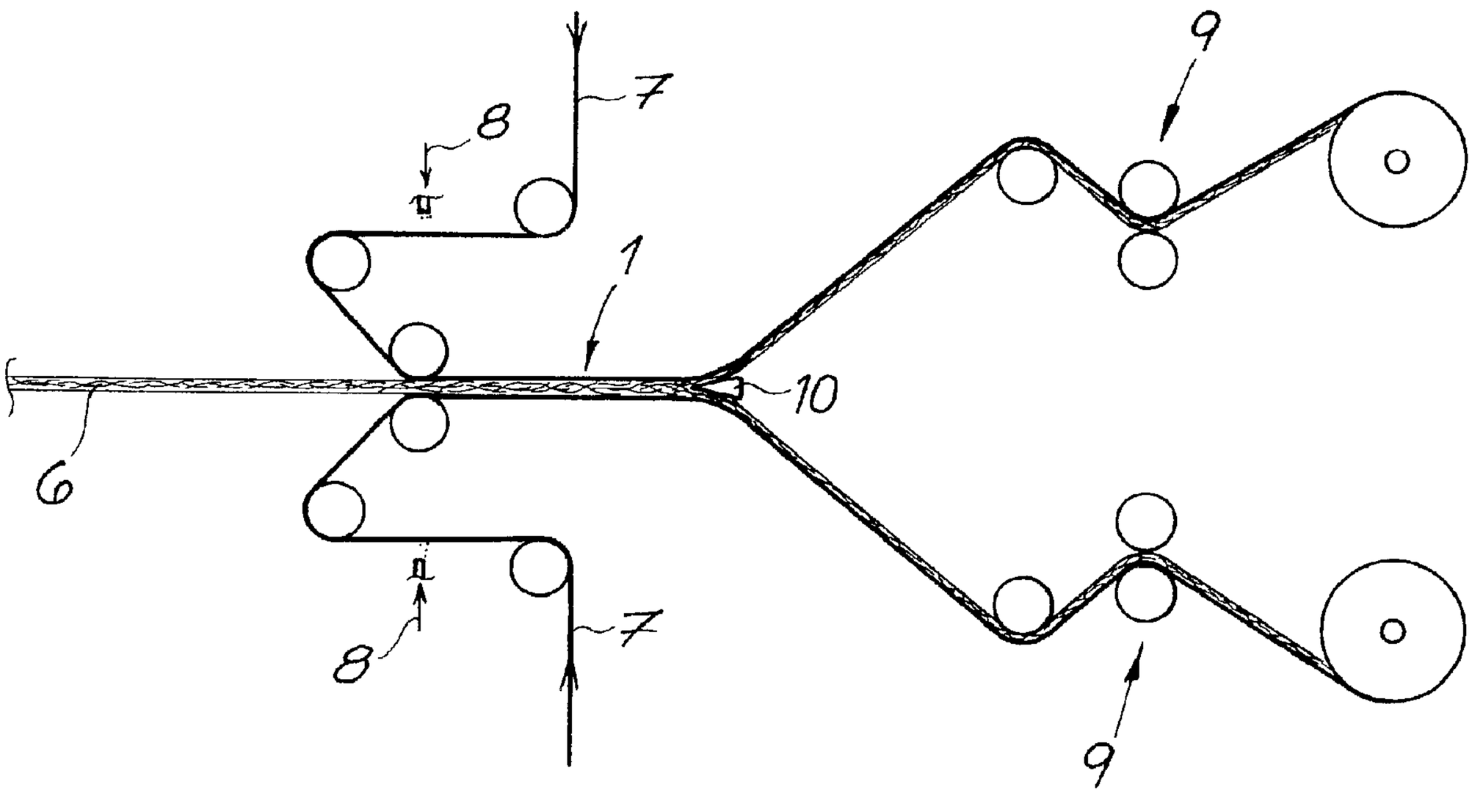
(54) Titre : METHODE DE PRODUCTION D'UN MATERIAU COMPOSITE ELASTIQUE PRESENTANT UNE SURFACE TEXTILE

(54) Title: METHOD FOR THE PRODUCTION OF AN ELASTIC COMPOSITE MATERIAL WITH A TEXTILE SURFACE



(57) Abrégé/Abstract:
The invention relates to a method for the production of an elastic composite material with a textile surface. First, a laminate (1) is produced, which has elastic cover layers (2, 2) and a core (3) composed of a nonwoven fabric. Subsequently, the laminate (1) is separated into two strips (4, 4'), each of which has a cover layer (2, 2') and an adhering layer (5) of nonwoven fabric, by tearing open the core (3).

Abstract:

The invention relates to a method for the production of an elastic composite material with a textile surface. First, a laminate (1) is produced, which has elastic cover layers (2, 2') and a core (3) composed of a nonwoven fabric. Subsequently, the laminate (1) is separated into two strips (4, 4'), each of which has a cover layer (2, 2') and an adhering layer (5) of nonwoven fabric, by tearing open the core (3). – Fig. 3.

Method for the production of an elastic composite material with a textile surface

Specification:

The invention relates to a method for the production of an elastic composite material with a textile surface.

Elastic composite materials with a textile surface are used, among other things, for the production of baby diapers, for example as tapes or as an elastic back-sheet, incontinence articles, feminine hygiene products, and the like. In these applications, the textile surface, which must be produced in cost-advantageous manner, has great importance. In this connection, the textile surface is not allowed to impair the elasticity of the film.

Composite materials composed of an elastic carrier film and a nonwoven fabric that is laminated on are known. The fabric forms a solid structure that decisively influences the stretching behavior of the composite material. Composite materials composed of an elastic carrier film and a nonwoven fabric that is laminated on must therefore be mechanically activated, by means of mechanical stretching, after the lamination process.

A method for the production of an elastic composite material with a textile surface is known from EP 2 177 654 A1, in which a layer of melt-blown nonwoven is produced and glued onto an elastic film without any prior consolidation. In this method, the nonwoven layer is not rolled up and unrolled, and no guidance of the nonwoven layer under tensile stress is provided. The nonwoven layer can therefore be formed with little strength and, in particular, with a low weight per surface area unit, and does not greatly hinder elastic stretching of the composite material. For this reason, the composite material does not require any subsequent mechanical activation. However, the bond strength between the fibers of the textile layer and the elastic film is not yet satisfactory. Since the work is conducted with loose fibers, to a great extent, it is not ensured that all the fibers are sufficiently anchored in the adhesive matrix. Fibers can unintentionally come loose from the composite and be taken in by the user.

Against this technological background, the invention is based on the task of indicating a method for the production of a composite material with a textile surface, which material is characterized by great stretching capacity, and the textile surface of which material

does not contain any loose fibers that come loose from the composite during use of the composite material.

The object of the invention and the solution for this task is a method according to claim 1. In the method according to the invention, first a laminate is produced, which has elastic cover layers and a core composed of a nonwoven fabric. The laminate is subsequently separated into two strips, each of which has a cover layer and an adhering layer of nonwoven fabric, by tearing open the core. The method has the advantage that the fibers of the textile surface are bound in the nonwoven fabric, and that when the core, which consists of a nonwoven fabric, is torn open, no free fibers that can easily come loose from the composite are formed. A nonwoven fabric that is slightly consolidated can be used. The degree of consolidation can be adjusted, for example when using calander consolidation, so that the composite material can be elastically stretched without subsequent mechanical activation, and so that the stretching properties are determined by the elasticity of the cover layer.

In order to separate the laminate, the strips are preferably grasped separately and pulled apart by applying tensile forces. The strips can be guided over driven rollers and wound up separately. It lies within the scope of the invention that the separation process is connected with mechanical activation of the elastic cover layer of the strips, specifically by means of stretching of the elastic cover layers during the pulling-off process. During pulling off and winding up of the strips, the strips can be stretched in the transverse direction and/or the longitudinal direction, by means of with suitable devices. In particular, the strips can also be passed over profiled rollers in which over-stretching of the strips transverse to the take-off direction takes place. In this way, the stretching properties of the composite material can be influenced and further improved.

Tearing open the nonwoven fabric can be supported by means of a blade disposed in the separation plane.

The laminate with elastic cover layers and a core composed of nonwoven fabric can be produced in different ways. Preferably, the nonwoven fabric is laminated in between two elastic film webs. However, extrusion lamination, in which the elastic layers are applied to the nonwoven fabric by means of extrusion, is fundamentally also possible.

The elastic cover layers preferably have a layer thickness between 20 µm and 100 µm, and can consist of a styrene block copolymer or a thermoplastic polyolefin elastomer. In addition to mono-films, multi-layer co-extruded films can also be used for the cover layers. In particular, perforated or breathable elastic films can also be used for the cover layers. When using a breathable elastic film, this important property is maintained in the composite material. In place of an elastic film, fundamentally an elastic nonwoven fabric that has sufficient tensile strength can also be used.

The nonwoven fabric and the elastic film webs or elastic cover layers are preferably glued to one another, whereby polyurethane adhesive and hot-melt adhesives are particularly suitable. The adhesive can be applied over the entire area or in patterns, for example in dots. Full-area application of adhesive is preferred, whereby an adhesive application with an application amount between 1 g/m^2 and 2.5 g/m^2 is sufficient when using a solvent-free one-component polyurethane adhesive (1-K-PUR). When using a hot-melt adhesive, a higher application weight of 3 g/m^2 to 5 g/m^2 will generally be necessary.

The nonwoven fabric that forms the core of the laminate and is torn open in the course of the production process preferably consists of a melt-blown nonwoven. The fibers of a melt-blown nonwoven are produced by means of extrusion, and usually exit from multiple holes of an extrusion nozzle disposed next to one another. Immediately after leaving the extrusion nozzle, the viscous polymer strands that exit from the holes are impacted with compressed air and stretched. Melt-blown fibers are characterized in that they are very thin and guarantee good homogeneous coverage of the elastic cover layers even at a low weight per surface area unit, and distinguish themselves by their particularly soft appearance. The nonwoven preferably consists of polyolefin fibers, particularly polypropylene fibers. The melt-blown nonwoven is only slightly consolidated for the method according to the invention, and can be used at a weight per surface area unit of 5 g/m^2 to 20 g/m^2. The degree of consolidation, for example by means of calander consolidation, is guided by the desired stretching properties of the composite material.

A multi-layer nonwoven fabric with an SMS layer structure (spun-melt-spun) can also be used as a nonwoven fabric; this has outer layers composed of a spun-bonded nonwoven fabric (S) and a center nonwoven layer composed of melt-blown fibers (M). The combination of layers composed of a spun-bonded nonwoven fabric and a melt-

blown nonwoven imparts greater strength in the machine direction (MD direction) to the nonwoven fabric. When the pre-finished laminate is torn open, separation of the nonwoven fabric within the core layer, which consists of a melt-blown nonwoven, takes place. It was found that the material thickness and the weight per surface area unit of the strips separated by tearing open the laminate remains constant, within close tolerances, if the parting plane runs through a core layer composed of a melt-blown nonwoven. High-quality composite material strips are obtained, particularly strips with a very high-quality textile surface.

Other nonwoven fabrics can also be used for the method according to the invention. However, the quality of the textile surface is poorer, for example if a carded nonwoven is used as the core layer of the laminate.

A composite material produced according to the method according to the invention is suitable for hygiene articles, for example for sections or closure elements on baby diapers and incontinence articles. Furthermore, so-called soft-touch films for applications outside of the hygiene sector can also be produced according to the method according to the invention.

In the following, the invention will be explained using a drawing that represents an embodiment merely as an example. The figures schematically show:

Fig. 1 a method for the production of an elastic composite material with a textile surface,

Fig. 2 a section through a laminate that is produced as a pre-product, in the method shown in Fig. 1,

Fig. 3 separation of the pre-product shown in Fig. 2, in a representation that is enlarged as compared with Fig. 1.

The method shown in Fig. 1 serves for the production of an elastic composite material with a textile surface, which can be used, for example, as a soft-touch film or as an elastic element on baby diapers, incontinence articles, and the like. In the method, in a first step, a laminate 1 is produced as a pre-product; this laminate has elastic cover layers 2, 2' and a core 3 composed of a nonwoven fabric. Fig. 2 shows the layer

structure of the pre-product. Subsequently, the laminate 1 is separated into two strips 4, 4' by tearing open the core 3; these strips each have a cover layer 2, 2' and an adhering layer composed of nonwoven fabric 5. The strips 4, 4' each form a method product that can be used as an elastic composite material, without any subsequent mechanical activation.

The core 3 consists of a melt-blown nonwoven or has a multi-layer structure with outer layers composed of a spun-bonded nonwoven fabric and a center nonwoven layer composed of melt-blown fibers. A nonwoven fabric web 6 that forms the core 3 is laminated in between two elastic film webs 7, and glued to the film webs 7. The adhesive 8 is preferably applied, over the full area, to the surface of the film web 7 that lies adjacent to the nonwoven fabric. Polyurethane adhesives or hot-melt adhesives can be used as the adhesive 8.

The laminate 1 is separated by tearing open the core 3 to form two strips 4, 4'. The strips 4, 4' are grasped separately and pulled apart by applying tensile forces. According to the representation in Fig. 1, the strips 4, 4' are passed over driven rollers of a take-off device 9 and wound up separately. Optionally, the take-off device 9 can be combined with a stretching device in which the strips 4, 4' are stretched in the transverse direction and thereby mechanically activated.

Tearing open the core 3 can be supported by means of a blade 10 disposed in the parting plane.

When comparing Fig. 2 and 3, it can be seen that elastic composite materials, namely the strips 4, 4', are produced according to the method according to the invention; these strips have an elastic carrier as well as a textile surface. The elastic carrier is formed by a cover layer 2, 2' of the laminate 1, and gives the composite material its mechanical properties. The textile structure is dependent on the nonwoven fabric used in the core 3 of the laminate 1. Preferably, separation takes place through a nonwoven layer composed of a melt-blown nonwoven, the fibers of which are thin and form a high-quality textile surface during separation. A slightly consolidated nonwoven is processed for the production of the laminate 1 that forms the pre-product. No free fibers that can come loose when the composite material is used are formed as the result of the separation of the nonwoven layer in the subsequent step. When the nonwoven fabric core 3 is separated, strips 4, 4' are formed, which have constant values with regard to

the material thickness and their weight per surface area unit, within close tolerance limits.

Claims:

1. Method for the production of an elastic composite material with a textile surface,

wherein a laminate (1) is produced, which has elastic cover layers (2, 2') and a core (3) composed of a nonwoven fabric, and

wherein the laminate (1) is subsequently separated into two strips (4, 4'), each of which has a cover layer (2, 2') and an adhering layer (5) of nonwoven fabric, by tearing open the core (3).

2. Method according to claim 1, characterized in that the strips (4, 4') are grasped separately and pulled apart by applying tensile forces.

3. Method according to claim 1 or 2, characterized in that the strips (4, 4') are passed over driven rollers and wound up separately.

4. Method according to one of claims 1 to 3, characterized in that tearing open the core (3) is supported by means of a blade (10) disposed in the parting plane.

5. Method according to one of claims 1 to 4, characterized in that a nonwoven fabric web (6) nonwoven fabric that forms the core (3) is laminated in between two elastic film webs (7).

6. Method according to claim 5, characterized in that the nonwoven fabric web (6) and the elastic film webs (7) are glued together.

7. Method according to one of claims 1 to 6, characterized in that the core (3) of the laminate (1) consists of a melt-blown nonwoven.

8. Method according to one of claims 1 to 6, characterized in that a multi-layer nonwoven fabric with an SMS layer structure is used for the core (3) of the laminate (1), which fabric has outer layers composed of a spun-bonded nonwoven fabric (S) and a center nonwoven layer composed of melt-blown fibers (M).

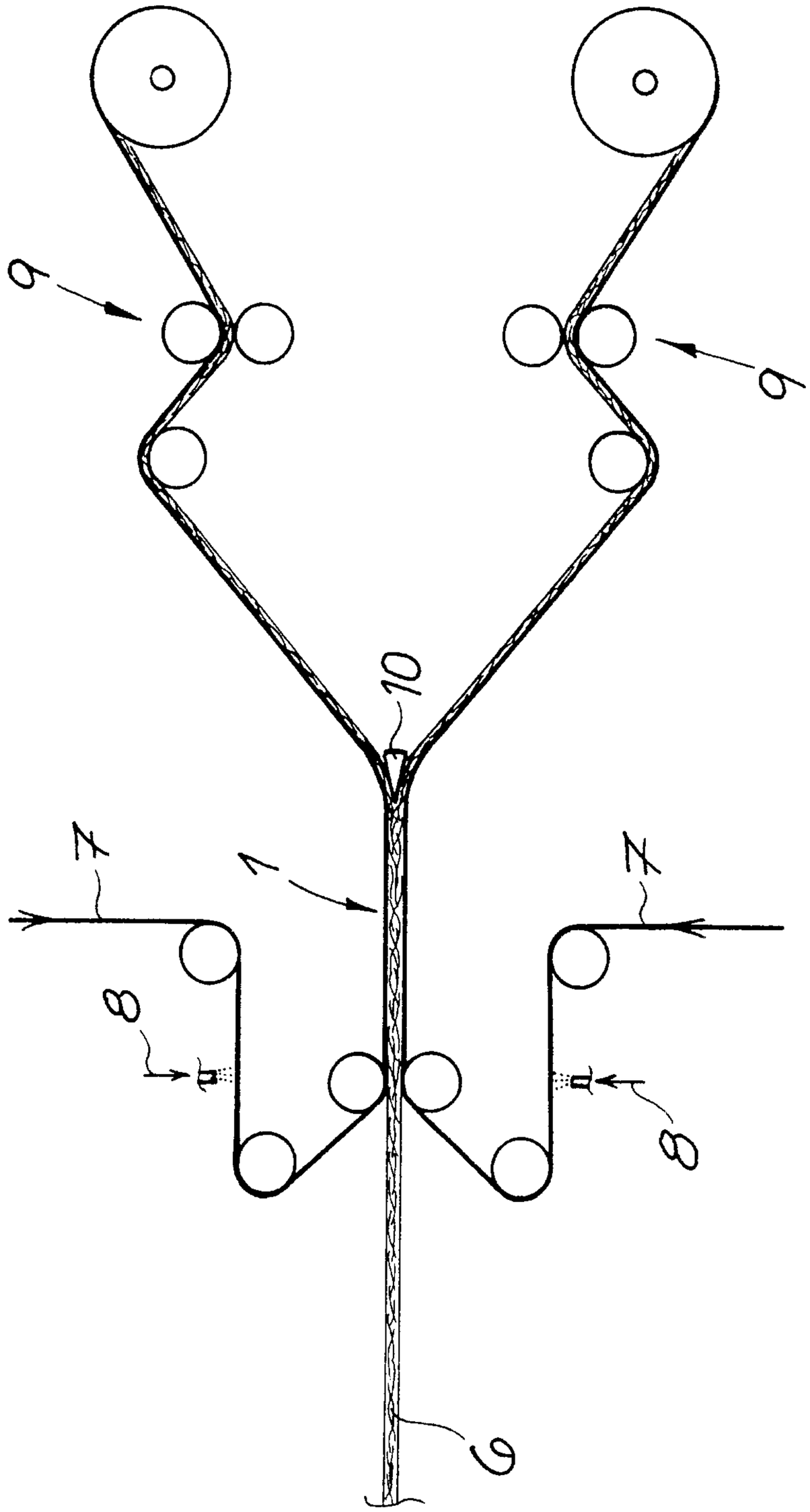


Fig.1

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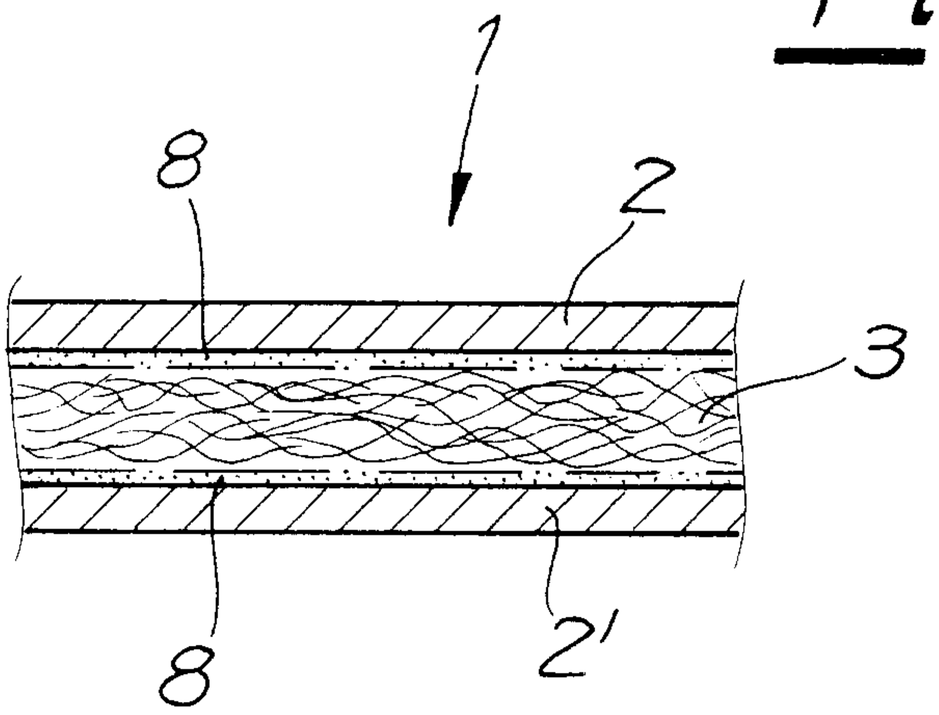
Fig.2



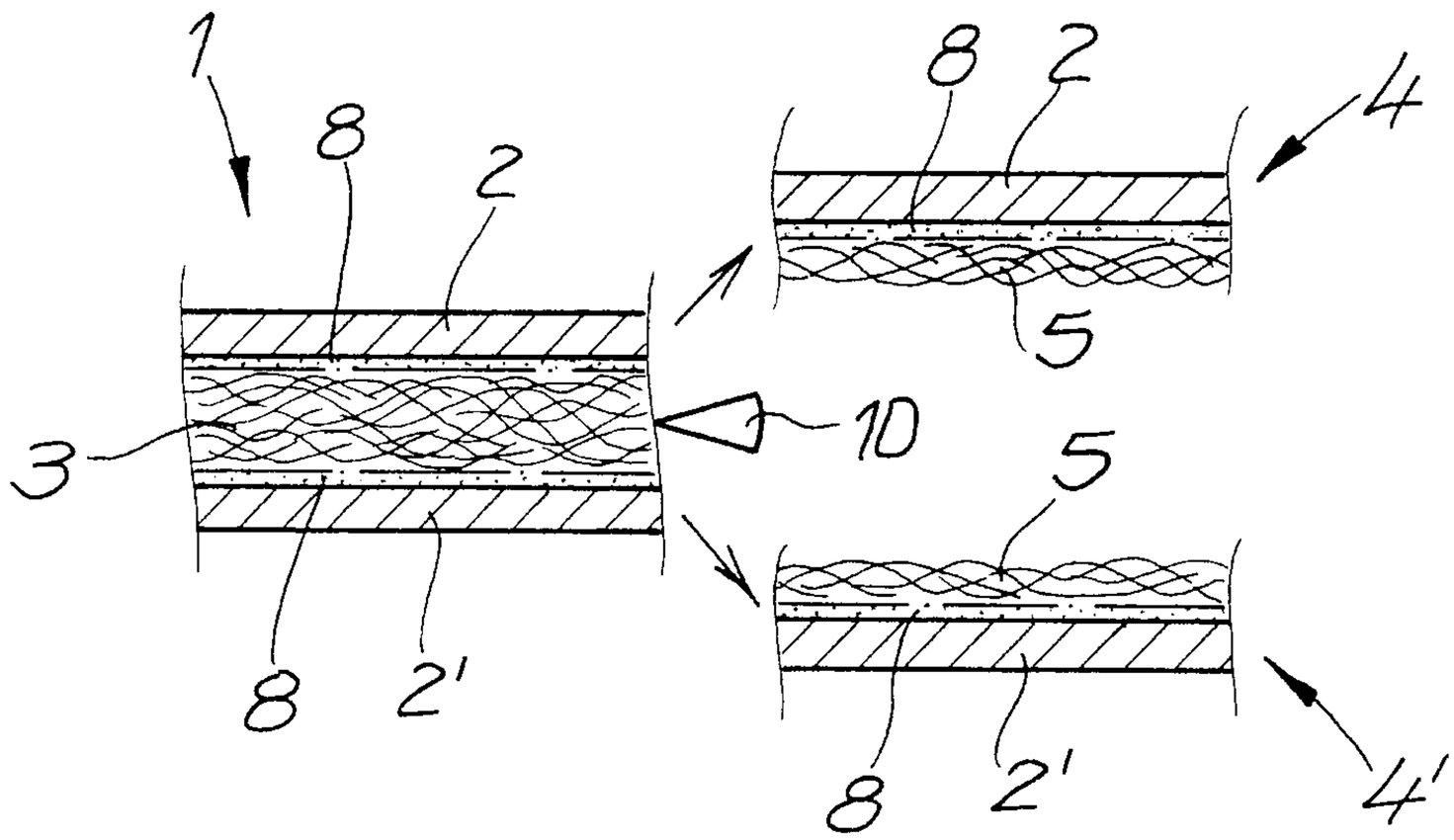
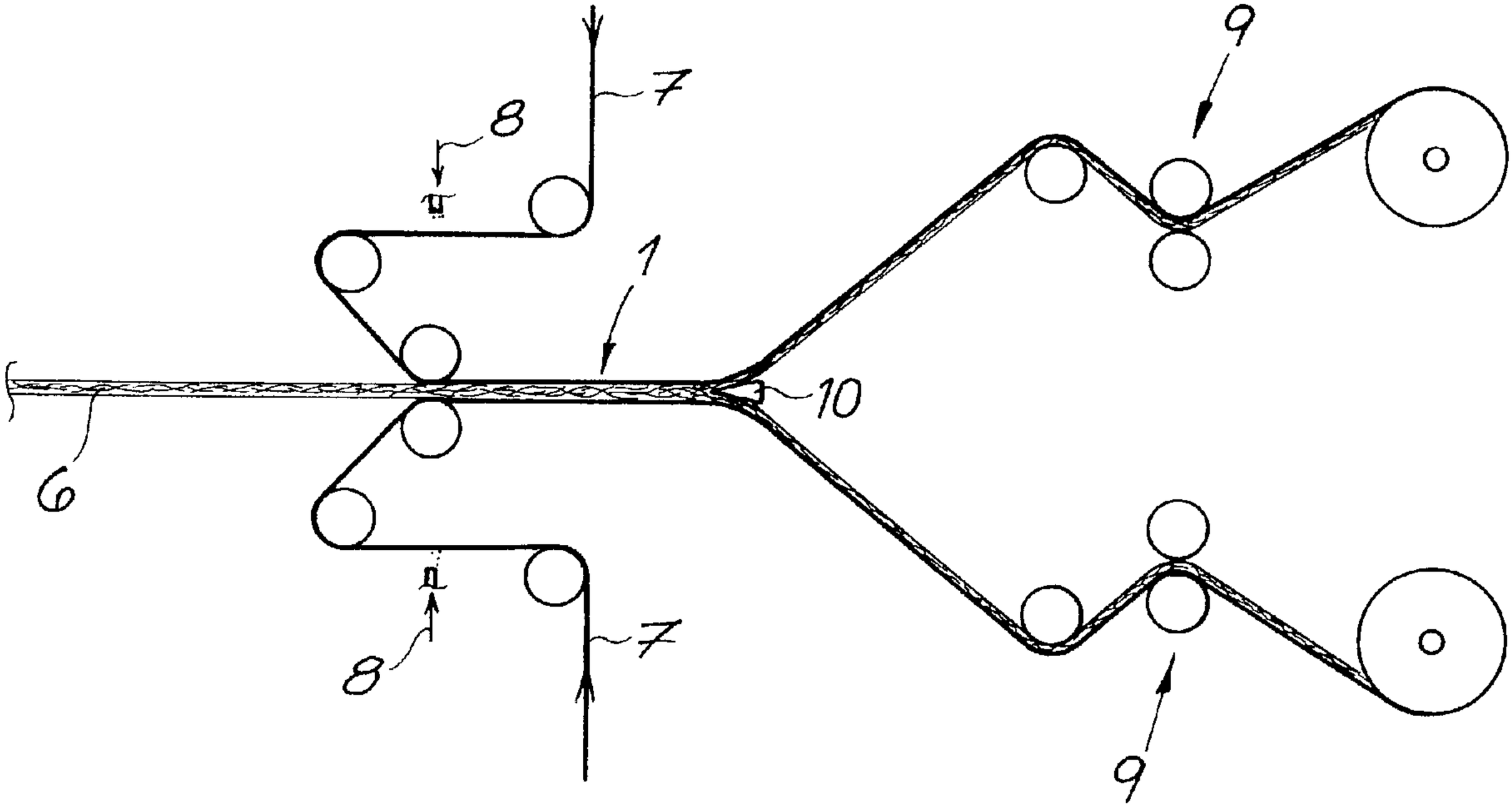


Fig.3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