(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 348 790 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
01.10.2003 Bulletin 2003/40

(21) Application number: **03425183.5**

(22) Date of filing: **24.03.2003**

(51) Int Cl.[7]: **D04B 23/10**, D04B 21/14, D04H 1/45, D04H 1/52, D04H 11/08, D04H 13/00, D06Q 1/14, D06Q 1/00, D06C 23/00, D06C 23/02

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

(30) Priority: **29.03.2002 IT FI20020054**

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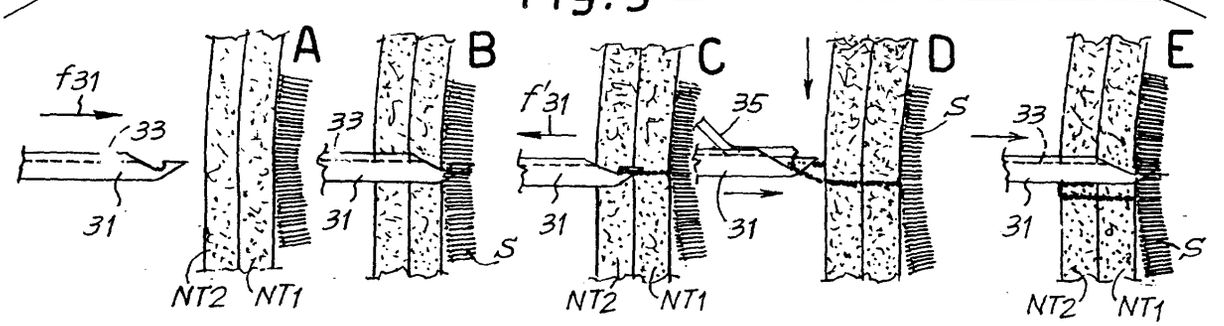
(54) Method and machine for producing a textile article decorated with an embroidery effect and article produced thereby

(57) A description is given of a method for producing a decorated textile article, comprising the following steps: inserting at least one needle into at least one textile layer; with said needle, grasping a quantity of fibers from the textile layer and causing the fibers, grasped by said needle, to appear on a front surface, by extracting the needle from the textile layer; and repeating steps a) and b) to form said design motif consisting of a sequence of stitches formed by the fibers which are caused to appear on the surface by said needle.

Fig.9



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Description

Technical field

[0001] The present invention relates to a method for producing a decorated textile article with an embroidery-effect decoration, especially but not exclusively an article made up of one or more layers of woven fabric, nonwoven, wadding or any textile structure suitable for releasing fibers or flocks of fibers.

[0002] The invention also relates to a machine for carrying out this method, and a decorated textile article, especially but not exclusively a nonwoven consisting of one or more textile layers joined together and decorated.

State of the art

[0003] Many product areas use textile articles consisting of textile layers formed from so-called nonwovens, which may or may not be combined with each other. A nonwoven is a layer of textile fibers whose orientation may be random or predominantly in one direction, the fibers being consolidated or bonded by a needlepunching, mechanical entanglement or hydroentanglement, thermal bonding by at least partial melting of hot-melt fibers, the application of adhesives, or other suitable methods.

[0004] Articles of this kind are used for example in the manufacture of products for upholstery (in both the building and automotive industries), for the production of apparel, the footwear industry, including slippers and similar products, and in numerous other product areas.

[0005] Nonwovens or other textile articles for similar uses are normally decorated by printing processes or even used without any decoration. Decoration by printing requires the use of inks and highly complex machinery which increases the cost of the finished product and moreover provides a result which is not always satisfactory in terms of quality and wear-resistance of the decoration.

Objects and summary of the invention

[0006] It is an object of the present invention to provide a method for decorating a textile article, especially but not exclusively in a nonwoven, that is better in terms of quality and cost than known procedures and in particular provides a permanent decoration, that is one which is essentially wear-resistant.

[0007] It is also an object of the invention to provide a machine capable of carrying out the decorative method.

[0008] It is also an object of the invention to provide a textile article, especially but not exclusively in a nonwoven, with an aesthetically valuable decoration that is durable therefore not subject to wear and can be produced relatively cheaply.

[0009] According to a first aspect of the invention, a method for producing a decorated textile article is provided, which characterized in that a design motif is generated on the textile article by displacing the fibers forming the structure of the textile article. In practice, the design is generated by grasping a certain amount or tuft of fibers from one face of the textile article and displacing them so that they appear on the opposite face. In practice, the article includes at least one textile layer that has a structure capable of releasing free fibers that can be displaced by one or more needles entering the article, and that are caused to appear on the opposite surface of the article from the surface into which the needle was inserted.

[0010] In one especially advantageous embodiment of the invention, the fibers displaced inside the textile article are partly reinserted into said textile article, in a different position from that from which they were extracted, to form a sort of decorative stitch or protuberance in imitation of embroidery. Repeating the operation along a desired line, in other words forming a plurality of decorative stitches along a desired design, creates the decoration on the article. The overall effect is similar to embroidery, but is obtained without the need to use an additional embroidery thread, but rather by a simple displacement of the fibers that make up the actual textile structure of the article.

[0011] While it is important that the textile article should have at least one layer with a structure capable of releasing fiber to one or more needles inserted into the article, it may also include other layers differing in configuration and structure, such as not to release free fibers. It will be the first layer to release the fibers intended to form the decoration.

[0012] In essence, in one advantageous embodiment, the method according to the invention employs the following steps:

a - inserting at least one needle into at least one textile layer;
b - with said needle, grasping a quantity of fibers from the textile layer and causing the fibers grasped by said needle to appear on a front surface of the textile layer; and
c - repeating steps a) and b) to form said design motif by a sequence of stitches in which said fibers appear on the surface.

[0013] The needle may be a felting needle which is inserted into the textile article from the rear surface and appears on the opposite front surface, taking with it a tuft of fibers released by the textile structure. When the needle is extracted from the same face as that through which it was inserted into the textile material, to perform the next insertion operation, the fibers displaced during the previous insertion step remain in the position to which they were pushed by the needle during the stroke of insertion into the textile article and appear here on

the surface of the article where they remain visible. The article is then shifted and the operation repeated at an adjacent point. Repeating the operation along points arranged to form a design produces a decoration on the front surface of the textile article, this decoration consisting of the flocks of fibers displaced by the felting needle.

[0014] In essence, in this possible embodiment of the method according to the invention, the fibers are caused to appear on the opposite surface from that into which the needle is inserted.

[0015] In a different and especially advantageous embodiment of the invention, however, the method is such that the needle enters the articles through a front surface and emerges from the opposite or rear surface. Next, the needle is extracted again from the front surface, and during the return stroke grasps a tuft of fibers, which it holds on to, for example owing to a hook shaping of the needle itself. Having grasped the fibers, as it emerges from the front face of the article it pulls the fibers with it and causes them to appear on the front surface of the article. It then re-enters the article, through the front surface, in a different position from the position in which it was extracted from the textile layer, to form a stitch or protuberance of the design motif with the fibers grasped by said needle. In this embodiment, in contrast to the situation in which the needle is a felting needle, the fibers are pulled from the article onto the same face as that through which the needle enters the textile article and from which the needle is then extracted.

[0016] The textile layer into which the needles are inserted is preferably a nonwoven or includes a nonwoven, but may also be formed by a knitted fabric, terry or the like, provided it has the property of releasing free fibers so that they can be gripped and displaced, that is moved, by the needle entering the textile layer. Since the decoration is produced by taking the fibers from one face of the textile layer and causing them to appear on the opposite face, the best results are obtained when the textile layer, or at least one of several combined textile layers, is a layer of nonwoven. The method can also be carried out on a textile article consisting of several combined layers, only one of which is a nonwoven, and in particular is the layer located on the rear face, that is the layer from which the needles take the fibers and expose them on the opposite face of the article. Alternatively, this layer too may have a different structure, such as a knit, provided its structure is such as to release free fibers.

[0017] If a number of textile layers laid together are used, they may be combined and united before the decoration is applied.

In one possible embodiment of the method according to the invention, the textile layer may consist of a web or mat of non consolidated fibers produced for example by plaiting card webs coming from a card set. The needles that enter the textile layer to produce the decoration have in this case the additional function of consolidating the fibers of the web in order to produce, at the end of the process, a nonwoven where the fibers are mechanically consolidated by needling. The invention does not exclude combining the needle--punching bonding effect with consolidation of some other kind, such as thermal bonding by partial melting of hot-melt fibers, e.g. bicomponent fibers contained in the web of carded fibers on which the decoration process is performed. In this case the finished product assumes a soft, very thick appearance, with a decoration similar to matelassé work, formed by the stitches produced by the various needles from the fibers displaced from one face of the textile article to the other.

[0018] Preferably, however, the decoration is produced by inserting the needles into a textile layer or into a plurality of textile layers laid together, made up of consolidated fibers, that is one or more layers of nonwoven. Advantageously, one preferred embodiment of the invention uses two textile layers of consolidated fibers, that is two layers of nonwoven that differ from each other in color, for example. In this way one face of the textile article will be given decorations consisting of the fibers appearing on said face but originating from the opposite nonwoven layer, which is of a different color. Between the two layers of nonwoven that form the external faces of the article there may be one or more additional layers of nonwoven, or textile layers of some other structure, and reinforcing elements such as a net or the like to give the textile article greater strength, especially where it is intended for use in footwear such as slippers or the like. Alternatively or in combination, there may be one or more layers of swelling products, such as an expanded polyurethane, wadding or other equivalent material.

[0019] If the decoration is produced on a plurality of textile layers combined together, these may first have been joined together by for example a partial melting of the hot-melt fibers present in at least one of the two layers, using for example a calendering, spot welding or other process.

[0020] In one especially advantageous embodiment of the invention, furthermore, the two or more textile layers are laid together and subjected to the action of the needles which generate a decorative design without first joining them together. In this case the anchoring together of the two layers is achieved mechanically by the process of decoration itself, thanks to the fibers which are grasped by the needles inserted into the textile layers to create the decorative stitches. This gives a simple and inexpensive process requiring no adhesives, application of heat, use of hot-melt fibers or other contrivances to bring about the joining together of the various textile layers forming the article. If desired, the mechanical joining produced by the displacement of the fibers by the action of the needles may be complemented by the addition of a heat-activated binder and a relatively small quantity of hot-melt fibers, which will not greatly affect the cost of the process.

[0021] Other advantageous characteristics of the

method according to the invention are indicated in the appended dependent claims.

[0022] In another aspect, the invention relates to a machine for producing a decorated textile article comprising:

- a path for the textile article;
- on one side of said path a plurality of needles shaped to grasp the fibers of the textile article; and
- on the other side of the path an opposing member against which said textile article presses when the needles enter it.

[0023] According to the invention, the opposing member has a flexible structure which allows the needles to enter the structure of the opposing member whatever the relative position of the needles and the opposing member. It is thus possible to give the textile material a movement in any direction relative to the needles to produce the desired designs. The opposing member is mobile relative to the needles, not only in a direction parallel to the direction of advance of the textile article, but also in a transverse direction with respect to the direction of advance of the textile article along the path of advance through the machine. It is thus possible to move the textile article relative to the needles both in the direction of advance, hereinafter also referred to as the machine direction, and in the orthogonal direction relative to the direction of advance, referred to for brevity as the transverse direction.

[0024] In one advantageous embodiment the opposing member comprises a roller brush, that is a cylindrical brush. The supporting surface on which the textile article is carried while the decoration is being applied consists in this case of the cylindrical surface on which the radial bristles of the brush lie. The flexibility of the bristles of the roller brush allows the needles to penetrate into the opposing member in any relative position between the latter and the needles, as well as allowing movement of the opposing member relative to the needles against which the latter are situated inside the opposing member.

[0025] Other advantageous characteristics and embodiments of the machine according to the invention are indicated in the appended dependant claims and will be illustrated in greater detail with reference to an illustrative embodiment.

[0026] In a further aspect the invention relates to a textile article comprising a first face and a second face, characterized in that it has a decoration composed of fibers of the textile article appearing on said second face and taken from the first face. In practice the decoration consists of a distribution of stitches formed from these fibers.

[0027] Advantageously in a preferred embodiment of the invention the article consists of at least one nonwoven, and preferably of two or more nonwovens joined together. It is preferable, as mentioned earlier, for the outermost nonwovens formed by the articles to be of different colors in order to give a chromatic decorative effect. However, it is also possible to use textile layers, and especially layers of nonwoven, of the same color, in which case the decoration will appear as a sort of monochrome embroidery on the decorated surface of the textile article.

[0028] Other advantageous characteristics and embodiments of the article according to the invention are indicated in the appended dependant claims.

Brief description of the drawings

[0029] A clearer understanding of the invention will be gained from the description and the accompanying drawing, the latter showing a practical, non-restrictive example of the invention. In the drawing:

Fig. 1 is a side view taken on I-I as marked in Fig. 3 of a machine according to the invention in one possible embodiment;
Fig. 2 is a view from the opposite side, taken on II-II as marked in Fig. 3, of the same machine;
Fig. 3 is a forward view taken on III-III as marked in Figs 1 and 2;
Fig. 4 shows an enlarged detail of the machine needles and the opposing member;
Figs 5 and 6 show enlarged details taken on V-V as marked in Fig. 4 in two embodiments;
Figs 7 and 8 show diagrammatically two possible decorations that can be produced by the machine according to the invention; and
Figs 9A-9E show successive relative positions of the two textile layers forming an article and of a needle producing the decoration.

Detailed description of the preferred embodiment of the invention

[0030] With initial reference to Figs 1-3, in this embodiment the machine, which has the general reference 1, comprises a support 3 for two reels R1 and R2 of nonwovens labeled NT1 and NT2, respectively. The nonwovens NT1 and NT2 are fed in the direction of the arrows f1 and f2 along a feed path towards a processing station with the general label 5 and described in greater detail below.

[0031] Beneath the station 5 is a larger-diameter deflection roll 7 and a series of additional deflection rolls 8, 9, 10, 13 and 14 which define the final part of the path of the textile article formed by combining the two layers of nonwoven NT1 and NT2, labeled MT, which is wound up to form a reel of processed material R3. The deflection roll 10 is mounted on two pivoting arms 11 whose angular position is sensed by a potentiometer 12 by means of a connecting chain 14. The rotational movement of the winding rolls 12 and 14 is controlled on the basis of the sensed angular position of the arms 11,

which is an indicator of the amount of textile article MT present between the roller 9 and roller 13.

[0032] The station 5 comprises a cylindrical brush or roller brush 21 rotating about an axis A-A orthogonal to the machine direction, that is to the direction of advance of the textile article formed by the two layers of nonwoven NT1 and NT2 travelling around the cylindrical brush 21. The cylindrical brush 21 is acted upon by a cleaning roll 23 which is fitted with points 25 which serve to clean the bristles of the cylindrical brush 21, to prevent the build-up of fibers on the bristles. The cleaning roll 23 and the cylindrical brush 21 are together mounted on a carriage 22 able to move as shown by the double-ended arrow f22 under the control of a cylinder-and-piston actuator 24 or equivalent.

[0033] In front of the cylindrical brush 21 is a mechanism bearing the general label 27 comprising a plurality of needles which carry out the decorative treatment of the nonwovens NT1, NT2, at the same time joining them together. This mechanism is known per se in textile technology and is typically used in so-called "Maliwatt" and "Malivlies" frames made by Textima (Germany).

[0034] This device has a straight bar 29 fitted with a plurality of needles 31 each with a hooked end. The needles 31 each have a channel 33 in which a closing member 35 or pin slides. The closing members 35 associated with the needles 31 attached to the bar 29 are carried by a straight bar 37 parallel to the bar 29. In a manner known per se the two bars 29 and 37 undergo independent reciprocating movements as indicated by the double-ended arrows in Fig. 4, at right angles to the longitudinal line of the bars, that is to the direction of alignment of the needles 31 and of the closing members 35.

[0035] In front of the needles 31 is a comb 39 through whose teeth the needles 31 and the closing members 35 pass as they move back and forth towards the two nonwovens NT1 and NT2 travelling together between the comb 39 and the cylindrical brush 21, as is clearly visible in Fig. 4.

[0036] The arrangement of the members 29 to 39 is essentially the same as in the MALIWATT and MALIVLIES frames made by Textima and they are actuated in the same way as the corresponding members of those frames. However, unlike conventional machines, in which the needles act in combination with a rigid comb situated on the opposite side of the path of the textile article to the needles 31, in the present case the textile article formed by the combined two layers of nonwoven NT1 and NT2 is carried around the cylindrical brush 21 which also acts as the opposing member for the needles 31 and 35, the elasticity of the bristles S of the brush 21 being a characterizing element of this new arrangement for obtaining the functions which will be described in detail below.

[0037] The cylindrical brush 21, the cleaning roll 23 and the deflection rolls which carry the textile article MT are driven by an arrangement of belts or chains 43 and 45, visible particularly in Fig. 2. These take their power together from a geared-down motor 47 visible particularly in Fig. 3. Alternatively independent drive motors may also be used, with appropriate electronic synchronizing by a control unit.

[0038] The geared-down motor 47, the cylindrical brush 21, the cleaning roll 23, and the deflection rolls 7, 8 and 9 are mounted on a frame 51 which is able to move on wheels 53 along a track 55. A geared-down motor 57 supplies transverse motion, by a threaded bar 59 and a nut 61, to the frame 51 in the directions of the double-ended arrow f51 (Fig. 3). The direction of the transverse motion is perpendicular to the machine direction, that is to the direction of advance of the nonwovens NT1 and NT2. The translational movement in the transverse direction indicated by the arrow f51 is also transmitted by the frame 51 to the support 3 carrying the reels R1 and R2, on which the reel R3 of textile material obtained at the output of the machine is also formed and held.

[0039] With this arrangement all the members with which the textile material formed by the two layers of nonwoven NT1 and NT2 come into contact move together in the directions f51 due to the motion imparted by the geared-down motor 57. This is controlled by a programmable central processing unit integrated schematically at 61 in Fig. 3, which also controls the geared-down motor 47 in a synchronized manner to supply the rotary motion to the cylindrical brush 21 and to the other driven rolls around which the textile article travels.

[0040] The operation of the machine described thus far is as follows (see also Figs 9A-9E): the two nonwovens NT1 and NT2 are gradually unwound from the reels R1 and R2 and fed around the cylindrical brush 21 which is turning on its own axis. As they pass in front of the needle device 27 the two layers of nonwoven NT1 and NT2 are subjected to the action of the needles 31. The effect of these needles is illustrated in Figs 9A-9E with reference to a single needle. The needle 31 enters, in the direction of arrow f31, the two nonwoven layers NT1, NT2 and passes out at the other side of the nonwoven NT1 so that its hooked end passes among the bristles S of the cylindrical brush 21 on which the nonwoven NT1 is carried, thus reaching the position shown in Fig. 9B. When the needle movement is reversed, as indicated by arrow f'31 (Fig. 9C), the hooked end of the needle pulls some fibers from the rear face of the nonwoven NT1, that is from the face in contact with the bristles S of the cylindrical brush 21, pulling them with it until they appear on the outer surface of the nonwoven NT2 (Fig. 9D).

[0041] The needle 31 is now closed by the closing member 35 which moves along the channel 33 formed in the needle 31, and the needle 31 and the closing member 35 again reverse their movement and re-enter the nonwoven NT2. The closing member 35 only enters to a limited depth and is withdrawn early to open the hook of the needle 31 and allow the fibers to come off the needle as the needle moves into the structure formed by the two nonwovens NT1 and NT2. In this way

a decorative stitch or protuberance is formed by the fibers themselves extracted from the rear surface of the textile article, that is from the surface in contact with the bristles of the cylindrical brush 21, and displaced by the hooked needle so that they appear on the front surface, that is on the surface through which the needle entered the textile article.

[0042] As it continues to move in, the needle 31 finds itself once again in the position seen in Fig. 9E, corresponding to the position seen in Fig. 9B. A new reversal of the movement which brings the needle 31 out of the nonwoven NT2 serves to bring back to the outer or front face of the nonwoven NT2 the fibers grasped from the rear surface, that is the outer surface of the nonwoven NT1.

[0043] As will be seen by comparing Figs 9C and 9D, when the needle 31 has been completely withdrawn from the nonwoven NT2, both layers of nonwoven NT1, NT2 advance in any direction such that the subsequent insertion of the needle 31 and of the closing member 35 takes place in a different position on the textile article composed of the joined nonwovens NT1 and NT2 from the position in which the same needle was inserted in the previous step.

[0044] The movement of the two layers of nonwoven NT1 and NT2 may take place in any direction as a combination of the two-way translational movement indicated by f51 of the frame 51 with all the parts carried by it (this movement being controlled by the geared-down motor 57) with the two-way rotational movement, controlled by the geared-down motor 47, of the cylindrical brush 21 and of the remaining deflection rolls carrying the textile article MT and nonwovens NT1 and NT2.

[0045] By this means the reciprocating motion of the needles 31 and closing members 35 generates a sort of sequence of decorative stitches formed by the fibers which, with each stroke, each needle 31 takes from the rear face of the nonwoven layer NT1 (in contact with the cylindrical brush 21) and which are moved, that is displaced, through the double layer of nonwoven NT1, NT2 to appear on the free surface of the nonwoven NT2.

[0046] Because the combination of movements of the frame 51 shown by the double-ended arrow f51 and of the cylindrical brush 21 about the axis A-A makes it possible to expose on the free surface of the layer NT2 fibers taken from the layer NT1 at points aligned along lines of any shape, by suitably programming the control unit 61 it is possible to create lines of decorative stitches on the nonwoven to form any decorative motif. Figs 7 and 8 show two possible decorations obtainable with the arrangement of needles seen in Figs 5 and 6. The lines L1, L2, L3, L4 sketched in Figs 7 and 8 represent alignments of decorative stitches obtained by using the needles 31 to extract fibers from the rear face of the layer NT1 and causing them to appear on the free face of the layer NT2. The flexibility of the bristles S of the cylindrical brush 21 ensures that it is possible to insert the needle 31 into the structure formed by the two layers of nonwoven NT1 and NT2 and then push it out from the free rear surface of the layer NT1 in any position, because the bristles S will always allow the needle to penetrate into the structure of the cylindrical brush 21. This allows the creation of any design on the outer surface of the nonwoven layer NT2.

[0047] Even very complex patterns can be obtained by simple programming of the movements in the axial direction of the cylindrical brush 21 (produced by a translation indicated by f51 of the frame 51) and of two-way rotation about the axis A-A of said cylindrical brush 21. The needles 31 can be arranged in a suitable sequence depending on the design required. Figs 5 and 6 show schematically the arrangement of the needles to generate the designs of Fig. 7 and Fig. 8, respectively. Basically, the needles can be arranged with a regular pitch, or be distributed in groups or in any suitable way, according to the need of the configuration of the design which it is wished to produce on the finished textile article MT.

[0048] The stitches formed by the needles 31 by pulling the fibers from the rear face of the nonwoven layer NT1 to the front face of the nonwoven NT2 not only form a decoration but also form a sort of seam uniting the two nonwovens NT1 and NT2, which therefore require no further operations of sewing or uniting them together, although an additional consolidation step is not ruled out, such as a thermal consolidation.

[0049] The layer of nonwoven NT1 is advantageously a different color from the layer of nonwoven NT2. The lines L1, L2, L3 and L4 forming the decoration on the surface of the nonwoven NT2 will therefore be a different color form the background color, that is the color of the nonwoven NT2. If on the other hand the two layers of nonwoven NT1, NT2 are the same color, the decoration will appear as a sort of monochrome embroidery.

[0050] A third and if desired further layers of reinforcing nonwoven may be inserted between the two nonwovens NT1 and NT2 to increase the strength of the final textile article MT. One or more of the nonwovens used may be replaced with textile layers of a different kind, such as fabrics, foams, knits, etc., although it is preferable for the rear layer, in contact with the cylindrical brush 21, to be a nonwoven, from which is easier to take the fibers with the hooked needle 31 in order to form the decoration on the free face of the outer layer on the other side (in the example the layer of nonwoven NT2).

[0051] If felting needles are used instead of hooked needles as shown in the example illustrated, the rear surface of the textile article will be oriented towards the needles, while the front surface will be in contact with the cylindrical brush 21. The movement of insertion of the needles will cause a displacement of the fibers from the rear surface so that they appear on the front surface.

[0052] The method described produces a decoration which has the general effect of embroidery, although no external thread is added and all that occurs is a displacement of fibers forming the base structure of the textile

article. The decoration is not only aesthetically pleasing, but also resistant and not subject to wear. Moreover, where the textile article is made up of two or more combined layers, the method of decoration according to the invention joins the various layers together at the same time without the need to resort to chemical, thermal or other joining means. This reduces the cost of the product and facilitates its recycling.

[0053] It will be understood that the drawing shows only an example purely as a practical demonstration of the invention, which invention can be varied in its shapes and arrangements without thereby departing from the scope of the concept on which the invention is based.

Claims

1. A method for producing a decorated textile article, **characterized in that** a design motif is generated on said textile article by exposing, on one face of the article, fibers forming the structure of the textile article.

2. Method according to Claim 1, **characterized by**:

   a - inserting at least one needle into at least one textile layer;
   b - with said needle, grasping a quantity of fibers from the textile layer and causing the fibers, grasped by said needle, to appear on a front surface, by causing the needle to emerge from the textile layer; and
   c - repeating steps a) and b) to form said design motif consisting of a sequence of stitches formed by the fibers which are caused to appear on the surface by said needle.

3. Method according to Claim 2, **characterized in that** the needle passes through said textile article by entering it through said front face and emerging from an opposite rear face, and is then withdrawn from the article from its front face, pulling said fibers with it.

4. Method according to Claim 3, **characterized in that** the needle extracted from the front surface of the article re-enters the article, through the front surface, in a different position from the position in which it was extracted from the surface, taking with it the previously exposed fibers and re-inserting them partially into said textile article in a different position from the position from which they were extracted, to form a decorative stitch or protuberance.

5. Method according to Claim 2 or 3 or 4, **characterized in that** said textile layer consists of a web of unconsolidated fibers and **in that** the fibers of the web are consolidated to form a nonwoven by the formation of said stitches.

6. Method according to Claim 5, **characterized in that** said fiber web is made up of one or more layers of carded fibers.

7. Method according to Claim 2 or 3 or 4, **characterized in that** said textile layer comprises at least one layer of consolidated fibers, forming a nonwoven.

8. Method according to one or more of the previous claims, **characterized in that** said textile article is formed from at least two textile layers joined together, the fibers grasped by said needle belonging to a first of said two textile layers and being caused to appear on the outside of a second of said textile layers.

9. Method according to Claim 8, **characterized in that** said at least two textile layers are of different colors.

10. Method according to Claim 8 or 9, **characterized in that** said at least two textile layers are joined together before undergoing the action of said at least one needle.

11. Method according to Claim 8 or 9, **characterized in that** said at least two textile layers are placed together and united by the stitches formed by said at least one needle.

12. Method according to one or more of Claims 8-11, **characterized in that** said textile article comprises at least three textile layers joined together.

13. Method according to one or more of the previous claims, **characterized in that** said at least one textile layer comprises at least one hot-melt component and **in that** said textile layer is consolidated by heat before or after said design motif is generated.

14. Method according to one or more of Claims 2-13, **characterized in that** at least one of the textile layers is a nonwoven.

15. Method according to Claim 14, **characterized in that** the textile layers forming said article are nonwovens.

16. A machine for producing a decorated textile article, comprising:

   - a path for said textile article;
   - on one side of said path a plurality of needles shaped to grasp the fibers of the textile article; and
   - on the other side of the path an opposing mem-

ber against which said textile article presses when the needles enter it,

characterized in that said opposing member has a flexible structure which allows said needles to penetrate said opposing member at any point, and **in that** the opposing member is mobile with respect to said needles in a transverse direction with respect to the direction of advance of the textile article along said path.

17. Machine according to Claim 16, **characterized in that** said opposing member comprises at least one roller brush.

18. Machine according to Claim 17, **characterized in that** it comprises a cleaning roller acting on said roller brush to remove any fibers from said roller brush.

19. Machine according to Claim 15, 16, 17 or 18, **characterized in that** said opposing member is mounted on a frame able to move transversely with respect to the direction of advance of the textile article, an actuator controlled by a programmable control unit being provided to control the transverse movements of said frame.

20. Machine according to Claim 19, **characterized in that** said frame is attached to means for deflecting and winding of the textile article which travel transversely with said frame.

21. Machine according to one or more of Claims 16-20, **characterized in that** said opposing member is given a two-way rotation movement about its axis.

22. Machine according to one or more of Claims 19-21, **characterized in that** said programmable control unit synchronously controls the transverse movements and the two-way rotational movements of said opposing member.

23. A textile article comprising a first face and a second face, **characterized in that** it has a decoration composed of fibers of said textile article appearing on said second face and taken from said first face.

24. Article according to Claim 23, **characterized in that** said decoration is formed by a distribution of stitches formed from said fibers.

25. Article according to Claim 23 or 24, **characterized in that** it consists of at least one nonwoven.

26. Article according to Claim 23, 24 or 25, **characterized in that** it comprises at least two textile layers joined together, the fibers of the decoration belonging to a first one of said layers and appearing on the free surface of the other of said layers.

27. Article according to Claim 26, **characterized in that** said at least two textile layers are of different colors.

28. Article according to Claim 26 or 27, **characterized in that** it comprises a third textile layer interposed between said first and second textile layers.

29. Article according to Claim 26, 27 or 28, **characterized in that** said at least two textile layers are united by the stitches formed from said fibers which form the decoration.

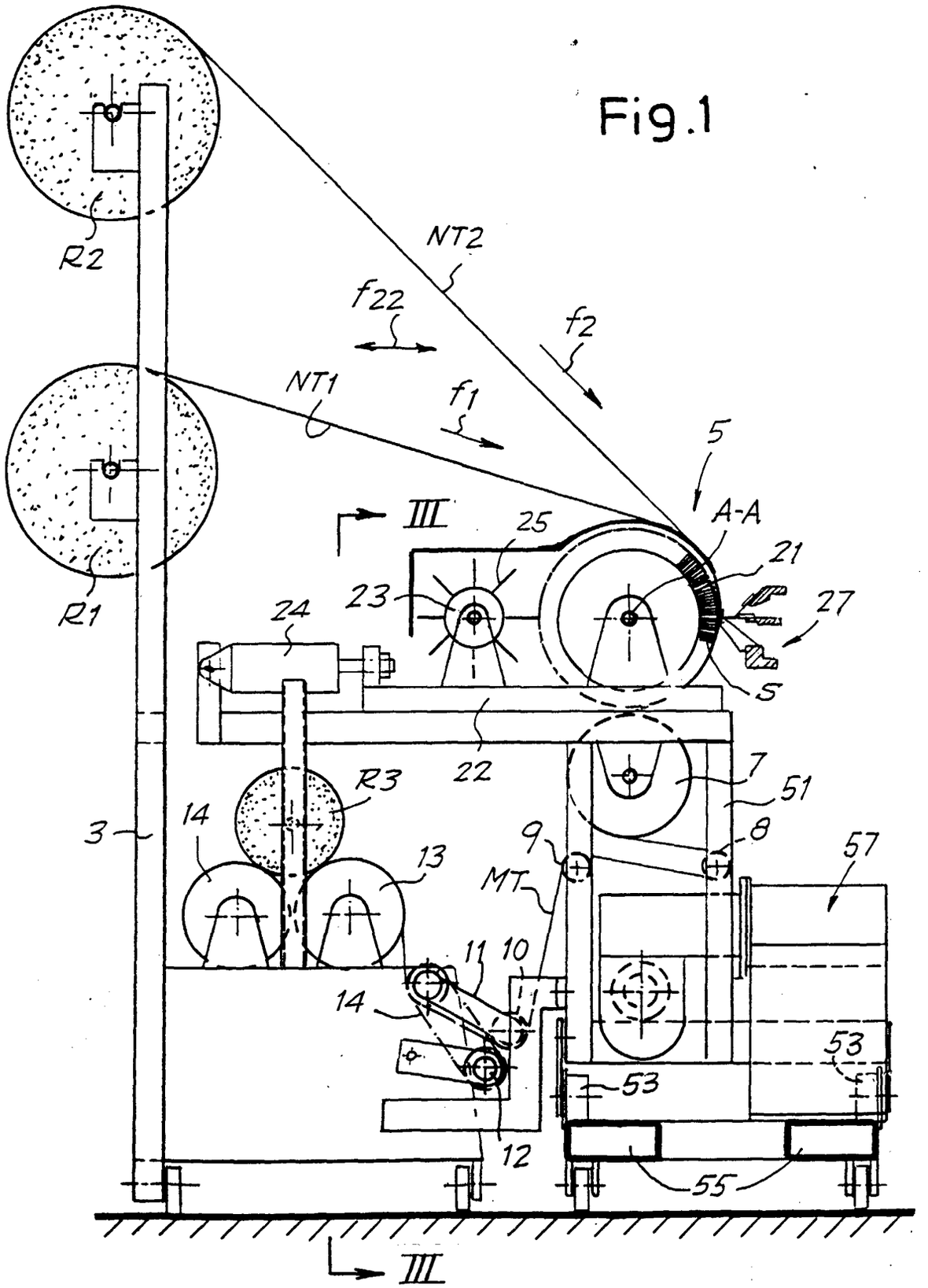
30. Article according to Claim 26, 27 or 28, **characterized in that** said layers are joined together at least partly by thermal bonding.

31. Article according to one or more of Claims 26-30, **characterized in that** at least one of said textile layers is a nonwoven.

32. Article according to Claim 31, **characterized in that** the textile layers forming said article are nonwovens.

33. Article according to one or more of Claims 23-32, **characterized in that** said decoration consists of a sequence of stitches or protuberances, each formed by a tuft of fibers appearing on said second face in a first position and partially reinserted into said article in a second position, different from said first position.

Fig.1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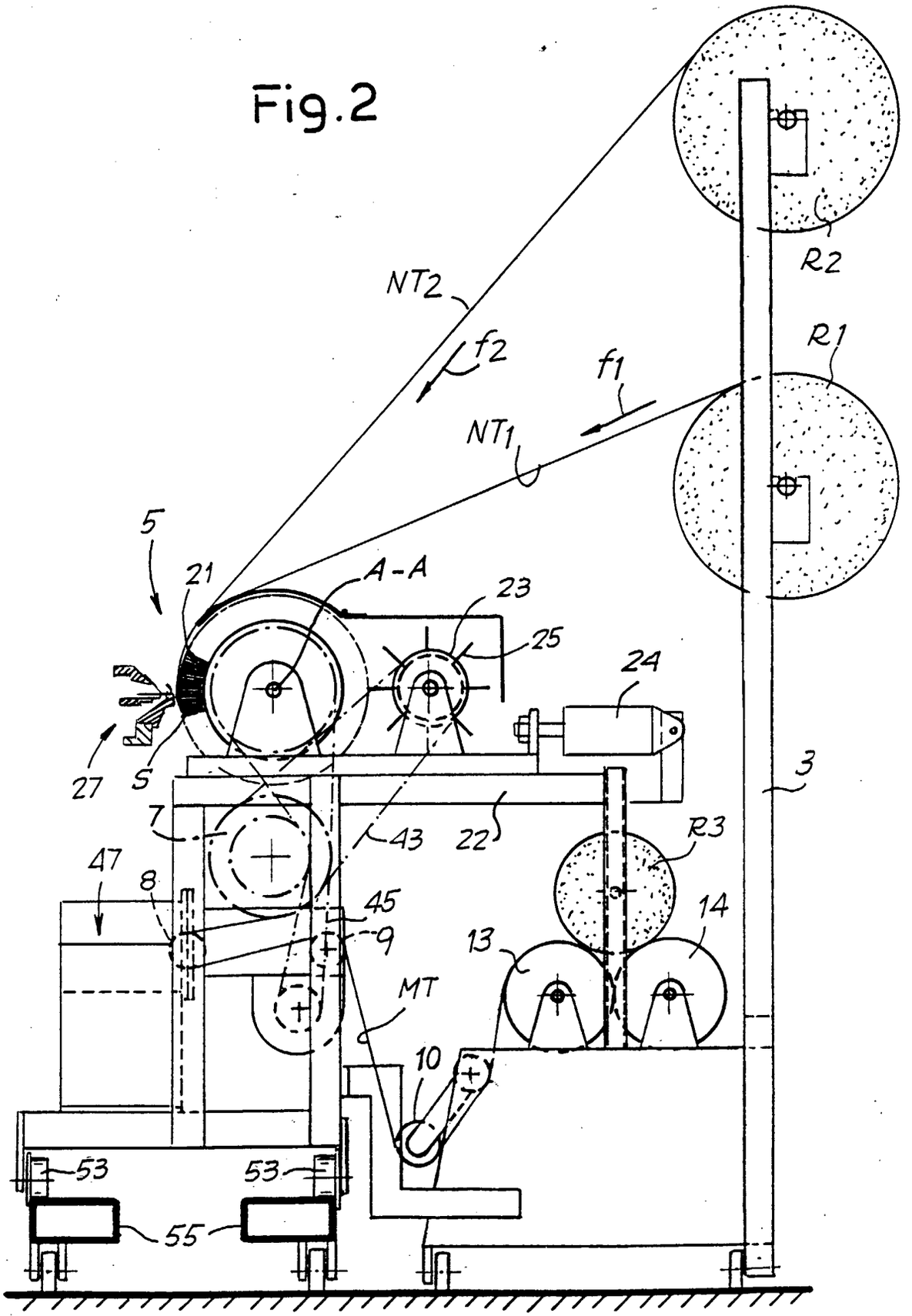
f22
f2
NT1
f1
5
III
A-A
25
21
23
27
24
S
22
7
51
R3
3
14
9
8
57
13
MT
11
10
14
53
53
12
55
III

Fig.2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f2
f1
NT1
R2
R1
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A-A
23
25
24
27
S
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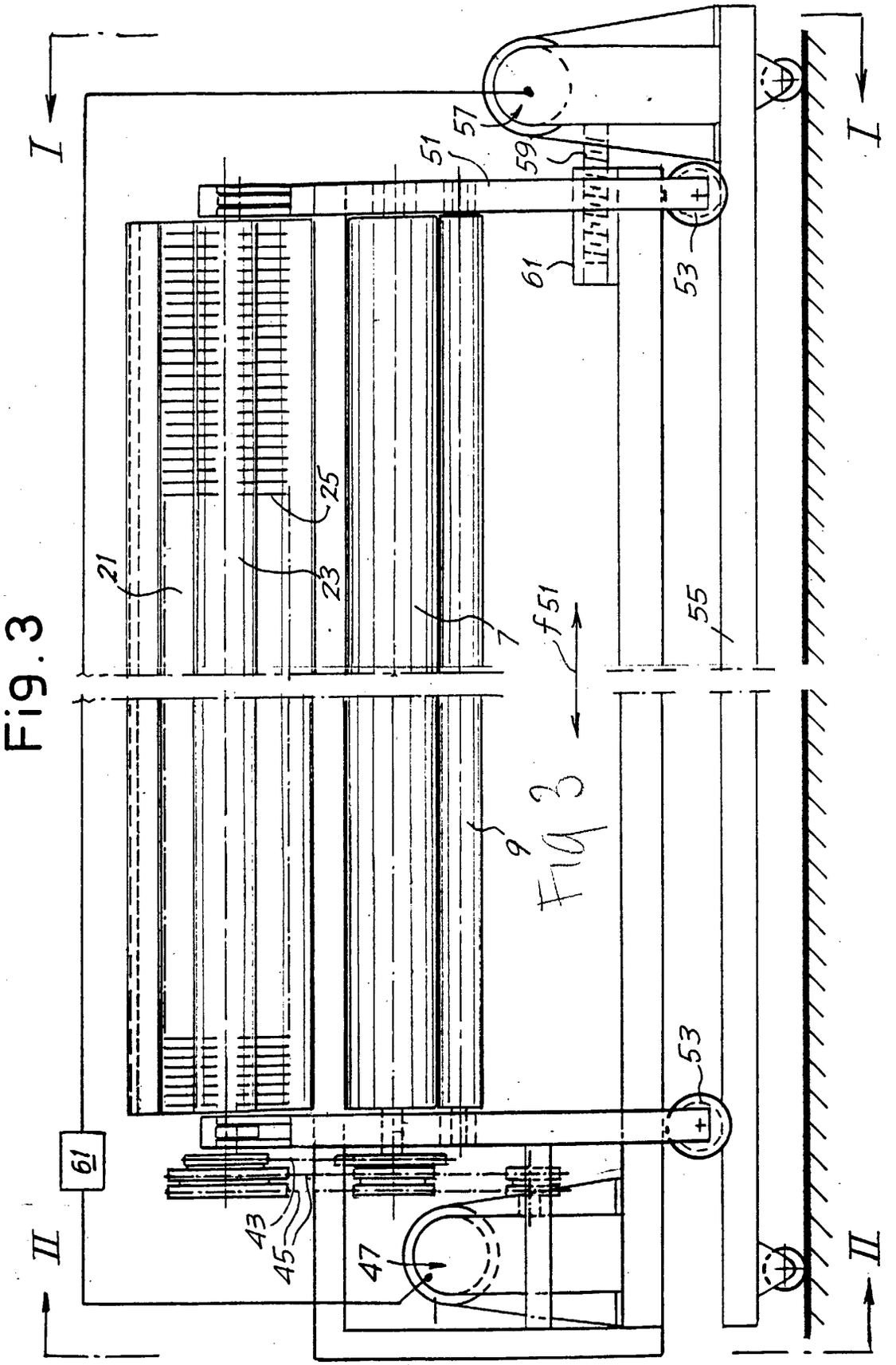
7
43
22
R3
47
8
45
9
14
13
MT
10
53
53
55

Fig.3



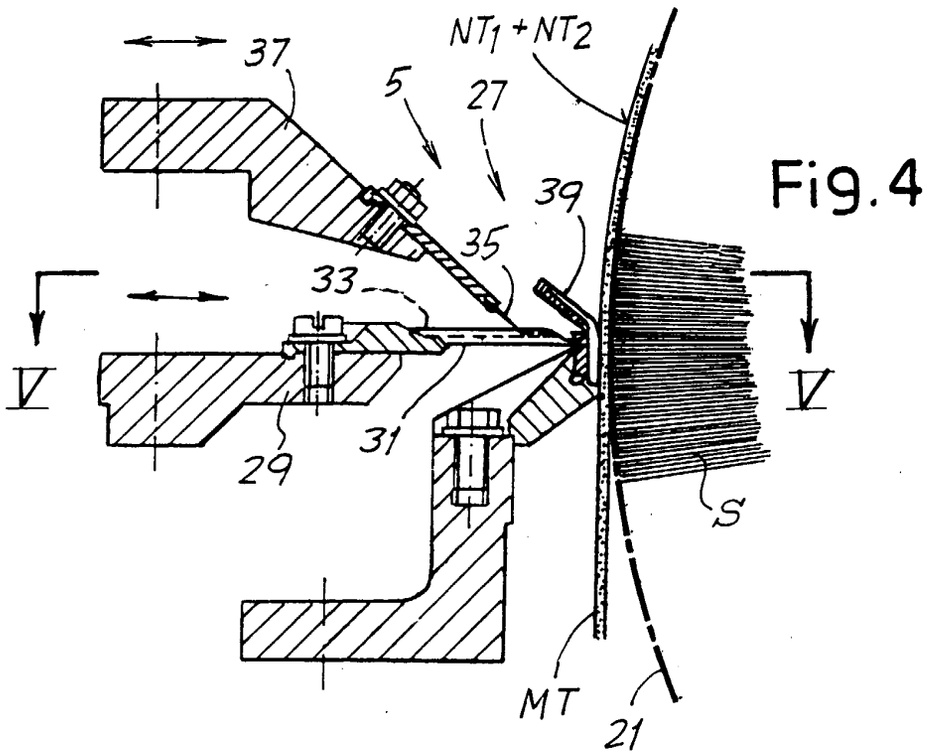


Fig.4

Fig.5

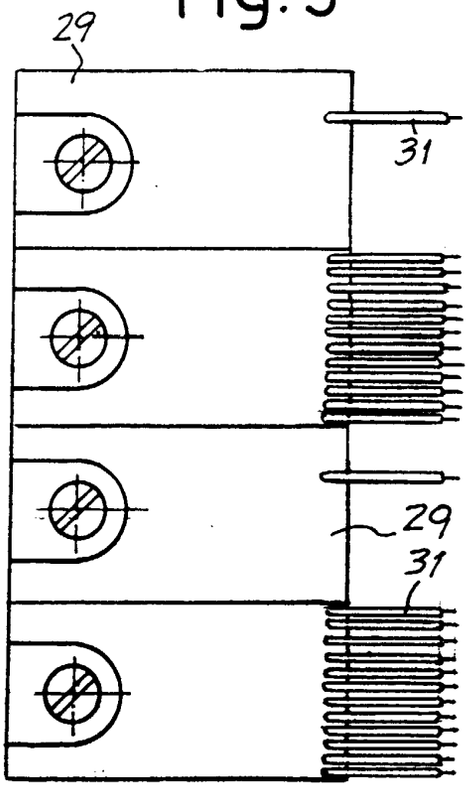
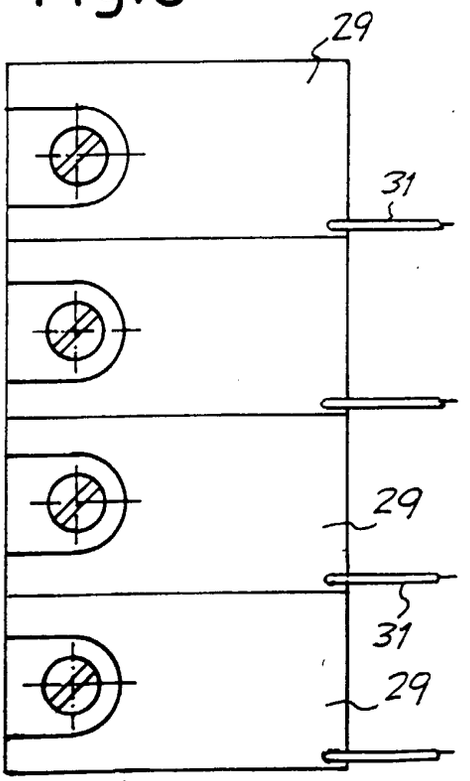


Fig.6



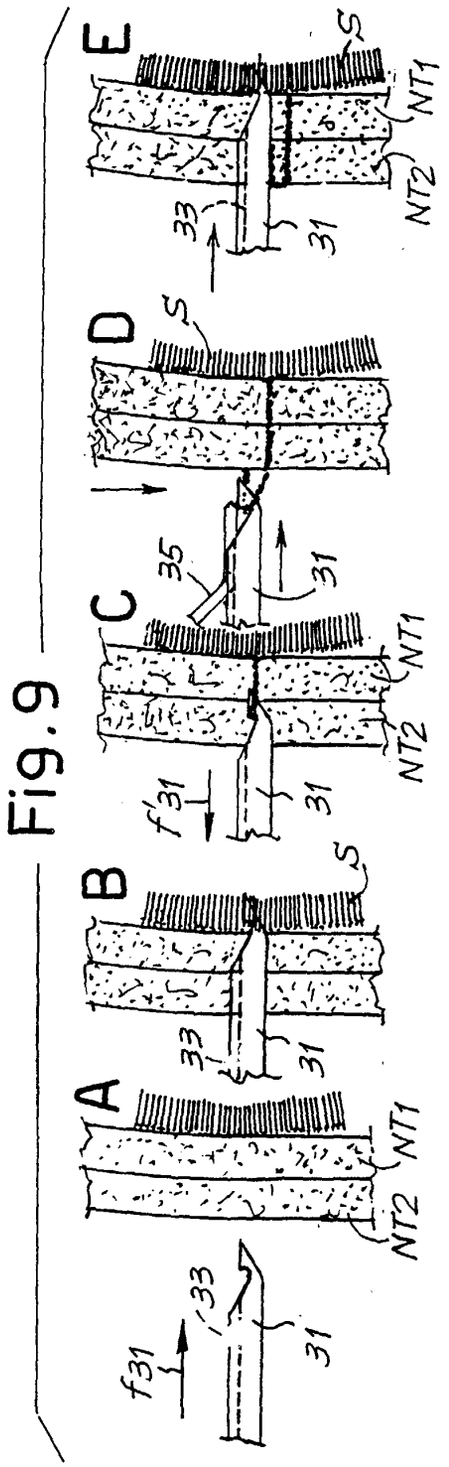


Fig.9

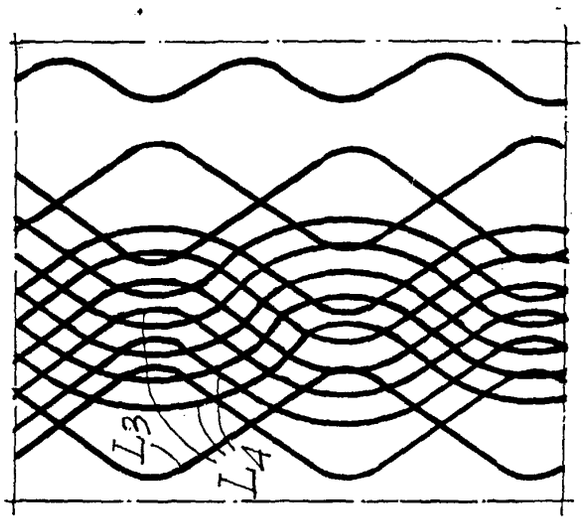


Fig.8

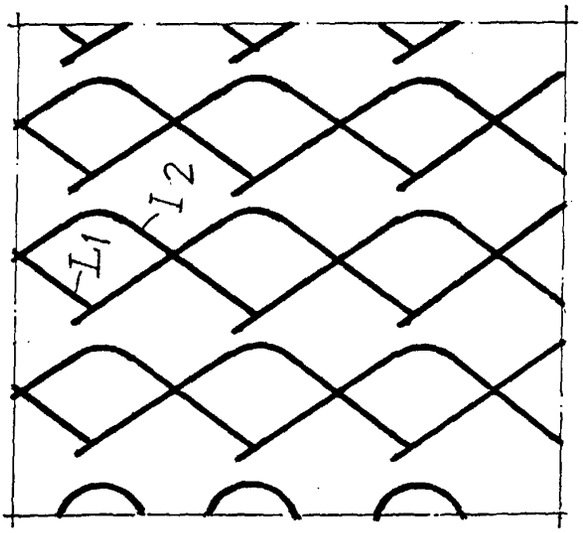


Fig.7

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Application Number
EP 03 42 5183

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Place of search	Date of completion of the search	Examiner
The Hague	24 July 2003	Barathe, R.

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