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- (71) **Applicant:** NOVO NORDISK A/S [DK/DK]; Novo Allé, 2880 Bagsværd (DK).
- (72) **Inventors:** KEISER-NIELSEN, Niels Frederik; Novo Nordisk A/S, Novo Allé, 2880 Bagsværd (DK). LARSEN, Ebbe Jannes; Novo Nordisk A/S, Novo Allé, 2880 Bagsværd (DK). MADSEN, Mads Faber; Novo Nordisk A/S, Novo Allé, 2880 Bagsværd (DK). OLESEN, Laurits Højgaard; Novo Nordisk A/S, Novo Allé, 2880 Bagsværd (DK).

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(54) **Title:** METHOD OF FORMING AN ADHESIVE BOND BETWEEN FIRST AND SECOND COMPONENTS OF A DEVICE AND A DEVICE FORMED BY THE METHOD

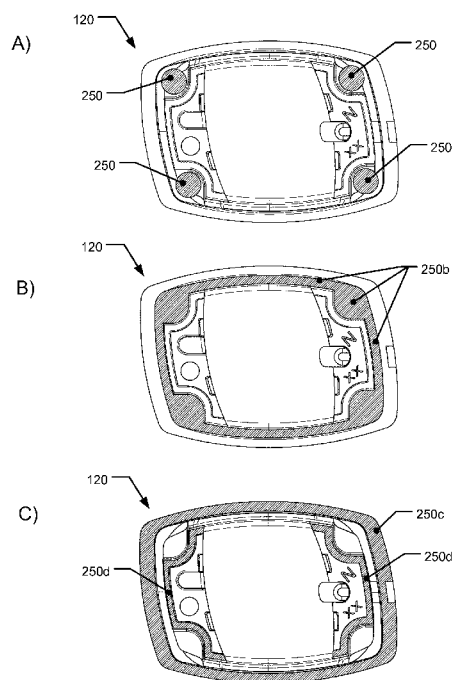


Fig. 4

(57) **Abstract:** A method of forming an adhesive bond between first and second components of a device is described. The method comprises the steps of a) providing a first component (110), b) providing a second component (120), the second component defining a first glue channel configuration (120a, 120b) adapted to receive an adhesive (250), c) depositing adhesive (250) in the first glue channel configuration (120a, 120b) of the second component (120) and allowing the deposited adhesive (250) to distribute in the first glue channel configuration (120a, 120b) by capillary effect, d) arranging the first component (110) and the second component (120) relative to each other to form an assembly thereby forming a second glue channel configuration (110, 120c, 120d) defined by surface geometries of the first component (110) and surface geometries of the second component (120), e) allowing at least part of the adhesive (250) disposed in the first glue channel configuration (120a, 120b) of the second component (120) to flow by capillary effect into and distribute in the second glue channel configuration (110, 120c, 120d), and f) allowing the adhesive (250) disposed in the second glue channel configuration (110, 120c, 120d) to cure.

METHOD OF FORMING AN ADHESIVE BOND BETWEEN FIRST AND SECOND COMPONENTS OF A DEVICE AND A DEVICE FORMED BY THE METHOD

The present invention relates to a method for use in manufacturing of a device wherein two or more device components of the device are fastened relative to each other by means of an adhesive fastening process. The present invention furthermore relates to devices obtained by the method of manufacturing.

In particular, the invention provides improvements with respect to manufacturability and assembling operations during manufacture of a device, such as a drug delivery device. In addition, the invention provides improvements having regard to factors including durability and robustness for such devices manufactured by the method.

BACKGROUND

In the disclosure of the present invention reference is mostly made to drug delivery devices used e.g. in the treatment of diabetes by delivery of insulin, however, this is only an exemplary use of the present invention.

State of the art methods for adhesively securing components relative to each other sometimes involve distribution of an adhesive in the interface between the components by using a suitable liquid adhesive that is able to flow by capillary effect into a desired target configuration or pattern. Examples of such attachment methods are disclosed in references WO 2006/046164 A1, US 5837090 A and EP 0711650 A1.

Typically, in prior art attachment methods that rely on glue application by capillary action, the components that need to be adhesively secured are brought together and interface gaps between the components which needs to be filled with an adhesive require one or more openings or inlets for the filling of the adhesive. This may make the manufacturing process unnecessary complicated and may further compromise the design of the final product.

Furthermore, the liquid distribution by capillary action subsequently to bringing the relevant components into mating engagement may result in excessive process times and thus be limiting on production.

SUMMARY

In the disclosure of the present invention, embodiments and aspects will be described which will address one or more of the above objects or which will address objects apparent from the below disclosure as well as from the description of exemplary
5 embodiments.

In a first aspect, the present invention relates to a method of forming an adhesive bond between first and second components of a device, the method comprising the steps of:

- 10 a) providing a first component,
- b) providing a second component, the second component defining a first glue channel configuration adapted to receive an adhesive,
- c) depositing adhesive in the first glue channel configuration of the second component and allowing the deposited adhesive to distribute in the first glue
15 channel configuration by capillary effect,
- d) arranging the first component and the second component relative to each other to form an assembly thereby forming a second glue channel configuration defined by surface geometries of the first component and surface geometries of the second component,
- 20 e) allowing at least part of the adhesive disposed in the first glue channel configuration of the second component to flow by capillary effect into and distribute in the second glue channel configuration, and
- f) allowing the adhesive disposed in the second glue channel configuration to cure to
25 provide an adhesive bond between the first component and the second component.

The method according to the first aspect enables the adhesive to be distributed in a desired configuration onto the second component prior to bringing the two components into mating or immediate contact.

- 30 Hence, at the time when the two components are brought into mating or immediate contact, the adhesive will be positioned at locations that allow a rapid redistribution to the second glue channel, i.e. the final destination for receiving the adhesive. This enables a reduction in the process time for fastening the relevant components relative to each other in their final interrelated position. In some
35 embodiments, the migration of the adhesive in the first channel configuration may occur while positioning the components relative to each other, e.g. while the first component

and second components are moved relative to each other so as to position the two components in their final interrelated position.

Furthermore, the method according to the first aspect enables a more accurate application of the adhesive to areas of components that are intended for receiving the adhesive while minimizing the risk that adhesive may leak or may become applied outside intended areas.

The method according to the first aspect further provides freedom in design. In prior art attachment methods, locations on the assembly formed by first and second components may require openings for depositing an adhesive from a source to enable the adhesive to be applied to the glue channels. For the present attachment method, in some embodiments, the deposition of adhesive from a source occurs prior to bringing the two components into mating or immediate contact. Hence the method generally does not require dedicated filling openings or inlets in the first and second components. In the context of the present disclosure the phrase "prior to bringing the two components into mating contact" means that the two components are initially arranged with a minimum separation distance relative to each other while the adhesive is applied onto the second component, where such minimum separation distance is chosen in the order of 2 mm or more.

In some embodiments, in step b) the first glue channel configuration is configured to enable distribution of the adhesive by capillary effect in the first glue channel configuration without the deposited adhesive contacting the first component. In accordance herewith, the deposited adhesive will be enabled to become distributed at least partly by capillary effect while the second component is positioned spaced from the first component by a distance, such as spaced by said minimum separation distance.

In some embodiments, in step c), the step of allowing the deposited adhesive to distribute in the first glue channel configuration by capillary effect occurs without the adhesive contacting the first component.

In step d) of arranging the first component and the second component relative to each other to form an assembly said arranging may comprise moving the first component, moving the second component or moving both components relative to each other from a first separated configuration towards an assembled configuration.

In some embodiments, subsequent to step c) of depositing adhesive in the first glue channel configuration and allowing the deposited adhesive to distribute in the first glue channel configuration by capillary effect, no further additional adhesive is deposited to the first component and/or the second component.

In some embodiments, subsequent to step d) of arranging the first component and the second component relative to each other to form the second glue channel configuration, no further additional adhesive is deposited to the first component and/or the second component. In other embodiments, additional adhesive may be supplied from an adhesive supply while the adhesive disposed in the first glue channel configuration of the second component migrates by capillary effect into and distributes into the second glue channel configuration.

In further embodiments, wherein in step (d) of forming the second glue channel configuration, the second glue channel configuration forms a continuous closed channel. In such embodiments, the adhesive present in the second glue channel may be arranged to form a seal where the sealing function is provided by the cured adhesive. For instance, the second glue channel may be formed to extend along peripheral areas of the first and/or second component whereby the sealing function seals areas located centrally relative to the peripheral areas.

In some embodiments, at least a portion of the second glue channel configuration is shaped to encircle the first glue channel configuration. In this manner, distribution of adhesive may be effectively confined to the second glue channel with no adhesive being distributed radially outside the second glue channel. In this way, in typical applications, the areas close to rim portions of the first component or the second component can be kept free from undesired portions of the adhesive thereby preventing potential visual imperfections.

The areas of the second glue channel configuration may comprise areas that are contiguous to areas of the first glue channel configuration. In some embodiments, the areas of the second glue channel configuration only include areas that are contiguous to areas of the first glue channel configuration.

The second glue channel configuration may comprise areas that extend along the first glue channel configuration. Non-limiting examples include embodiments wherein the first glue channel configuration extends in parallel with the second glue channel configuration. In further other embodiments, the second glue channel configuration may comprise at least one channel wherein one end emerges at the first glue channel configuration and where the at least one channel extends in a direction away from the first glue channel configuration towards a second end.

In some embodiments, associated with the first glue channel configuration, one or more glue deposition areas are formed in the second component adapted to receive the adhesive as provided by a source of adhesive. In step c) adhesive may be disposed by means of one or more nozzles into said one or more glue deposition areas.

In some embodiments, the first glue channel configuration includes narrow areas having a smaller width than the width of said one or more glue deposition areas.

In further exemplary embodiments the first glue channel configuration and the second glue channel configuration each form a capillary channel and wherein either one of said capillary channels or both capillary channels extend(s) in a non-planar manner, such as along a curved surface.

Having regard to the curing of the adhesive mentioned in step f) non-limiting examples of suitable curing methods include curing occurring by room temperature, by application of heat, radiation, such as UV radiation, or any other principles known in the art.

In some embodiments, during step e) and/or during step f), pressure may be applied so as to force the first component and the second component towards each other.

In an exemplary embodiment the first and second components of the device are components of a medical device such as a drug delivery device or a drug delivery auxiliary device adapted to be mounted relative to a drug delivery device. In particular embodiments a drug delivery device is provided in the form of a syringe or an injection pen. A non-limiting example includes a drug delivery device wherein the first or the second component is provided as a housing component and wherein the other of the first and the second component is provided as an element that is to be adhesively secured to said housing component. Exemplary elements could include a secondary housing component, a display window, a decal, a label, an identifier, a pen clip, etc. Other non-limiting embodiments could include a drug delivery device wherein two or more of the said components or elements are adhesively secured together, or wherein first and second button components, first and second cap components are adhesively secured to each other, etc., all by using the claimed method. In other exemplary embodiments, the first and second components are components that are comprised within a pen needle for cooperation with a drug delivery device. In still other embodiments, the first and second components are components comprised within an add-on monitoring device for attachment to a drug delivery device.

In a second aspect, the present invention relates to a drug delivery device for injecting a drug from a reservoir, wherein the drug delivery device comprises a first component and a second component and wherein the first component and the second component is attached relative to each other by the adhesive bonding method in accordance with the first aspect of the invention.

Within the context of the present application, when referring to "allowing deposited adhesive to distribute by capillary effect", this shall be construed so that capillary forces at least in part act to drive the adhesive from one configuration and into another configuration. In addition to the capillary forces, the distribution of the adhesive may be aided by other factors such as gravity, mechanical force application, magnetic force application etc. However, in exemplary embodiments, the distribution of the adhesive may occur exclusively by capillary forces.

As used herein, the term "insulin" is meant to encompass any drug-containing flowable medicine capable of being passed through a delivery means such as a cannula or hollow needle in a controlled manner, such as a liquid, solution, gel or fine suspension, and which has a blood glucose controlling effect, e.g. human insulin and analogues thereof as well as non-insulins such as GLP-1 and analogues thereof. In the description of exemplary embodiments reference will be made to the use of insulin.

BRIEF DESCRIPTION OF DRAWINGS

In the following the invention will be further described with reference to the drawings, wherein

fig. 1 shows a side view of a pen-formed drug delivery device,
fig. 2a shows a perspective view of first and second components of the drug delivery device intended for being mutually attached by adhering,
fig. 2b shows a side view of the first and second components after attachment,
fig. 2c shows a cross sectional view along section C-C shown in fig. 2b,
fig. 3a, fig. 3b, fig. 3c and fig. 3d respectively show a front view, a rear view, a side view and a cross sectional view through section G-G of the second component,
fig. 4 schematically shows the second component and liquid adhesive configurations in three different stages during the attachment procedure,
fig. 5, view a) through c) show the second component and liquid adhesive migration prior to assembling with the first component, and
fig. 6, view a') through c') show liquid adhesive migration after the second component and the first component have been moved into immediate contact with each other.

In the figures like structures are mainly identified by like reference numerals.

DESCRIPTION

When in the following terms such as "upper" and "lower", "right" and "left", "horizontal" and "vertical" or similar relative expressions are used, these only refer to the appended figures and not necessarily to an actual situation of use. The shown figures are schematic representations for which reason the configuration of the different structures as well as their relative dimensions are intended to serve illustrative purposes only. When the term member or element is used for a given component it generally indicates that in the described embodiment the component is a unitary component, however, the same member or element may alternatively comprise a number of sub-components just as two or more of the described components could be provided as unitary components, e.g. manufactured as a single injection moulded part. The term "assembly" does not imply that the described components necessarily can be assembled to provide a unitary or functional assembly during a given assembly procedure but is merely used to describe components grouped together as being functionally more closely related.

Referring to fig. 1 a pen-formed drug delivery device 1 as disclosed in WO 2010/052275 will be described. In the present context the device represents a "generic" prior art drug delivery device providing an example of an injection pen, i.e. a pen shaped injection device for injection of one or more doses of a drug and being provided with a drug expelling mechanism. A drug delivery device similar to the device of fig. 1 is marketed by Novo Nordisk A/S as NovoPen Echo®.

More specifically, the pen device 1 comprises a cap part (not shown) and a main part having a proximal body or drive assembly portion 10 with a housing component 110 in which a drug expelling mechanism is arranged or integrated, and a distal cartridge holder portion in which a drug-filled transparent cartridge 30 with a distal needle-penetrable septum can be arranged and retained in place by a cartridge holder 20 releasably attached to the proximal portion, e.g. by a threaded connection or a bayonet coupling, the cartridge holder having openings allowing a portion of the cartridge to be inspected. The cartridge may for example contain an insulin, GLP-1 or growth hormone formulation. The device is designed to be loaded by the user with a new cartridge through a proximal receiving opening in the cartridge holder, the cartridge being provided with a piston driven by a piston rod forming part of the expelling mechanism. A proximal-most rotatable dose member 130 serves to manually set a desired dose of drug shown in display window 120 and which can then be expelled when the button 135 is actuated. Depending on the type of expelling mechanism embodied in a given drug delivery device, the expelling mechanism may comprise a spring which is strained during dose setting and then released to drive the piston rod when the release button is

actuated, this being known from e.g. the FlexTouch® offered by Novo Nordisk A/S. Alternatively the expelling mechanism may be fully manual in which case the dose member and the actuation button moves proximally during dose setting corresponding to the set dose size, and then is moved distally by the user to expel the set dose, this
5 corresponding to the shown embodiment. The cartridge is provided with distal coupling means in the form of a needle hub mount allowing a needle assembly 40 to be mounted, e.g. by means of a thread or a bayonet coupling. Instead of forming the cartridge holder as detachable for allowing an empty cartridge to be replaced, the cartridge holder may alternatively be fixedly attached to the proximal body so as to form a prefilled injection
10 pen, i.e. a disposable injection device.

Addressing the issue of manufacturing injection pens of the above described kind, a particular bonding method of fixedly securing two components relative to each other will now be described. In the following, the two components are provided as the housing component 110 and the display window 120, but any other components of a
15 device suitable for adhesive bonding may equally well be adapted for such bonding method.

Referring to figs. 2a, 2b and 2c, the housing component 110 of the device may be provided as a shell made of a material such as a steel alloy, aluminium or plastic. In the shown embodiment, the shell is formed as a tubular component comprising a window
20 opening 111 located in a side wall portion of the shell, the window opening 111 defining a display area for receiving the above mentioned display window 120. The component forming the display window 120 is in the shown example provided as a multi-shot injection moulded element. The display window 120 defines a front surface that, when attached relative to housing component 110, points away from a central longitudinal axis
25 of the tubular housing component 110. A rear surface of the display window 120 is configured for being secured to the outer surface of housing component 110 at the periphery of the window opening 111.

Shown in fig. 3a is a front view of the display window 120. Display window 120 includes a transparent portion 121 which enables visible inspection of a display, such as a
30 scale drum provided with a series of dose-scale indications, arranged internally in housing component 110. The transparent portion 121 is surrounded by a blinding portion 122 providing a non-transparent frame section. In this example the overall outer shape of display window exhibits upper and lower long edges adapted to extend along the axis of the housing component 110 and short edges arranged at left and right sides adapted
35 to extend along the circumference of housing component 110. An arrow element 123 is disposed mainly in the blinding portion 122 and points towards a region of the

transparent portion 121. In the assembled state of the shown embodiment the transparent portion 121 performs as a magnifying glass to increase the visibility of the dose size that is shown in display window 120.

Display window 120 is further shown in fig. 3b and 3c where fig. 3b shows a rear view whereas fig. 3c shows a side view. Fig. 3d is a cross sectional view of display window 120 along section G-G as indicated in fig. 3b. The rear surface of display window 120 generally exhibits a curved shape configured to correspond to the curvature of the outer surface of the tubular housing component 110.

A peripheral recessed channel 120b extends along the periphery of display window 120 but spaced relative therefrom by a small distance. In the shown example, between the periphery and the recessed channel 120b, a first adherence section 120c extends all the way along the periphery of display window 120 and defines a band shaped region having a surface exhibiting a curvature that enables intimate contact with the housing component 110. The first adherence section 120c is adapted to be attached to the housing component 110 by means of an adhesive. The outer boundary of the recessed channel 120b adjoins the first adherence section 120c.

In the shown example, to further increase adherence between display window 120 and housing component 110, along the left and right short edges of display window 120, further band shaped regions are provided that extend along the inner boundary of recessed channel 120b. These further band shaped regions exhibits a surface having a curvature enabling intimate contact with the housing component 110 thereby defining a second adherence section 120d. The inner boundary of the recessed channel 120b adjoins the second adherence section 120c.

At each corner of display window 120, and overlapping the first glue channel 120b, a glue deposition area 120a is formed arranged to receive a liquid adhesive for example as applied by means of an adhesive dispensing nozzle. Each of the glue deposition areas 120a define a widened area of the recessed channel 120b and thus functions as a buffer volume for liquid adhesive. The shape of the recessed channel 120b is so formed that when the window component 120 is spaced away from housing component 110, a liquid adhesive that is present in each of the glue deposition areas 120a seeks to flow by capillary action towards the narrow parts of the recessed channel 120b. The glue deposition areas 120a and the recessed channel 120b commonly define a first glue channel configuration.

Fig. 4 schematically shows liquid adhesive application through three different stages. In the upper view A) wherein the display window 120 is not yet in contact with housing component 110, portions of a low viscosity liquid adhesive 250 is applied at each

of the glue deposition areas 120a. As mentioned above liquid adhesive may be applied by using one or more adhesive dispensing nozzles but other applicable glue deposition methods may alternatively be used. View B) shows that liquid adhesive rapidly distributes from the glue deposition areas 120a into recessed channel 120b driven by the capillary forces. Thus, even when the display window 120 is physically separated from housing component 110, the capillary action effectively serves to distribute the adhesive into the first glue channel configuration (120a, 120b) and thus the applied adhesive enters into the adhesive configuration 250b. View C) shows the final distribution of the adhesive 250c and 250d after the display window 120 is mated with housing component 110, i.e. in the state where they have been into close proximity or even contact. During assembly, the display window 120 and the housing component 110 is moved into intimate contact though leaving a minor gap between the components. Surfaces of the first adherence section 120c and the second adherence section 120d together with the adjacent outer surfaces of the housing component 110 forms a second glue channel configuration. Due to the geometry of the second glue channel configuration (110, 120c, 120d) the adhesive previously present in the adhesive configuration 250b as shown in view B) will seek to be drawn into the final distribution 250c and 250d by capillary forces.

In fig. 5 the three different views a) through c) schematically show liquid adhesive migration on the second component prior to assembling the second component with the first component. In fig. 6 the three views a') through c') schematically show liquid adhesive migration between the second component and the first component subsequent to assembling the second component with the first component. The series of views in fig. 5 and fig. 6 depict the display window 120 and the housing component 110 in cross section along section C-C as depicted in fig. 2c. Liquid adhesive 250 is only shown in the right-hand side of each view, whereas, for illustrative purposes, the left-hand side of each view has been shown omitting the liquid adhesive.

In fig. 5, view a) liquid adhesive has initially been drawn into the recessed channel 120b. By the action of capillary forces, the liquid adhesive present in glue deposition areas 120a gradually fills into recessed channel 120b to enter into the adhesive configuration 250b, cf. fig. 5, view b) and c).

Hereafter, the display window 120, having the adhesive 250 arranged in the adhesive configuration 250b, and housing component 110 is moved relative to each other so that the two components enter into the configuration shown in fig. 6, view a'). In this view, the housing component 110 has been moved into contact with the adhesive present in the recessed channel 120b. Initially, no adhesive is present at the first adherence section 120c or in second adherence section 120d (120d not shown in fig. 6).

The relative position between housing component 110 and display window 120 is accurately controlled so that a small gap between adherence section 120c and housing component is formed allowing the adhesive 250b present in recessed channel 120b gradually seeking to flow into the gap by capillary action, cf. fig. 6, views b') and c'). Due to the capillary action, the adhesive that is drawn into the gap accurately fills the gap at the intended target areas thereby avoiding that adhesive is applied outside the intended target areas.

A similar effect simultaneously occur for the second adherence section 120d allowing adhesive present in in recessed channel 120b gradually seeking to flow into the gap formed between the second adherence section 120d and the housing component 110. Although not shown in the drawings, in some embodiments, particular geometry features such as raised protrusions on the display window 120 and/or the housing component 110 may be used to accurately define the gap between the two components enabling an effective distribution of adhesive to be provided. In other embodiments assembly machinery may serve to accurately define said gap.

Subsequently to the adhesive having been allowed to enter into its desired final configuration the adhesive is cured. The curing of the adhesive may occur by room temperature or by application of heat, by radiation, such as UV radiation or using any other principles known in the art.

After curing of the adhesive the two components are effectively secured to each other leaving a strong bond between the two components. In cases where adherence sections that define the attachment interface between the two components form a closed loop, the provided attachment may serve as an effective seal preventing ingress of moisture or dirt across the seal.

While certain features of the invention have been illustrated and described herein, many modifications, substitutions, changes, and equivalents will now occur to those of ordinary skill in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the invention.

CLAIMS

Claim 1. A method of forming an adhesive bond between first and second components of a device, the method comprising the steps of:

5

- a) providing a first component (110),
- b) providing a second component (120), the second component defining a first glue channel configuration (120a, 120b) adapted to receive an adhesive (250) and to enable a deposited adhesive to distribute in the first glue channel configuration by capillary effect without the adhesive contacting the first component,
- 10 c) depositing adhesive (250) in the first glue channel configuration (120a, 120b) of the second component (120) and allowing the deposited adhesive (250) to distribute in the first glue channel configuration (120a, 120b) by capillary effect without the adhesive contacting the first component,
- 15 d) arranging the first component (110) and the second component (120) relative to each other to form an assembly thereby forming a second glue channel configuration (110, 120c, 120d) defined by surface geometries of the first component (110) and surface geometries of the second component (120),
- e) allowing at least part of the adhesive (250) disposed in the first glue channel configuration (120a, 120b) of the second component (120) to flow by capillary effect into and distribute in the second glue channel configuration (110, 120c, 120d), and
- 20 f) allowing the adhesive (250) disposed in the second glue channel configuration (110, 120c, 120d) to cure to provide an adhesive bond between the first
- 25 component (110) and the second component (120).

30

Claim 2. The method as defined in claim 1, wherein subsequent to step d) of arranging the first component (110) and the second component (120) relative to each other to form the second glue channel configuration (110, 120c, 120d), no further additional adhesive is deposited to the first component (110) and/or the second component (120).

35

Claim 3. The method as defined in any of the claims 1-2, wherein in step (d) the second glue channel configuration (110, 120c, 120d) forms a continuous closed channel and wherein the adhesive (250c, 250d) in the second glue channel is arranged to form a seal.

Claim 4. The method as defined in claim 3, wherein in step (d) at least a portion of the second glue channel configuration (110, 120c, 120d) is shaped to encircle the first glue channel configuration (120a, 120b).

- 5 Claim 5. The method as defined in any of the claims 1-4, wherein areas of the second glue channel configuration (110, 120c, 120d) are contiguous to areas of the first glue channel configuration (120a, 120b).

- 10 Claim 6. The method as defined in any of the claims 1-5, wherein the second glue channel configuration (110, 120c, 120d) comprises areas that extend along the first glue channel configuration (120a, 120b).

- 15 Claim 7. The method as defined in any of the claims 1-5, wherein one or more glue deposition areas (120a) are formed in the second component (120) adapted to receive the adhesive (250, 250a).

- 20 Claim 8. The method as defined in claim 7, wherein the first glue channel configuration (120a, 120b) include narrow areas (120b) having a smaller width than the width of said one or more glue deposition areas (120a).

Claim 9. The method as defined in any of the claims 7-8, and wherein in step c) adhesive is disposed by means of one or more nozzles into said one or more glue deposition areas (120a).

- 25 Claim 10. The method as defined in any of the claims 1-9, wherein respective ones of the first glue channel configuration (120a, 120b) and/or the second glue channel configuration (110, 120c, 120d) forms a channel that extends in a non-planar manner.

- 30 Claim 11. The method as defined in any of the claims 1-10, wherein the first component (110) and the second component (120) are components that are comprised within or that form a medical device (1).

Claim 12. The method as defined in claim 11, wherein the medical device (1) is a drug delivery device.

- 35 Claim 13. The method as defined in claim 12, wherein the drug delivery device (1) forms a syringe or an injection pen.

Claim 14. A device (1) comprising a first component (110) and a second component (120) wherein the first component (110) and the second component (120) are adhesively secured to each other by using the method as defined in any of the claims 1-13.

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Claim 15. A device as defined in claim 14, wherein the device forms a drug delivery device (1) for injecting a drug from a held drug cartridge (30).

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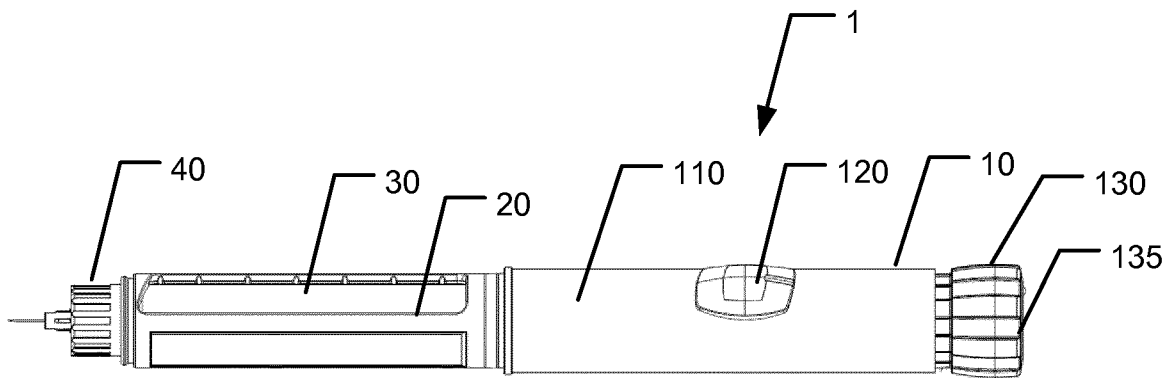


Fig. 1

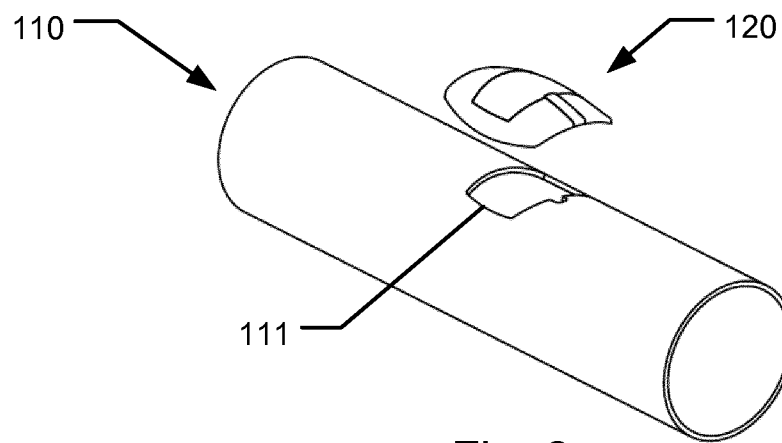


Fig. 2a

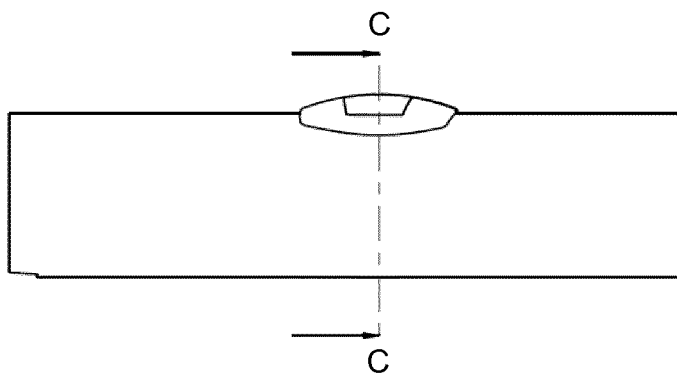


Fig. 2b

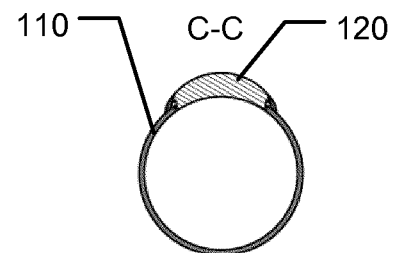


Fig. 2c

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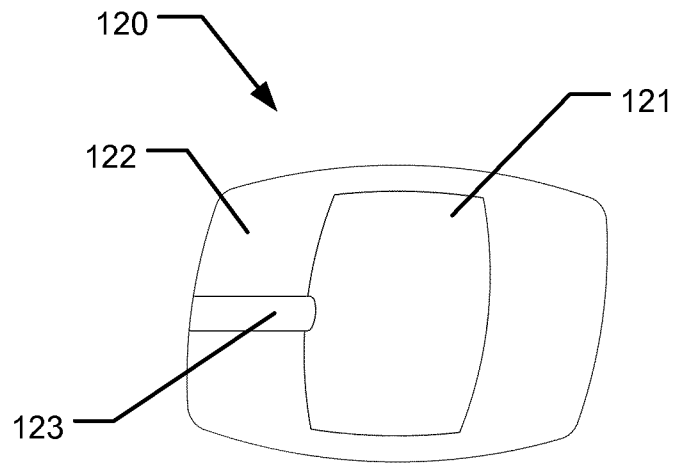


Fig. 3a

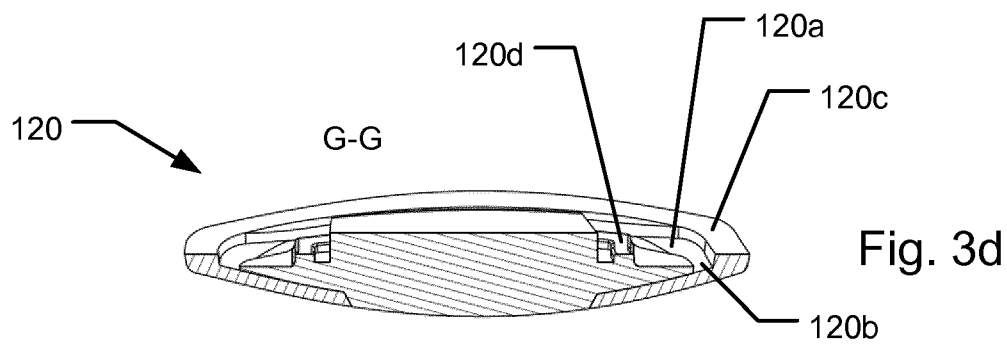


Fig. 3d

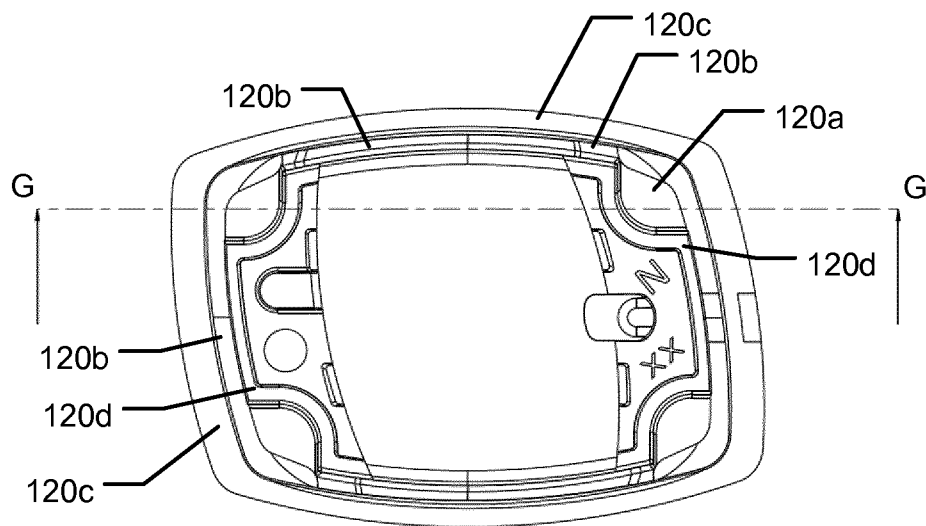


Fig. 3b

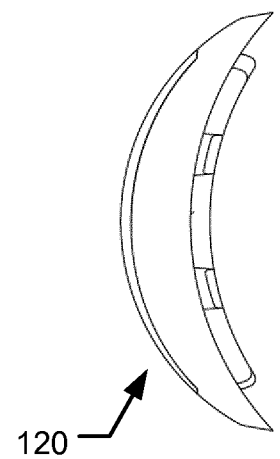


Fig. 3c

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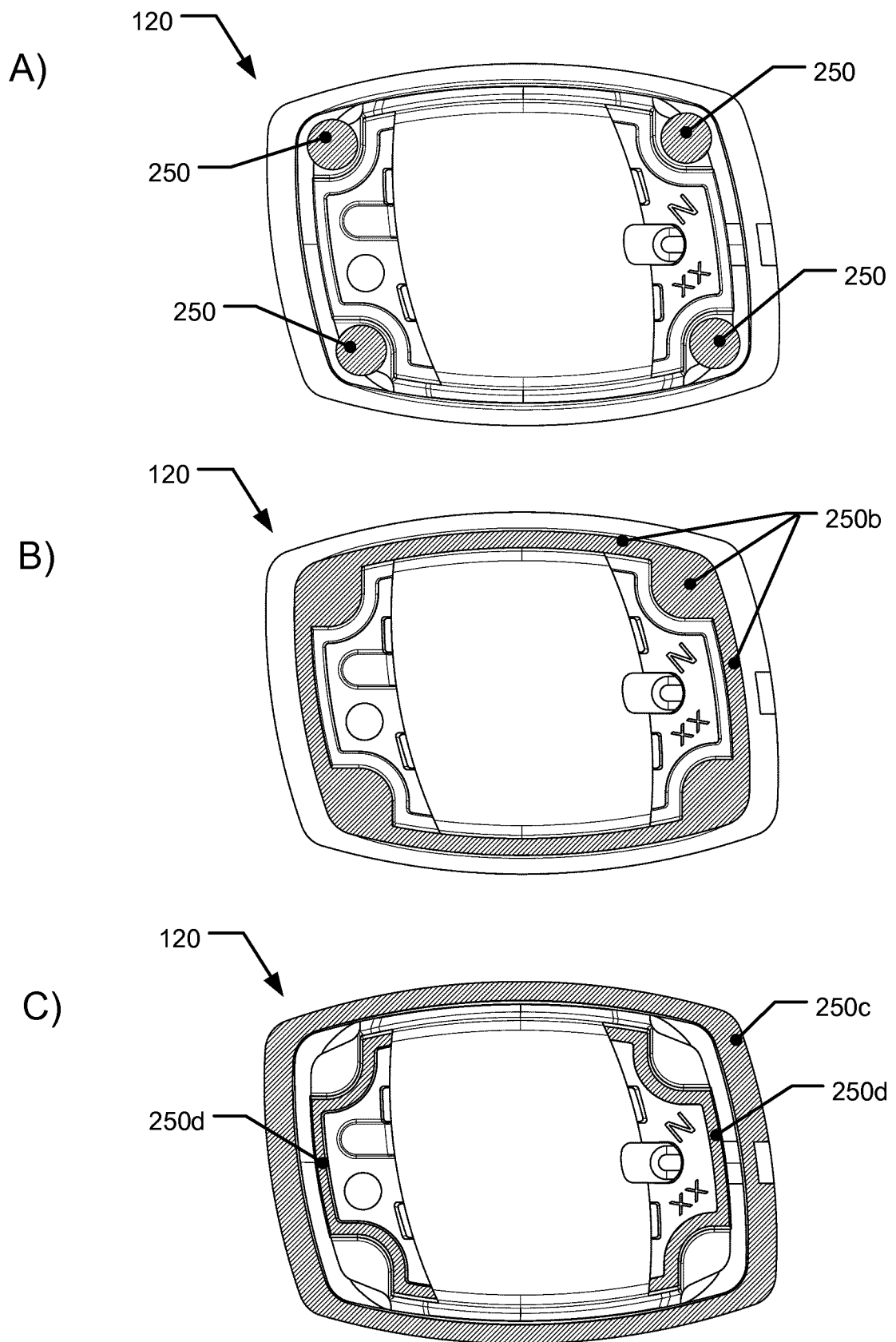


Fig. 4

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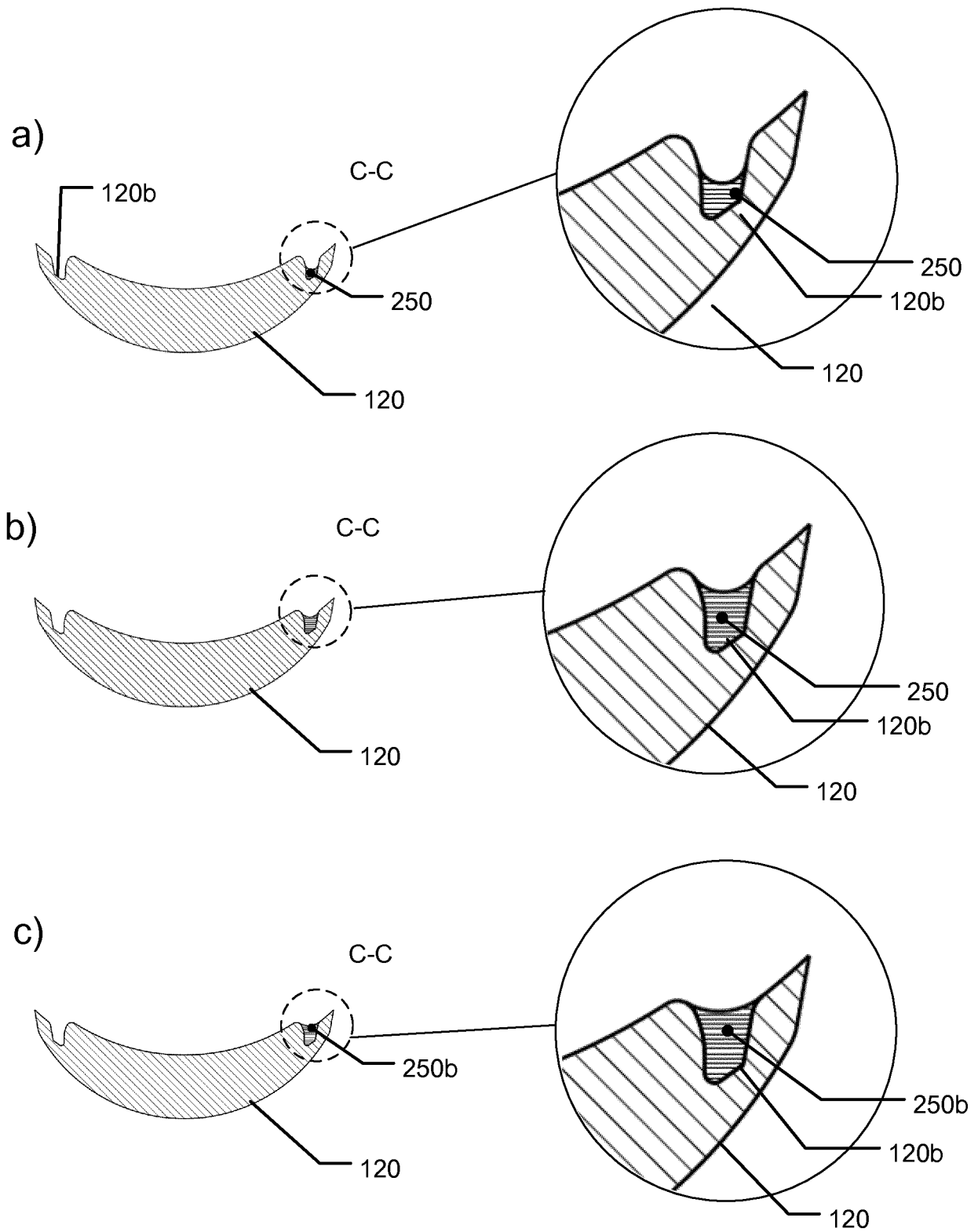


Fig. 5

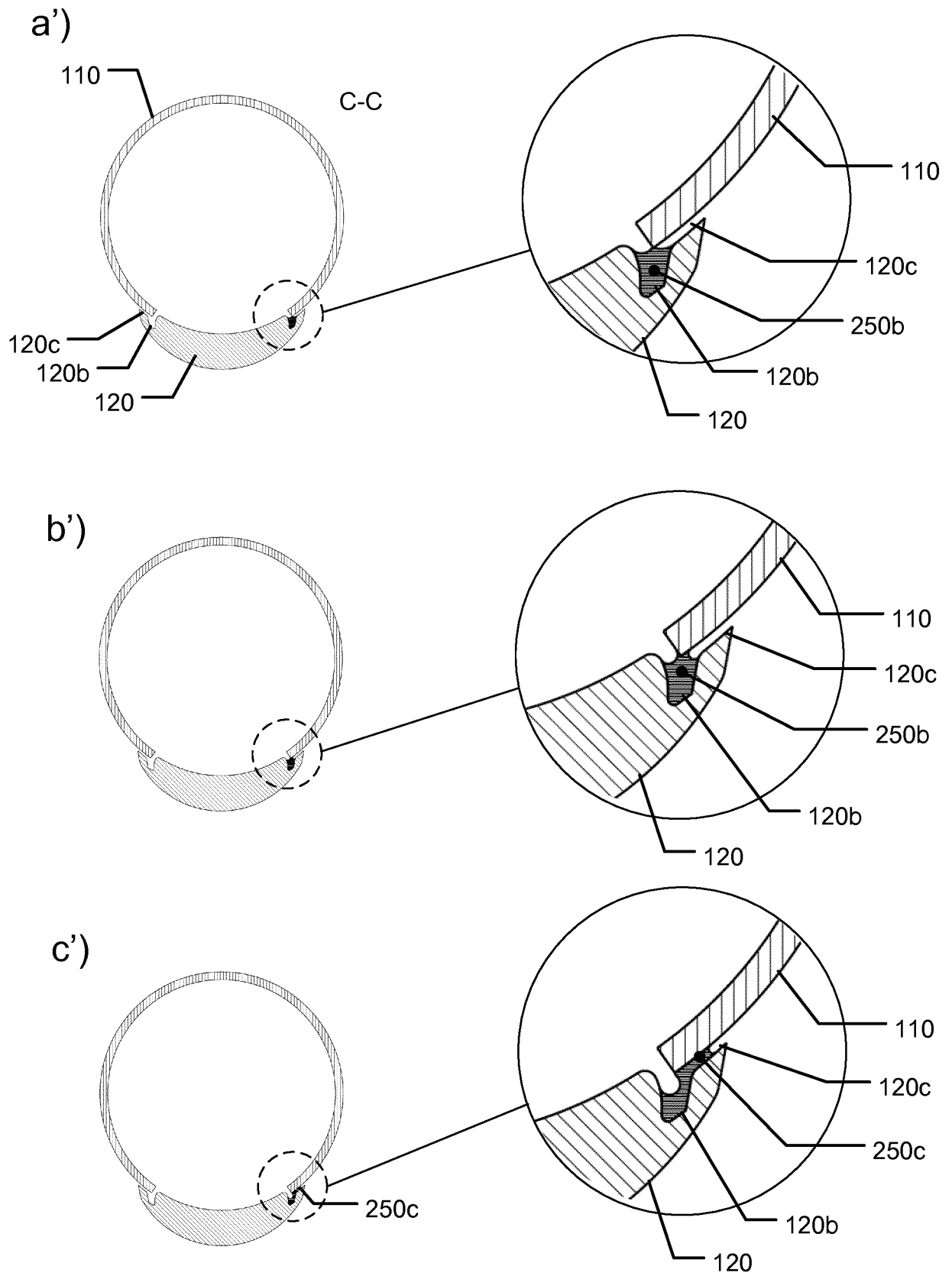


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/064039

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16B11/00
ADD. A61M5/31

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)
F16B A61M B29C A61B C09J

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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 811 667 A2 (SIEMENS AG [DE]) 10 December 1997 (1997-12-10) figures 1,5,6 column 4, lines 34-52 column 5, lines 40-57 column 10, lines 23-57 claims 8-10	1-15
A	----- WO 2006/046164 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]; WIMBERGER-FRIEDL REINHOLD [DE]; D) 4 May 2006 (2006-05-04) cited in the application figure 4 page 8, lines 3-7	1-15
A	----- US 2010/274198 A1 (BECHTOLD HERBERT [DE]) 28 October 2010 (2010-10-28) figures 1,4,7-8 paragraphs [0032] - [0033] -----	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

31 August 2016

Date of mailing of the international search report

15/09/2016

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Schandel, Yannick

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2016/064039

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