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(54) Titre : INJECTEUR A USAGE UNIQUE COMPRENANT UNE UNITE DE PREMONTAGE SIMPLIFIANT
L'ASSEMBLAGE

(54) Title: SINGLE-USE INJECTOR HAVING A RELEASE ASSEMBLY UNIT FOR SIMPLIFIED ASSEMBLY

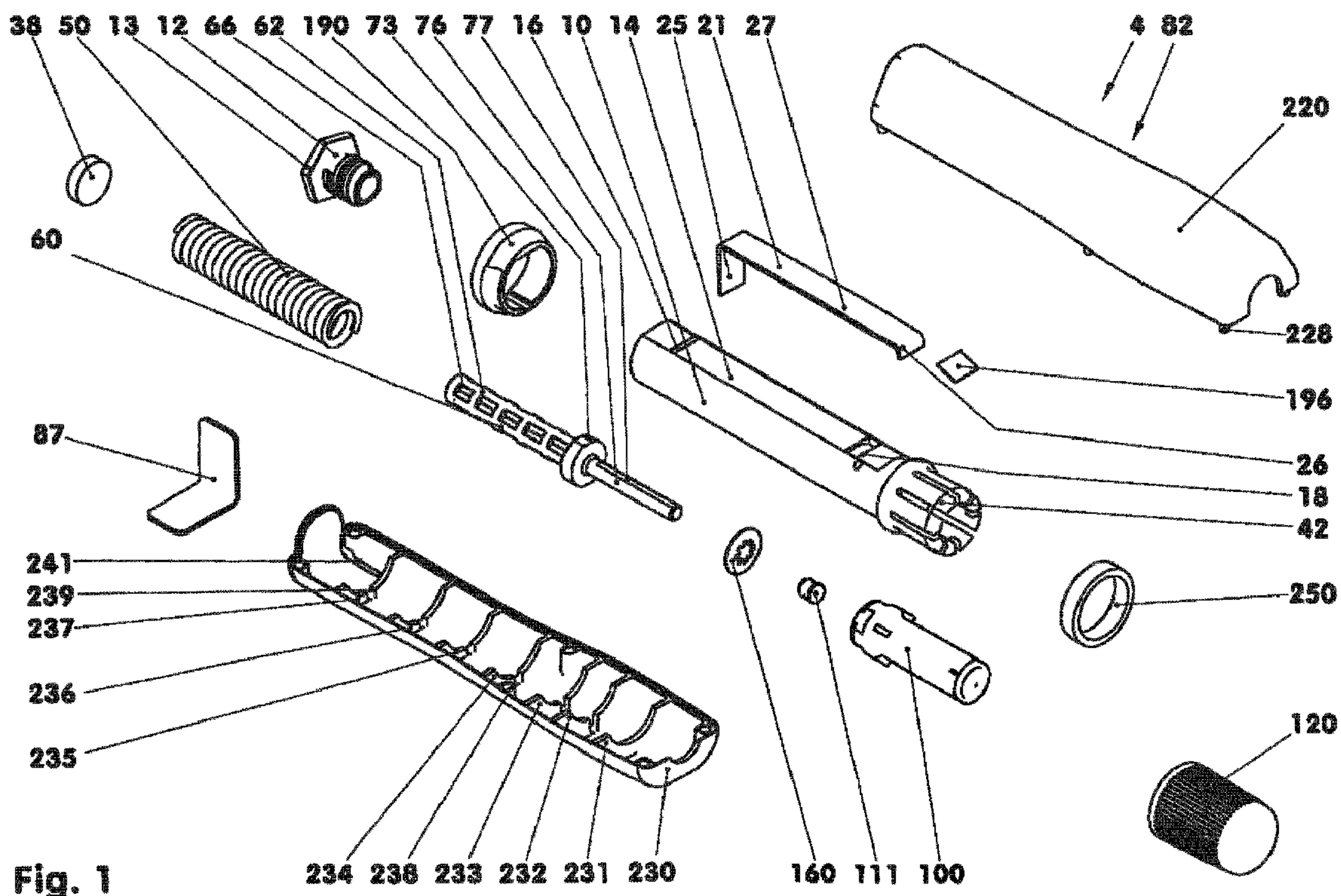


Fig. 1

(57) **Abrégé/Abstract:**

The invention relates to a single-use injector having a plunger actuation means (60) which is mounted in a housing (10), which is loaded by means of a spring energy storage means, and which can be unlocked by means of a moveable release device (80),

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

wherein the plunger actuation means can be supported by a traction rod (21) mounted in the housing. The release device comprises a casing housing (82). The casing housing comprises an upper shell and a lower shell, the separation line of which is oriented in the longitudinal direction of the single-use injector. The casing housing has a cornerless cross-section deviating from the circular shape. In addition, the housing is anti-rotationally centred in the casing housing. According to the invention, a single-use injector is developed wherein the production, assembly and handling thereof is simplified.

ABSTRACT

The invention relates to a single-use injector having a plunger actuation means (60) which is mounted in a housing (10), which is loaded by means of a spring energy storage means, and which can be unlocked by means of a moveable release device (80), wherein the plunger actuation means can be supported by a traction rod (21) mounted in the housing. The release device comprises a casing housing (82). The casing housing comprises an upper shell and a lower shell, the separation line of which is oriented in the longitudinal direction of the single-use injector. The casing housing has a cornerless cross-section deviating from the circular shape. In addition, the housing is anti-rotationally centred in the casing housing. According to the invention, a single-use injector is developed wherein the production, assembly and handling thereof is simplified.

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SINGLE-USE INJECTOR HAVING A RELEASE ASSEMBLY UNIT FOR
SIMPLIFIED ASSEMBLY**Description:**

5 The invention relates to a disposable injector having a
piston actuation ram which is supported in a housing
and which is loaded by means of a resilient energy
store and which can be unlocked by means of a
displaceable triggering device, wherein the piston
10 actuation ram can be supported by means of a tensile
rod which is supported in the housing.

DE 10 2008 063 519 A1 discloses such a disposable
injector. The production and assembly of this
15 disposable injector are complex.

The problem addressed by the present invention is to
simplify the production, the assembly and the handling
of the disposable injector.

20

This problem is solved with the features of the main
claim. To this end, the triggering device comprises a
covering housing. The covering housing comprises an
upper shell and a lower shell whose separation joint is
25 orientated in the longitudinal direction of the
disposable injector. The covering housing has a
cornerless cross-section which differs from the
circular shape. Furthermore, the housing is centered in
a rotationally secure manner in the covering housing.

30

Other details of the invention will be appreciated from
the dependent claims and the following descriptions of
schematically illustrated embodiments.

35 Figure 1: is an exploded drawing of a disposable
injector;

Figure 2: is a dimetric illustration of the housing;

Figure 3: shows a piston actuation ram;

Figure 4: shows a tensile rod;

Figure 5: shows a triggering ring;

Figure 6: shows a support disk;

Figure 7: shows a preassembly group without any cylinder/piston unit;

5 Figure 8: is a longitudinal section of the preassembly group from Figure 7;

Figure 9: shows a preassembly group and covering housing prior to the final assembly;

Figure 10: shows a disposable injector after assembly;

10 Figure 11: is a cross-section of the disposable injector from Figure 10;

Figure 12: is a longitudinal section of the disposable injector from Figure 10;

15 Figure 13: is a longitudinal section which is normal relative to Figure 12;

Figure 14: shows a disposable injector after the triggering;

Figure 15: shows a disposable injector with an emptied cylinder/piston unit.

20

Figures 1 - 15 show a disposable or single-use injector (4). Such injectors (4) are used for the one-off introduction of an injection solution (1) or a solvent into the skin of a patient.

25

The single-use injector (4) illustrated in Figure 1 as an exploded view comprises an inner housing (10), a resilient energy store (50), a piston actuation ram (60), a tensile rod (21), a triggering ring (190), a
30 cylinder/piston unit (100) and a covering housing (82).

The housing (10), cf. also Figure 2, has, for example, a length of 127 millimeters. It is tubular and has a substantially cylindrical inner contour. The inner
35 diameter is in the embodiment 15.5 millimeters. In the rear region facing away from the injection location, a single-flight inner thread (11) is arranged, cf. Figure 8. The outer contour of the housing (10) has a

cylindrical basic shape with a diameter of, for example, 20.5 millimeters and with a flattened portion (14). In the embodiment, the flattened portion (14) is flush with the rear end of the housing (10) and has a length of 100 millimeters. In both end regions of the flattened portion (14), the housing (10) has slot-like apertures (16) and (18), wherein the upper aperture (16) extends through the housing (10). With respect to the flattened portion (14), the housing (10) has a guiding rib (15) which is orientated in the longitudinal direction (5). In the front region facing the injection location, the housing has inwardly protruding resilient hooks (42). Between the front and the rear region, an annular housing expansion (211) is arranged. Close to this housing expansion (211) there are arranged in the rear region of the housing (10) assembly openings (212) which extend through the cover of the housing (10).

20 The resilient energy store (50) is in the embodiment a cylindrical helical compression spring (50) with an outer diameter of, for example, 15.2 millimeters. It is produced from austenitic steel and has along the length thereof a constant wire diameter. The diameter is 2.7 millimeters in the embodiment. The compressed spring (50) has a length of 65 millimeters. In the relaxed state, the helical compression spring (50) is, for example, more than 35% longer than this value.

30 In Figure 3, the piston actuation ram (60) is illustrated as a single component. It comprises a, for example, cylindrical guiding journal (62), a ram plate (73) and a piston sliding member (76). The piston actuation ram (60) is produced, for example, from a glass-fiber-reinforced plastics material. The thermoplastic plastics material used is, for example, a polyamide.

The guiding journal (62) is shorter than the length of the compressed helical compression spring (50). It has circle-segment-like recesses (66) which are orientated in a radial direction. These are, for example, distributed over the periphery of the guiding journal (62) and along the length thereof. In the embodiment, the mass of the guiding journal (62) is thereby 10% lower than the mass of a cylindrical guiding journal without recesses. The guiding journal (62) may also be constructed in a tubular manner.

The ram plate (73) of the piston actuation ram (60) is constructed in a disk-like manner and orientated normally with respect to the longitudinal center axis (7) of the disposable injector (4). The diameter thereof is, for example, 14.8 millimeters. It has a conical collar face (75) which faces away from the guiding journal (62). The apex angle of the notional cone of the collar face (75) is, for example, 160 degrees. At mutually opposing sides of the peripheral face (74), the ram plate (73) has a flattened portion (79) in each case.

The piston sliding member (76) is constructed in a rod-like manner and has in the embodiment a diameter of 5.2 millimeters. Two mutually opposing key flats (77) which are orientated in the longitudinal direction (5) each have a length of, for example, 32 millimeters. The collar face (75) of the ram plate (73) merges in a peripheral groove (78) into the piston sliding member (76).

Figure 4 shows the tensile rod (21), which is produced from a sheet metal strip, for example, with a constant rectangular cross-sectional surface-area. The material thereof is, for example, a rust-resistant and acid-resistant steel, for example, X10CrNi18-8 with the material number 1.4310. This austenitic material is,

for example, used to produce springs. The elasticity modulus thereof is, for example, greater than 190,000 Newton per square millimeter. The length of the tensile rod (21) is in the embodiment 77 millimeters, the width thereof is 10 millimeters and the thickness thereof is 1.2 millimeters. It is constructed in a U-shaped manner and comprises a main member (27), a clamping member (25) and a wrap-around hook (26). The clamping member (25) which is bent, for example, by means of a bending shaping method defines an angle of 90 degrees with the main member (27). The wrap-around hook (26) defines with the main member (27) an angle of 100 degrees. The length of the wrap-around hook (26) is, for example, 20% of the length of the clamping member (25).

The triggering ring (190) which is illustrated in a dimetric view in Figure 5 is in the embodiment produced from a glass-fiber-reinforced thermoplastic plastics material. This is, for example, polyamide PA 6.6 with 30% glass fiber proportion. The covering face of the triggering ring (190) has an upper cylindrical portion (192) and a lower portion (191). The lower portion (191) is constructed in a partially cylindrical and partially frustoconical manner. The inner wall (193) which is cylindrical in terms of the basic shape has at one side a rotation prevention groove (194) which is orientated in the longitudinal direction (5). At the opposite side, an oblique abutment face (195) is formed. This abutment face (195) is, for example, orientated at an angle of 20 degrees with respect to the longitudinal direction (5). This angle, whose tip in the triggering direction (6) of the disposable injector (4) is located offset with respect to the triggering ring (190), may be between 10 degrees and 45 degrees. The abutment face (195) terminates at a lower shoulder (197). In the region of this lower shoulder (197), the inner wall is delimited by a chord of the basic shape.

During the assembly, a housing preassembly unit (260) is assembled, cf. Figures 7 and 8. In this instance, for example, a support disk (160) is first pushed onto
5 the piston sliding member (76) of the piston actuation ram (60).

In the embodiment, the support disk (160) illustrated as a single component in Figure 6 is a perforated disk.
10 It is produced, for example, from the same material as the tensile rod (21). Around the central hole there are arranged grooves (163) and wedges (162) by means of which the support disk (160) after the fitting is located in a positive-locking manner on the piston
15 sliding member (76) of the piston actuation ram (60). In the side view, the support disk (160) is constructed in a frustoconical manner. The apex angle corresponds to the apex angle of the collar face (75), against which the support disk (160) is in abutment after
20 fitting to the piston actuation ram (60).

The helical compression spring (50) is fitted to the guiding journal (62) of the piston actuation ram (60). In this instance, the relaxed helical compression
25 spring (50) protrudes beyond the piston actuation ram (62).

An adjustment disk (38) is inserted in the housing (10). The thickness of this cylindrical disk (38)
30 determines the pretensioning of the single-use injector (4). The thicker the adjustment disk (36) is, the higher is the injection pressure of the single-use injector (4). Where applicable, the housing preassembly unit (260) may also be constructed without an
35 adjustment disk (38).

The clamping member (25) of the tensile rod (21) is introduced in the upper housing slot (16) so that the

main member (27) faces in the direction of the housing expansion (19). Where applicable, the main member (27) may be in abutment with the flattened portion (14). The tensile rod (21) is consequently arranged in an asymmetrical manner in the housing (10).

The piston actuation ram (60) with the helical compression spring (50) and the support ring (60) is introduced from the side of the resilient hooks (42) into the inner space (17) of the housing (10). The helical compression spring (50) is then in abutment with the adjustment disk (38) and this disk contacts the clamping member (25).

The triggering ring (190) is - before or after the piston actuation ram (60) has been introduced - fitted from the rear onto the housing (10). In this instance, a sliding plate (196) is placed in the triggering ring (190). This rectangular sliding plate (196) is, for example, produced from the same material as the tensile rod (21) and has, for example, a thickness of 0.5 millimeters. It is in abutment with the abutment face (195) of the triggering ring (190) and is supported on the shoulder (197). It may optionally be fixed at that location.

When the triggering ring (190) is pushed on, it is guided on the tensile rod (21) and on the guiding rib (15) of the housing (10). The triggering ring (190) is pushed on until it is in abutment with the housing expansion (19) below the rectangular housing recess (18).

A support screw (12) is screwed into the inner thread (11) of the housing (10) until it is in abutment with the clamping member (25) or presses against it. The support screw (12) has, for example, a hexagonal portion (13) for positioning a tool. Where applicable,

the thread (213) of the support screw (12) and/or the housing (10) may have a planar tooth arrangement in order to prevent unintentional release of the support screw (12).

5

The piston actuation ram (60) is now pressed, for example, by means of a tool into the housing (10). The helical compression spring (50) is tensioned. In this instance, for example, the housing (10) is retained on
10 a retention ring (211). The wrap-around hook (26) of the tensile rod (21) is introduced into the rectangular recess (18) and placed at the lower side (161) of the support disk (160) which armours the collar face (75). The triggering ring (190) is pulled upward until it is
15 in abutment with the tensile rod (21). The tensile rod (21) is now supported on the sliding plate (196) which forms an armour-plating of the triggering ring and acts as a locking rod (21). In order to secure the assembly position, it is possible to introduce a, for example,
20 U-shaped curved member into assembly openings (212) of the housing (10). This curved member secures the position of the triggering ring (190) after the clamping device of the resilient energy store (50) has been removed. Even with relatively long-term storage,
25 the resiliently loaded tensile rod (21) does not cause any deformations of the sliding plate (196). Consequently, even after a relatively long period of storage, reliable triggering is ensured.

30 In the lower region of the housing (10), a securing ring (250) may be placed on the resilient hooks (42) until it is, for example, in abutment with the retention ring (211). In this instance, the splayed resilient hooks (42) are pressed together so that,
35 after the assembly, the securing ring (250) is located with a clearance fit in a non-releasable manner on the housing (10). This housing preassembly unit (260) may now, for example, be conveyed to another workplace.

In another production line, the cylinder/piston unit (100) is, for example, produced and filled. The cylinder/piston unit (100) comprises a, for example, transparent cylinder (101) and a piston (111) which is guided in the cylinder (101). In the upper region, the cylinder (101) has a peripheral collar (108). The discharge opening (106) of the cylinder/piston unit (100) arranged at the end face (103) is constructed as a short, cylindrical, nozzle-like hole (106). The diameter of this hole (106) is, for example, 0.18 millimeters.

After the cylinder (101) has been filled, the piston (111) which is then located with a press-fit in the cylinder (101) is inserted. The closure cap (120) can now be positioned. This has on the peripheral face (122) thereof a fluting (123) in order to prevent fingers from sliding off. The piston/cylinder unit (100) which has been provided in this manner can now be stored until further assembly.

Prior to the final assembly, the cylinder/piston unit (100) is inserted into the housing preassembly group (260), cf. Figure 9. In this instance, the cylinder/piston unit (100), with the resilient hooks (42) being expanded, is inserted into the housing (10) until the resilient hooks (42) engage behind and lock the collar (108). The resilient hooks (42) act as catch hooks (42). Now, the securing ring (250) is pushed forward and presses the catch hooks (42) against the cylinder/piston unit (100). The cylinder/piston unit (100) is now retained in the housing (10) in a non-releasable manner. The closure cap (120) is spaced apart from the housing (10). This subassembly (261) can be handled, transported and stored.

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The covering housing (82) comprises in the embodiment an upper shell (220) and a lower shell (230). The separation joint (83) of both shells (220, 230) is orientated in the longitudinal direction (5) of the disposable injector (4).

The two shells (220, 230) of the covering housing (82) have at the inner side thereof in each case reinforcement ribs (221-227; 231 - 237). These transverse ribs (221 - 227; 231 - 237) are orientated normally with respect to the longitudinal direction (5) of the single-use injector (4). In this instance, the rear reinforcement ribs (223 - 227; 232 - 237) each have two portions between which a groove (239) is arranged. The foremost reinforcement ribs (221, 222; 231) facing away from the operator are each constructed in an interruption-free manner. The upper shell (220) and the lower shell (230) are connected to each other, for example, by means of a plurality of journal connections (228, 238). In this instance, in the embodiment, the upper shell (220) has at the separation joint (83) six journals (228) which engage in journal holes (238) of the lower shell (230). Where applicable, the journal connections (228, 238) may engage with each other during the assembly. Adhesive bonding of the lower shell (230) to the upper shell (220) is also conceivable.

The housing (10) and the covering housing (82) are, for example, produced from plastics material. This may be a thermoplastic or thermosetting material, for example, POM, ABS, etcetera.

During the final assembly of the disposable injector (4), the housing preassembly group (260) is placed with the cylinder/piston unit (100), for example, in the lower shell (230). In this instance, the rib (15) of the housing (10) is centered in the longitudinal groove

(239) of the lower shell (230). The triggering ring (190) is located between the second transverse ribs (222, 232) and the third transverse ribs (223, 233). The head of the support screw (12) protrudes beyond the
5 rearmost transverse rib (227; 237). The closure cap (120) is located outside the covering housing (82). There is inserted into the slot (241) the securing element (87) which, for example, is clamped between the securing screw (12) and the covering housing (82). The
10 support screw (12) can be secured against further rotation, for example, in a positive-locking manner. Where applicable, an additional compression spring between the support screw (12) and the covering housing (82) can increase the resistance against unintentional
15 triggering. This spring also determines the resistance of the disposable injector (4) during triggering. The U-shaped curved member can be removed.

In order to complete the assembly, the upper shell
20 (220) is placed on the lower shell (230) and secured, for example, by means of adhesive bonding, engagement, etcetera. Now, an additional originality closure, for example, a banderole may be fitted over the covering housing (82) and the closure cap (120). It is also
25 conceivable for the assembly to be carried out in a different sequence from the one described.

The completely assembled disposable injector (4) is illustrated in Figure 10 as a dimetric view and in
30 Figure 11 in cross-section. The cross-section of the covering housing (82) has no corners and edges and deviates from a circular shape. In the embodiment, the cross-section is constructed in a similar manner to a regular triangle with rounded corners. However, it is
35 also conceivable to construct the cross-section in a manner similar to a polygon.

The cross-sectional surface-area in the rear region of the disposable injector (4) is 70% of the cross-sectional surface-area in the front region of the disposable injector (4) facing the injection location.

5 The constant increase of the cross-sectional surface-area is located, when viewed from the rear, in the third quarter of the length of the disposable injector (4). Consequently, the disposable injector (4) can be readily gripped by the operator. For example, he

10 encloses the cover housing (82) with all his fingers. In this instance, the outlet opening (106) may be located, for example, at the side of the index finger or at the side of the little finger.

15 The fully assembled disposable injector (4) may now be packaged and marketed. If, for example, it is placed on a table after unpacking, as a result of the housing geometry there is no risk of it rolling away.

20 The disposable injector (4) which is illustrated in Figures 12 and 13 in longitudinal sections which are orientated normally with respect to each other comprises the covering housing (82) in which the inner housing (10) with the piston actuation ram (60) and the

25 helical compression spring (50) as a permanently loaded resilient energy store (50) and the cylinder/piston unit (100) are arranged. The piston actuation ram (76) is spaced apart from the piston (111) by means of an intermediate space (141). The cylinder/piston unit

30 (100) is closed by means of the protective cap (120). The triggering of the single-use injector (4) is prevented by means of the securing sliding member (87). In this instance, the side of the transverse ribs (222, 232) facing the triggering ring (190) forms a locking

35 flank (242).

Before the single-use injector (4) is used, the originality closure is first removed. After the closure

cap (120) has been removed, the securing element (87) can be pulled out. The single-use injector (4) is now ready for use and is, for example, placed on the skin of the patient. In this state, the self-locking between
5 the locking rod (21) and the triggering ring (190) also prevents unintentional self-triggering of the disposable injector (4).

In order to trigger the single-use injector (4), the
10 triggering device (80) is actuated by the operator. The operator presses the covering housing (82), which forms a triggering element in the structural form of a triggering sleeve (82), in the triggering direction (6) relative to the housing (10) in a forward direction,
15 that is to say, in the direction of the skin of the patient. The triggering sleeve (82), in this instance by means of the side of the transverse rib (222, 233) facing the triggering ring (190), which rib forms a triggering flank (243), displaces the triggering ring
20 (190) downward relative to the housing (10), cf. the sectioned illustrations of Figures 12-15. In Figure 14, the non-static state directly after the triggering is illustrated. The resilient energy store (50) presses the ram plate (73) forward. In this instance, the
25 pressure disk (160) displaces the wrap-around hook (26) of the locking rod (21). The locking rod (21) slides along the sliding plate (196) in an outward direction and consequently completely releases the piston actuation ram (60). In this instance, the locking rod
30 (21) may where applicable strike an insulating rubber layer. The piston actuation ram (60), in a state loaded by the relaxing resilient energy store (50), rapidly moves forward or downward. The piston sliding member (76) strikes the piston (111) and pushes it forward. In
35 this instance, the air is displaced from the intermediate space (141) along the key flats (77). The injection solution (1) which is stored in the cylinder (101) is displaced through the outlet opening (106) and

the hard skin of the patient into the body of the patient.

Figure 15 shows the single-use injector (4) after the
5 triggering. The triggering device (80) and the
triggering ring (190) are displaced downward relative
to the housing (10). The limit stop of the triggering
sleeve (82) on the securing ring (250) prevents the
triggering device (80) from being pushed further out
10 relative to the housing (10). The locking rod (21) is
displaced outward. In this instance, it blocks, for
example, the release sleeve (82) with the triggering
ring (190) from being pushed in again. The resilient
energy store (50) is relaxed. The piston actuation ram
15 (60) is located in the front end position thereof. The
cylinder/piston unit (100) is emptied.

Of course, it is also conceivable to combine the
different embodiments mentioned with each other.

List of reference numerals:

- 1 Injection solution, water for injection purposes
- 4 Single-use injector, disposable injector
- 5 5 Longitudinal direction
- 6 Triggering direction
- 7 Longitudinal center axis
- 10 Housing
- 11 Inner thread
- 10 12 Support screw
- 13 Hexagonal portion
- 14 Flattened portion
- 15 Guiding rib
- 16 Housing opening, slot-like
- 15 17 Inner space
- 18 Housing opening with rectangular cross-section
- 19 Housing expansion
- 21 Support rod, locking rod
- 25 Clamping member
- 20 26 Wrap-around hook
- 27 Main member
- 38 Disk, adjustment disk
- 42 Catch hook, resilient hook
- 50 Resilient energy store, helical compression spring,
- 25 spring
- 60 Piston actuation ram
- 62 Guiding journal
- 66 Recesses
- 73 Ram plate
- 30 74 Peripheral face
- 75 Collar face
- 76 Piston sliding member
- 77 Key flats
- 78 Grooves
- 35 79 Flattened portion
- 80 Triggering device
- 82 Covering housing, triggering element, triggering sleeve

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- 83 Separation joint
- 87 Securing sliding member, securing element
- 100 Cylinder/piston unit
- 101 Cylinder
- 5 103 End face
- 106 Hole/discharge opening
- 108 Collar
- 111 Piston
- 120 Closure cap
- 10 122 Peripheral face
- 123 Fluting
- 141 Intermediate space
- 160 Support disk, pressure disk
- 161 Lower side
- 15 162 Wedges
- 163 Grooves
- 190 Triggering ring
- 191 Lower region
- 192 Cylindrical region
- 20 193 Inner wall
- 194 Rotation prevention groove
- 195 Abutment face
- 196 Metal insertion sheet, sliding plate
- 197 Shoulder
- 25 211 Retention ring
- 212 Assembly openings, securing element apertures
- 213 Thread
- 220 Upper shell
- 221, 222 Reinforcement ribs, transverse ribs, one-piece
- 30 223-227 Reinforcement ribs, transverse ribs, two-piece
- 228 Journal
- 230 Lower shell
- 231 Reinforcement rib, transverse rib, one-piece
- 232-237 Reinforcement rib, transverse rib, two-piece
- 35 238 Journal holes
- 239 Longitudinal groove
- 241 Slot
- 242 Locking flank

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243 Triggering flank

250 Securing ring

260 Housing preassembly unit, housing preassembly group

5 261 Subassembly

Patent Claims:

1. A disposable injector (4) having a piston actuation ram (60) which is supported in a housing (10) and which
5 is loaded by means of a resilient energy store (50) and which can be unlocked by means of a displaceable triggering device (80), wherein the piston actuation ram (60) can be supported by means of a tensile rod (21) which is supported in the housing (10),
10 characterized in that
- the triggering device (80) comprises a covering housing (82),
 - in that the covering housing (82) comprises an upper shell (220) and a lower shell (230) whose separation
15 joint (83) is orientated in the longitudinal direction (5) of the disposable injector (4),
 - in that the covering housing (82) has a cornerless cross-section which differs from the circular shape, and
 - 20 - in that the housing (10) is centered in a rotationally secure manner in the covering housing (82).
2. The disposable injector (4) as claimed in claim 1,
25 characterized in that the housing (10) comprises a triggering ring (190) which is arranged between a locking flank (242) and a triggering flank (243) of the covering housing (82).
- 30 3. The disposable injector (4) as claimed in claim 2, characterized in that there is arranged in the covering housing (82) a preassembly unit (260) which comprises the housing (10) with the resilient energy store (50), the piston
35 actuation ram (60), the tensile rod (21) and the triggering ring (190).
4. The disposable injector (4) as claimed in claim 1,

characterized in that
the tensile rod (21) is constructed in a U-shaped
manner and is arranged in an asymmetrical manner in the
housing (10).

5

5. The disposable injector (4) as claimed in claim 4,
characterized in that
the tensile rod (21) is constructed in a strip-like
manner and is supported in the housing (10) by means of
10 a clamping member (25).

6. The disposable injector (4) as claimed in claim 5,
characterized in that
the housing (10) has an inner thread (11) in which a
15 support screw (12) which clamps the tensile rod (21) is
screwed.

7. The disposable injector (4) as claimed in claim 1,
characterized in that
20 the housing (10) has securing element apertures (212).

8. The disposable injector (4) as claimed in claim 1,
characterized in that
it comprises a cylinder/piston unit (100) which is
25 arranged in a state secured in the housing (10) by
means of catch hooks (42) and a securing ring (250)
which surrounds them.

9. The disposable injector (4) as claimed in claim 1,
30 characterized in that
an adjustment disk (38) is arranged between the
resilient energy store (50) and the housing (10).

10. The disposable injector (4) as claimed in claim 1,
35 characterized in that
the housing (10) is supported in the covering housing
(82) by means of an unlockable securing element (87).

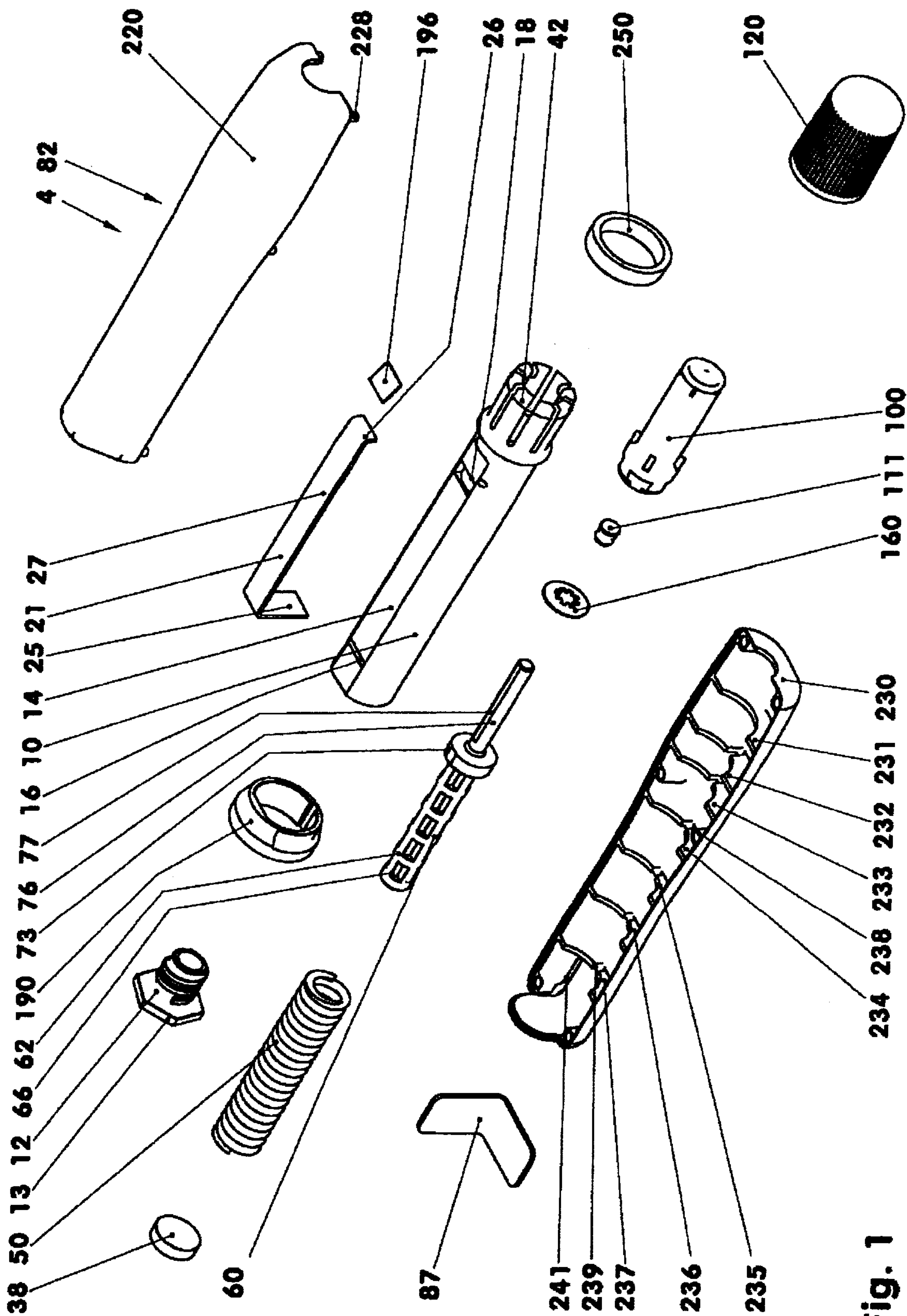


Fig. 1

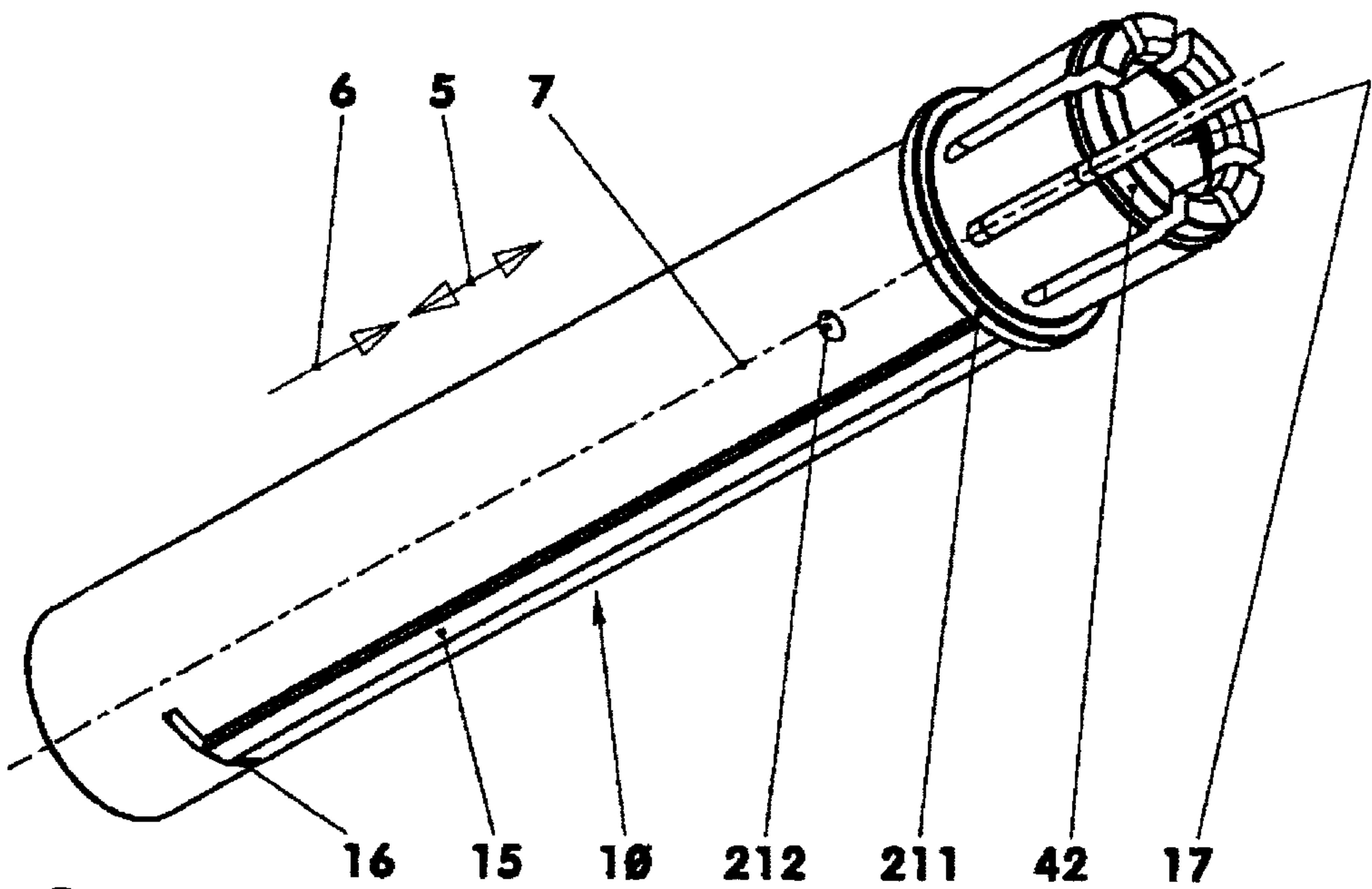


Fig. 2

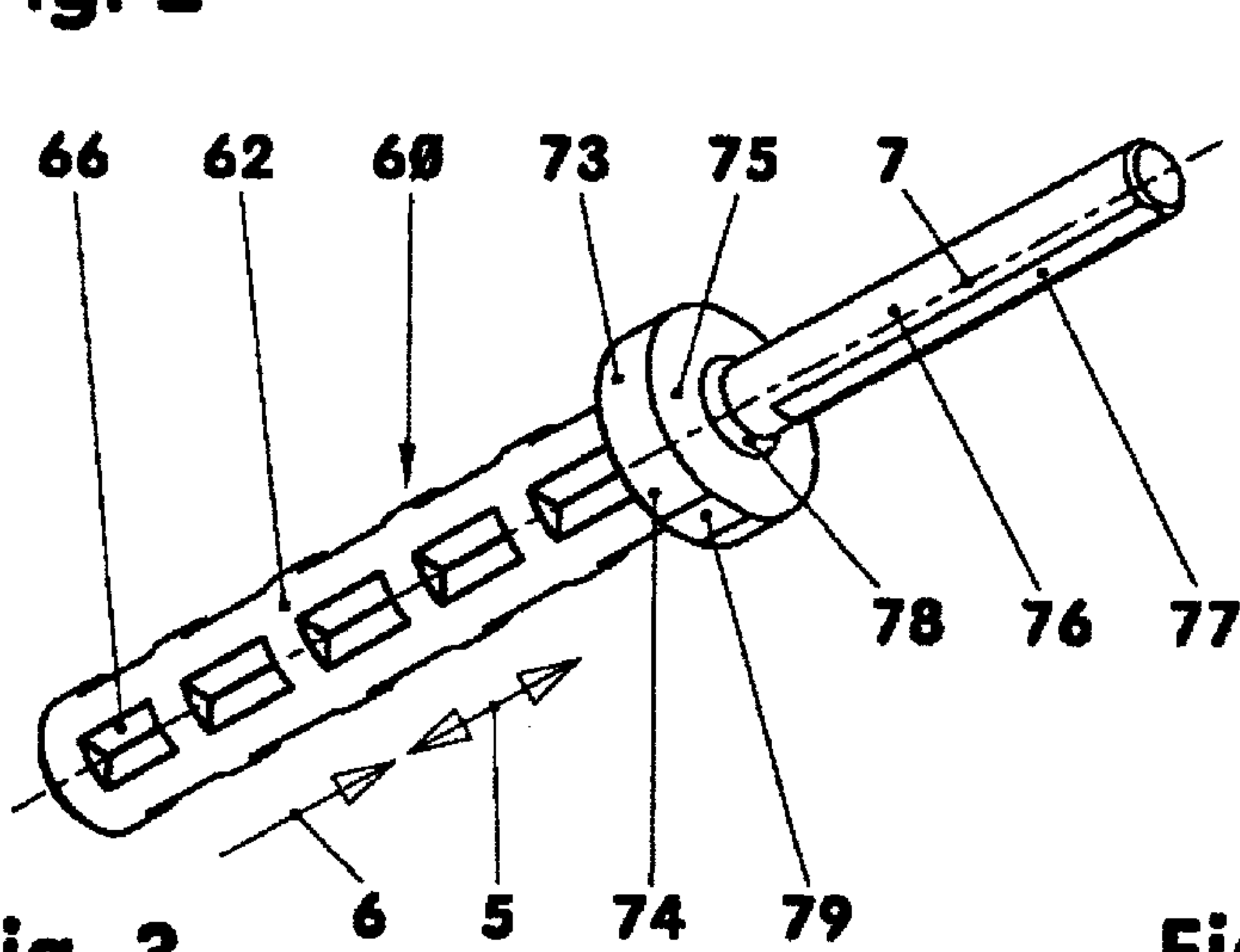


Fig. 3

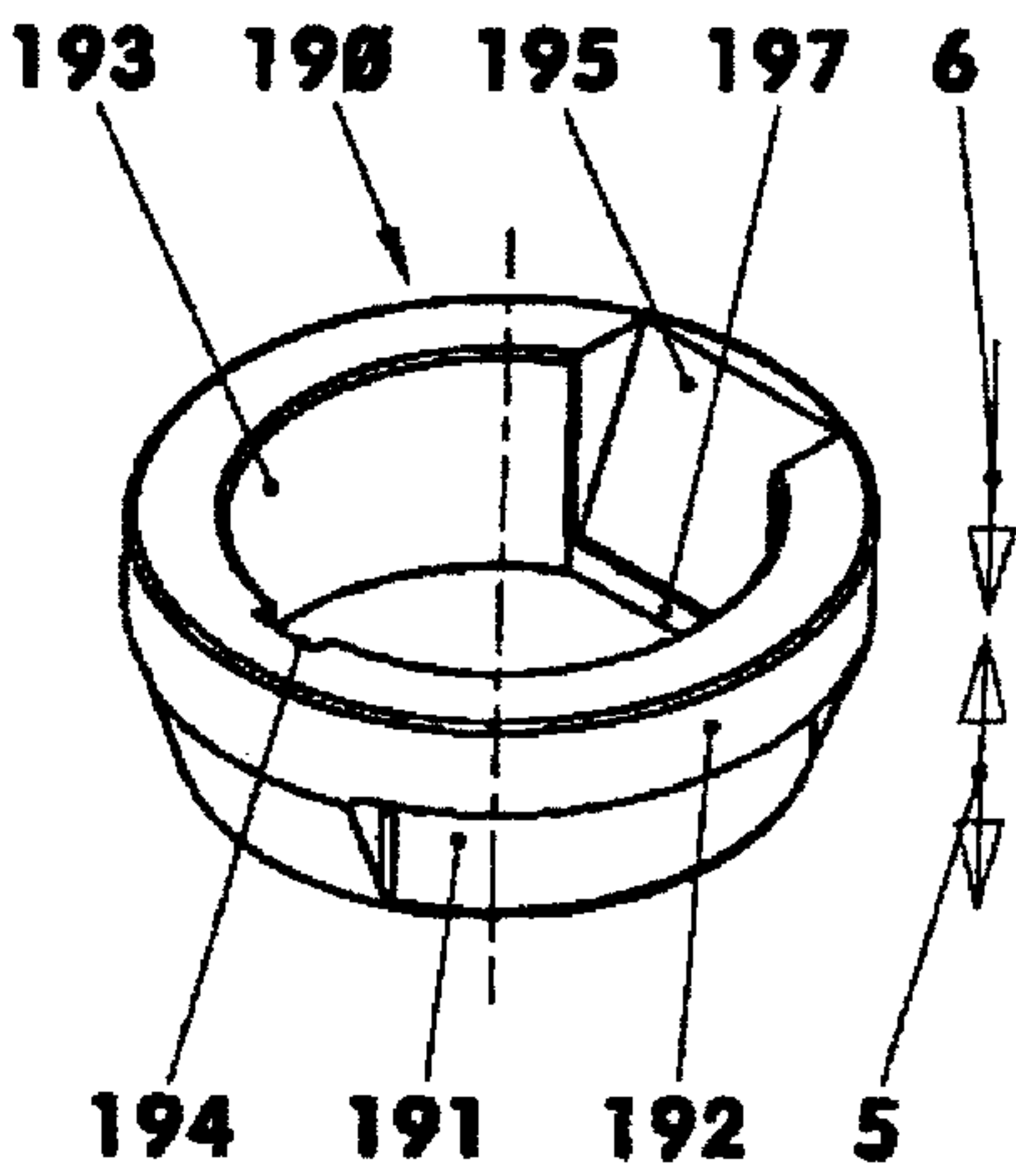


Fig. 5

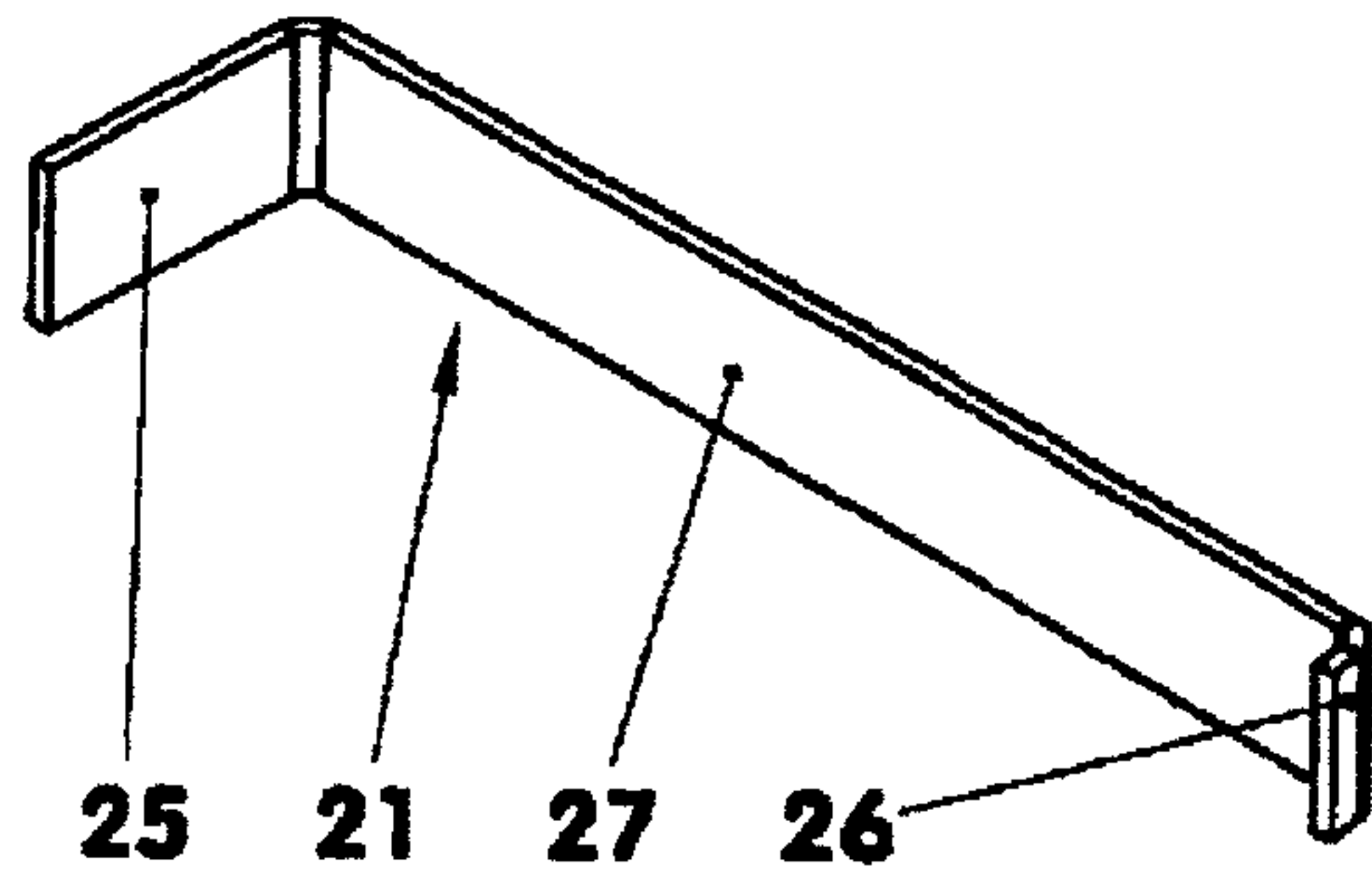


Fig. 4

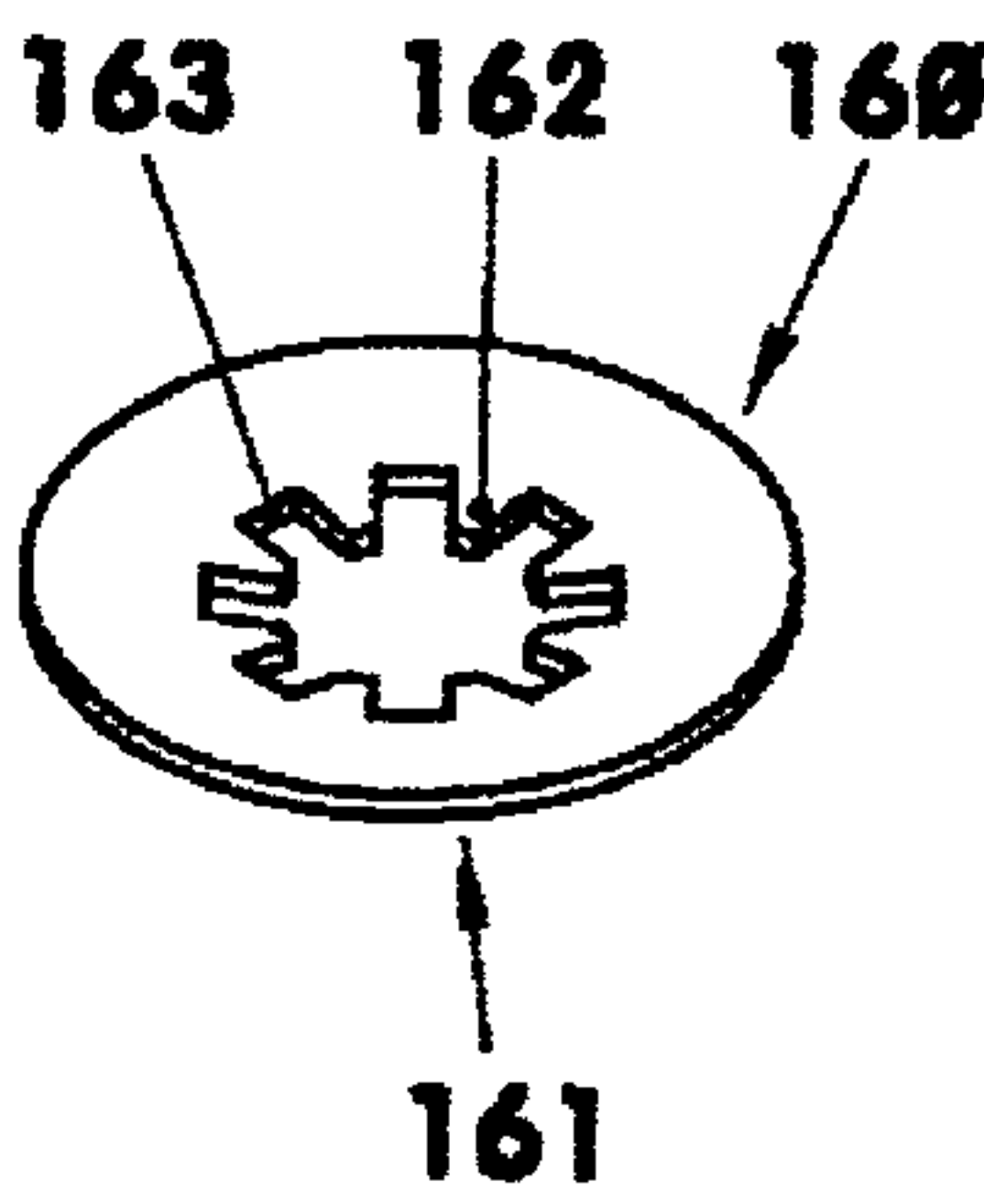


Fig. 6

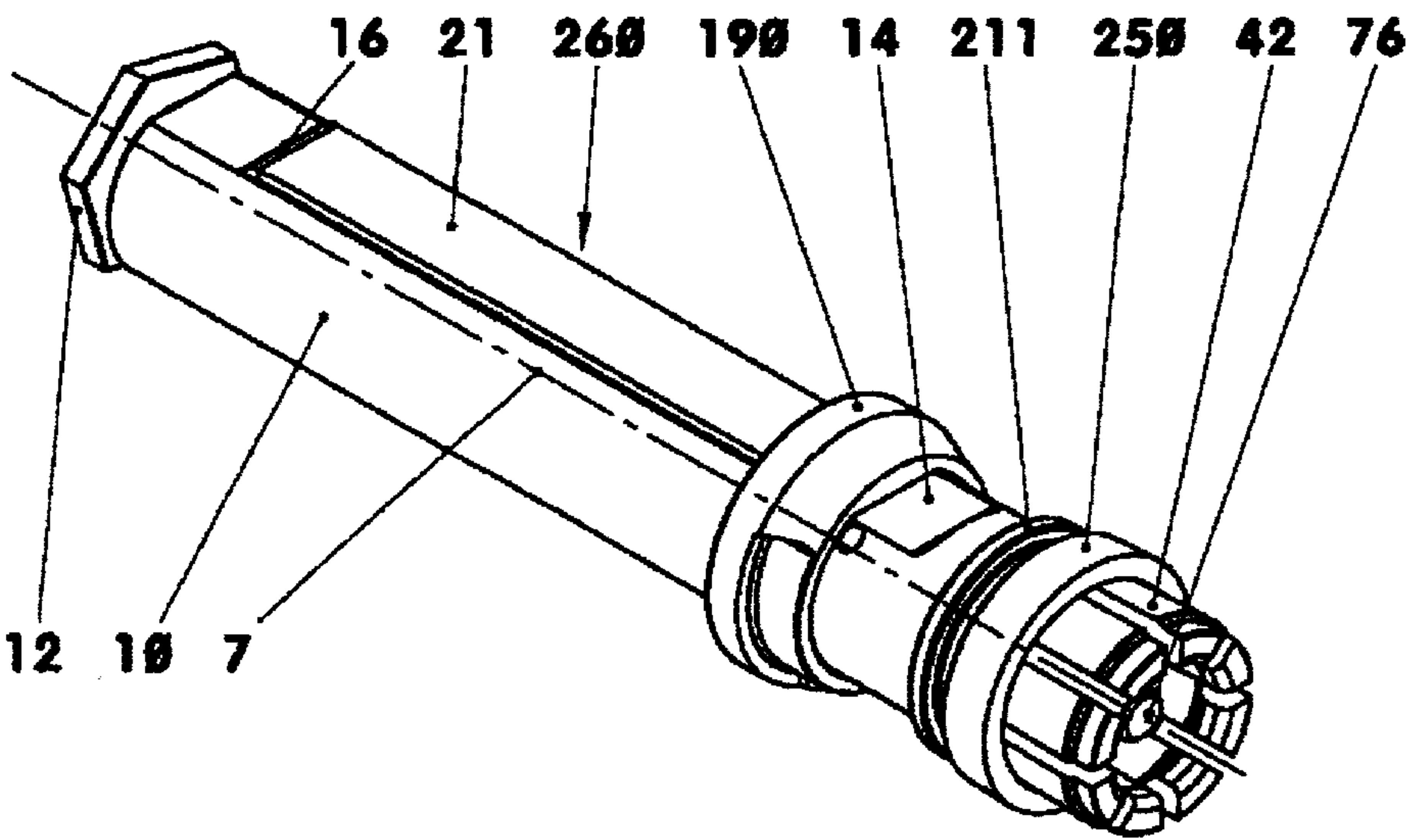


Fig. 7

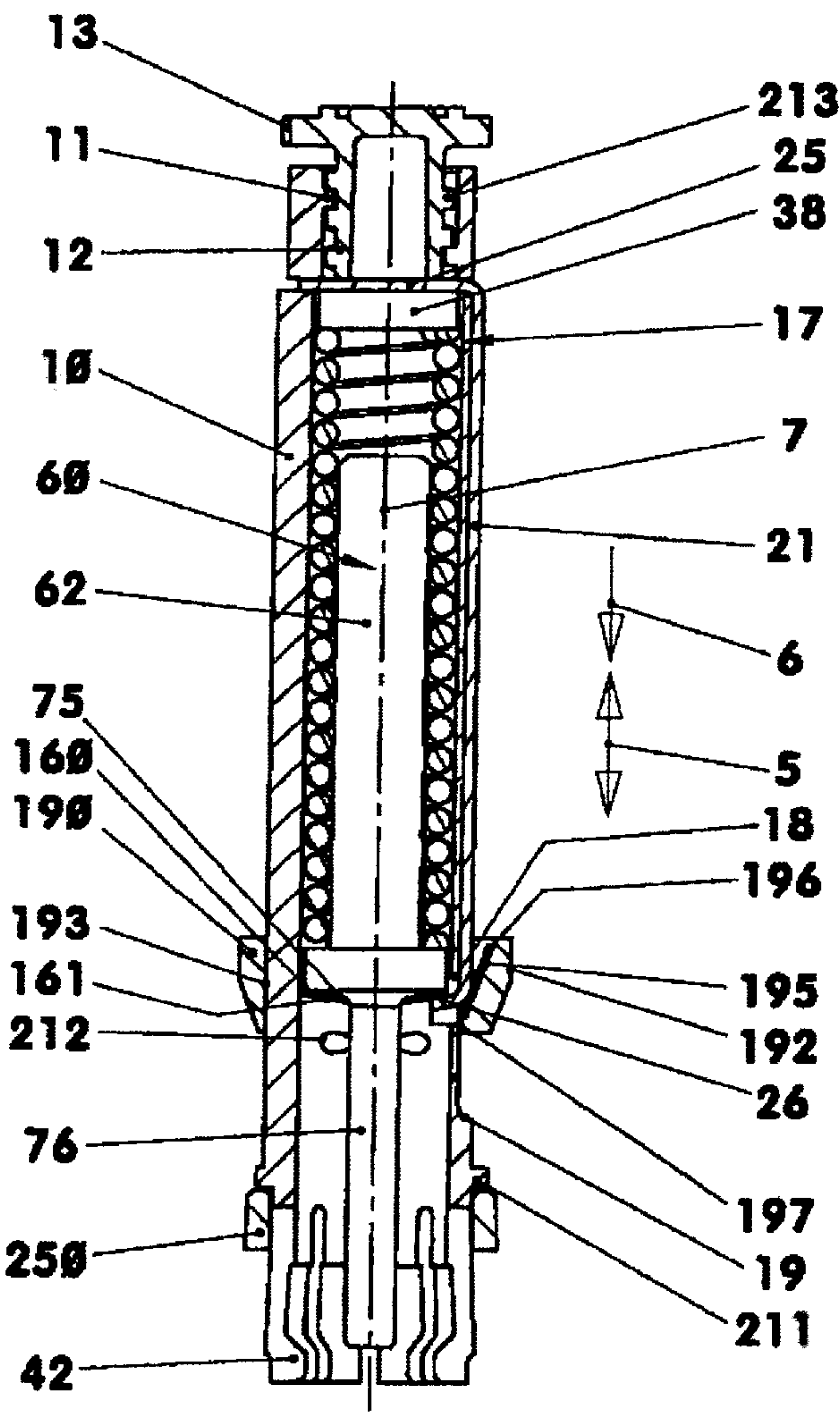


Fig. 8

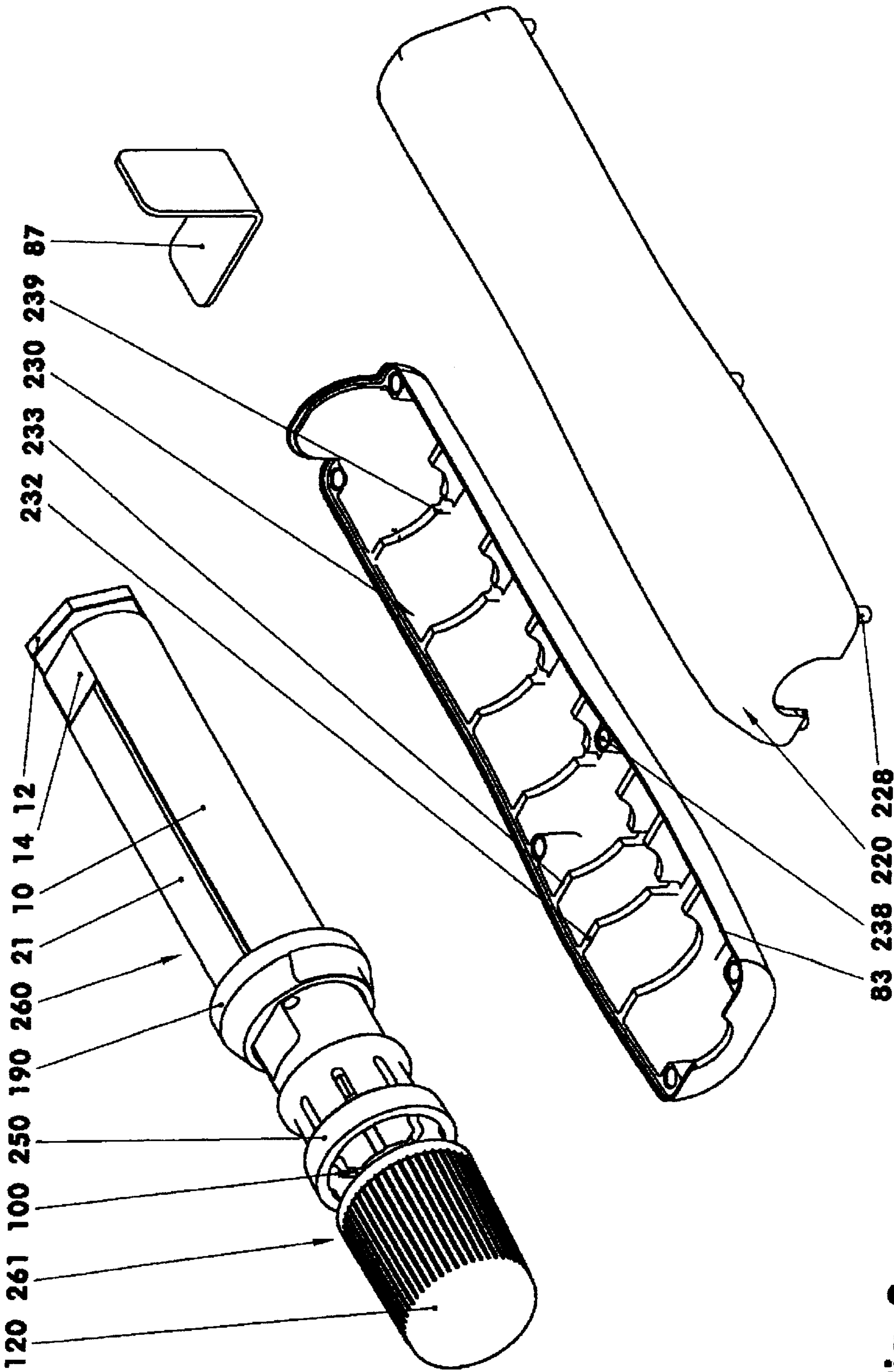


Fig. 9

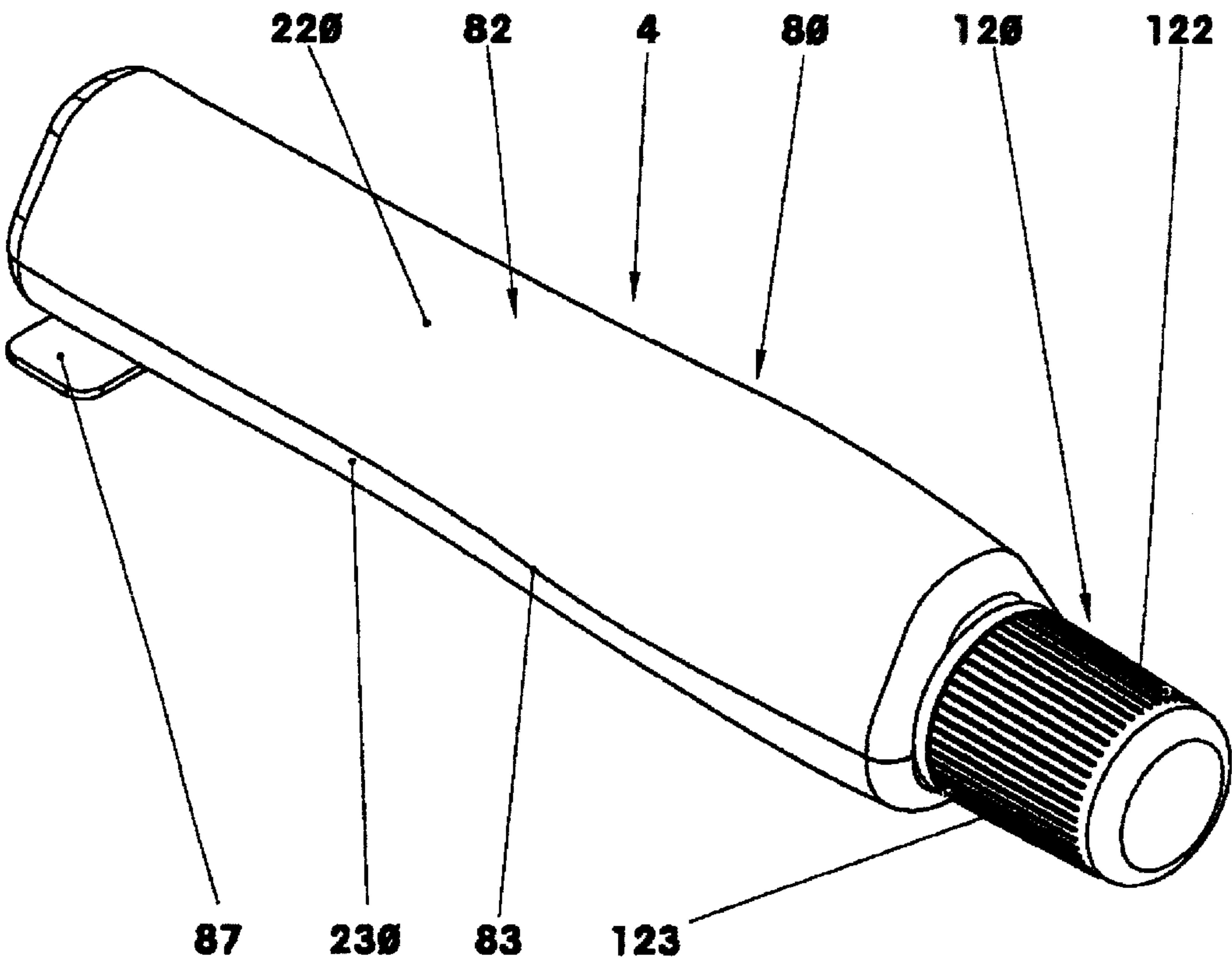


Fig. 10

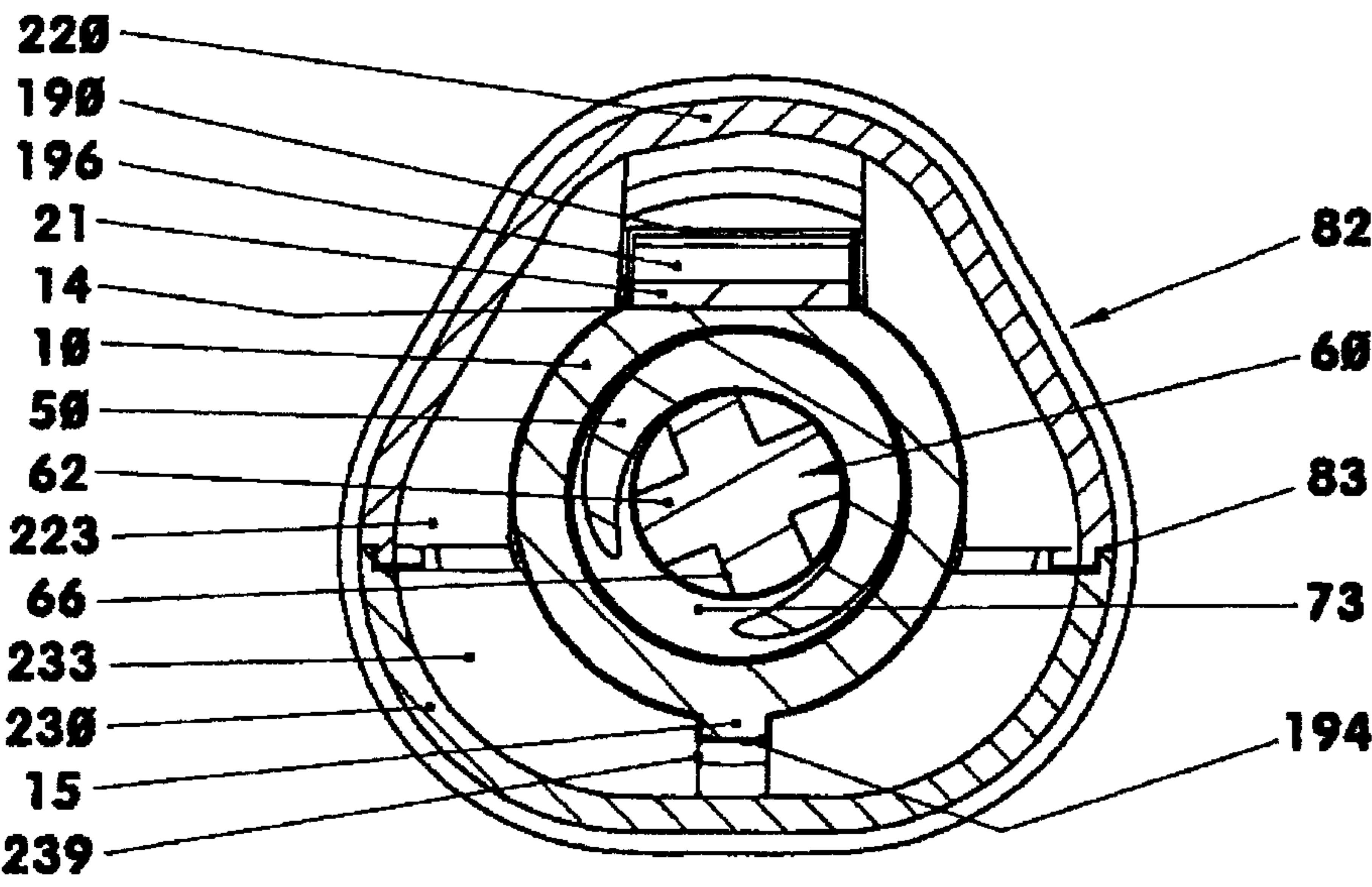


Fig. 11

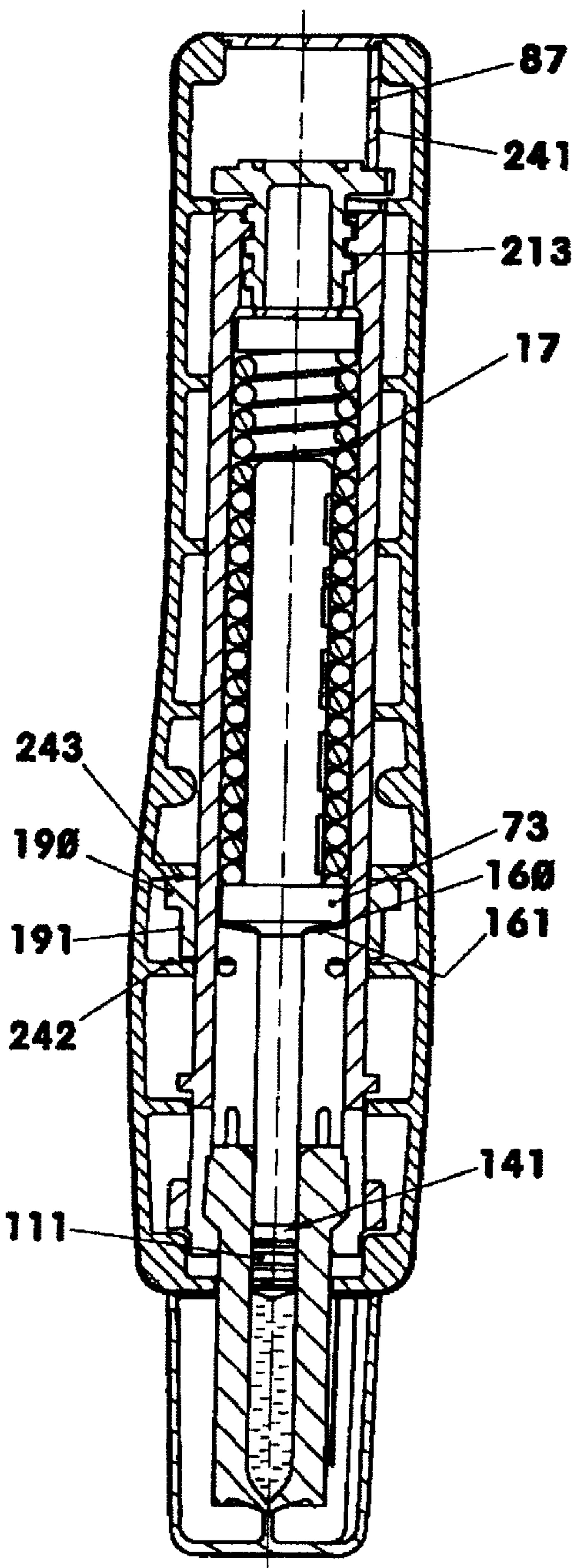


Fig. 12

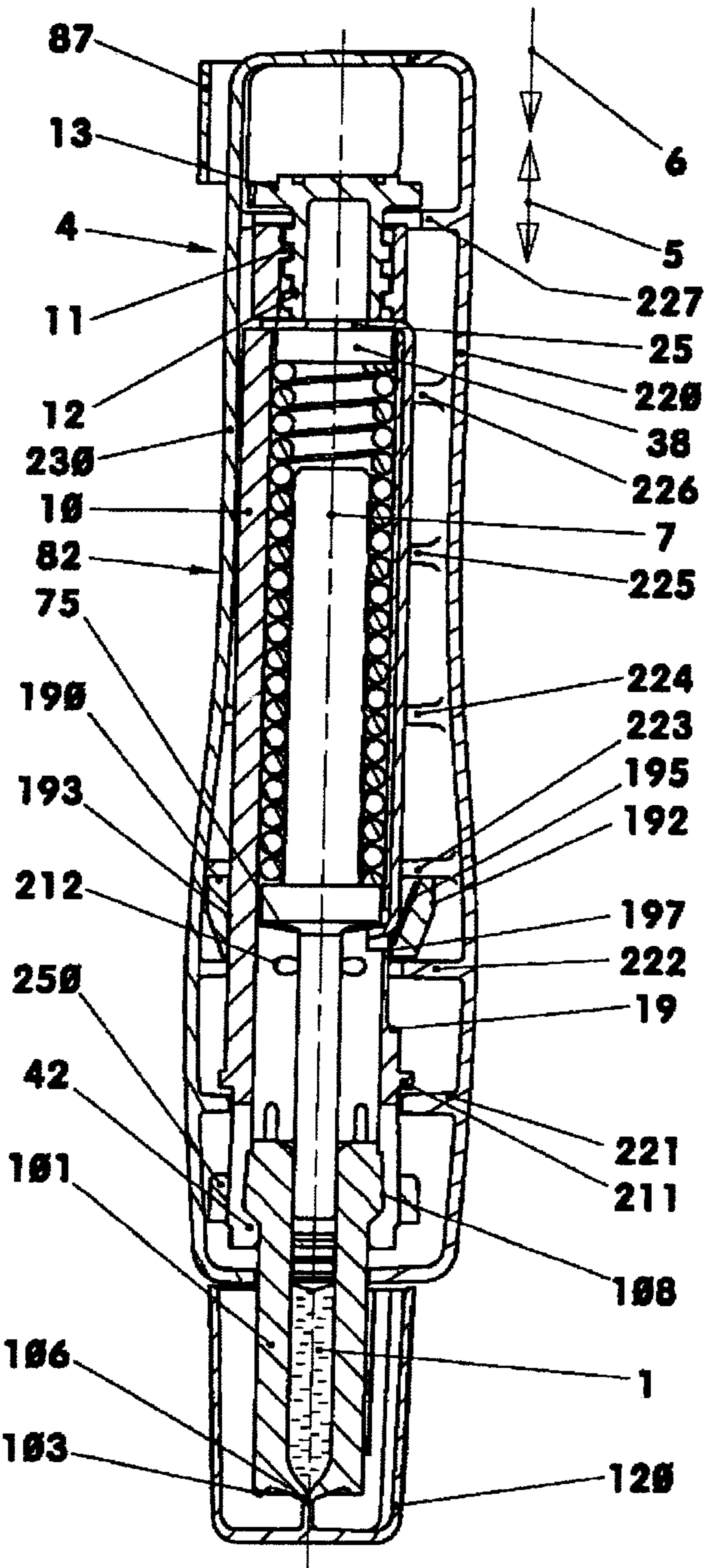


Fig. 13

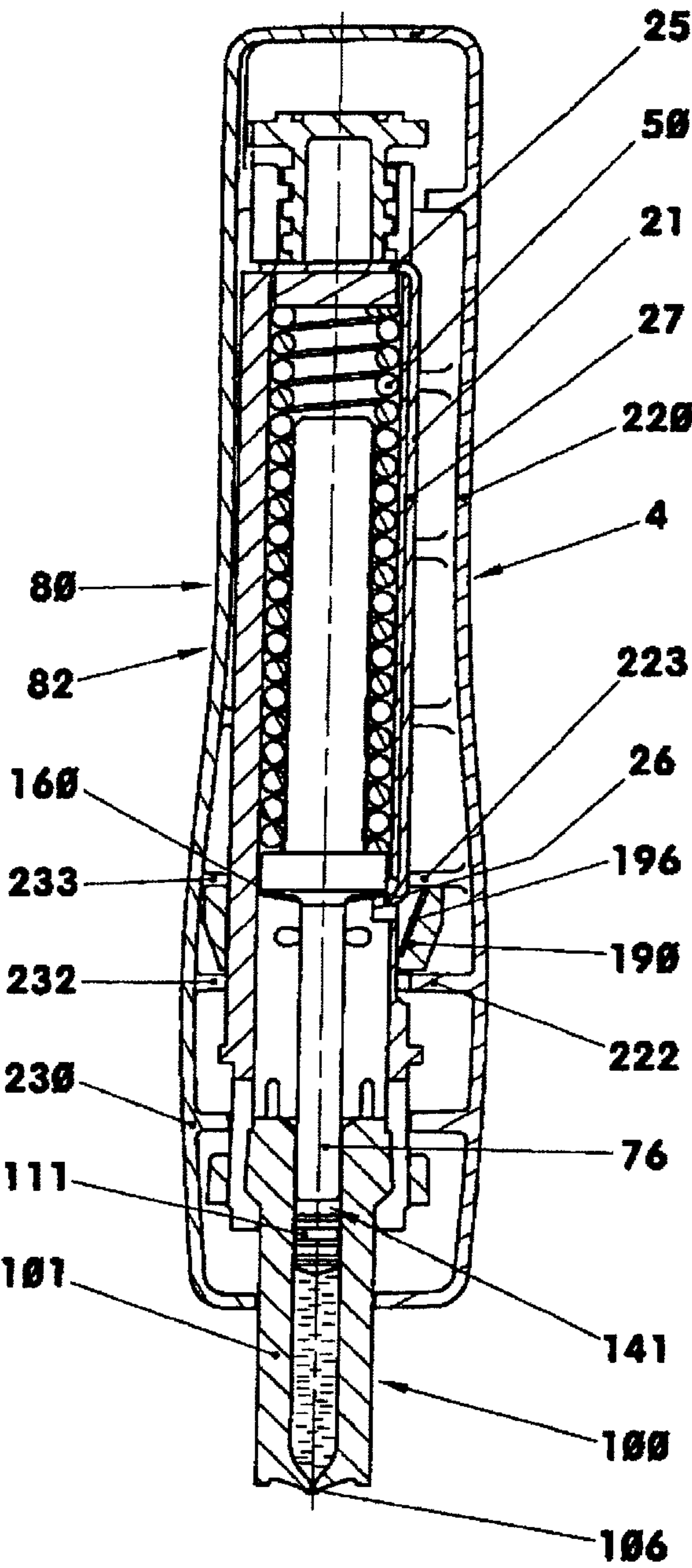


Fig. 14

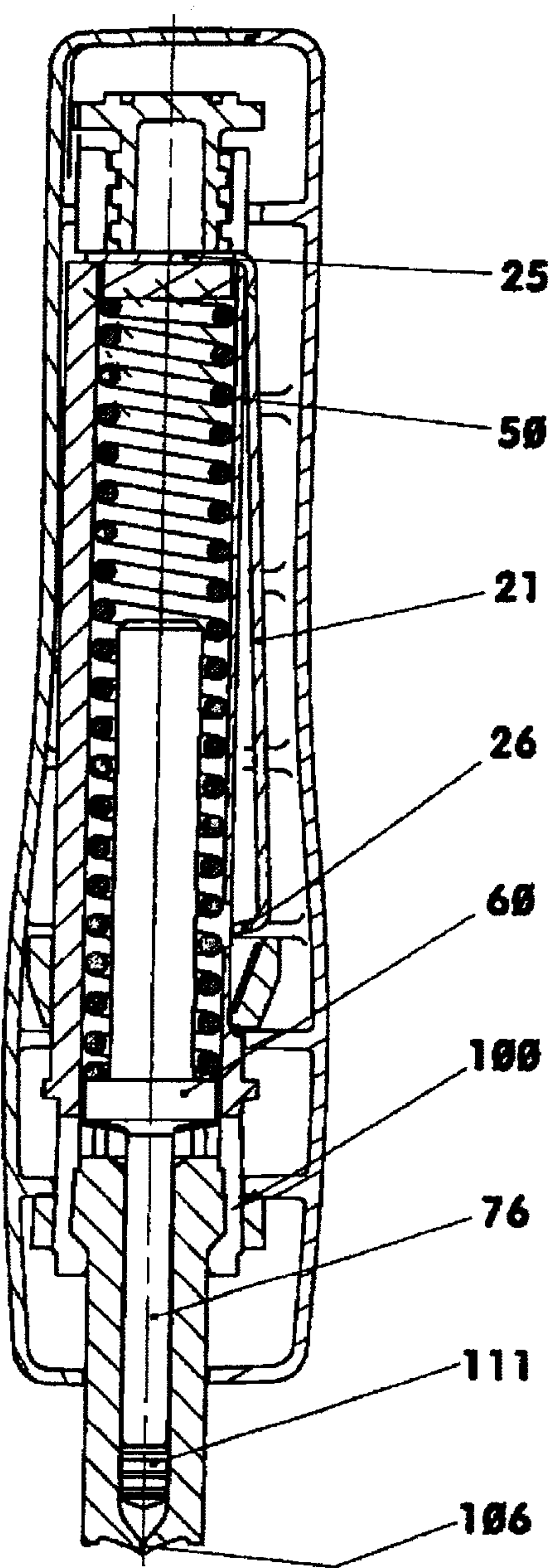


Fig. 15

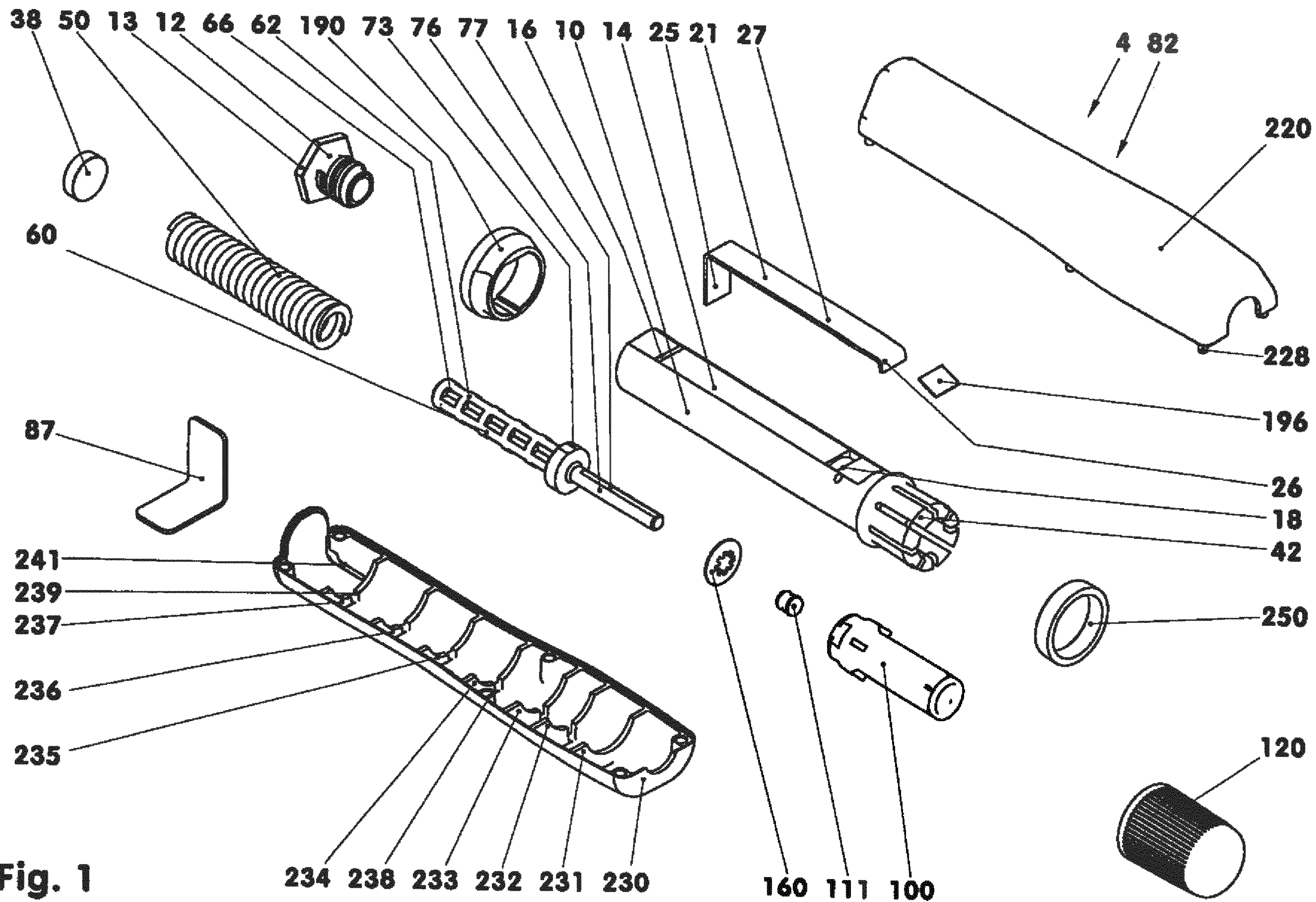


Fig. 1