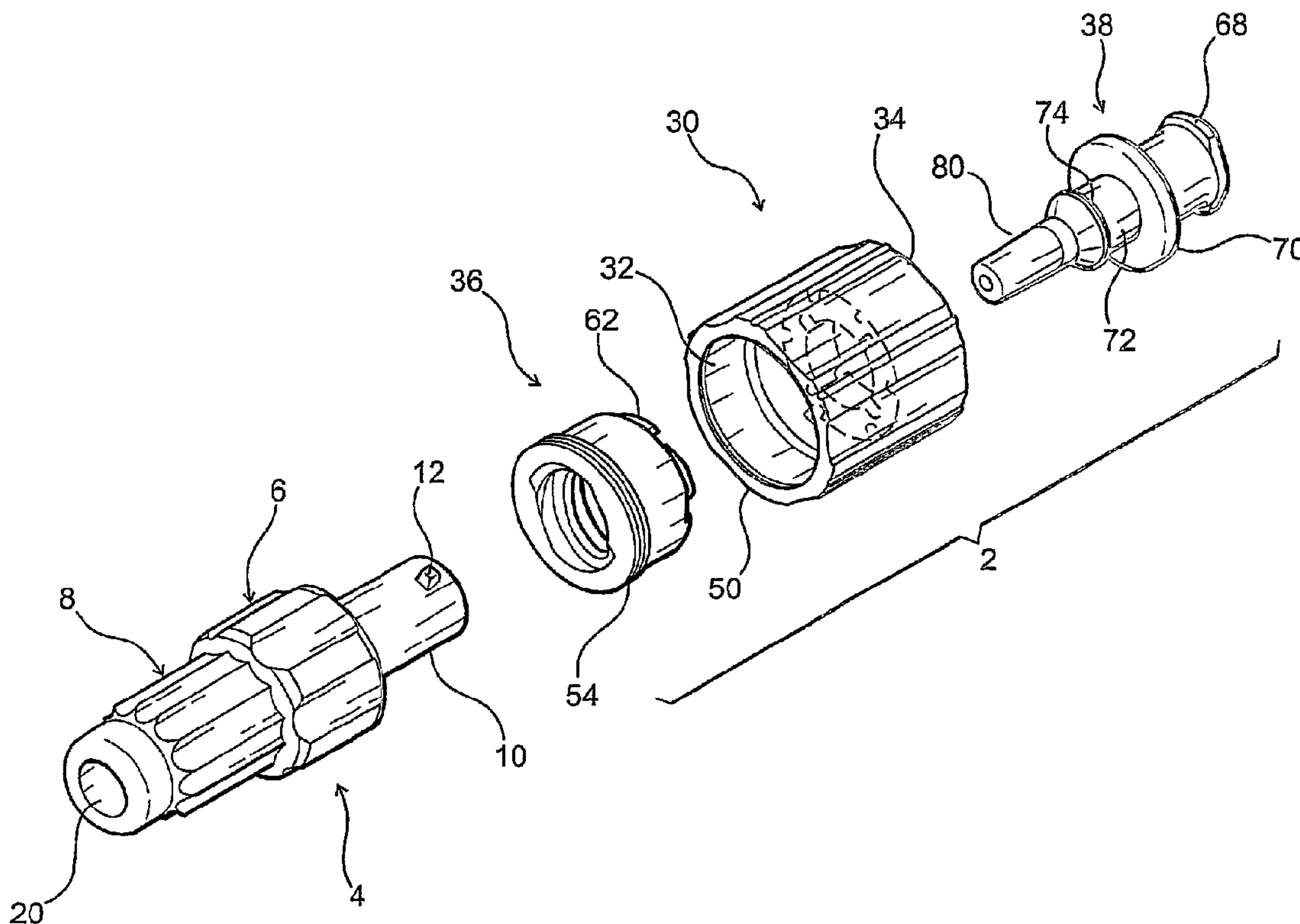




(22) Date de dépôt/Filing Date: 2005/08/09
 (41) Mise à la disp. pub./Open to Public Insp.: 2006/02/23
 (62) Demande originale/Original Application: 2 575 136
 (30) Priorité/Priority: 2004/08/11 (US10/915,574)

(51) Cl.Int./Int.Cl. *F16L 25/00* (2006.01),
A61M 39/10 (2006.01), *F16L 37/10* (2006.01)
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(54) Titre : **SYSTEME DE COUPLAGE MEDICAL**
 (54) Title: **MEDICAL COUPLING SYSTEM**



(57) **Abrégé/Abstract:**

A connector comprises one portion configured to have a given configuration. The connector includes an elongate connector end having a distal end with an opening and two projections extending from the outer wall of the elongate connector end away from the distal end. The elongate connector end can only couple to another connector end having a corresponding configuration that accepts the elongate connector end of the connector. The connector has other portion with an opening to which one end of a catheter is fixed.



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Abstract

A connector comprises one portion configured to have a given configuration. The connector includes an elongate connector end having a distal end with an opening and two projections extending from the outer wall of the elongate connector end away from the distal end. The elongate connector end can only couple to another connector end having a corresponding configuration that accepts the elongate connector end of the connector. The connector has other portion with an opening to which one end of a catheter is fixed.

MEDICAL COUPLING SYSTEM

Related Application

This application is a divisional of Canadian Patent Application No. 2,575,136 and claims priority from therein.

Field of the Invention

[001] The present invention relates to connectors for a fluid path, and more particularly an adapter for coupling a medication providing device with a connector for providing medication to a patient.

Background of the Invention

[002] To prevent mis-connection of a fluid line to a device containing a particular medication, it has been shown in the prior art that a connector may be made up of two portions, with the portions being connected by complementary configured opposing surfaces. Such two portions connector ensures that the one line from one portion of the connector would not be wrongly connected to a different medication line. A fastening mechanism comprised of such complementary connecting portions is disclosed in U.S. patent 6,612,624 and its parent patent 6,402,207. The '624 patent discloses in particular a ratchet mechanism, as part of the connector, that prevents or impedes the uncoupling of one portion of the connector from a syringe to which the other portion may be connected. In practice, since the ratchet mechanism is dependent on the interaction of the teeth on the inner surface of an outer sleeve with a pawl of an inner body that fits into the outer sleeve, if the syringe were to be tightened too forcefully, the inner body would pop out of the outer sleeve. Moreover, as disclosed in the '624 patent, the ratchet mechanism is a portion of the connector that does not fully isolate the relative rotation of the outer sleeve and the inner body.

Summary of the Present Invention

[003] The adapter of some embodiments of the invention is adapted to be interposed between a medication providing device and a connector. The adapter is designed to prevent the medication providing device from being removed therefrom, once the device is secured to one end of the adapter. The other end of the adapter is configured to accept a connector. The connector is rotatably connected to the adapter in one direction. Once fully connected, any further rotational movement along the same direction would simply cause the

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connector to rotate freely relative to the adapter. With a rotational motion in a counter direction, the connector can be removed from the adapter.

[004] The adapter of some embodiments of the invention includes an outer cylindrical sleeve or a housing shroud that has an internal circumferential hub catch. In addition, a plurality of bumps extend from the inner wall of the housing shroud toward the central axis of the shroud. Fitted to this housing shroud is a cylindrical inner shroud that has a protrusion circumferentially formed proximate to its distal end that snap-mates to a circumferential groove formed at the distal end of the shroud. The inner shroud and the housing shroud are rotatable relative to each other.

[005] A plurality of teeth extend from the proximal end of the inner shroud. When biased by a given force, these teeth of the inner shroud would act against the bumps extending from the inner wall of the housing shroud to prevent the inner shroud from rotating relative to the housing shroud. The extending teeth have inclining ramps that prevent the teeth from acting against the bumps, thereby allowing the two shrouds to rotate freely relative to each other when the biasing force is removed. The inner shroud may be internally threaded for accepting a specially designed connecting end of the connector.

[006] A third component of the adapter of some embodiments of the invention is a core that fits to the housing shroud from the latter's other end. The core has a cylindrical central portion defined by a chamfered flange and a ring-shaped flange. This cylindrical central portion mates with the hub catch of the housing shroud that has a number of fingers configured to allow the chamfered flange to pass through but prevent the chamfered flange, the back of which is flat, from passing in the reverse direction. Thus, once the central portion of the core mates with the hub catch, the core is non-removably fitted to, but rotatable freely relative with, the housing shroud. The respective dimensions of the cylindrical central portion of the core and the opening formed by the hub catch fingers are configured to allow the core to rotate freely relative to the housing shroud. With the core fitted to the housing shroud, a medication providing device can be mated to the proximal end of the core.

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[007] The connector, for example a luer connector, of the medication providing device allows the medication providing device such as a syringe to be mated to the proximal connector of the core. Once the medication providing device is mated to the core, if a user were to try to remove the medication providing device from the core by applying a counter torque to the medication providing device, the core will rotate freely along the direction of the counter torque. The medication providing device is therefore prevented from being removed from the adapter. Additional torque in the direction that mates the medication providing device to the core does not cause any additional tightening, as the core will also rotate freely relative to the shroud. Thus, once the medication providing device is mated to the core, it could not be removed therefrom.

[008] Some embodiments of the invention therefore relate to an adapter for use with a medication providing device and a connector for providing medication to a patient. The adapter includes a housing shroud and an inner shroud fitted to the housing shroud. The inner shroud has an opening for accepting a connecting end of the connector such that the connector, once mated to the inner shroud, is freely rotatable in one direction and is removable from the inner shroud when rotated in a counter direction. The adapter further includes a core fitted in the housing shroud to allow the medication to be routed from the medication providing device to the connector. The core has a proximal end for enabling the medication providing device to be connected to the adapter. The medication providing device is not removable from the adapter once it is connected thereto.

[009] Some embodiments of the invention also relate to a combination of a shroud having two open ends and an inner shroud non-removably fitted into one of the open ends of the shroud. The inner shroud has a connector end for enabling it to be mated to a given medication conveying connector. The inner shroud is rotatable freely in one direction once the given connector is mated thereto. The given connector is removable from the inner shroud when it is rotated in a counter direction. The combination further includes a core that is non-removably fitted to the other end of the shroud. The core has a through passage and a connector end for enabling the core to be mated to a luer connector of

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a medication providing device. The medication providing device, once mated to the connector end of the core, is not removable from the core.

[0010] Some embodiments of the invention also relate to a method of routing a medication from a given medication providing device that includes the steps of providing a given medication conveying connector, providing an adapter having a shroud with one and other open ends, non-removably fitting an inner shroud into one end of the shroud and non-removably fitting a core into the other end of the shroud. The inner shroud has a connector end that enables the inner shroud to be mated to the given medical conveying connector, while the core has a through passage and a connector end for enabling it to be mated to the connector of the medication providing device that, once mated to the connector end of the core, is not removable from the core.

[0010a] Some embodiments of the invention provide an adapter for use with a medication providing device and a connector for providing medication to a patient, comprising: a shroud; an inner shroud fitted to said shroud, said inner shroud having an opening for accepting a connecting end of said connector, said inner shroud having a catch mechanism configured to enable said connector to freely rotate in one direction relative to said shroud once said connector is fully mated to said inner shroud and be removable from said inner shroud when rotated in a counter direction; and a core fitted in said shroud to allow the medication to be routed from said medication providing device to said connector, said core having a proximal end for enabling said medication providing device to be connected to said adapter, said medication providing device not removable from said adapter once it is connected thereto.

[0010b] Some embodiments of the invention provide in combination, a shroud having one and other open ends, an inner shroud non-removably fitted to the one end of said shroud, said inner shroud having a connector end for enabling said inner shroud to be mated to a given medication conveying connector, said inner shroud having a catch mechanism configured to enable said inner shroud to be rotatable freely in one

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direction relative to said shroud once said given connector is mated thereto and to enable said given connector to be removable from said inner shroud when rotated in a counter direction, and a core non-removably fitted to the other end of said shroud, said core having a through passage and a connector end for enabling said core to be mated to a luer connector of a medication providing device, said medication providing device once mated to said connector end of said core is not removable from said core.

[0010c] Some embodiments of the invention provide a method of routing a medication from a given medication providing device, comprising the steps of: a) providing a given medication conveying connector; b) providing an adapter having a shroud with one and other open ends; c) non-removably fitting an inner shroud to the one end of said shroud, said inner shroud having a connector end for enabling said inner shroud to be mated to said given medication conveying connector, said inner shroud having a catch mechanism configured to enable said connector to freely rotate in one direction relative to said shroud once said connector is fully mated to said inner shroud and to be removable from said inner shroud when rotated in a counter direction; and d) non-removably fitting a core to the other end of said shroud, said core having a through passage and a connector end for enabling said core to be mated to a connector of said medication providing device, said medication providing device once mated to said core is not removable from said core.

[0010d] Some embodiments of the invention provide apparatus, comprising: a core having a through bore; an inner shroud positioned about at least one portion of said core, said inner shroud having at least one tooth that extends at one end of said inner shroud, at least one portion of the inside circumferential wall of said inner shroud threaded so that said inner shroud has an internal thread; a shroud into which said core and said inner shroud are movably positioned, said shroud having at least one bump that extends in position relative to said at least one tooth; wherein when a directional torque force is applied to said shroud relative to a fluid connector to be connected to said apparatus, the at least one tooth and the at least one bump would contact each other to enable the fluid connector to be mated to said inner shroud.

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[0010e] Some embodiments of the invention provide connector, comprising: a core having a through bore; an inner shroud positioned about said core, said inner shroud having at least one tooth, at least one portion of the inside circumferential wall of said inner shroud threaded so that said inner shroud has an internal thread; a shroud
5 movably positioned about said core and said inner shroud, at least one bump at said shroud being positioned relative to said one tooth of said inner shroud so as to make contact with said one tooth when said shroud and said inner shroud are rotated relative to each other; wherein when said shroud is rotated relative to a fluid
10 connector to be connected to said connector, the at least one tooth and the at least one bump would contact each other to enable the fluid connector to be mated to said inner shroud.

[0010f] Some embodiments of the invention provide system, comprising: an adapter having a core having a through bore; an inner shroud positioned about said core, said inner shroud having at least one tooth, at least one portion of the inside
15 circumferential wall of said inner shroud threaded so that said inner shroud has an internal thread; a shroud movably positioned about said core and said inner shroud, at least one bump at said shroud being positioned relative to said one tooth of said inner shroud so as to make contact with said one tooth when said shroud and said inner shroud are rotated relative to each other; a fluid connector having a first end
20 matable to the internal thread of said inner shroud; and a medication source for supplying medication to said adapter; wherein when said shroud is rotated relative to said fluid connector, the at least one tooth and the at least one bump would contact each other to enable the fluid connector to be threadedly mated to said inner shroud.

[0010g] Some embodiments of the invention provide a connector comprising one
25 portion configured to have a given configuration that includes an elongate connector end having a distal end with an opening and two projections extending from the outer wall of the elongate connector end away from the distal end so that the elongate connector end can only couple to another connector end having a corresponding configuration that accepts the elongate connector end of said connector, said

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connector having other portion with an opening whereto one end of a catheter is fitted.

[0010h] Some embodiments of the invention provide apparatus, comprising: a connector having one portion configured to have a given configuration that includes
5 an elongate connector end with a distal end having an opening and two projections extending from the outer wall of the elongate connector end away from the distal end, the given configuration at the one portion enables the one portion to be connectable only to another connector end having a corresponding configuration that would accept the elongate connector end of the one portion, the connector having other
10 portion with an opening whereto one end of a catheter is fitted; a medication providing device adaptedly fitted with the another connector end having the corresponding configuration that enables the another connector end to couple to the elongate connector end of said connector; wherein when the another connector end of the medical providing device and the elongate connector end of said connector are
15 coupled to each other, fluid from the medication providing device can be conveyed to said connector and the catheter fitted thereto, and from there to a patient connected to the catheter.

Brief Description of the Figures

[0011] The present invention will become apparent and the invention itself will be
20 best understood with reference to the following description of the present invention taken in conjunction with the accompanying drawings, wherein:

[0012] Fig. 1 is an illustration of an exemplar overall path through which a medication is provided to a patient, with the various components being shown;

[0013] Fig. 2 is a perspective view of the adapter of one embodiment of the instant
25 invention, with its components in alignment but not assembled, and a connector for conveying fluid to a patient;

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[0014] Fig. 3 is a perspective view of the adapter of one embodiment of the instant invention in which the components have been assembled;

[0015] Figs. 4A-4D are different views of the housing shroud of the adapter of one embodiment of the instant invention;

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[0016] Figs. 5A-5D are different views of the inner shroud of the adapter of one embodiment of the instant invention; and

[0017] Figs. 6A-6D are different views of the core of the adapter of one embodiment of the instant invention.

Detailed Description of the Invention

[0018] As shown in Fig. 1, the adapter of one embodiment of the instant invention, designated 2, is connected to a connector 4, which is shown to include two portions 6 and 8. Portion 6 has a given connector end 10 that has a pair of projections 12 that enable connector end 10 to be mated to adapter 2. Connector end 10 may also be connected to a female end of a connector such as luer connector 16 of filter 14 shown in Fig. 1. Filter 14 is interposed between connector 4 and adapter 2 for filtering out contaminants that may be present in the medication or fluid that passes from a medication providing device, such as for example a syringe or a pump, to connector 4. Filter 14, in addition to luer connector 16, also has a second connector 18 that has a configuration similar to that of connector end 10 of connector 4, so as to enable filter 14 to be coupled to adapter 2.

[0019] In the embodiment shown in Fig. 1, the end of portion 8 of connector 4 that is not connected to portion 6 has an opening 20 to which one end of a catheter is fitted. The other end of the catheter is connected to a patient. Thus, a fluid such as medication may be conveyed from connector 4 to a patient. Portions 6 and 8 of connector 4 have respective complementary opposing surfaces so that only portions 6 and 8 may be coupled to each other. This is to avoid mistaken coupling of either one of those portions with a different half portion, so as to prevent the conveying of an incorrect medication to the patient via the catheter. Filter 14 is provided in the Fig. 1 embodiment for filtration purposes and is not necessary for the practice of the instant invention, as evidenced by the direct coupling of connector 4 to adapter 2 as shown in the Fig. 2 embodiment.

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[0020] During transport and before use, to maintain sterility, a cap 22 may be used to cover connector end 10 of connector 4. Similarly, connector 18 of filter 14 may be covered by a cap 24. A plug 26 that has a connector end 28 that may have the same configuration as connector end 10 is used to cover the end opening of adapter 2, that, as shown in Fig. 1, faces connector 18 of filter 14. A more detailed discussion of the complementary opposing surfaces of portions 6 and 8 of connector 4 may be gleaned from the disclosure of the above-mentioned U.S. patent 6,612,624.

[0021] With reference to Fig. 2, adapter 2 is shown to include an outer housing sleeve or a housing shroud 30 that has the shape of a cylinder with two opposed open ends 32 and 34. Adapter 2 further has an insert or an inner shroud 36 that fits into housing shroud 30 by way of its opening 32. A third component of the adapter 2 of the instant invention comprises a core insert, or simply core 38 that fits into housing shroud 30 by way of the latter's opening 34.

[0022] Fig. 3 shows adapter 2 in its assembled form with inner shroud 36 and core 38 respectively fittingly mated to housing shroud 30.

[0023] A perspective view of housing shroud 30 is shown in Fig. 4A. Together with the sectional views of Figs. 4B and 4C and the end view of Fig. 4D, housing shroud 30 is shown to have a first or distal opening 32 and a second or proximal opening 34. As best shown in the sectional views of Figs. 4B and 4C, a hub catch 40 made up of extending fingers 42 is provided at the proximal portion of housing shroud 30. Each of fingers 42 has a finger tip 44 that extends toward the longitudinal axis 46 of cylindrical housing shroud 30 to form an opening 48 that has a smaller diameter than proximal opening 34. Finger tips 44 of the fingers 42 that make up hub catch 40 are chamfered in the direction of opening 34 and yet are flat when viewed from the direction of opening 32. At distal opening 32 of housing shroud 30 there is a lip 50. Opening 32 is reduced in diameter at location 52. As can be seen from the end view of Fig. 4D, which is viewed from opening 32, each of fingers 42, best represented by fingertips 44, is separated from its adjacent fingers by a notch or slot 57 that provides additional flexibility to

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the fingers when core 38 is inserted to housing shroud 30 via opening 34. Also shown in Fig. 4D, as well as the cross-sectional views of Figs. 4B and 4C, are a plurality of bumps 56 that extend inwardly toward longitudinal axis 46.

[0024] Figs. 5A-5D show inner shroud 36 of the instant invention adapter. As shown, inner shroud 36 has a through bore 53 that extends from its distal end 54 to its proximal end 55. At its distal end there is a protrusion 58 formed circumferentially at its outer surface. Outer wall 60 extends from distal end 54 to proximal end 55, ending with a plurality of teeth 62 that extend longitudinally away from proximal end 55. Each of the teeth has an apex 62a, a ramp portion 62r and an upright portion 62u. Each of the teeth is separated from its adjacent teeth by a space 64. Inner shroud 36 is internally threaded from its proximal opening 54 through a major portion of the shroud, per indicated by designation 66.

[0025] Core 38 of the adapter of the instant invention is best shown in Figs 6A-6D. Core 38 comprises at its proximal portion a connector end, in the form of a luer fitting 68 that allows it to be coupled to a luer end of a medication providing device such as for example a syringe or medication pump. Extending from the proximal portion of core 38 is a circumferential flange 70 that has a diameter substantially the size of proximal opening 34 of housing shroud 30. A cylindrical central portion 72 extends from flange 70 to a shoulder flange 74 that has a flat rear surface 76 facing flange 70. Shoulder flange 74 is chamfered at an angle along its surface 78 so that the widest portion of shoulder flange 74 extends at an angle inwards towards longitudinal axis 46 until it joins the distal male portion 80. A bore 82 through core 38 extends from the tip of distal portion 80 to opening 84 at the proximal end of core 38.

[0026] In combination, the adapter of the instant invention has fitted into housing shroud 30 at its proximal opening 34 core 38 and at its distal opening 32 inner shroud 36. With reference to Figs. 4A-4D, 5A-5D and 6A-6C, it can be seen that inner shroud 36 is mated to housing shroud 30. More particularly, the circumferential protuberance 58 of inner shroud 36 is press or snap fitted to space 51 at the distal end of housing shroud 30. Since the cross dimension of inner shroud 36 is configured to fit within

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space 51 of housing shroud 30, once protuberance 58 is movably mated to space 51 and is retained by lip 50, inner shroud 26 is no longer removable from housing shroud 30. Protuberance 58 of inner shroud 36 is slidably movable within space 51 between reduced diameter location 52 and lip 50, as shown by bi-directional arrow 59.

[0027] Inner shroud 36 may be biased relative to housing shroud 30 in the direction indicated by directional arrow 86 (Fig. 4B) when connector 4 is being coupled to adapter 2 via the opening at distal end 54 of inner shroud 36. When connector 4 is being threadingly mated to inner shroud 36, a force is applied by the user, i.e., a torque in the direction to lock connector end 10 of connector 4 to the internal threaded portion 66 of inner shroud 36. The torque force, which is combined with a biasing forward force, causes inner shroud 36 to be pushed along the direction of directional arrow 86 so that teeth 62 of inner shroud 36 would come into contact with bumps 56 formed internally at housing shroud 30. Bumps 56 then act as a backstop to enable the user to threadingly mate connector 10 to inner shroud 36, and therefore adapter 2.

[0028] Once connector end 10 is fully mated to the threaded portion 66 of inner shroud 36, if connector 4 is rotated further in the direction of the locking torque movement, inner shroud 36 would pull away and rotate freely, as ramp portion 62r of teeth 62 would guide teeth 62 away from bumps 56. But if a counter torque were to be applied to connector 4 to rotate inner shroud 36 in a direction opposite to that of mating connector 4 to inner shroud 36, connector 4 is removable from inner shroud 36, as back portion 62b of each of teeth 62 acts against a side of a corresponding bump 56 to thereby prevent rotation of inner shroud 36 relative to housing shroud 30. As a result, connector 4 is removable from adapter 2 when it is rotated in a direction counter to the rotation needed to thread it into adapter 2.

[0029] Core 38 is fitted to housing shroud 30 via its proximal opening 34. As core 38 is pushed into housing shroud 30, the chamfered surface 78 of shoulder 74, since it is at a forward incline, is able to readily cause catch fingers 44 of housing shroud 30 to slightly flex, particularly since the adjacent fingers 44 are separated by slots 57, so that shoulder 76 would pass opening 48 of catch hub 40. Once shoulder 74 fully passes the

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catches 44 of fingers 42, since its back surface is flat, core 38 is prevented by catch hub 48, more specifically by the plurality of fingers 42, from being removed or separated from housing shroud 30.

[0030] Distal opening 34, as best shown in the cross-sectional views of Figs. 4B and 4C, has a cross section 35 that has the same diameter as flange 70. A ledge 37 at opening 34 prevents flange 70 from being pushed further into housing shroud 30, per directional arrow 88. Thus, once core 38 is fitted to housing shroud 30, it is non-removably fitted thereto. The cylindrical central portion 72, which is sandwiched by shoulder 76 and flange 70, is positioned within the proximal portion of housing shroud 30.

[0031] The nose portion 80 of core 38 is configured to have a length that allows it to be positioned within space 51 of housing shroud 30, as best shown in Fig. 3. Thus positioned, nose portion 80 is adaptable to mate with connector end 10 of connector 4, when connector 4 is mated to inner shroud 36. Once connector 4 is mated to inner shroud 36, a through path extending from opening 20 of connector 4 to opening 84 of core 38 is established to thereby enable fluid such as medication to pass from a medication providing device to the connector, and from there through the catheter connected thereto to the patient.

[0032] As core 38 is non-removably connected to housing shroud 30 by central portion 72 being rotatably mounted to catch hub 42, core 38 is rotatable freely either clockwise or counterclockwise relative to housing shroud 30. The respective dimensions of proximal opening 34 of housing shroud 30 and flange 70 may be manufactured to establish a predetermined friction between housing shroud 30 and core 38 to enable a user to readily connect a medication providing device, such as for example a conventional syringe or the connector of a medication pump, to luer connector 68 of core 38. But once the syringe is fully connected to core 38, due to the fact that core 38 is freely rotatable relative to housing shroud 30, the medication providing device could no longer be removed from adapter 2, as any rotational movement applied to the

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medication providing device would cause core 38 to rotate freely relative to housing shroud 30.

[0033] By thus preventing the detachment of the medication providing device from adapter 2 once it is connected to the luer connector end 68 of core 38, the adapter of the instant invention ensures that the medication in the medication providing device could only be conveyed to the connector that has a connector end that could mate correctly only with the connector end of the adapter, i.e., threaded connector portion 66 of inner shroud 36 for the embodiment being discussed. Of course, if connector 4 has a differently configured connector end 10, a corresponding connector end is needed at inner shroud 36 for properly mating therewith. Adapter 2 of the instant invention is therefore able to provide a bridge for connecting a medication providing device to the proper connector, to thereby ensure that a correct fluid pathway is established to convey the correct medication to the patient.

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CLAIMS:

1. A connector comprising one portion configured to have a given configuration that includes an elongate connector end having a distal end with an opening and two projections extending from the outer wall of the elongate connector end away
5 from the distal end so that the elongate connector end can only couple to another connector end having a corresponding configuration that accepts the elongate connector end of said connector, said connector having other portion with an opening whereto one end of a catheter is fitted.
2. Connector of claim 1, wherein the another connector end is adapted to fit to
10 and non-removable from a medication providing device.
3. Connector of claim 1, wherein the one and other portions of said connector have respective complementary opposing surfaces so that the one and other portions may only be coupled to each other.
4. Connector of claim 1, wherein the projections are threadedly matable only to
15 an internal threaded portion of the another connector end having the corresponding configuration.
5. Connector of claim 1, wherein the catheter, once fitted into the opening of the other portion, enables medication from the medical providing device to be conveyed to the patient through the connector and the catheter.
- 20 6. Connector of claim 1, wherein the another connector end is a part of an adapter that is non-removably fitted to the medication providing device.
7. Connector of claim 6, wherein the adapter includes a core having a through bore that combines with the another connector end to provide a through passage with the opening of the one portion to allow medication to pass between the medication providing
25 device and said connector when the elongate connector end and the another connector end are coupled to each other.

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8. Connector of claim 1, wherein the elongate connector end is connectable to a connector end of a filter configured to accept the elongate connector end of said connector, the filter having a second end with a conventional luer fitting connectable to a conventional luer fitting of a medical providing device.

5 9. Connector of claim 1, wherein the another connector end of the corresponding configuration is not connectable to a conventional luer fitting.

10. Connector of claim 1, wherein said connector is coupled to the another connector end having the corresponding configuration when the elongate connector is rotated in one direction relative to the another connector end, said connector freely rotates
10 relative to the another connector end after the elongate connector end is fully mated to the another connector end if said connector is further rotated in the one direction relative to the another connector end, said connector is removable from the another connector end when rotated in a direction opposite to the one direction.

11. Apparatus, comprising:

15 a connector having one portion configured to have a given configuration that includes an elongate connector end with a distal end having an opening and two projections extending from the outer wall of the elongate connector end away from the distal end, the given configuration at the one portion enables the one portion to be connectable only to another connector end having a corresponding configuration that
20 would accept the elongate connector end of the one portion, the connector having other portion with an opening whereto one end of a catheter is fitted;

a medication providing device adaptedly fitted with the another connector end having the corresponding configuration that enables the another connector end to couple to the elongate connector end of said connector;

25 wherein when the another connector end of the medical providing device and the elongate connector end of said connector are coupled to each other, fluid from the medication providing device can be conveyed to said connector and the catheter fitted thereto, and from there to a patient connected to the catheter.

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12. Apparatus of claim 11, wherein the one and other portions of said connector have respective complementary opposing surfaces so that the one and other portions may only be coupled to each other.

13. Apparatus of claim 11, wherein the projections are threadedly matable only
5 to an internal threaded portion of the another connector end having the corresponding configuration.

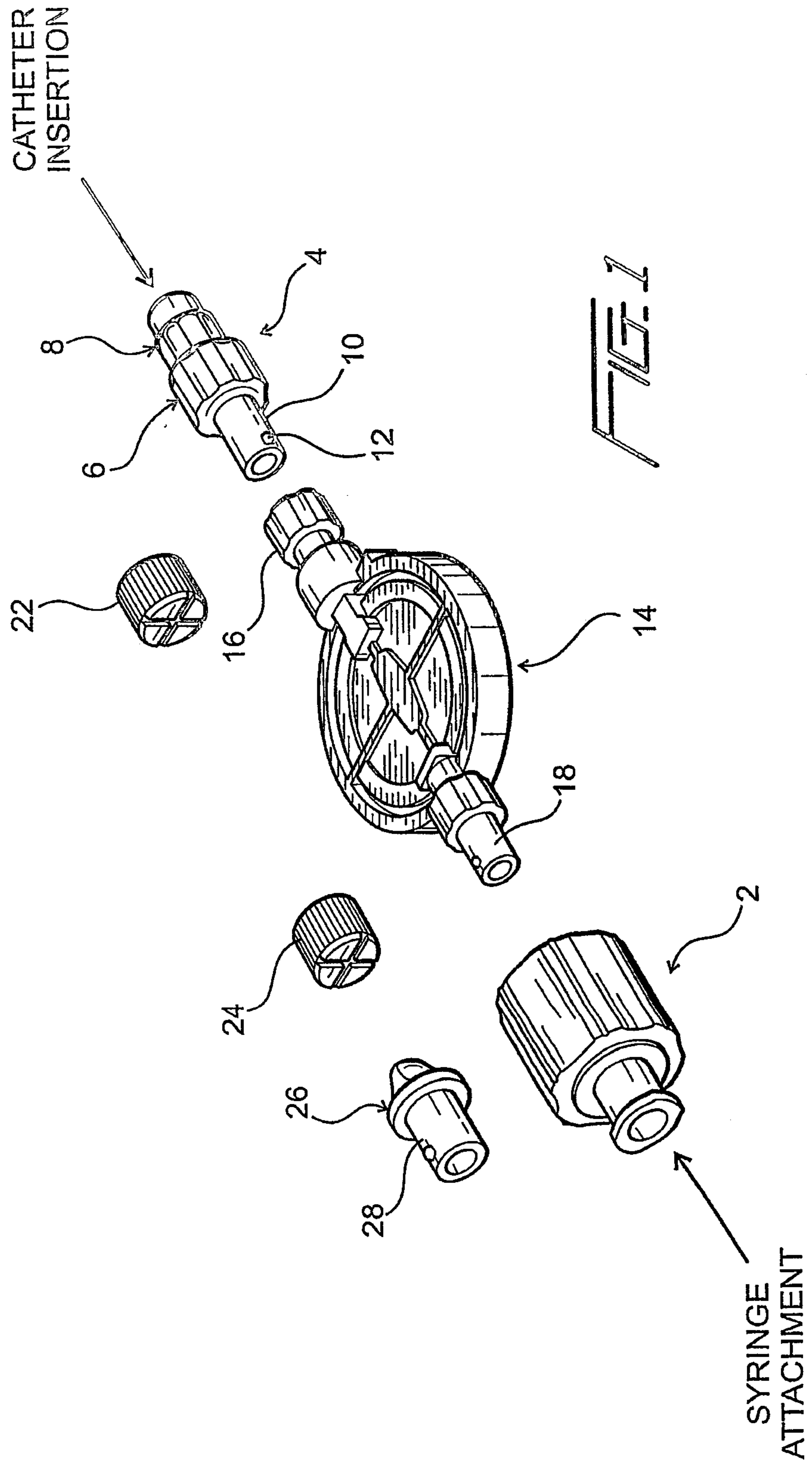
14. Apparatus of claim 11, wherein the another connector end is a part of an adapter that is non-removably fitted to the medication providing device.

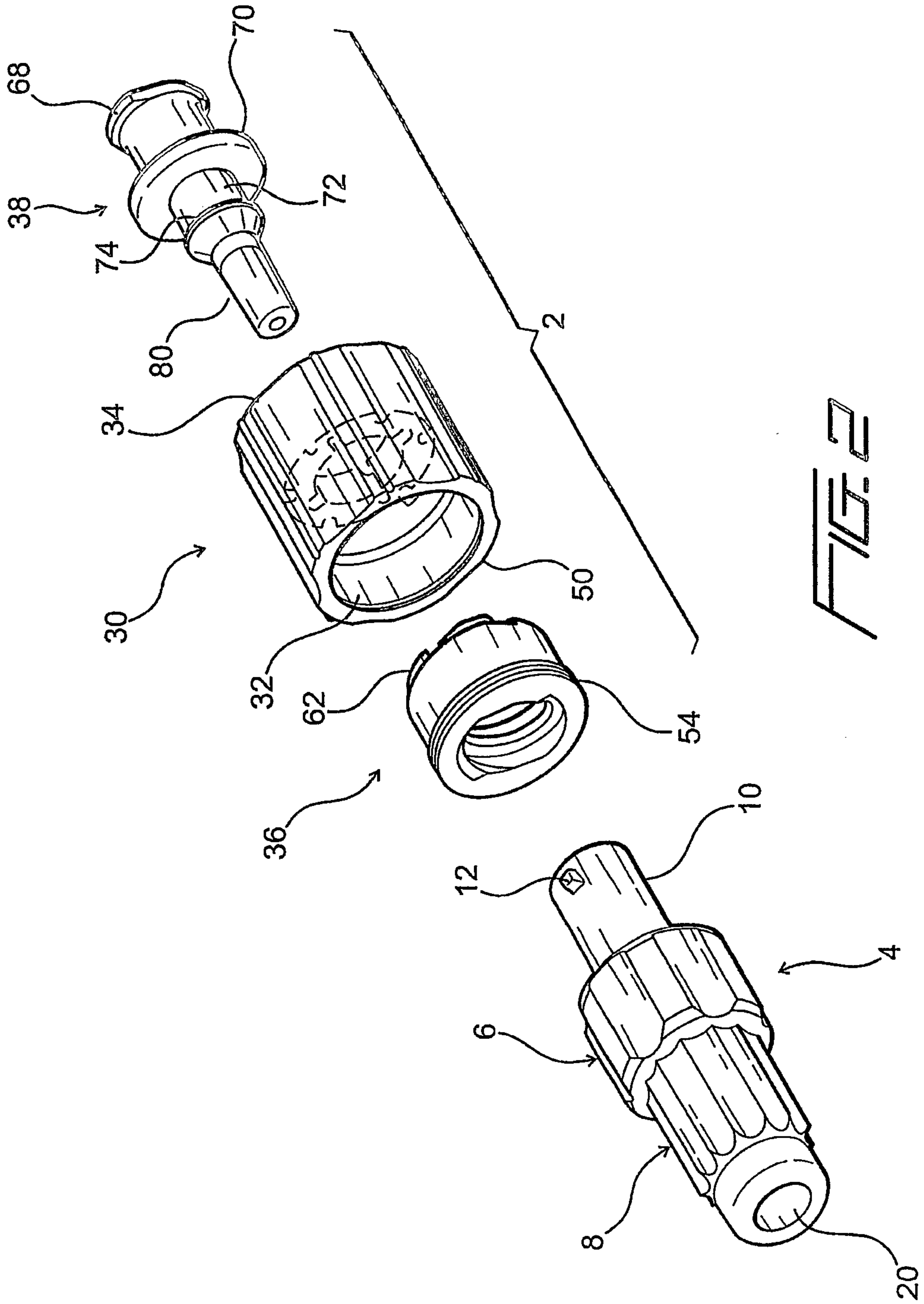
15. Apparatus of claim 14, wherein the adapter includes a core having a
10 through bore that combines with the another connector end to provide a through passage with the opening of the one portion to allow medication to pass between the medication providing device and said connector when the elongate connector end and the another connector end are coupled to each other.

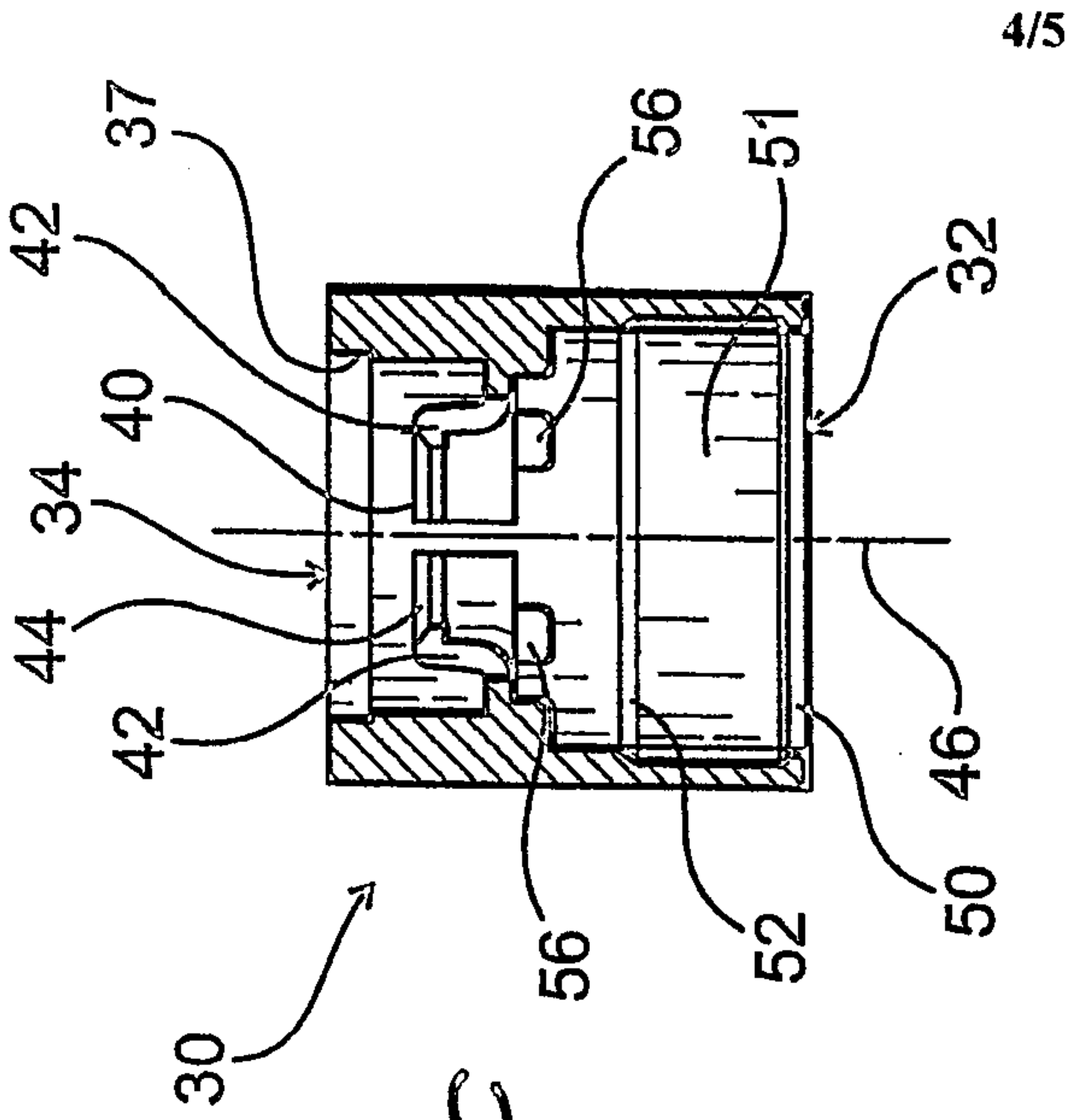
16. Apparatus of claim 11, wherein the elongate connector end is connectable
15 to a connector end of a filter configured to accept the elongate connector end of said connector, the filter having a second end with a conventional luer fitting connectable to a conventional luer fitting of a medical providing device.

17. Apparatus of claim 11, wherein the another connector end of the corresponding configuration is not connectable to a conventional luer fitting.

20 18. Apparatus of claim 11, wherein said connector is coupled to the another connector end having the corresponding configuration when the elongate connector is rotated in one direction relative to the another connector end, said connector freely rotates relative to the another connector end after the elongate connector end is fully mated to the another connector end if said connector is further rotated in the one direction relative to the
25 another connector end, said connector is removable from the another connector end when rotated in a direction opposite to the one direction.







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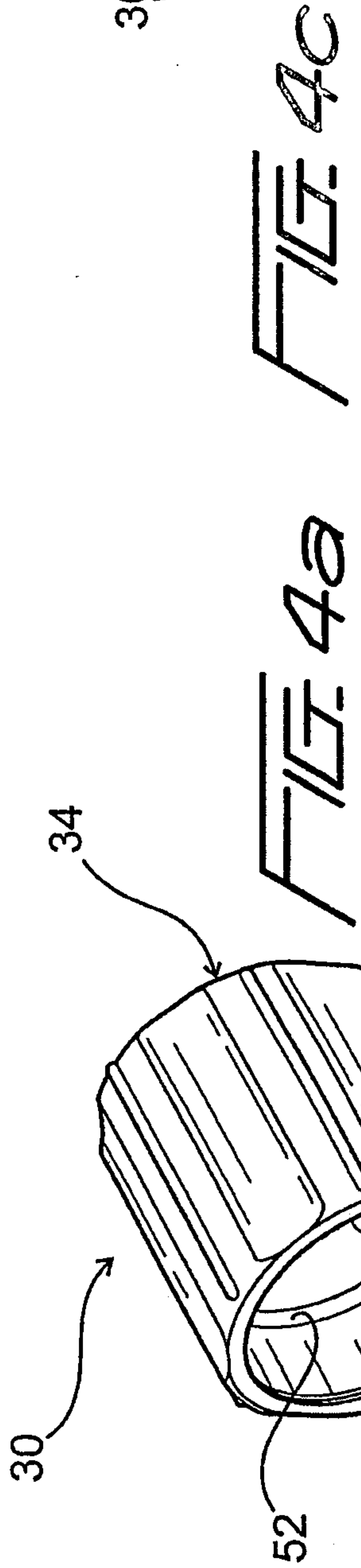
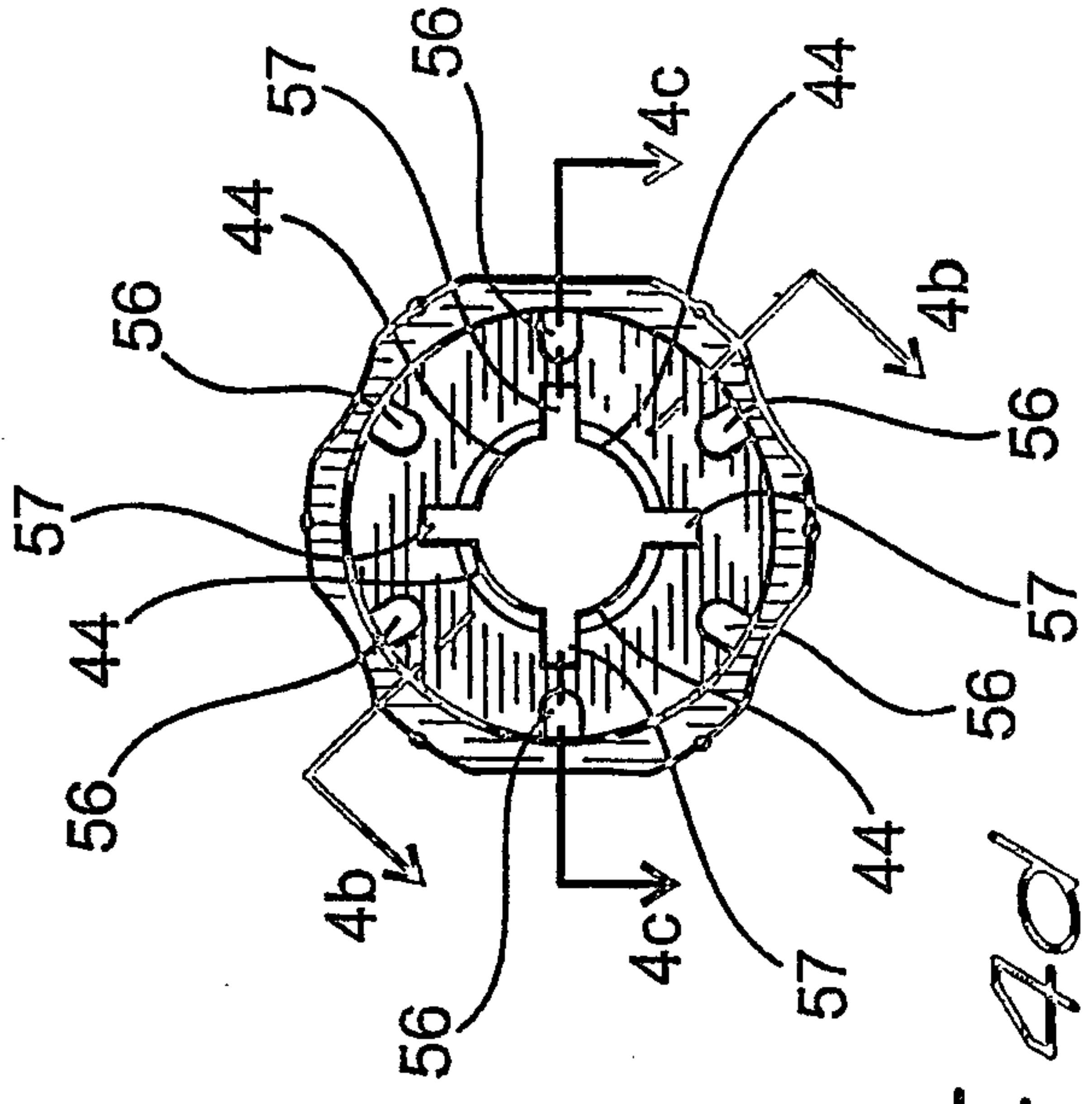


FIG. 4a

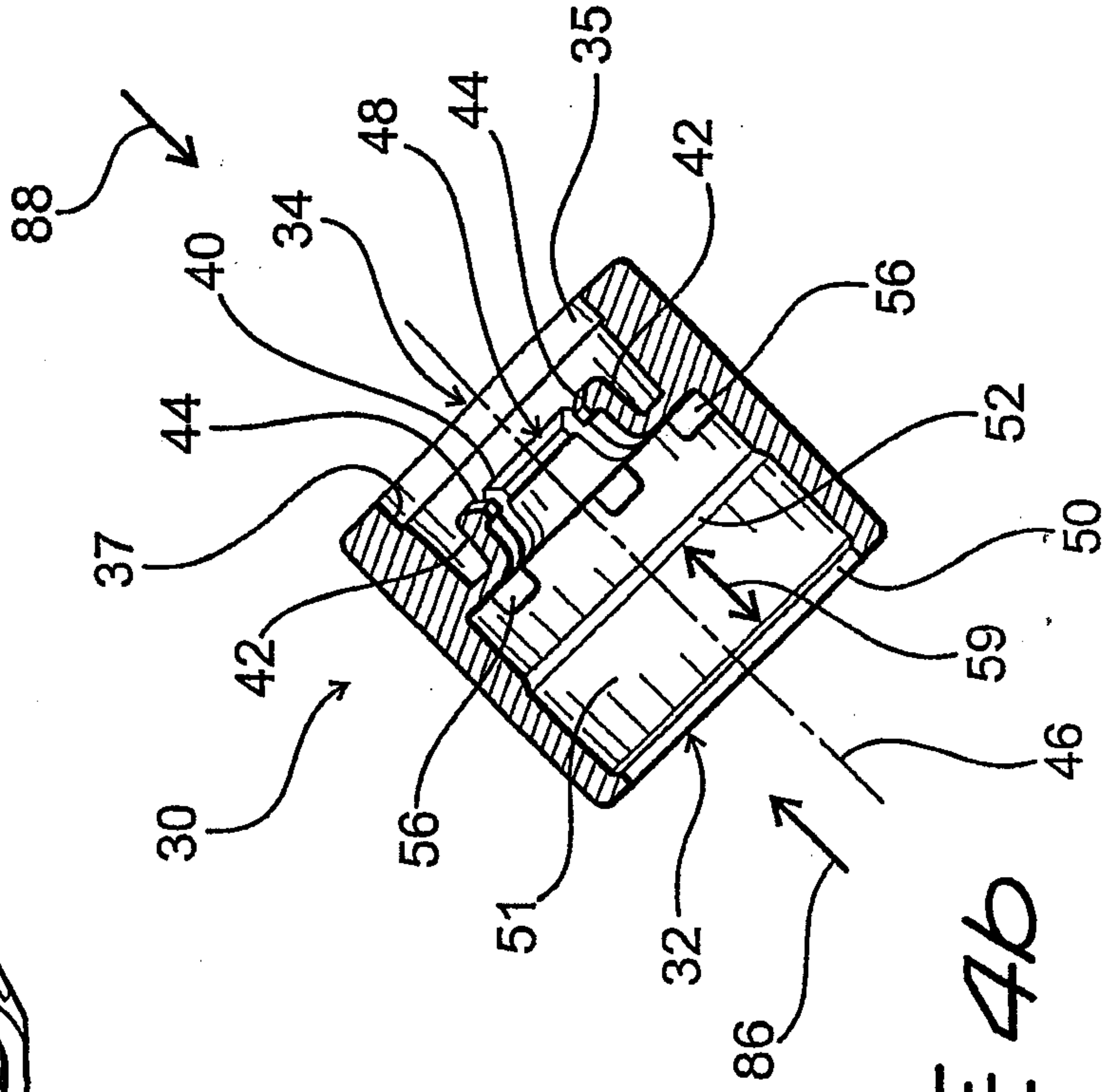


FIG. 4b

FIG. 4d

