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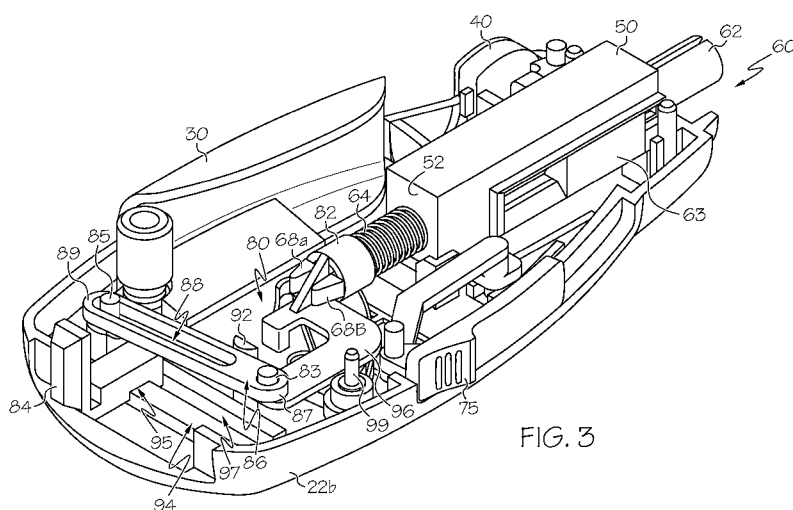


FIG. 3

(57) **Abstract:** A depth-control mechanism for selectively-adjusting a lancing stroke depth of a lancet carrier (60). The depth-control mechanism includes a positioning tab (84) that is configured to be repositioned along an axis that is orthogonal to the lancing stroke axis of the lancet carrier. The depth-adjustment mechanism also includes a tether (80) that is pivotally coupled between the positioning tab (84) and the lancet carrier (60). The positioning tab is configured to manipulate a pivot axis of the tether to adjust the lancing stroke length of the lancet carrier.

LANCING DEVICE WITH MOVING PIVOT DEPTH ADJUST

Cross-Reference to Related Application

[0001] This application claims the priority benefit of U.S. Provisional Patent Application Serial No. 61/622,570 filed April 11, 2012, the entirety of which is hereby incorporated herein by reference for all purposes.

Technical Field

[0002] The present invention relates generally to the field of medical devices, and more particularly to a lancing device for blood sampling and testing, and an incorporated mechanism for adjusting the penetration depth of the lancet tip.

Background

[0003] Lancing devices are utilized for penetrating the skin of a human or animal subject at a lancing site to obtain a sample of blood or other body fluid for medical testing, as in blood-typing or blood-glucose testing. Known lancing devices commonly include a housing containing a drive mechanism, a charging mechanism for energizing the spring or other drive means of the drive mechanism, and a release mechanism for releasing the drive mechanism upon actuation.

[0004] A lancet is typically propelled by the drive mechanism from a retracted position within the housing to an extended position wherein a sharp tip portion of the lancet projects from the housing to prick the subject's skin at a desired lancing site. The lancet is typically a disposable component that is removably mounted into a receiver or lancet carrier portion of the drive mechanism of a lancing device. A used lancet typically is removed from the lancet carrier after sampling for subsequent disposal. An ejection mechanism can optionally be included for discharge of the used lancet from the lancing device. A new, sterile lancet is then replaced into the lancet carrier for further sampling.

[0005] A depth-control mechanism can optionally be provided to adjust the penetration depth of the lancet, to control sample size and/or to minimize pain. Known depth control mechanisms typically include endcaps that are adjustably positioned relative to the lancing device housing, and movable stops that limit the travel of the drive mechanism by contact with the lancet carrier.

[0006] Ongoing improvement to depth control mechanisms for lancing devices is sought. It is to the provision of improved lancing devices and lancing depth control mechanisms that the present invention is primarily directed.

Summary

[0007] The present invention provides an improved lancing device with a depth control mechanism including a pivot post or column movably mounted within a pivoting link for adjustment of the lancet penetration depth. In example embodiments, adjustment of the lancing depth is controlled by varying the point of contact or connection of the pivot post to the lancing device housing, and/or by varying the length between the movable post relative to a stationary post and/or a spring retainer.

[0008] In one aspect, the present invention relates to a depth-control mechanism for selectively-adjusting a lancing stroke depth of a lancet carrier. The depth-control mechanism includes a positioning tab that is configured to be repositioned along an axis that is orthogonal to the lancing stroke axis of the lancet carrier. The depth-adjustment mechanism also includes a tether that is pivotally coupled between the positioning tab and the lancet carrier. The positioning tab is configured to manipulate an adjustable pivot axis of the tether to adjust the lancing stroke length of the lancet carrier.

[0009] In another aspect, the present invention relates to a depth-control mechanism for a lancing device including a drive-mechanism and a lancet carrier that is translationally

secured along a lancing stroke axis within a housing including an engagement post and a proximal elongated aperture. The depth-control mechanism includes a repositioning post that is slidably secured along the housing proximal elongated aperture. The repositioning post is distance-adjustable relative to the engagement post. The depth-control mechanism also includes a link that couples the repositioning post and the lancet carrier. The link includes an elongate slot therein to slidably receive the repositioning post therein. The distance between the engagement post and the repositioning post is adjustable to control the penetration depth of the lancet carrier lancing stroke.

[0010] In still another aspect, the invention relates to a lancing device for carrying a lancet along a lancing stroke defining an axial direction. The lancing device includes a housing and a lancet carrier that is translationally mounted within the housing. The lancing device also includes a positioning slider that is translationally mounted with respect to the housing for movement in a transverse direction that is generally orthogonal to the lancing stroke axial direction. The lancing device also includes a pivotal linkage that is coupled between the positioning slider and the lancet carrier. Adjustment of the positioning slider varies the length of the lancing stroke.

[0011] These and other aspects, features and advantages of the invention will be understood with reference to the drawing figures and detailed description herein, and will be realized by means of the various elements and combinations particularly pointed out in the appended claims. It is to be understood that both the foregoing general description and the following brief description of the drawings and detailed description of the invention are exemplary and explanatory of preferred embodiments of the invention, and are not restrictive of the invention, as claimed.

Brief Description of the Drawings

[0012] **FIGURE 1** is a front perspective view of a lancing device according to an example embodiment of the present invention.

[0013] **FIGURE 2** is a rear perspective view of the lancing device of **FIGURE 1**.

[0014] **FIGURE 3** shows the lancing device of **FIGURE 1** with portions of its external housing removed to show internal components thereof.

[0015] **FIGURE 4** is a top perspective view of the depth-control mechanism of the lancing device of **FIGURE 1**.

[0016] **FIGURE 5** is a bottom perspective view of the depth-control mechanism of the lancing device of **FIGURE 1**.

[0017] **FIGURE 6** is a partial assembly view of the lancing device of **FIGURE 1** with portions removed to show internal components thereof and with the depth-control mechanism at its minimum setting.

[0018] **FIGURES 7A-12B** are top views of the lancing device of **FIGURE 1** with portions of its external housing removed, showing the sequence of operation of the lancing device with the depth-adjust mechanism positioned at both the minimum and maximum settings.

[0019] **FIGURE 13** is an exploded assembly view of the lancing device of **FIGURE 1**.

Detailed Description of Example Embodiments

[0020] The present invention may be understood more readily by reference to the following detailed description of the invention taken in connection with the accompanying drawing figures, which form a part of this disclosure. It is to be understood that this

invention is not limited to the specific devices, methods, conditions or parameters described and/or shown herein, and that the terminology used herein is for the purpose of describing particular embodiments by way of example only and is not intended to be limiting of the claimed invention. Any and all patents and other publications identified in this specification are incorporated by reference as though fully set forth herein.

[0021] Also, as used in the specification including the appended claims, the singular forms “a,” “an,” and “the” include the plural, and reference to a particular numerical value includes at least that particular value, unless the context clearly dictates otherwise. Ranges may be expressed herein as from “about” or “approximately” one particular value and/or to “about” or “approximately” another particular value. When such a range is expressed, another embodiment includes from the one particular value and/or to the other particular value. Similarly, when values are expressed as approximations, by use of the antecedent “about,” it will be understood that the particular value forms another embodiment.

[0022] With reference now to the drawing figures, wherein like reference numbers represent corresponding parts throughout the several views, **Figures 1-13** show various aspects and features of a lancing device 10 according to an example form of the invention. As best shown in **Figure 1**, the lancing device 10 includes a housing 20 generally comprising separable upper 22a and lower 22b housing shells, and a forward or distal end 24 defining a lancet opening through which at least a sharp tip 74 portion of a lancet 72 projects at the extended position of the lancing stroke to penetrate the skin of a subject during the lancing process. As best shown in **Figures 3-13**, the housing 20 protects a lancet carrier that is movably housed within the shells 22a, 22b. As depicted, the housing 20 has a generally elongate ergonomic shape that is wider at the back and tapering to a narrower front; however, alternate housing shapes can be utilized. The housing 20 can be

constructed of a substantially rigid durable material, for example plastic, in example embodiments.

[0023] As best shown in **Figures 9A-9B**, a release button 40 projects through a side opening formed in the housing shells 22a, 22b. The release button 40 acts to release a trigger mechanism when depressed, thereby actuating the device to propel the lancet 72 along a lancing stroke from a retracted position within the housing 20 to an extended position. As best shown in **Figures 10A-10B**, the lancet 72 is in the extended position when at least the sharp tip portion 74 of the lancet projects outwardly of the lancet opening at the distal end of the housing 24.

[0024] A charging handle or actuator 30 forms a portion of, and is secured between, the housing shells 22a, 22b along one side of the housing 20. Actuating the charging handle or actuator 30 retracts the lancet carrier toward the housing proximal end 26 and energizes a biasing spring 64 to provide motive force to propel the lancet 72 along the lancing stroke. As best shown in **Figure 13**, the charging handle or actuator 30 includes a flange having at least one feature, for example a receiver aperture 31, to engage and/or actuate the drive mechanism. An arm 34 can be pivotally mounted to the housing 20 at a pivot end and have a free-end rod 32 movably mounted with respect to the flange feature. The pivot end can include a cylindrical receiver or sleeve. Actuating or pivoting the charging actuator 30 into the housing 20 forces the flange to move causing the arm 34 to pivot and engage a portion of a coupling or spring retainer 82, further retracting the lancet carrier and energizing the biasing spring 64. A further description of the charging mechanism is presented in Applicant's U.S. Provisional Patent Application Number 61/623,276 filed April 12, 2013, and hereby incorporated by reference for all purposes.

[0025] As depicted in **Figure 2**, a proximal end 26 of the lancing device 10 includes an elongated opening 81 through which a depth positioning tab or slider 84 extends. As shown, the depth positioning tab 84 can be moved within the elongated limits of the

opening 81. The positioning tab 84 and/or housing can include one or more interengaging surface features or couplings (not shown) for positioning the tab in discrete and/or infinitely variable positions within the opening 81 and allowing it to slide back and forth therein.

[0026] **Figures 3 and 6** show the lancing device in a fixed position with its upper housing shell 22a removed. An inner drive core 50 is engaged within the housing 20 by one or more interengaging surface features in the lower housing shell 22b. In example embodiments, a portion of an inner drive mechanism is translationally mounted to slide within an axial bore or channel through the inner drive core 50. As depicted, the drive mechanism includes a lancet carrier 60 that has a distal collar or sleeve receiver 62 for releasably receiving the lancet 72. A biasing spring or combination drive-and-return spring 64 is engaged between a proximal wall 52 of the drive core 50 and a coupling or spring retainer 82. The biasing spring 64 propels the lancet 72 along the forward portion of the lancing stroke, and subsequently returns the lancet carrier to a retracted position within the housing 20 after the lancing has been completed. Optionally, separate drive and return springs can be used as desired. For example, an additional biasing spring can be added between a pair of arms 63 on the carrier 60 and the interior face of the proximal wall 52 to function as a drive spring, propelling the lancet 72 along the forward portion of the lancing stroke. A separate biasing spring 64 can function as a return spring, to return the lancet carrier 60 to a retracted position within the housing.

[0027] As depicted, the distal end of the lancet carrier 60 includes a split yoke having a pair of resilient forks 68a, 68b with outwardly-directed barbs to permit installation and retention of the biasing spring 64. The resilient forks 68a, 68b are inserted through an aperture in the proximal wall of the drive core 50. As best shown in **Figure 3**, the resilient forks 68a, 68b can then insert through, and secure with a friction fit to, a coupling 82 at the distal end of a linkage joint or tether 80.

[0028] As best shown in **Figures 9A-9B**, a cantilevered release finger 66 projects from the axial shaft of the lancet carrier 60 for releasable engagement with a catch surface 54 of the drive core 50 to retain the lancet carrier 60 in its retracted position when the device is charged. When the release button 40 pressed, it contacts/depresses the release finger 66 to release the lancet carrier 60 to travel along its lancing stroke and thereby initiate the lancing procedure.

[0029] **Figures 4 and 5** show details of the linkage joint or tether 80 for adjustment of the penetration or lancing depth of the lancing stroke. In the depicted embodiment, the distal coupling 82 has an axially oriented bore or connector with a vertical divider at the proximal end to divide the flexible forks 68a, 68b secured within the coupling. The tether 80 has an elbow or hook-shaped arm 96 with a downwardly-extending grip 98 positioned directly proximal to the coupling 82, and an upwardly-extending post 83 at a laterally displaced end of the hook-shaped arm. The downwardly-extending grip 98 engages the arm 34. The upwardly-extending post 83 pivotally inserts through a pivot aperture 86 in a pivoting link. The pivoting link is slidably and pivotally connected between the positioning tab 84 and the tether 80. An elongated slot 88 extends between the pivot aperture 86 and a free end 89 of the link 86.

[0030] A pivot post 85 on the positioning tab 84 is received and slides within the link elongated slot 88. The positioning tab 84 has a downwardly-facing receiver channel and insert 95 to slidably engage a support guide 94 provided within the bottom housing shell 22b. The support guide 94 has an elongated channel 97 that extends horizontally across the bottom housing shell 22b. In use, the positioning tab insert 95 slidably inserts within the elongated channel 97.

[0031] **Figure 6** shows surface features of the bottom housing shell 22b engaging portions of the inner drive core 50 and the tether 80. As depicted by the dashed lines, interengaging surface features 90, 91 engage the proximal and distal ends of the inner

drive core 50 in a fixed position within the bottom housing shell 22b. A proximal portion of the lower shell 22b includes an engagement post 92 for abutting the pivoting link 86 and functioning as a fulcrum about which the link 86 pivots. The engagement post 92 generally has an outer profile shaped to accommodate minimal surface contact with the pivoting link 86, for example a cylindrical or arcuate outer profile facing toward the proximal opening 81 in the housing 20. Optionally, the post can include other profiles as desired, for example, an angled or polygonal outer profile to define discrete surfaces along the contour of the outer profile. The bottom housing shell 22b can also have a pivot post 99 to pivotally receive the arm 34 pivot end.

[0032] **Figures 7A-12B** show the operation of the lancing device throughout the lancing procedure with the positioning tab 84 of the tether 80 positioned in both the minimum (**Figures 7A, 8A, 9A, 10A, 11A and 12A**) and the maximum (**Figures 7B, 8B, 9B, 10B, 11B and 12B**) depth penetration settings. As shown in **Figures 7A-7B**, in a neutral position, the pivoting link 86 is angled such that the free end 80 is angled toward the housing distal end 24 and the pivot link pivoting aperture 86 is angled toward the housing proximal end 26. The elongated channel 88 extends along the same axis as the pivot link. It will be understood that the positioning tab 84 can be positioned at one or more intermediate points between the minimum depth and maximum depth settings as well. As the positioning tab 84 is repositioned from the minimum depth setting to the maximum depth setting, the pivot post 85 engages the elongated channel 88 and forces the angle of the pivot link to increase away from horizontal and push the free end 89 further toward the housing distal end 24.

[0033] As depicted, the lancet carrier 60 translates from a neutral position (**Figures 7A, 7B**), through a charging position (**Figures 8A, 8B**) to a charged position (**Figures 9A, 9B**) by actuating the charging handle 30 to energize the biasing spring 64 and engage the release finger 66 with the catch surface 54 of the drive core 50. Upon actuating the

release member 40 to disengage the release finger 66 from the catch surface 54, the biasing spring propels the lancet carrier 60 along an advancing portion of the lancing stroke from the charged position within the housing to an advanced position (**Figures 10A, 10B**) wherein at least the sharp lancet tip 74 projects externally of the housing to penetrate the subject's skin at a lancing site.

[0034] As depicted, the depth or extension of the lancet tip 74 projecting external to the housing is determined by the horizontal position of the pivot position post 85 relative to the engagement post 92. When driven forward by the bias spring 64, the pivot link pivot aperture 86 is pulled forward by the tether arm post 83. The maximum length between the pivot post 85 and engagement post 92 results in minimum depth penetration of the lancet 72 (**Figure 10A**) because the pivot link engages the engagement post 92 with the pivot aperture 86 positioned proximally behind the engagement post. The minimum length between the pivot post 85 and the engagement post 92 results in maximum depth penetration of the lancet (**Figure 10B**) because the pivot link engages the engagement post 92 with the pivot aperture 86 further toward the housing distal end 24 with respect to the engagement post. After the forward lancing stroke, the biasing spring 64 subsequently returns the lancet carrier 60 and the lancet 72 to the neutral position (**Figures 11A, 11B**).

[0035] Optionally, the housing 20 comprises a removable endcap or nose-cone portion 70. As best shown in **Figures 12A-12B**, removal of the endcap 70 allows access for removal and replacement of the lancet 72 after use, for example by actuation of an ejector handle 75. In example embodiments, the ejector handle 75 movably mounts within an elongated opening 76 of the housing generally opposite the charging handle 30 and extends within the housing to selectively engage and eject the lancet.

[0036] Optionally, one or more releasable index detents (not shown) can be provided between the positioning tab 84 and the housing 20 to secure the positioning tab in a user-selected position within the elongated opening 81 on the housing or other portion of the

lancing device, to permit indexed movement; or alternatively a continuously variable positional adjustment is provided. Example engagement features can include rigid points or a lip corresponding with cut-outs or notches in the surface of the opening 81, rubberized friction pads, or similar gripping elements.

[0037] While the invention has been described with reference to preferred and example embodiments, it will be understood by those skilled in the art that a variety of modifications, additions and deletions are within the scope of the invention, as defined by the following claims.

What is Claimed is:

1. A depth-control mechanism for selectively-adjusting a lancing stroke depth of a lancet carrier, the depth-control mechanism comprising:

a positioning tab configured to be repositioned along an axis orthogonal to the lancing stroke axis of the lancet carrier, and

a tether pivotally coupled between the positioning tab and the lancet carrier, the positioning tab is configured to manipulate an adjustable pivot axis of the tether to adjust the lancing stroke length of the lancet carrier.

2. The depth-control mechanism of Claim 1, wherein the positioning tab is configured to be slidably repositioned along an axis that is perpendicular to the lancing stroke axis of the lancet carrier.

3. The depth-control mechanism of Claim 1, wherein the tether comprises a pivot link comprising an elongated channel with an elongated axis extending between a minimum depth end and a maximum depth end.

4. The depth-control mechanism of Claim 3, wherein the positioning tab is slidably secured in the pivot link elongated channel to move between the minimum depth end and the maximum depth end.

5. The depth-control mechanism of Claim 3, wherein the elongated channel elongated axis is configured to pivot to at least a two distinct axial angles with respect to the lancing stroke axis.

6. The depth-control mechanism of Claim 5, wherein the positioning tab comprises a pivot post, the pivot link elongated channel configured to pivot to the at least two distinct axial angles about the pivot post.

7. The depth-control mechanism of Claim 3, wherein the tether comprises an arm with a distal end secured to the lancet carrier and a proximal end pivotally secured to the pivot link.
8. The depth-control mechanism of Claim 7, wherein the pivot link comprises a pivot aperture at the maximum depth end, and the arm comprises a pivot insert at the proximal end, the pivot insert pivotally inserted through the pivot link aperture.
9. The depth-control mechanism of Claim 8, wherein the pivot link is configured to pivot around the arm pivot insert when the positioning tab is slidably repositioned with respect to the lancing stroke axis of the lancet carrier.
10. A depth-control mechanism for a lancing device comprising a drive-mechanism and a lancet carrier translationally secured along a lancing stroke axis within a housing comprising an engagement post and a proximal elongated aperture, the depth-control mechanism comprising,
 - a repositioning post slidably secured along the housing proximal elongated aperture, the repositioning post being distance-adjustable relative to the engagement post; and
 - a link coupling the repositioning post and the lancet carrier, the link comprising an elongate slot therein to slidably receive the repositioning post therein;
 - wherein the distance between the engagement post and the repositioning post is adjustable to control the penetration depth of the lancet carrier lancing stroke.
11. The depth-control mechanism of Claim 10, wherein the link elongate slot comprises a longitudinal axis extending between a minimum-depth end and a maximum-depth end, the elongate slot longitudinal axis configured to pivot to at least two distinct angles with respect to the lancing stroke axis.

12. The depth-control mechanism of Claim 11, wherein the link comprises a pivot linkage comprising a pivot end and a free end, the pivot end comprising a pivot aperture and the pivot linkage comprising the link elongated slot extending between the pivot aperture and the free end.

13. The depth-control mechanism of Claim 12, wherein the link comprises a pivot post pivotally inserted through the pivot linkage aperture.

14. The depth-control mechanism of Claim 12, wherein the pivot linkage is configured pivotally engage the housing engagement post to define the lancing stroke depth.

15. The depth-control mechanism of Claim 10, wherein the distance between the repositioning post and the engagement post is inversely related to the lancing stroke depth.

16. A lancing device for carrying a lancet along a lancing stroke defining an axial direction, the lancing device comprising:

a housing;

a lancet carrier translationally mounted within the housing;

a positioning slider translationally mounted with respect to the housing for movement in a transverse direction generally orthogonal to the lancing stroke axial direction; and

a pivotal linkage coupled between the positioning slider and the lancet carrier, whereby adjustment of the positioning slider varies the length of the lancing stroke.

17. The lancing device of Claim 16, wherein the pivotal linkage comprises a receiver to receive the lancet carrier.

18. The lancing device of Claim 16, wherein the positioning slider comprises a repositioning post that slidably secures the pivotal linkage.

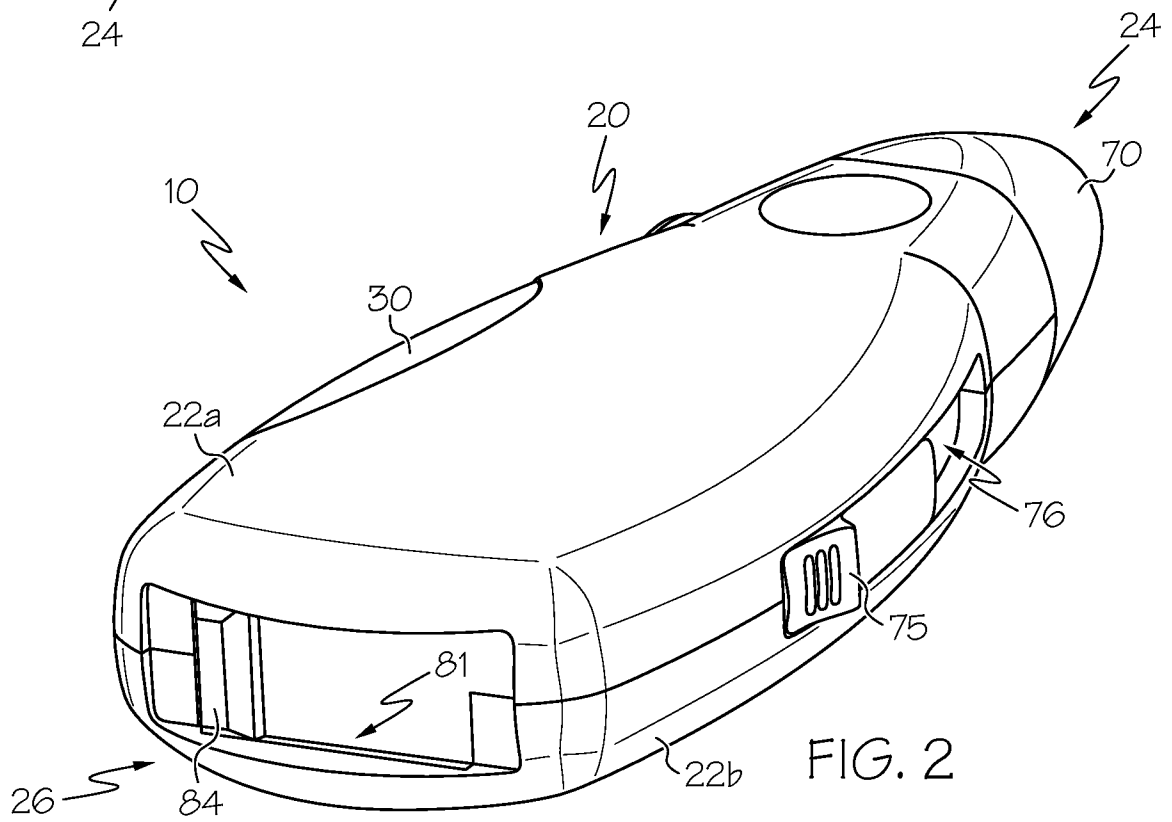
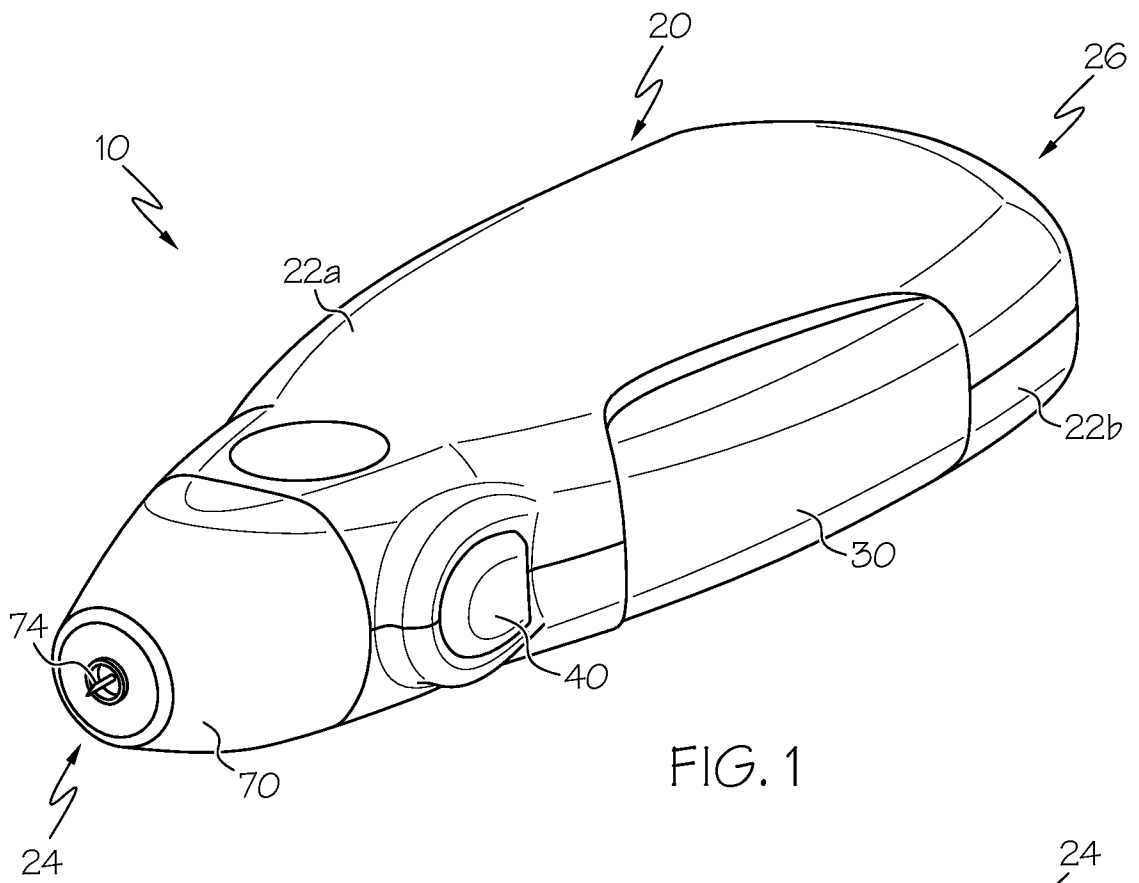
19. The lancing device of Claim 18, wherein the pivotal linkage comprises a link comprising an elongated channel extending between a minimum-depth end and a maximum-depth end, the positioning slider pivot post slidably inserts within the elongated channel.

20. The lancing device of Claim 18, wherein the pivotal linkage comprises:

a link with a pivot aperture; and

a coupling comprising a pivot post pivotally inserted through the link pivot aperture.

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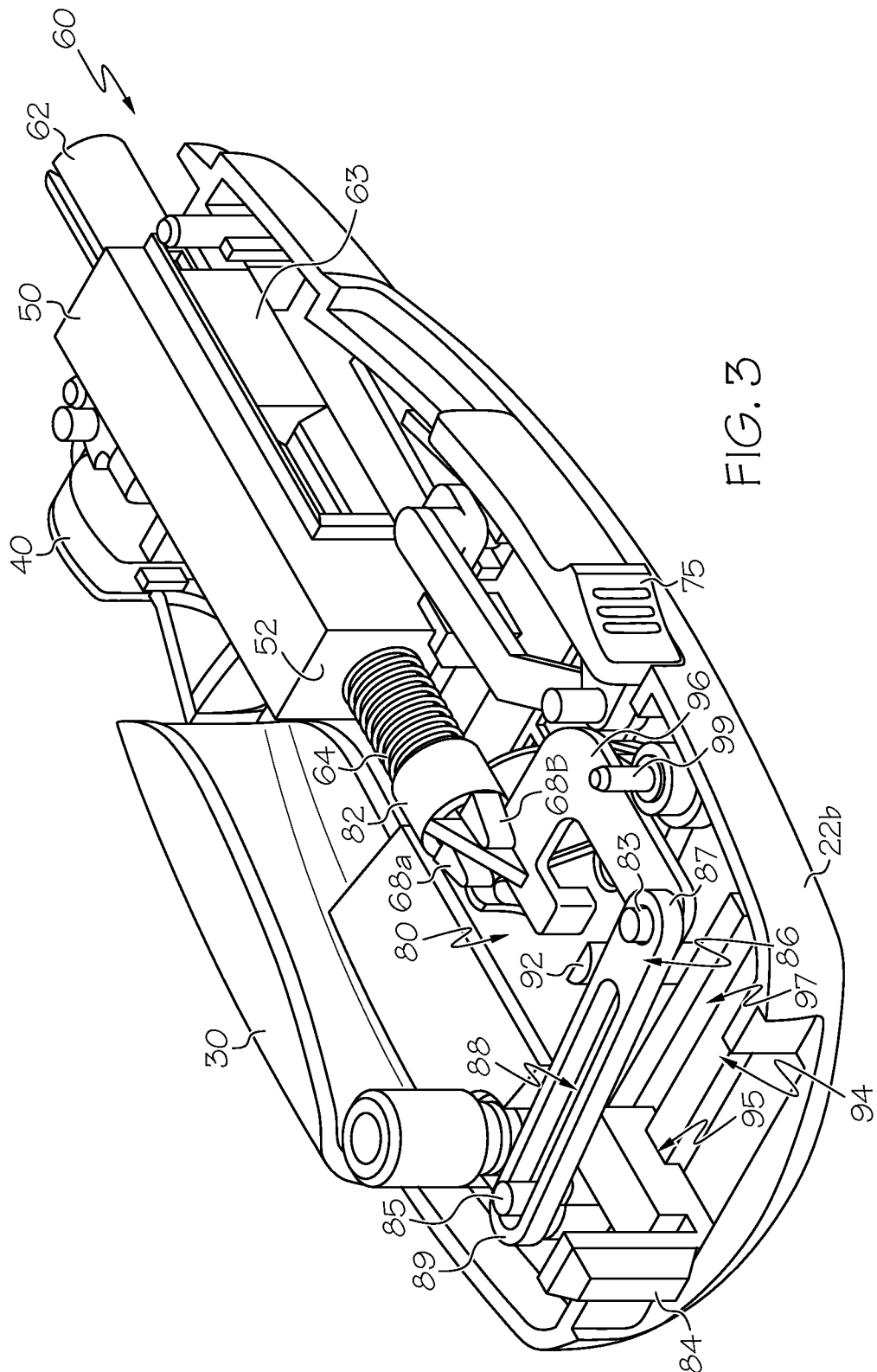


FIG. 3

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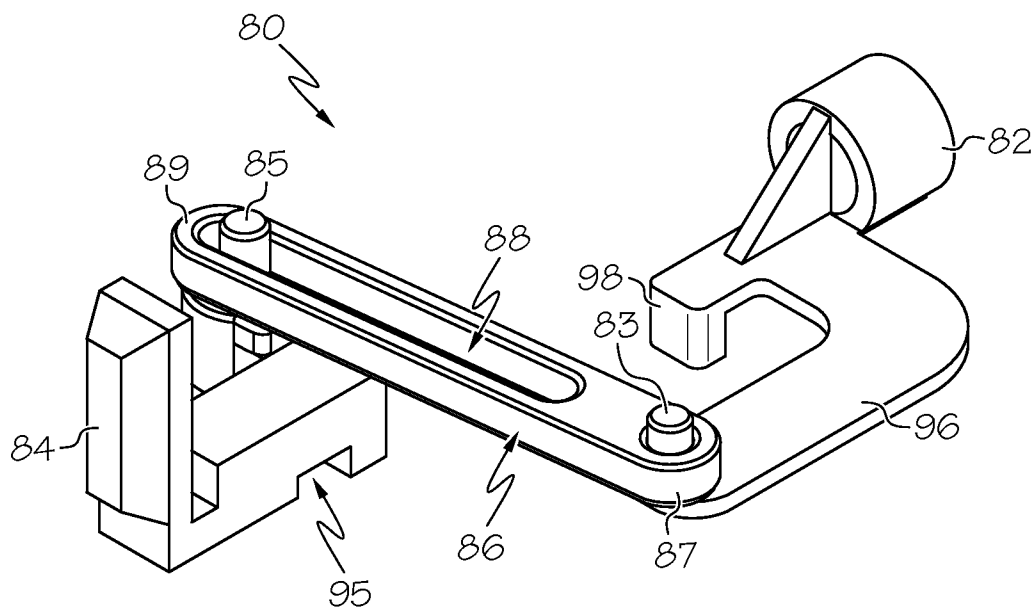


FIG. 4

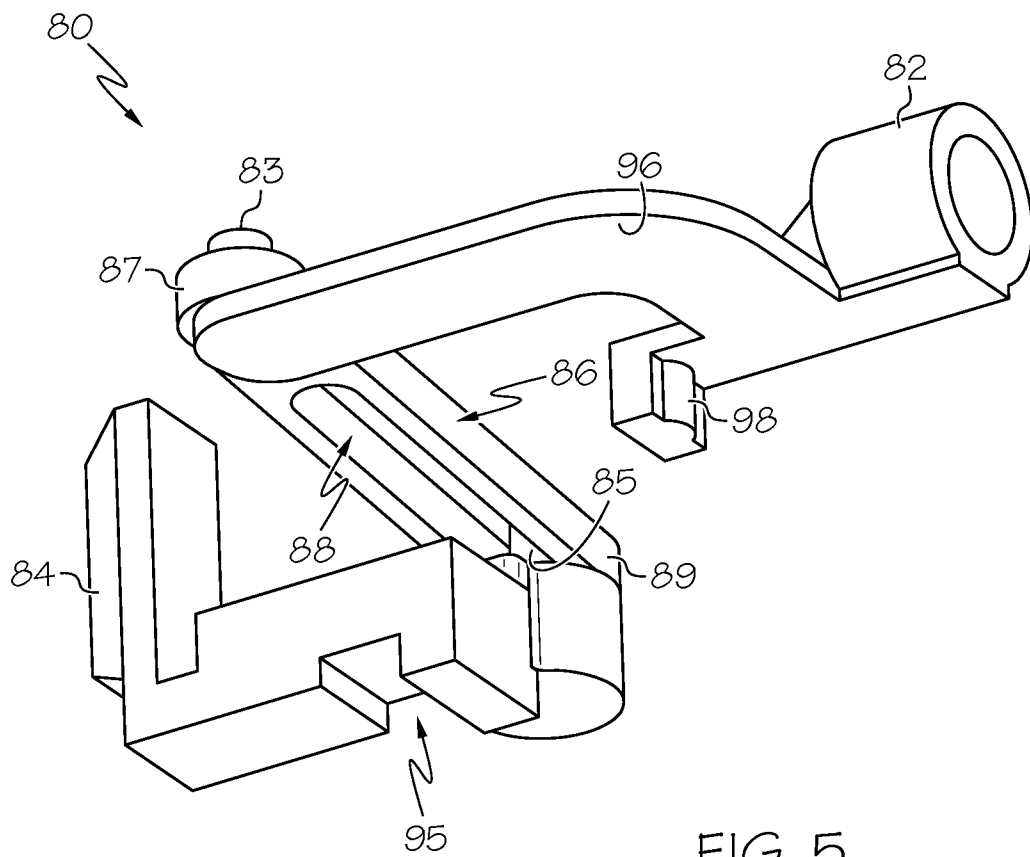


FIG. 5

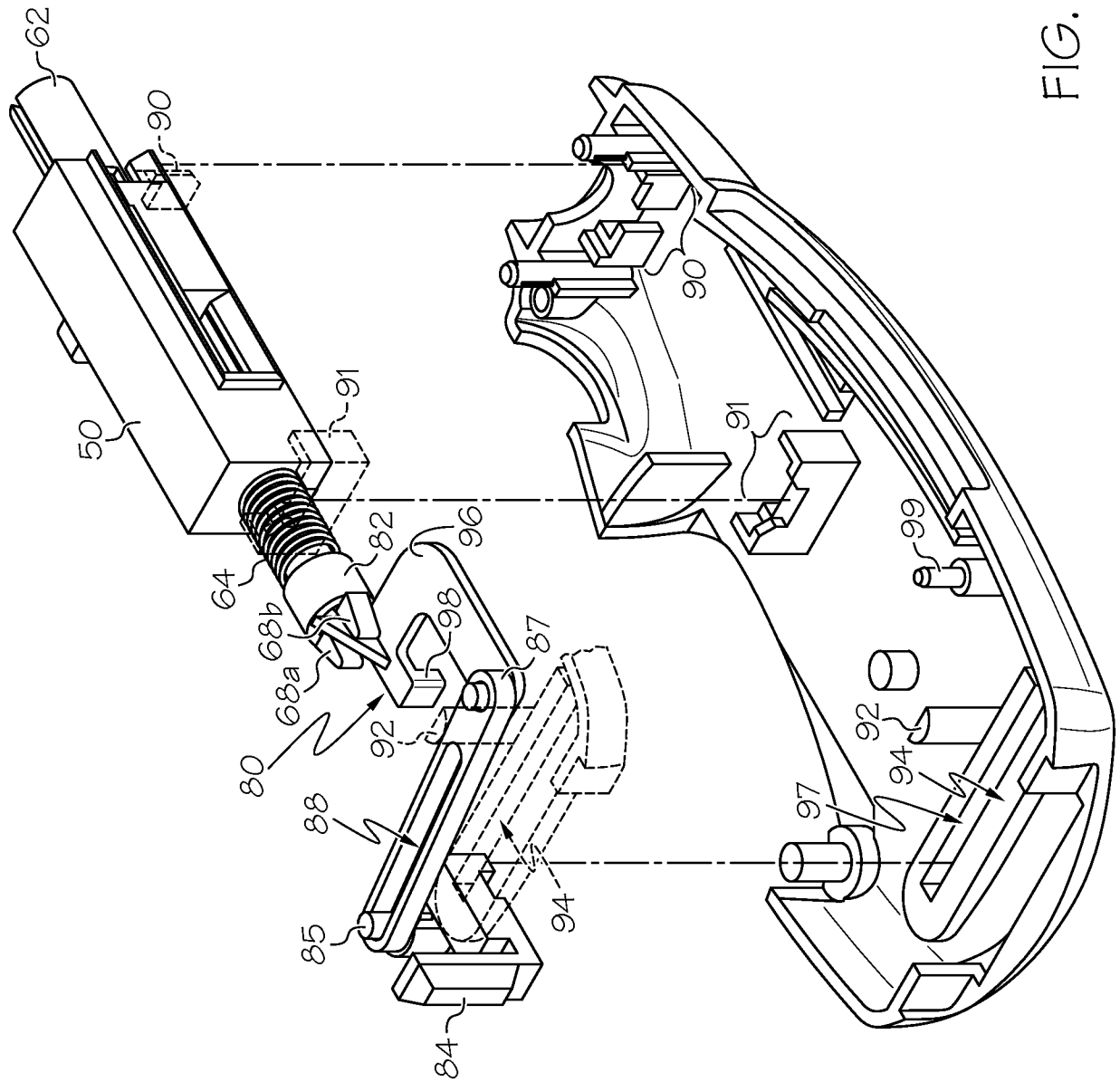
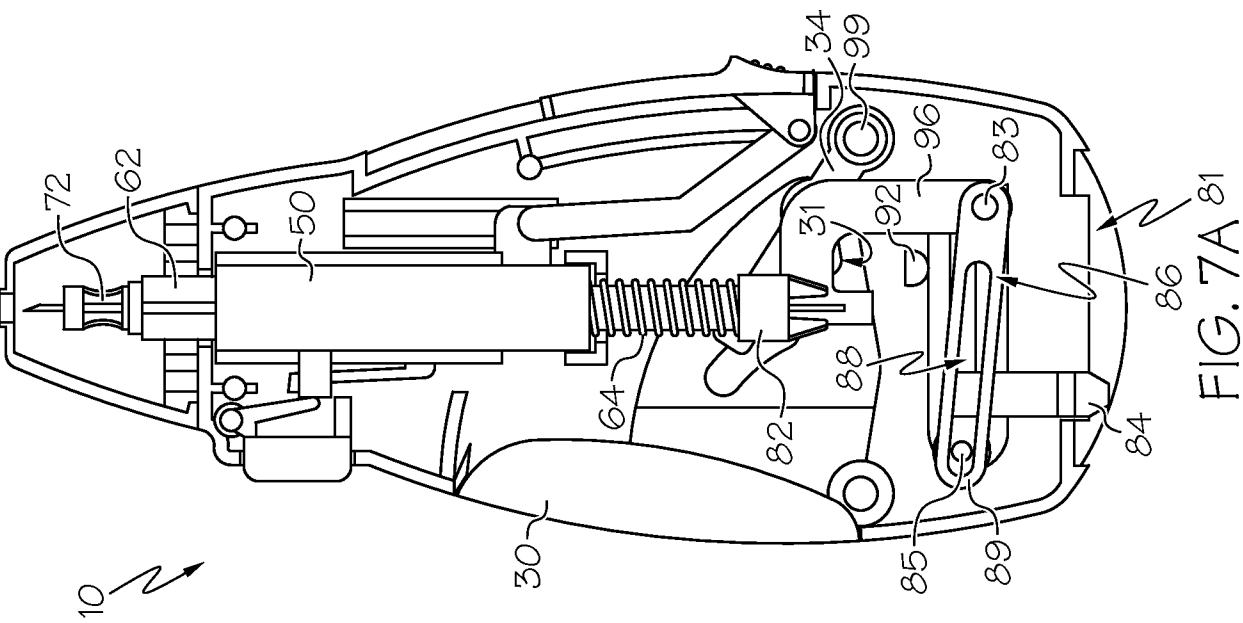
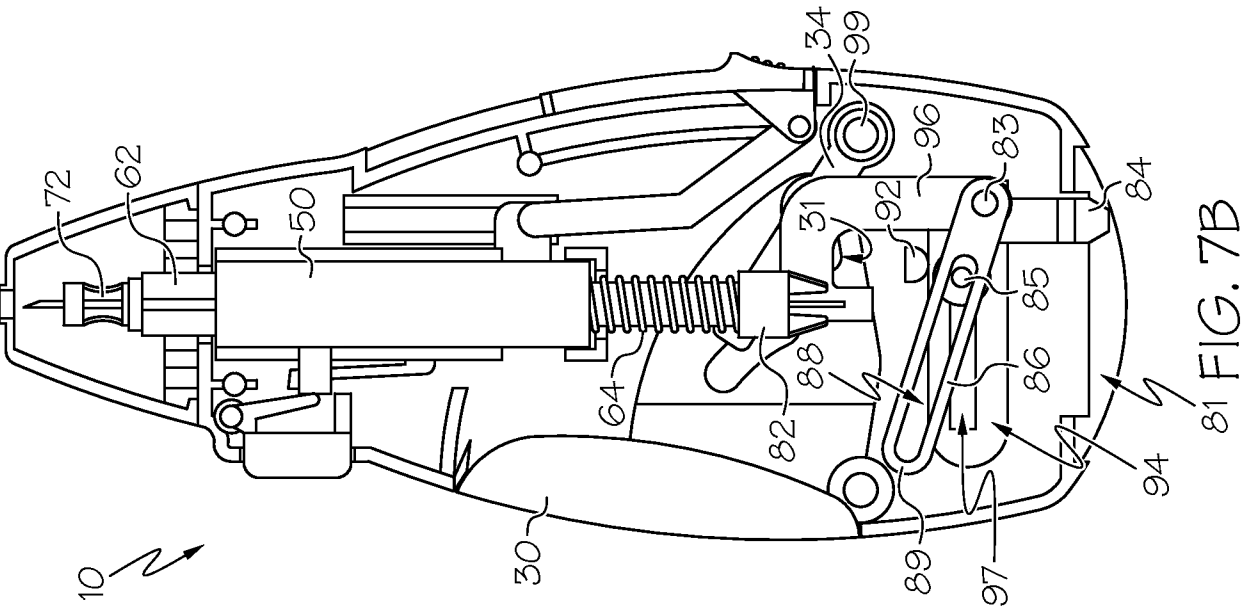


FIG. 6



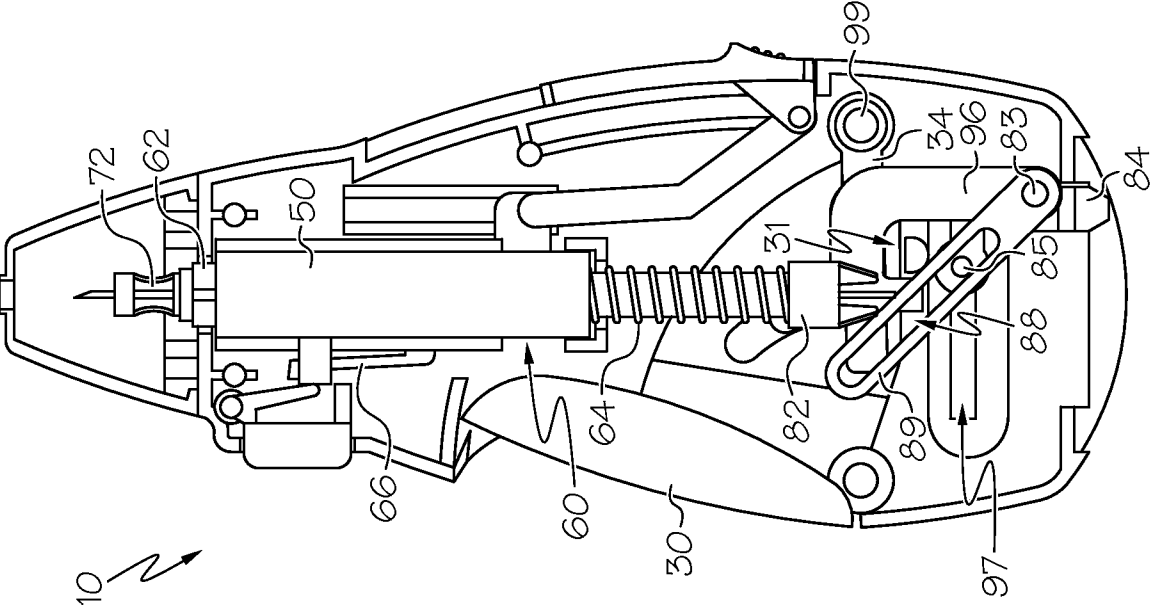


FIG. 8B

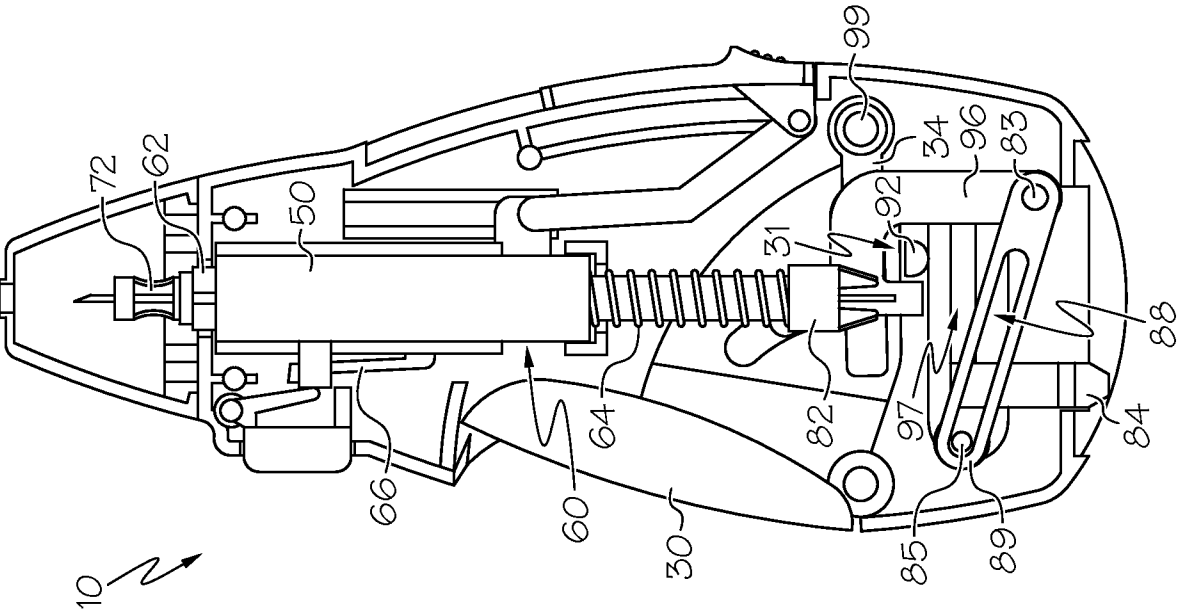


FIG. 8A

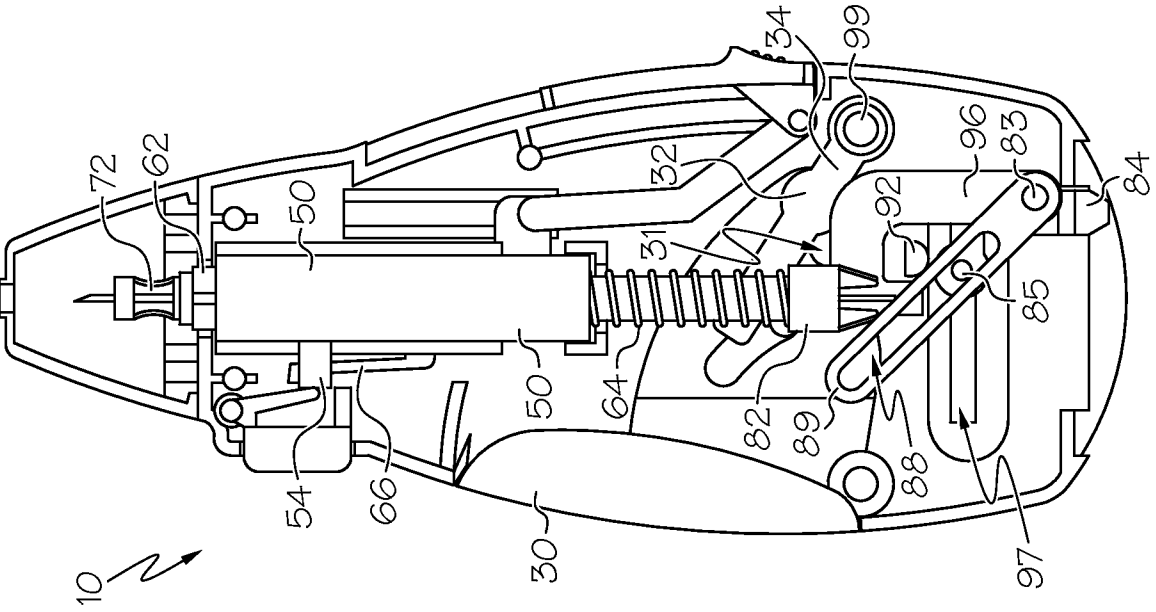


FIG. 9B

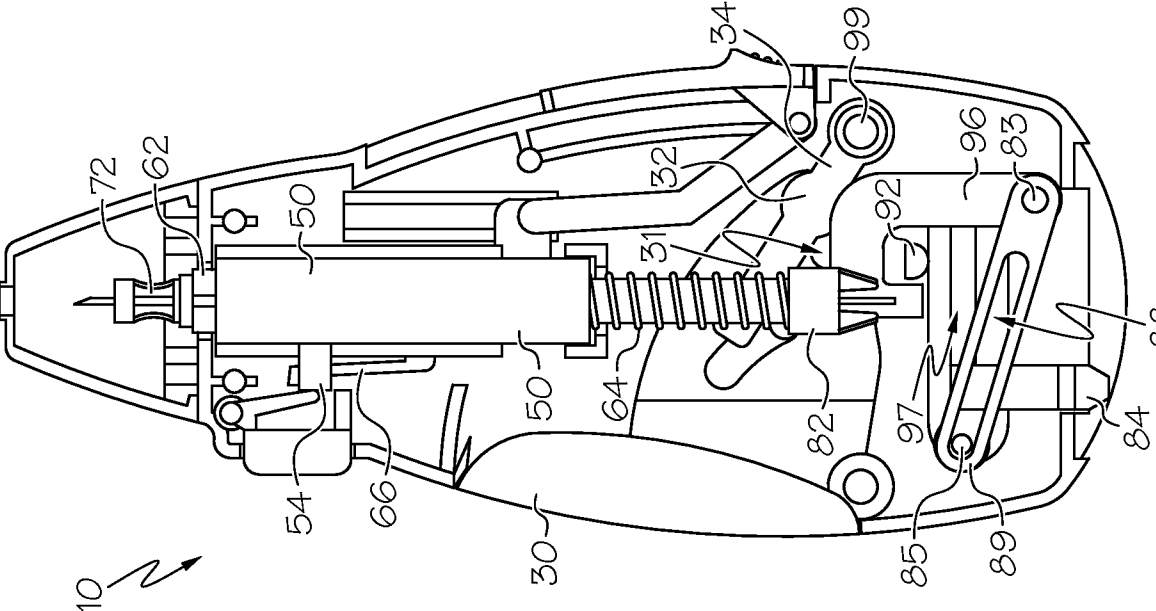


FIG. 9A

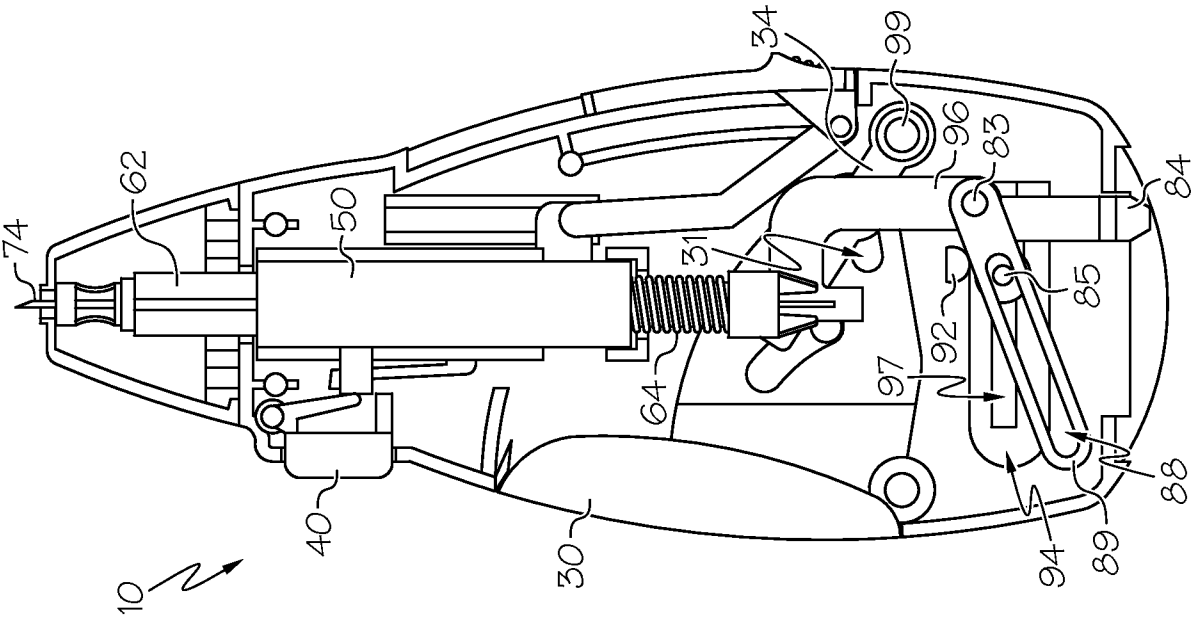


FIG. 10B

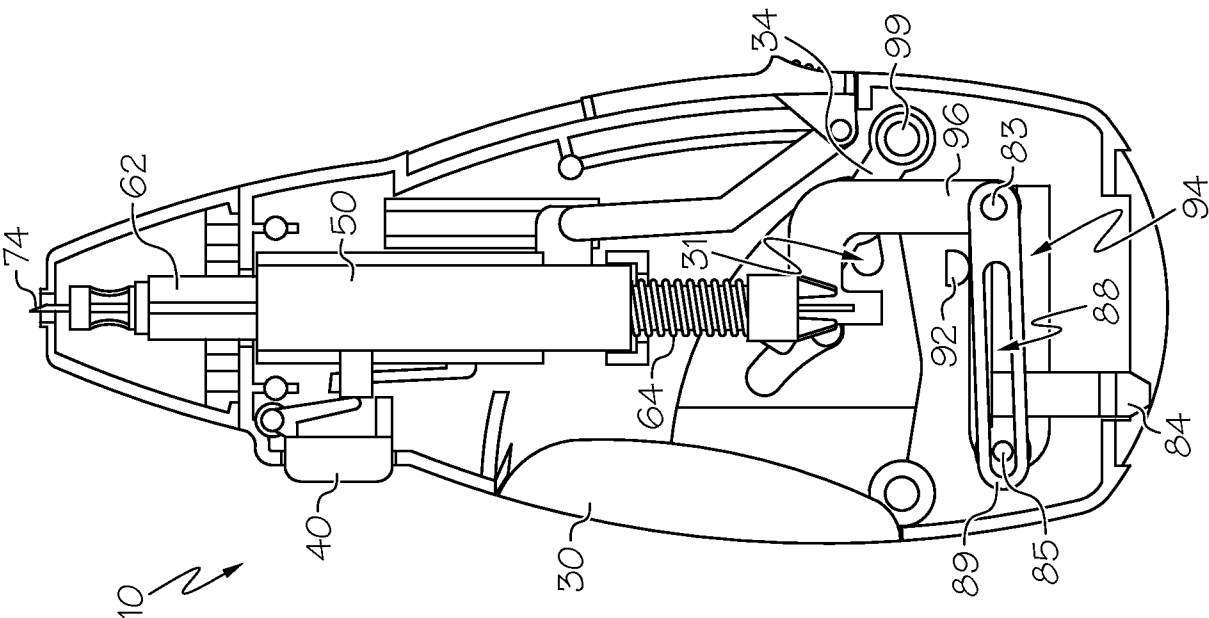


FIG. 10A

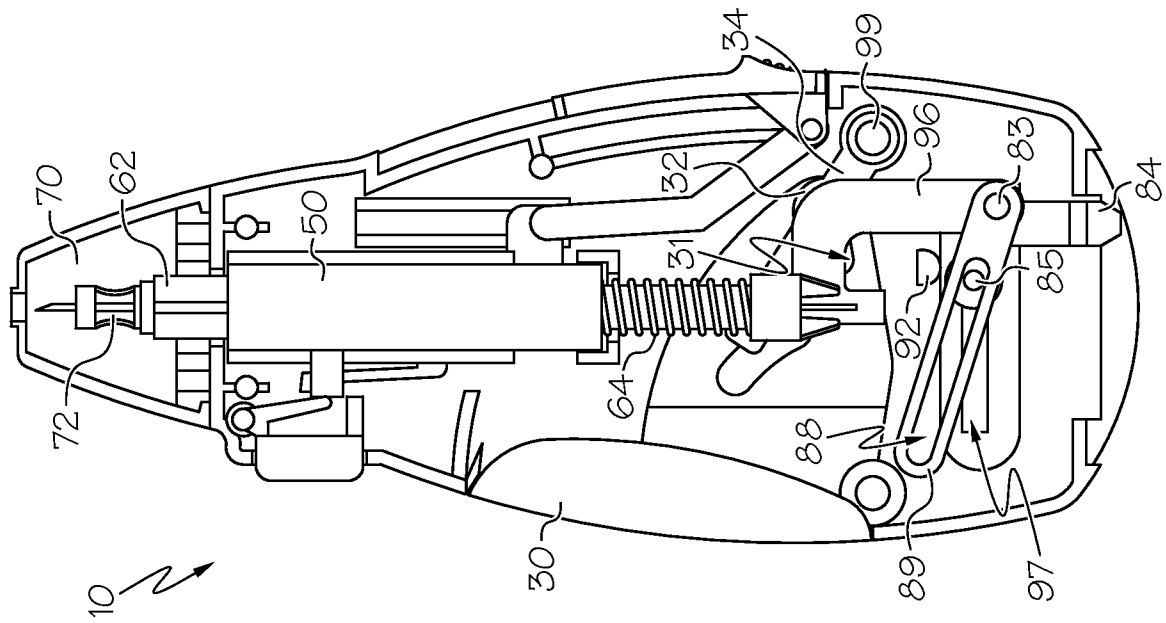


FIG. 11B

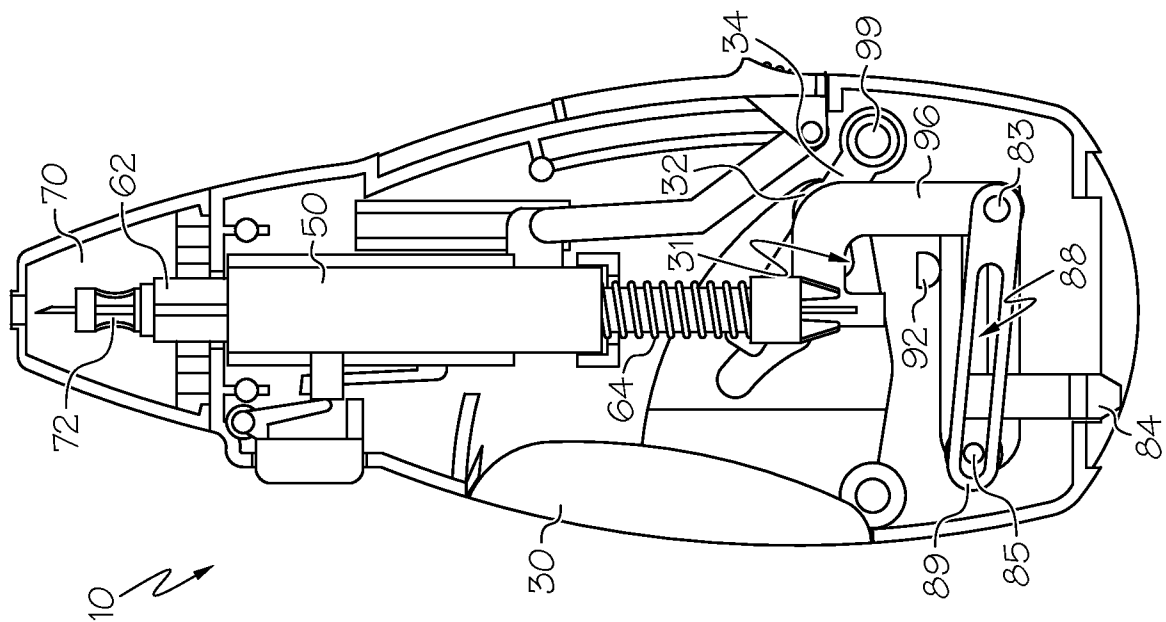


FIG. 11A

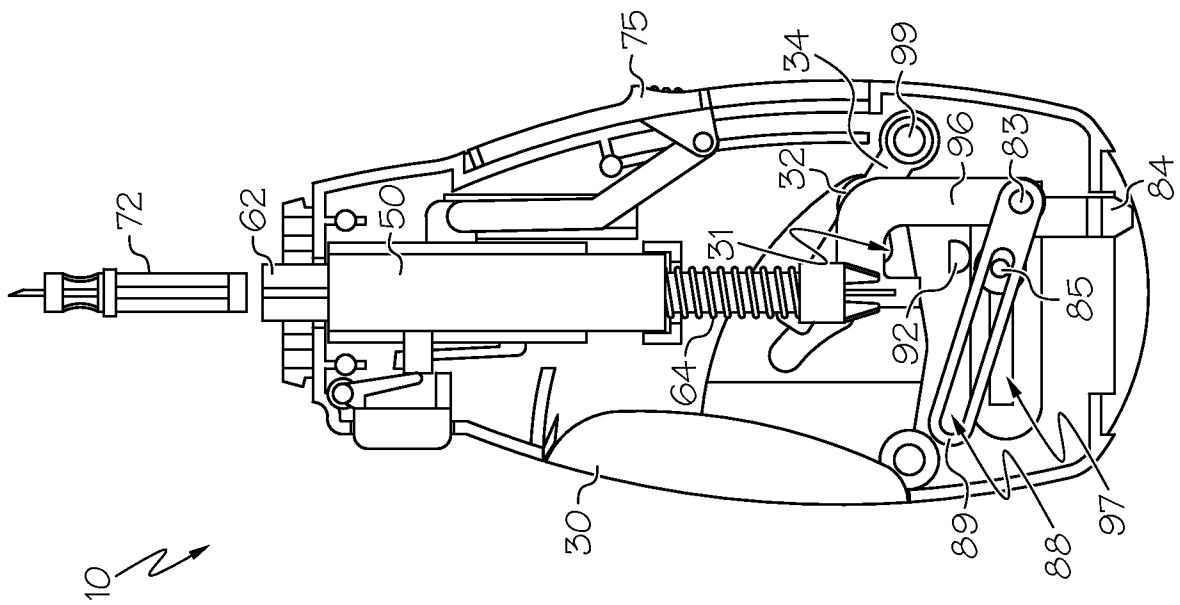


FIG. 12B

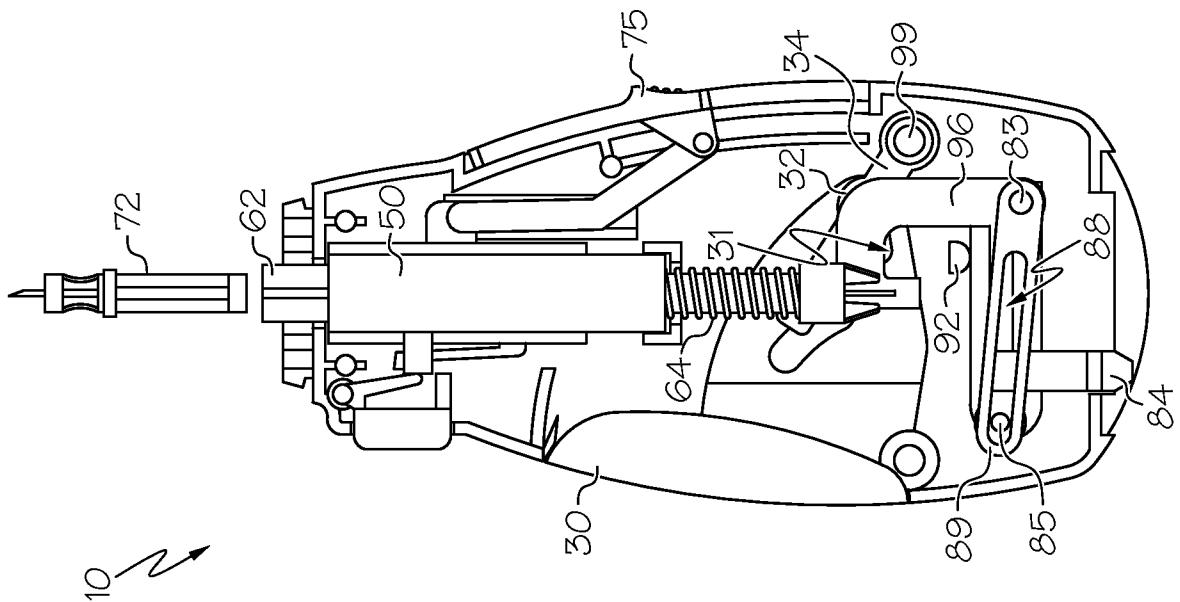


FIG. 12A

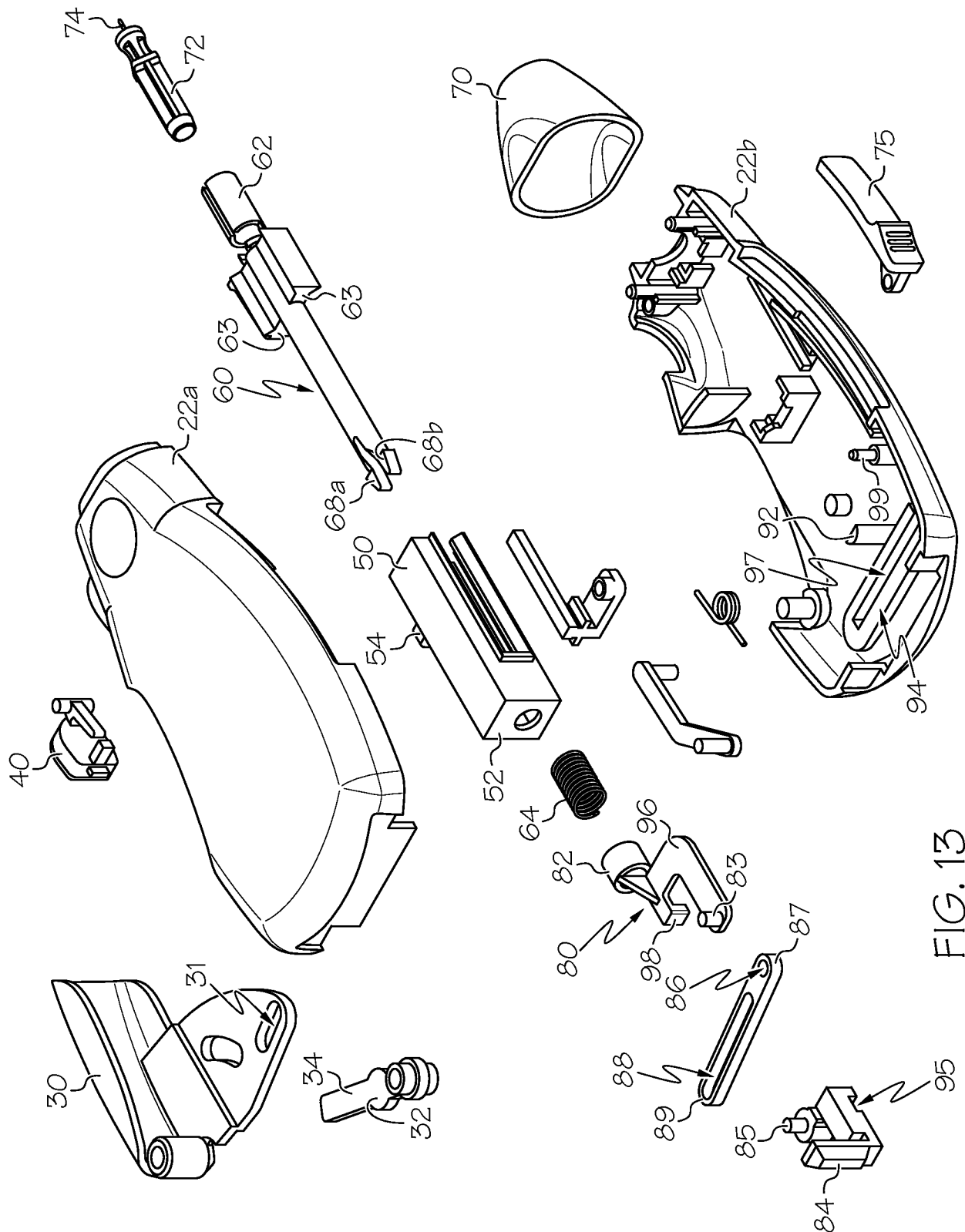


FIG. 13

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/035917

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61B5/15 A61B5/151
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)

A61B

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)

EP0-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	EP 2 221 000 A1 (ARKRAY INC [JP]) 25 August 2010 (2010-08-25) the whole document -----	1-9, 16-20
A	WO 03/015627 A2 (INVERNESS MEDICAL LTD [GB]; MOERMAN PIET [BE]; GRIFFITH ALUN [GB]) 27 February 2003 (2003-02-27) page 9, line 22 - page 15, line 25 figures 1-8 -----	1-9, 16-20
A	WO 2011/127346 A1 (FACET TECHNOLOGIES LLC [US]; ROBBINS AVI M [US]) 13 October 2011 (2011-10-13) abstract; figures -----	1-9, 16-20
A	EP 1 779 780 A2 (LIFESCAN SCOTLAND LTD [GB]) 2 May 2007 (2007-05-02) figures -----	1-9, 16-20

☐

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

10 July 2013

Date of mailing of the international search report

06/09/2013

Name and mailing address of the ISA/

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Schultz, Ottmar

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/035917

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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			EP 2221000 A1	25-08-2010
			US 2010312266 A1	09-12-2010
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			EP 1349497 A2	08-10-2003
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			WO 03015627 A2	27-02-2003

WO 2011127346	A1	13-10-2011	CA 2793226 A1	13-10-2011
			EP 2555680 A1	13-02-2013
			JP 2013523350 A	17-06-2013
			US 2011313438 A1	22-12-2011
			WO 2011127346 A1	13-10-2011

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			EP 1779780 A2	02-05-2007
			JP 2007125382 A	24-05-2007
			US 2007100364 A1	03-05-2007

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/035917

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

see additional sheet

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.:

1-9, 16-20

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9, 16-20

Positioning tab/slider configured to be repositioned along an axis orthogonal to the lancing stroke axis of the lancet carrier.

2. claims: 10-15

Distance between engagement post and repositioning post is adjustable.
