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

(11) EP 2 792 606 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.10.2014 Bulletin 2014/43

(51) Int Cl.:
B65D 5/02 *(2006.01)* ***B65D 5/42*** *(2006.01)*

(21) Application number: **13163992.4**

(22) Date of filing: **16.04.2013**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) Blank for a box with a marker to indicate authenticity, box, and method of and system for making the blank

(57) A method of making a blank (1, 10, 100) for a box, the method comprising providing a blank (1, 10, 100) having a plurality of fixing zones (2, 8, 20, 21, 22, 23, 200, 210, 220, 230), depositing adhesive on at least one of the fixing zones (2, 8, 20, 21, 22, 23, 200, 210, 220, 230), and depositing a UV fluorescer or phosphorescer on at least one portion of the blank (1, 10, 100), thereby providing a means of identification of the blank, wherein the depositing of adhesive and the depositing of a UV fluorescer or phosphorescer are separate steps.

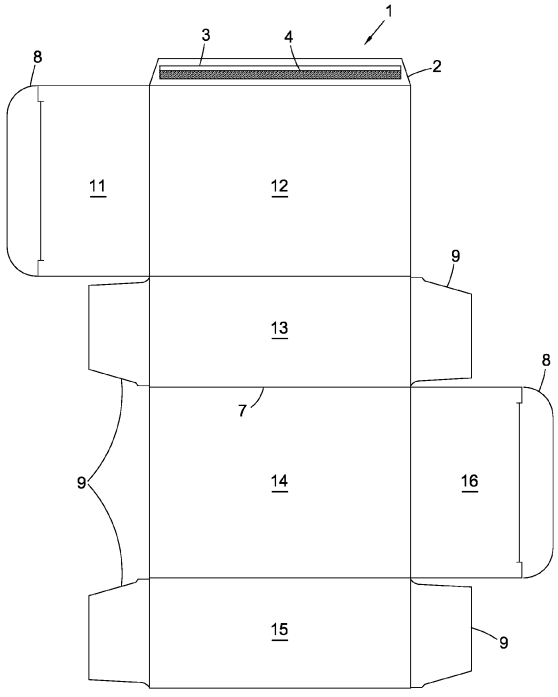

Fig. 3

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Description

[0001] The present invention relates to boxes for products such as cosmetic or fragrance products.

[0002] In this specification, the word "box" is not limited to containers with lids, but includes containers with or without lids.

[0003] A typical folded box is made of paperboard. To make a first type of folded box, a blank is cut, folded (creased), laminated and printed. The blanks are shipped flat to a product manufacturer, which will have its own machinery to fold the fold the blank into shape to produce a container, often for cosmetic or fragrance products.

[0004] A second type of folded box, which is usually more rigid than the first type, is composed of an inner layer or liner of rigid paperboard and an outer layer or shell of stiffer paperboard. Each layer is processed and assembled separately. The inner layer has an inner side (visible when the box is assembled) and an outer side (not visible when the box is assembled). The inner side is typically coloured while the outer side is typically left rough. The outer layer can be printed or coloured. At the end of the manufacturing process, the inner layer (which can contain for example cosmetics, watches or smaller consumer electronics) is positioned inside the outer layer forming a single rigid box. Unlike the first type of folded box, these are assembled at the point of manufacture of the blanks therefor, and are transported after assembly. The second type of folded box is typically more expensive than the first type, and the second type is typically used for protecting high value items such as cosmetics, watches or smaller consumer electronics.

[0005] United States Patent Number 5,375,722 discloses a carton glue monitoring system and a means for detecting glue skips or excess glue. In the system, a glue applicator applies a glue strip having a fluorescent material added thereto to cartons. A glue check station includes a UV light source for illuminating the fluorescent material in the glue and a UV sensor for sensing the fluorescent material. The glue station further includes a glue skip detector and an excess glue detector.

[0006] As mentioned above, folded boxes are often used as containers for cosmetic or fragrance products. The cosmetic or fragrance products are often shipped from the manufacturer to the customer in such folded boxes. Often, each box is given a separate data matrix that uniquely identifies each individual folded box. However, a recent problem has emerged in that counterfeit data matrices are being used to give the appearance of being genuine to boxes of counterfeit cosmetic or fragrance products. Thus the receiver of the boxes of cosmetic or fragrance products identifying the boxes using a data matrix cannot be sure of the authenticity of the products.

[0007] United States Patent Number 5,375,722 does not disclose that the system could be used to make boxes for products to indicate the authenticity of the product. The present invention seeks to overcome or mitigate at least one of these problems.

[0008] The present inventor has realised that a blank for a box may be made by a method comprising providing a blank having a plurality of fixing zones, depositing adhesive on at least one of the fixing zones, and depositing a UV fluorescer or phosphorescer on at least one portion of the blank, thereby providing a means of identification of the blank. The depositing of adhesive and the depositing of a UV fluorescer or phosphorescer may be separate steps.

[0009] Accordingly, the depositing of the UV fluorescer or phosphorescer may be done by adding a means for depositing of the UV fluorescer or phosphorescer to an existing production system, such means preferably comprising a printer, preferably an industrial inkjet printer. An existing production system may comprise a folding gluing machine (for the first type of folded box) or a cartoning machine (for the second type of folded box).

[0010] In this specification, separate steps may mean separate in a temporal sense or a positional sense.

[0011] In a first aspect of the present invention, there is provided a method of making a blank for a box, the method comprising providing a blank having a plurality of fixing zones, depositing adhesive on at least one of the fixing zones, and depositing a UV fluorescer or phosphorescer on at least one portion of the blank, thereby providing a means of identification of the blank, wherein the depositing of adhesive and the depositing of a UV fluorescer or phosphorescer are separate steps.

[0012] By providing the depositing of adhesive and the depositing of a UV fluorescer or phosphorescer as separate steps, the depositing of the UV fluorescer or phosphorescer on at least one portion of the blank can easily be achieved. This provides easy control of the depositing of the UV fluorescer or phosphorescer, and therefore easy control of the area of fluorescence. This also allows less UV fluorescer or phosphorescer to be used than if the depositing of adhesive and UV fluorescer or phosphorescer occurred in the same step. Preferably, the adhesive is deposited before the UV fluorescer or phosphorescer.

[0013] In a second aspect of the present invention, there is provided a method of making a blank for a box, the method comprising providing a blank having a plurality of fixing zones, depositing adhesive on at least one portion of at least one of the fixing zones, and depositing a UV fluorescer or phosphorescer on at most a part of the at least one portion of at least one of the fixing zones, thereby providing a means of identification of the blank.

[0014] The blank may be for a folded box.

[0015] In aspects of the invention, there is provided a method of assembling a box, comprising making a blank for a box by a method according to the first or second aspect of the invention, and further comprising adhering the at least one fixing zone on which adhesive has been deposited to another part of the blank to form a box, providing the box as an inner layer in or an outer layer around an additional box, wherein the UV fluorescer or phospho-

rescer is deposited between the box and the additional box. Thus the box and additional box form a folded box of the second type, and the UV fluorescer or phosphorescer is not visible unless the box is separated from the additional box. This makes it harder for a counterfeiter to detect the UV fluorescer or phosphorescer in order to produce a counterfeit box using UV fluorescer or phosphorescer. The inner layer may form a liner and the outer layer may form a shell.

[0016] Instead of the UV fluorescer or phosphorescer being deposited between the box and the additional box, when the box is an inner layer in the additional box, the UV fluorescer or phosphorescer may be deposited on the inside surface of the box. Thus, when the assembled box comprising the box and additional box is sealed, the presence of the UV fluorescer or phosphorescer cannot be detected without this seal being broken, thus providing an indication to the receiver of the box that detection has occurred.

[0017] Preferably, the box is adhered to the additional box. This means that the presence of the UV fluorescer or phosphorescer cannot be detected without this adhesion being broken, thus providing an indication to the receiver of the box that detection has occurred.

[0018] The UV fluorescer or phosphorescer may be deposited on a wall or base of the box.

[0019] In aspects of the invention, the UV fluorescer is deposited on the same portion of the blank or fixing zone on which the adhesive is deposited, but UV fluorescer may be deposited on a different portion of the blank or fixing zone from that on which the adhesive is deposited.

[0020] Hereinafter, where a UV fluorescer is referred to, it includes a UV phosphorescer where the context permits.

[0021] In a third aspect of the invention, there is provided a blank for a box, the blank having a plurality of fixing zones, at least one portion of at least one of the fixing zones having adhesive deposited thereon, and the at least one portion having a UV fluorescer deposited on at most a part thereof, thereby providing a means of identification of the blank.

[0022] In aspects of the invention, the adhesive may be deposited before the UV fluorescer, or the UV fluorescer may be deposited before the adhesive. Thus the adhesive may be interposed between the UV fluorescer and the at least one of the fixing zones, or the UV fluorescer may be interposed between the adhesive and the at least one of the fixing zones. The UV fluorescer may or may not be detectable without separating the fixing zone from another part of the blank to which it is adhered.

[0023] In aspects of the invention, the UV fluorescer may be deposited on the same or a different part of the blank from the at least one portion.

[0024] According to a fourth aspect of the present invention, there is provided a system for making a box, comprising a cartoning machine or a folding gluing machine for making the box from a blank, and a printer for printing a UV ink fluorescer onto the blank. By providing the depositing of a UV fluorescer using a printer and the depositing of adhesive as separate steps, the depositing of the UV fluorescer can easily be achieved. This provides easy control of the depositing of the UV fluorescer, and therefore easy control of the area of fluorescence. This also allows less UV fluorescer to be used than if the depositing of adhesive and UV fluorescer occurred in the same step. The box may be a folded box. Preferably, the printer is an industrial inkjet printer.

[0025] In aspects of the invention, the at least one portion having adhesive deposited thereon has a UV fluorescer deposited on at most a part thereof. This includes the situation where the UV fluorescer is layered on the whole of the adhesive deposition when viewed in plan but not when viewed in elevation, and where the adhesive is layered on the whole of the UV fluorescer deposition when viewed in plan but not when viewed in elevation. In other words, the side or sides of the bottom layer is or are exposed.

[0026] The UV fluorescer may be deposited on a part of the portion having adhesive deposited thereon. This means that the presence of the UV fluorescer can normally only be detected by the receiver of the products using a UV light source if the box is opened and the fixing zone and the portion to which the fixing zone is adhered are separated. This has the following advantage over providing the UV fluorescer for example on an area of the blank forming the inside of a wall of the assembled box that does not have adhesive deposited thereon: such an assembled box may not be entirely sealed by gluing and so a counterfeiter could open the assembled box and detect the UV fluorescer without providing an indication that the detection has occurred. In the present invention, the detection cannot occur without breaking of the adhesive seal, thereby providing an indication that detection has occurred.

[0027] In the case that the fluorescer is deposited on less than the whole of the portion on which adhesive is deposited, the position of deposition of the fluorescer within the portion can be used to identify the box and to indicate that the products are genuine. The manufacturer of the products and the receiver of the products can agree on a particular position or pattern of deposition of the fluorescer for a particular batch. Thus, following such an agreement, the receiver would be aware that the products are not genuine if the position or pattern of deposition of the fluorescer does not match the agreed position or pattern for that particular batch.

[0028] The manufacturer of a blank according to the invention can check that the UV fluorescer has been suitably deposited by using a UV light source to illuminate the UV fluorescer. If the manufacturer of the blank according to the first aspect is different from the manufacturer of the product to be contained within the folded box, the latter can check that a blank received from the blank manufacturer is genuine. The receiver of the folded box containing products, which has been produced from the blank made according to the second aspect, can open

the box by separating the tab and the portion to which the tab is adhered and can illuminate the UV fluorescer using a UV light source. Hence the origin of the products contained within the box can be reliably determined.

[0029] The deposition of UV fluorescer on a portion of the tab on which adhesive is deposited avoids making any visual impact on the blank or box. This characteristic is of importance when it comes to luxury packaging considering the high quality standards normally required by customers.

[0030] In addition, the authenticity of the products can be easily determined through sample analysis.

[0031] Furthermore, the costs involved for the manufacturer and receiver are limited. In particular, the manufacturer simply needs to purchase an industrial inkjet printer or another means for depositing UV fluorescer, and a UV light source if the manufacturer wishes to check that the UV fluorescer is functioning correctly. The receiver on the other hand only needs to purchase a UV light source.

[0032] According to the invention, the UV fluorescer provides a marker to indicate authenticity.

[0033] The blank may be for a folded box.

[0034] The at least one of the fixing zones may be two, three, four, five, six, or more fixing zones. The at least one portion may be two, three, four, five, six, or more portions. The fixing zones may comprise one or more tabs, areas near slots formed in the blank, or walls of the blank. The at least one portion may be the whole of the at least one of the tabs. Depositing adhesive and UV fluorescer on more fixing zones or portions may make it quicker for the receiver to detect the presence of the UV fluorescer, and thereby to determine whether the products contained in the box are genuine.

[0035] The at least one of the fixing zones or tabs may be provided to overlap another of the fixing zones or tabs or another part of the blank for adhesion thereto when the folded box has been assembled. An edge of the at least one of the tabs may be provided to abut another of the tabs or an edge thereof for adhesion thereto when the folded box has been assembled.

[0036] The deposition of UV fluorescer may have any suitable form. For example, it may be in the form of a batch number, code or pattern, or one or more simple shapes such as a rectangle, square, circle, ellipse, triangle and the like. The code may be alphanumeric. A code may provide a more definite indication of origin than one or more simple shapes.

[0037] The blank may be formed of any suitable material, for example paper, paperboard, card, cardboard, synthetic material such as thermoplastic material. It may comprise a laminated material. The blank may be manufactured by any suitable process such as stamping.

[0038] The adhesive may be any suitable adhesive, for example a glue. It may be water based, for example a water-based glue. For example, it may comprise a polymeric material such as a vinyl material, for example poly vinyl acetate.

[0039] In aspects of the invention, the adhesive may be an adhesive tape. The tape may be thermo-adhesive. The UV fluorescer may be deposited on an adhesive side of the tape, or on a non-adhesive side of the tape.

[0040] The UV fluorescer may comprise any suitable material. It may comprise a UV fluorescent component and a carrier. The carrier may be any suitable carrier, for example a liquid. It is suitably a solvent based carrier. The UV fluorescer may be in the form of an ink or toner.

[0041] The UV fluorescent component may be any suitable fluorescer. The UV fluorescer may comprise for example an ink whose formulation comprises:

- 2-METHYLPROPAN-2-OL
  - N° CAS: 75-65-0
  - N° CE: 200-889-7
  - **Percentage: < 1%**
- BUTANONE
  - N° CAS: 78-93-3
  - N° CE: 201-159-0
  - **Percentage: 70-90%**
- ETHANOL
  - N° CAS: 64-17-5
  - N° CE: 200-578-6
  - **Percentage: 10-30%**

[0042] The deposition of the adhesive may be on top of or underneath the deposition of the UV fluorescer. In other words, the deposition of the adhesive may have occurred before or after the deposition of the UV fluorescer. Preferably, the UV fluorescer is deposited on top of the adhesive.

[0043] Alternatively to the second aspect, at least one portion of at least one of the fixing zones may have a UV fluorescer deposited thereon, and the at least one portion may have adhesive deposited on at most a part thereof.

[0044] In a fifth aspect of the present invention, there is provided a box made from a blank according to the third aspect. The box may have the at least one of the fixing zones adhered to another part of the box by the adhesive deposited thereon. To detect the presence of the UV fluorescer and thereby to identify the box and to determine the authenticity of the products contained within the box, the receiver would normally first have to break the adhesion formed by the adhesive.

[0045] The box may be a folded box.

[0046] The method of the first or second aspects may further comprise adhering the at least one of the fixing zones to another part of the blank using the adhesive. The method may further comprise depositing adhesive on the other of the fixing zones, and adhering the other of the fixing zones to other parts of the blank to form a box.

[0047] In a seventh aspect of the present invention,

there is provided a method of making a blank for a box, the method comprising providing a blank having a plurality of fixing zones, depositing adhesive on at least one portion of at least one of the fixing zones, and depositing a UV fluorescer on the at least one portion of at least one of the fixing zones, wherein the depositing of adhesive and the depositing of a UV fluorescer are separate steps.

[0048] According to the seventh aspect, the depositing of the UV fluorescer may be done by adding a means for depositing of the UV fluorescer to an existing production system, such means preferably comprising a printer, more preferably an industrial inkjet printer. An existing production system may comprise a folding gluing machine (for the first type of folded box) or a cartoning machine (for the second type of folded box). By providing the depositing of adhesive and the depositing of a UV fluorescer as separate steps, the depositing of the UV fluorescer on at most a part of the portion having adhesive deposited thereon can easily be achieved. This provides easy control of the depositing of the UV fluorescer, and therefore easy control of the area of fluorescence. This also allows less UV fluorescer to be used than if the depositing of adhesive and UV fluorescer occurred in the same step.

[0049] The at least one portion having adhesive deposited thereon may have a UV fluorescer deposited on at most a part thereof.

[0050] The blank may be for a folded box.

[0051] According to a eighth aspect of the present invention, there is provided a UV fluorescer comprising butanone, methylpropan - 2 - ol and ethanol.

[0052] According to a different aspect of the invention, there is provided a blank for a box, the blank having a plurality of fixing zones, at least one portion of each of at least two of the fixing zones having adhesive deposited thereon, and at least one of the portions having a UV fluorescer deposited thereon, thereby providing a means of identification of the folded box, wherein not all of the portions have a UV fluorescer deposited thereon. The blank may be for a folded box.

[0053] Embodiments of the invention will now be described, purely by way of example, with reference to the drawings in which:

Figure 1 shows an example of a blank for a folded box of the first type;

Figure 2 shows an example of a blank for the inner part of a folded box of the second type;

Figure 3 shows the example blank of Figure 1 on which adhesive and UV fluorescer has been deposited, according to a first embodiment of the invention;

Figure 4 shows the example blank of Figure 2 on which adhesive and UV fluorescer has been deposited, according to a second embodiment of the invention;

Figure 5 shows a schematic view of the process steps of producing a box according to the first embodiment of the invention;

Figure 6 shows a blank for a folded box of the first type, according to a third embodiment of the invention;

Figure 7 shows the example blank of Figure 6 on which adhesive has been deposited;

Figure 8 shows the blank of Figure 7 on which UV fluorescer has been deposited;

Figure 9 shows a blank for the inner part of a folded box of the second type, according to a fourth embodiment of the invention;

Figure 10 shows a box formed from the blank of Figure 9;

Figure 11 shows the box of Figure 10 on which adhesive has been deposited;

Figure 12 shows the box of Figure 11 on which UV fluorescer has been deposited;

Figure 13 shows an example of a folding gluing machine production line to process the blank shown in Figure 6; and

Figure 14 shows an example of a cartoning machine production line to process the blank shown in Figure 9.

[0054] Referring to the drawings, Figure 3 shows a blank 1 for a folded box of the first type mentioned above, the blank 1 having a plurality of tabs 2, 8, 9 (seven tabs in Figure 3), a portion 3 of one of the tabs 2 having adhesive deposited thereon, and the portion 3 having a UV fluorescer deposited on a part 4 (shown stippled) thereof, thereby providing a means of identification of the blank 1.

[0055] A suitable UV fluorescer is butanone, methylpentan - 2 - one (methyl isobutyl ketone), esfluoro tetrabutylammonium phosphate 2.5, and thiophenediylbis (5 - tern - butyl - 1.3 - benzoaxole).

[0056] Figure 3 shows six walls 11, 12, 13, 14, 15, 16 to which the tabs 2 are joined. The walls 11, 12, 13, 14, 15, 16 form the respective walls of the folded box once the blank 1 has been fully assembled.

[0057] Figure 3 shows a single tab 2 having a portion 3 with adhesive deposited thereon, the portion 3 having a part 4 with UV fluorescer deposited thereon. However, any one of the other tabs 2 could be provided thus instead of, or in addition to, the single tab 2 shown in Figure 3.

[0058] Similarly, Figure 4 shows a blank 10 for the inner part of a folded box of the second type mentioned above, the blank 10 having a plurality of tabs 20, 21, 22, 23 (four

tabs in Figure 4), a portion 30 of one of the tabs 20 having adhesive deposited thereon, and the portion 30 having a UV fluorescer deposited on a part 40 thereof, thereby providing a means of identification of the blank 10.

[0059] In Figure 4 the tabs 20, 21, 22, 23 form the four walls of the inner part of the folded box once the blank 10 has been fully assembled. The wall 60 forms the base wall of the folded box once the blank 10 has been fully assembled.

[0060] A folding gluing machine may be used to assemble a blank (e.g. blank 1) for the first type of folded box. Referring to the blank 1 of Figure 3, during assembly the folding gluing machine applies adhesive to a desired portion (in this case, portion 3) of the tab 2. UV fluorescer is then deposited on a part 4 of portion 3. The folding gluing machine then folds the blank_1 along crease 7 between walls 13 and 14, so that tab 2 on which the adhesive is applied can then be folded onto and adhered to wall 15, which is provided at the other end of the blank 1 from tab 2.

[0061] Next, a cartoning machine picks up the blank 1 once it has been processed by the folding gluing machine, erects the blank 1 to form a box shape so that it can be filled with a desired product. The product or products are usually inserted horizontally through an open end of the erected box. The cartoning machine then closes the box by tucking tabs 8 and 9 into the open ends of the erected blank 1, or by gluing tabs 8, which are joined to end walls 11, 16, to the other respective sides of walls 12 and 14 to which end walls 11 and 16 are joined. The gluing of tabs 8 could occur by depositing adhesive on at least one portion of at least one of the tabs 8, and by depositing a UV fluorescer on at most a part of the at least one portion of at least one of the tabs 8.

[0062] The product or products can be inserted using a mechanical or sleeve or pressurised air. However, luxury products are usually inserted manually into the box.

[0063] The assembly of a blank according to the first embodiment by the folding gluing machine and the cartoning machine is shown schematically in Figure 5.

[0064] The full procedure for processing the blank 1 by the folding gluing machine will now be described. The blank 1 enters the folding gluing machine along belts and advances towards a first station, where, while the blank 1 is in motion, the tab 2 on which adhesive is to be applied is compressed onto a gluing disc impregnated with adhesive (in the present embodiment, a water-based adhesive), thereby depositing adhesive on the tab 2 on portion 3. In this way, a strip of water-based adhesive is left on the tab 2 by the gluing disc.

[0065] The blank 1 then moves along the same line to a second station. In this station, an industrial inkjet printer deposits UV fluorescer on a part 4 of the portion 3 on which the adhesive was deposited. In the present embodiment, printer prints a strip of UV fluorescer ink, but in other embodiments the printer prints alphanumeric characters. Alternatively, the printer may print a single drop of ink. The UV fluorescer is deposited at a particular (predetermined) point of the portion 3 which the product manufacturer and the product receiver have agreed on. The point can be customised by the manufacturer.

[0066] The blank 1 moves further along the same line to a third station. Here, the folding gluing machine folds the blank 1 along crease 7, so that tab 2 on which the adhesive and UV fluorescer are deposited can then be folded onto and adhered to the wall 5 that is shown at the bottom of Figure 3.

[0067] Once the packaging process of the folded box has been completed (for example, by a cartoning machine), the receiver of the box from the product manufacturer can determine the authenticity of the box by opening the box, separating the tab 2 and wall 5 to which the tab 2 is adhered, and illuminating the portion 3 using a UV light source, whereupon part 4 will be illuminated.

[0068] The third embodiment, as shown in Figures 6 to 8, is similar to the first embodiment, as shown in Figures 1 and 3, and only differences will be described.

[0069] As shown in Figure 7, in the third embodiment adhesive is deposited on tab 8 rather than tab 2, in portion 3'. Referring to Figure 8, UV fluorescer is also deposited on tab 8 rather than tab 2, in portion 4'. In the third embodiment, the adhesive is deposited so that portion 4' forms alphanumeric characters, although Figure 8 does not show this.

[0070] The fourth embodiment, as shown in Figures 9 to 12, is similar to the second embodiment, as shown in Figures 2 and 4. The processing of the blank 100 to box 500 by the cartoning machine is described below.

[0071] As shown in Figure 11, the adhesive is deposited on the outside of the box 500 in the fourth embodiment, in the form of thermo-adhesive paper. In addition, the UV fluorescer is deposited on the outside of the box 500, as shown in Figure 12. As shown in Figure 12, the UV fluorescer is deposited on portion 303 of the tab 210 in part 400. It is also deposited in the middle of tab 210 between portions 302 and 303, on a different part of the box 500 from where the adhesive is deposited.

[0072] The full procedure for processing the blank 100 shown in Figure 9 by the cartoning machine will now be described.

[0073] The blank 100 enters the cartoning machine along belts and advances towards a first station, where, while the blank 100 is in motion, the tabs 200, 210, 220, 230 are closed (as shown in Figure 10) and welded along their adjacent edges with thermo-adhesive paper 320. Figure 11 shows that the thermo-adhesive paper 320 is deposited on portions 300, 301, 302 and 303 of the tabs 210 and 230. The portions on tabs 200 and 220 on which the thermo-adhesive paper 320 is deposited are not shown in the figures. In this way, a strip of thermo-adhesive paper 320 is deposited at all the corners of the resulting box 500 so that adjacent tabs 200 and 210, 210 and 230, 230 and 220, and 220 and 200 are joined.

[0074] The resulting box 500 then moves along the same line to a second station. In this station, an industrial inkjet printer deposits UV fluorescer on a part 400 of the

portion 303 on which the thermo-adhesive paper 320 is deposited (as shown in Figure 12). Alternatively, the industrial inkjet printer may deposit UV fluorescer on different part of the box 500 from the portions where the thermo-adhesive paper is deposited (portions 300, 301, 302 and 303 in Figure 12). In this embodiment, as shown in Figure 12, UV fluorescer is deposited on the middle of tab 210 i.e. between the portions 302 and 303, but could be deposited on the middle of tabs 200, 230 or 220. In the present embodiment, the printer prints a strip of UV fluorescer ink, but in other embodiments the printer prints alphanumeric characters. Alternatively, the printer may print a single drop of ink. The UV fluorescer is deposited at a particular (predetermined) point of the portion 303 which the product manufacturer and the product receiver have agreed on. The point can be customised by the manufacturer.

[0075] The box 500 moves further along the same line to a third station where the box 500 is assembled with the outer layer. In this embodiment the box 500 forms the inner layer of a folded box of the second type.

[0076] Once the packaging process of the folded box has been completed (for example, by a cartoning machine), the receiver of the box from the product manufacturer can determine the authenticity of the box by opening the box, separating the inner layer (box 500) from the outer layer, and illuminating the portion 303 using a UV light source, whereupon part 400 will be illuminated.

[0077] In Figure 14, the UV fluorescer is shown as deposited next to the portion 303 whereas in the deposition should be on portion 303 as shown in Figure 12.

[0078] The embodiments described above are exemplary and explanatory and are not intended the limit the scope of protection, which is defined by the appended claims. The person skilled in the art would contemplate variations and modifications to the embodiments described above without departing from the scope of protection defined by the appended claims.

Claims

1. A method of making a blank (1, 10, 100) for a box, the method comprising:

   providing a blank (1, 10, 100) having a plurality of fixing zones (2, 8, 20, 21, 22, 23, 200, 210, 220, 230);
   depositing adhesive on at least one of the fixing zones (2, 8, 20, 200, 210, 220, 230), and
   depositing a UV fluorescer or phosphorescer on at least one portion of the blank (1, 10, 100), thereby providing a means of identification of the blank,
   wherein the depositing of adhesive and the depositing of a UV fluorescer or phosphorescer are separate steps.

2. A method according to claim 1, wherein the deposition of UV fluorescer or phosphorescer forms a code.

3. A method according to claim 1 or 2, wherein the adhesive is deposited on at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210), and UV fluorescer or phosphorescer is deposited on the at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210).

4. A method according to claim 1, 2 or 3, wherein the adhesive is water-based.

5. A method according to any preceding claim, wherein the UV fluorescer or phosphorescer is deposited by a printing device.

6. A method according to any preceding claim, wherein the UV fluorescer or phosphorescer comprises a carrier and a fluorescent component.

7. A method according to any preceding claim, wherein the UV fluorescer or phosphorescer is deposited onto a surface of the adhesive.

8. A method according to any preceding claim, wherein the UV fluorescer or phosphorescer is deposited in the form of an ink or toner.

9. A method of making a blank (1, 10, 100) for a box, the method comprising:

   providing a blank (1, 10, 100) having a plurality of fixing zones (2, 8, 20, 21, 22, 23, 200, 210, 220, 230);
   depositing adhesive on at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210), and
   depositing a UV fluorescer or phosphorescer on at most a part (4, 4', 40, 400) of the at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210), thereby providing a means of identification of the blank (1, 10, 100).

10. A method according to claim 9, wherein the depositing of adhesive and the depositing of a UV fluorescer or phosphorescer are separate steps.

11. A method of assembling a box, comprising making a blank for a box by a method according to any preceding claim, and further comprising:

    adhering the at least one fixing zone (2, 8, 20, 200, 210, 220, 230) on which adhesive has been deposited to another part of the blank (12, 14, 15, 21, 200, 210, 220, 230) to form a box (500);
    providing the box (500) as an inner layer in or an outer layer around an additional box, wherein

the UV fluorescer or phosphorescer is deposited between the box (500) and the additional box.

12. A method of assembling a box comprising the method according to any one of claims 1 to 10, further comprising:

depositing adhesive on other of the fixing zones (8, 21, 22, 23), and
adhering the other of the fixing zones (8, 21, 22, 23) to other parts of the blank (12, 14, 20, 22, 23) to form a box.

13. A blank (1, 10, 100) for a box (500), the blank (1, 10, 100) having a plurality of fixing zones (2, 8, 9, 20, 21, 22, 23, 200, 210, 220, 230), at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210) having adhesive deposited thereon, and the at least one portion (3, 3', 30, 303) having a UV fluorescer or phosphorescer deposited on at most a part (4, 4' 40, 400) thereof, thereby providing a means of identification of the blank (1, 10, 100).

14. A box (500) made from a blank according to claim 13.

15. A system for making a box (500), comprising:

a cartoning machine or a folding gluing machine for making the box (500) from a blank (1, 10, 100), and
a printer for printing a UV ink fluorescer or phosphorescer onto the blank (1, 10, 100).

Amended claims in accordance with Rule 137(2) EPC.

1. A method of making a blank (1, 10, 100) for a box, the method comprising:

providing a blank (1, 10, 100) having a plurality of fixing zones (2, 8, 20, 21, 22, 23, 200, 210, 220, 230);
depositing adhesive on at least one of the fixing zones (2, 8, 20, 200, 210, 220, 230), and
depositing a UV fluorescer or phosphorescer on at least one portion of the blank (1, 10, 100), thereby providing a means of identification of the blank,
wherein the depositing of adhesive and the depositing of a UV fluorescer or phosphorescer are separate steps,
wherein the adhesive is deposited on at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210), and UV fluorescer or phosphorescer is deposited on the at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210), and
wherein the blank (1, 10, 100) has a plurality of walls, to form the respective walls of the box, and deposition of the adhesive is to join respective walls of the box, and
wherein, when the respective walls are joined by the adhesive, the UV fluorescer or phosphorescer deposited on the at least one portion is not detectable using a UV light source.

2. A method according to claim 1, wherein the deposition of UV fluorescer or phosphorescer forms a code.

3. A method according to claim 1 or 2, wherein the adhesive is water-based.

4. A method according to any preceding claim, wherein the UV fluorescer or phosphorescer is deposited by a printing device.

5. A method according to any preceding claim, wherein the UV fluorescer or phosphorescer comprises a carrier and a fluorescent component.

6. A method according to any preceding claim, wherein the UV fluorescer or phosphorescer is deposited onto a surface of the adhesive.

7. A method according to any preceding claim, wherein the UV fluorescer or phosphorescer is deposited in the form of an ink or toner.

8. A method of making a blank (1, 10, 100) for a box, the method comprising:

providing a blank (1, 10, 100) having a plurality of fixing zones (2, 8, 20, 21, 22, 23, 200, 210, 220, 230);
depositing adhesive on at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210), and
depositing a UV fluorescer or phosphorescer on at most a part (4, 4', 40, 400) of the at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210), thereby providing a means of identification of the blank (1, 10, 100), and
wherein the blank (1, 10, 100) has a plurality of walls, to form the respective walls of the box, and deposition of the adhesive is to join respective walls of the box, and
wherein, when the respective walls are joined by the adhesive, the UV fluorescer or phosphorescer deposited on the at least one portion is not detectable using a UV light source.

9. A method according to claim 8, wherein the depositing of adhesive and the depositing of a UV fluorescer or phosphorescer are separate steps.

10. A method of assembling a box, comprising making a blank for a box by a method according to any preceding claim, and further comprising:

adhering the at least one fixing zone (2, 8, 20, 200, 210, 220, 230) on which adhesive has been deposited to another part of the blank (12, 14, 15, 21, 200, 210, 220, 230) to form a box (500);
providing the box (500) as an inner layer in or an outer layer around an additional box, wherein the UV fluorescer or phosphorescer is deposited between the box (500) and the additional box.

11. A method of assembling a box comprising the method according to any one of claims 1 to 9, further comprising:

depositing adhesive on other of the fixing zones (8, 21, 22, 23), and
adhering the other of the fixing zones (8, 21, 22, 23) to other parts of the blank (12, 14, 20, 22, 23) to form a box.

12. A blank (1, 10, 100) for a box (500), the blank (1, 10, 100) having a plurality of fixing zones (2, 8, 9, 20, 21, 22, 23, 200, 210, 220, 230), at least one portion (3, 3', 30, 303) of at least one of the fixing zones (2, 8, 20, 210) having adhesive deposited thereon, and the at least one portion (3, 3', 30, 303) having a UV fluorescer or phosphorescer deposited on at most a part (4, 4' 40, 400) thereof, thereby providing a means of identification of the blank (1, 10, 100),
wherein the blank (1, 10, 100) has a plurality of walls, to form the respective walls of the box, and deposition of the adhesive is to join respective walls of the box, and
wherein, when the respective walls are joined by the adhesive, the UV fluorescer or phosphorescer deposited on the at least one portion is not detectable using a UV light source.

13. A box (500) made from a blank according to claim 12.

14. A method according to any of claims 1 to 11, wherein the at least one fixing zone on which adhesive is deposited comprises a tab joined to an edge of a wall of the blank.

15. A method according to any of claims 1 to 11, wherein the at least one fixing zone on which adhesive is deposited comprises a wall of the blank.

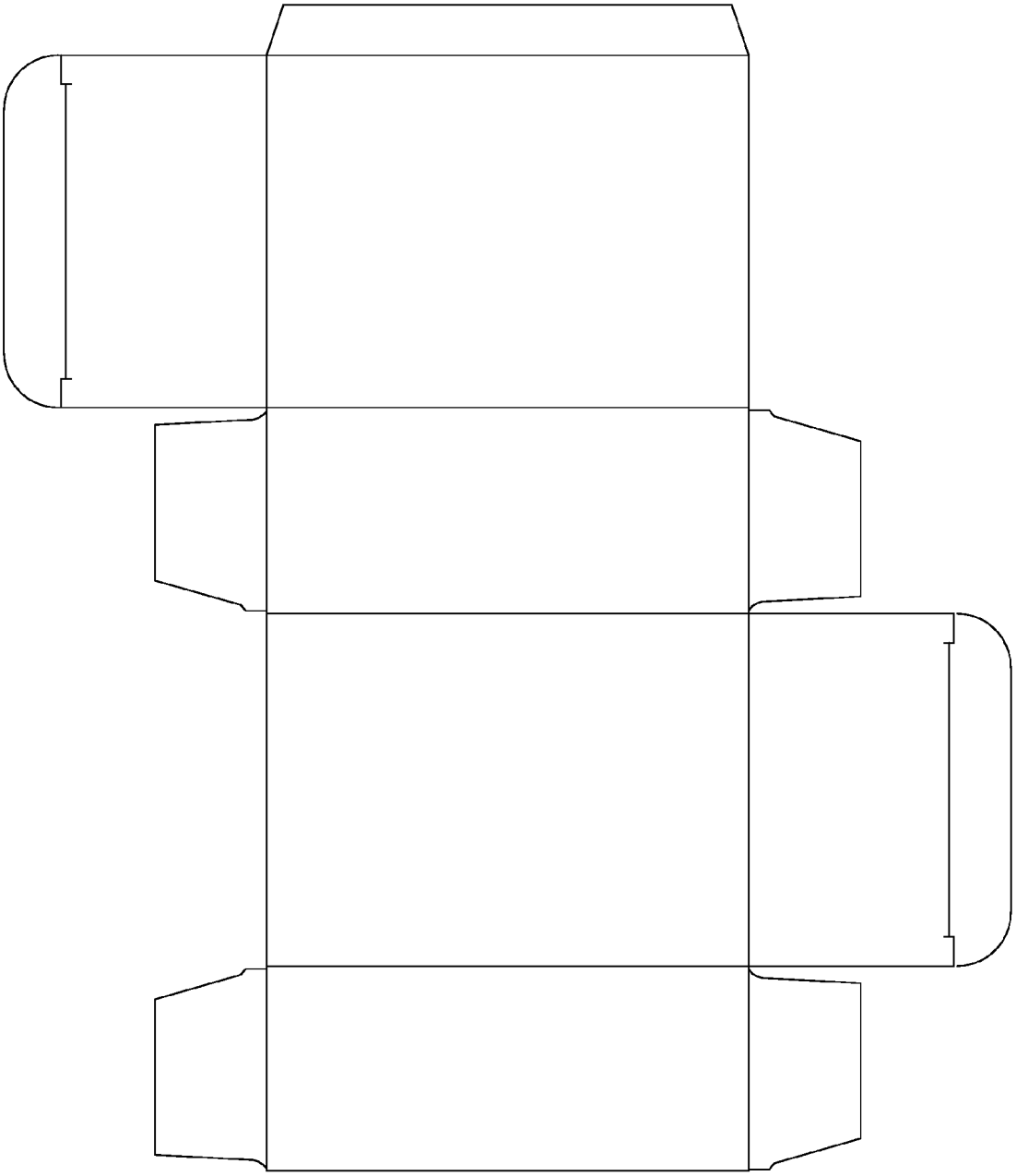

Fig. 1

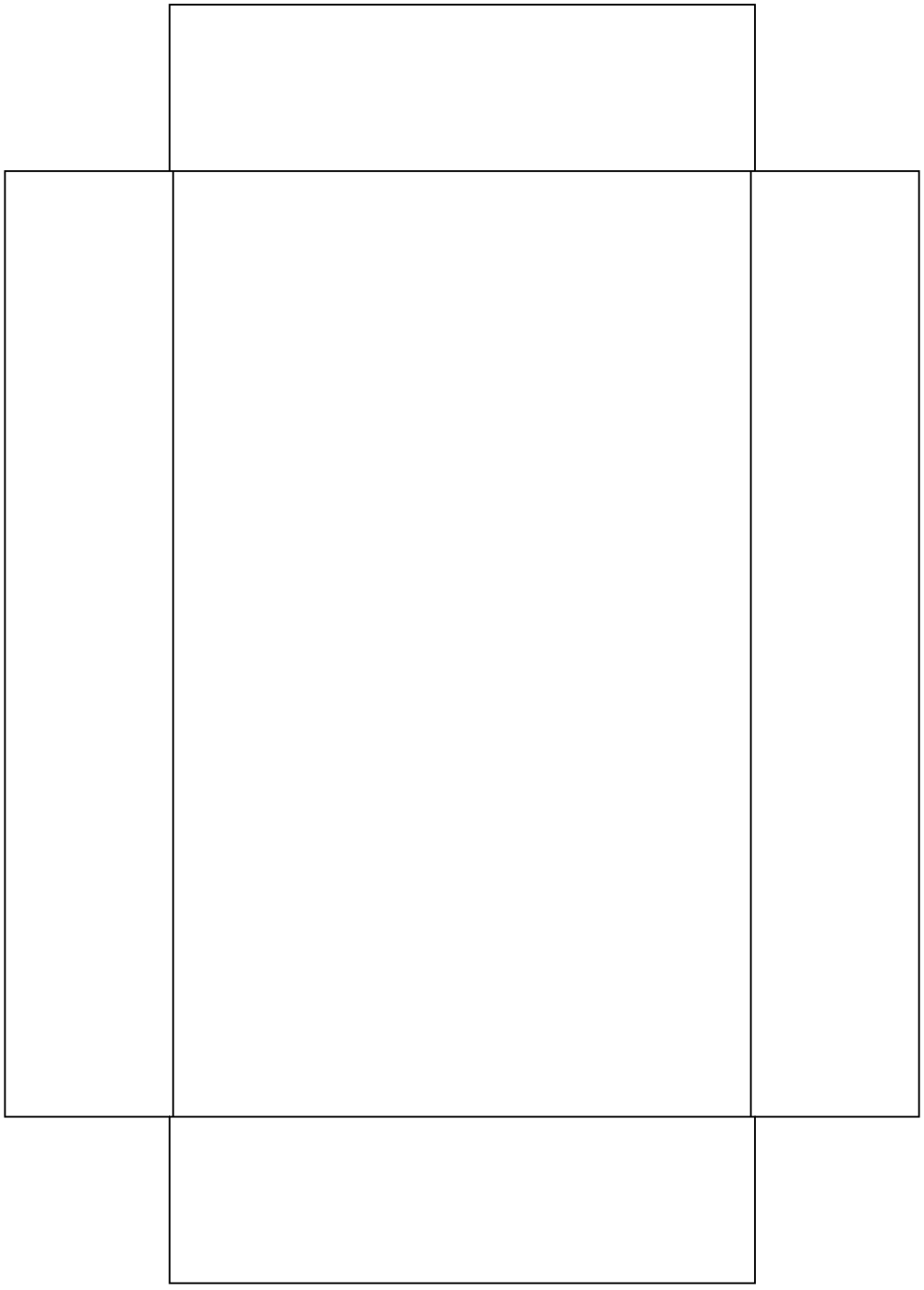

Fig. 2

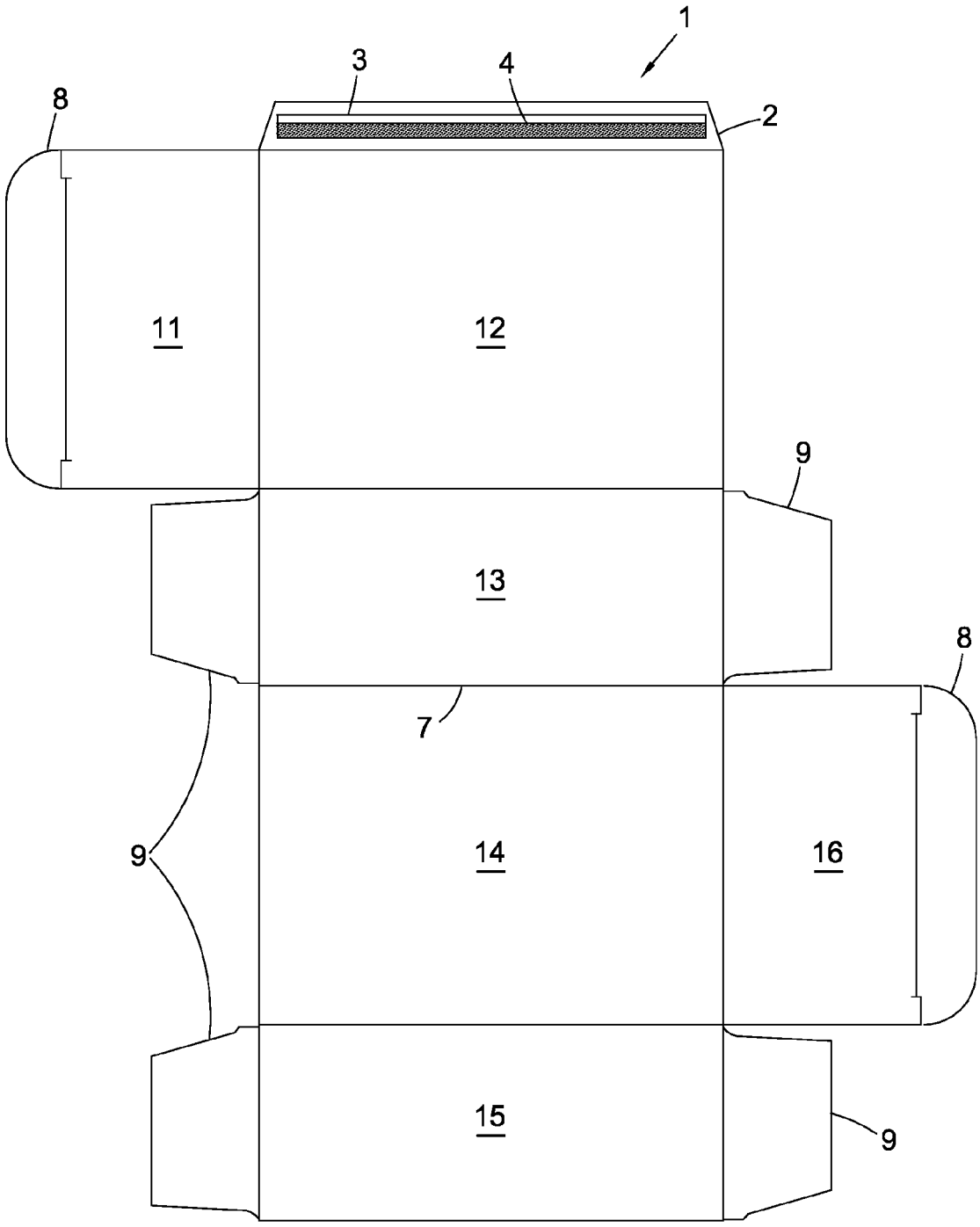

Fig. 3

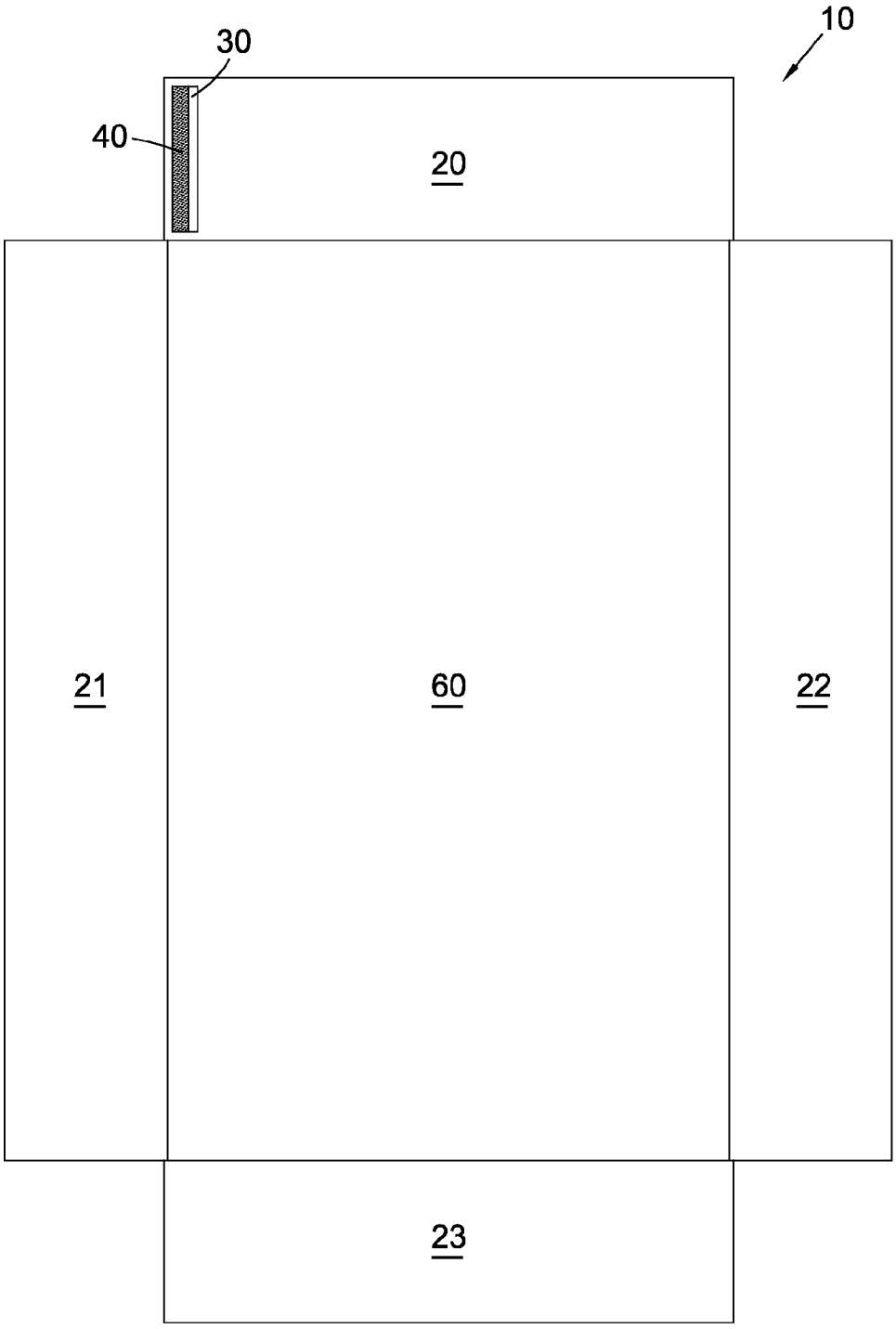

Fig. 4

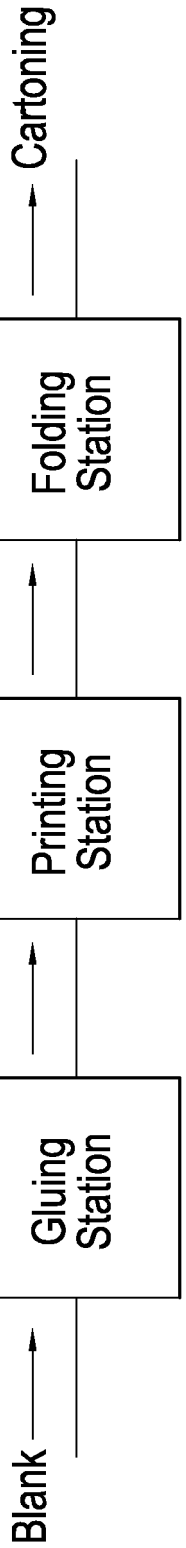
Blank
Gluing Station
Printing Station
Folding Station
Cartoning

Fig. 5

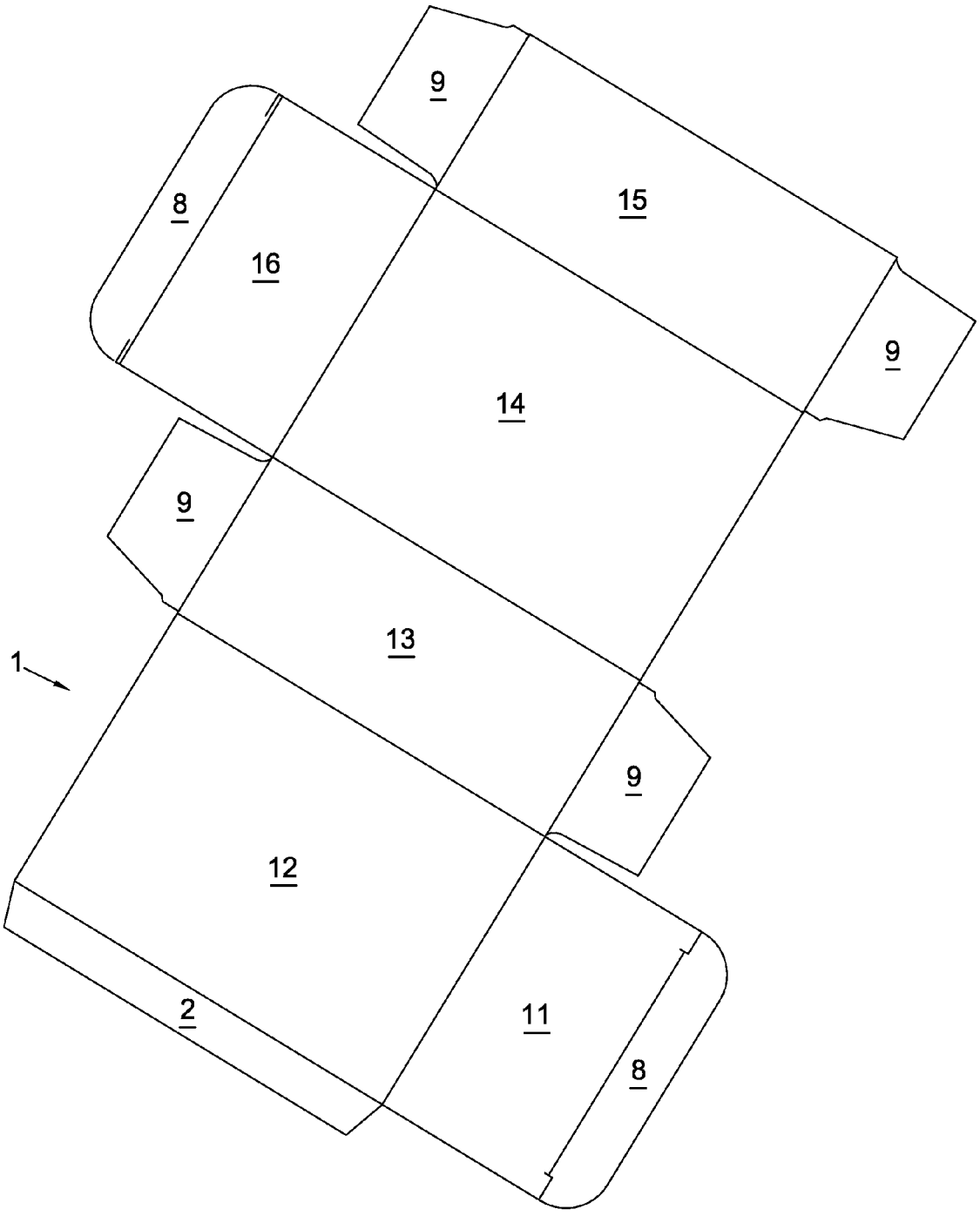

Fig. 6

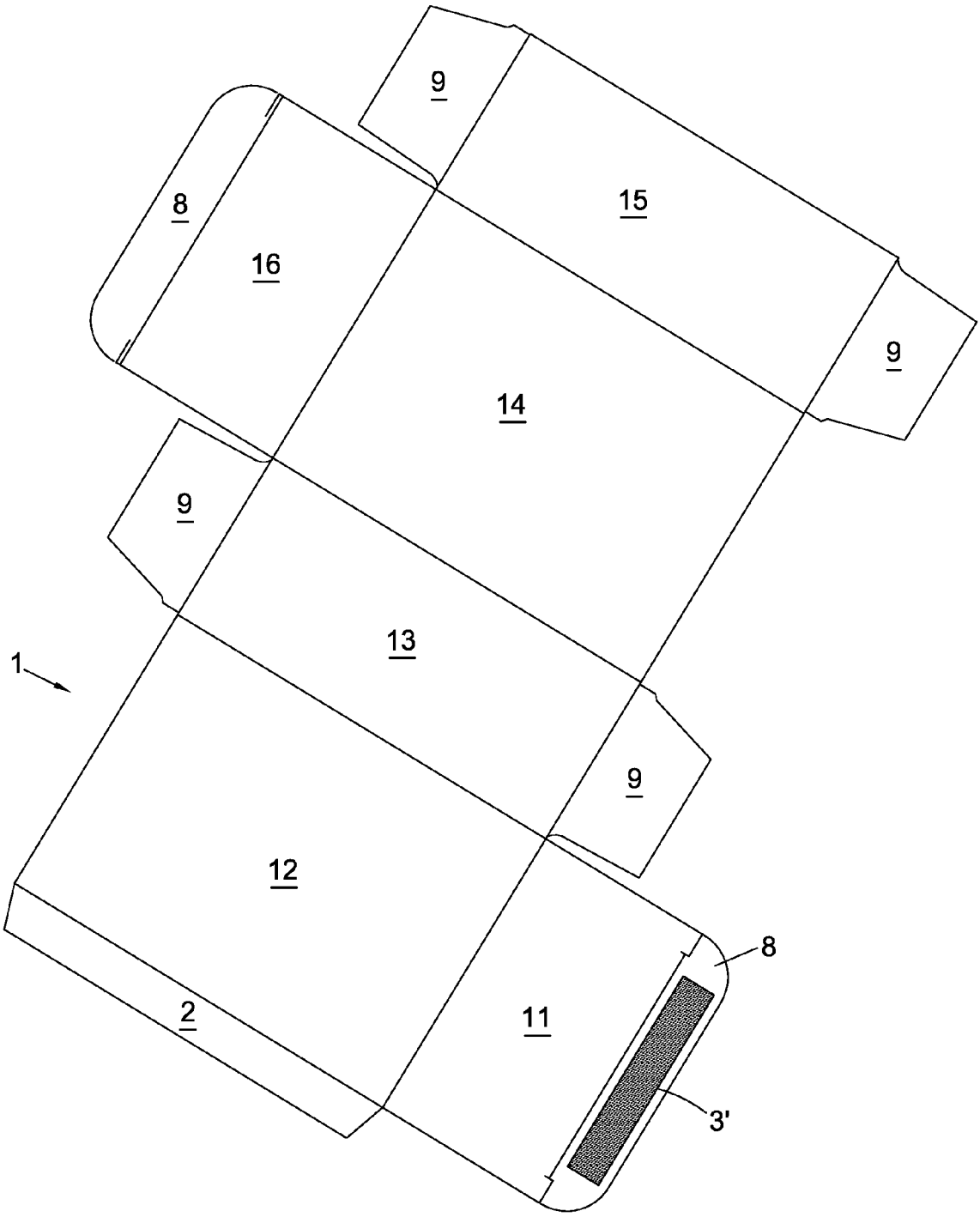

Fig. 7

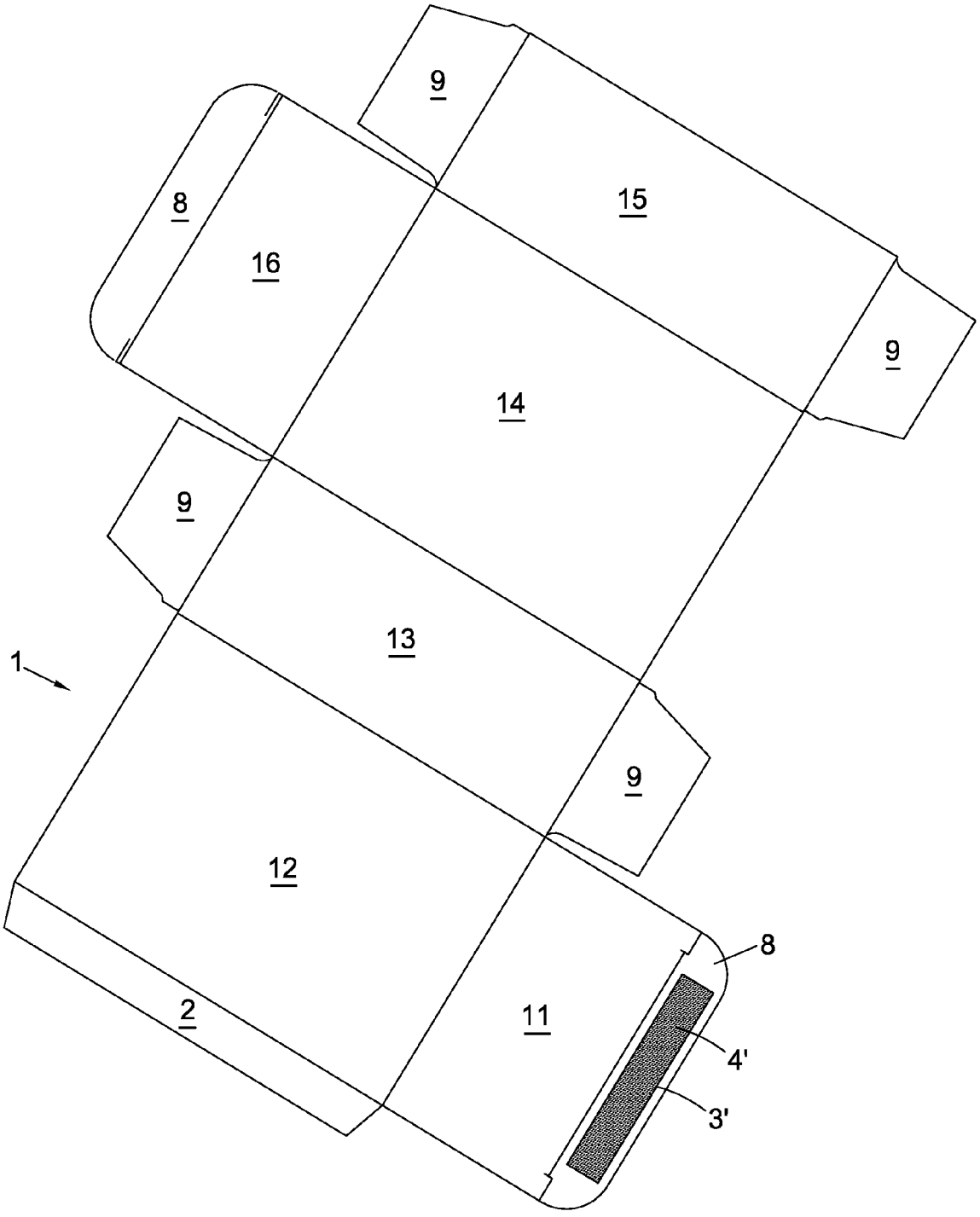

Fig. 8

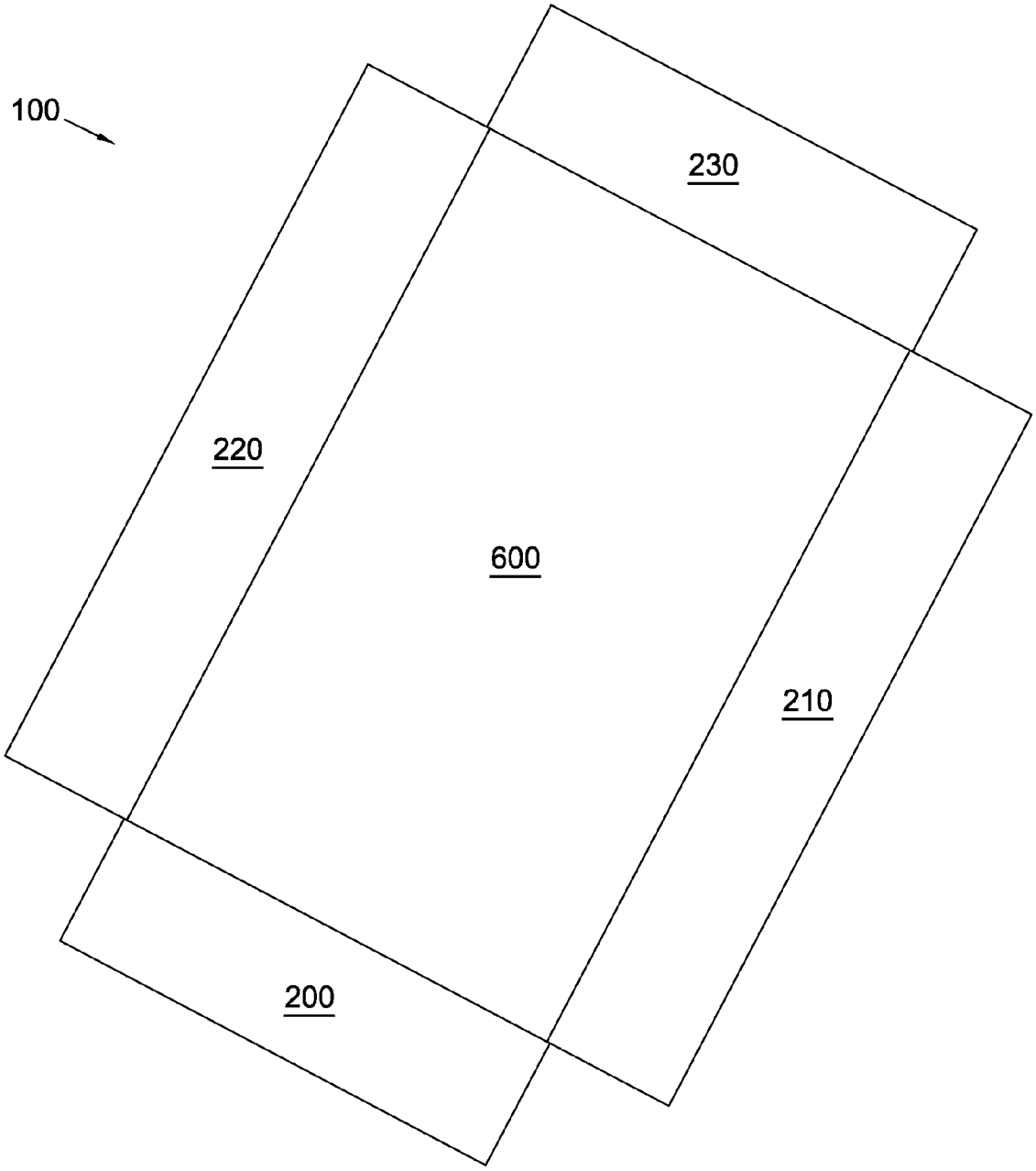

Fig. 9

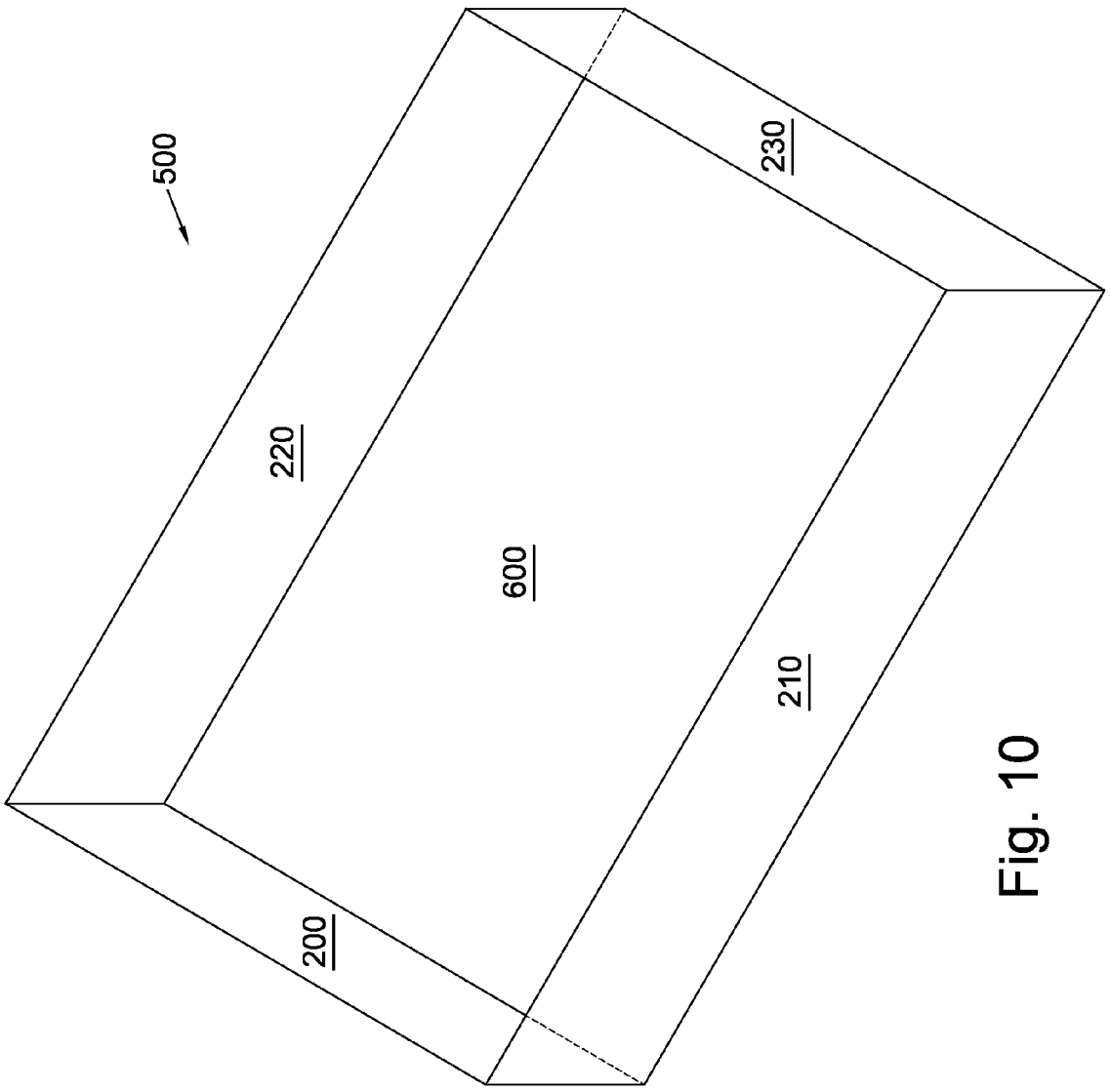

Fig. 10

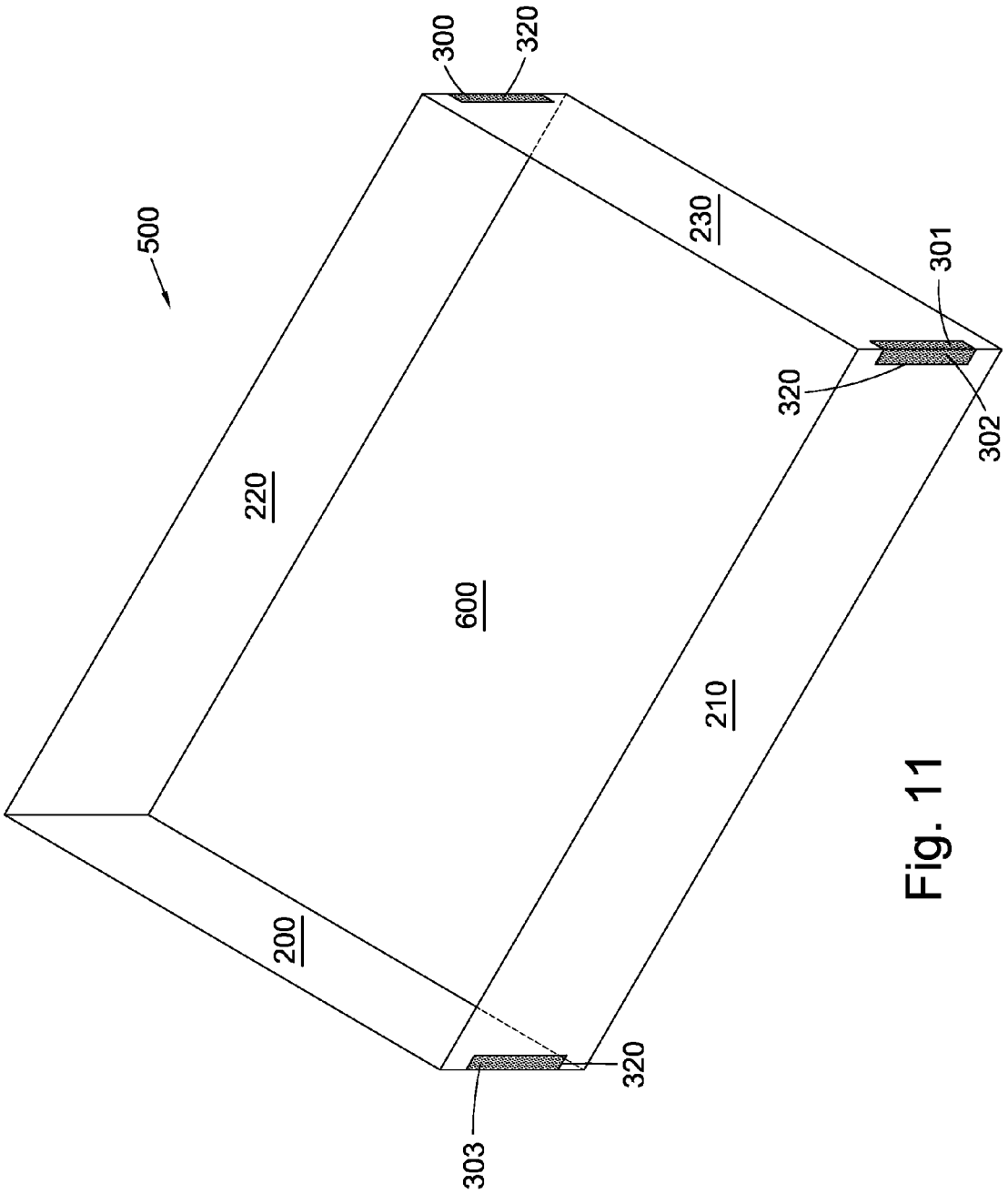

Fig. 11

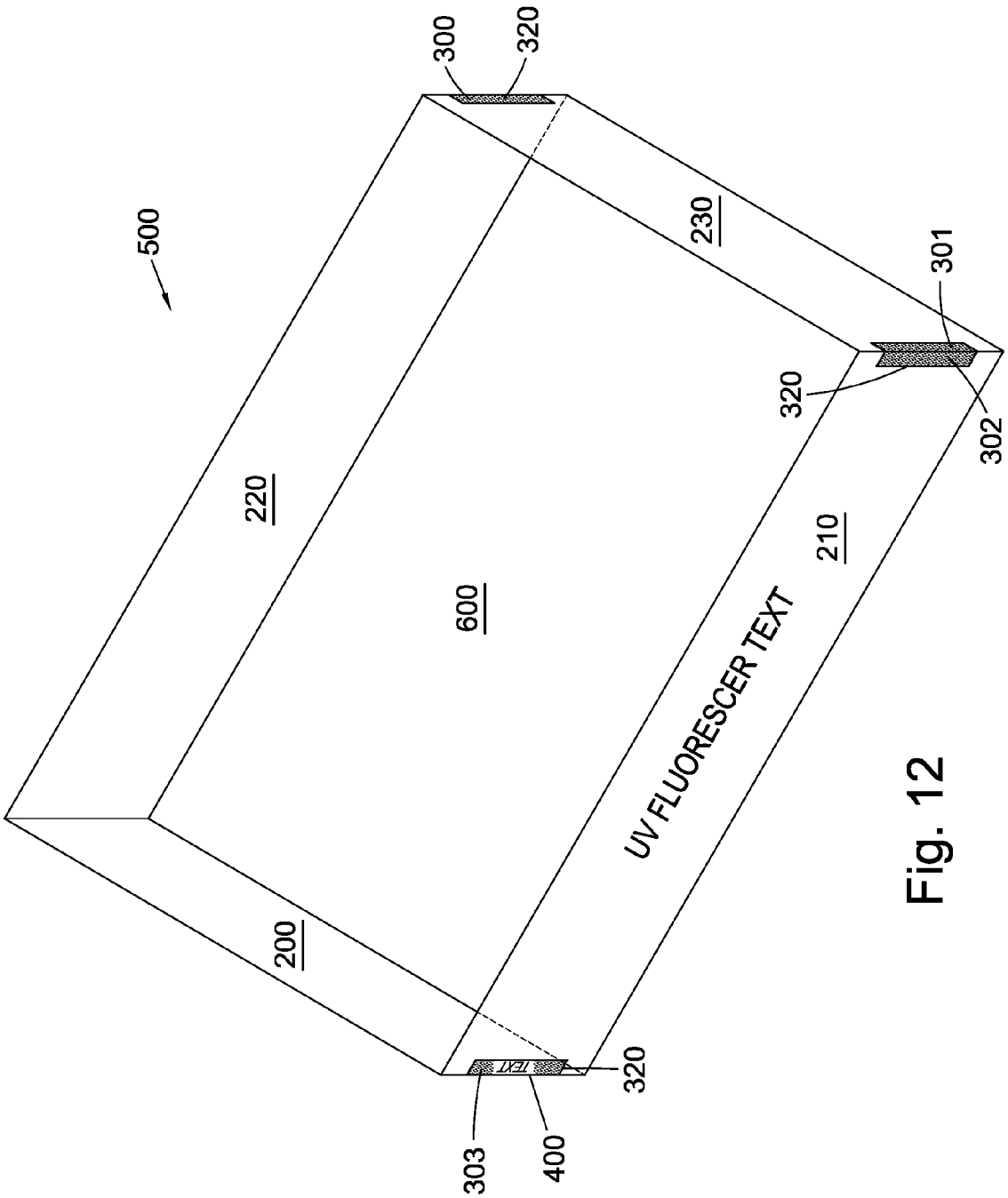
500
300
320
230
301
320
302
220
600
210
UV FLUORESCER TEXT
200
320
303
400

Fig. 12

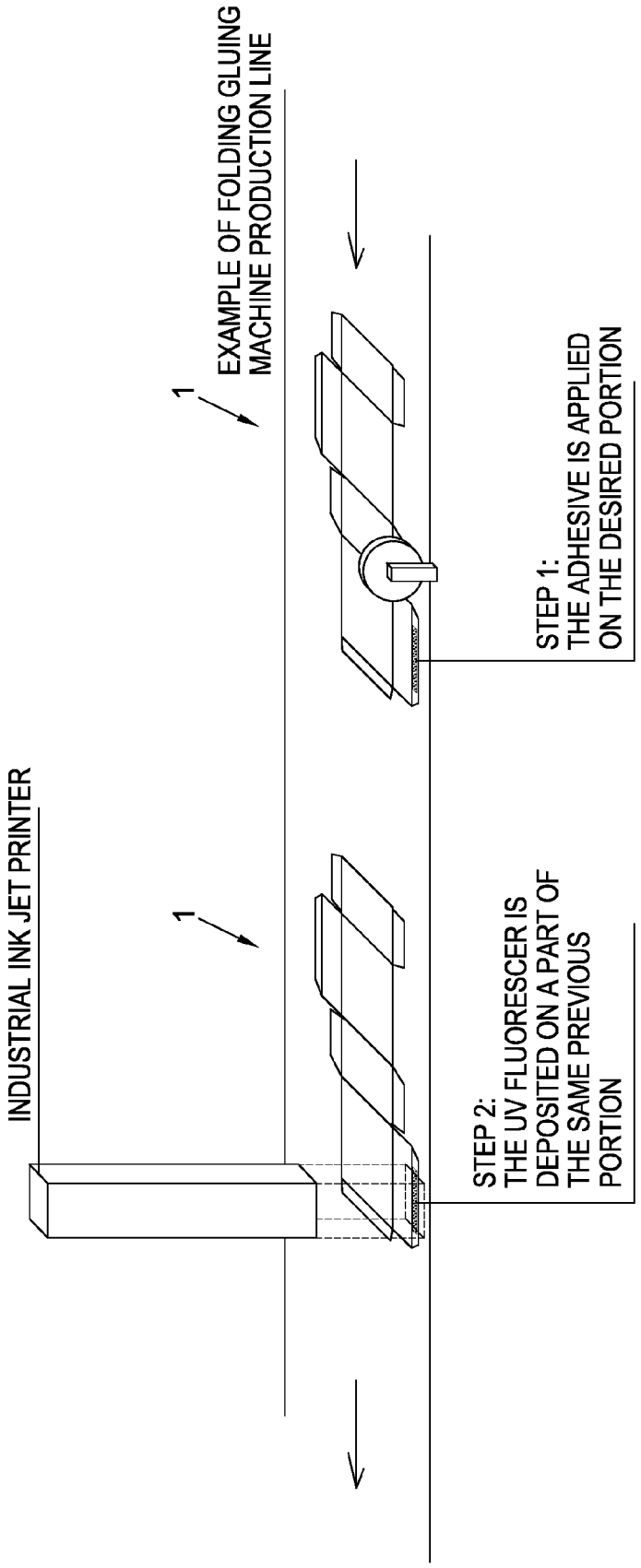
EXAMPLE OF FOLDING GLUING MACHINE PRODUCTION LINE
1
1
INDUSTRIAL INK JET PRINTER
STEP 1: THE ADHESIVE IS APPLIED ON THE DESIRED PORTION
STEP 2: THE UV FLUORESCER IS DEPOSITED ON A PART OF THE SAME PREVIOUS PORTION

Fig. 13

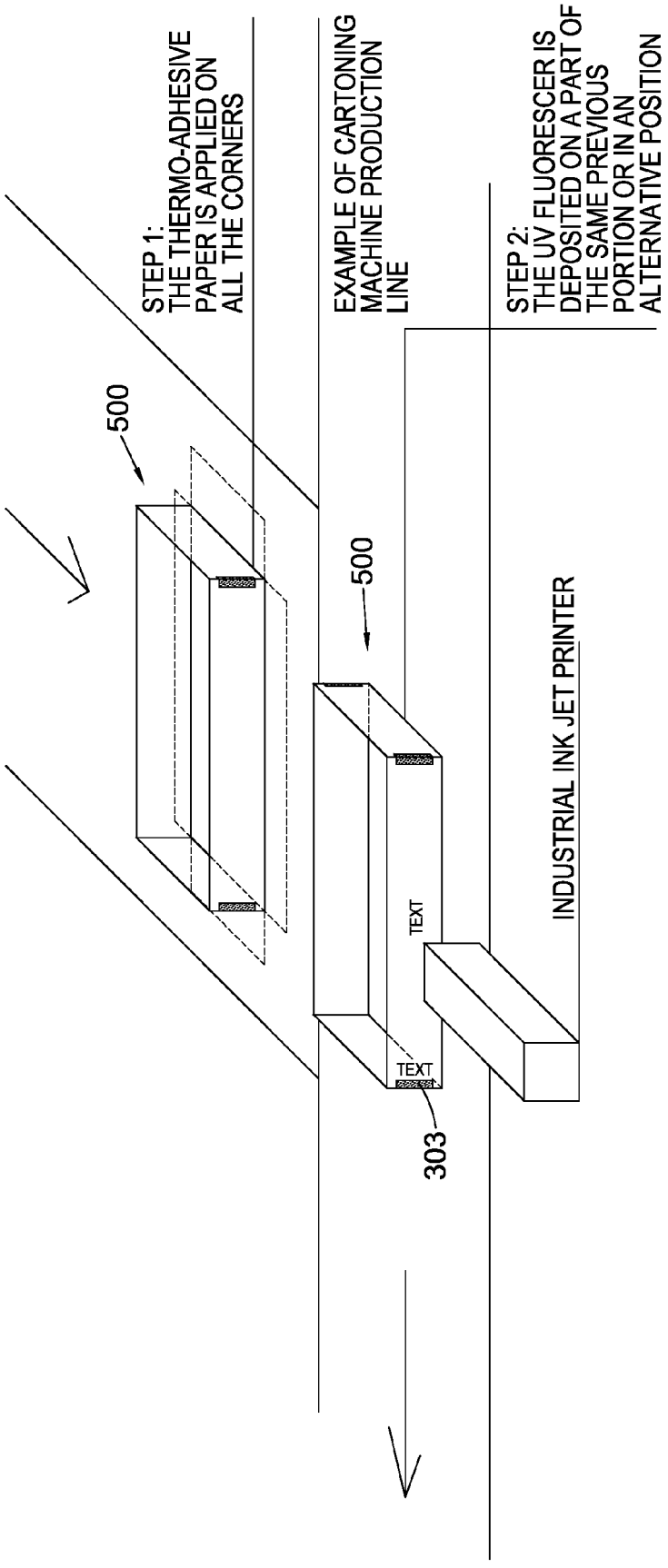
STEP 1:
THE THERMO-ADHESIVE
PAPER IS APPLIED ON
ALL THE CORNERS
EXAMPLE OF CARTONING
MACHINE PRODUCTION
LINE
STEP 2:
THE UV FLUORESCER IS
DEPOSITED ON A PART OF
THE SAME PREVIOUS
PORTION OR IN AN
ALTERNATIVE POSITION
500
500
INDUSTRIAL INK JET PRINTER
TEXT
TEXT
303

Fig. 14

Europäisches Patentamt
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EUROPEAN SEARCH REPORT

Application Number
EP 13 16 3992

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	DE 195 11 962 A1 (EMRICH DIRK [DE]) 11 January 1996 (1996-01-11) * column 6, line 62 - column 7, line 7; claim 1; figures 1-3 *	1,2,5,6, 8,12,15 9-11,13, 14	INV. B65D5/02 B65D5/42
X A	WO 99/12818 A1 (EIKON GRAFICHE SRL [IT]) 18 March 1999 (1999-03-18) * page 2, line 16 - page 4, line 19; figures 1-3 *	1,2,4-6, 8,12,15 9,11,13, 14	
X	DE 20 2004 006327 U1 (HEISEL CLAUDIA [DE]) 29 July 2004 (2004-07-29) * paragraph [0019] - paragraph [0022]; figures 1-4 *	1,3,7,9, 10,13,14	
X	BE 480 240 A (BERGHGRACHT M) 28 February 1948 (1948-02-28) * page 3, paragraph 2-6; claims 1-3; figures 1-6 *	1,11,12	
A	US 2007/085335 A1 (LAMPE SCOTT A [US]) 19 April 2007 (2007-04-19) * paragraph [0002] * * paragraph [0029] - paragraph [0035]; figures 1-5 *	1,9,13, 14	TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	6 September 2013	Grondin, David

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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06-09-2013

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		DE 19511962 A1	11-01-1996
WO 9912818 A1	18-03-1999	NONE	
DE 202004006327 U1	29-07-2004	NONE	
BE 480240 A	28-02-1948	NONE	
US 2007085335 A1	19-04-2007	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

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