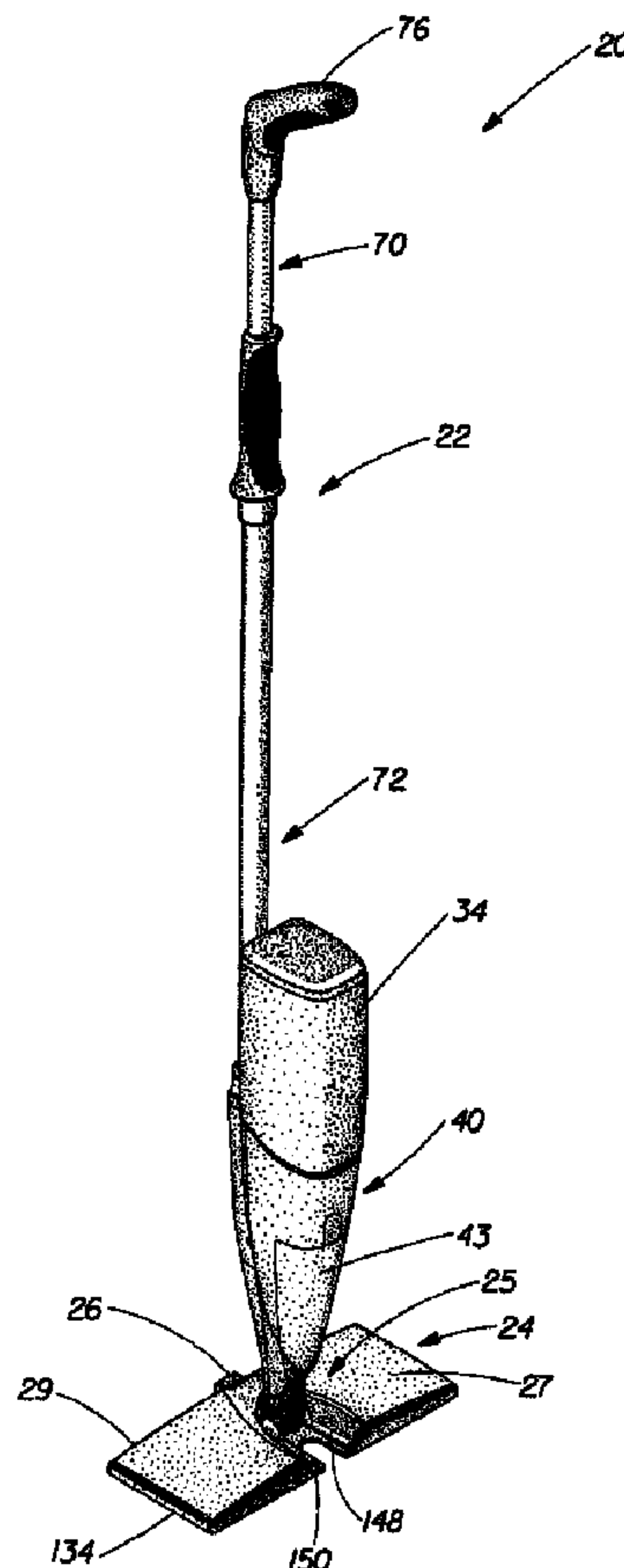




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(57) Abrégé/Abstract:

A cleaning implement is provided. The cleaning implement includes a liquid delivery system for providing a cleaning liquid to a surface to be cleaned having a canister for storing a liquid, an electrical motor driving a pump, and a voltage source for energizing



(57) **Abrégé(suite)/Abstract(continued):**

the electric motor. A support tread is pivotally attached to the handle for releasably receiving a cleaning sheet. The handle includes a switch and is formed from a plurality of handle sections. Each handle section has at least one electrical connector which is electrically connected with an electrical connector of an adjacent handle section so that the switch can activate the electrical motor. The support head can be configured to allow visual inspection of the cleaning sheet through the support head during use. The canister is provided with a plurality of side walls and vent valve having a cracking pressure of at least about 0.6 Kpa, wherein the canister is substantially in the form of a parallelogram in a plan view cross section and wherein one or more of the side walls has a plurality of grooves.

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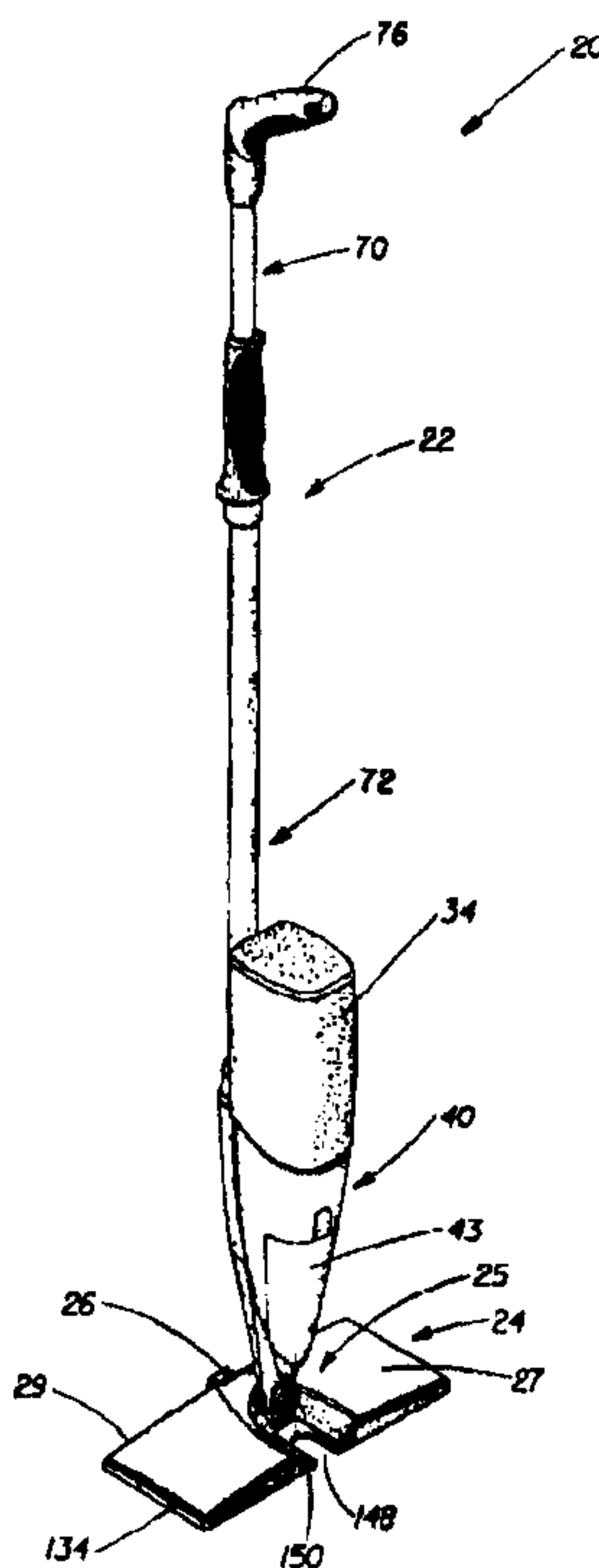
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[Continued on next page]

(54) Title: **CLEANING IMPLEMENTS**



(57) Abstract: A cleaning implement is provided. The cleaning implement includes a liquid delivery system for providing a cleaning liquid to a surface to be cleaned having a canister for storing a liquid, an electrical motor driving a pump, and a voltage source for energizing the electric motor. A support head is pivotally attached to the handle for releasably receiving a cleaning sheet. The handle includes a switch and is formed from a plurality of handle sections. Each handle section has at least one electrical connector which is electrically connected with an electrical connector of an adjacent handle section so that the switch can activate the electrical motor. The

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support head can be configured to allow visual inspection of the cleaning sheet through the support head during use. The canister is provided with a plurality of side walls and vent valve having a cracking pressure of at least about 0.6 Kpa, wherein the canister is substantially in the form of a parallelogram in a plan view cross section and wherein one or more of the side walls has a plurality of grooves.

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CLEANING IMPLEMENTS

TECHNICAL FIELD

The present invention relates to the field of cleaning implements, and, more particularly,
5 to the field of electrically operated mops for spraying cleaning liquids onto a floor.

BACKGROUND OF THE INVENTION

The literature is replete with products capable of cleaning hard surfaces such as ceramic
tile floors, hardwood floors, counter tops and the like. In the context of cleaning floors, numerous
10 devices are described comprising a handle and some means for absorbing a fluid cleaning
composition. Such devices include those that are reusable, including mops containing cotton
strings, cellulose and/or synthetic strips, sponges, and the like. While these mops are successful
in removing many soils from hard surfaces, they typically require the inconvenience of
performing one or more rinsing steps during use to avoid saturation of the material with dirt, soil,
15 and other residues. These mops therefore require the use of a separate container to perform the
rinsing step(s), and typically these rinsing steps fail to sufficiently remove dirt residues. This can
result in redeposition of significant amounts of soil during subsequent passes of the mop.
Furthermore, as reusable mops are used over time, they become increasingly soiled and
malodorous. This negatively impacts subsequent cleaning performance.

20 While there is a desire to provide mops which are convenient and adept at soil removal,
there is a further need to provide these mops in a form which is easy to ship and assemble by a
consumer. Still further, there is a desire to provide cleaning mops which facilitate proper
assembly by a consumer and which are ergonomic and easy to use.

SUMMARY OF THE INVENTION

25 A cleaning implement is provided. The cleaning implement includes a liquid delivery
system for providing a cleaning liquid to a surface to be cleaned having a canister for storing a
liquid, an electrical motor driving a pump, and a voltage source for energizing the electric motor.
A support head is pivotally attached to the handle for releasably receiving a cleaning sheet. The
30 handle includes a switch and is formed from a plurality of handle sections. Each handle section
has at least one electrical connector which is electrically connected with an electrical connector of
an adjacent handle section so that the switch can activate the electrical motor. The support head
can be configured to allow visual inspection of the cleaning sheet through the support head during
use. The canister is provided with plurality of side walls and vent valve having a cracking

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pressure of at least about 0.4 Kpa, wherein the canister is substantially in the form of a parallelogram in a plan view cross section and wherein one or more of the side walls have a plurality of grooves.

5

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the invention, it is believed that the present invention will be better understood from the following description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of a preferred floor mop made in accordance with the present invention;

Fig. 2 is front elevational view of the floor mop of Fig. 1;

Fig. 3 is a rear elevational view of the floor mop of Fig. 1;

Fig. 4 is an exploded view of an exemplary cleaning sheet suitable for use with the floor mop of Fig. 1;

Fig. 5 is a schematic illustration of a liquid delivery system suitable for use with the floor mop of Fig. 1;

Fig. 6 is an exploded view of the first handle section of the floor mop of Fig. 1;

Fig. 7 is a cross-sectional side view of the first handle section of the floor mop of Fig. 1;

Fig. 8 is an exploded view of the second handle section of the floor mop of Fig. 1;

Fig. 9 is a cross-sectional side view of the second handle section of the floor mop of Fig. 1;

Fig. 10 is an exploded view of the third handle section, canister housing, and mop head of the floor mop of Fig. 1;

Fig. 11 is a cross-sectional side view of the of the third handle section, housing, and mop head of the floor mop of Fig. 1;

Fig. 12 is an exploded perspective view of a pair of electrical connectors made in accordance with the present invention and suitable for use with the floor mop of Fig. 1;

Fig. 13 is an exploded perspective view of the pair of electrical connectors of Fig. 12, wherein the opposite side is illustrated;

Fig. 14 is a perspective view of a perspective view of a pair of locking connectors made in accordance with the present invention;

Fig. 15 is an end view of the locking connector;

Fig. 16 is a cross sectional side view of the locking connector of Fig. 15, taken along line 16-16 thereof;

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Fig. 17 is a perspective view of a lower plate of the mop head of Fig. 1;

Fig. 18 is a cross-sectional side view of the handle of the first handle section of the floor mop of Fig. 1;

Fig. 19 is a perspective view of a bottle made in accordance with another aspect of the present invention and suitable for use with the floor mop of Fig. 1;

Fig. 20 is a cross-sectional top plan view of the bottle of Fig. 19, taken along line 20-20 thereof;

Fig. 21 is a top plan view of a kit, including a package, made in accordance with the present invention;

Fig. 22 is a side elevational view of the kit of Fig. 21;

Fig. 23 is an exploded view of an electrical motor, gear pump, seal, and top plate made in accordance with yet another aspect of the present invention and suitable for use with the floor mop of Fig. 1;

Fig. 24 is a top view of the combination of Fig. 22, wherein the top plate has been removed for clarity;

Fig. 25 is a cross-sectional side view of the combination of Fig. 23, taken along line 25-25 thereof, wherein the top plate has been included for completeness;

Fig. 26 is top planar view of a battery cradle from the floor mop of Fig. 1 made in accordance with still another aspect of the present invention, wherein four batteries are disposed within the cradle in a first position;

Fig. 27 is a top planar of the battery cradle of Fig. 26, wherein the four batteries are disposed in a second position; and

Fig. 28 is a front elevational view of the battery cradle of Fig. 26.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the present preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings wherein like numerals indicate the same elements throughout the views. As described more fully hereafter, the present invention is directed to cleaning implements for use with hard surfaces such as floors, and the like. The cleaning implement is used in combination with a liquid cleaning composition (although other liquid compositions, such as waxes, etc., can be used with cleaning implements of the present invention) and a cleaning substrate, such as a removable pad or sheet, for absorbing and removing the cleaning composition and particulates (e.g., dirt, soil, dust, etc.) from the hard surface.

Preferred liquid cleaning compositions, examples of which are described in greater detail in WO01/23510 and WO 00/27271, can comprise:

- 5 (a) optionally, from about 0.001% to about 0.5% by weight of the composition of surfactant, preferably selected from the group consisting of alkylpolysaccharides, alkyl ethoxylates, alkyl sulfonates, and mixtures thereof;
- (b) optionally, hydrophilic polymer, preferably less than about 0.5% by weight of the composition;
- 10 (c) optionally, organic solvent, preferably from about 0.25% to about 7% by weight of the composition and preferably having a boiling point of from about 120°C to about 180°C;
- (d) optionally, from about 0.01% to about 1% by weight of the composition of mono- or polycarboxylic acid;
- 15 (e) optionally, from about 0.01% to about 1% by weight of the composition of odor control agent, preferably cyclodextrin;
- (f) optionally, a source of peroxide, preferably from about 0.05% to about 5% by weight of the composition and preferably selected from the group consisting of benzoyl peroxide, hydrogen peroxide, and mixtures thereof;
- 20 (g) optionally, from about 0.001% to about 0.1% by weight of the composition of thickening polymer;
- (h) aqueous solvent system, preferably at least about 80% by weight of the composition;
- (i) optionally, suds suppressor;
- (j) optionally, from about 0.005% to about 0.2% by weight of the composition of a
- 25 perfume comprising:
 - (i) optionally, from about 0.05% to about 90% by weight of the perfume of volatile, hydrophilic perfume material;
 - (ii) optionally, at least about 0.2% by weight of the perfume of volatile, hydrophobic perfume material;
 - 30 (iii) optionally, less than about 10% by weight of the perfume of residual, hydrophilic perfume material;
 - (iv) less than about 10% by weight of the perfume of residual, hydrophobic perfume material;

- (k) optionally, a detergent adjuvant, preferably selected from the group consisting of detergency builder, buffer, preservative, antibacterial agent, colorant, bleaching agents, chelants, enzymes, hydrotropes, and mixtures thereof.

The cleaning implement is also used in combination with a cleaning substrate, such as a
 5 sheet, a premoistened wipe, or other woven or non-woven fabric, examples of which are also described in greater detail in WO00/27271 and US Patent No. 5,960,508 issued October 5, 1999 to S.A. Holt et

al., to remove the liquid cleaning composition and particulates from the hard surface. A preferred cleaning substrate suitable for use with the present invention can comprise:

- 10 (a) at least one absorbent layer;
- (b) optionally, a liquid pervious scrubbing layer; wherein the liquid pervious scrubbing layer is preferably an apertured formed film, more preferably a macroscopically expanded three-dimensional plastic web, having tapered or funnel-shaped apertures and/or surface aberrations and preferably comprising
 15 a hydrophobic material;
- (c) optionally, an attachment layer, wherein the attachment layer preferably comprises a clear or translucent material, more preferably a clear or translucent polyethylene film, and wherein the attachment layer preferably comprises loop and/or hook material for attachment to a support head of a
 20 handle of a cleaning implement;
- (d) optionally, multiple planar surfaces;
- (e) optionally, at least one functional cuff, preferably at least one free-floating, looped functional cuff;
- (f) optionally, a density gradient throughout at least one absorbent layer; wherein
 25 the density gradient preferably comprises a first absorbent layer having a density of from about 0.01 g/cm³ to about 0.15 g/cm³, preferably from about 0.03 g/cm³ to about 0.1 g/cm³, and more preferably from about 0.04 g/cm³ to about 0.06 g/cm³, and a second absorbent layer having a density of from about 0.04 g/cm³ to about 0.2 g/cm³, preferably from about 0.1 g/cm³ to about
 30 0.2 g/cm³, and more preferably from about 0.12 g/cm³ to about 0.17 g/cm³; wherein the density of the first absorbent layer is about 0.04 g/cm³, preferably about 0.07 g/cm³, and more preferably about 0.1 g/cm³, less than the density of the second absorbent layer;

(g) optionally, at least one adhesive scrubbing strip, preferably comprising a material selected from the group consisting of nylon, polyester, polypropylene, abrasive material, and mixtures thereof; and

5 (h) optionally, perfume carrier complex, preferably selected from the group consisting of cyclodextrin inclusion complex, matrix perfume microcapsules, and mixtures thereof; wherein the perfume carrier complex is preferably located in an absorbent layer.

The various layers and/or elements can be bonded in a variety of ways including, but not limited to, adhesive bonding, thermal bonding, ultra sonic bonding, and the like. The various
10 layers and/or elements can be assembled to form a cleaning pad either by hand or by a conventional line converting process known in the art. While these are examples of preferred liquid cleaning compositions and cleaning substrates, it will be appreciated that the present invention can be used with other cleaning compositions and substrates without departing from scope of the invention.

15 Referring to Figs. 1, 2, and 3, an exemplary cleaning implement made in accordance with the present invention and in the form of a floor mop 20 is illustrated. The floor mop 20 comprises a handle 22 formed from a plurality of sections, a mop head 24 attached to the handle by a universal joint 25, and a liquid delivery system which includes a spray nozzle 26 attached to the upper plate 27 of the mop head 24 adjacent to its leading edge 29 such that the spray nozzle 26
20 can move in the direction of the mop head 24 when the mop 20 is maneuvered. While the spray nozzle 26 is preferably attached independent of the handle 22 for directional control of the spray nozzle 26, it will be appreciated that the spray nozzle can be attached at locations other than the mop head 24. For example, the spray nozzle 26 can be attached to the universal joint 25 or the handle 22.

25 As previously discussed, the cleaning implements of the present invention use a removeably attached cleaning substrate 28, such as the tri-layer cleaning substrate illustrated in Fig. 4, for absorbing the cleaning liquid and particulates from the surface to be cleaned. The cleaning substrate 28 can be mechanically attached in a variety ways to mop head 24. For example, adhesives, snaps, hook and loop fasteners, etc. can be used. Alternatively, attachment
30 structures such as those described in WO 01/12052, can be incorporated onto the upper surface of the mop head 24.

In alternate embodiments, the backsheet 26 may comprise elastomeric films, foams, strands, or combinations of these or other suitable materials with nonwovens or synthetic films.

The backsheet 26 may be joined to the topsheet 24, the absorbent core 28 or any other element of the diaper 20 by any attachment means known in the art. (As used herein, the term "joined" encompasses configurations whereby an element is directly secured to another element by affixing the element directly to the other element, and configurations whereby an element is indirectly secured to another element by affixing the element to intermediate member(s) which in turn are affixed to the other element.) For example, the attachment means may include a uniform continuous layer of adhesive, a patterned layer of adhesive, or an array of separate lines, spirals, or spots of adhesive. One preferred attachment means comprises an open pattern network of filaments of adhesive as disclosed in U.S. Pat. No. 4,573,986 entitled "Disposable Waste-Containment Garment", which issued to Minetola et al. on March 4, 1986. Other suitable attachment means include several lines of adhesive filaments which are swirled into a spiral pattern, as is illustrated by the apparatus and methods shown in U.S. Pat. No. 3,911,173 issued to Sprague, Jr. on October 7, 1975; U.S. Pat. No. 4,785,996 issued to Ziecker, et al. on November 22, 1978; and U.S. Pat. No. 4,842,666 issued to Werenicz on June 27, 1989.

Adhesives which have been found to be satisfactory are manufactured by H. B. Fuller Company of St. Paul, Minnesota and marketed as HL-1620 and HL-1358-XZP. Alternatively, the attachment means may comprise heat bonds, pressure bonds, ultrasonic bonds, dynamic mechanical bonds, or any other suitable attachment means or combinations of these attachment means as are known in the art.

The topsheet 24 is preferably positioned adjacent the body surface 47 of the absorbent core 28 and may be joined thereto and/or to the backsheet 26 by any attachment means known in the art. Suitable attachment means are described above with respect to means for joining the backsheet 26 to other elements of the diaper 20. In one preferred embodiment of the present invention, the topsheet 24 and the backsheet 26 are joined directly to each other in some locations and are indirectly joined together in other locations by directly joining them to other elements of the diaper 20.

manufactured by Bowles Fluidics Corporation of Columbia, MO. This exemplary spray nozzle is more fully described in one or more of U.S. patent nos. 4,508,206 to Stouffer, issued April 2, 1985; 5,788,394 to Hess et al., issued August 4, 1998; and 5,860,603 to Raghu et al., issued January 19, 1999 . The handle

5 22, canister housing 37, mop head 24, universal joint 25, and pump gears can be injection molded using thermoplastic materials as is known in the art. Preferably, the canister housing 37 and mop head 24 are formed from polypropylene, the universal joint 25 and the pump gears are preferably formed from an acetal polymer. The handle 22 can be formed from aluminum by extrusion. The voltage source 39 is preferably four AA, 1.5 volt Panasonic Alkaline Plus batteries which are
10 connected in series.

In accordance with one aspect of the present invention, the handle 22 preferably comprises three handle sections 70, 72, and 74 which are interconnected to form the handle 22. As seen in Figs. 6 and 7, the upper or first handle section 70 includes a handle grip 76 attached to a tube 77, the switch 44 mounted in the handle grip 76, an external electrical connector 78, and a
15 locking connector 80 having prongs 82. The external electrical connector 78 is connected to the tube 77 by a screw 83. Two electrical wires 84 disposed within the tube 77 interconnect the switch 44 with the external electrical connector 78, these wires being each only partially visible in Fig. 6 for clarity. The locking connector 80 is preferably offset a distance from the end 81 of the first handle section 70. More preferably, the locking connector 80 is disposed at least about 20
20 mm from the end 81 of the first handle section 70. Most preferably, the locking connector 80 is disposed between about 20 mm and about 150 mm from the end 81 of the first handle section 70. The locking connector 80 is secured to the tube 77 by a screw 85 through a hole 87 in the tube 77.

As shown in Figs 8 and 9, the middle or second handle section 72 includes a tube 89 and two internal electrical connectors 86 disposed within the tube 89 adjacent, and preferably offset
25 from, each end 88 of the tube 89. Electrical wires 90 disposed within the tube 89 interconnect the internal electrical connectors 86. More preferably, each internal electrical connector 86 is disposed at least about 15 mm from its respective adjacent end 88 of the tube 89. Most preferably, each internal electrical connector is disposed between about 15 mm and about 240 mm from its respective adjacent end 88. Locking connectors 92 having holes 94 are disposed at each
30 end 88 of the tube 89. As discussed more fully hereafter, the prongs 82 of the locking connector 80 engage the holes 94 of the locking connector 92 to secure the first handle section 70 to the second handle section 72. The internal electrical connectors 86 are secured to the tube 89 by screws 83 while the locking connectors 92 are secured to the tube 89 by screws 91.

flow off the topsheet 24 rather than being drawn through the topsheet 24 and being absorbed by the absorbent core 28. The topsheet 24 can be rendered hydrophilic by treating it with a surfactant or by incorporating a surfactant into the topsheet. Suitable methods for treating the topsheet 24 with a surfactant include spraying the topsheet 24 material with the surfactant and immersing the material into the surfactant. A more detailed discussion of such a treatment and hydrophilicity is contained in U.S. Pat. No. 4,988,344 entitled "Absorbent Articles with Multiple Layer Absorbent Layers" issued to Reising, et al. on Jan. 29, 1991 and U.S. Pat. No. 4,988,345 entitled "Absorbent Articles with Rapid Acquiring Absorbent Cores" issued to Reising on Jan. 29, 1991. A more detailed discussion of some suitable methods for incorporating surfactant in the topsheet can be found in U.S. Statutory Invention Registration No. H1670, published on July 1, 1997 in the names of Aziz et al.

Alternatively, the topsheet 24 may include an apertured web or film which is hydrophobic. This may be accomplished eliminating the hydrophilizing treatment step from the production process and/or applying a hydrophobic treatment to the topsheet 24, such as a polytetrafluoroethylene compound like SCOTCHGUARD or a hydrophobic lotion composition, as described below. In such embodiments, it is preferred that the apertures be large enough to allow the penetration of aqueous fluids like urine without significant resistance.

Any portion of the topsheet 24 may be coated with a lotion as is known in the art. Examples of suitable lotions include those described in U.S. Pat. Nos. 5,607,760 entitled "Disposable Absorbent Article Having A Lotioned Topsheet Containing an Emollient and a Polyol Polyester Immobilizing Agent" which issued to Roe on March 4, 1997; U.S. Pat. No. 5,609,587 entitled "Diaper Having A Lotion Topsheet Comprising A Liquid Polyol Polyester Emollient And An Immobilizing Agent" which issued to Roe on March 11, 1997; U.S. Pat. No. 5,635,191 entitled "Diaper Having A Lotioned Topsheet Containing A Polysiloxane Emollient" which issued to Roe et al. on June 3, 1997; and U.S. Pat. No. 5,643,588 entitled "Diaper Having A Lotioned Topsheet" which issued to Roe et al. on July 1, 1997. The lotion may function alone or in combination with another agent as the hydrophobizing treatment described above. The topsheet may also include or be treated with antibacterial agents, some examples of which are disclosed in PCT Publication No.

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each electrical connector might contain only male or only female structures rather than the described plug and socket arrangement. Alternatively, the electrical connectors might be combined with the locking connectors. Further, spring-biased connectors might be employed to insure electrical contact when assembled.

5 As best seen in Fig. 8 (the cross-sectional shape of the tube 89 of Fig. 8 being also representative of the cross-sectional shape of tubes 77 and 93), tube 89 is substantially circular in cross section with the exception of a substantially flat or planar guide surface 112 which preferably extends the length of the handle section. The first and third handle sections 70 and 74 preferably have outside diameters which are about equal and which are slightly less than the
10 inside diameter of the tube 89 of the second handle section 72 so that the handle sections 70 and 74 can slide into the hollow interior of the tube 89, as discussed more fully hereafter. The internal and external electrical connectors have protrusions 114 (Fig. 13) disposed adjacent a flat 115 of the first portions 101. As discussed more fully hereafter, the protrusions 114 and flats 115 of the external electrical connector 78 cooperate with the locking connectors 92 and the flat portion 112
15 of the tube 89 to align and guide assembly of the handle sections. More particularly, these features cooperate to align and slidably guide external electrical connectors 78 into the ends 81 and 92 of the first and third handle sections 70 and 74, as shown in Figs. 7 and 11, respectively, until the first portions 101 of the external electrical connectors bottom or engage the ends 81 and 92 of these tubes.

20 Referring to Figs. 14 and 15, the locking connectors 80 and 92 will now be described in greater detail. The locking connector 92 has an inner surface 118 (Fig. 15), a portion 119 of which approximates the size and shape of the cylindrical outer surface of the tube 77 and external electrical connector 78 of first handle section 70 and the tube 93 and external electrical connector 78 of the third handle section 74. The inner surface 118 also approximates the surface defined by
25 the inside diameter of the tube 89 of the second handle section 72. Grooves 122 are disposed along a portion of the inner surface 118 to slidably receive the protrusions 114 of the external electrical connectors 92. A portion of the grooves 122 are preferably defined by the track 124 which is aligned with the flat surface 112 of the second handle section 72 when assembled, as best seen in Fig. 9. An extension 126 of the track 124 is disposed adjacent the flat surface 112 such
30 that the retaining screw 83 can pass through the flat surface 112 into the hole 128 of the extension 126 to secure the locking connector 92 to the second handle section 72. The grooves 122 cooperate to initially align the external electrical connector 78 with the locking connector 92, thereby also aligning the first and third handle sections 70 and 74 with the second handle section 72 so that the internal and external electrical connectors 78 and 86 are aligned for engagement of

Individualized, Polycarboxylic Acid Crosslinked Wood Pulp Cellulose Fibers" which issued to Herron et al. on August 11, 1992; U.S. Pat. No. 5,147,345 entitled "High Efficiency Absorbent Articles For Incontinence Management" issued to Young et al. on September 15, 1992; U.S. Pat. No. 5,342,338 entitled "Disposable Absorbent Article For Low-Viscosity Fecal Material" issued to Roe on August 30, 1994; U.S. Pat. No. 5,260,345 entitled "Absorbent Foam Materials For Aqueous Body Fluids and Absorbent Articles Containing Such Materials" issued to DesMarais et al. on November 9, 1993; U.S. Pat. No. 5,387,207 entitled "Thin-Until-Wet Absorbent Foam Materials For Aqueous Body Fluids And Process For Making Same" issued to Dyer et al. on February 7, 1995; and U.S. Pat. No. 5,625,222 entitled "Absorbent Foam Materials For Aqueous Fluids Made From high Internal Phase Emulsions Having Very High Water-To-Oil Ratios" issued to DesMarais et al. on July 22, 1997.

The diaper 20 may also comprise at least one elastic waist feature 34 that helps to provide improved fit and containment. The elastic waist feature 34 is generally intended to elastically expand and contract to dynamically fit the wearer's waist. The elastic waist feature 34 preferably extends at least longitudinally outwardly from at least one waist edge 62 of the absorbent core 28 and generally forms at least a portion of the end edge 52 of the diaper 20. Disposable diapers are often constructed so as to have two elastic waist features, one positioned in the first waist region 36 and one positioned in the second waist region 38. Further, while the elastic waist feature 34 or any of its constituent elements may comprise one or more separate elements affixed to the diaper 20, the elastic waist feature 34 may be constructed as an extension of other elements of the diaper 20, such as the backsheet 26, the topsheet 24, or both the backsheet 26 and the topsheet 24.

The elastic waist feature 34 may be constructed in a number of different configurations including those described in U.S. Pat. No. 4,515,595 issued to Kievit et al. on May 7, 1985; U.S. Pat. No. 4,710,189 issued to Lash on December 1, 1987; U.S. Pat. No. 5,151,092 issued to Buell on September 9, 1992; and U.S. Pat. No. 5,221,274 issued to Buell on June 22, 1993. Other suitable waist configurations may include waistcap features such as those described in U.S. Pat. No. 5,026,364 issued to Robertson on June

25, 1991 and U.S. Pat. No. 4,816,025 issued to Foreman on March 28, 1989.

The diaper 20 may also include a fastening system 40. The fastening system 40 preferably maintains the first waist region 36 and the second waist region 38 in an overlapping configuration so as to provide lateral tensions about the circumference of the diaper 20 to hold the diaper 20 on the wearer. The fastening system 40 preferably comprises tape tabs and/or hook and loop fastening components, although any other known fastening means are generally acceptable. Some exemplary fastening systems are disclosed in U.S. Pat. No. 3,848,594 entitled "Tape Fastening System for Disposable Diaper" issued to Buell on November 19, 1974; U.S. Pat. No. B1 4,662,875 entitled "Absorbent Article" issued to Hirotsu et al. on May 5, 1987; U.S. Pat. No. 4,846,815 entitled "Disposable Diaper Having An Improved Fastening Device" issued to Scripps on July 11, 1989; U.S. Pat. No. 4,894,060 entitled "Disposable Diaper With Improved Hook Fastener Portion" issued to Nestegard on January 16, 1990; U.S. Pat. No. 4,946,527 entitled "Pressure-Sensitive Adhesive Fastener And Method of Making Same" issued to Battrell on August 7, 1990; and the herein before referenced U.S. Pat. No. 5,151,092 issued to Buell on September 9, 1992; and U.S. Pat. No. 5,221,274 issued to Buell on June 22, 1993. The fastening system may also provide a means for holding the article in a disposal configuration as disclosed in U.S. Pat. No. 4,963,140 issued to Robertson et al. on October 16, 1990. In alternative embodiments, opposing sides of the garment may be seamed or welded to form a pant. This allows the article to be used as a pull-on type diaper, such as a training pant.

The diaper 20 may also comprise side panels 30. The side panels 30 may be elastic or extensible to provide a more comfortable and contouring fit by initially conformably fitting the diaper 20 to the wearer and sustaining this fit throughout the time of wear well past when the diaper 20 has been loaded with exudates since the elasticized side panels 30 allow the sides of the diaper 20 to expand and contract. The side panels 30 may also provide more effective application of the diaper 20 because even if the diaperer pulls one elasticized side panel 30 farther than the other during application, the diaper 20 will "self-adjust" during wear.

While the diaper 20 of the present invention preferably has the side panels 30 disposed in the second waist region 38, the diaper 20 may be provided with side panels 30 disposed in the first waist region 36 or in both the first waist region 36 and the second waist region 38. (As used herein, the term "disposed" is used to mean that an element(s) of the diaper is formed (joined and positioned) in a particular place or position as a unitary structure with other elements of the diaper or as a separate element joined to another element of the diaper.) The side panels 30 may be constructed in any suitable configurations. Examples of diapers with elasticized side panels are disclosed in U.S. Pat. No. 4,857,067, entitled "Disposable Diaper Having Shirred Ears" issued to Wood, et al. on August 15, 1989; U.S. Pat. No. 4,381,781 issued to Sciaraffa, et al. on May 3, 1983; U.S. Pat. No. 4,938,753 issued to Van Gompel, et al. on July 3, 1990; the herein before referenced U.S. Pat. No. 5,151,092 issued to Buell on September 9, 1992; and U.S. Pat. No. 5,221,274 issued to Buell on June 22, 1993; U.S. Pat. No. 5,669,897 issued to LaVon, et al. on September 23, 1997 entitled "Absorbent Articles Providing Sustained Dynamic Fit"; U.S. Pat. No. 6,004,306 issued to Robles, et al. on December 21, 1999 entitled "Absorbent Article With Multi-Directional Extensible Side Panels".

The diaper 20 preferably further includes leg cuffs 32 which provide improved containment of liquids and other body exudates. Leg cuffs may also be referred to as leg bands, side flaps, barrier cuffs, or elastic cuffs. U.S. Pat. No. 3,860,003 describes a disposable diaper which provides a contractible leg opening having a side flap and one or more elastic members to provide an elasticized leg cuff (a gasketing cuff). U.S. Pat. Nos. 4,808,178 and 4,909,803 issued to Aziz et al. on February 28, 1989 and March 20, 1990, respectively, describe disposable diapers having "stand-up" elasticized flaps (barrier cuffs) which improve the containment of the leg regions. U.S. Pat. Nos. 4,695,278 and 4,795,454 issued to Lawson on September 22, 1987 and to Dragoo on January 3, 1989, respectively, describe disposable diapers having dual cuffs, including gasketing cuffs and barrier cuffs. In some embodiments, it may be desirable to treat all or a portion of the leg cuffs with a lotion, as described above.

Embodiments of the present invention may also include pockets for receiving and containing waste, spacers which provide voids for waste, barriers for limiting the

movement of waste in the article, compartments or voids which accept and contain waste materials deposited in the diaper, and the like, or any combinations thereof. Examples of pockets and spacers for use in absorbent products are described in U.S. Pat. No. 5,514,121 issued to Roe et al. on May 7, 1996, entitled "Diaper Having Expulsive Spacer"; U.S. Pat. No. 5,171,236 issued to Dreier et al. on December 15, 1992, entitled "Disposable Absorbent Article Having Core Spacers"; U.S. Pat. No. 5,397,318 issued to Dreier on March 14, 1995, entitled "Absorbent Article Having A Pocket Cuff"; U.S. Pat. No. 5,540,671 issued to Dreier on July 30, 1996, entitled "Absorbent Article Having A Pocket Cuff With An Apex"; and PCT Application WO 93/25172 published December 3, 1993, entitled "Spacers For Use In Hygienic Absorbent Articles And Disposable Absorbent Articles Having Such Spacer"; and U.S. Pat. No. 5,306,266, entitled "Flexible Spacers For Use In Disposable Absorbent Articles", issued to Freeland on April 26, 1994. Examples of compartments or voids are disclosed in U.S. Pat. No. 4,968,312, entitled "Disposable Fecal Compartmenting Diaper", issued to Khan on November 6, 1990; U.S. Pat. No. 4,990,147, entitled "Absorbent Article With Elastic Liner For Waste Material Isolation", issued to Freeland on February 5, 1991; U.S. Pat. No. 5,062,840, entitled "Disposable Diapers", issued to Holt et al. on November 5, 1991; and U.S. Pat. No. 5,269,755 entitled "Trisection Topsheets For Disposable Absorbent Articles And Disposable Absorbent Articles Having Such Trisection Topsheets", issued to Freeland et al. on December 14, 1993. Examples of suitable transverse barriers are described in U.S. Pat. No. 5,554,142 entitled "Absorbent Article Having Multiple Effective Height Transverse Partition" issued September 10, 1996 in the name of Dreier et al.; PCT Patent WO 94/14395 entitled "Absorbent Article Having An Upstanding Transverse Partition" published July 7, 1994 in the name of Freeland, et al.; and U.S. Pat. No. 5,653,703 entitled "Absorbent Article Having Angular Upstanding Transverse Partition", issued Aug. 5, 1997 to Roe, et al.

Embodiments of the present invention may also include a waste management device 110 such as is shown in Figure 2. The waste management device 110 may include a waste bag 111 to collect feces, urine or both. The waste bag 111 may have an aperture 121 and a flange 112 surrounding the aperture for preferably adhesive attachment to the

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plate 184, and a second seal 188 about the motor shaft 190. The pump housing 178 is directly attached to the motor housing 192 of the electrical motor 38 by two screws 176, wherein the drive gear 180 is disposed between the screws 176 and the drive gear 180 is directly attached to the shaft 190 of the electrical motor 38. More preferably, the drive gear 180 is keyed to the shaft 190 and the shaft 190 passes through the motor casing 192. The minimum outside diameter of the motor casing is generally dictated by the motor configuration (e.g., shaft diameter and rotor diameter) which in turn is driven by motor performance. In order to directly couple the gear pump 36 to an electrical motor 38 having a power output of between about 2 watts and about 10 watts at maximum efficiency with a casing outside diameter of less than about 35 mm, and, more preferably less than 30 mm, the screw spacing 194 is preferably between about 9 mm and about 27 mm in order to securely engage the top surface of the casing 192 of the electrical motor 38 while avoiding contact with the motor shaft bearing. The gear pump housing 178 also preferably engages the motor casing 192 when the screws threadably engage the casing screw holes 196 (Fig. 23), as best seen in Fig. 25, in order to provide a compact configuration. Due to the compact size and shape of the electrical motor and gear pump combination, it can be used in a variety of appliances and therefore with a variety of aqueous liquids. More preferably, the liquids have a pH range of between about 2 and about 14. Most preferably, the liquids have a pH range of between about 4 and about 11. In order to accommodate liquids having such a broad pH range, the idle gear 182 and the drive gear 184 are formed from an acetal copolymer or other material which is compatible with the pH range. As used herein, the term "compatible" is intended to refer to a polymer or other material which substantially maintains its dimensional characteristics, weight, tensile modulus, and/or yield strength when exposed to a liquid product for at least 6 months at 20 degrees C to 50 degrees C. However, acetal copolymers have a tendency to swell in aqueous liquids, thereby affecting gear performance, such as efficiency, and potentially leading to gear binding during use. Thus, in order to accommodate a broad pH liquid range in a directly coupled motor and pump arrangement (i.e., where the gear size is constrained due to the spacing of the screws) while still providing a motor/pump efficiency of at least about 5%, the drive gear 180 and the idle gear 182 preferably have the following shape characteristics while accommodating a closely spaced screw arrangement for compactness:

	Driven and Drive Gears
Number of Teeth	14
Module	0.5
Pressure Angle	20 degrees

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Tooth Thickness	0.785 mm
Outside Diameter	7.95 mm
Root Diameter	6.033 mm
Tooth Tip Radius	0.203 mm

In addition, the flow path 198 of the gear pump 36 is preferably downwardly curved away from the screws 176 such that the inlet 200 and the outlet 202 of the gear pump are not tangential with the contact line 204 of the idle and drive gears. This advantageously provides a configuration
5 where the screws are disposed outside the flow pump path, as shown, while accommodating the screw spacing limitations of the directly coupled gear pump. While the directly coupled electrical motor and gear pump 36 have been described herein with respect to the floor mop 20 for simplicity and clarity, it will be appreciated that this arrangement can be used in other electrically operated liquid sprayers. For instance, this arrangement can be incorporated in a hand-held
10 sprayer, other types of floor cleaning implements, home care appliances, etc.

In accordance with another aspect of the present invention and with reference to Figs. 26 and 27, the battery cradle 43 incorporates at least one, and more preferably two, prongs 206 which are sized to prevent electrical contact between the batteries and the electrical pickups 208 (Fig. 10) adjacent the battery cradle 43 when the batteries are incorrectly inserted into the cradle 43.
15 This can prevent inadvertent reverse operation of the electrical motor 38 which can confuse a user of the floor mop and return liquid or air into the canister 34. The prongs 206 have a gap 209 there between which allows the positive terminal 210 (which is usually in the form of a button having a diameter between about 3 mm and about 5 mm) of the battery to pass there through and contact one of the electrical pickups 208, as shown in Fig. 26. However, when the battery is inserted
20 incorrectly such that the negative terminal 212 is disposed adjacent the prongs 206, the prongs separate the negative terminal 212 from the electrical pickup 206. The gap 209 between the prongs is between about 5 mm and about 14 mm and the prongs have a height 216 which is between about 2 mm and about 14 mm, as best seen in Fig. 28. Thus, when the batteries are properly inserted in the first position as show in Fig. 26, the contact surface of the positive
25 terminal 210 is substantially planar with the contact surface of the negative terminal 212, but when the batteries are improperly inserted in the second position shown in Fig. 27, the contact surface of the positive terminal 210 is disposed below the contact surface of the negative terminal 212 such that both a positive battery terminal and a negative battery terminal do not cooperatively contact the electrical pickups 208.

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The foregoing description of the preferred embodiments of the invention have been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Modifications or variations are possible and contemplated in light of the above teachings by those skilled in the art, and the embodiments
5 discussed were chosen and described in order to best illustrate the principles of the invention and its practical application. It is intended that the scope of the invention be defined by the claims appended hereto.

WHAT IS CLAIMED IS:

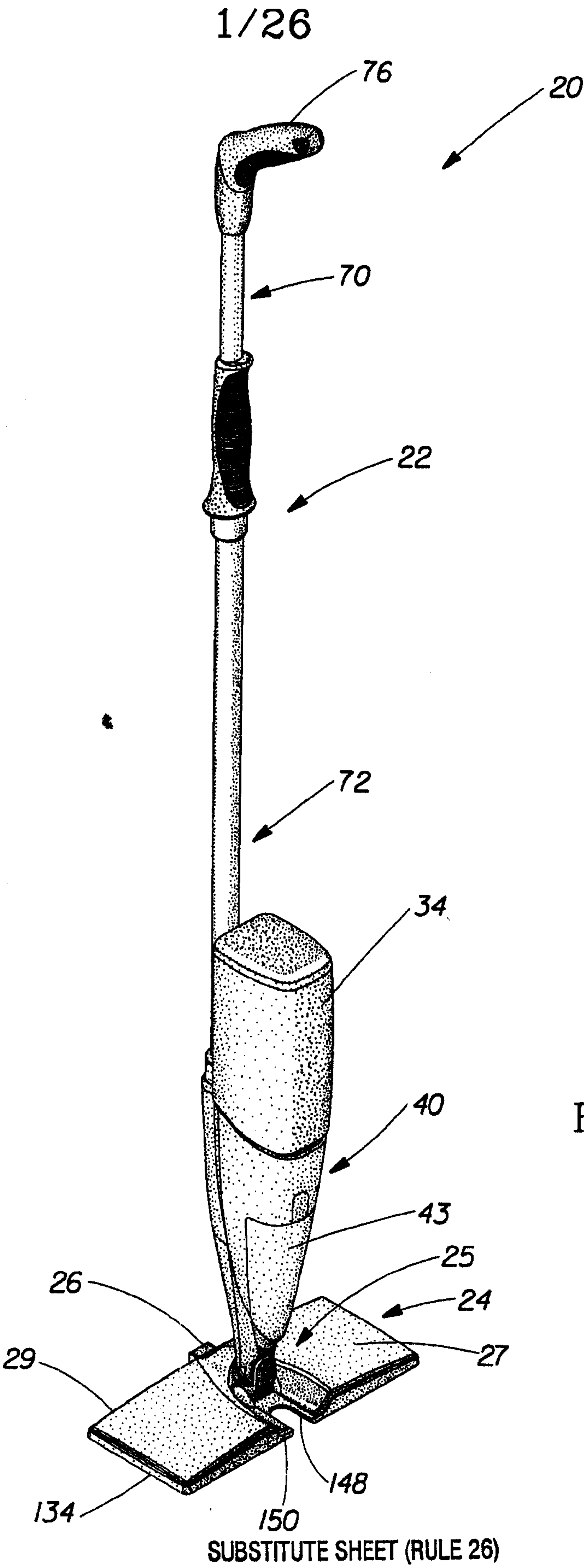
1. A kit characterized in that it comprises:

a mop head;

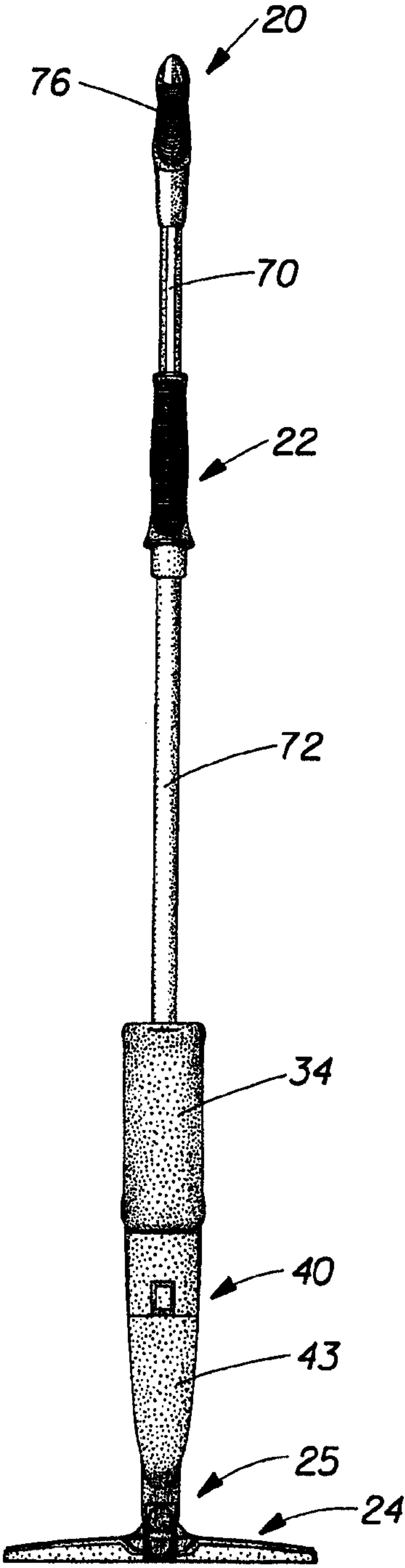
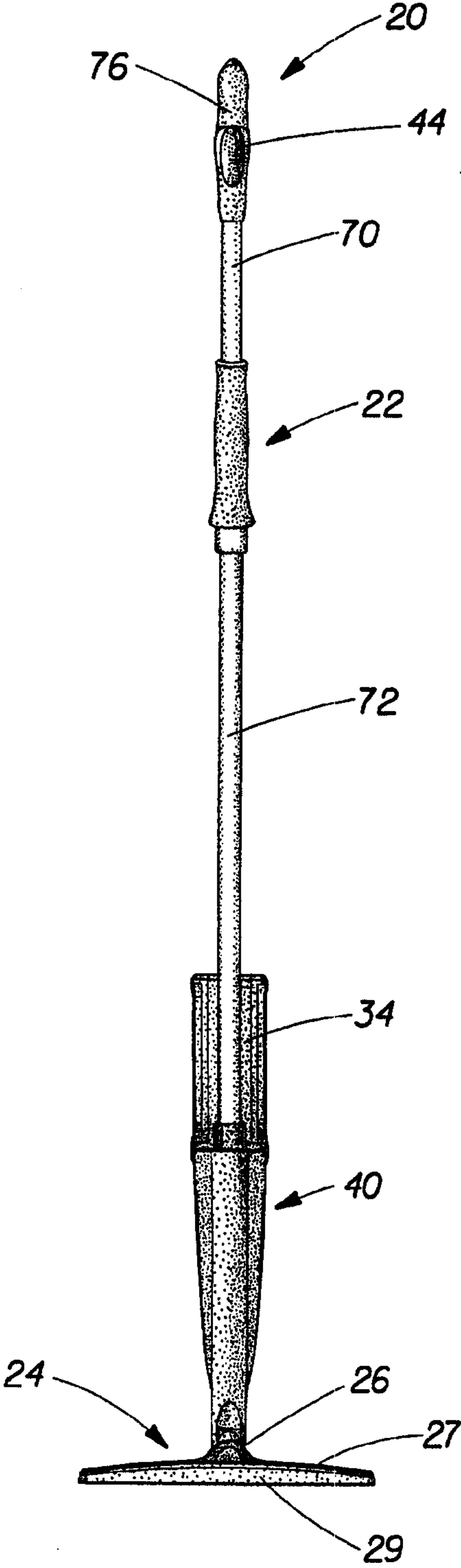
a universal joint connected to said mop head;

a canister housing connected to said universal joint, said canister housing comprising an electrical motor and pump; and

a handle comprising at least one handle section and having a switch, wherein said handle is electrically disconnected from said housing when disassembled from said canister housing but which is electrically connected to said housing when assembled with said canister housing.



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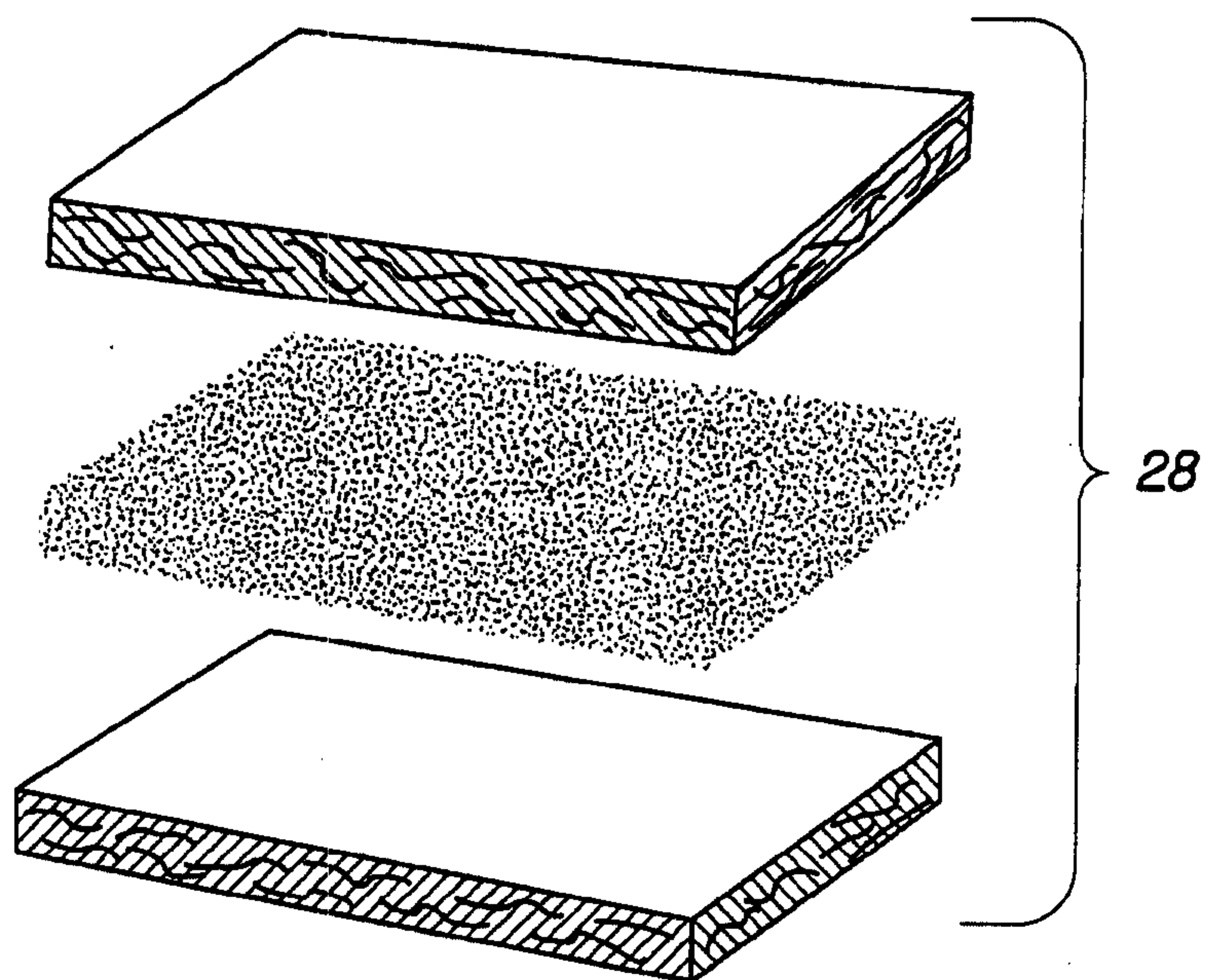
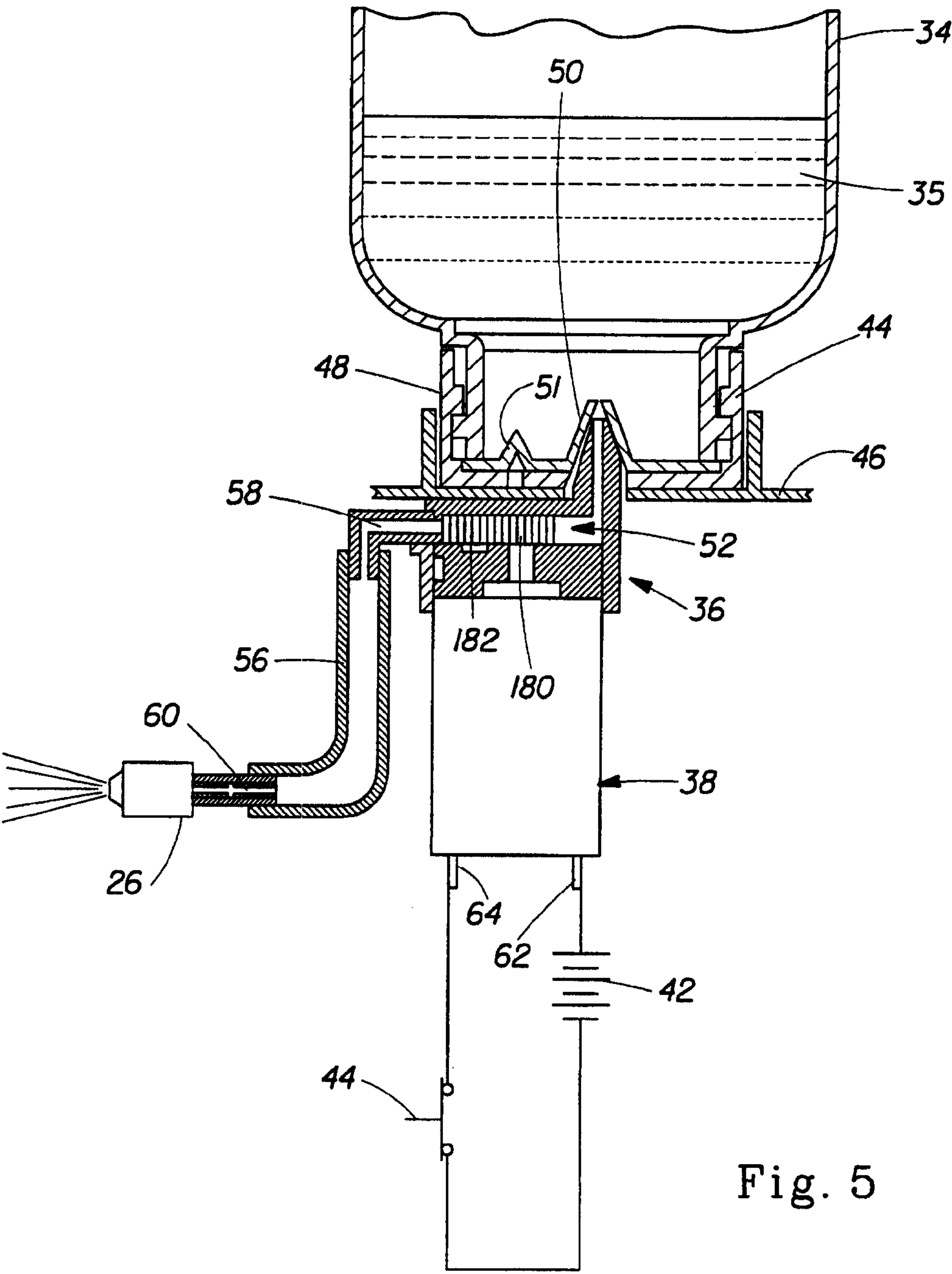


Fig. 4

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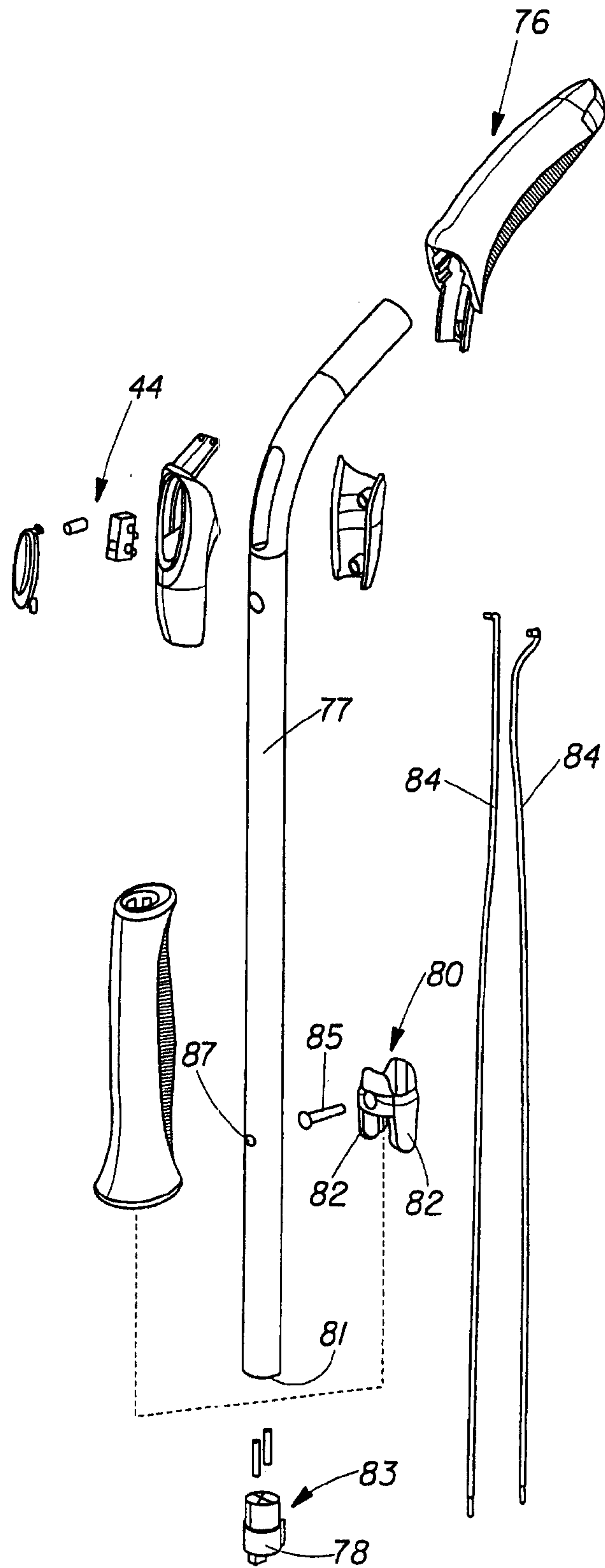


Fig. 6

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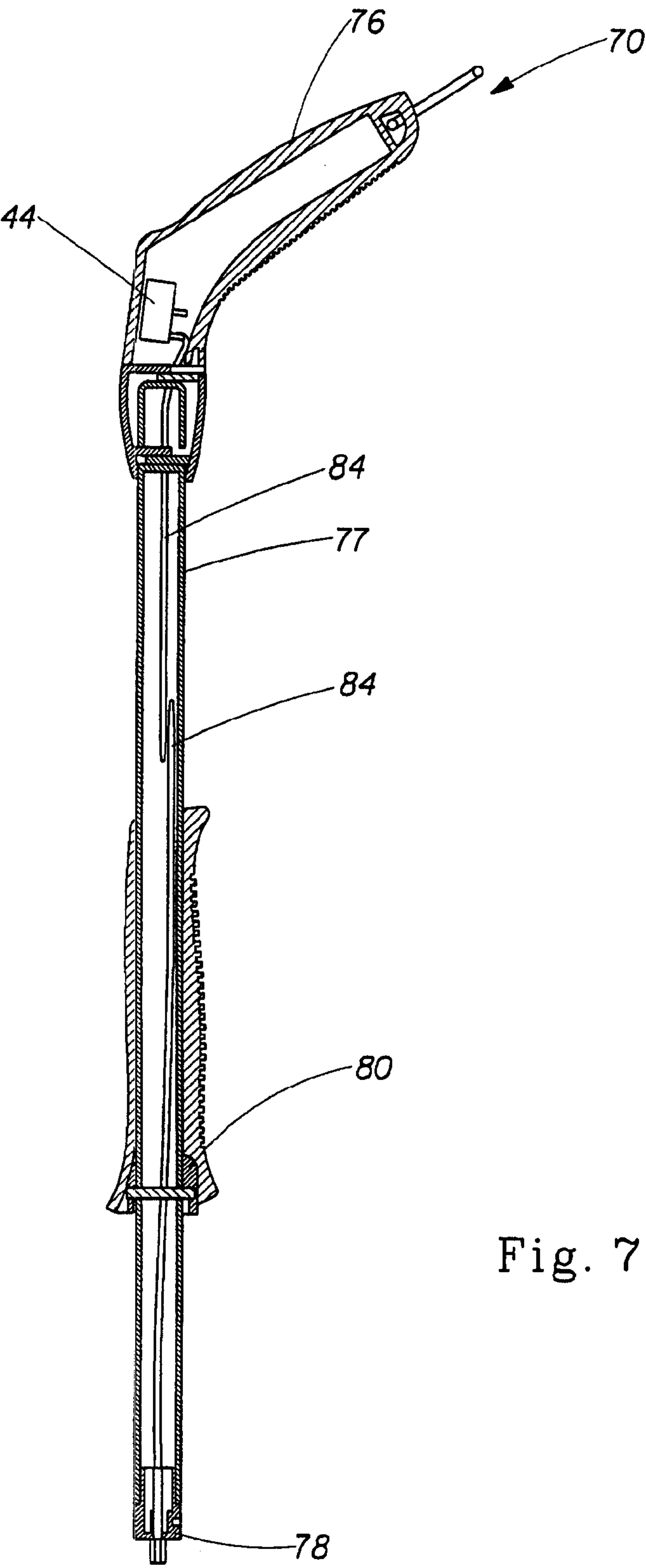
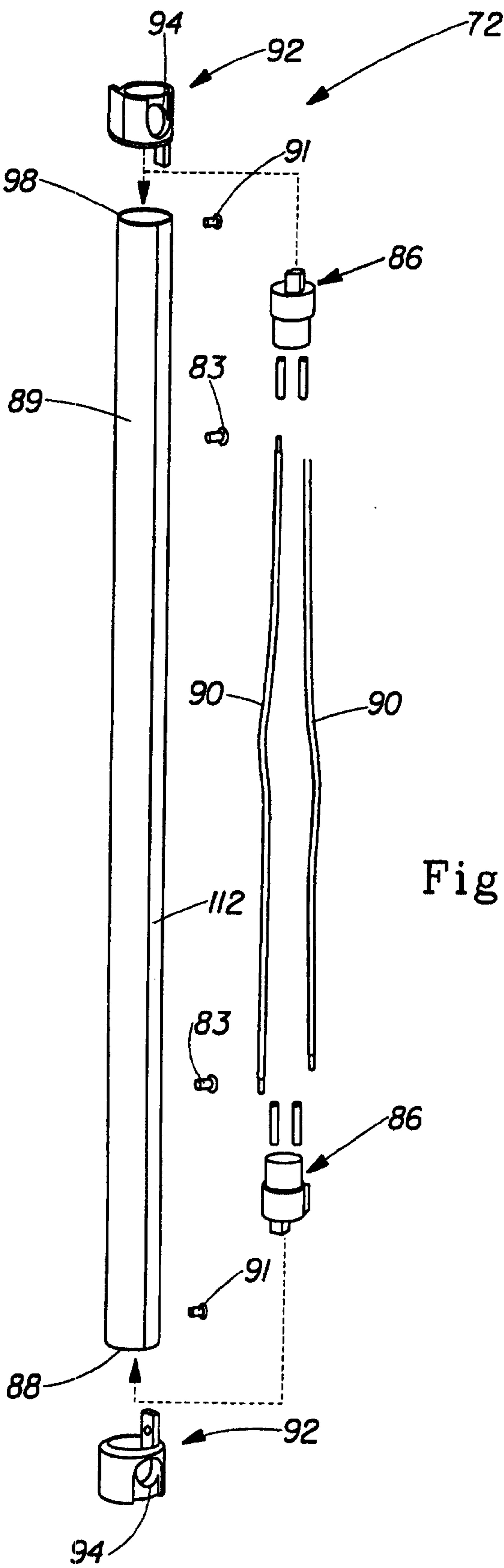


Fig. 7

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SUBSTITUTE SHEET (RULE 26)

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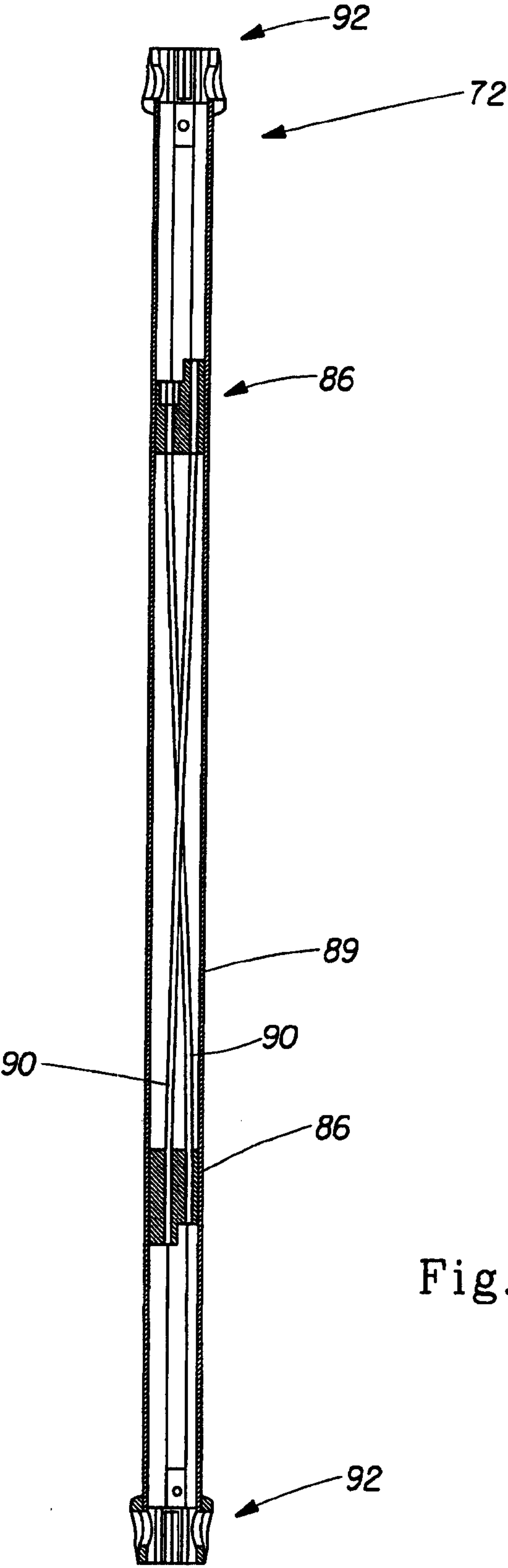


Fig. 9

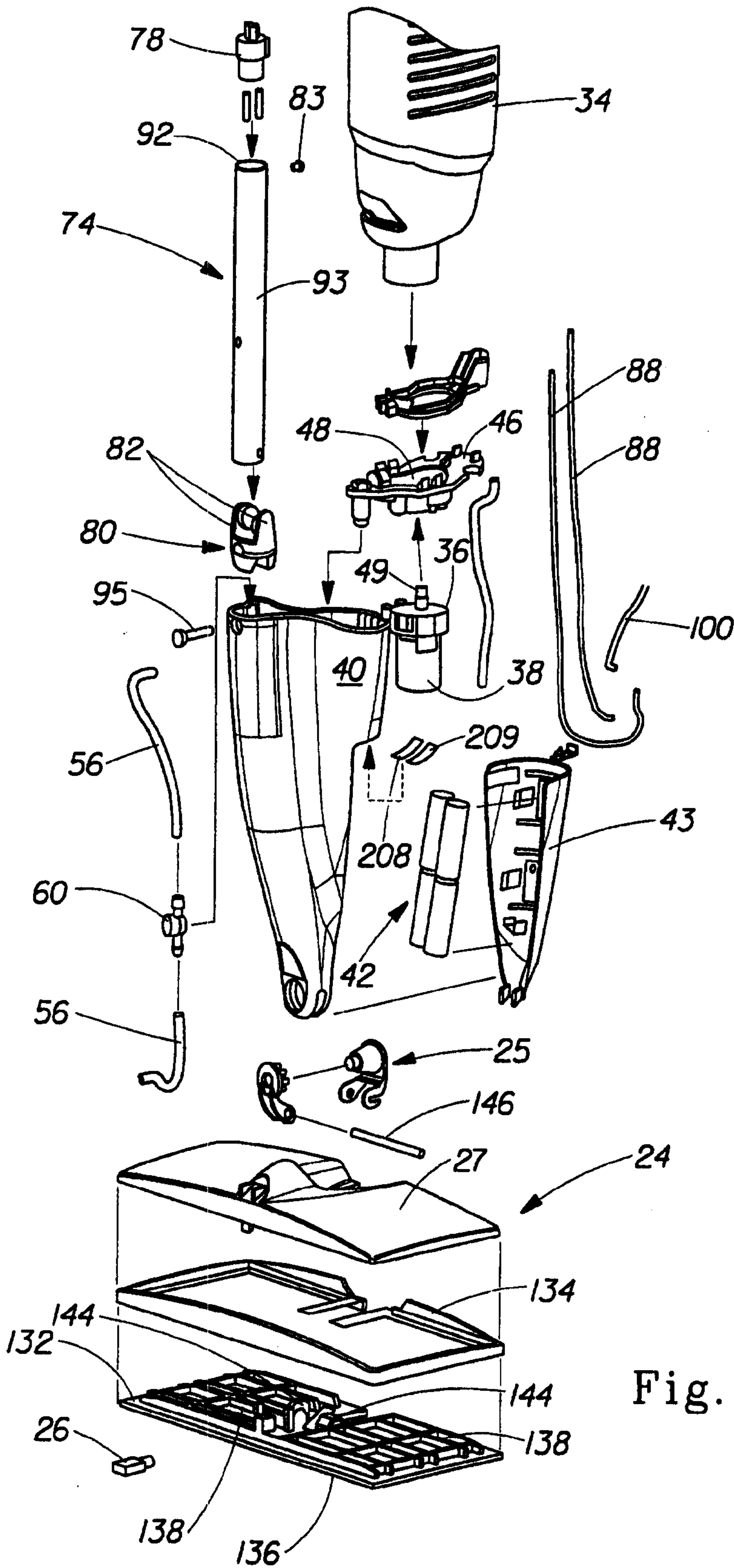


Fig. 10

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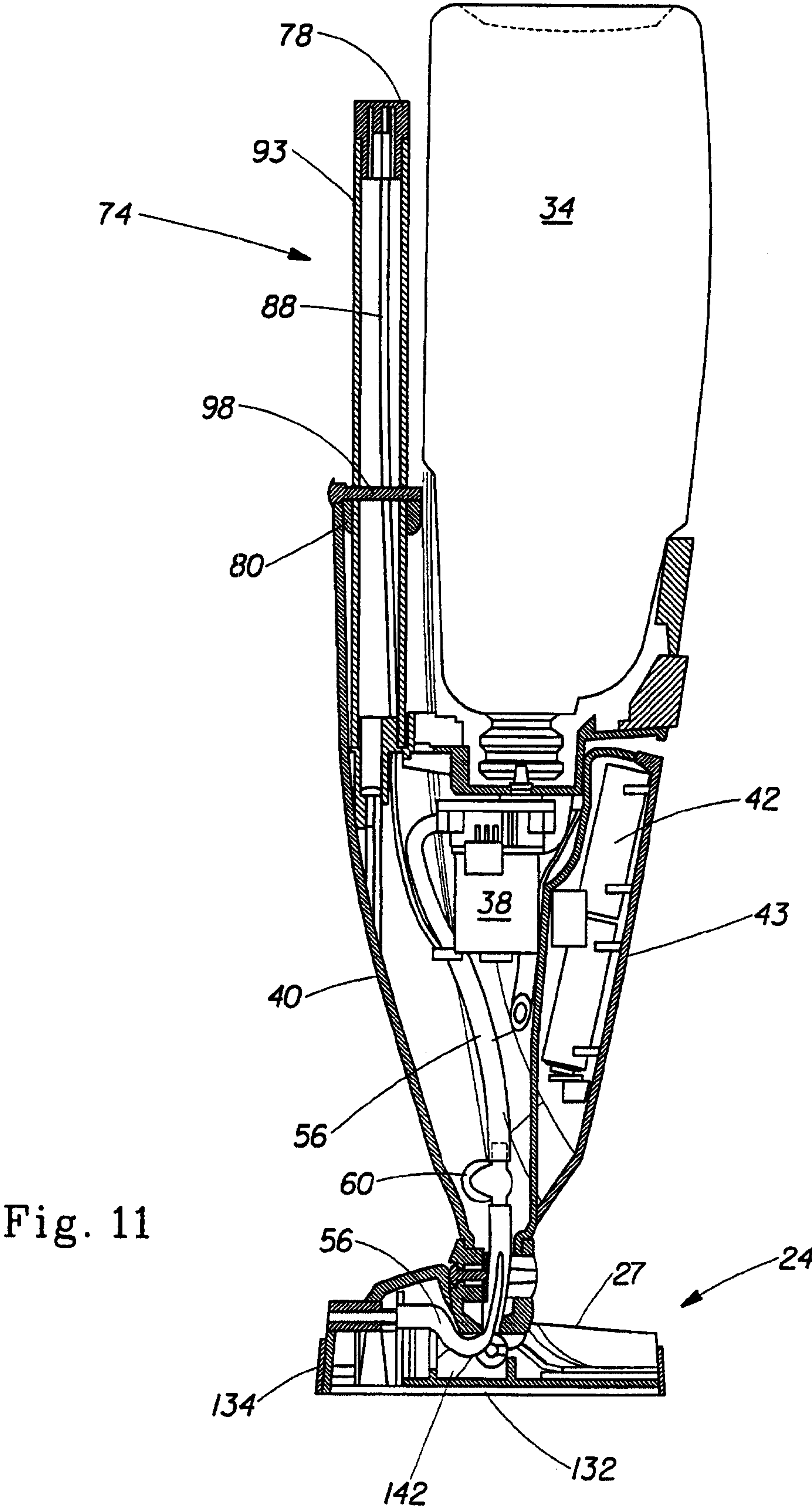


Fig. 11

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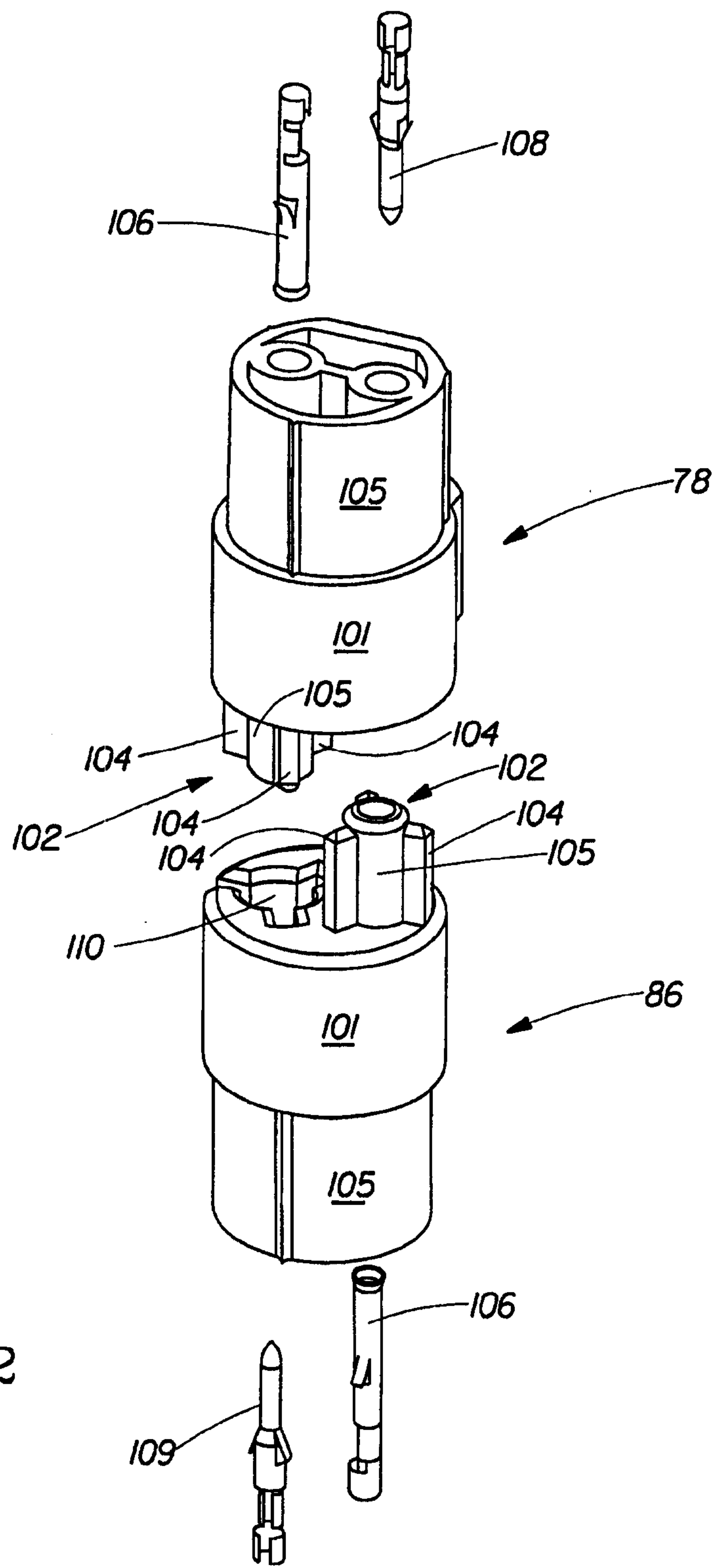


Fig. 12

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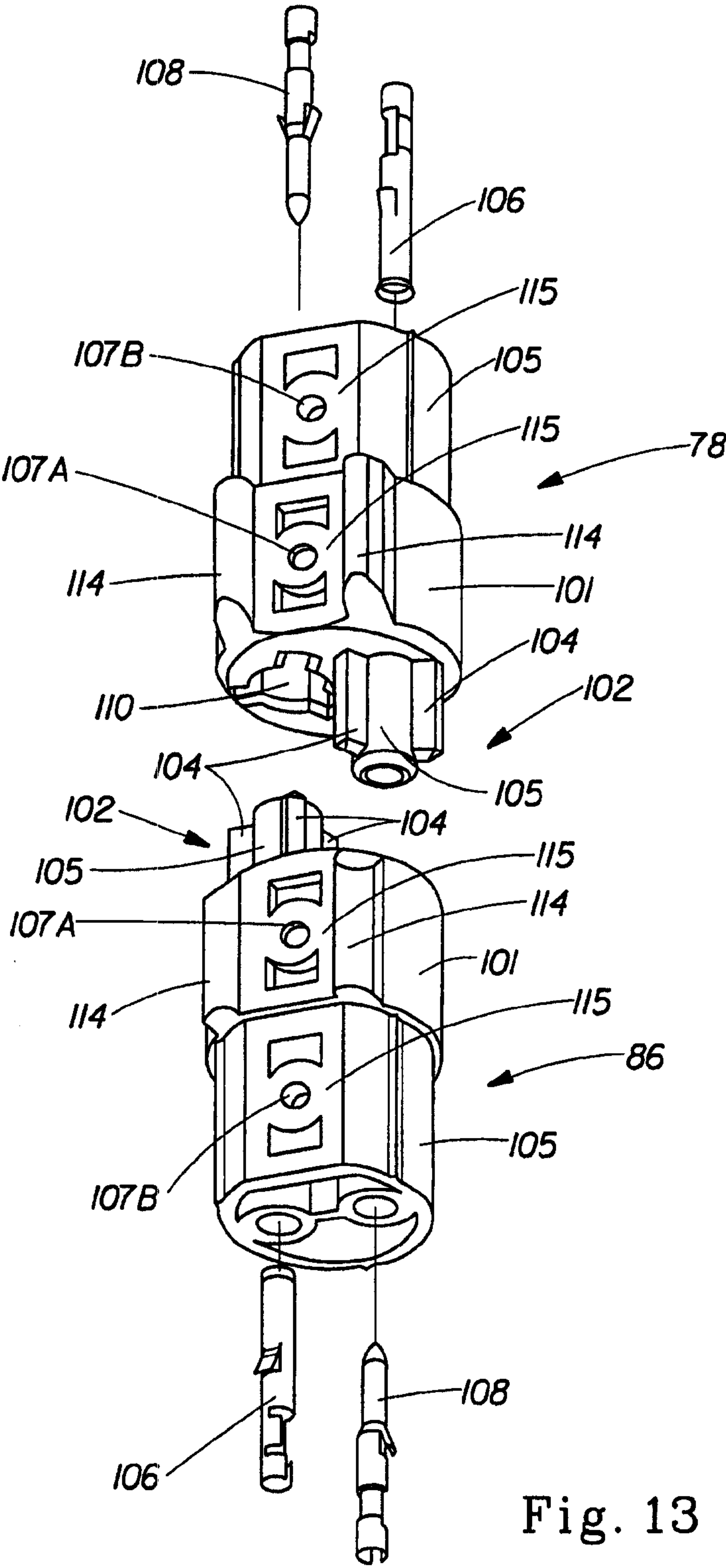


Fig. 13

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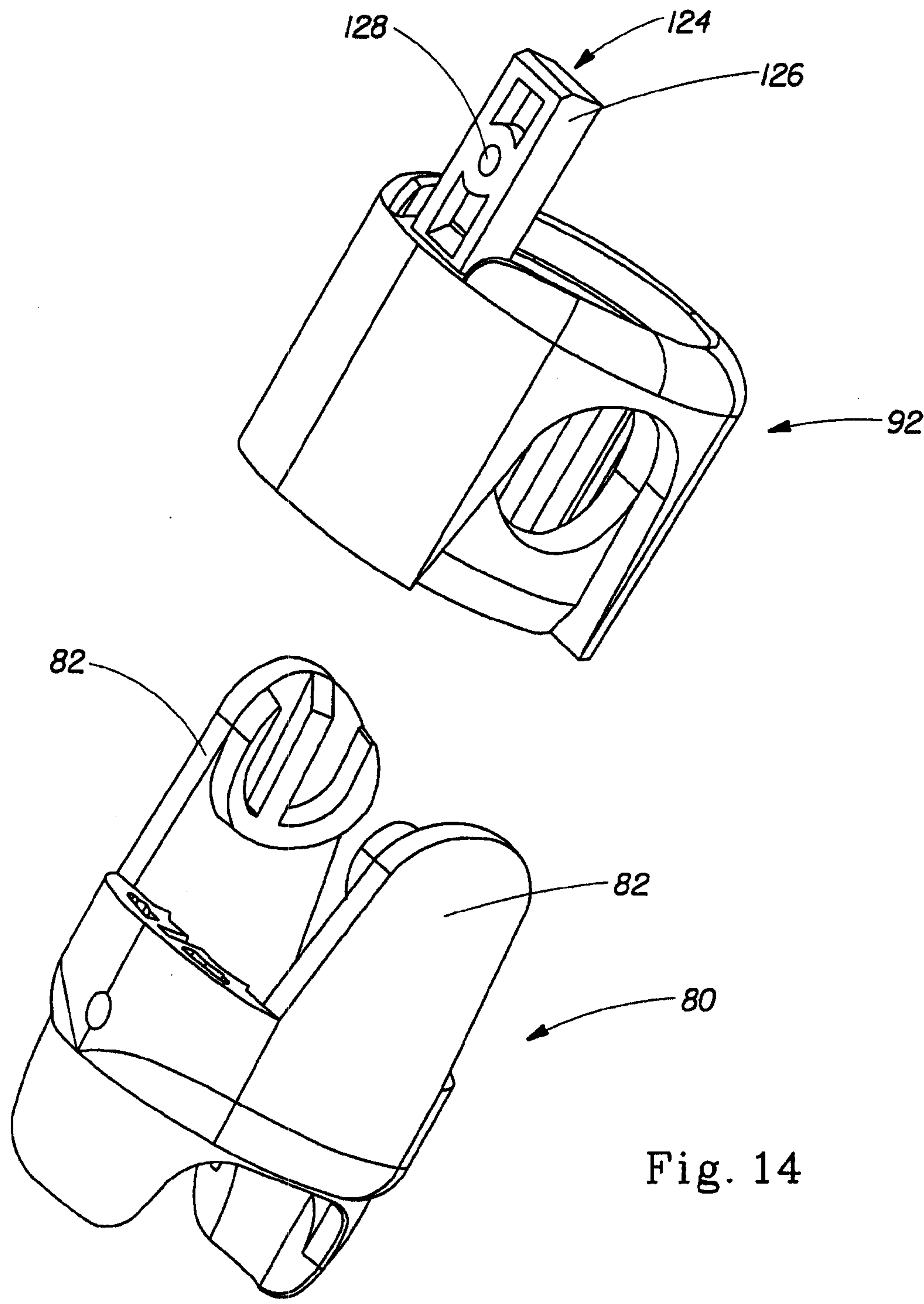


Fig. 14

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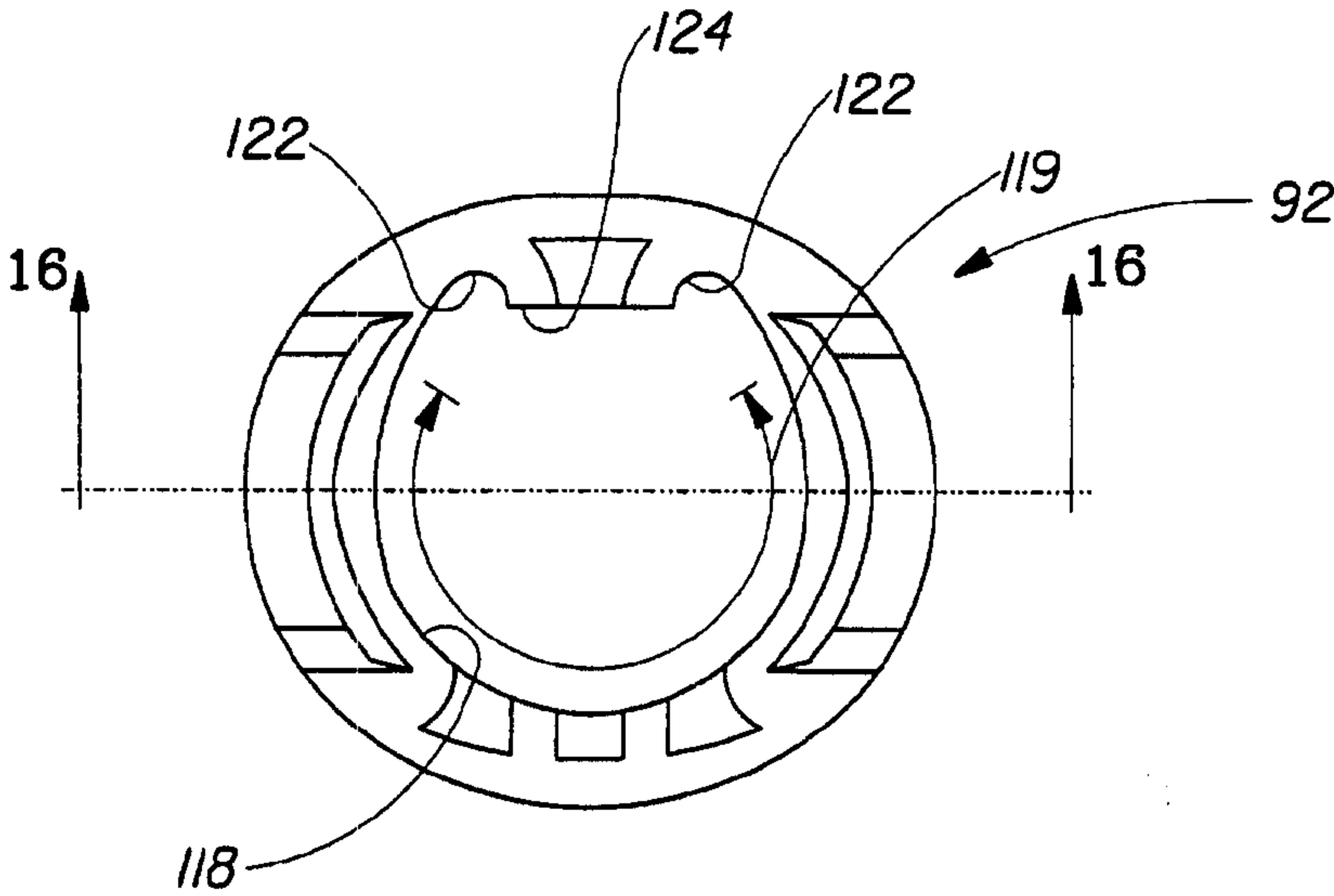


Fig. 15

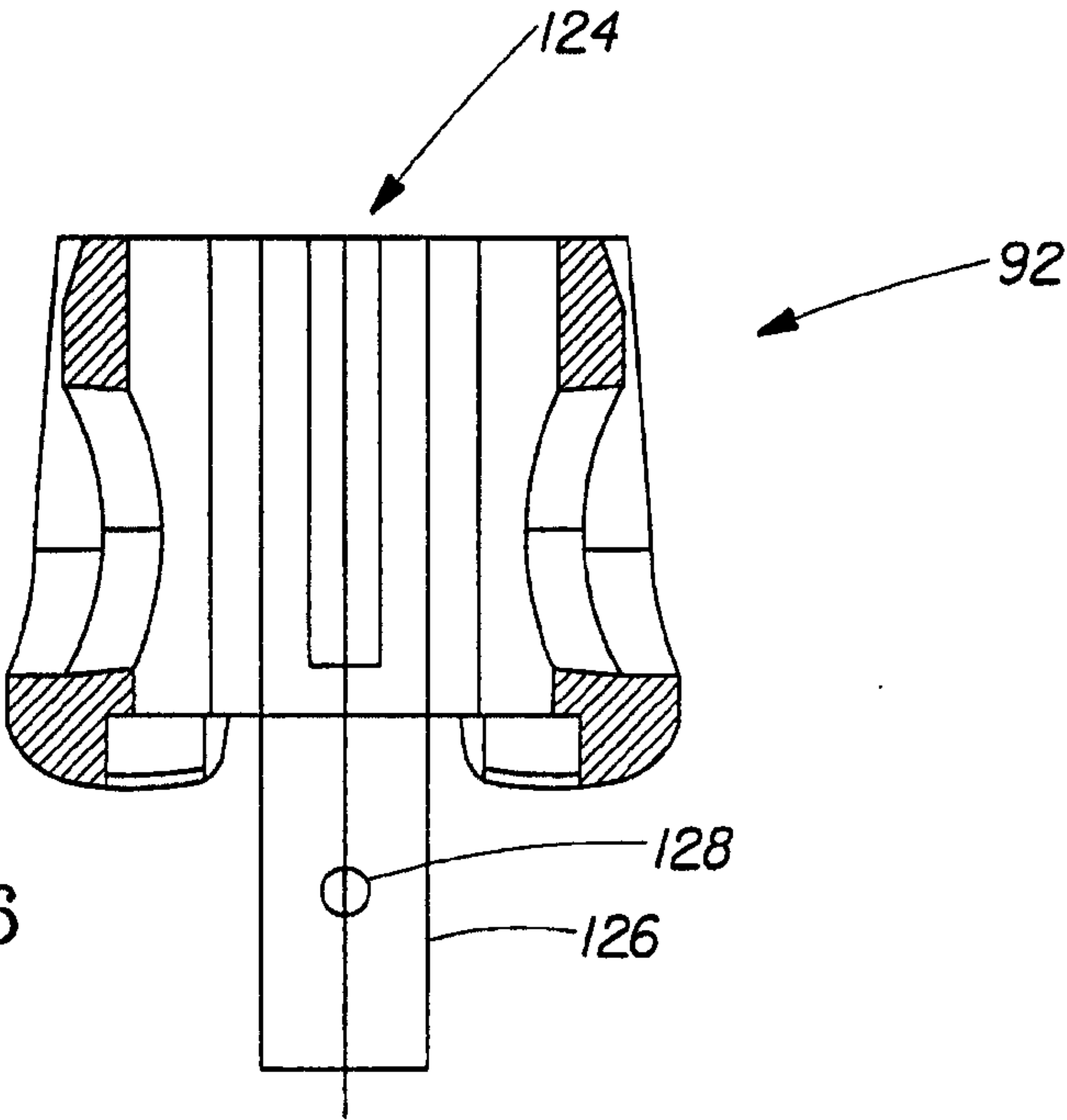


Fig. 16

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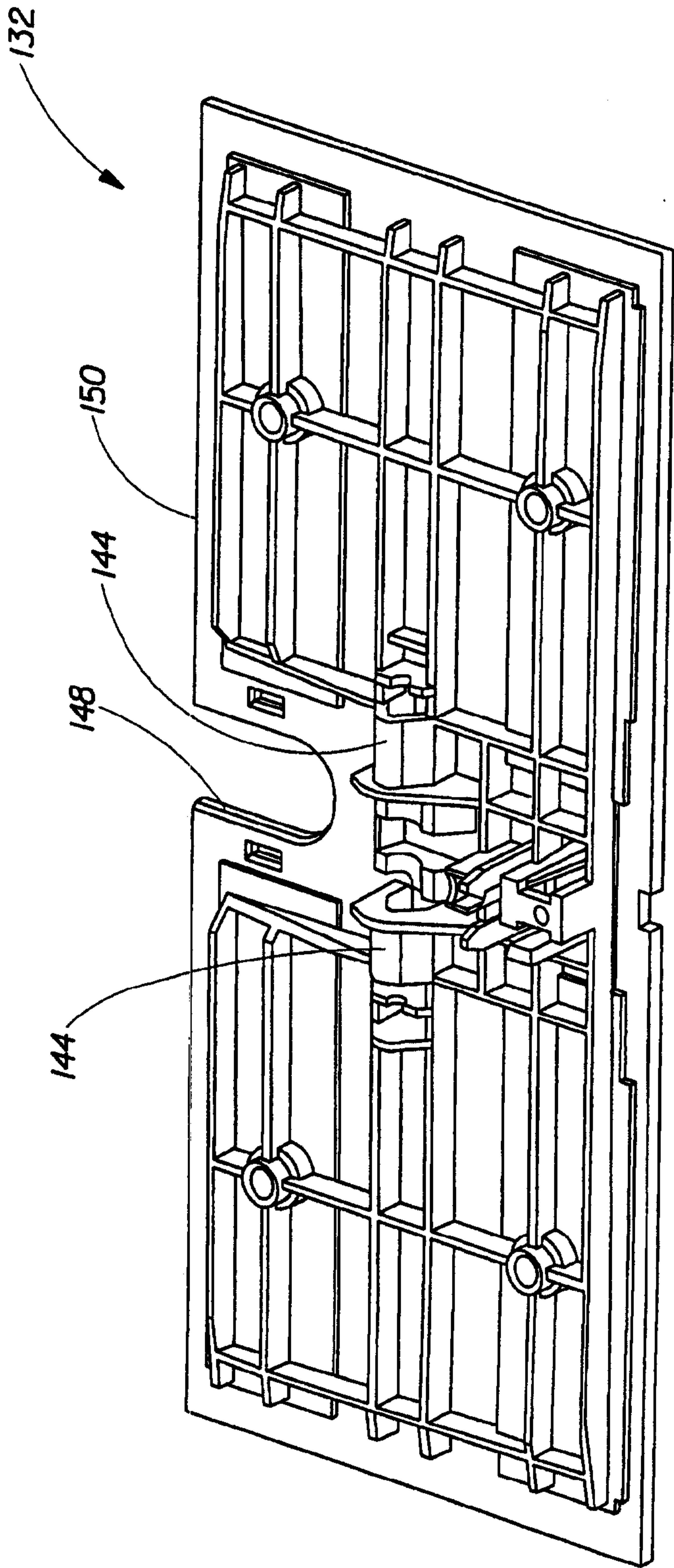


Fig. 17

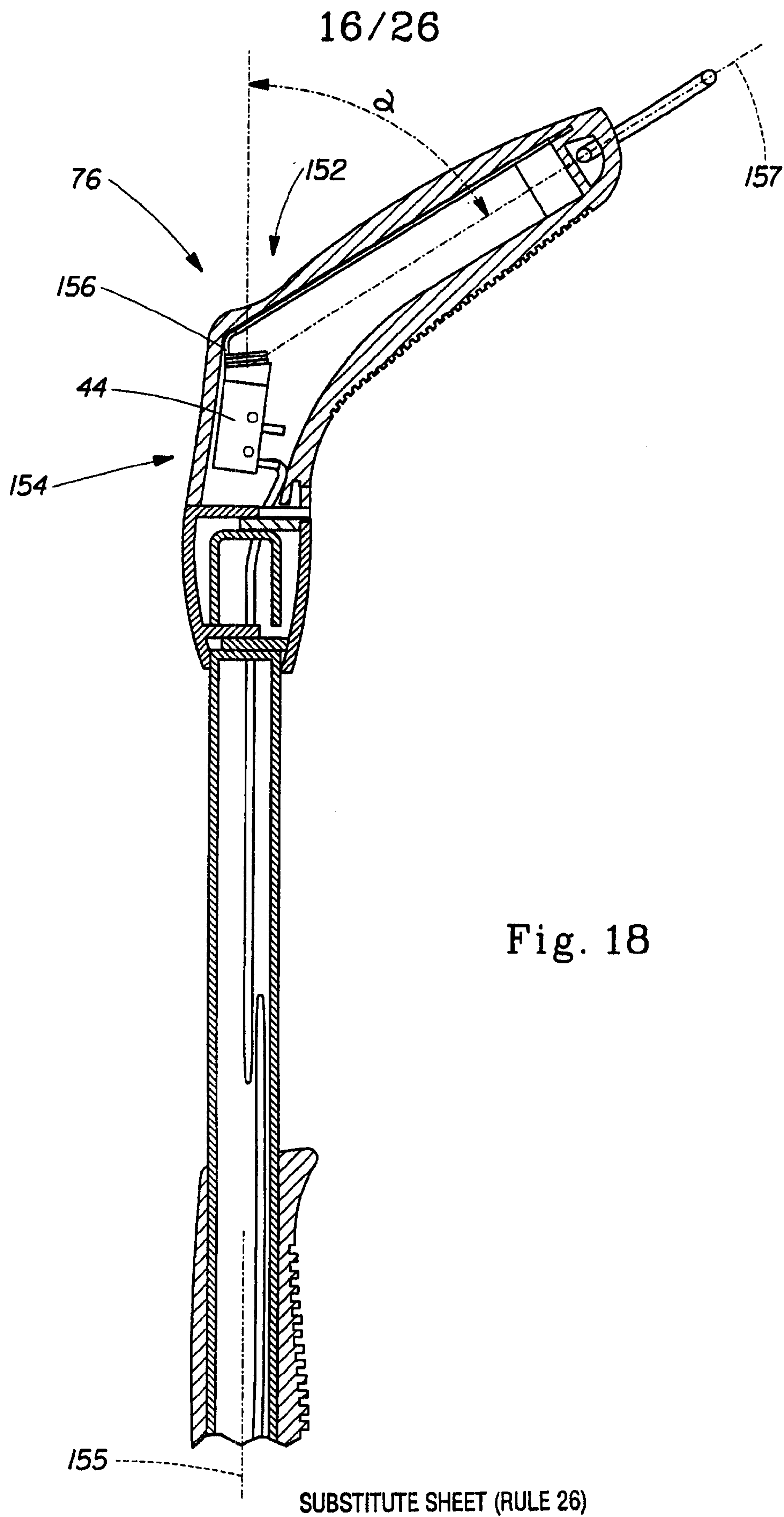
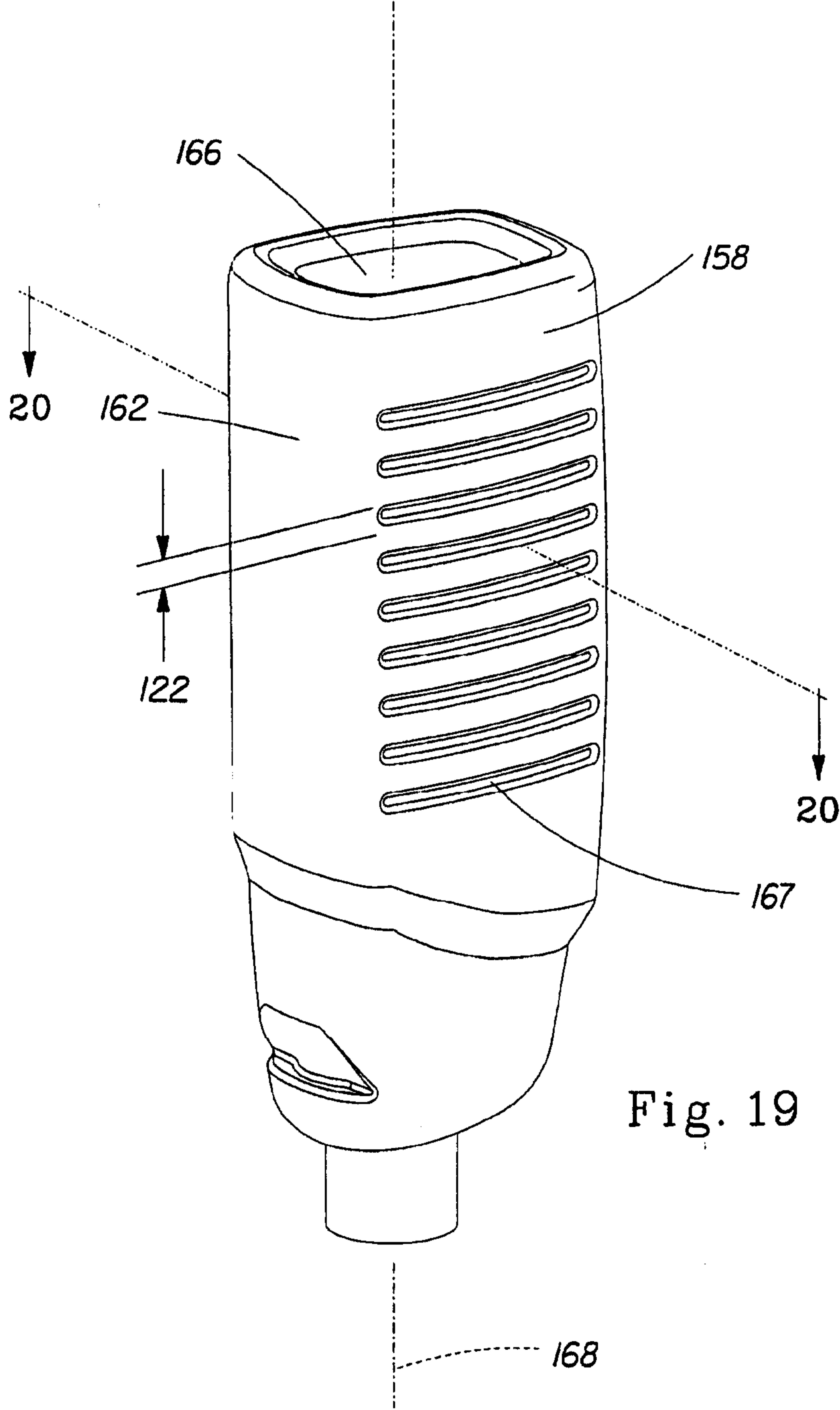


Fig. 18

SUBSTITUTE SHEET (RULE 26)

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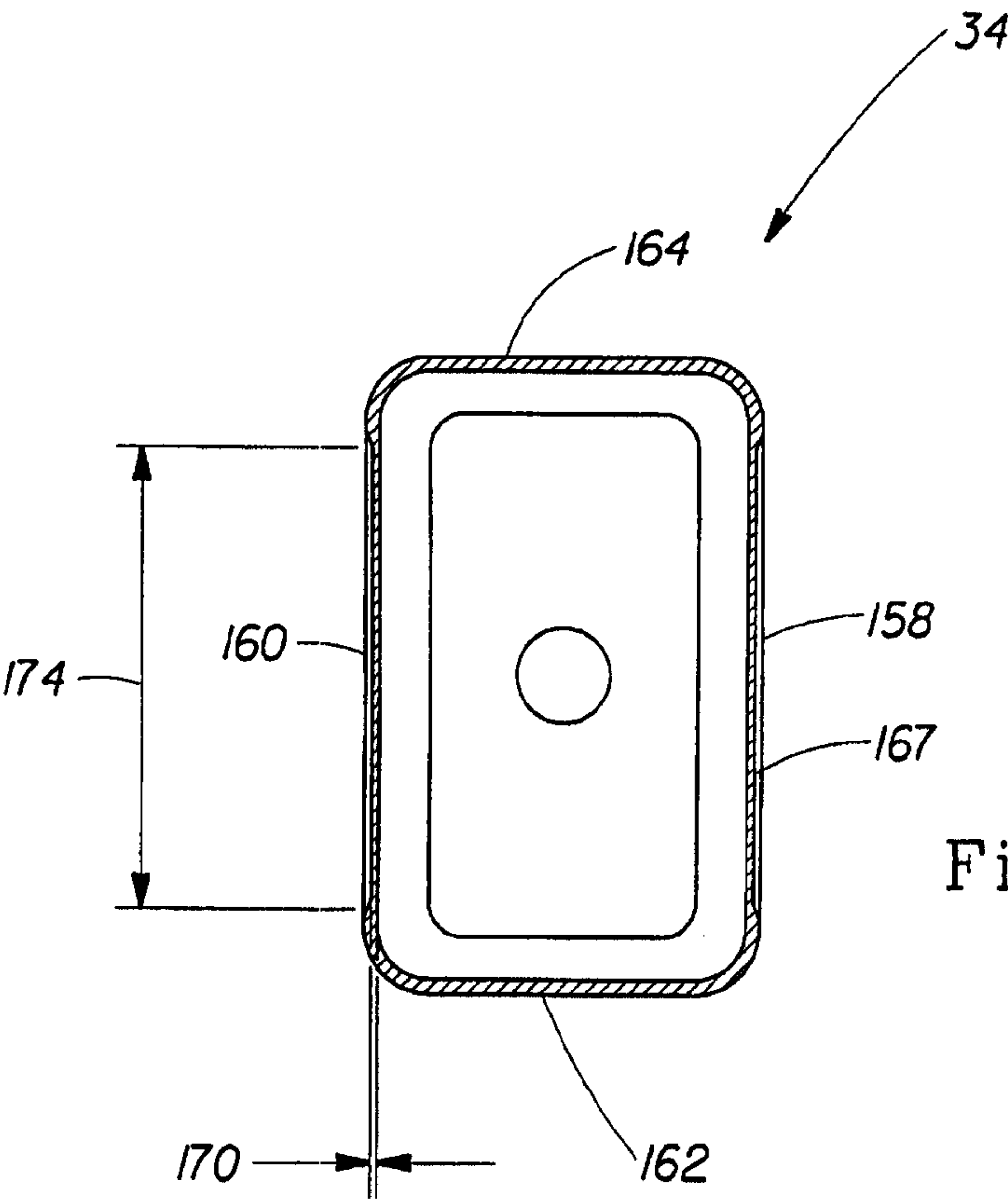


Fig. 20

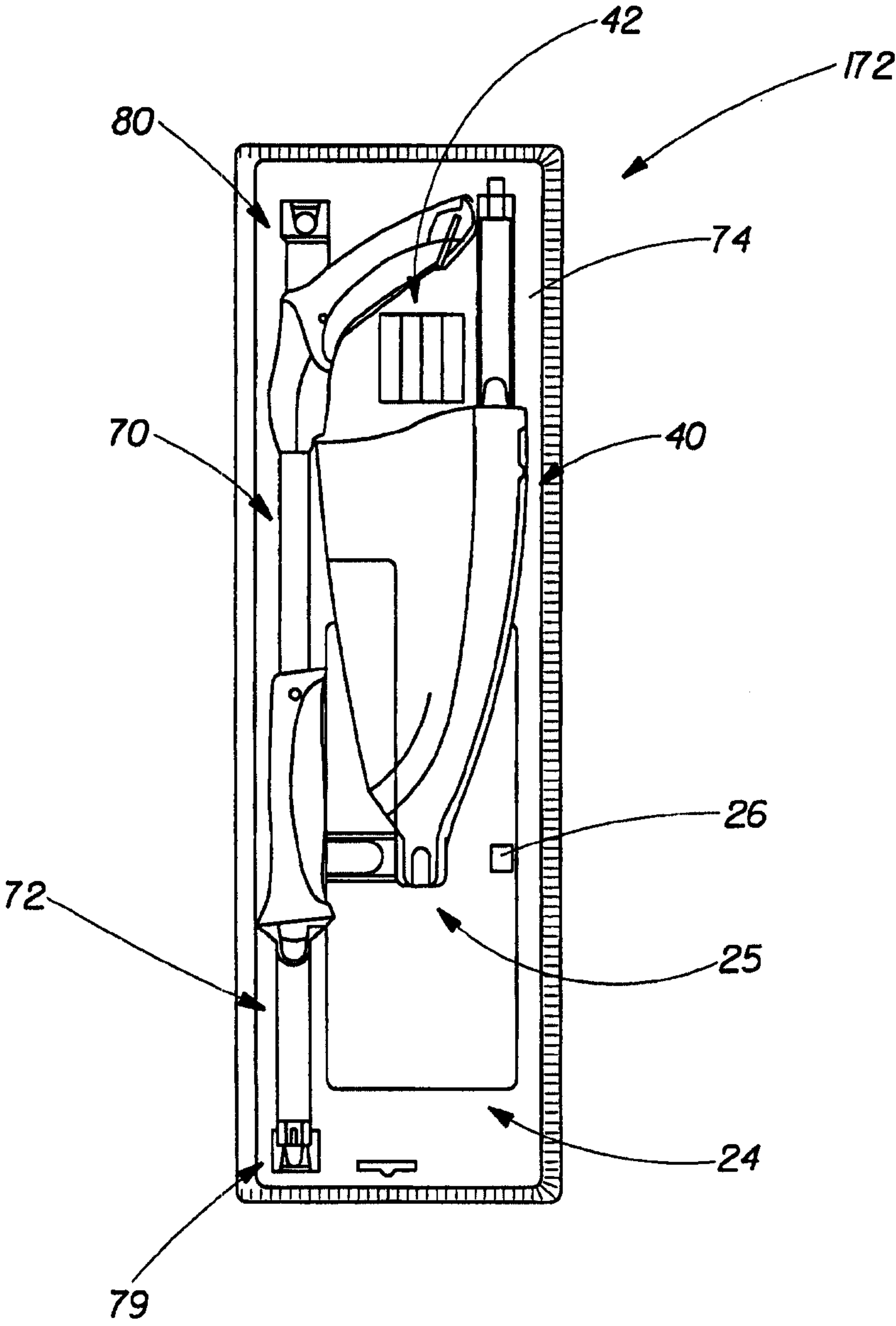


Fig. 21

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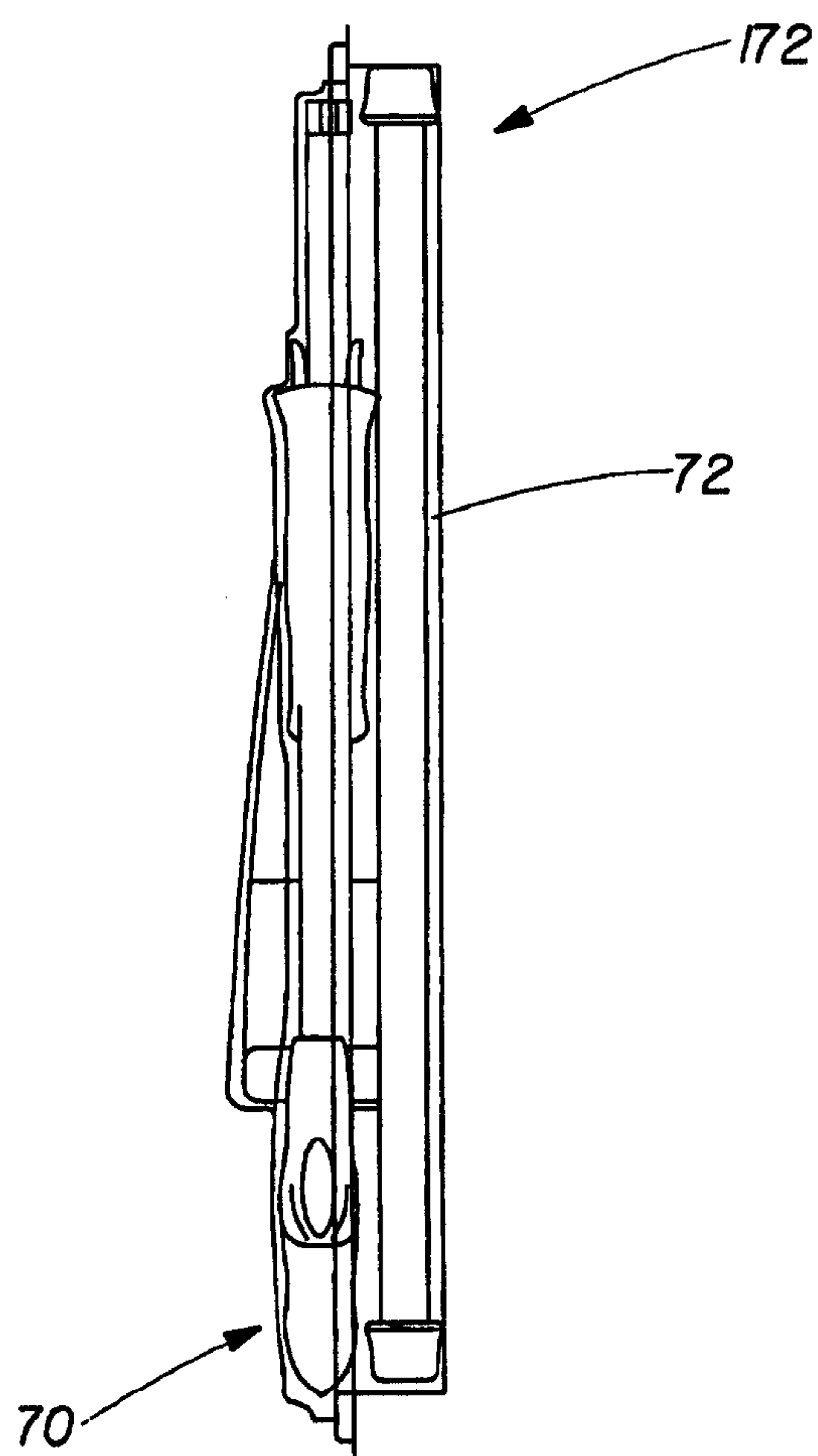


Fig. 22

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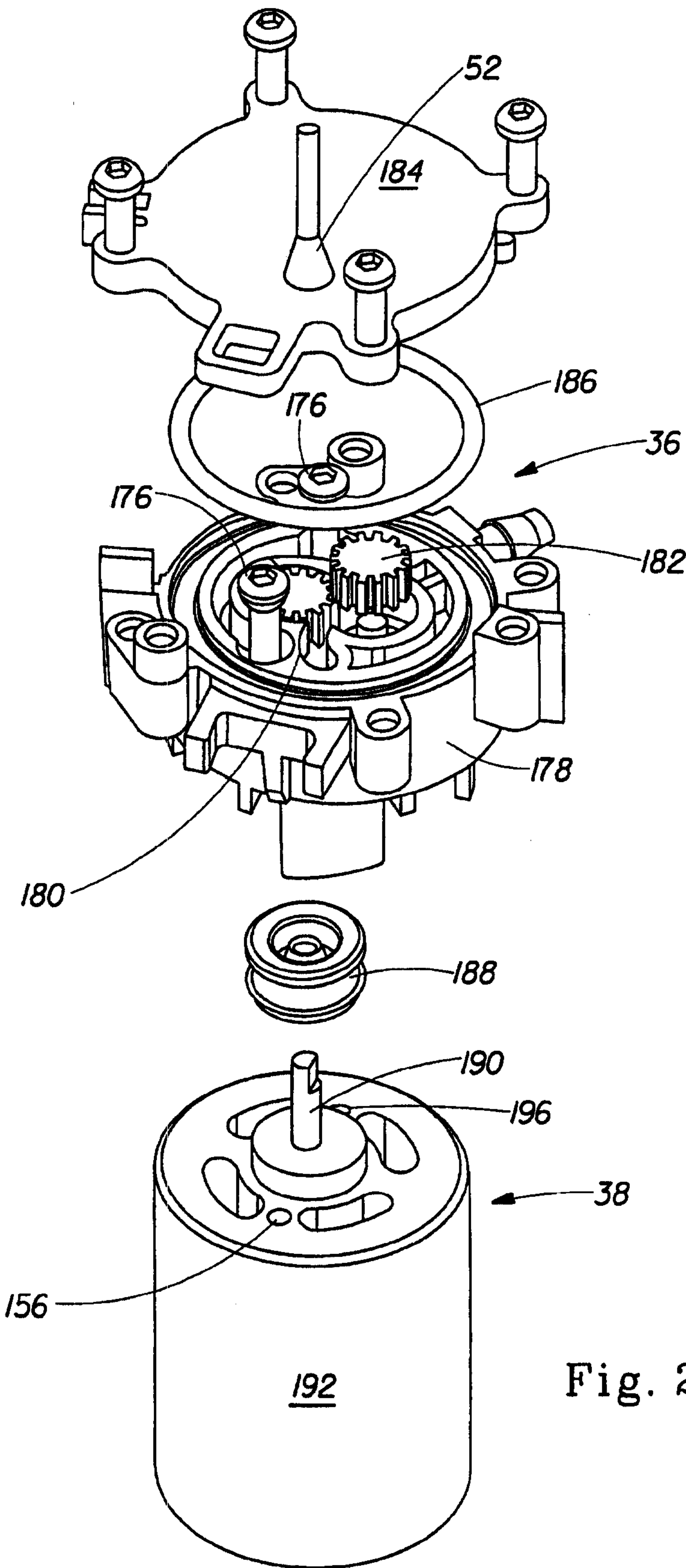


Fig. 23

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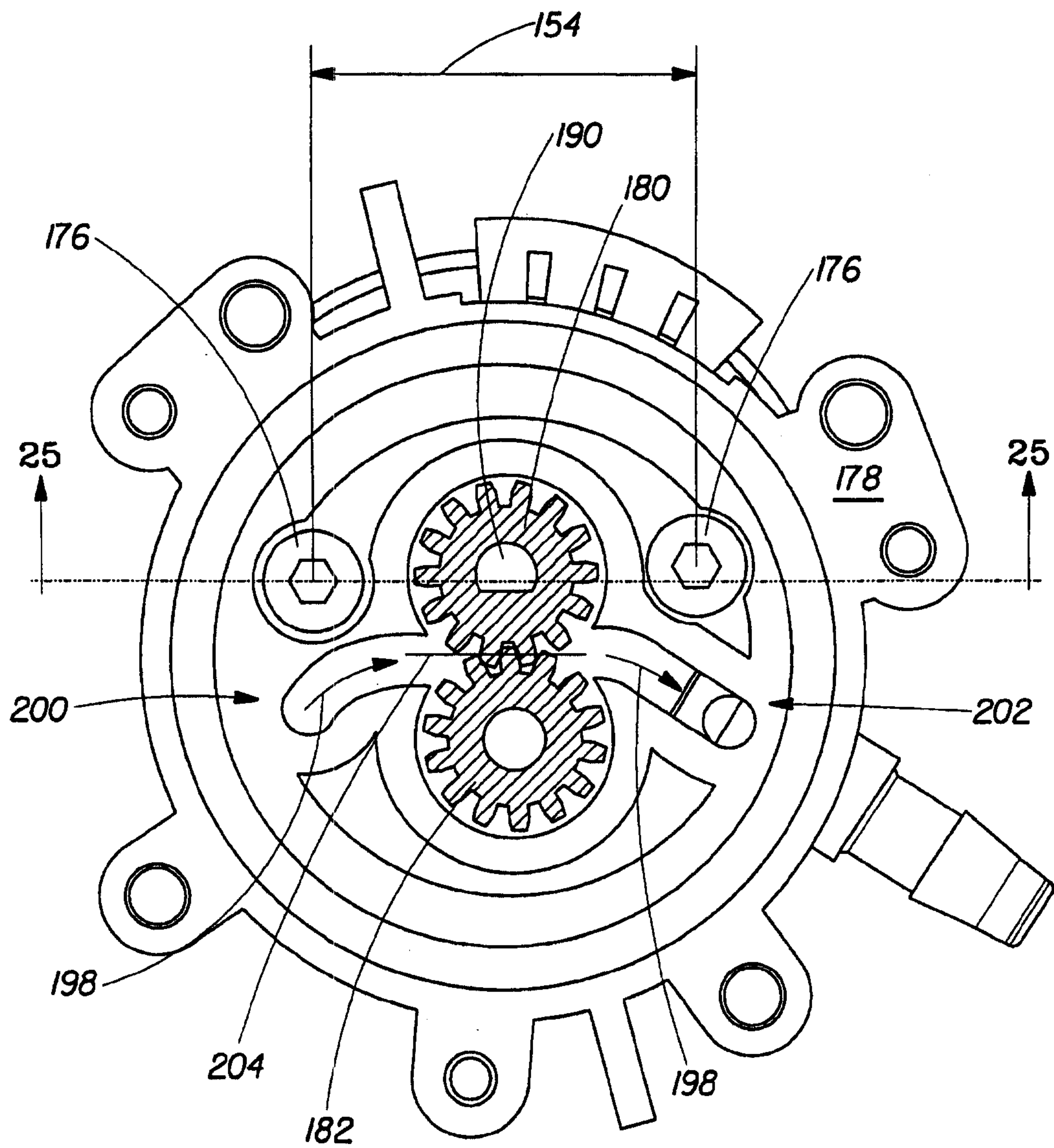


Fig. 24

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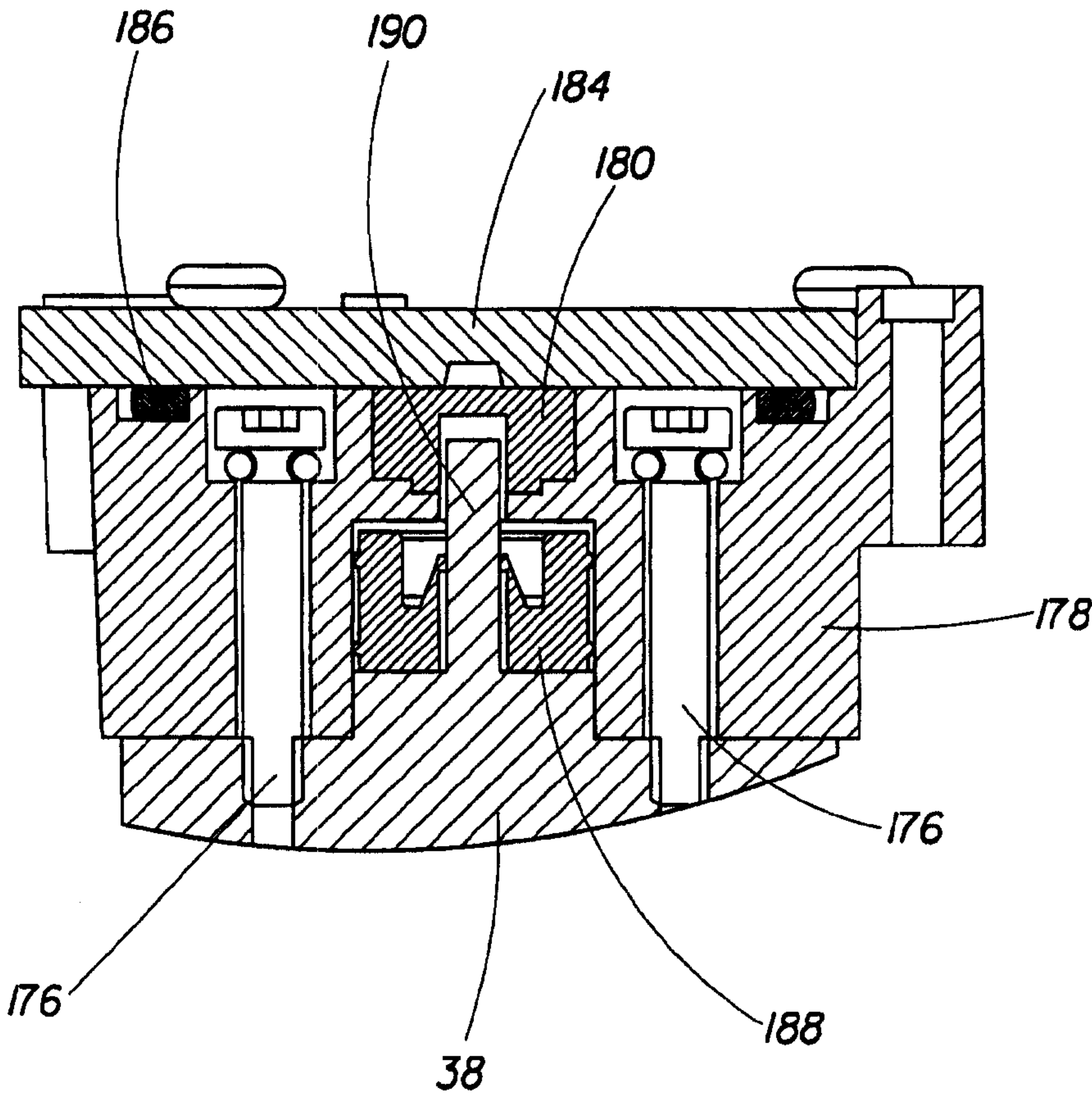


Fig. 25

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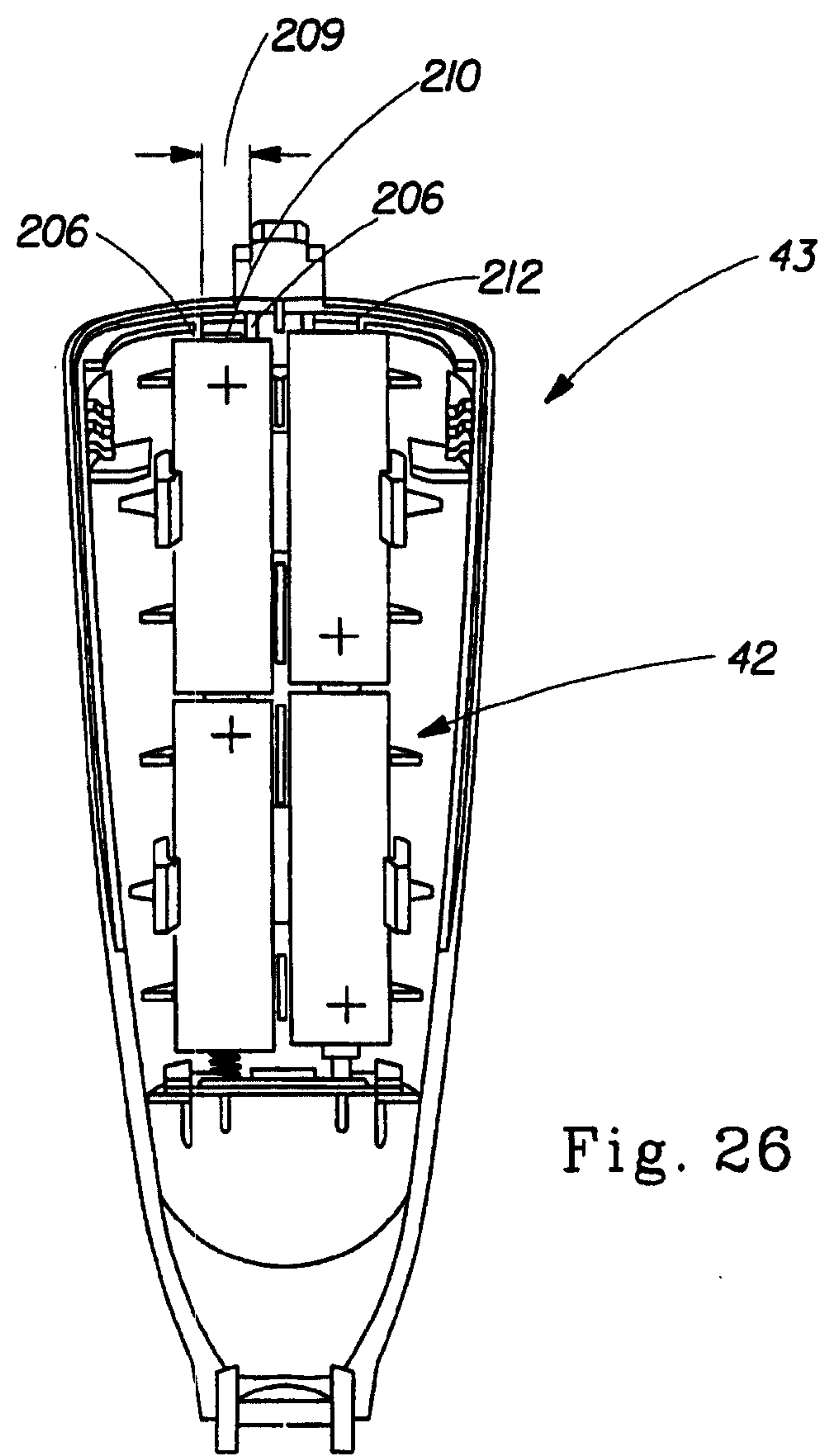
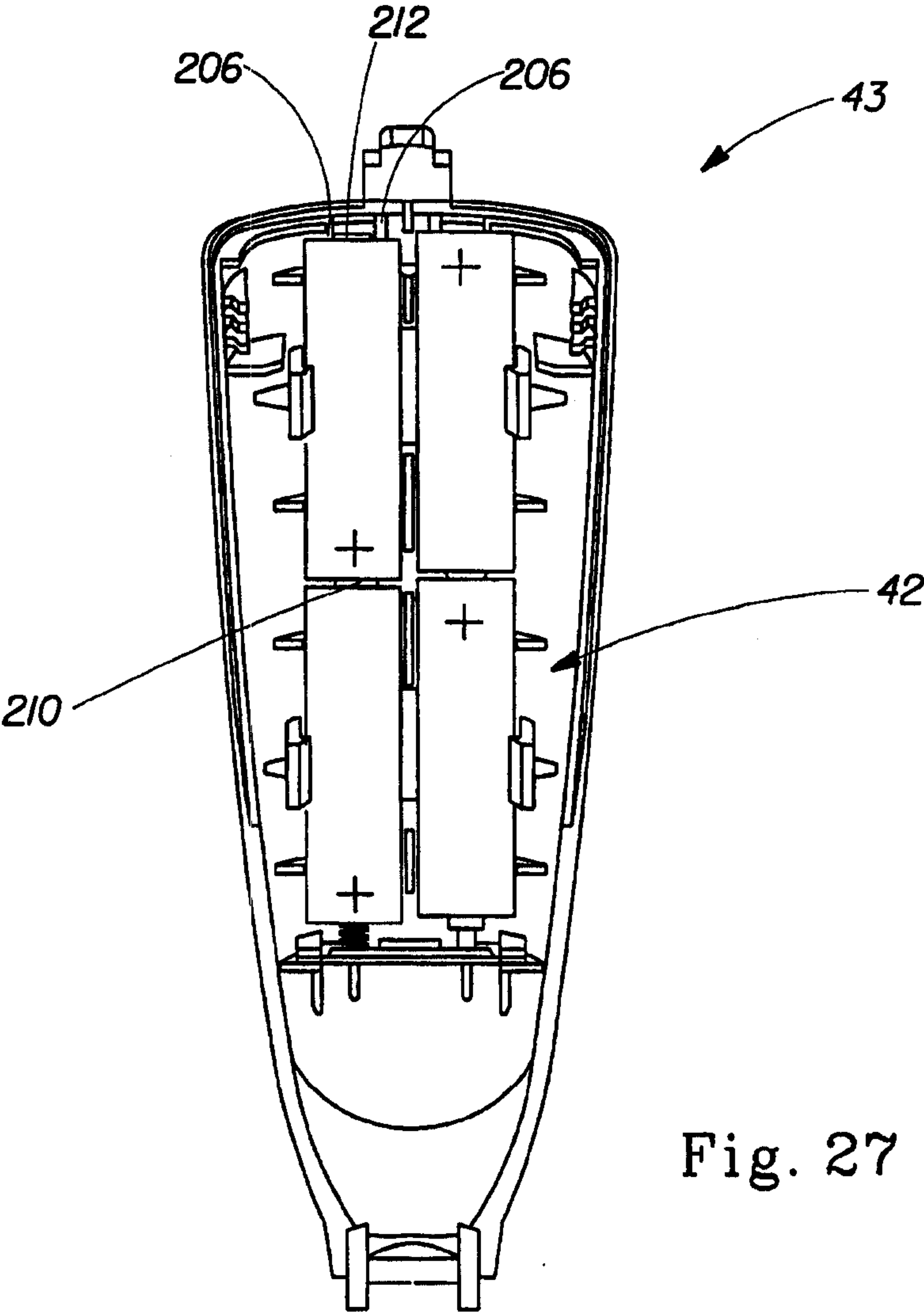


Fig. 26

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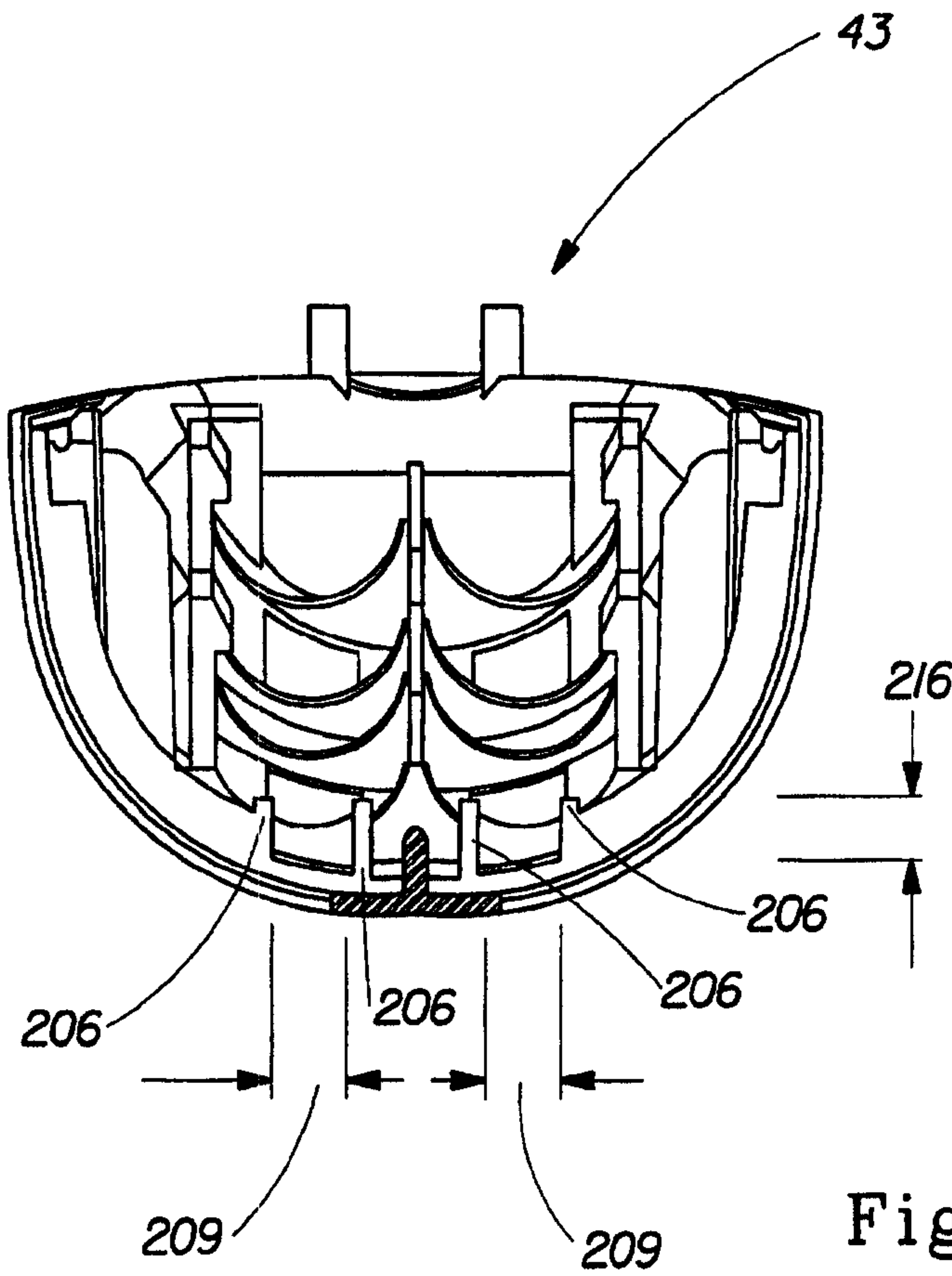


Fig. 28

