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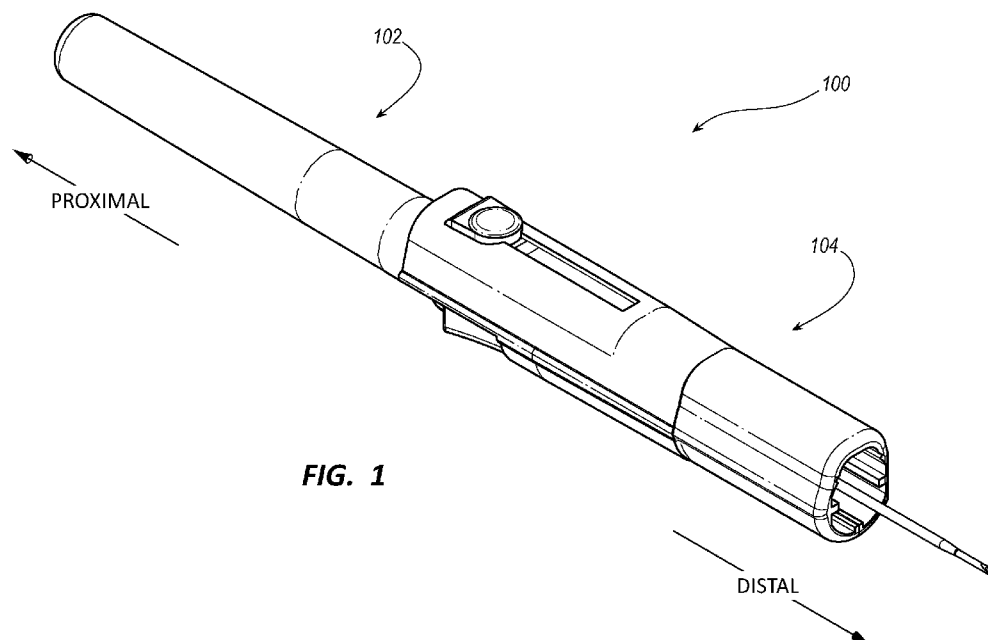


FIG. 1

(57) Abstract: An IV catheter-placement device and method thereof. The IV catheter-placement device can include a cartridge and a case fixedly disposed over the cartridge. The cartridge can include a barrel having a release button, a spring-loaded needle extending from the barrel, and an IV catheter including a catheter hub slidably disposed over the needle. The case can include a deployment button configured to slide the IV catheter over the needle. The deployment button can also be configured to press the release button when the deployment button slides into the release button. A spring compressed between a needle hub and a distal-end portion of the barrel can be released when the deployment button slides into the release button. An entirety of the needle is subsequently launched into a needle cavity of the barrel.

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INTRAVENOUS CATHETER-PLACEMENT DEVICE

BACKGROUND

[0001] Existing intravenous (“IV”) catheter-placement devices such as that of US 5,685,855 have longer needles than the traditional needles used for venous access. The reason for the longer needles is the IV catheters of the existing IV catheter-placement devices are disposed over the needles thereof, and the IV catheters need to be long enough for placement once venous access is attained. During a typical IV-catheter placement procedure with an existing IV catheter-placement device, however, only a portion of the needle needs to be inserted into a patient such as less than about half a length of the needle before attaining venous access. That said, the length of the needle in the existing IV catheter-placement devices can frighten patients, particularly those with a needle phobia.

[0002] Existing IV catheter-placement devices are also used with implanted ports such as the PowerFlow™ Implantable Apheresis IV Port. During a typical procedure for placement of an IV catheter in such an implanted port using an existing IV catheter-placement device, a greater portion of the needle than set forth above needs to be inserted into a patient before attaining venous access through the implanted port. This is because the needle must penetrate subcutaneous tissue and insert into an access funnel of the implanted port. In addition, the IV catheter must be advanced much farther into the access funnel of the implanted port. Depending upon the patient, a length of the IV catheter can be insufficient for placing the IV catheter in the implanted port. For this reason, there is a need for IV catheter-placement devices with longer IV catheters than existing IV catheter-placement devices. However, such IV catheter-placement devices need even longer needles than the existing IV catheter-placement devices, which can further frighten patients.

[0003] Disclosed herein is an IV catheter-placement device and method that address the foregoing.

SUMMARY

[0004] Disclosed herein is an IV catheter-placement device including, in some embodiments, a cartridge and a case fixedly disposed over the cartridge. The cartridge includes a barrel having a release button on a side of the barrel, a spring-loaded needle extending from a distal-end portion of the barrel, and an IV catheter including a catheter hub slidably disposed

over the needle. The case includes a deployment button on a side of the case. The deployment button is configured to slide the IV catheter over the needle. The deployment button is also configured to press the release button when the deployment button slides into the release button. A spring compressed between a needle hub and the distal-end portion of the barrel is released when the deployment button slides into the release button. An entirety of the needle is subsequently launched into a needle cavity of the barrel.

[0005] In some embodiments, the deployment button includes a longitudinal extension disposed between the case and the cartridge having a distal end abutting a portion of the catheter hub. The longitudinal extension is configured to slide the IV catheter over the needle.

[0006] In some embodiments, the deployment button includes a radial extension. The radial extension is configured to press the release button when the deployment button slides into the release button.

[0007] In some embodiments, the case is opaque. The case being opaque hides from a patient a length of the needle proximal of a distal end of the case.

[0008] In some embodiments, the IV catheter-placement device is configured for one-handed operation with respect to advancing the IV catheter and retracting the needle.

[0009] Also disclosed herein is an IV catheter-placement device including, in some embodiments, a cartridge and a case fixedly disposed over the cartridge. The cartridge includes a barrel, a needle extending from the barrel, and an IV catheter including a catheter hub slidably disposed over the needle. The barrel includes a needle cavity, a spring compressed against a distal-end portion of the needle cavity in at least an initial state of the IV catheter-placement device, and a release button on a side of the barrel configured to release the spring when the spring is compressed. The needle includes a needle hub captively disposed in the needle cavity. The needle hub compresses the spring against the distal-end portion of the needle cavity in at least the initial state of the IV catheter-placement device. The case includes a deployment button on a side of the case. The deployment button is configured to slide the IV catheter over the needle. The deployment button is also configured to press the release button when the deployment button slides into the release button. The spring compressed between the needle hub and the distal-end portion of the barrel is released when the deployment button slides into the release button. An entirety of the needle is subsequently launched into the needle cavity of the barrel for a deployed state of the IV catheter-placement device.

[0010] In some embodiments, the deployment button includes a longitudinal extension disposed between the case and the cartridge having a distal end abutting a portion of the catheter hub in at least the initial state of the IV catheter-placement device. The longitudinal extension is configured to slide the IV catheter over the needle.

[0011] In some embodiments, a length of the longitudinal extension is commensurate with at least about half a distance the IV catheter should be advanced into a vein for placement of the IV catheter into the vein.

[0012] In some embodiments, the deployment button includes a radial extension. The radial extension is configured to press the release button when the deployment button slides into the release button.

[0013] In some embodiments, the needle hub includes a step between a medial portion of the needle hub and a proximal-end portion of the needle hub. The spring is around the medial portion of the needle hub compressed between the step and the distal-end portion of the needle cavity in at least the initial state of the IV catheter-placement device.

[0014] In some embodiments, the needle hub includes a catch in a distal-end portion of the needle hub. The release button includes a radial extension disposed in the catch in at least the initial state of the IV catheter-placement device.

[0015] In some embodiments, the needle hub includes a needle-hub cavity configured for blood flashback upon establishing venous access with the needle.

[0016] In some embodiments, the case is opaque. The case being opaque hides from a patient a length of the needle proximal of a distal end of the case in at least the initial state of the IV catheter-placement device.

[0017] In some embodiments, the IV catheter-placement device is configured for one-handed operation with respect to advancing the IV catheter and retracting the needle.

[0018] Also disclosed herein is a method of an IV catheter-placement device including, in some embodiments, an obtaining step of obtaining the IV catheter-placement device. The IV catheter device includes a cartridge and a case fixedly disposed over the cartridge. The cartridge includes a barrel having a release button on a side of the barrel, a spring-loaded needle extending from a distal-end portion of the barrel, and an IV catheter including a catheter hub

slidably disposed over the needle. The case includes a deployment button on a side of the case. The method also includes a piercing step of piercing a vein of a patient with the needle. The method also includes a sliding step of sliding the IV catheter over the needle and into the vein by way of the deployment button. The method also includes a button-pressing step of pressing the release button when the deployment button slides into the release button, which launches an entirety of the needle into a needle cavity of the barrel by releasing a spring compressed against a distal-end portion of the needle cavity by a needle hub of the needle.

[0019] In some embodiments, the sliding step includes sliding the IV catheter by way of a longitudinal extension of the deployment button disposed between the case and the cartridge. The longitudinal extension has a distal end abutting a portion of the catheter hub for the sliding step.

[0020] In some embodiments, the sliding step advances the IV catheter at least about half a distance the IV catheter should be advanced into the vein for placement of the IV catheter into the vein.

[0021] In some embodiments, the button-pressing step includes pressing the release button by way of a radial extension of the deployment button.

[0022] In some embodiments, the button-pressing step includes withdrawing a radial extension of the release button from a catch in a distal-end portion of the needle hub.

[0023] In some embodiments, the method further includes hiding from the patient a length of the needle proximal of a distal end of the case. The case is opaque for hiding the length of the needle.

[0024] In some embodiments, the method further includes operating the IV catheter-placement device with one hand with respect to at least advancing the IV catheter and retracting the needle.

[0025] These and other features of the concepts provided herein will become more apparent to those of skill in the art in view of the accompanying drawings and following description, which describe particular embodiments of such concepts in greater detail.

DRAWINGS

[0026] FIG. 1 illustrates an IV catheter-placement device in accordance with some embodiments.

[0027] FIG. 2 illustrates a cross section of the IV catheter-placement device in accordance with some embodiments.

[0028] FIG. 3A illustrates a cross section of the IV catheter-placement device in an initial state of the IV catheter-placement device in accordance with some embodiments.

[0029] FIG. 3B illustrates a cross section of the IV catheter-placement device immediately before a deployment state of the IV catheter-placement device in accordance with some embodiments.

[0030] FIG. 4A illustrates an IV catheter-placement device having a case with a hinged mouth while in an initial state of the IV catheter-placement device in accordance with some embodiments.

[0031] FIG. 4B illustrates the IV catheter-placement device of FIG. 4A in a deployment state of the IV catheter-placement device in accordance with some embodiments.

DESCRIPTION

[0032] Before some particular embodiments are disclosed in greater detail, it should be understood that the particular embodiments disclosed herein do not limit the scope of the concepts provided herein. It should also be understood that a particular embodiment disclosed herein can have features that can be readily separated from the particular embodiment and optionally combined with or substituted for features of any of a number of other embodiments disclosed herein.

[0033] Regarding terms used herein, it should also be understood the terms are for the purpose of describing some particular embodiments, and the terms do not limit the scope of the concepts provided herein. Ordinal numbers (e.g., first, second, third, etc.) are generally used to distinguish or identify different features or steps in a group of features or steps, and do not supply a serial or numerical limitation. For example, “first,” “second,” and “third” features or steps need not necessarily appear in that order, and the particular embodiments including such features or steps need not necessarily be limited to the three features or steps. Labels such as

“left,” “right,” “top,” “bottom,” “front,” “back,” and the like are used for convenience and are not intended to imply, for example, any particular fixed location, orientation, or direction. Instead, such labels are used to reflect, for example, relative location, orientation, or directions. Singular forms of “a,” “an,” and “the” include plural references unless the context clearly dictates otherwise.

[0034] With respect to “proximal,” a “proximal portion” or a “proximal end portion” of, for example, a catheter disclosed herein includes a portion of the catheter intended to be near a clinician when the catheter is used on a patient. Likewise, a “proximal length” of, for example, the catheter includes a length of the catheter intended to be near the clinician when the catheter is used on the patient. A “proximal end” of, for example, the catheter includes an end of the catheter intended to be near the clinician when the catheter is used on the patient. The proximal portion, the proximal end portion, or the proximal length of the catheter can include the proximal end of the catheter; however, the proximal portion, the proximal end portion, or the proximal length of the catheter need not include the proximal end of the catheter. That is, unless context suggests otherwise, the proximal portion, the proximal end portion, or the proximal length of the catheter is not a terminal portion or terminal length of the catheter.

[0035] With respect to “distal,” a “distal portion” or a “distal-end portion” of, for example, a catheter disclosed herein includes a portion of the catheter intended to be near or in a patient when the catheter is used on the patient. Likewise, a “distal length” of, for example, the catheter includes a length of the catheter intended to be near or in the patient when the catheter is used on the patient. A “distal end” of, for example, the catheter includes an end of the catheter intended to be near or in the patient when the catheter is used on the patient. The distal portion, the distal-end portion, or the distal length of the catheter can include the distal end of the catheter; however, the distal portion, the distal-end portion, or the distal length of the catheter need not include the distal end of the catheter. That is, unless context suggests otherwise, the distal portion, the distal-end portion, or the distal length of the catheter is not a terminal portion or terminal length of the catheter.

[0036] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by those of ordinary skill in the art.

[0037] As set forth above, the length of the needles in the existing IV catheter-placement devices can frighten patients, particularly those with a needle phobia. However,

there is a needed for IV catheter-placement devices with even longer needles than the existing IV catheter-placement devices, which can further frighten patients. Disclosed herein is an IV catheter-placement device and method that address the foregoing.

[0038] For example, an IV catheter-placement device includes, in some embodiments, a cartridge and a case fixedly disposed over the cartridge. The cartridge includes a barrel having a release button, a spring-loaded needle extending from the barrel, and an IV catheter including a catheter hub slidably disposed over the needle. The case includes a deployment button on a side of the case. The deployment button is configured to slide the IV catheter over the needle. The deployment button is also configured to press the release button when the deployment button slides into the release button. A spring compressed between a needle hub and a distal-end portion of the barrel is released when the deployment button slides into the release button. An entirety of the needle is subsequently launched into a needle cavity of the barrel.

[0039] Additional details of the IV catheter-placement device and method are set forth below such as how the case hides from a patient a true length of the needle by hiding a length of the needle proximal of a distal end of the case of the IV catheter-placement device.

IV catheter-placement device

[0040] FIGS. 1 and 2 illustrate different views of an IV catheter-placement device 100 in accordance with some embodiments. FIGS. 3A and 3B respectively illustrate a cross section of the IV catheter-placement device 100 in an initial state of the IV catheter-placement device 100 and immediately before a deployment state of the IV catheter-placement device 100 in accordance with some embodiments. FIGS. 4A and 4B illustrate an IV catheter-placement device 400 having a case 404 with a hinged mouth 405 respectively in an initial state and a deployed state of the IV catheter-placement device in accordance with some embodiments.

[0041] As shown, the IV catheter-placement device 100 includes a cartridge 102 and a case 104 over the cartridge 102. The case 104 is configured to be fixedly disposed over the cartridge 102 such that a deployment button of the case 104 can slide an IV catheter of the cartridge 102 in a distal direction as set forth in more detail below.

[0042] The cartridge 102 includes a barrel 206, a needle 208 extending from the barrel 206, and an IV catheter 210 including a catheter hub 212 slidably disposed over the needle 208. In at least the initial state of the IV catheter-placement device 100, a tip of the needle 208

extends past a tip of the IV catheter 210 for piercing a vein of a patient with the needle 208. As set forth above, both the needle 208 and the IV catheter 210 can be longer than those of existing IV catheter-placement devices as needed for IV-catheter placement in implanted ports such as the PowerFlow™ Implantable Apheresis IV Port.

[0043] The barrel 206 includes a needle cavity 313, a spring 314 compressed against a distal-end portion of the needle cavity 313 in at least the initial state of the IV catheter-placement device 100, and a release button 316 on a side of the barrel 206 configured to release the spring 314 when the spring 314 is compressed such as in the initial state of the IV catheter-placement device 100. The barrel 206 includes a groove or channel in a side of the barrel 206 configured to provide a run for a radial extension of a deployment button on a side of the case 104, which features of the case 104 are as set forth below.

[0044] The needle 208 includes a needle hub 218, at least of portion of which is captively disposed in the needle cavity 313 of the barrel 206. The needle hub 218 is configured to compress the spring 314 against the distal-end portion of the needle cavity 313 in at least the initial state of the IV catheter-placement device 100. Indeed, the needle hub 218 includes a step 320 between a medial portion of the needle hub 218 and a proximal-end portion of the needle hub 218, wherein the medial portion of the needle hub 218 has a smaller diameter than the proximal-end portion of the needle hub 218. The spring 314 is around the medial portion of the needle hub 218 compressed between the step 320 and the distal-end portion of the needle cavity 313 in at least the initial state of the IV catheter-placement device 100.

[0045] The needle hub 218 includes a catch 322 in a distal-end portion of the needle hub 218 configured to accept a portion of the release button 316 in at least the initial state of the IV catheter-placement device 100. Indeed, the release button 316 includes a radial extension 324 disposed in the catch 322 in at least the initial state of the IV catheter-placement device 100.

[0046] The needle hub 218 includes a needle-hub cavity 326 in the proximal-end portion of the needle hub 218 configured for blood flashback upon piercing a vein of a patient with the needle 208 and establishing venous access.

[0047] The case 104 includes a deployment button 228 disposed in a longitudinal slot 229 of a side of the case 104. The deployment button 228 has at least two functions. The deployment button 228 is configured to slide along the longitudinal slot 229 and, in turn, slide

the IV catheter 210 over the needle 208 for a first function of the deployment button 228. The deployment button 228 is also configured to press the release button 316 when the deployment button 228 slides into the release button 316 for a second function of the deployment button 228.

[0048] With respect to sliding the IV catheter 210 over the needle 208, the deployment button 228 includes a longitudinal extension 230 disposed between the case 104 and the cartridge 102 having a distal end abutting a portion (e.g., a tab) of the catheter hub 212 in at least the initial state of the IV catheter-placement device 100. The deployment button 228 is configured to slide the IV catheter 210 over the needle 208 by way of the longitudinal extension 230. A length of the longitudinal extension 230 or the longitudinal slot 229 of the side of the case 104 is commensurate with at least about half up to an entire distance the IV catheter 210 should be advanced into a vein for placement of the IV catheter 210 into the vein.

[0049] With respect to pressing the release button 316 when the deployment button 228 slides into the release button 316, the deployment button 228 includes a radial extension 232. The radial extension 232 is configured to press the release button 316 when the deployment button 228 slides into the release button 316. (*See* FIG. 3B, which illustrates the radial extension 232 pressing the release button 316.) The spring 314 compressed between the needle hub 218 and the distal-end portion of the barrel 206 is released by pivoting the radial extension 324 of the release button 316 away from the catch 322 of the needle hub 218 when the deployment button 228 slides into the release button 316. An entirety of the needle 208 is subsequently launched into the needle cavity 313 of the barrel 206 for a deployed state of the IV catheter-placement device 100.

[0050] The case 104 can be shaped as shown or include a taper from a medial section of the case 104 to a distal-end portion of the case 104. If tapered, the case 104 can include a mechanism such as the hinged mouth 405 of the case 404 configured to open and allow the catheter hub 212 therethrough when advancing the IV catheter 210. Hinges of the hinged mouth 405 are configured to open the hinged mouth 405 to the sides of the case 404 so as to not interfere with a patient. Regardless of the shape of the case, the case 104 can advantageously be opaque. The case 104 being opaque hides from a patient a true length of the needle 208 by hiding a length of the needle 208 proximal of a distal end of the case 104 in at least the initial state of the IV catheter-placement device 100. The length of the needle hidden by the case 104

can be about half the length of the needle 208, which makes it possible to increase the length of the needle 208 without frightening patients of the length of the needle 208.

[0051] Advantageously, the IV catheter-placement device 100 is configured with the deployment button 228 proximally offset from the release button 316. Because the deployment button 228 has the two functions set forth above including advancing the IV catheter 210 and retracting the needle 208, the offset allows for one-handed operation of the IV catheter-placement device 100 with respect to at least advancing the IV catheter 210 and retracting the needle 208. Indeed, the offset places the deployment button 228 in a convenient medial location of the IV catheter-placement device 100 allowing one-handed operation of the IV catheter-placement device 100 even for clinicians with smaller sized hands.

Method

[0052] A method of an IV catheter-placement device 100 includes an obtaining step of obtaining the IV catheter-placement device 100. As set forth above, the IV catheter device 100 includes the cartridge 102 and the case 104 fixedly disposed over the cartridge 102. The cartridge 102 includes the barrel 206 having the release button 316 on the side of the barrel 206, the spring-loaded needle 208 extending from the distal-end portion of the barrel 206, and the IV catheter 210 including the catheter hub 212 slidably disposed over the needle 208. The case 104 includes a deployment button 228 on the side of the case 104. The method also includes a piercing step of piercing a vein of a patient with the needle 208. The method also includes a sliding step of sliding the IV catheter 210 over the needle 208 and advancing the IV catheter 210 into the vein by way of the deployment button 228. The method also includes a button-pressing step of pressing the release button 316 when the deployment button 228 slides into the release button 316, which launches the entirety of the needle 208 into the needle cavity 313 of the barrel 206 by releasing the spring 314 compressed against the distal-end portion of the needle cavity 313 by the needle hub 218 of the needle 208.

[0053] With respect to the sliding step, the sliding step includes sliding the IV catheter 210 by way of the longitudinal extension 230 of the deployment button 228 disposed between the case 104 and the cartridge 102. The longitudinal extension 230 has the distal end thereof abutting the portion of the catheter hub 212 for the sliding step. The sliding step advances the IV catheter 210 at least about half up to an entire distance the IV catheter 210 should be advanced into the vein for placement of the IV catheter 210 into the vein.

[0054] With respect to the button-pressing step, the button-pressing step includes pressing the release button 316 by way of the radial extension 232 of the deployment button 228. The button-pressing step includes withdrawing the radial extension 324 of the release button 316 from the catch 322 in the distal-end portion of the needle hub 218.

[0055] The method further includes hiding from the patient the length of the needle 208 proximal of the distal end of the case 104. As set forth above, the case 104 is opaque for hiding the length of the needle 208.

[0056] The method further includes operating the IV catheter-placement device 100 with one hand with respect to at least advancing the IV catheter 210 and retracting the needle 208.

[0057] While some particular embodiments have been disclosed herein, and while the particular embodiments have been disclosed in some detail, it is not the intention for the particular embodiments to limit the scope of the concepts provided herein. Additional adaptations and/or modifications can appear to those of ordinary skill in the art, and, in broader aspects, these adaptations and/or modifications are encompassed as well. Accordingly, departures may be made from the particular embodiments disclosed herein without departing from the scope of the concepts provided herein.

CLAIMS

What is claimed is:

1. An intravenous (“IV”) catheter-placement device, comprising:
a cartridge including a barrel having a release button on a side of the barrel, a spring-loaded needle extending from a distal-end portion of the barrel, and an IV catheter including a catheter hub slidably disposed over the needle; and
a case fixedly disposed over the cartridge including a deployment button on a side of the case, the deployment button configured to slide the IV catheter over the needle and press the release button when the deployment button slides into the release button such that a spring compressed between a needle hub and the distal-end portion of the barrel is released and an entirety of the needle is launched into a needle cavity of the barrel.
2. The IV catheter-placement device of claim 1, wherein the deployment button includes a longitudinal extension disposed between the case and the cartridge having a distal end abutting a portion of the catheter hub configured to slide the IV catheter over the needle.
3. The IV catheter-placement device of either claim 1 or 2, wherein the deployment button includes a radial extension configured to press the release button when the deployment button slides into the release button.
4. The IV catheter-placement device of any claim of claims 1-3, wherein the case is opaque, thereby hiding from a patient a length of the needle proximal of a distal end of the case.
5. The IV catheter-placement device of any claim of claims 1-4, wherein the IV catheter-placement device is configured for one-handed operation with respect to advancing the IV catheter and retracting the needle.
6. An intravenous (“IV”) catheter-placement device, comprising:
a cartridge including:
a barrel including a needle cavity, a spring compressed against a distal-end portion of the needle cavity in at least an initial state of the IV catheter-

placement device, and a release button on a side of the barrel configured to release the spring when the spring is compressed;

a needle extending from the barrel, the needle including a needle hub captively disposed in the needle cavity compressing the spring against the distal-end portion of the needle cavity in at least the initial state of the IV catheter-placement device; and

an IV catheter including a catheter hub slidably disposed over the needle; and

a case fixedly disposed over the cartridge including a deployment button on a side of the case, the deployment button configured to slide the IV catheter over the needle and press the release button when the deployment button slides into the release button such that the spring is released and an entirety of the needle is launched into the needle cavity for a deployed state of the IV catheter-placement device.

7. The IV catheter-placement device of claim 6, wherein the deployment button includes a longitudinal extension disposed between the case and the cartridge having a distal end abutting a portion of the catheter hub in at least the initial state of the IV catheter-placement device configured to slide the IV catheter over the needle.

8. The IV catheter-placement device of claim 7, wherein a length of the longitudinal extension is commensurate with at least about half a distance the IV catheter should be advanced into a vein for placement of the IV catheter into the vein.

9. The IV catheter-placement device of any claim of claims 6-8, wherein the deployment button includes a radial extension configured to press the release button when the deployment button slides into the release button.

10. The IV catheter-placement device of any claim of claims 6-9, wherein the needle hub includes a step between a medial portion of the needle hub and a proximal-end portion of the needle hub, the spring around the medial portion of the needle hub compressed between the step and the distal-end portion of the needle cavity in at least the initial state of the IV catheter-placement device.

11. The IV catheter-placement device of any claim of claims 6-10, wherein the needle hub includes a catch in a distal-end portion of the needle hub, the release button including a radial extension disposed in the catch in at least the initial state of the IV catheter-placement device.

12. The IV catheter-placement device of any claim of claims 6-11, wherein the needle hub includes a needle-hub cavity configured for blood flashback upon establishing venous access with the needle.

13. The IV catheter-placement device of any claim of claims 6-12, wherein the case is opaque, thereby hiding from a patient a length of the needle proximal of a distal end of the case in at least the initial state of the IV catheter-placement device.

14. The IV catheter-placement device of any claim of claims 6-13, wherein the IV catheter-placement device is configured for one-handed operation with respect to advancing the IV catheter and retracting the needle.

15. A method of an intravenous (“IV”) catheter-placement device, comprising:
obtaining the IV catheter-placement device, the IV catheter device including:
a cartridge including a barrel having a release button on a side of the barrel,
a spring-loaded needle extending from a distal-end portion of the barrel,
and an IV catheter including a catheter hub slidably disposed over the
needle; and
a case fixedly disposed over the cartridge including a deployment button on
a side of the case;
piercing a vein of a patient with the needle;
sliding the IV catheter over the needle and into the vein by way of the
deployment button; and
pressing the release button when the deployment button slides into the release
button, thereby launching an entirety of the needle into a needle cavity of
the barrel by releasing a spring compressed against a distal-end portion of
the needle cavity by a needle hub of the needle.

16. The method of claim 15, wherein sliding the IV catheter over the needle includes sliding the IV catheter by way of a longitudinal extension of the deployment button disposed between the case and the cartridge having a distal end abutting a portion of the catheter hub.

17. The method of either claim 16 or 17, wherein sliding the IV catheter over the needle advances the IV catheter at least about half a distance the IV catheter should be advanced into the vein for placement of the IV catheter into the vein.

18. The method of any claim of claims 15-17, wherein pressing the release button when the deployment button slides into the release button includes pressing the release button by way of a radial extension of the deployment button.

19. The method of any claim of claims 15-18, wherein pressing the release button when the deployment button slides into the release button includes withdrawing a radial extension of the release button from a catch in a distal-end portion of the needle hub.

20. The method of any claim of claims 15-19, further comprising:
hiding from the patient a length of the needle proximal of a distal end of the case, wherein the case is opaque.

21. The method of any claim of claims 15-20, further comprising:
operating the IV catheter-placement device with one hand with respect to at least advancing the IV catheter and retracting the needle.

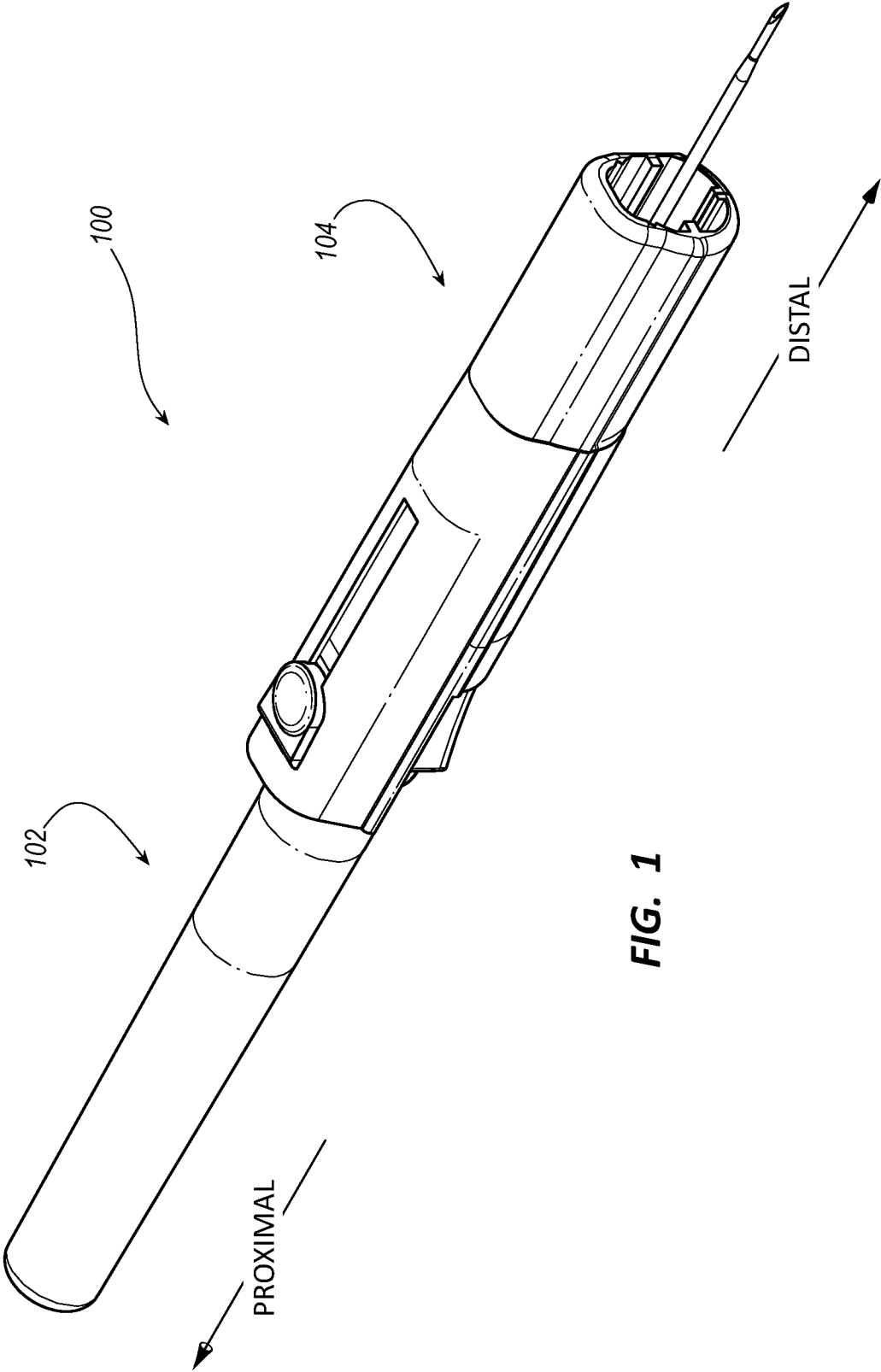


FIG. 1

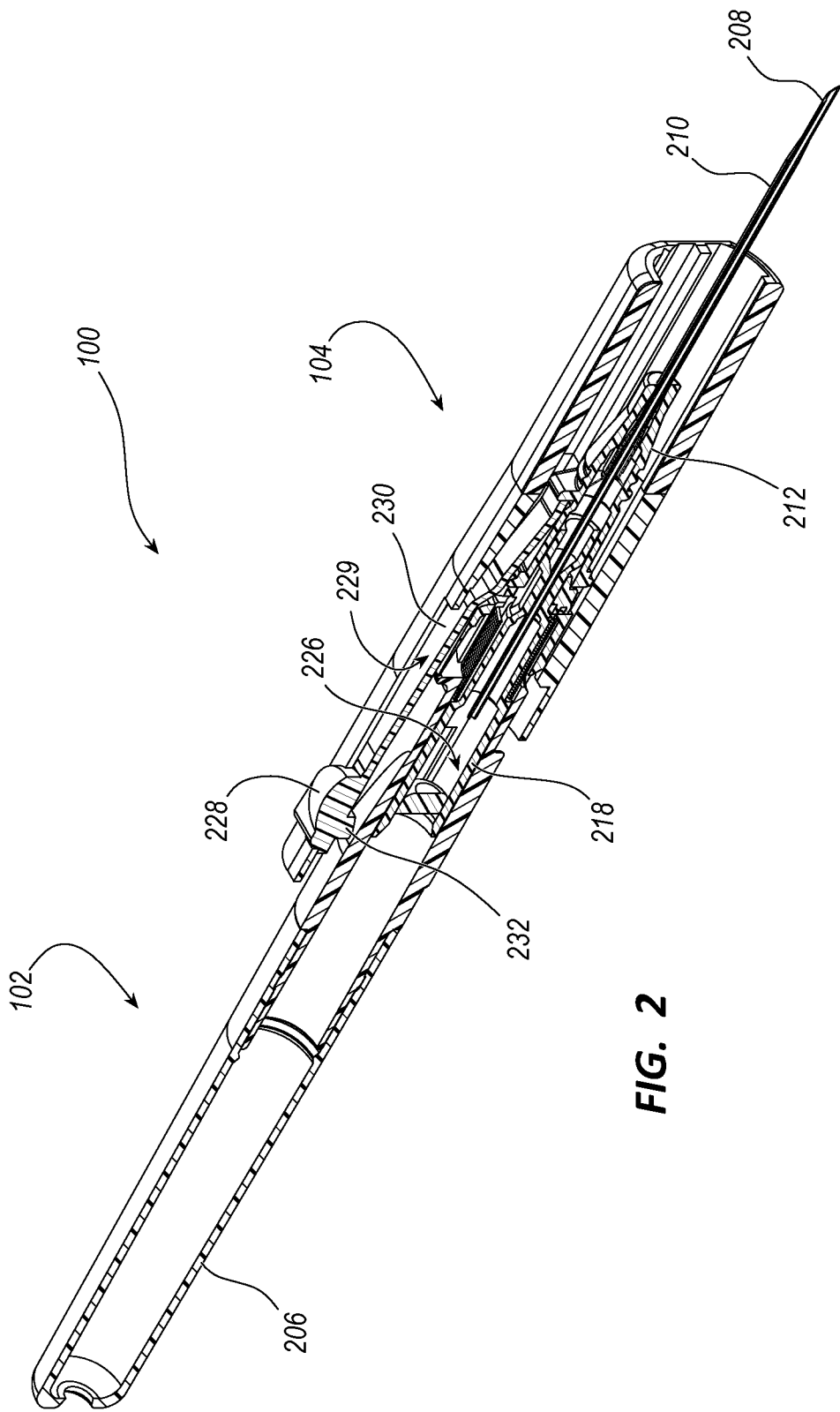


FIG. 2

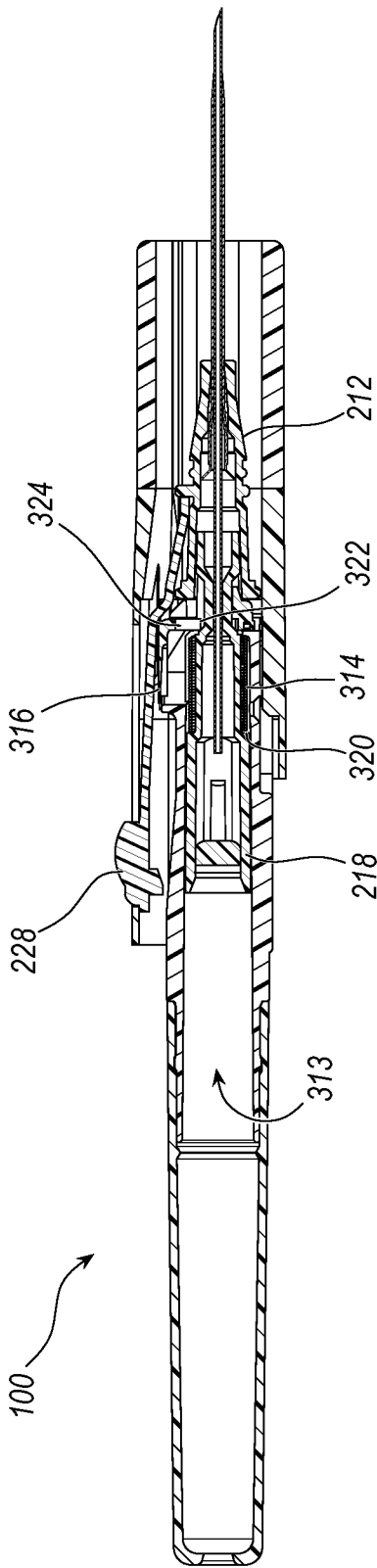


FIG. 3A

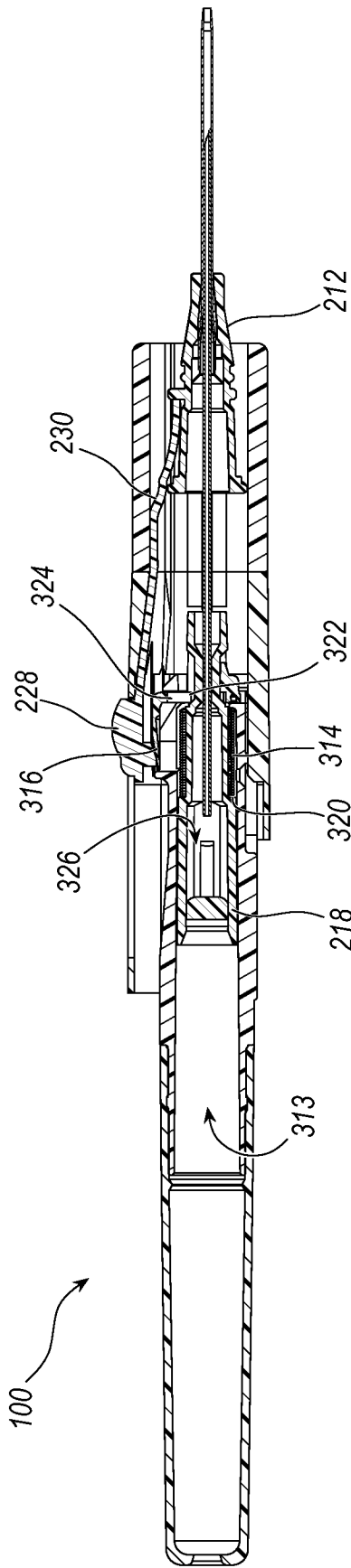


FIG. 3B

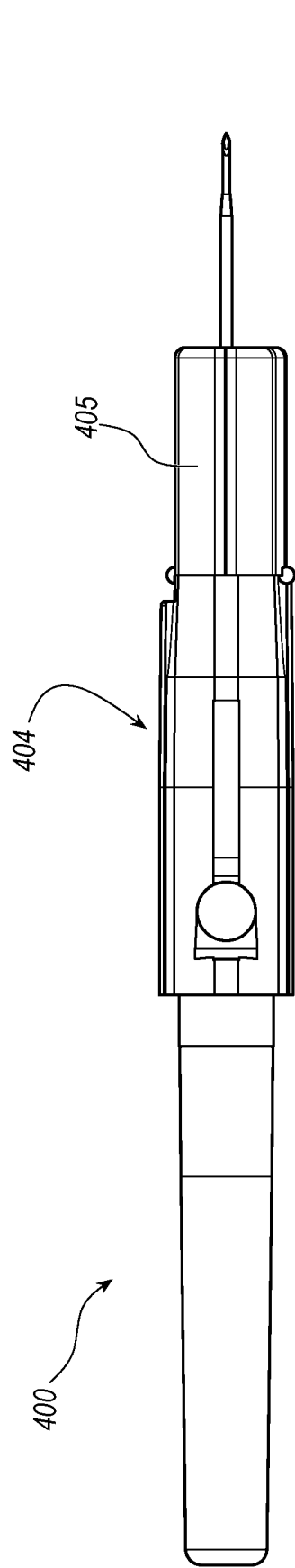


FIG. 4A

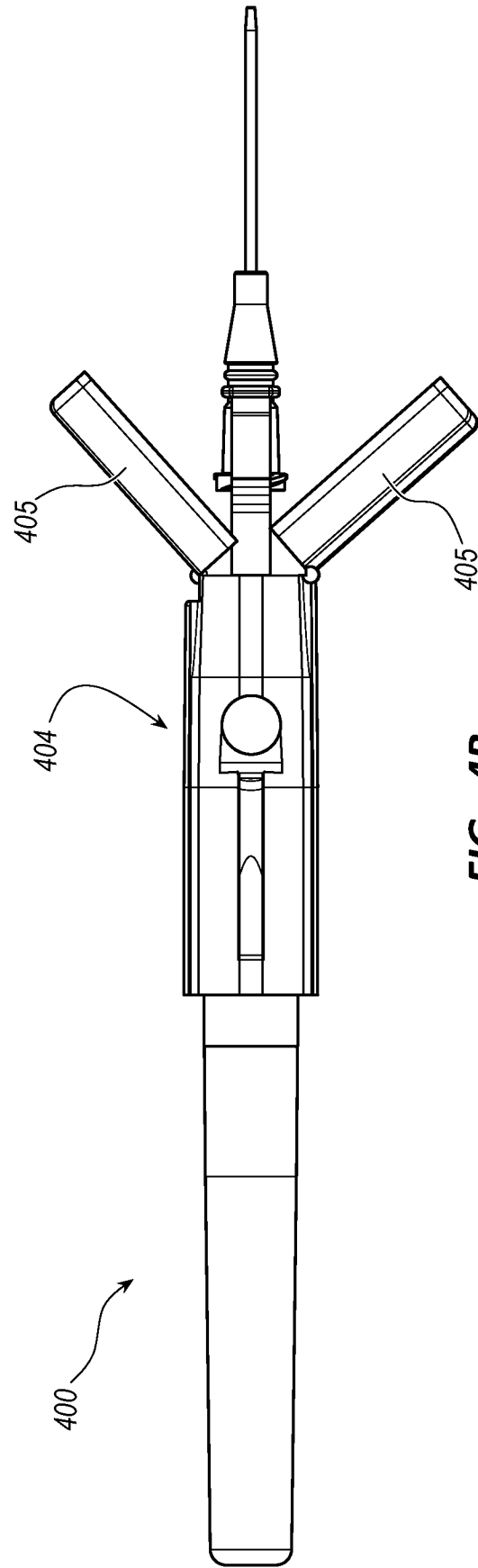


FIG. 4B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/052225

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 15-21
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such
an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2019/052225

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61M25/06 A61M25/01
ADD.

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)

A61M

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.
X	US 2009/131872 A1 (POPOV SERGEY [IL]) 21 May 2009 (2009-05-21) paragraphs [0045] - [0051]; figures 1-12 -----	1-14
X	WO 02/41932 A2 (SERPOMED LTD [IL]; POPOV SERGEY [IL]) 30 May 2002 (2002-05-30) page 12 - page 14; figures 7-15 -----	1,3-6, 8-10, 12-14
A	EP 0 730 880 A1 (BECTON DICKINSON CO [US]) 11 September 1996 (1996-09-11) page 3, line 36 - page 5, line 48; figures 1-5 -----	1-14
A	WO 2008/137956 A2 (VASCULAR PATHWAYS INC [US]; BELSON AMIR [US]) 13 November 2008 (2008-11-13) the whole document -----	1-14



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search

16 June 2020

Date of mailing of the international search report

25/06/2020

Name and mailing address of the ISA/

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Authorized officer

Berndorfer, Urs

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2019/052225

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		US 2019022358 A1	24-01-2019
		WO 2008137956 A2	13-11-2008

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 15-21

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery Cl. 15: "A method of an intravenous ("IV") catheter-placement device, comprising: ...; piercing a vein of a patient with the needle; sliding the IV catheter over the needle and into the vein by way of the deployment button; and pressing the release button when the deployment button slides into the release button, thereby launching an entirety of the needle into a needle cavity of the barrel by releasing a spring compressed against a distal-end portion of the needle cavity by a needle hub of the needle". Claims 15 - 21 describe the use of such a catheter-placement device within the body. The claimed method therefore clearly impacts the result of the described treatment carried out by a physician.