



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 632 349 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.03.2006 Bulletin 2006/10

(51) Int Cl.:
B41F 16/02 (2006.01) B65H 35/02 (2006.01)

(21) Application number: **05107641.2**

(22) Date of filing: **19.08.2005**

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

(30) Priority: **03.09.2004 ES 200402148**

(71) Applicant: **Pardo Martinez, Angel**
08970 Sant Joan Despi (ES)

(72) Inventor: **Pardo Martinez, Angel**
08970 Sant Joan Despi (ES)

(74) Representative: **Ponti Sales, Adelaida et al**
Oficina Ponti
C. Consell de Cent, 322
08007 Barcelona (ES)

(54) **Method for printing strips of fabric and feed device of a machine for implementing said method**

(57) The method includes the stages of: a) printing images onto transfer paper, b) cutting said paper into strips (1a), in accordance with the images that must be included on each one of the strips, c) continuous transferring by ink sublimation of said images from the strips

of paper (1a) onto respective strips of fabric (2a). Also disclosed is a feed device (4) of the transfer machine (3) of the method. It permits easy tailoring of fabric for trimmings and/or decoration, with motifs completely parallel to the fabric cutting line.

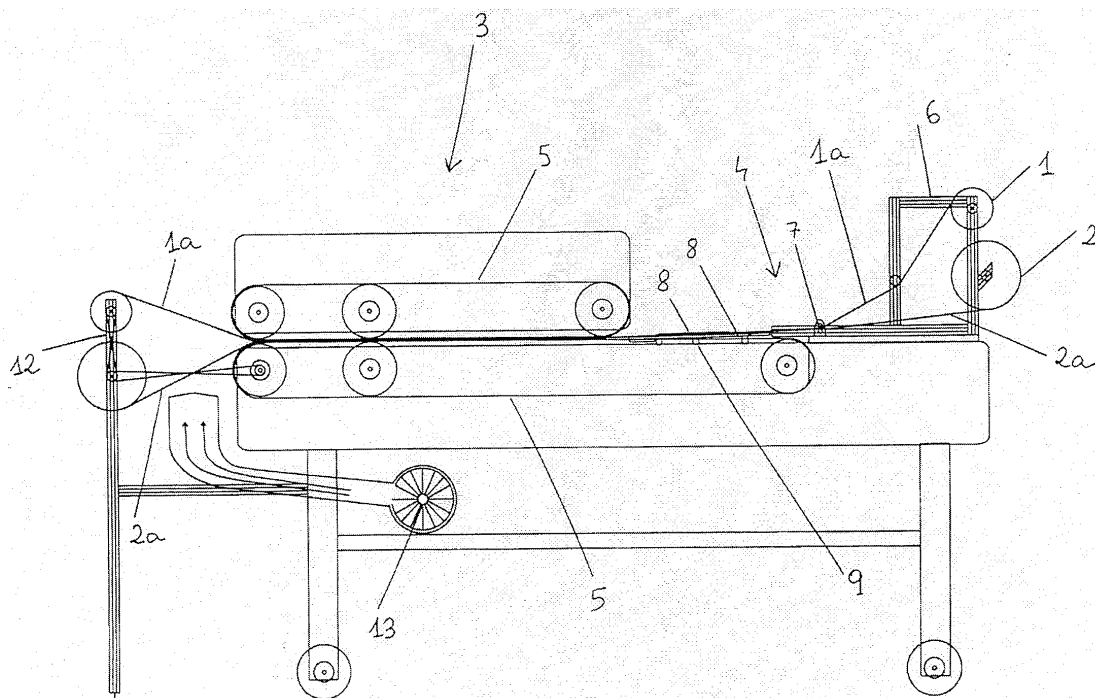


Fig. 3

EP 1 632 349 A2

Description

[0001] The present invention relates to a method for printing strips of fabric that uses the system of continuous transfer by ink sublimation of images into printed paper, and to a feed device of the machine that carries out said continuous transfer.

BACKGROUND OF THE INVENTION

[0002] The printing of fabric strips enables the production of fabric that is useful for fast and easy tailoring of trimming and/or decorative pieces, for which the requirement is that the printed images appear visually in a regular and/or precise manner.

[0003] Known in the art are fabric-strip printing processes that are carried out by means of conventional printing systems, such as those that use rollers or templates to apply the colour into the fabric.

[0004] Printing of strips of fabric by means of such conventional systems has the disadvantage that, if it is to be profitable, it must be carried out in long production runs and is therefore not useful for printing strips for the tailoring of personalised clothing produced in short runs. Moreover, printing using conventional systems presents the disadvantage that, in practice, the number of colours that are applied to the fabric is limited, since the cost of the printing process increases in proportion to the number of colours used.

[0005] Known in the art are new fabric printing systems that employ ink-sublimation transfer of images printed on paper. Unlike the above-mentioned conventional systems, said new printing systems have, among others, the advantages that no large sets of machinery or numerous specialised personnel are required, thus rendering them suitable for printing fabrics for making articles produced in short production runs. Furthermore, such systems enable the application of a large number of colours onto the fabric, without this significantly increasing the cost of the printing process.

[0006] Despite the advantages presented by the new printing systems when compared with the conventional systems cited, said new systems are not used for the industrial production of printed strips of fabric.

[0007] The industrial production of printed edging and/or decorative pieces for clothing items produced in short runs, as in the case of swimming costumes, is at present basically carried out using strips of fabric that are obtained by cutting fabrics that have been printed previously, whether with conventional systems or with the new systems that use transfer by sublimation.

[0008] However, the known industrial fabrics cutting systems do not allow fabric strips to be obtained with images arranged in a precise and regular way. For this reason, the printed edging and/or decorative pieces tailored for articles produced in short runs inevitably present images arranged in an imprecise or irregular way, which conditions the quality and design potential of the tailored

garments.

DESCRIPTION OF THE INVENTION

[0009] The objective of the present invention is to resolve the disadvantages mentioned above, while providing other advantages that will be described below.

[0010] A first aspect of this invention is to provide a method of printing fabric strips that uses the system of continuous transfer by ink sublimation of images on printed paper, that permits the printing of strips for tailoring articles produced in short runs, as well as the use of large numbers of colours.

[0011] A second aspect of the invention is to provide a feed device of the machine that carries out said continuous transfer.

[0012] In accordance with the first aspect of the invention, the method of printing fabric strips of this invention is characterised in that it includes the stages of:

- a) printing images onto transfer paper,
- b) cutting said paper into strips, in accordance with the images that must be included on each one of the strips,
- c) continuous transferring by ink sublimation of said images from the strips of paper onto respective strips of fabric.

[0013] Thanks to the characteristics of the method described, it is viable to implement printing of fabric strips for the tailoring of articles produced in short runs, such as swimming costumes. Thus is rendered possible cheap, rapid and easy production of edging and/or decorative pieces printed with images such as stripes, letters or strips of flowers, in which such images are achieved visually in a regular and precise manner. Thanks to this, the quality and design potential of clothing garments produced in short runs are improved enormously. Furthermore, the method enables the printing of strips of fabric with a large number of colours without the cost of the printing process being significantly increased thereby.

[0014] In accordance with the second aspect of the invention, the feed device of the machine that carries out the continuous transfer of the method described, is characterised in that it includes means for continuous supply of strips of paper and strips of fabric to said machine, means for keeping said strips of paper continuously superimposed on their respective strips of fabric as far as the ironing belts of the machine, and means for guiding superimposed strips up to said ironing belts.

[0015] The device described has the advantage of permitting continuous transfer of the images from the paper strips obtained in the paper printing process, automatically and with the desired level of quality.

[0016] In this invention, "strips of fabric or strips of paper" are taken to mean a long piece of fabric or paper of a width ranging between 10 mm and 200 mm.

[0017] In accordance with the second aspect of the

invention, a device is provided whose means for keeping said strips continuously superimposed preferably comprise two superimposed plates mounted transversally on a support, in such a way that said strips slide between the two plates. This means that a plurality of strips of paper with their respective strips of fabric can be kept superimposed in a simple and easy way.

[0018] Also preferably, the means of the device for guiding the superimposed strips include stop elements each pair of which defines a channel along which said strips move.

[0019] Advantageously, said stop elements can move horizontally in order to adapt to different fabric and paper strip widths.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] For a better understanding of all that has been set out, some drawings are attached that show, schematically and solely by way of non-restrictive example, a practical case of embodiment of the feed device of the machine that carries out the continuous transfer of the method of the invention.

[0021] In said drawings,

[0022] Figures 1a and 1b show, respectively, a plan view and longitudinal section of the set of elements of the device of the present invention that keeps the strips of paper and fabric continuously superimposed.

[0023] Figure 2 shows a side view of the group of elements of the device of the present invention that supplies and aligns the strips of paper and fabric.

[0024] Figure 3 shows a schematic side view of the continuous transfer machine onto which the feed device of the present invention has been fitted.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0025] The method of printing strips of fabric starts with design of a pattern specifically created for decorating said strips of fabric.

[0026] Multiple reproduction of said pattern onto a roll of paper is then carried out, so that a plurality of "strips" are left printed on the roll, parallel to each other and each reproducing said pattern. For the reproduction, a plotter is used that has been set up and adapted to print with paper and inks suitable for sublimation.

[0027] Once the roll of paper has been printed it is then wound using a machine (not shown) specially designed to ensure that the winding is carried out keeping the pattern "strips" completely aligned from the start to the end of the roll, while maintaining a predetermined winding tension necessary for the subsequent stage of cutting said printed paper.

[0028] After the winding process, said roll of paper is cut into multiple independent rolls or reels 1 of paper strips, each one of which includes one of the "strips" of pattern reproduced on the original roll of paper. The cutting of the roll of paper is carried out using a machine

(not shown) with multiple, width-adjustable blades.

[0029] The strips of fabric onto which transfer of the images or "strips" of printed patterns onto the paper will be carried out are obtained from pieces of fabric that are treated as described below.

[0030] The pieces of fabric from the supplier are unwound and left to rest for 24 hours in order to prevent possible shrinkages that would hinder the subsequent cutting and printing processes. After resting, the fabric is wound again at a predetermined tension, in linear 25- to 50-metre pieces, depending on the thickness and weight of the fabric. Once wound, the pieces of fabric are wrapped in shrink in order to compact the fabric and prepare it for the subsequent cutting or sectioning stage.

[0031] The cutting or sectioning of the wound fabric piece is carried out fully automatically using any of the cutting machines on the market, in such a way as to obtain multiple pieces of wound fabric, each of which constitutes a reel 2 of strips of fabric 2a onto which the printing will be carried out.

[0032] Once the reels 1, 2 that include the corresponding strips of fabric 2a and of printed paper 1a have been prepared, the printing process as such is carried out.

[0033] As noted in the description of the invention, the printing is carried out by means of continuous transfer by ink sublimation of the images from the strips of paper 1a onto the respective strips of fabric 2a. A continuous transfer machine 3 is used for this purpose, as shown in Figure 3, which machine is fitted with the feed device 4 of the present invention.

[0034] As can be observed in said Figure 3, the continuous transfer machine 3 includes a pair of ironing conveyor belts 5, between which the superimposed strips of paper 1a and fabric 2a move. The transfer by sublimation of inks is carried out with heat and pressure applied on the strips 1a and 2a for an approximate time of 40 seconds, which is the time said strips 1a and 2a take to travel through the interior of the machine 3.

[0035] Supply of the strips 1a and 2a of paper and fabric to the machine 3 is carried out by the feed device 4 of the present invention.

[0036] Said device 4 is made up of two groups of elements. The first of them, shown in Figure 2, includes a reel-holder support 6 onto which the reels 1, 2 of paper and fabric are placed, and a pair of rollers 7 that secure and align the two strips 1a and 2a coming from said reels 1, 2. The second group of elements, shown in Figures 1a and 1b, forms a unit designed to keep the strips 1a and 2a superimposed at the transfer machine 3 intake, preventing any kind of undesirable movements that would lead to serious printing errors.

[0037] As can be seen in Figures 1a and 1b, said second group of elements includes two superimposed plates 8, mounted on a chassis 9 arranged transversally on the machine 3, and a plurality of stop elements 10, provided between said plates 8, each pair of which form a channel along which said strips 1a, 2a move. Said stop elements 10 can move horizontally in order to adapt to the width

and position of the strips 1a, 2a, their position being fixed between the plates 8 by means of the screws 11. As remarked upon in the specification, the width of the strips of fabric can vary from 10 mm to 200 mm.

[0038] As Figure 3 shows, thanks to the device 4 the strips 1a, 2a of fabric and paper are inserted perfectly aligned and superimposed between the ironing belts 5.

[0039] The machine 3 is completed with a winder 12 that independently winds the already-printed strips 2a of fabric and the used strips 1a of paper, which emerge from the machine 3 directly and continuously. Said winder 12 also has the function of maintaining the alignment of the strips 1a, 2a inside the machine 3.

[0040] As can also be seen in this Figure 3, the machine 3 further includes means 13 for cooling the printed strips 2a of fabric.

[0041] With the strips 2a of printed fabric reels of different strip lengths are formed, depending on the base fabric, though in any case avoiding said reels exceeding a weight of 150 g, as this facilitates the subsequent tailoring process.

[0042] Thanks to the method and device of the present invention, it is possible to produce rapidly, easily and cheaply strips of fabric for edging and/or decorative pieces, with motifs or patterns completely parallel to the fabric cutting line.

4. Device (4) according to Claim 2, **characterised in that** said means for guiding the superimposed strips include stop elements (10) each pair of which define a channel along which said strips (1a, 2a) move.

5. Device (4) according to Claim 4, **characterised in that** said stop elements (10) can move horizontally in order to adapt to the width and position of the strips (1a, 2a).

Claims

1. Method of printing strips of fabric (2a), **characterised in that** it includes the stages of:

- a) printing images onto transfer paper,
- b) cutting said paper into strips (1a), in accordance with the images that must be included on each of the strips,
- c) continuous transferring by ink sublimation of said images from the strips of paper (1a) onto respective strips of fabric (2a).

2. Feed device (4) of the machine (3) that carries out the continuous transfer of the method of Claim 1, **characterised in that** it includes means (1, 2, 6, 7) for continuous supply of strips of paper (1a) and strips of fabric (2a) to said machine, means (8, 9) for keeping said strips of paper (1a) continuously superimposed on their respective strips of fabric (2a) as far as the ironing belts (5) of the machine (3), and means (10, 11) for guiding the superimposed strips (1a, 2a) up to said ironing belts (5).

3. Device (4) according to Claim 2, **characterised in that** said means for keeping said strips continuously superimposed comprise two superimposed plates (8) mounted transversally on a support (9), in such a way that said strips (1a, 2a) slide between the two plates (8).

Fig. 1a

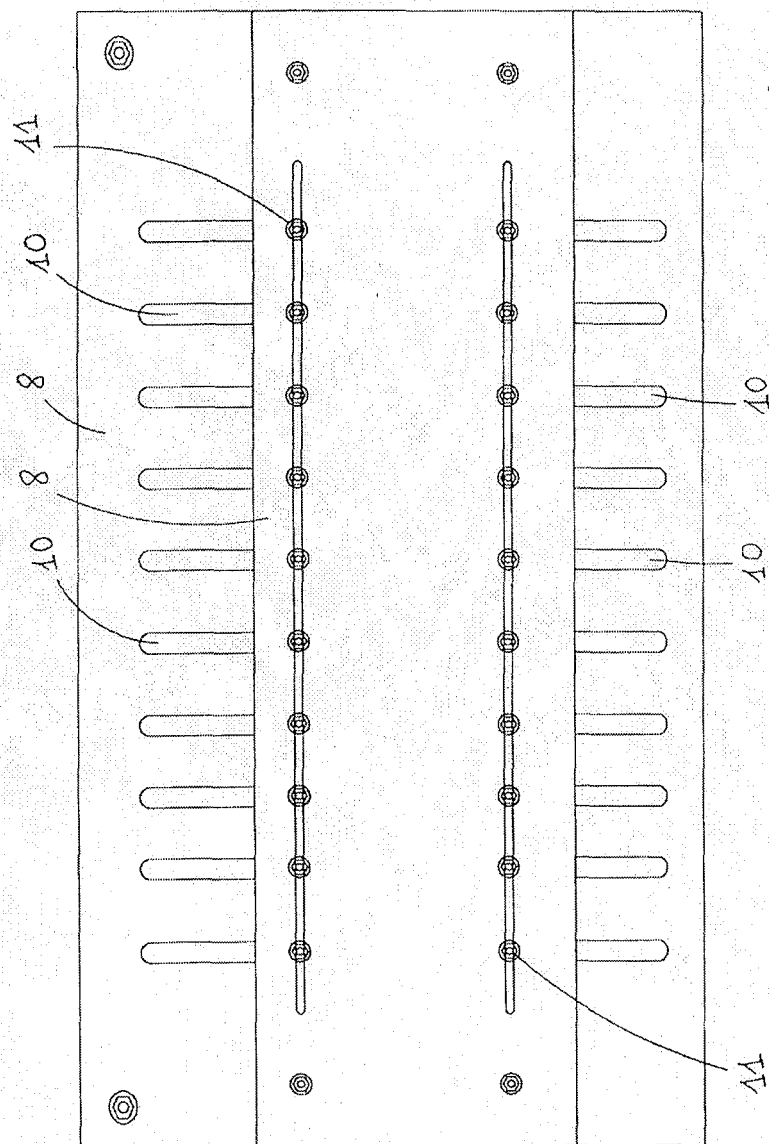
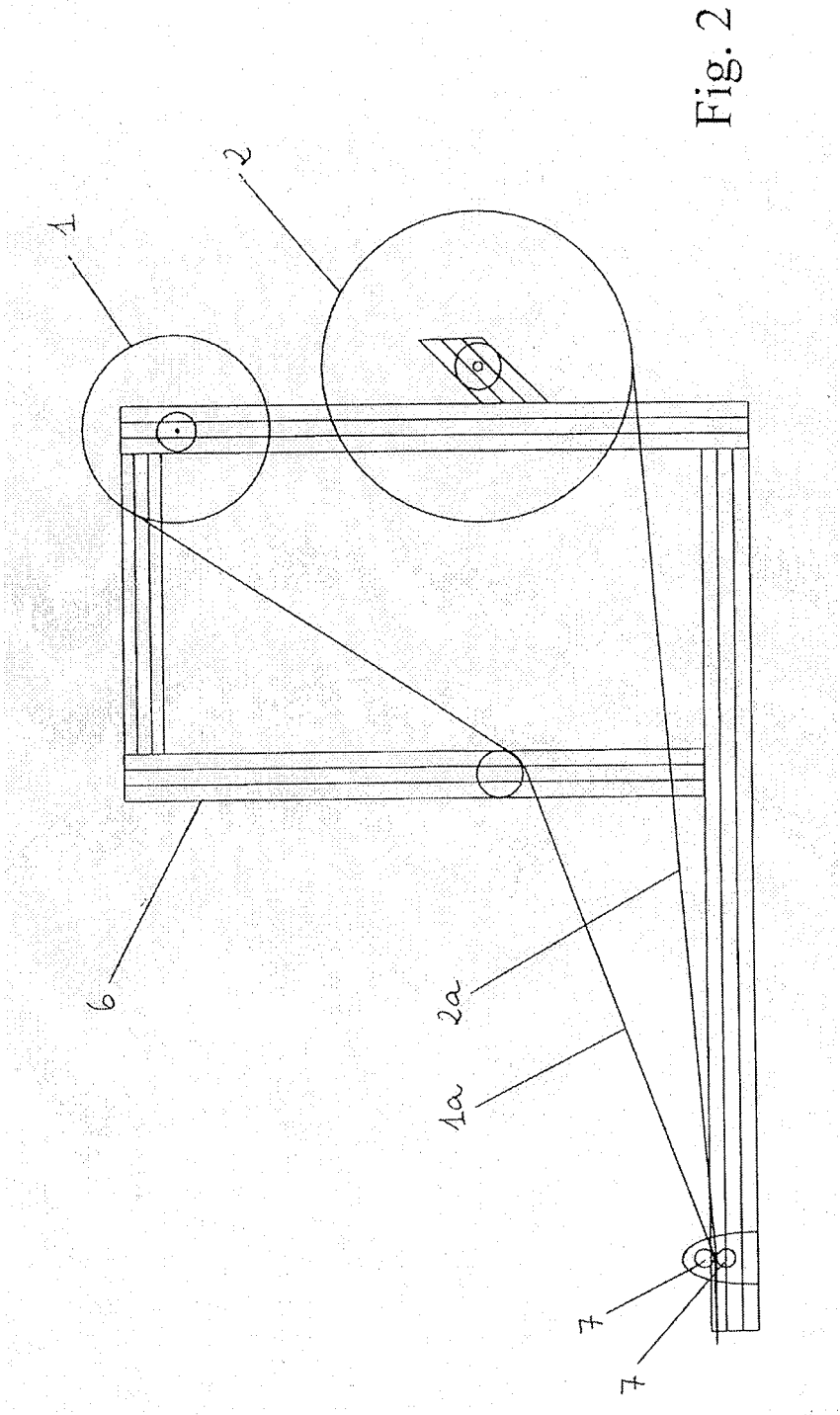


Fig. 1b





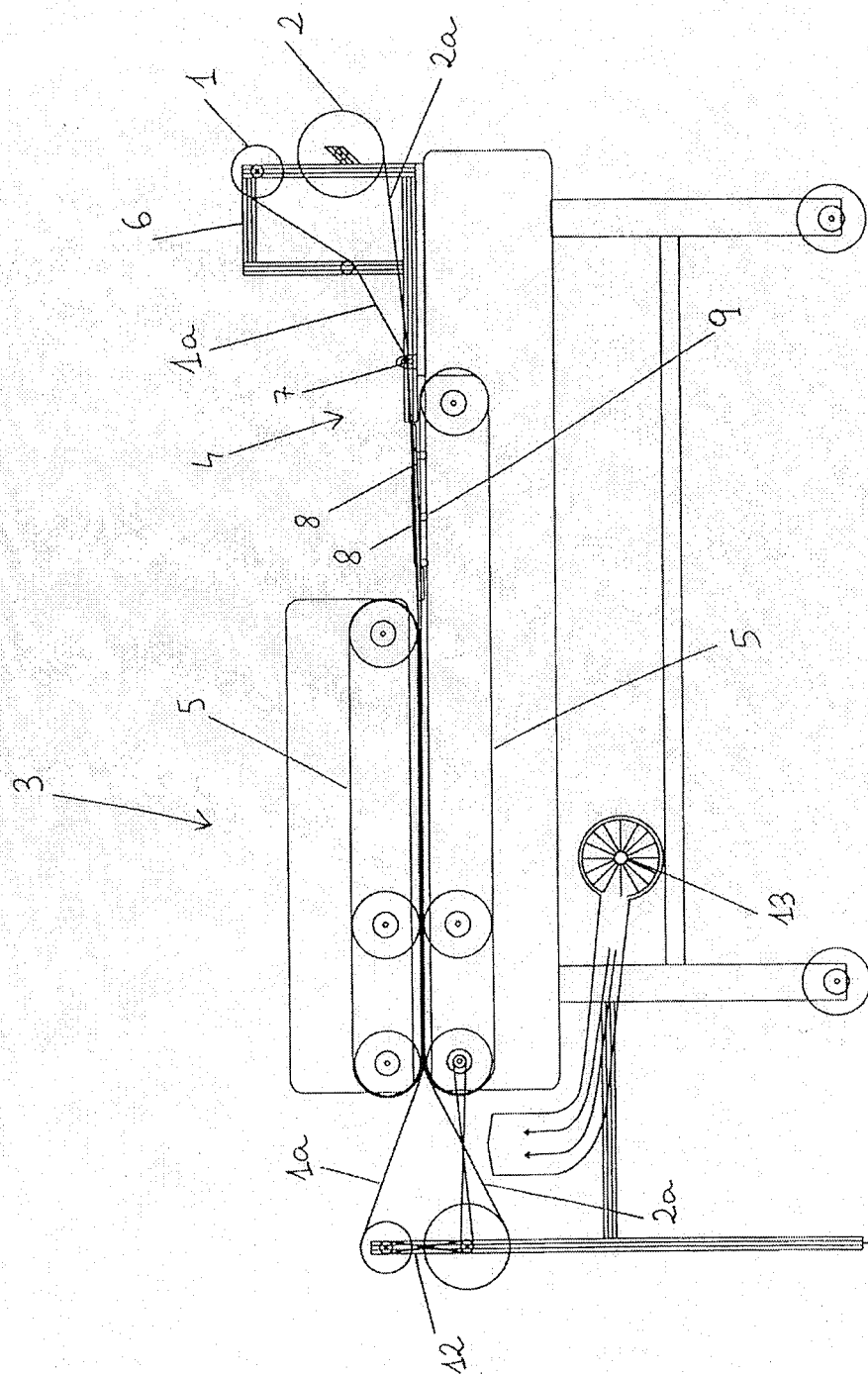


Fig. 3