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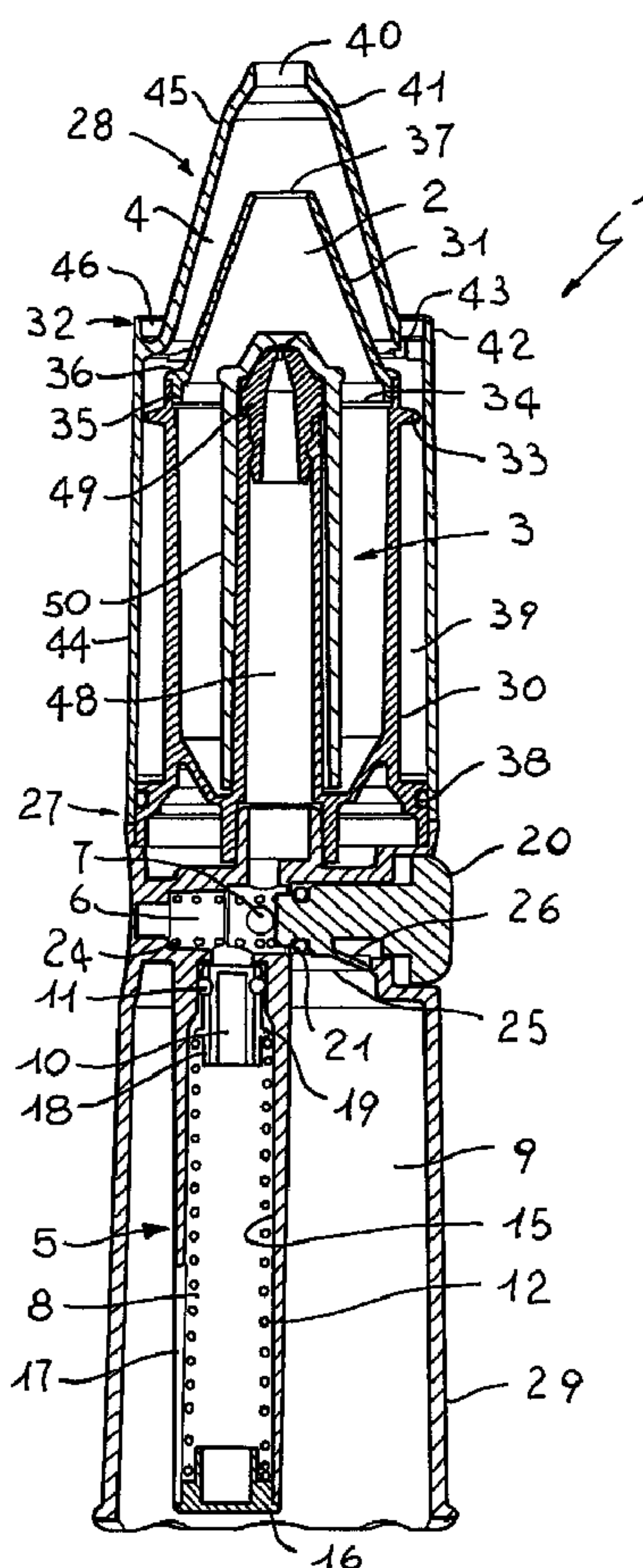
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(54) Titre : APPAREIL DE LAVAGE DES FOSSES NASALES

(54) Title: APPARATUS FOR WASHING THE NASAL CAVITIES



(57) Abrégé/Abstract:

A nasal atomized shower apparatus has a body defining an atomizing chamber, a pressurized air injector arranged at the region of feed of washing liquid to be atomized and facing the atomizing chamber and a conduit for discharging the washing liquid. The



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

apparatus further includes a valve associated with the body, and adapted to control the pressure of the pressurized air for releasing the excessive pressure.

ABSTRACT

A nasal atomized shower apparatus has a body defining an atomizing chamber, a pressurized air injector arranged at
5 the region of feed of washing liquid to be atomized and facing the atomizing chamber and a conduit for discharging the washing liquid. The apparatus further includes a valve associated with the body, and adapted to control the pressure of the pressurized air for releasing the excessive
10 pressure.

(FIG. 1)

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APPARATUS FOR WASHING THE NASAL CAVITIES

BACKGROUND OF THE INVENTION

1. Field of the invention

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The present invention relates to an apparatus for washing the nasal cavities and related areas, such as the paranasal sinuses, nasopharynx, pharynx, eustachian tube, and middle ear.

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2. Description of the Prior Art

Several apparatuses for washing the nasal cavities and related areas are known on the market and used effectively.

15 Conventional apparatuses comprise a body formed by a first member having a nozzle and a second member formed as a bell and defining an atomizing chamber. A different type of apparatus comprises a further member defining a collection chamber adapted to collect the discharge material containing
20 catarrh from the nasal cavities.

Each of the conventional apparatuses may only be used with the specifically provided aerosol device adapted to ensure a constant atomizing pressure and preventing possible over-
25 pressures.

Furthermore, the user must turn the apparatus on only after having applied the container to the nose in order to avoid getting the face wet with the aerosol spray.

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An aim of the present invention is to eliminate the above mentioned problems by providing an apparatus for washing the

nasal cavities which can be used with any aerosol equipment.

A further aim is to provide an apparatus adapted to produce aqueous micelles even after turning the aerosol device on.

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A further aim is to provide an apparatus adapted to produce a jet of aqueous micelles having a diameter greater than 20 microns to further enhance the cleaning action of the nasal cavities and surrounding regions.

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A further aim of the invention is to provide an apparatus than can be used by users of any age and with different conditions, by simply replacing the bell member to be introduced in the nose.

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Still a further aim of the invention is to provide a safe and reliable apparatus also having a versatile use.

SUMMARY OF THE INVENTION

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The above aims, and other aims that will become apparent to those skilled in the art, are achieved by an apparatus for washing the nasal cavities comprising a body defining at least one atomizing chamber, at least one pressurized air injector arranged at the region of feed of washing liquid to be atomized and connected to said atomizing chamber and discharge means for discharging at least said washing liquid, said apparatus further comprising pressure control valve means associated with said body, and adapted to control the pressure of said pressurized air for releasing the excessive pressure.

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In one aspect of the present invention, the pressure control valve means comprises at least one cursor provided with a

first seal means and mobile within a conduit connected to the outside, said cursor being biased by first elastic means.

Further characteristics and advantages of the invention will become apparent from a reading of the detailed description of a preferred but not exclusive embodiment of the apparatus according to the invention, illustrated only by way of a non-limiting example in the accompanying drawings.

10 BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevated section view of the apparatus according to the invention shown with the push-button undepressed;

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FIG. 2 is a front elevated section view of the apparatus according to the invention shown with the push-button depressed;

20 FIG. 3 is a front elevated section view of the apparatus according to the invention shown with the conduit 8 partially opened by the slider 10; and

FIG. 4 is an exploded view of the main component parts of the apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

With reference to the figures, the apparatus according to the invention, generally designated by the reference numeral 1, is constituted by a body comprising an atomizing chamber 2, an injector 3, discharge means or cavity 4 for discharging the washing liquid and pressure control means 5.

A chamber 6 inside the body receives pressurized air from a port 7. Said chamber 6 is connected to the injector 3, with a first conduit 8 and with a second conduit 9 for discharging the pressurized air for controlling the pressure and for
5 controlling the start of the atomizing action.

The pressure control means comprises a cursor 10, having a seal means 11, and adapted to move inside conduit 8. Cursor 10 is biased by first elastic means, namely a calibrated
10 helicoidal spring 12. Conduit 8 has a region 13, that can be engaged by cursor 10 to ensure a seal, a region 14 with a suitably variable diameter for discharging pressurized air and connected with a region 15 having a conduit diameter greater than the diameter of cursor 10. The end of conduit 10 has a
15 cylindrical shape with four ridges 18 interrupted by a seat for a first seal means, namely an O-ring 11. A first end of spring 12 engages four teeth 19 provided on the ridges 18 while the second end of spring 12 is in contact with a cover 16. An atomizing start up means is arranged inside the chamber
20 6, namely a control member constituted by a push button 20, which is biased by second elastic means, namely an helicoidal spring 24, and the second seal means constituted by a seal or gasket 21 arranged in an adapted seat formed on the body of push-button 20. Push-button 20 also has a protruding finger
25 member 26 coupled to a slit 25 for guiding the push-button and for keeping it in place by abutting on the body of the apparatus.

Chamber 6 has a discharge valve means constituted by an
30 opening which makes chamber 6 communicate with the outside through the seat of push-button 20, slit 25 and conduit 9. Push-button 20 extends inside the opening and partially engages its section also in the rest position.

The body of apparatus 1 comprises a first portion, operating as a hand grip 27 and substantially cylindrically shaped, wherein the push button 20 is arranged. The body also
5 comprises a second portion constituted by two coaxial bell members 28, one of the bell members being adapted to be inserted in the nostrils. The cylindrical hand grip 27 of the apparatus is constituted by two sealingly joined half members 29 and 30. Control means 20 and 23 and pressure
10 control means 5 are arranged in the first half member 29, while injector 3 is arranged in the second half member 30 and has shaped surfaces adapted to make the bell members 28 to couple. A cavity or interspace 4 is provided between the bell members 31 and 32 and its size may be varied by
15 changing the bell members in order to obtain a large or narrow cavity or no cavity at all when the bell members walls are in contact. The second half member 30 has spacer members 33 arranged along a circumference at the connection region of the bell 31.

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These spacer members are constituted by projections associated with the half member 30 and adapted to support the bell member 32.

25 The first bell member 31 has a substantially truncated cone shape having a base 34, with an edge 35 for coupling to the half member 30, and an edge 36 abutting the half member 30. An opposite end has an outlet 37 for the liquid micelles jet. According to a further aspect of the invention, such
30 outlet 37 extends also on the side surface of member 31, for example in the form of longitudinal slit.

The second bell member 32 has a first cylindrical region 44 one end thereof being adapted to couple to the half member 30 forming a discharged washing liquid collect chamber 39. The seal of said collect chamber 39 is provided by seals or
5 gaskets 38 arranged in a seat formed in the half member 30. A second region of member 32 has a truncated cone shape 45 having an end provided with a tapered region 41, having a decidedly reduced diameter, followed by the micelle jet outlet 40. The region of union of parts 44 and 45 of member
10 32 has a channel 46 formed by the wall of the truncated cone 45 and by an edge 42 extending from the cylindrical region 44. Any possible oscillation of the cylindrical region 44 is prevented by projections 33. Channel 46 has apertures 43 connecting the collect chamber 39 with the outside for
15 allowing to collect the washing liquid possibly present outside wall 45 of member 32. For the same reason, bell 45 has planar regions on its surface (not illustrated in the drawings) angled towards said apertures 43 to promote the discharge of soiled liquid.

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At least the bell members 31 and 32 and the injector are coaxial while the axis of conduit 8 is staggered with respect to such members and injector.

25 Injector 3 is constituted by a conduit 48 associated with the half member 30 and a first end of the conduit faces chamber 6. A second end of conduit 48 has a nozzle 49 for ejecting pressurized air. A cover 50 is provided above the conduit 48 and nozzle 49 and has a slightly greater diameter
30 than the diameter of conduit 48 allowing to draw liquid by virtue of the venturi effect by crossing the volume comprised between conduit 48 and cover 50.

The operation of the apparatus according to the invention is apparent from what has been described and illustrated. With particular reference to the figures, considering the
5 situation where the push-button 20 is not depressed, pressurized air enters hole 7 in chamber 6 and is therefrom partially discharged to the outside through opening 23, slit 25 and conduit 9 and partially sent to the injector 3. In this situation, the air cannot prime the venturi effect: the
10 air at the exit of the injector has no micelles of washing liquid.

Considering the situation where the push-button 20 is depressed, air enters chamber 6 through opening 7 and
15 therefrom goes to the injector because the passage through opening 23 is blocked by the push-button 20. The air exiting the injector nozzle is in this case capable to prime a venturi effect and therefore a jet of micelles of washing liquid exits the apparatus.

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In case the pressure in chamber 6 is greater than it should be, when the push-button is closed, the pressure control means 5 is activated and particularly the cursor 10 compresses the calibrated spring 12 which opens conduit 8
25 and allows pressure which exceeds the calibration of the spring to be released.

The collection of washing liquid, exiting the nose and entering the apparatus, in chamber 39, is obtained by
30 letting the liquid pass in the cavity 4 connected to chamber 39, and letting the liquid dripping along the external wall of the external bell 44, pass through the apertures

43 comprised in the collection region 46.

It has been seen in practice how the apparatus according to the invention is particularly advantageous as it can be used
5 regardless of the type of pressurized air delivery device. Furthermore, the apparatus has improved properties of nasal cavities washing and of collection of the soiled liquid. Further advantages of the invention regard the possibility for the use to activate the atomizing action and to adapt
10 the apparatus to his or her requirements by substituting one or more of the bell members.

The apparatus according to the invention is susceptible to numerous modifications and variations, all of which are
15 within the scope of the inventive concept. All the details may furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, as well as the
20 dimensions, may be any according to the requirements.

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Claims:

1. An apparatus for washing the nasal cavities comprising a body defining at least one atomizing chamber, at least one pressurized air injector arranged at the region of feed of washing liquid to be atomized and connected to said atomizing chamber and discharge means for discharging at least said washing liquid, said apparatus further comprising pressure control valve means associated with said body, and adapted to control the pressure of said pressurized air for releasing the excessive pressure, wherein said pressure control valve means comprises at least one cursor provided with a first seal means and mobile within a conduit connected to the outside, said cursor being biased by first elastic means.
2. The apparatus, according to claim 1, wherein said pressure control valve means is adapted to regulate said pressure of said atomizing air continuously.
3. The apparatus, according to claim 1, wherein said first elastic means comprises at least one calibrated helicoidal spring.
4. The apparatus, according to claim 1, wherein said conduit is adapted to discharge said pressurized air in a different direction and preferably in an opposite direction with respect to said injector.
5. The apparatus, according to claim 1, further comprising a controlled prime means for priming the atomizing of said washing liquid when pressurized air is fed to said body.
6. The apparatus, according to claim 5, wherein said controlled prime means comprises at least one control member

having second seal means adapted to intercept said pressurized air.

7. The apparatus, according to claim 5, wherein said controlled prime means comprises at least one control member constituted by at least one push-button biased by second elastic means.

8. The apparatus, according to claim 5, wherein said controlled prime means comprises at least one control member constituted by at least one push-button biased by second elastic means and having at least one projecting member adapted to guide said push-button along its movements and to keep it at rest by abutting it against said body.

9. The apparatus, according to claim 5, wherein said controlled prime means comprises at least one control member having second seal means adapted to intercept said pressurized air and constituted by at least one gasket.

10. The apparatus, according to claim 5, wherein said controlled prime means comprises at least one control member, said apparatus further comprising pressurized air discharge valve means controlled by said control member.

11. The apparatus, according to claim 5, wherein said controlled prime means comprises at least one control member, said apparatus further comprising pressurized air discharge valve means constituted by at least one opening adapted to connect the inside of said body with the outside.

12. The apparatus, according to claim 1, wherein said body comprises at least a first portion, having an ergonomical shape and adapted to allow to be gripped by a hand, and at

least a member substantially shaped as a bell associated with said first portion and with other bell-shaped members having different shapes according to the requirements.

13. The apparatus, according to claim 1, comprising at least a substantially bell-shaped second member interchangeable with other substantially bell-shaped members and cooperating with said first member to define a cavity of variable dimensions according to the requirements.

14. The apparatus, according to claim 12, comprising a controlled prime means for priming the atomizing of said washing liquid when pressurized air is fed to said body, said controlled prime means comprising at least one control member having second seal means adapted to intercept said pressurized air, said at least first portion has sealingly associated first and second half members, said first half member accommodating said control member and over-pressure control valve members, said second half member accommodating said bell-shaped members.

15. The apparatus, according to claim 14, wherein said second half member has spacer members between said second half member and said at least second bell-shaped member.

16. The apparatus, according to claim 15, wherein said spacer members are constituted by projections arranged along at least one curved surface of said second half member.

17. The apparatus, according to claim 14, wherein said first bell-shaped member has an abutment edge at the joining region with said second half member, said abutment edge at least partially projecting from the surface of said second half member coupled thereto.

18. The apparatus, according to claim 15, wherein second bell-shaped member has slits connecting the outside with a cavity defined between said first and second bell-shaped members.

19. The apparatus, according to claim 12, wherein the outlet of the micelles of liquid of said at least first bell-shaped member has a supplementary exit region extending on the side surface of said bell-shaped member.

20. The apparatus, according to claim 12, wherein first bell-shaped member has a substantially ergonomical shape.

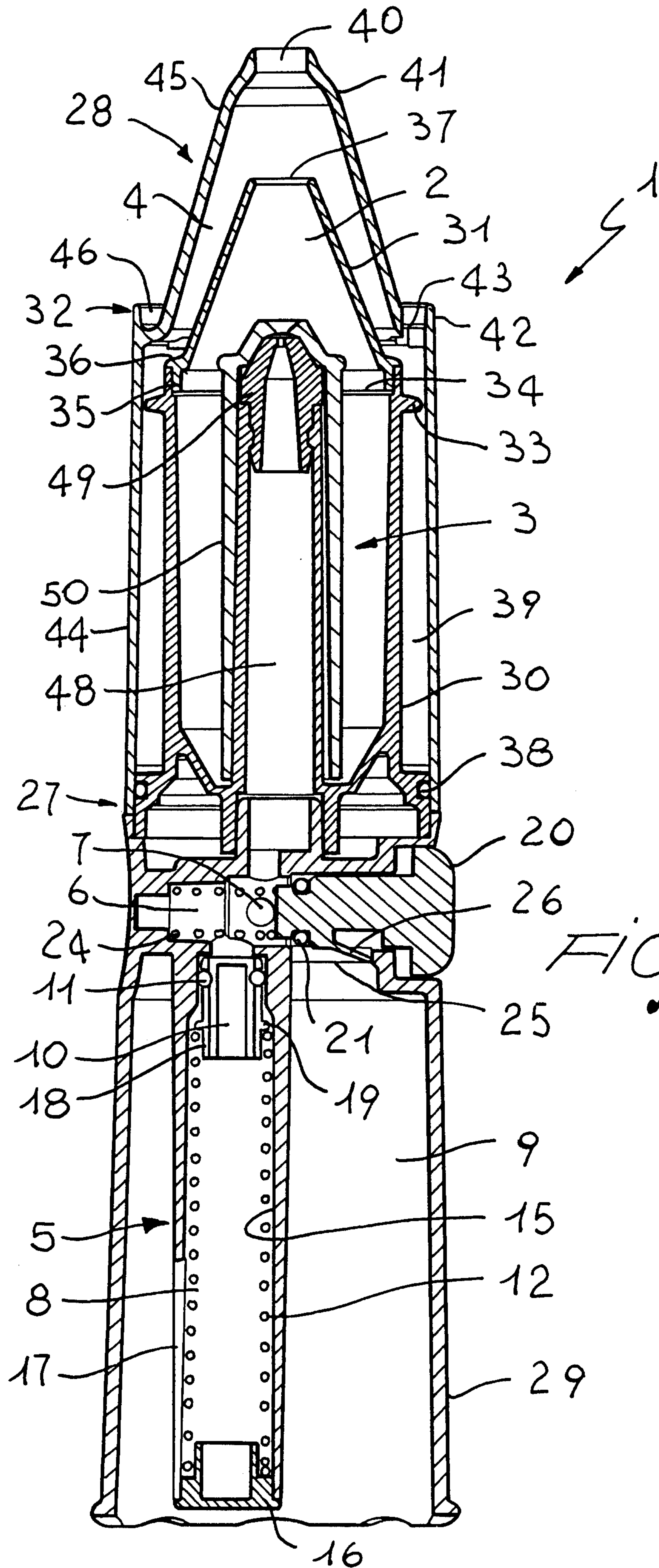
21. The apparatus, according to claim 12, wherein said second bell-shaped member has at least a first portion having a cylindrical shape and at least a second portion having a truncated cone shape.

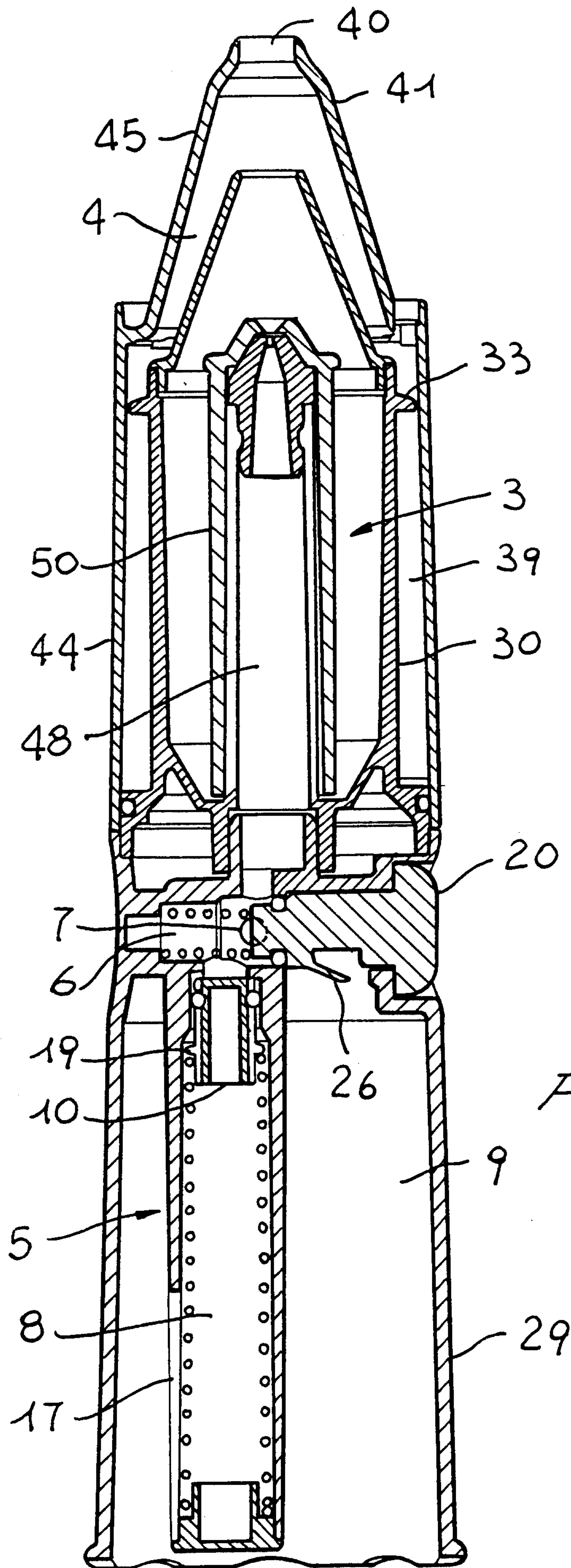
22. The apparatus, according to claim 12, wherein said second bell-shaped member has a projecting edge at the region joining said at least first portion to said substantially truncated cone second portion, said projecting edge extending at said substantially bell-shaped portion.

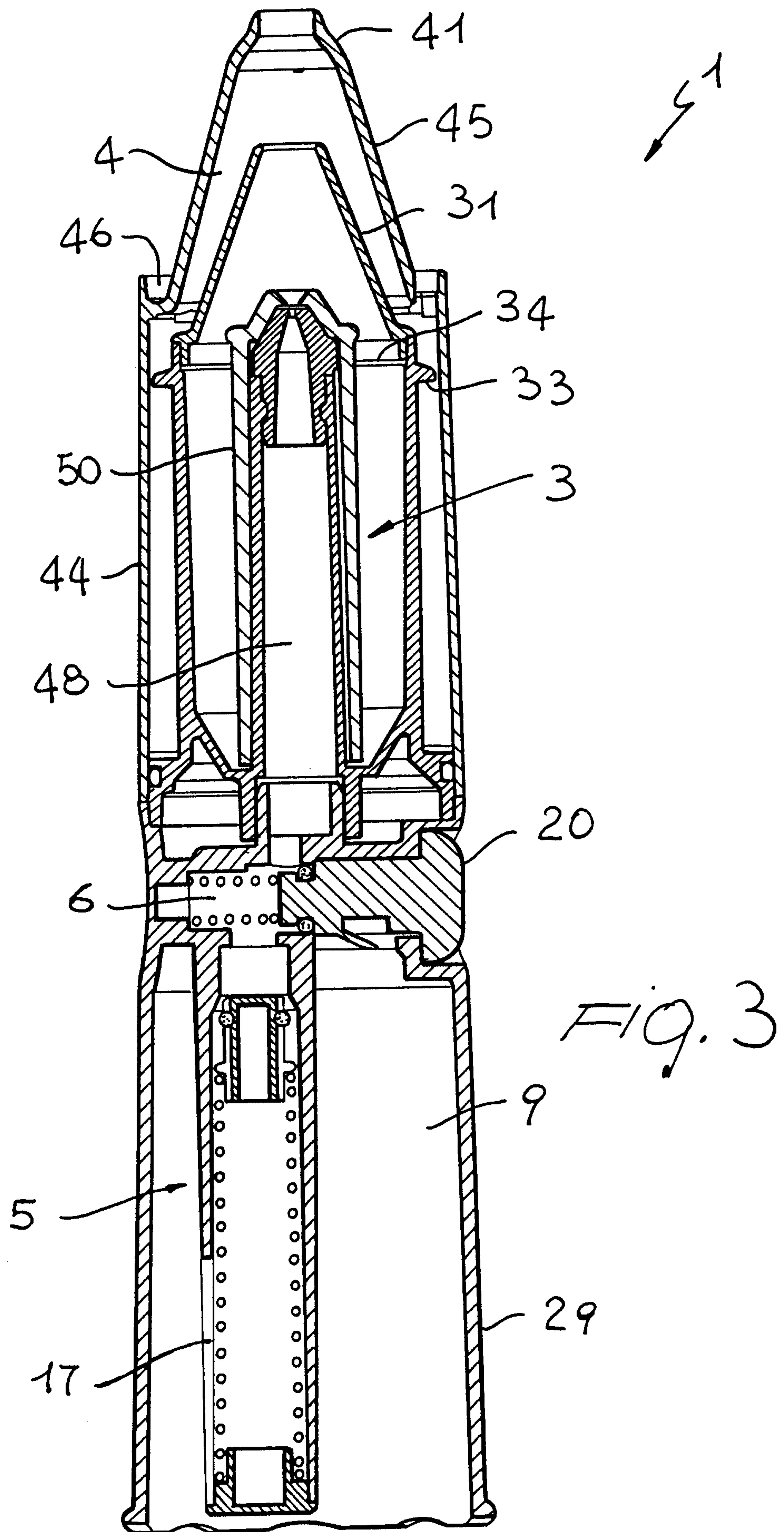
23. The apparatus, according to claim 1, wherein said injector and said pressure control valve means conduit have substantially parallel axes.

24. The apparatus, according to claim 14, wherein said first half member comprises at least one chamber connected to said injector to said pressure control valve means conduit, said chamber having at least one inlet for pressurized air.

25. The apparatus, according to claim 12, wherein said injector and at least one of said bell-shaped members are substantially coaxial.







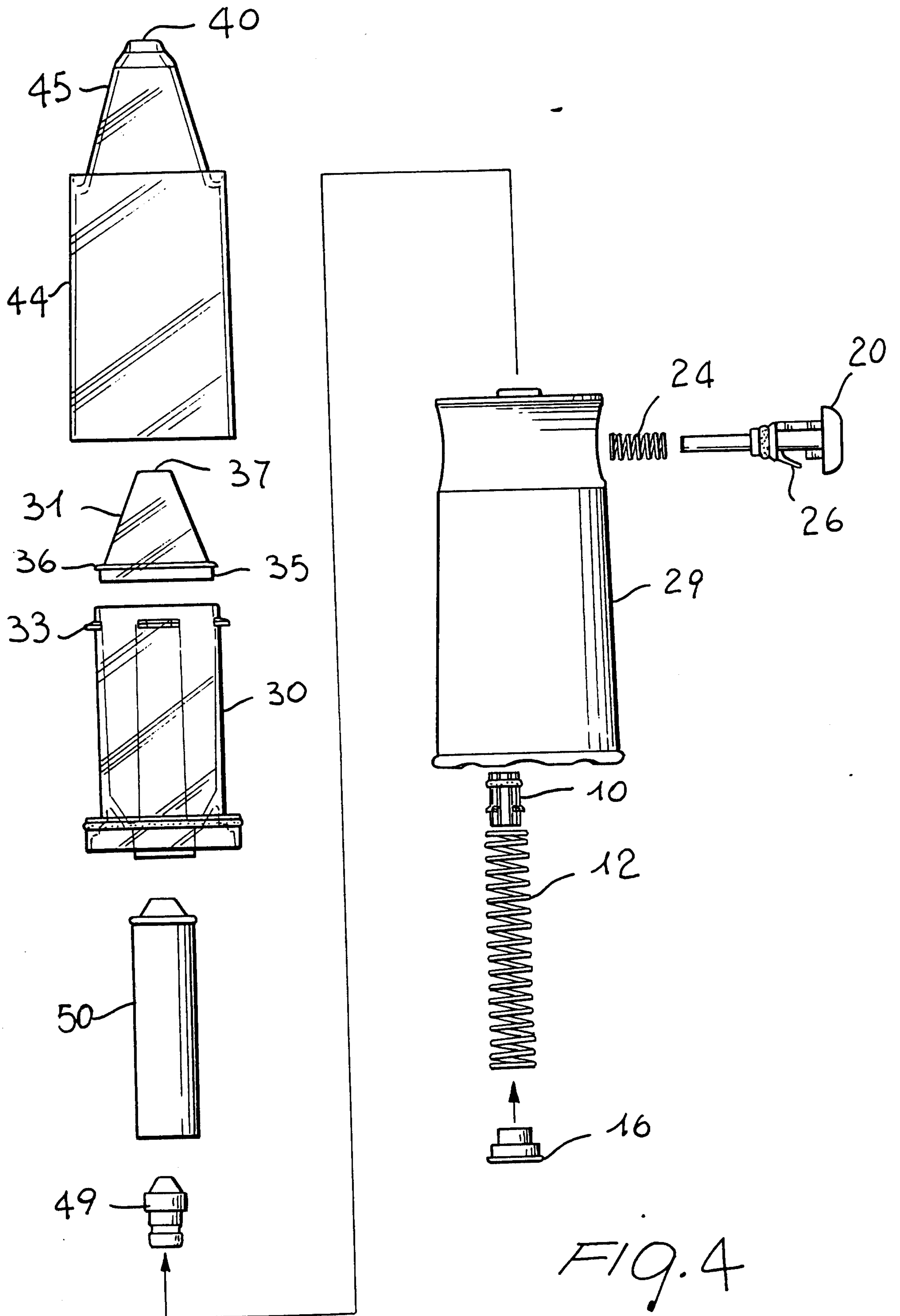


FIG. 4

