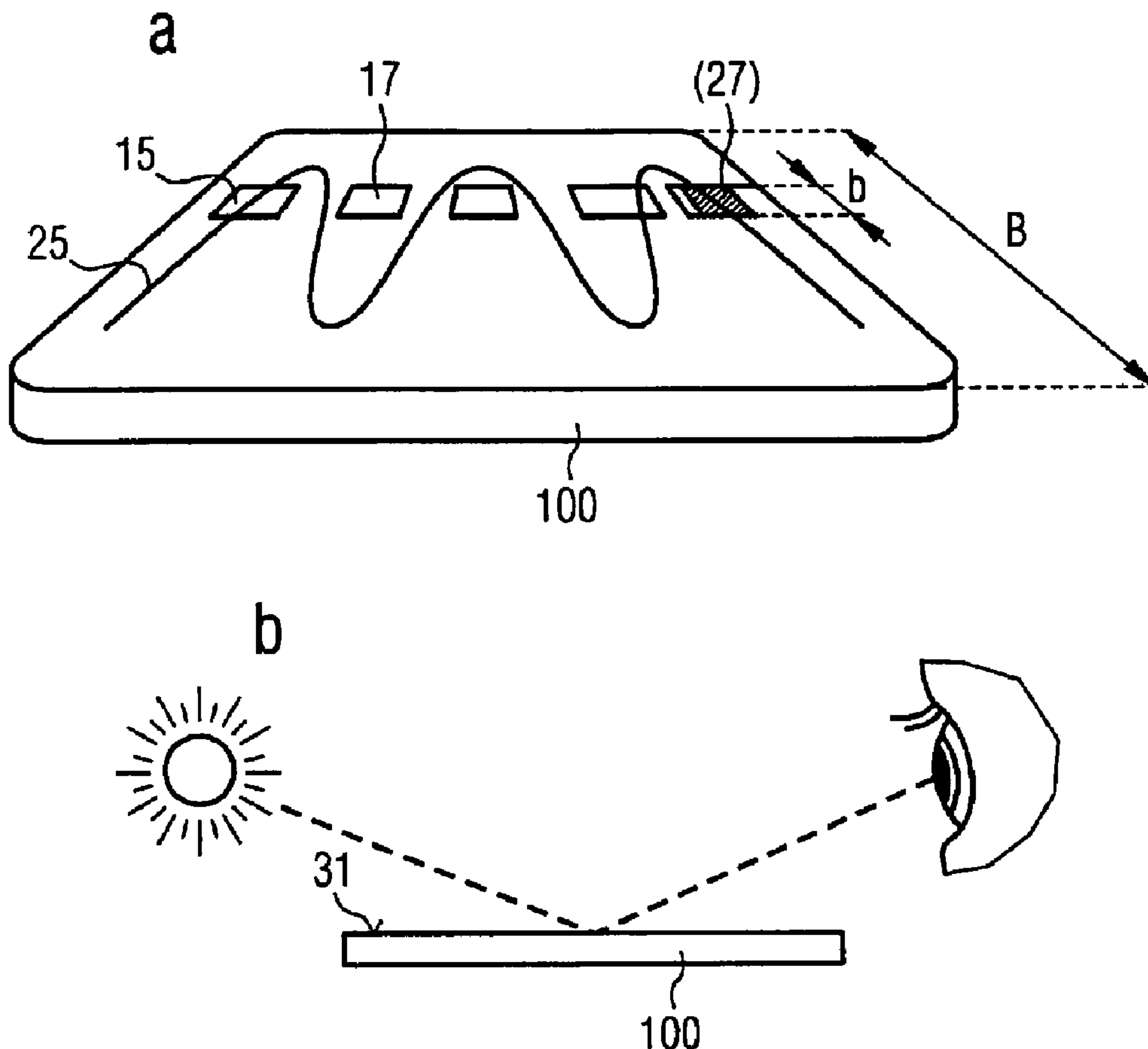




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(72) **Inventeurs/Inventors:**
RIEDL, JOSEF, DE;
ENDRES, GUENTER, DE
(73) **Propriétaire/Owner:**
GIESECKE & DEVRIENT GMBH, DE
(74) **Agent:** RIDOUT & MAYBEE LLP

(54) **Titre : SUPPORT DE DONNEES A CARACTERISTIQUE DE SECURITE IMPRIMEE**
(54) **Title: DATA CARRIER WITH PRINTED SECURITY FEATURE**



(57) **Abrégé/Abstract:**

There is proposed a multilayer data carrier (100) having a core layer (10) and a viewing side. On the latter the data carrier (100) has a security print applied in two printing arrangements, the second printing arrangement (25) being executed over a large area, in

(57) Abrégé(suite)/Abstract(continued):

particular as a design print, and covering the entire area of the data carrier (100). The first printing arrangement (15) is disposed below the first printing arrangement (25) and possesses a reflective surface (16); it consists of print elements (17) covering only a small area in comparison to the design print of the second printing arrangement (25). The print elements (17) show a viewing-angle-dependent traveling effect which constitutes an authenticity feature.

Abstract

There is proposed a multilayer data carrier (100) having a core layer (10) and a viewing side. On the latter the data carrier (100) has a security print applied in two printing arrangements, the second printing arrangement (25) being executed over a large area, in particular as a design print, and covering the entire area of the data carrier (100). The first printing arrangement (15) is disposed below the first printing arrangement (25) and possesses a reflective surface (16); it consists of print elements (17) covering only a small area in comparison to the design print of the second printing arrangement (25). The print elements (17) show a viewing-angle-dependent traveling effect which constitutes an authenticity feature.

Data carrier with printed security feature

[0001] This invention relates to a multilayer data carrier, in particular an identification card or the like, on which there is realized a security feature applied by printing technology and recognizable to the naked eye from a viewing side.

[0002] From EP 1 317 352 B1 there is known a generic data carrier having an opaque layer and at least one transparent layer located thereover on a viewing side. On the transparent layer there is formed a security printed image consisting of two parts, one part being so placed on the upper side and one part on the underside that the two partial images supplement each other to form an overall image upon viewing in plan. Upon viewing at an angle, however, the two partial images appear as neutral line structures. The tilt effect arises from the spaced arrangement of the two partial images on two sides of the transparent layer and becomes the clearer, the thicker the transparent layer is.

[0003] The known solution provides a well recognizable security feature, but presupposes that a sufficiently thick transparent carrier layer for the two-part security printed image can be realized on the data carrier. Furthermore, the interaction of the two partial images of the security printed image means that when one part is specified, the geometry and printing arrangement of the second part are necessarily also determined.

[0004] The object of the invention is to specify a security feature for a data carrier that is producible by printing technology and makes lower demands on the required layer thicknesses and is as simple as possible to produce.

[0005] This object is achieved by a data carrier having the features of claim 1. According to the invention there is provided a security feature recognizable to the naked eye by forming a security print on a data carrier in two printing arrangements, the first printing arrangement being a large-area design print, while the second printing arrangement consists only of print elements covering limited partial areas and is produced with a reflective ink. Advantageously, the two printing arrangements

of the security print can be applied directly over each other, but also with the interposition of interlayers. It is particularly advantageous that between the patterns contained in the two printing arrangements there is no direct interaction, so that the two printing arrangements can be freely designed quite independently of each other.

[0006] In a preferred embodiment, the printing arrangement of the security print regarded from the viewing side is a guilloche print. The first printing arrangement more remote from the viewing side imitates, in a preferred embodiment, a security thread as is known from bank notes, and consists of rectangular portions which are applied in the manner of a dot-dash line. The rectangular elements can, like the security thread of a bank note, comprise alphanumeric characters. The latter can expediently be produced by gaps in the print.

[0007] In a particularly advantageous development of the invention, there is applied over the large-area second printing arrangement of the security print a third printing arrangement which consists of a fluorescent ink transparent to the unaided eye and which partially covers the pattern of the first printing arrangement. In the covered areas a traveling effect on the pattern of the first printing arrangement is then no longer recognizable. In this way it is possible in a simple manner to increase the strength of the produced security feature by the first printing arrangement having, on the one hand, areas that show a traveling effect and, on the other hand, areas that do not.

[0008] Advantageously there is applied over the large-area second printing arrangement or optionally over the third printing arrangement a cover layer with a high-gloss surface on the viewing side.

[0009] The inventive security print shows a viewing-angle-dependent traveling effect, whereby the pattern formed by the second printing arrangement appears in plan viewing to lie in, or even over, the plane of the design print realized by the first printing arrangement, while upon viewing of the data carrier surface at an angle the element realized in the second printing arrangement "travels" under the design print

in the first printing arrangement, becomes milky and vanishes almost completely. This traveling effect has the advantageous property of being lost upon photocopying of the inventive data carrier. An inventive data carrier is accordingly very forgery-resistant.

[0010] With reference to the drawing, an exemplary embodiment of the invention will be explained in more detail in the following.

[0011] Therein are shown:

- Fig. 1 a cross-section through the structure of an inventive data carrier,
- Fig. 2 an illustration of the interaction of the different printing arrangements upon viewing of an inventive data carrier at an angle, and
- Fig. 3 the appearance of the print elements produced in the printing arrangements upon viewing in plan.

[0012] Fig. 1 illustrates in an exploded view the structure of an inventive data carrier 100 comprising a plurality of layers which are shown before being joined into a finished data carrier; the dimensions and proportions shown are not to scale.

[0013] On a core layer 10 of the data carrier 100 there is located on the viewing side indicated by an arrow an interlayer 20 on which there is in turn formed a cover layer 30. On the other side of the core layer 10 there are formed further layers which will be collectively referred to here as the back 40.

[0014] The data carrier 100 is preferably an identification card, e.g. a credit card, bank card, cash payment card or authorization card, a national identity card or a passport personalization page. The data carrier 100 can also be a chip card, e.g. in the IC card format or in the SIM format, or part of a book cover, for example of a passport cover. The data carrier 100 further [*sic*] also be a transfer element disposed on a carrier layer for application to an identification card or the like.

[0015] All layers 10, 20, 30, 40 lie consist [*sic*] of plastics as are known from the production of chip cards or identification cards, in particular polyester, polycarbonate or mixtures thereof, and are expediently present for processing in foil form. However, there are basically no restrictions with respect to the materials to be used, provided they have the properties resulting from the following and are suitable for the particular purpose described.

[0016] The core layer 10 is preferably configured to be opaque. It can in turn consist internally of a sequence of layers which bring about certain desired properties for the data carrier 100, for example with regard to elasticity. The core layer 10 typically has a thickness of 50 to 500 μm . The interlayer 20 is basically optional and can also be fully omitted. When present, it is transparent and has a height between 0 and 250 μm . In practice, a maximum total thickness is typically given for the data carrier 100, which normally greatly restricts the latitude for the thickness of a possible interlayer 20 and frequently does not permit any interlayer 20 at all.

[0017] Like the core layer 10, it can consist internally of a plurality of partial layers, e.g. to attain certain desired properties. The cover layer 30 is likewise transparent and preferably possesses a high-gloss surface on the viewing side; it has a thickness of typically 50 to 250 μm . The layer sequence of the back 40 is normally configured in basically the same manner as the layer sequence on the viewing side and possesses for example a transparent interlayer and disposed thereover a final cover layer on the back side. However, the layer sequence of the back 40 can also readily deviate from the layer sequence on the viewing side and e.g. consist only of a one single layer, as indicated in Fig. 1.

[0018] On the surface 11 of the core layer 10 facing the viewing side there is applied by printing technology, e.g. by offset, a first printing arrangement 15 of a security print, said layer having, on a scale from poorly reflective for matt surfaces to very highly reflective for specular surfaces, an at least moderately to highly reflective surface 16. For this purpose, the application of the first printing arrangement 15 is

- 5 -

expediently effected employing a special ink having metallic reflection behavior. In practical tests there was employed in particular a UV-curing silver ink of the 770WL series from SICPA.

[0019] The first printing arrangement 15 consists of print elements 17 which cover one or more limited small partial areas of the entire surface 11 of the core layer 10. Limited means here that the partial areas are small in relation to the entire surface 11 and have at the edges a clear brightness difference to the ink of the surface 11. For the size of the print elements 17, it holds that with increasing surface area the perceptibility of the desired traveling effect decreases, and with decreasing size the recognizability.

[0020] In an expedient graphic design, the first printing arrangement 15, as to be seen in Figs. 2 and 3, imitates a security thread as is known from bank notes. The partial areas then have the form of rectangles which are placed one behind the other in the form of a dot-dash line. The individual partial areas or rectangles can, as indicated by a rectangle in Fig. 3, in turn contain graphic patterns 18, e.g. alphanumeric characters. The patterns or characters are expediently produced by gaps in the partial areas or rectangles. The rectangles have for example a width b of 1 to 2 mm at a width B of the data carrier of 54 mm.

[0021] On the upper side 21 of the interlayer 20 facing the viewing side there is applied a second printing arrangement 25 of the security print. The second printing arrangement 25 preferably possesses a poorly to moderately reflective surface 26. Preferably, the second printing arrangement 25 covers the entire available surface 21 of the interlayer 20 and forms a design print. The second printing arrangement 25 can for example be executed as a guilloche print. If no interlayer 20 is present, the second printing arrangement 25 of the security print is simply applied directly to the first printing arrangement 15.

[0022] In a particularly preferred embodiment of the invention, there is also applied to the second printing arrangement 25 of the security print a third printing

arrangement 27. The third printing arrangement 27 is geometrically so designed that it is partially superimposed on the first printing arrangement 15. For the third printing arrangement 27 there is employed a transparent ink invisible to the naked eye.

Expediently, the ink is fluorescent in order to thereby provide a further verifiable security feature. In practical tests there was used in particular a common UV-curing transparent ink, as to be obtained e.g. from SICPA. Between the second printing arrangement 25 and the third printing arrangement 27 of the security print there can be provided, as needed, a preferably thin, transparent interlayer (not shown), in particular when this is expedient for reasons of production engineering.

[0023] The layers represented in an exploded view in Fig. 1 are connected into a data carrier 100 by a customary method. Connecting can be effected for example by a laminating technique known from chip card manufacture. However, it is readily also possible to use other connecting techniques, it being in particular also possible to glue individual or all layers together.

[0024] In the finished state, the printing arrangements 15, 25 and 27 of the security print produce, without being bound to any specific explanations thereof, a security feature in the form of a traveling effect which is perceptible by plan viewing of the data carrier 100 from different angles.

[0025] Fig. 2 illustrates the perception of the security print upon plan viewing of the data carrier 100 from the viewing side at an angle against a light source. In this case, the second printing arrangement 25 of the security print, i.e. typically the design print, is recognizable well and clearly, while the print elements 17 formed in the first printing arrangement 15 are recognizable only in milky fashion or not at all. The print elements 17 of the first printing arrangement 15 moreover tend to appear to be located below the second printing arrangement 25 or in the same plane as the latter.

[0026] Excepted from this perception of the print elements 17 of the first printing arrangement 15, however, are those print elements over which there is formed a transparent third printing arrangement 27 imperceptible to the viewer. These

superimposed print elements 17 of the first printing arrangement 15 also appear strong and applied over the second printing arrangement 25 in plan viewing at an angle in back light.

[0027] Fig. 3 illustrates the appearance of the same data carrier as in Fig. 2 in a perpendicular plan view. In this case, all print elements 17 of the first printing arrangement 15, as well as the design print formed in the second printing arrangement 25, are equally clearly recognizable, whereby the print elements 17 of the first printing arrangement 15 appear to be located over the second printing arrangement 25 or applied directly thereto.

[0028] The viewing-angle-dependent apparent vertical travel of the print elements 17 of the first printing arrangement 15 between the positions, clearly recognizable on the design print and poorly to not at all recognizable behind the design print, is suitable as a security feature for proving the authenticity of a data carrier 100 equipped therewith. This applies all the more so when a third printing arrangement 27 of the security print has additionally been applied and a portion of the print elements 17 of the first printing arrangement 15 is thus excepted from the apparent, viewing-angle-dependent travel. The described traveling effect is perceptible particularly well at certain viewing angles and increases with increasing thickness of the interlayer 20. Suitable viewing angles are primarily, as indicated in Fig. 2, viewing angles at which direct light from a light source is directed over the surface 16 of the first printing arrangement 15 onto the viewer's eye. Since particularly suitable viewing angles cannot readily be stated analytically, the check of the inventive authenticity feature is effected in practice by viewing at different angles a data carrier 100 to be checked in order to recognize a traveling effect.

- 8 -

Claims

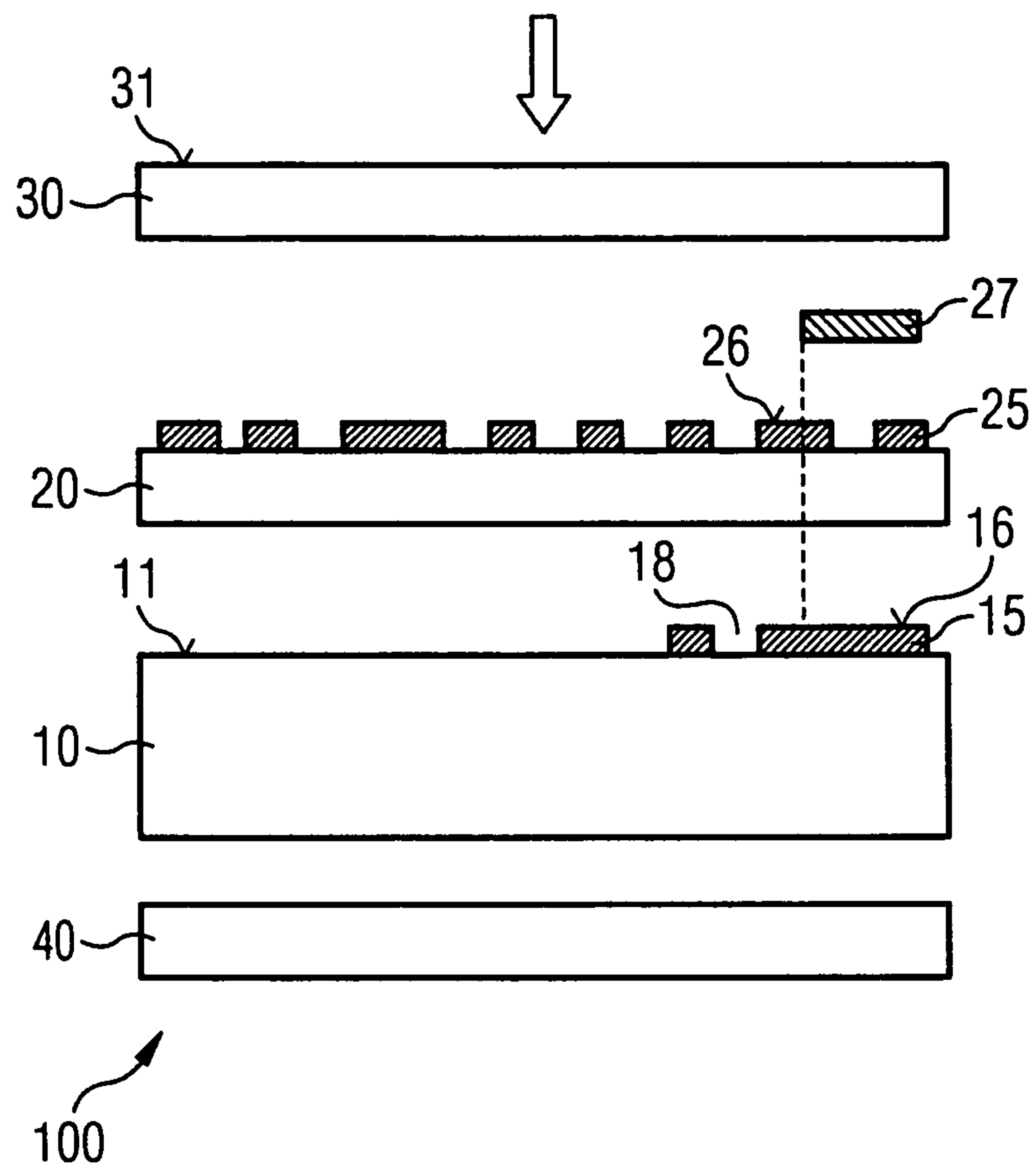
1. A multilayer data carrier having a core layer and a viewing side and having a security print applied in two printing arrangements, the first printing arrangement covering a partial area of the data carrier, and second printing arrangement being executed over a large area in relation to the first, and the first printing arrangement being disposed below the second printing arrangement, characterized in that the first printing arrangement possesses a reflective surface and it consists of at least one print element which covers a limited partial area of the surface of the core layer, the second printing arrangement forms a design print whose pattern has no interaction with the print elements of the first printing arrangement, and there is applied to the second printing arrangement a cover layer which has a high-gloss surface.
2. The data carrier according to claim 1, characterized in that the surface of the first printing arrangement is at least moderately to highly reflective, on a scale on which a matt surface is rated poorly reflective and a specular surface very highly reflective.
3. The data carrier according to claim 1, characterized in that the first printing arrangement is formed on the core layer.
4. The data carrier according to claim 1, characterized in that there is printed over the second printing arrangement a third printing arrangement which partially covers the print elements of the first printing arrangement and consists of a transparent ink.
5. The data carrier according to claim 1, characterized in that the print elements of the first printing arrangement have graphic patterns which are formed by blank areas.

- 9 -

6. The data carrier according to claim 1, characterized in that the second printing arrangement is printed on a transparent interlayer which is applied over the first printing arrangement.
7. The data carrier according to claim 1, characterized in that the third printing arrangement consists of a UV-curing ink which is applied by screen printing.
8. The data carrier according to any one of claims 1-7, characterized in that the second printing arrangement covers the total area of the data carrier.
9. The data carrier according to claim 4, characterized in that the transparent ink is fluorescent.

1/2

FIG 1



2/2

FIG 2a

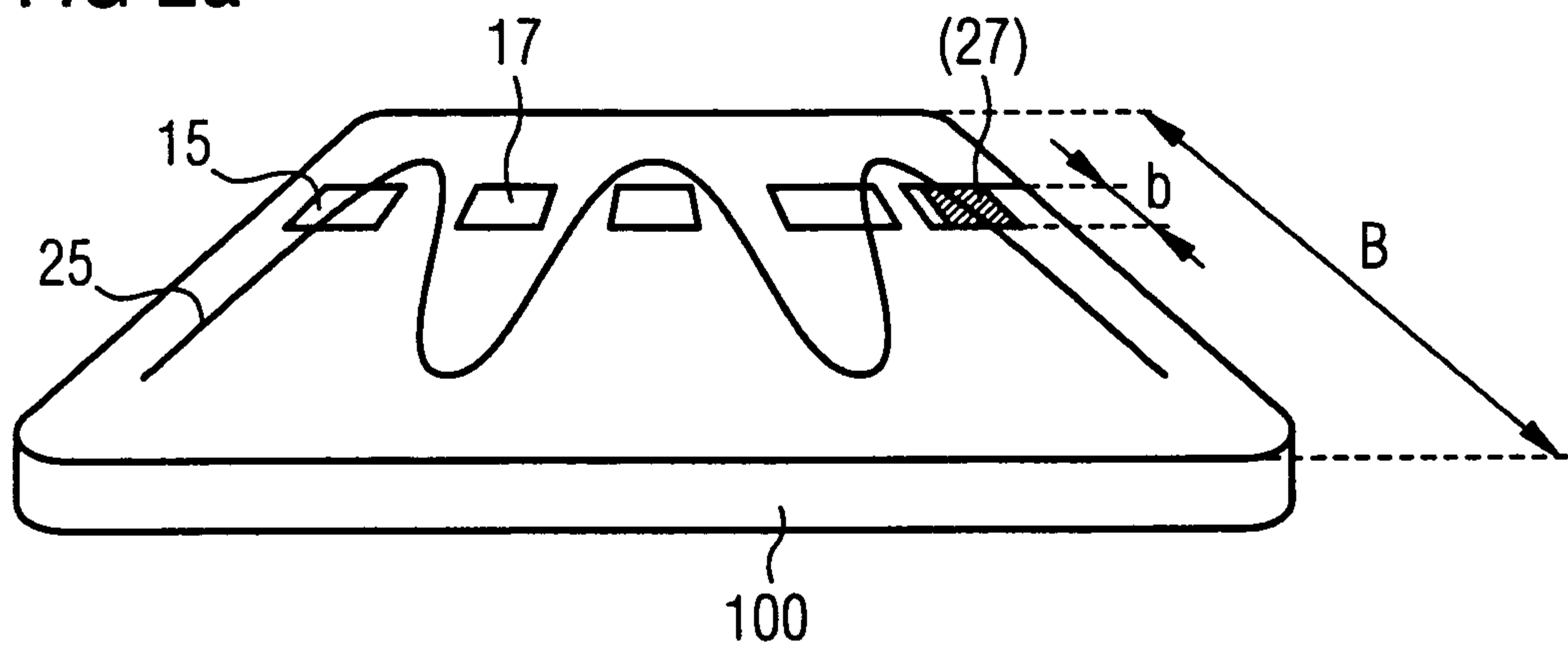


FIG 2b

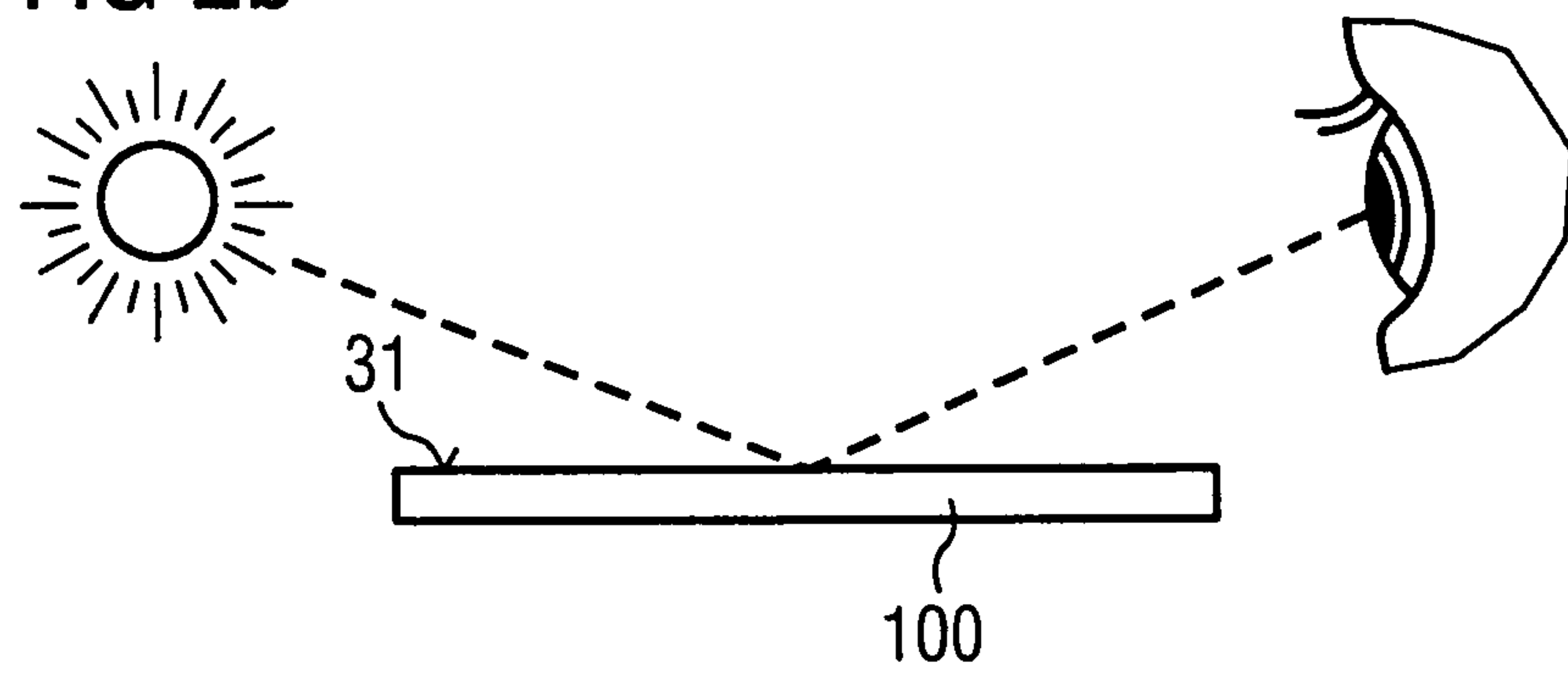


FIG 3a

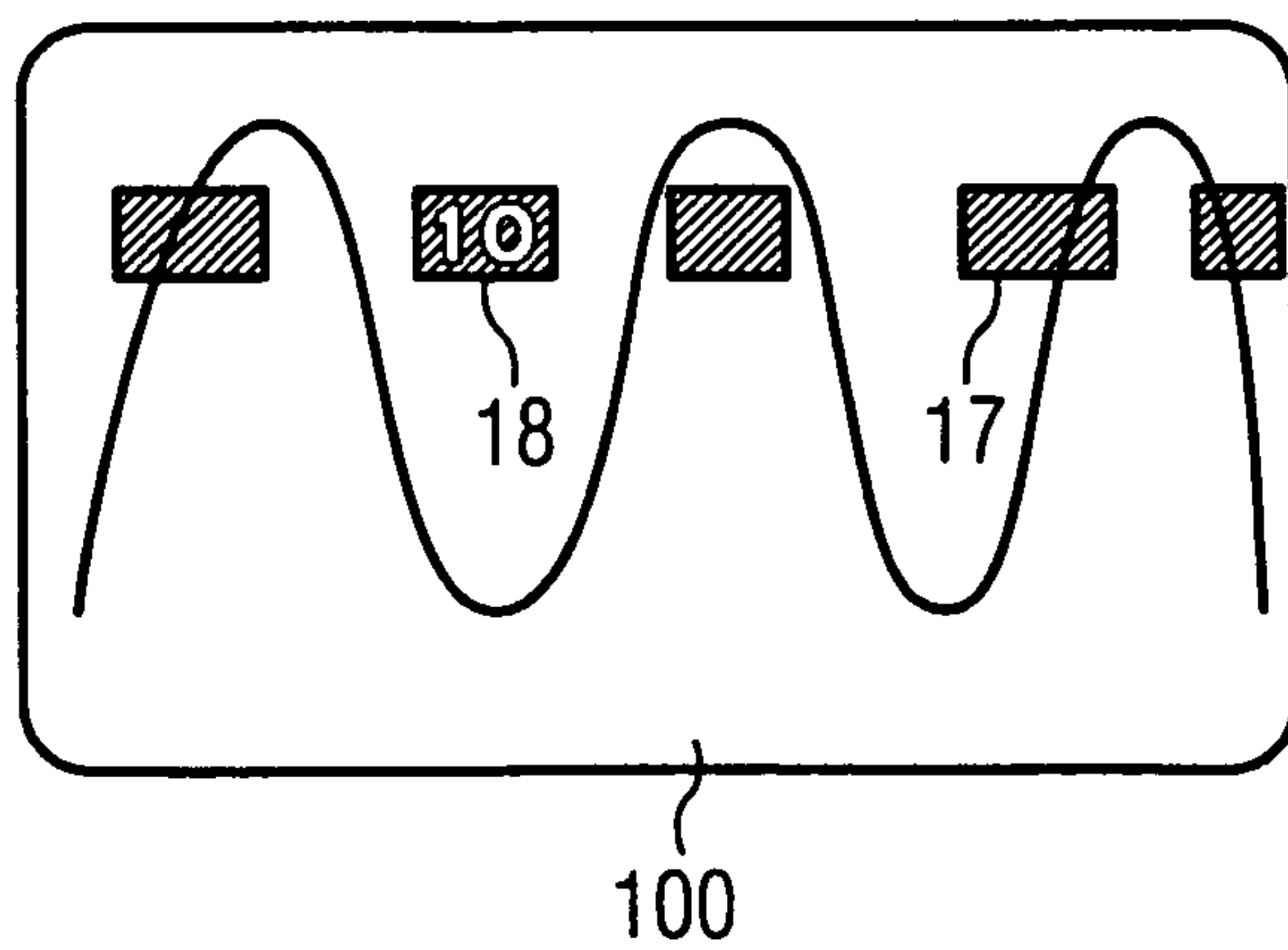


FIG 3b

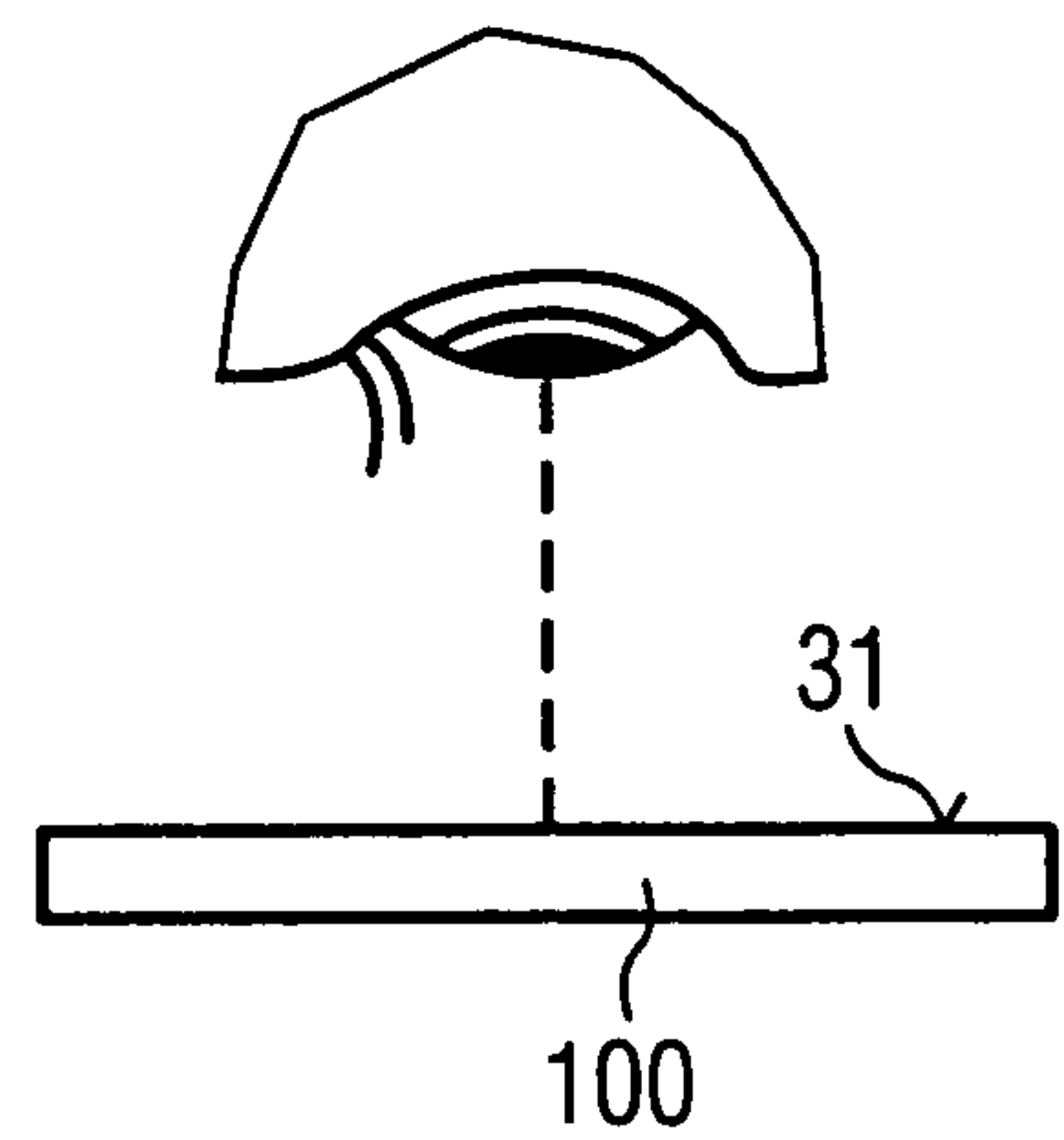


FIG 2a

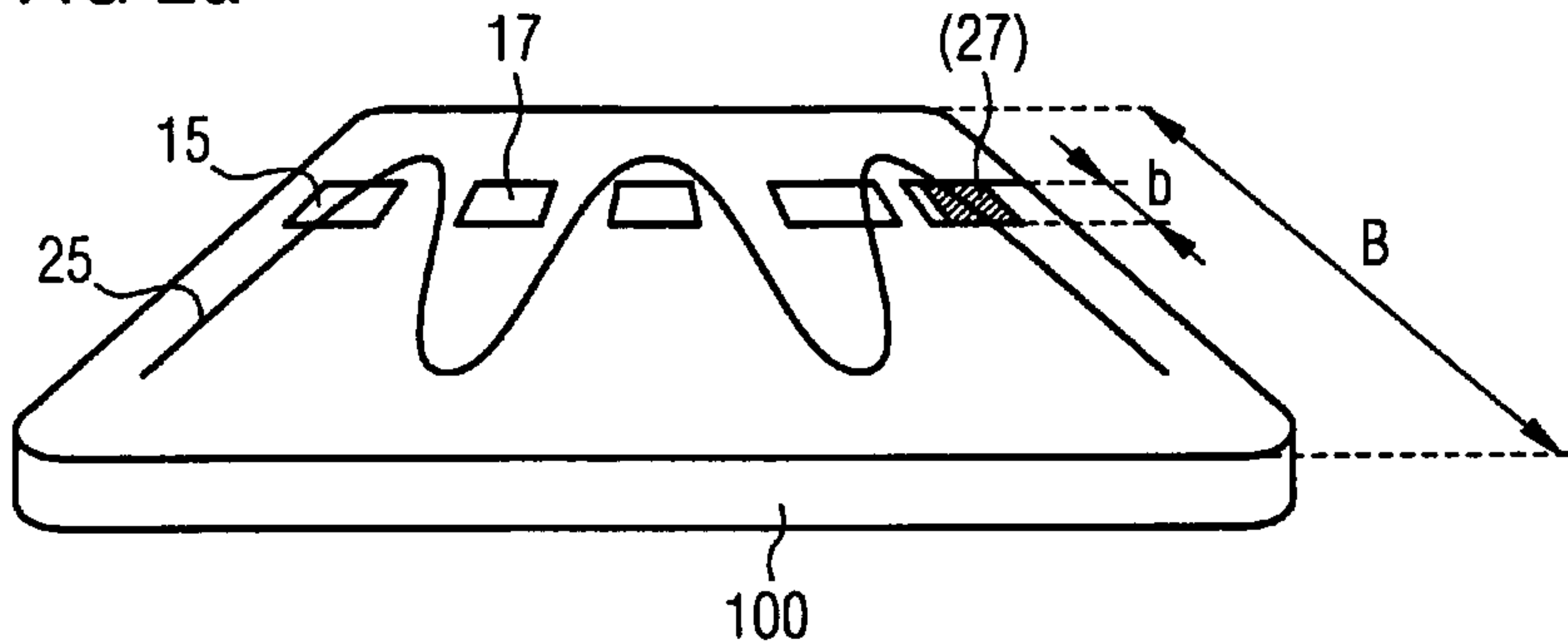


FIG 2b

