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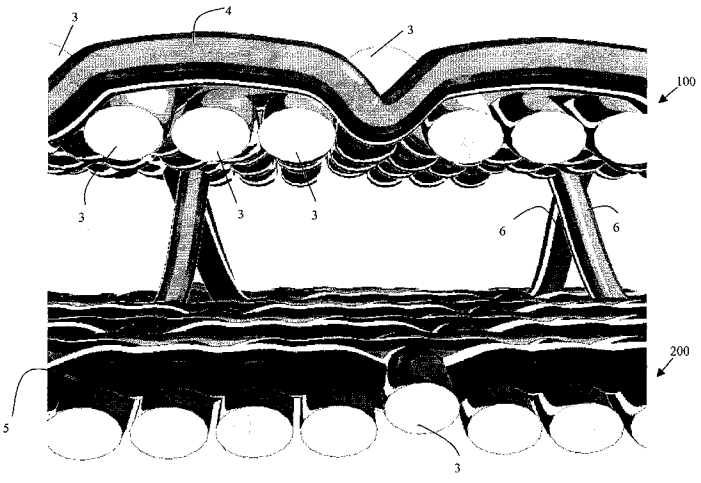
(54) **Title:** METHOD FOR WEAVING FABRICS WITH WOVEN EMBROIDERY EFFECT



(57) **Abstract:** This invention relates to a method for producing fabrics with an embroidery effect comprising a base fabric, said base fabric being manufactured on a weaving device by introducing first weft yarns (1) between the warp yarns (a,b,c,d) of a series of warp yarn systems in successive sheds, and second weft yarns (2) being introduced in such a way with respect to the warp yarns (a,b,c,d) that these second weft yarns (2) create an embroidery effect on an effect side of the base fabric, characterized in that at least two base fabrics (100, 200) are woven simultaneously, wherein one set of weft yams, comprising one first weft yarn (1) per base fabric and at least one second weft yarn (2), is introduced in a series of successive weft cycles, in such a manner that each second weft yarn (2) creates an embroidery effect over at least part of its path in at least one base fabric (100, 200), and wherein at least one second weft yarn (2) is introduced with respect to the warp yarns in such a manner that different parts thereof create an embroidery effect in at least two different base fabrics (100,200).

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METHOD FOR WEAVING FABRICS WITH WOVEN EMBROIDERY EFFECT

The present invention relates on the one hand to a method for producing fabrics with an embroidery effect comprising a base fabric, said base fabric being manufactured on a weaving device by introducing first weft yarns between the warp yarns of a series of warp yarn systems in successive sheds, and second weft yarns being introduced in such a way with respect to the warp yarns that these second weft yarns create an embroidery effect on an effect side of the base fabric.

There is a growing trend for the application of figure-forming and preferably multicoloured figure-forming on fabrics. One of the known techniques for this is embroidery. This technique offers the possibility to apply figure-forming and multicoloured figure-forming locally on a fabric. Another trend in production is to finish a product as far as possible in one operation.

Embroidery comprises creating an effect on a fabric by moving a yarn in and out of a fabric with a needle, so that the yarn covers the fabric and the desired design is achieved. To this end, the fabric is first produced and in a subsequent step the embroidering operation is performed. The embroidering operation may be carried out by machine on a separate machine or by means of a manual operation. This way of working has the drawback that, following weaving, an additional operation is required in which the woven cloth has to be fitted on an embroidering machine and has to be fed to the embroidering needle or needles in a controlled manner in order to create the embroidery effect at the desired location in the fabric. Deformation of the fabric, for example as a result of elasticity, makes it quite difficult in this case to apply the embroidery effect precisely at the desired location.

The abovementioned drawbacks are solved in the prior art by alternating a weft yarn for forming the base fabric with one or more weft yarns for forming a figure using a weaving device, in which warp and weft yarns form a fabric. The figure-forming weft yarns are introduced in such a manner that they come to the surface of the fabric locally and thus create an effect which resembles that of an embroidered effect. At the locations where figure-forming is desired, the figure-forming weft yarns are laid

over the warp yarns and tied up on the used side (effect side) of the fabric. When the figure-forming weft yarns are not figure-forming, these weft yarns float under the warp yarns on the unused side of the fabric.

This method has the advantage that the base fabric comprising an effect resembling an embroidered effect is woven in one operation. However, with this method it is necessary, if n colours are used over the width of the fabric, to introduce n + 1 weft yarns in order to add one fabric line to the base fabric: one weft yarn serves to form the base fabric (first weft yarn) and n wefts (one per colour) (second weft yarns) serve to enable to make each colour visible over the width of the fabric. The weft yarn of each of the n colours forms a figure over part of the width of the fabric on the used side (effect side) of the fabric and floats freely over the rest of the width on the unused side of the fabric. The fact that these second weft yarns float freely on the unused side means that large quantities of these figure-forming weft yarns are used which do not contribute to the figure-forming and which, in addition, usually have to be subsequently removed. This method results in both a waste of raw materials and a risk of lower efficiency of the device as the course of long floating weft yarns is not controlled in a strict manner and these weft yarns may assume positions which may lead to disruption in the weaving process.

It is an object of the invention to provide an improved method for creating embroidery effects in fabrics during weaving with higher efficiency, less waste of material and more design possibilities than has been possible to date with the known methods.

The object of the invention is achieved by providing a method for producing fabrics with an embroidery effect comprising a base fabric, said base fabric being manufactured on a weaving device by introducing first weft yarns between the warp yarns of a series of warp yarn systems in successive sheds, and second weft yarns being introduced in such a way with respect to the warp yarns that these second weft yarns create an embroidery effect on an effect side of the base fabric. The method according to the invention is characterized by the fact that at least two base fabrics are woven simultaneously, wherein one set of weft yarns, comprising one

first weft yarn per base fabric and at least one second weft yarn, is introduced in a series of successive weft cycles, in such a manner that each second weft yarn creates an embroidery effect over at least part of its path in at least one base fabric, and wherein at least one second weft yarn is introduced with respect to the warp yarns in such a manner that different parts thereof create an embroidery effect in at least two different base fabrics.

In the context of this patent application, the term fabric line is intended to mean the entirety of the weft cycles which are added to a fabric during introduction of a set of weft yarns as defined above (one first weft yarn per base fabric and one or more second weft yarn(s) which create an embroidery effect in this fabric line).

Compared to the prior art, this method according to the invention offers the following advantages:

- Several fabrics are woven simultaneously rather than fabric by fabric;

- By using second weft yarns which create the embroidery effect in several of the simultaneously woven fabrics during one weft introduction, the number of weft threads introduced per fabric for forming a fabric line is reduced and the efficiency of the weaving process is increased. If, for example, two fabrics are woven simultaneously, with the same two weft yarns creating an embroidery effect in certain zones which extend in the weft direction in each of the two fabrics and which do not overlap, then, according to the prior art method, fabric by fabric: n + 1 = 3 weft introductions are required in order to add one fabric line to the base fabric, while the method according to the invention requires the weft introduction of a set of weft yarns consisting of two first weft yarns (one per base fabric) and two second weft yarns (one per colour) used in order to create the embroidery effect, which, taken together, means four weft threads to be introduced or two weft introductions per fabric, thus resulting in an increase in weaving efficiency in these zones of 33 %;
- As second weft yarns create an embroidery effect over several fabrics when the figure-forming does not overlap, this means that the lost yarn which floats

during weaving fabric by fabric on the side of the fabric where no effect is being created, now is partially used for creating an embroidery effect on a second fabric. This may result in a considerable saving in raw material compared to the known fabric-by-fabric weaving. In addition, less material has to be scraped away.

- The investment costs for two separately operating weaving devices which weave fabric by fabric are higher than the investment costs for one weaving device which can weave several fabrics simultaneously.

According to a preferred method according to the invention, a set of weft yarns comprises at least two second weft yarns with a different colour, effect and/or appearance, with said second weft yarns each creating an embroidery effect in a different base fabric at an identical position in the weft direction.

As the different parts of at least one second weft yarn have to create an embroidery effect in at least two different base fabrics, such a weft yarn can only be used to create an embroidery effect in different ones of the simultaneously woven base fabrics if the zones in which the weft yarn has to create an embroidery effect do not overlap in the weft direction. Since embroidery effects usually occur locally and to a limited extent in the fabric and in view of the advantages of the method according to the invention, it is definitely worthwhile to take this limitation into account when designing the products and to distribute the desired embroidery effects over the fabric in such a manner that when several fabrics are woven simultaneously the same type of weft yarn does not have to create an embroidery effect in the same zone in the weft direction in several fabrics simultaneously.

In a more preferred method, the position which the second weft yarns have in the base fabrics is determined selectively based on forming a predetermined pattern or figure.

According to a particular method according to the invention, the second weft yarns alternately create a part of the predetermined figure or pattern in the different base fabrics.

According to a most preferred method, the first weft yarns of the set of weft yarns have colours, effects and/or appearances which differ from one another. By using a different colour for the first weft yarn in one base fabric to that for the first weft yarn in another base fabric, a greater variation in effects is achieved between the various effect sides of the base fabrics.

As the base fabrics are connected to one another, the second weft yarns, according to a preferred method, the different parts of which create an embroidery effect in at least two different base fabrics, are cut between these fabrics. After a base fabric has been separated from the other base fabrics by cutting, the floating weft yarns on the non-effect side can be scraped away and removed, as is known in the prior art from face-to-face weaving where fabrics are formed which have all non–figure-forming pile yarns on the back of one of the formed fabrics and these non-figure-forming pile yarns were subsequently scraped off on a separate device.

With another preferred method according to the invention, the second weft yarns, the different parts of which create an embroidery effect in at least two different base fabrics, are not cut between these fabrics, so that a spacer fabric is formed. Preferably at least one filler yarn is provided per warp yarn system, which filler yarn is situated between said base fabrics.

According to a more preferred method according to the invention, when two base fabrics are woven simultaneously, the second weft yarns, when they are not creating an embroidery effect in one of said base fabrics, are positioned between the base fabrics in such a manner that the embroidery effect is created on the fabric sides of the base fabrics turned away from one another. This has the advantage that when cutting between the two base fabrics, no embroidery effects can be touched and become damaged.

According to a particular method for weaving fabrics with a woven embroidery effect, the number and/or colour of the second weft yarns within a set of weft yarns can be varied in the warp direction, depending on the embroidery effects to be produced in

the various fabrics. This is determined in this case by the flexibility of the weft introduction for introducing different colours as weft threads into the fabric. Where the embroidery effects of the same colour to be woven overlap in the weft direction it is possible to provide the second weft yarns in question twice in the set, in particular, over the number of overlapping cycles.

According to a particularly advantageous method according to the invention, the same embroidery effect pattern is woven into the different base fabrics, with said fabrics being woven in a position in which the embroidery effect patterns created in the different fabrics are offset with respect to one another so that, per fabric line, each colour, effect and/or appearance which has to be produced by a second weft yarn only has to create an embroidery effect in one base fabric simultaneously. By means of applying a displacement in the warp direction, in the weft direction or a displacement resulting from a combination of said directions, it is possible to weave virtually identical fabrics with mirrored embroidery effects if the embroidery effects are sufficiently far apart so that a displacement prevents second weft yarns having to create an embroidery effect at an identical position in the weft direction in more than one base fabric. The displacement of the embroidery effect pattern in the weft direction takes place in particular as all second weft yarns are in this way used in the different base fabrics so that both the weaving efficiency and the consumption of yarn are favourably affected. In the case of two base fabrics being woven one above the other, on the one hand, for example, the weaving efficiency will increase as each weft thread replaces two weft threads compared to the prior art methods which weave fabric by fabric. On the other hand, the consumption of yarn will decrease as, with each weft yarn, the floating parts of the second weft yarns which do not create an embroidery effect in the one base fabric are partly used in order to create an embroidery effect in the other base fabric. The consumption of material for second weft yarns can in this case be halved when two fabrics are woven simultaneously.

With another preferred method according to the invention, the same pattern shape is woven simultaneously into the different base fabrics as embroidery effect pattern, with the embroidery effect pattern created in both fabrics only differing in colour, effect and/or appearance from the second weft yarns used. Preferably, the different

second weft yarns, which are used in order to produce the same pattern shape in the different base fabrics, are alternated during successive fabric lines so that virtually the same embroidery effect pattern is produced in the different base fabrics. This way of working is particularly advantageous if the embroidery pattern in the one base fabric can be derived from the embroidery pattern in the other fabric by applying a colour transformation in which each colour, effect and/or appearance of the pattern shape in the one base fabric is replaced in the same pattern shape in the other fabric by another colour, effect and/or appearance which is used in the one base fabric in another pattern shape.

In the case of a busy jacquard pattern as embroidery pattern, this means that the two base fabrics are well connected to one another. The term busy jacquard pattern is understood to mean that the embroidery pattern is created by a plurality of lines in free forms, with the lines being formed by colour transitions.

The colour effects in both base fabrics can be made to be almost identical by alternating two colours with one another as weft threads in the first fabric in successive fabric lines for colour effect. By then alternating the colours in the other fabric in opposition to the one base fabric, virtually identical embroidery patterns are produced in both fabrics (which are only offset by one weft thread with respect to one another).

According to a more preferred method according to the invention, a second weft yarn is tied up in one base fabric with the warp yarns of the respective base fabric according to a known weave pattern, such as for example plain weave, when the creation of the embroidery effect starts or finishes. This has the advantage that the stability of the embroidery effect is maintained, even after the floating parts of the second weft yarns have been scraped away.

In a most preferred method, the warp yarns are positioned by means of an electronic dobby device, which makes it possible to produce limited and repetitive embroidery effects as designs in the base fabrics.

According to another preferred method, the warp yarns are positioned by means of a jacquard device. The warp yarns are preferably positioned in the shed, as a result of which free forms in accordance with an embroidered effect can be produced in the base fabrics.

The present patent application furthermore relates to a weaving device which is designed for carrying out a method as described above. Said weaving device is preferably a flat weaving device.

In a preferred embodiment of the weaving device according to the invention, said weaving device comprises means for turning at least one of the base fabrics over while the base fabrics produced are let off. This offers the opportunity to provide an inspection zone, where the base fabric which is on the underside during weaving can be inspected visually. In particular, said weaving device is provided with an inspection system on the basis of camera technology for inspecting one or more of the base fabrics.

This invention furthermore relates to a fabric which is woven according to one of the above-described methods. In particular, the simultaneously woven base fabrics together exhibit an embroidery effect pattern, in which, per fabric line, each colour, effect and/or appearance, which has been produced by a second weft yarn, only simultaneously creates an embroidery effect in one of said base fabrics.

Below, the method according to the present invention is explained in more detail and a number of preferred methods and fabrics are described in detail by way of example. The only purpose of this is to explain the general principles and said features and advantages of the invention further by means of a number of concrete examples. It should be clear that nothing in this description can therefore be interpreted as limiting the scope of the patent rights claimed in the claims or as limiting the area of application of this invention.

In the following description, reference numerals are used to refer to the attached drawings, in which:

- *Figures 1 to 9 show an illustration of the sheds which the warp yarns of one warp yarn system can assume in order to form a fabric according to a method according to the invention in which a, b, c and d are the warp yarns of one warp yarn system, two for the top fabric and two for the bottom fabric;*
  - *Figures 1 and 2 show the shed for introducing a first weft yarn (1) in the bottom fabric;*
  - *Figures 3 and 4 show the shed for introducing a first weft yarn (1) in the top fabric;*
- *Figures 5, 6 and 7 show the sheds for introducing second weft yarns (2) in which*
  - *Figure 5 shows the shed by means of which a second weft yarn (2) will assume a floating position between the two fabrics;*
  - *Figure 6 shows the shed by means of which a second weft yarn (2) will create an embroidery effect in the top fabric;*
  - *Figure 7 shows the shed by means of which a second weft yarn (2) will create an embroidery effect in the bottom fabric;*
  - *Figures 8 and 9 show a shed by means of which a second weft yarn (2) is tied up in the bottom fabric and the top fabric, respectively, at the transition from an embroidery effect to a floating effect in order to sew the embroidery effect into the base fabric, as it were;*
- *Figures 10 to 19 show an illustration of sheds as used during weaving according to a method according to the invention three fabrics one above the other;*
- *Figure 20 shows a cross section through a fabric structure according to the invention in which two fabrics have been woven one above the other;*
- *Figures 21 a, b and c show a diagrammatic illustration of a fabric structure woven according to a method according to the invention;*
- *Figures 22 a, b and c show a diagrammatic illustration of a fabric structure woven according to a method according to the invention.*

The present invention relates to a method for producing fabrics with an embroidery effect comprising a base fabric, said base fabric being manufactured on a weaving

device by introducing first weft yarns (1) between the warp yarns (a,b,c,d) of a series of warp yarn systems in successive sheds, and second weft yarns (2) being introduced in such a way with respect to the warp yarns (a,b,c,d) that these second weft yarns (2) create an embroidery effect on an effect side of the base fabric characterized by the fact that at least two base fabrics (100, 200) are woven simultaneously, wherein a set of weft yarns, comprising one first weft yarn (1) per base fabric and at least one second weft yarn (2), is introduced in a series of successive weft cycles, in such a manner that each second weft yarn (2) creates an embroidery effect over at least part of its path in at least one base fabric (100, 200), and wherein at least one second weft yarn (2) is introduced with respect to the warp yarns in such a manner that different parts thereof create an embroidery effect in at least two different base fabrics (100, 200).

The sheds that the warp yarns of one warp yarn system can assume in order to form a fabric with embroidery effects according to the method according to the invention are illustrated in Figures 1 to 9. The first (1) or second (2) weft yarns are introduced at the weft inserion level (i). After a weft yarn has been inserted, a weaving reed (not illustrated in the figures) moves the weft thread against the fabric fell (j), following which the warp yarns (a-d) can assume a new position in the shed, in this case controlled by an electronic dobby or by a jacquard device.

In order to produce an embroidery effect, a set of weft yarns is introduced for both fabrics and for each fabric line to be formed, comprising one first weft yarn (1) for each base fabric to be formed and a number of second weft yarns (2), with at least one second weft yarn (2) over the successive warp yarn systems in the weft direction at least extending through one shed as illustrated in Figure 6 and one shed as illustrated in Figure 7. In this case, this second weft yarn (2) may optionally extend through a number of sheds as illustrated in Figures 5, 8 and 9.

Figures 10 to 19 illustrate sheds which the warp yarns of one warp yarn system can assume in order to produce a fabric with embroidery effects according to the method according to the invention when three base fabrics are woven one above the other.

In this case as well, the first (1) or second (2) weft yarns are introduced at the weft insertion level (i) and, after a weft thread has been inserted, a weaving reed (not illustrated in the figures) moves the weft thread against the fabric fell (j), following which the warp yarns (k-p) can assume a new position in the shed, in this case controlled by an electronic dobby or by a jacquard device.

In order to produce an embroidery effect, a set of weft yarns is introduced for both fabrics and for each fabric line to be formed, comprising one first weft yarn (1) for each base fabric to be formed and a number of second weft yarns (2), with at least one second weft yarn (2) over the successive warp yarn systems in the weft direction at least extending through two sheds as illustrated in Figures 16, 17, 18 or 19. First weft yarns extend through sheds as illustrated in Figures 10 to 15, with Figures 10 and 11 illustrating the sheds through which a first weft yarn which is tied up in the bottom base fabric extends, Figures 12 and 13 illustrating the sheds through which a first weft yarn which is tied up in the middle base fabric extends and Figures 14 and 15 illustrate the sheds through which a first weft yarn which is tied up in the top base fabric extends.

In the figures, creating an embroidery effect and floating is based on a preferred embodiment, in which the embroidery effect is produced on the sides turned away from one another (outer side) of the fabrics (100, 200) produced; floating takes place between the fabrics (100, 200).
If three fabrics are to be woven simultaneously and above one another according to the method according to the invention, a choice has to be made regarding the side of the middle fabric on which the embroidery effect will be created and on which side the second weft yarns (2) will float when they are not creating an embroidery effect.

Figure 20 is a cross section of a fabric structure obtained via the method according to the invention in which two fabrics (100, 200) woven above one another are represented which comprise warp yarns (3) and (second) weft yarns (4,5,6). The first weft yarns (1) for producing the bottom (200) and the top (100) fabric are not illustrated. Reference numeral (4) denotes a second weft yarn which creates an embroidery effect in a zone on the upper side of the top fabric (100), reference

numeral (5) denotes a second weft yarn in a zone where it floats between the two fabrics (100, 200), in other words on the non-effect side of the bottom fabric (200). Reference numeral (6) denotes second weft yarns in a zone in which they change from the top fabric (100) in which they have created an embroidery effect to the bottom fabric (200) in which they will create an embroidery effect or vice versa.

It is likewise possible to position the floating second weft yarns on the outer side of the fabrics and thus provide the embroidery effects on the sides facing one another. However, at the transition of the second weft yarns (2) from the top (100) fabric to the bottom fabric (200), on the side where the embroidery effects occur, a cut pile effect will be produced after cutting which will have to be removed in most cases. However, this cut pile effect produced may also have a decorative effect in combination with the embroidery effect.

Figures 21 a, b and c diagrammatically show a fabric which was produced using the method according to the present invention, with Figure 21a symbolically showing what both fabrics look like, seen from the top fabric. As embroidery effects, the fabric shows in the top fabric (100), on the one hand, two L–elements (7) having a first colour which alternate with a circle element (8) as embroidery element in a second colour. In the bottom fabric (200), circle elements (10) in the second colour are woven in as embroidery effect below the L–elements (7) in the top fabric (100) while an L–element (9), which can be seen from this position as a mirrored L–element, is woven as an embroidery effect in the first colour.

Figure 21b shows the top fabric (100) on its effect side. Figure 21c shows the bottom fabric (200) on its effect side, which means that it is shown as a mirror image with respect to the illustration in Figure 21a.

In these figures, the background colours of the top fabric (100) and the bottom fabric (200) are shown as being identical. According to the invention, these background colours for both fabrics may also be made different by choosing a different colour for the first weft yarn for the top fabric (100) than for the first weft yarn for the bottom fabric (200). As can be seen, in this figure, the embroidery effect pattern is offset in the weft direction as a result of which virtually identical fabrics with embroidery effects are woven as the embroidery effects are sufficiently far apart to prevent, by

means of an offset, second weft yarns having to create an embroidery effect in the same position in the weft direction in more than one fabric.

The offset of two embroidery patterns with different colours in the weft direction offers the advantage that in this manner both second weft yarns (2) are used in the different fabrics so that both the weaving efficiency and the consumption of material are favourably affected. Thus, for example, the weaving efficiency in this case increases because each weft thread of a second weft yarn (2) replaces two weft threads compared to the method known from the prior art (where weaving takes place fabric by fabric), thus reducing the consumption of material and in addition reducing the amount of waste yarn to be scraped away as the floating parts of the second weft yarns of each weft yarn which do not create an embroidery effect are partly used for creating an embroidery effect in the other fabric.
By distributing the desired embroidery effects over the fabric during the designing of the fabrics in such a manner that when two fabrics are woven simultaneously the same type of second weft yarn does not create an embroidery effect in the same zone in the weft direction in several fabrics, a fabric is obtained which is more efficient and more economical to weave if the method according to the invention is used.

Figures 22a, b and c reveal that the embroidery patterns do not necessarily have to alternate, but that it is likewise possible to weave embroidery patterns in both fabrics with identical figure-forming (which will, however, be the mirror image of one another after cutting), with this figure-forming having to be woven using a jacquard device with open harness. Here, open harness is intended to mean figure-forming in which one hook of the jacquard device only drives one heald at a time, so that there is no systematic repetitive pattern over the weaving width in the fabric, as is the case when several healds are driven simultaneously.

Figure 22a shows that, viewed from above, the top (100) and bottom fabric (200) have identical figures which have been filled with different colours (11,12,13,14). In this case, the preferred embodiment is illustrated, in which the colours (11,12) of the "cat" figure in the top fabric (100) correspond with the colours (11,12) of the "flower"

figure in the bottom fabric (200) and the colours (13,14) of the "flower" figure in the top fabric (100) correspond with the colours (13,14) of the "cat" figure in the bottom fabric (200). This makes it possible to use only one second weft yarn (2) per fabric line per colour (11,12,13,14) in order to produce an embroidery effect which has many colours on both sides of the double fabric or on each of the effect sides of the separated fabrics.

In the fabric illustrated here, the background colour, formed by the first weft yarns (1), is identical for both fabrics/fabric sides, but it is possible to provide more variation by providing two different first weft yarns (1) for both fabric parts (100, 200).

Figure 22b illustrates the effect side of the fabric produced on the upper side, while Figure 22c illustrates the effect side of the fabric produced on the bottom side. The effect side of the fabric produced on the bottom side is the mirror image of the same fabric part as illustrated in Figure 22a.

CLAIMS

1. Method for producing fabrics with an embroidery effect comprising a base fabric, said base fabric being manufactured on a weaving device by introducing first weft yarns (1) between the warp yarns (a,b,c,d) of a series of warp yarn systems in successive sheds, and second weft yarns (2) being introduced in such a way with respect to the warp yarns that these second weft yarns (2) create an embroidery effect on an effect side of the base fabric, **characterized in that** at least two base fabrics (100,200) are woven simultaneously, wherein one set of weft yarns, comprising one first weft yarn (1) per base fabric (100,200) and at least one second weft yarn (2), is introduced in a series of successive weft cycles, in such a manner that each second weft yarn (2) creates an embroidery effect over at least part of its path in at least one base fabric (100,200), and wherein at least one second weft yarn (2) is introduced with respect to the warp yarns (a,b,c,d) in such a manner that different parts thereof create an embroidery effect in at least two different base fabrics (100,200).

2. Method according to Claim 1, **characterized in that** a set of weft yarns comprises at least two second weft yarns (2) with a different colour, effect and/or appearance, with said second weft yarns (2) each creating an embroidery effect in a different base fabric (100,200) at an identical position in the weft direction.

3. Method according to Claim 1 or 2, **characterized in that** the position which the second weft yarns (2) have in the base fabrics (100,200) is determined selectively based on forming a predetermined pattern or figure.

4. Method according to one of the preceding claims, **characterized in that** the second weft yarns (2) alternately create a part of the predetermined figure or pattern in the different base fabrics (100,200).

5. Method according to one of the preceding claims, **characterized in that** the first weft yarns (1) of the set of weft yarns have colours, effects and/or appearances which differ from one another.

6. Method according to one of the preceding claims, **characterized in that** the second weft yarns (2), the different parts of which create an embroidery effect in at least two different base fabrics (100,200), are cut between these fabrics (100,200).

7. Method according to one of Claims 1 to 5, **characterized in that** the second weft yarns (2), the different parts of which create an embroidery effect in at least two different base fabrics (100,200), are not cut between these fabrics (100,200), so that a fabric is formed.

8. Method according to Claim 7, **characterized in that** at least one filler yarn is provided per warp yarn system, which filler yarn is situated between said base fabrics (100,200).

9. Method according to one of the preceding claims, **characterized in that** when two base fabrics (100,200) are woven simultaneously, the second weft yarns (2), when they are not creating an embroidery effect in one of said base fabrics (100,200), are positioned between the base fabrics (100,200) in such a manner that the embroidery effect is created on the fabric sides of the base fabrics (100,200) turned away from one another.

10. Method according to one of the preceding claims, **characterized in that** the number and/or colour of the second weft yarns (2) within a set of weft yarns can be varied in the warp direction.

11. Method according to one of the preceding claims, **characterized in that** the same embroidery effect pattern is woven into the different base fabrics (100,200), with said fabrics (100,200) being woven in a position in which the embroidery effect patterns created in the different fabrics (100,200) are offset

with respect to one another so that, per fabric line, each colour, effect and/or appearance which has to be produced by a second weft yarn (2) only has to create an embroidery effect in one base fabric (100,200) simultaneously.

12. Method according to Claim 11, **characterized in that** the offset of the embroidery effect pattern takes place in the weft direction.

13. Method according to one of Claims 1 to 10, **characterized in that** the same pattern shape is woven simultaneously into the different base fabrics (100,200) as embroidery effect pattern, with the embroidery effect pattern created in both fabrics (100,200) only differing in colour, effect and/or appearance from the second weft yarns (2) used.

14. Method according to Claim 13, **characterized in that** the different second weft yarns (2), which are used in order to produce the same pattern shape in the different base fabrics (100,200), are alternated during successive fabric lines so that virtually the same embroidery effect pattern is produced in the different base fabrics (100,200).

15. Method according to one of the preceding claims, **characterized in that** a second weft yarn (2) is tied up in one base fabric (100,200) with the warp yarns (a,b,c,d) of the respective base fabric (100,200) according to a known weave pattern, when the creation of the embroidery effect starts or finishes.

16. Method according to one of the preceding claims, **characterized in that** the warp yarns (a,b,c,d) are positioned by means of an electronic dobby device.

17. Method according to one of Claims 1 to 15, **characterized in that** the warp yarns (a,b,c,d) are positioned by means of a jacquard device.

18. Weaving device **characterized in that** the weaving device is designed for carrying out a method according to one of Claims 1 to 17.

19. Weaving device according to Claim 18, **characterized in that** said weaving device is a flat weaving device.

20. Flat weaving device according to Claim 19, **characterized in that** said weaving device comprises means for turning at least one of the base fabrics (100,200) over while the base fabrics (100,200) produced are let off.

21. Flat weaving device according to Claim 19 or 20, **characterized in that** said weaving device is provided with an inspection system on the basis of camera technology for inspecting one or more of the base fabrics (100,200).

22. Fabric, **characterized in that** the fabric is woven according to a method according to one of Claims 1 to 17.

23. Fabric according to Claim 22, **characterized in that** the simultaneously woven base fabrics (100,200) together exhibit an embroidery effect pattern, in which, per fabric line, each colour, effect and/or appearance, which has been produced by a second weft yarn (2), only simultaneously creates an embroidery effect in one of said base fabrics (100,200).

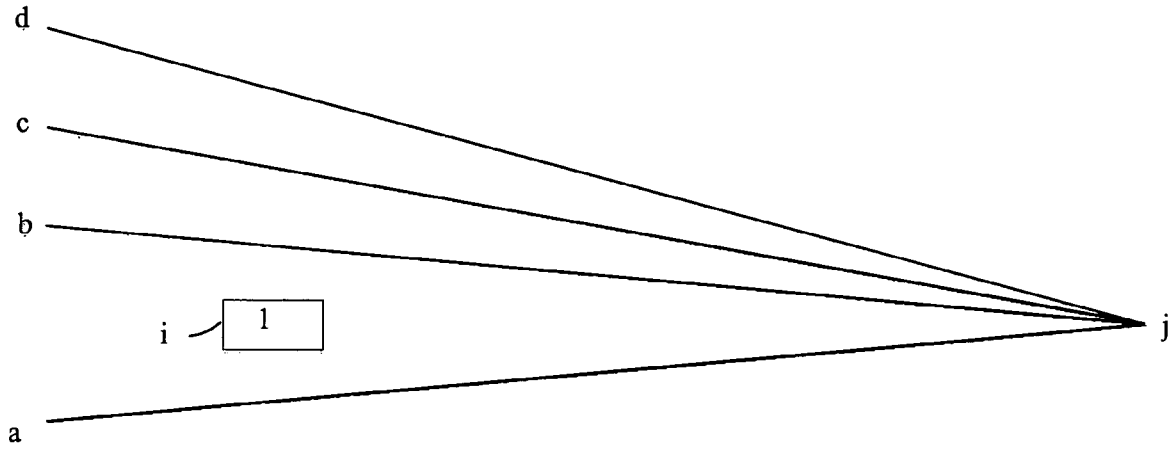

Fig. 1

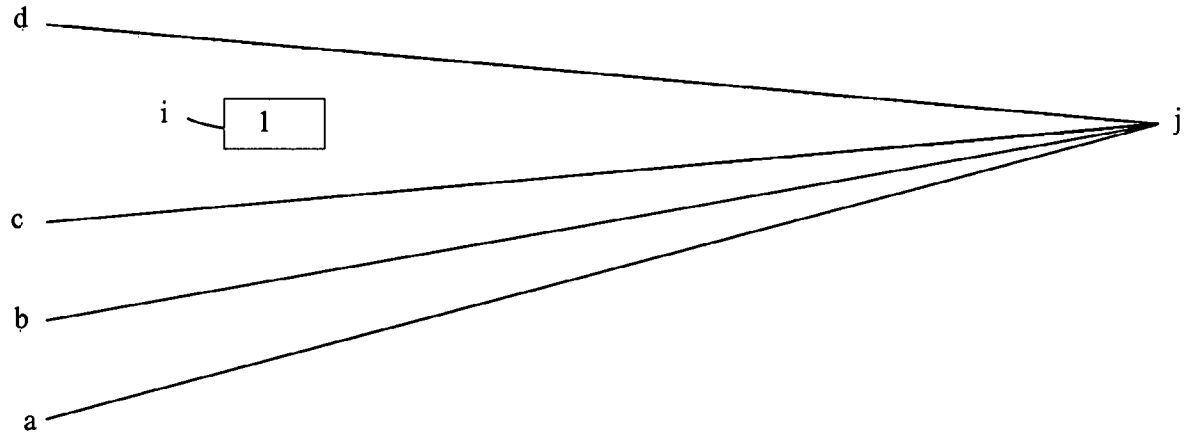

Fig. 3

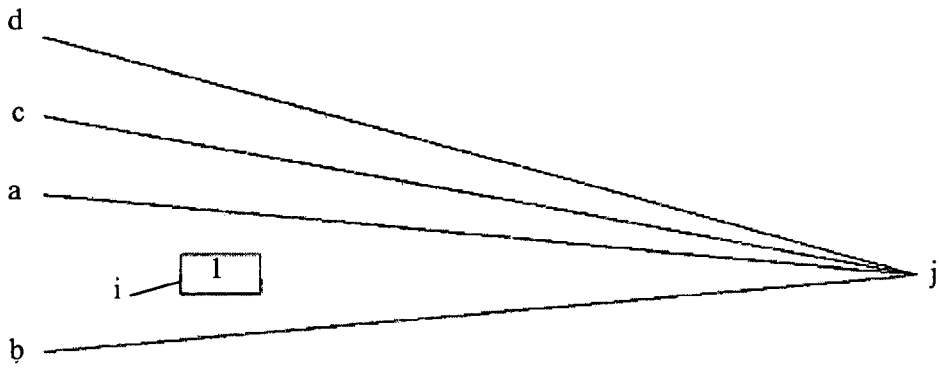

Fig. 2

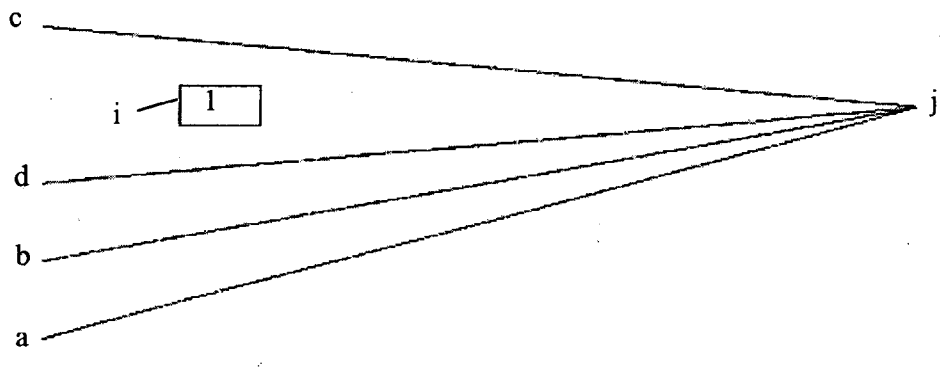

Fig. 4

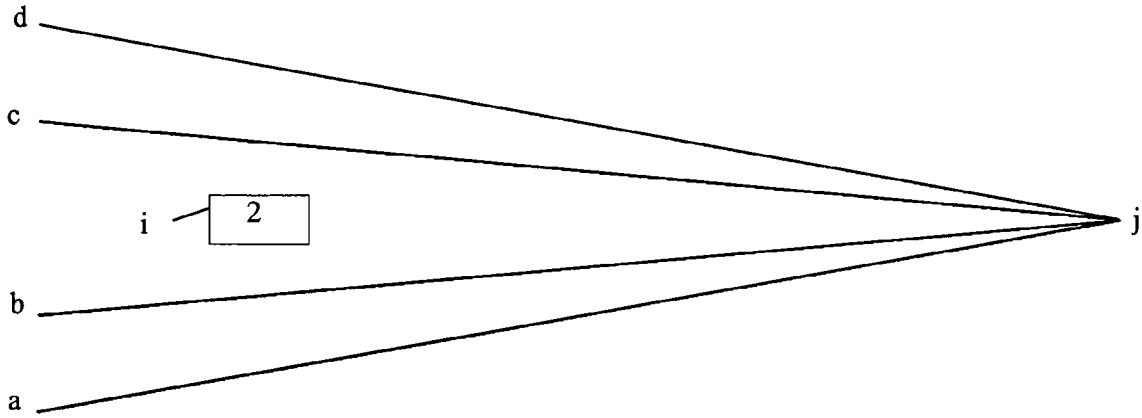

Fig. 5

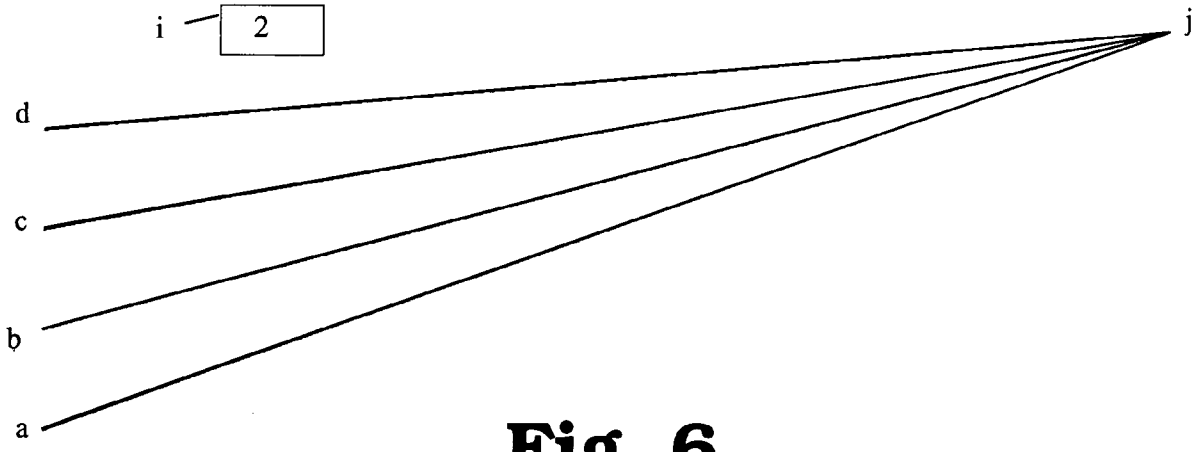

Fig. 6

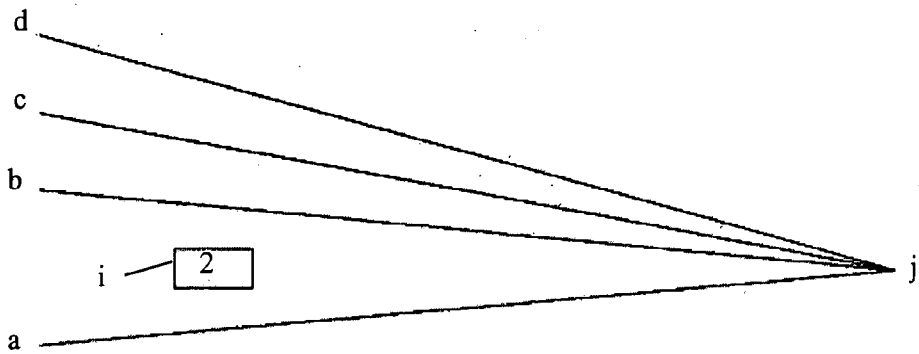

Fig. 8

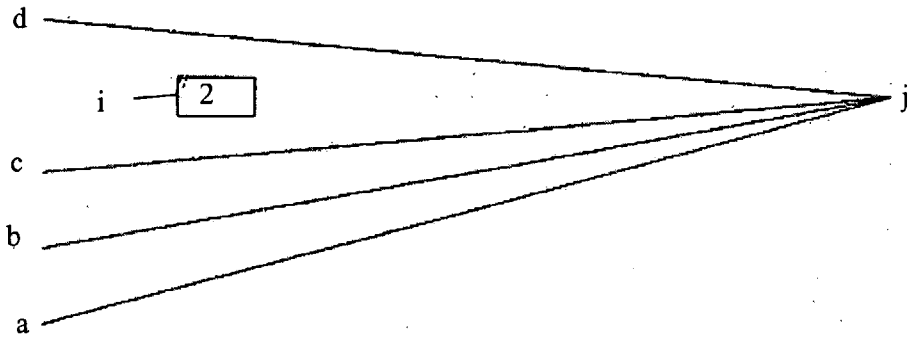

Fig. 9

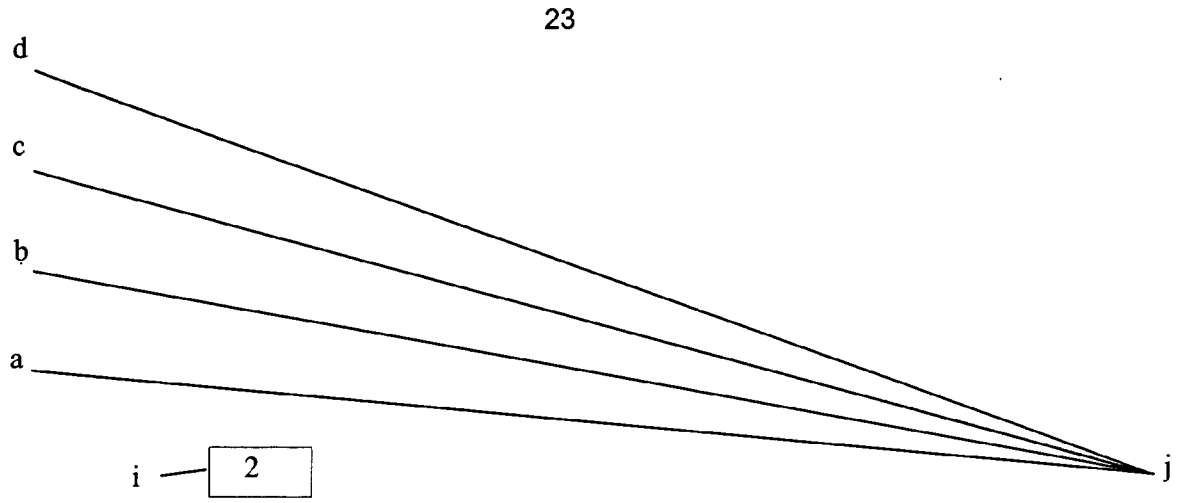

Fig. 7

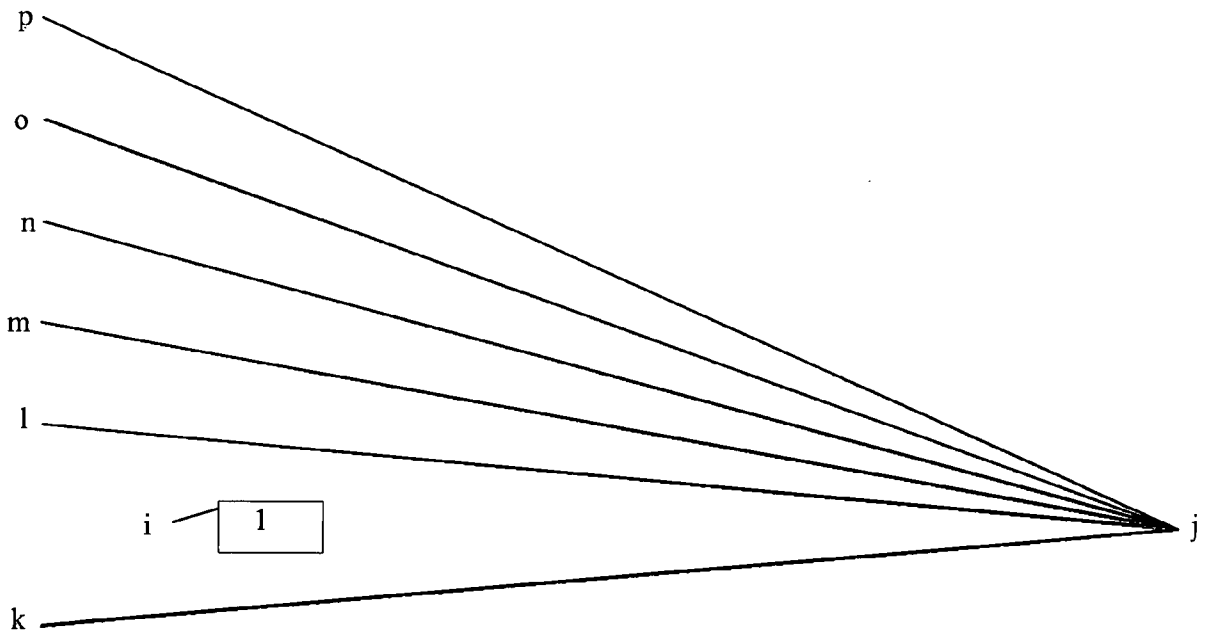

Fig. 10

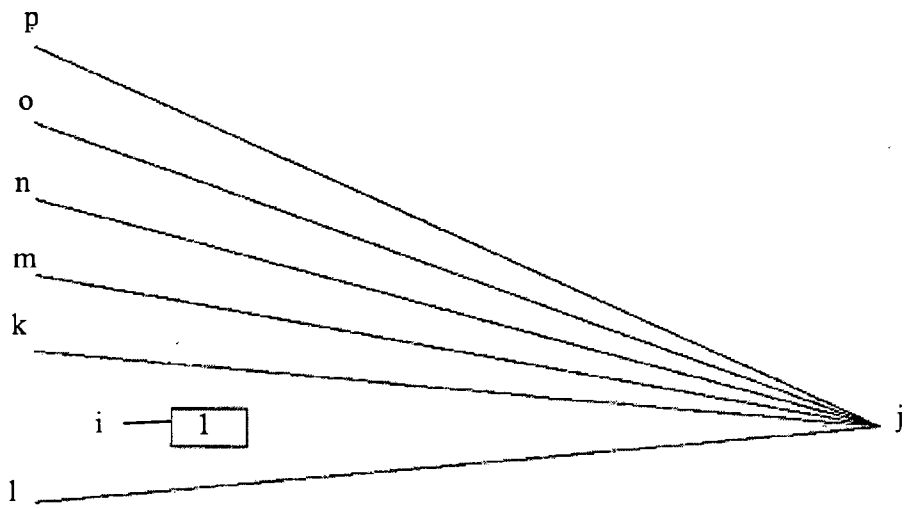

Fig. 11

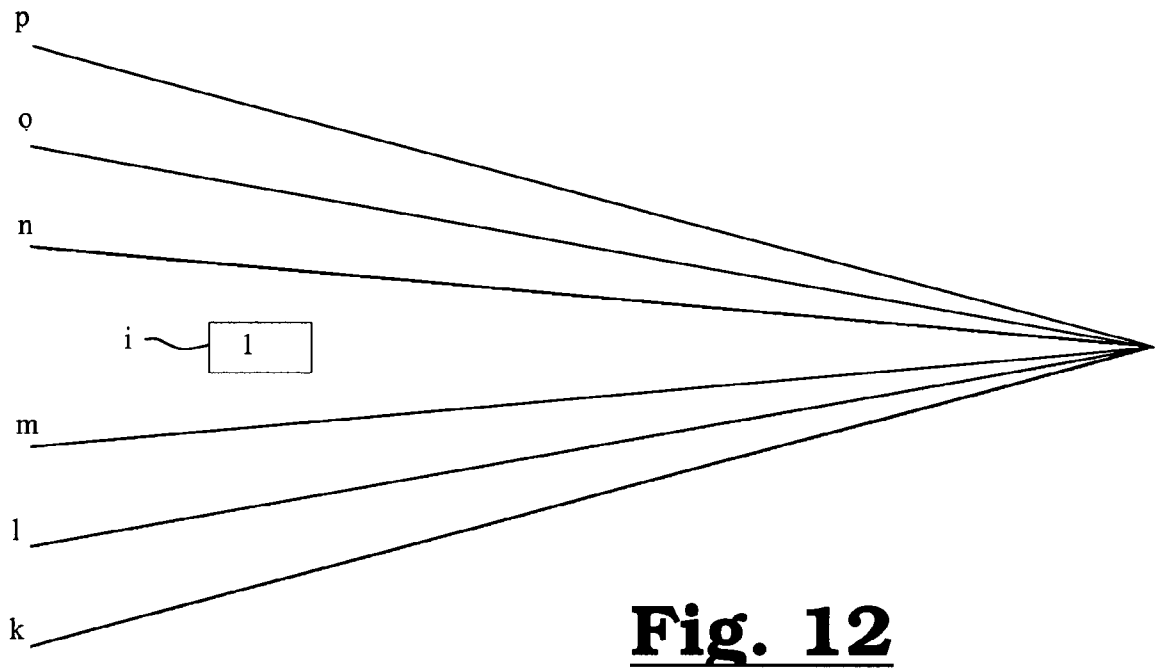

Fig. 12

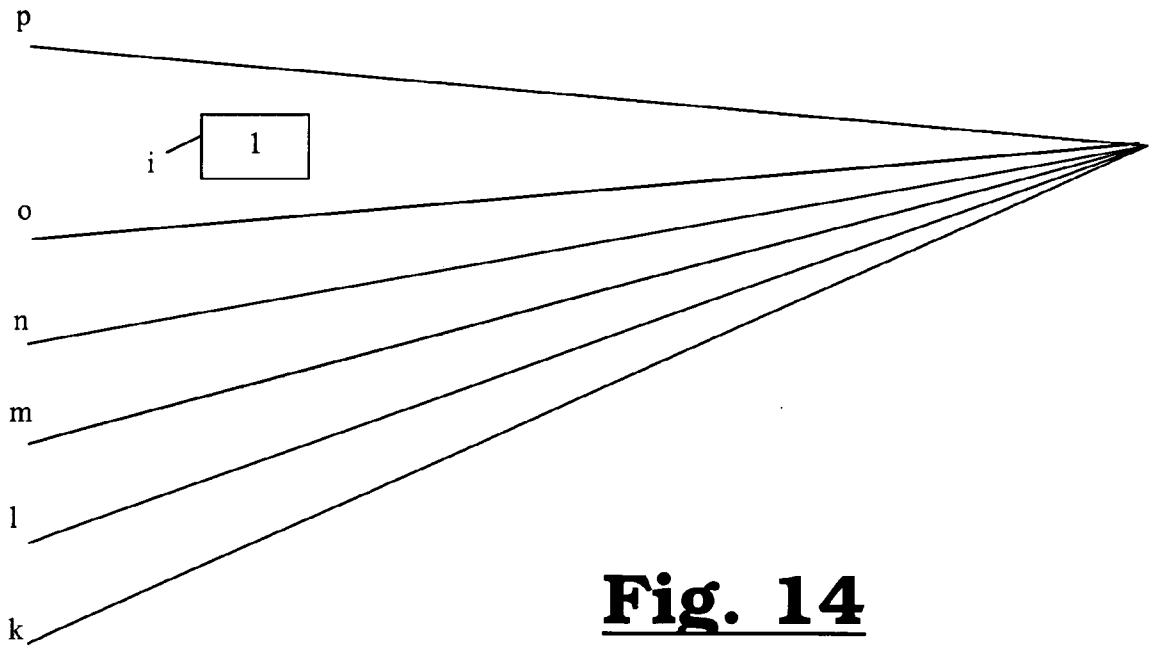

Fig. 14

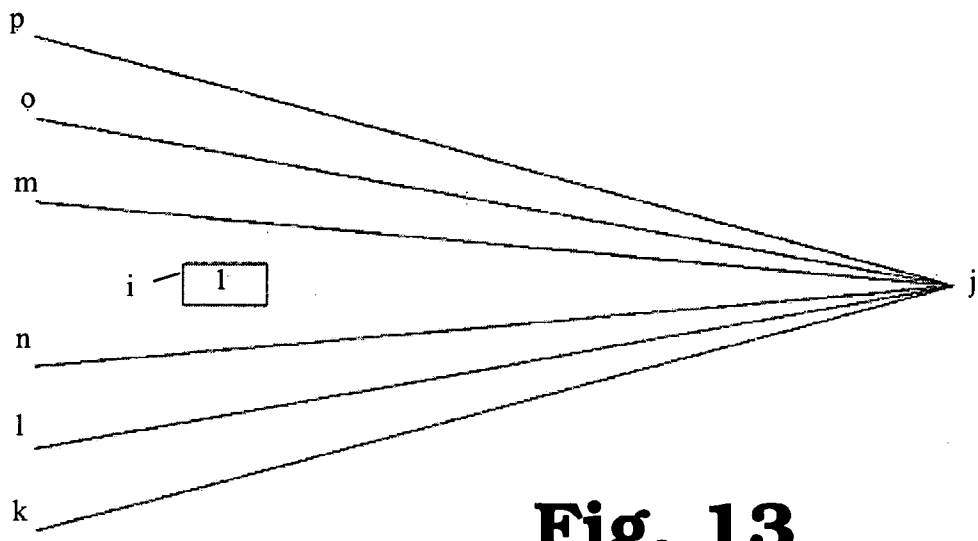

Fig. 13

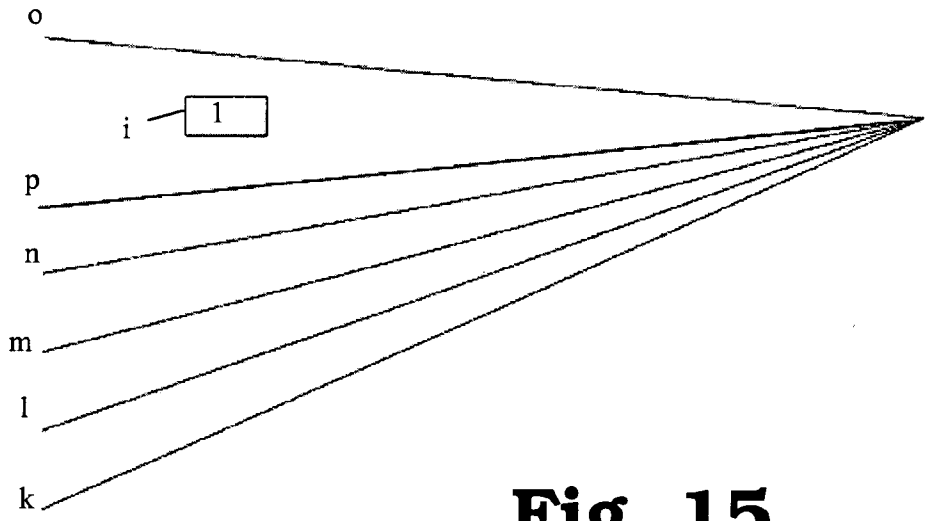

Fig. 15

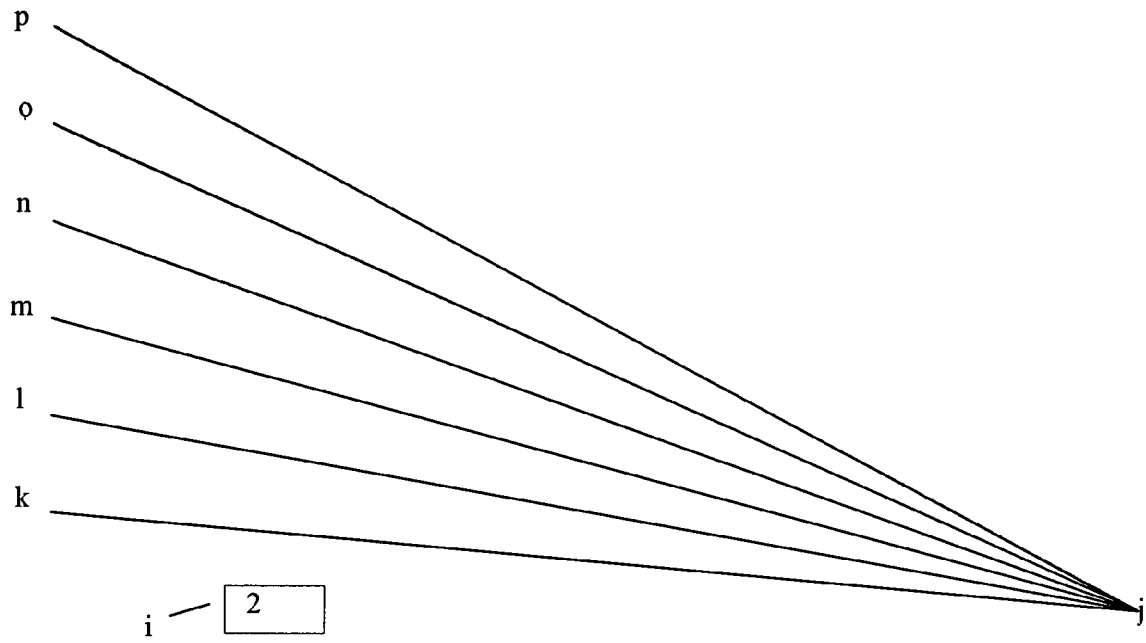

Fig. 16

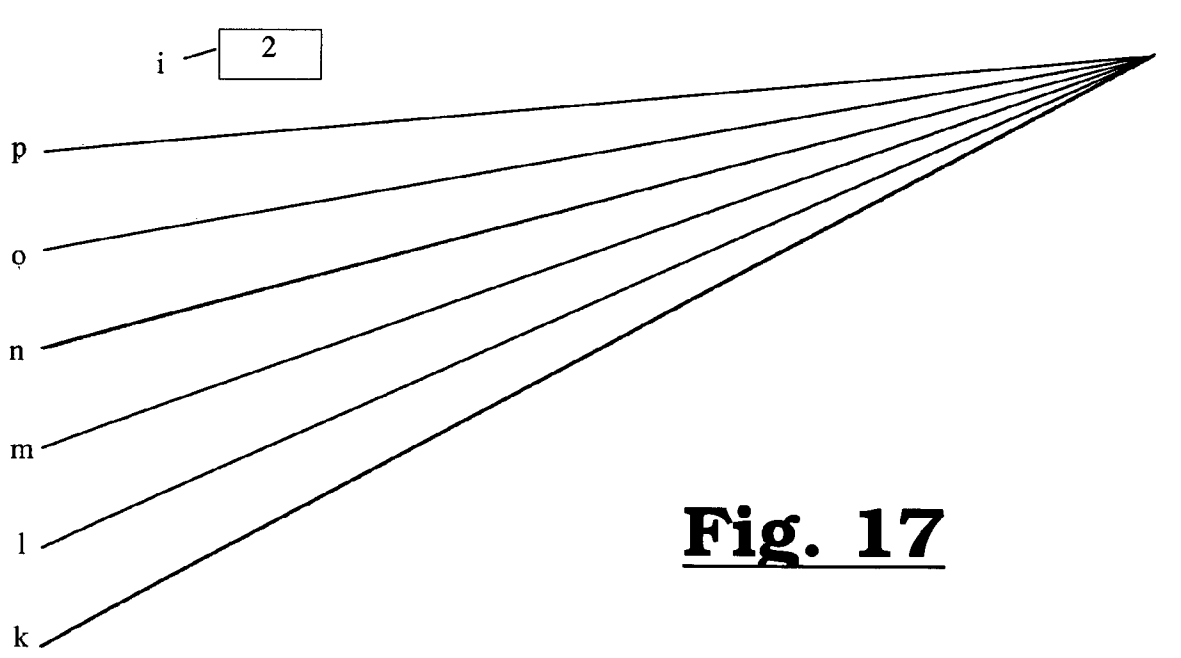

Fig. 17

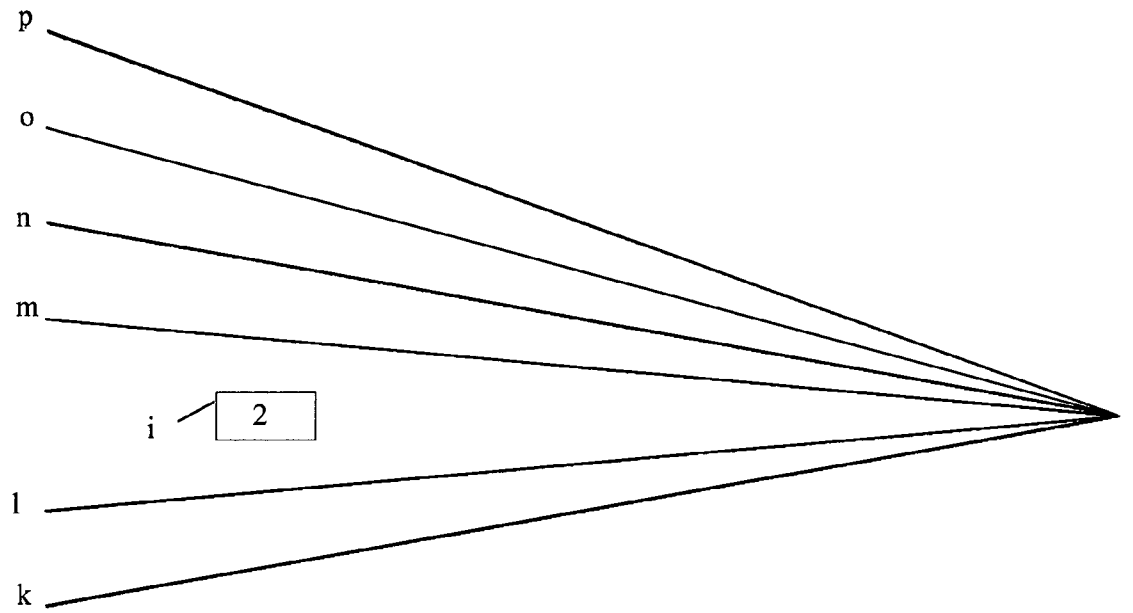

Fig. 18

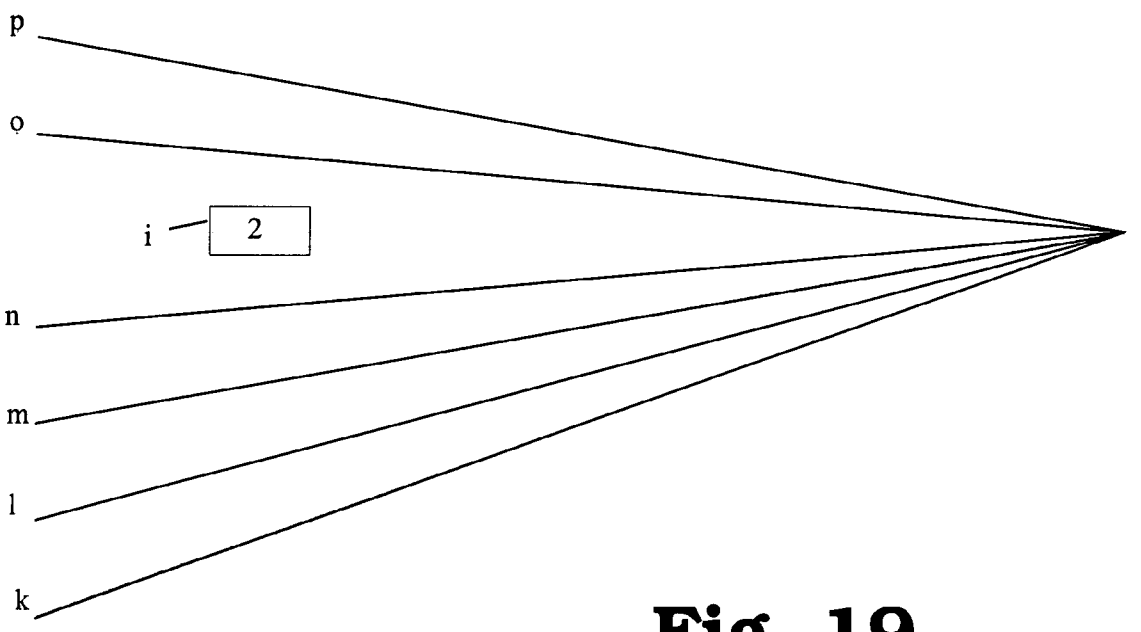

Fig. 19

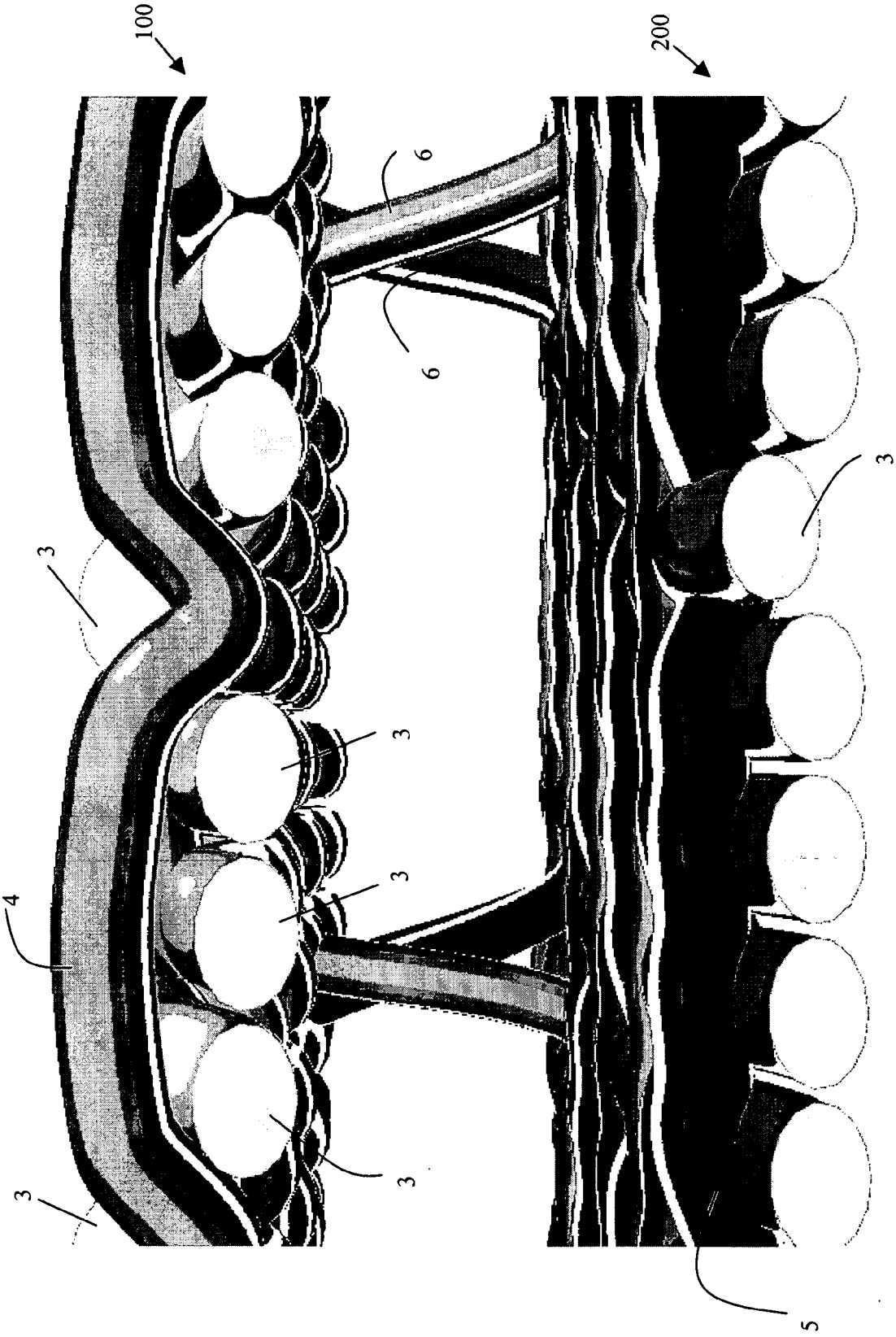

Fig. 20

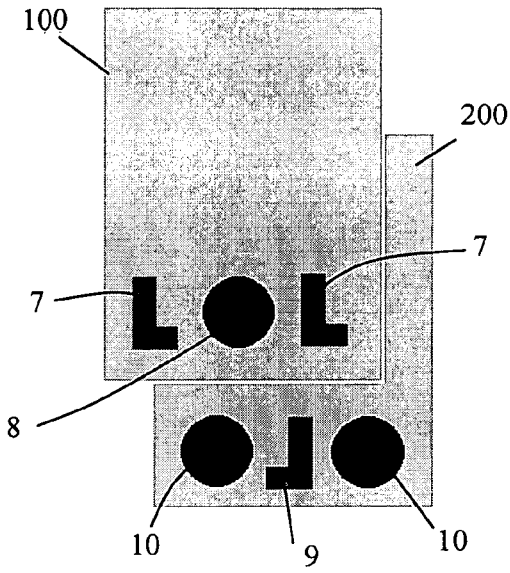

Fig. 21a

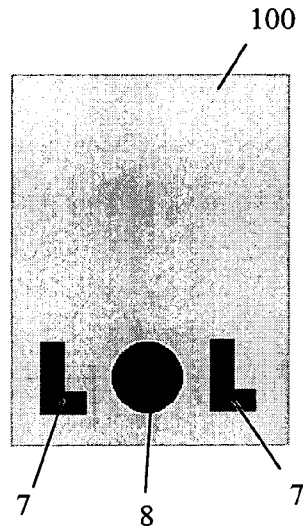

Fig. 21b

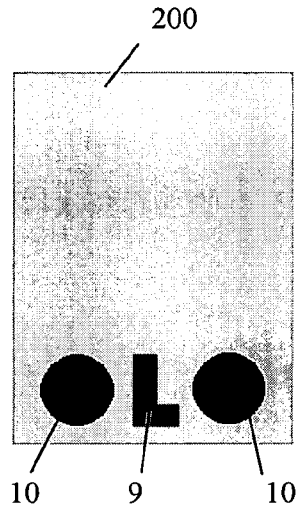

Fig. 21c

Fig. 21

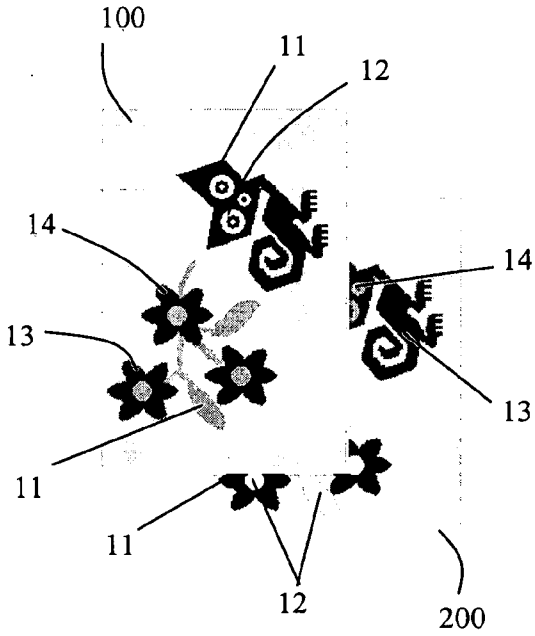

Fig. 22a

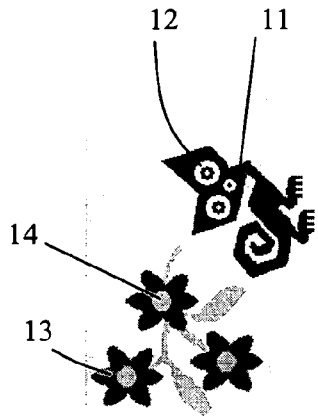

Fig. 22b

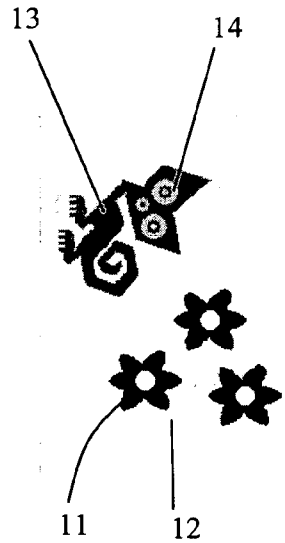

Fig. 22c

Fig. 22

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/004153

A. CLASSIFICATION OF SUBJECT MATTER
INV. D03D13/00 D03D25/00 D03D23/00 D03D39/16

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D03D

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 200 03 167 U1 (TEXTILMA AG [CH]) 20 April 2000 (2000-04-20)	1-17
X	page 5, line 12 - page 6, line 31; figures 3-12	22
A	JP 09 143832 A (TAKASHIMA ORIMONO KK) 3 June 1997 (1997-06-03)	1-17
X	abstract; figures 1-5	22

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 August 2007	10/09/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Louter, Petrus

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2007/004153

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 18-21
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 18-21

It is not clear from claim 18 which apparatus features are necessary to carry out the method of claims 1-17. Claim 18 is therefore undefined and no meaningful search is possible.

The features of claims 19-21 are not suitable to render claim 18 clear. These claims are thus equally unclear.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2007/004153

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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