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(54) CONTAINER WITH FLEXIBLE PRESSURE ELEMENT

(57) Present invention relates to a container with flexible element containing a pressurised container, spring, collecting tube and top, wherein the flexible element (2) is connected to the pressurised container (1), in which the flexible element (2) is formed by a base (26) and body (22), or is formed by a base (26) and spring (21), of by a base (26) and body (22) containing a spring (21), in which the base (26), body (22) and spring (21) adjoin to the inner walls of the pressurised container (1), and/or the flexible element (2) is furnished with at least one sealing element (33), which is inserted at the edges of the base (26) for preventing the penetration of liquid above or below the base (26), in which the body (22) of the flexible element (2) is made of a material with memory and/or rubber and/or plastic and/or textile, and the pressurised container (1) also contains a head (29), in which the head (29) of the flexible element (2) or pressurised container (1) is furnished with a securing top (25) and a catch (27) created in the base (26) of the flexible element (2) in order to secure the position of the base (26), in which the head (29) further contains a hole (251) for inserting the securing top (251) or stopper (30), in which the head (29) of the flexible element (2) or pressurised container (1) contains an outlet hole (231) with a neck (23) and release valve (24) controlled by a lever (241) and spring (242).

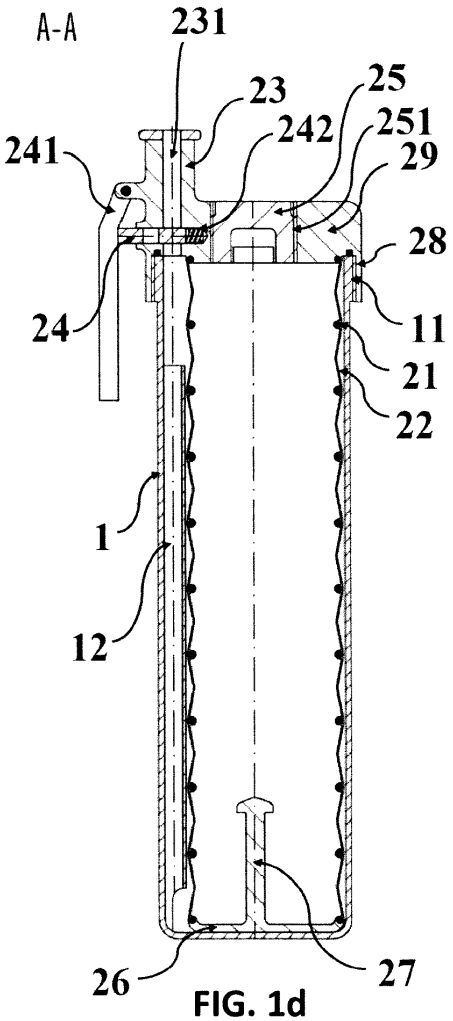

FIG. 1d

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Description

Technical Field

[0001] The invention relates to a special adjustment of any closed container, residing in the fact that a flexible element is installed in the internal space of the container. A spring or other material with a memory for shape can be used as the flexible element, e.g. plastic, rubber etc., which is capable of exerting pressure after compression or stretching.

[0002] In the case that the flexible element changes its shape from the original shape, i.e. from the resting position, it begins to impact upon the content of the container, which as a rule is gas or liquid, and thus creates overpressure within the internal space of the container. It is then possible to force out the content of the container into the external environment by means of the pressure of the flexible element, via a suitable valve. The flexible element may be in direct contact with the internal content of the container, or may be separated from it via a suitable membrane or sealing.

Background Art

[0003] At present there are a number of designs for pressurised containers, which work mainly on the principle of compressed gas. Mechanically it is then possible also to utilise the moving piston inside the container on hydraulic principles.

[0004] The disadvantage of this type of design is the necessity to fill the given pressurised container with compressed gas after each emptying, or the need for a complex hydraulic piston mechanism with the relevant sealing elements.

[0005] No pressurised container is available on the market which users could easily fill themselves, thus creating permanent overpressure inside the container without the use of other gases, liquids or complex mechanisms. The design can be used especially in the area of small drinks bottles or as a component of aerosols etc.

[0006] Especially in the field of sport, e.g. during running, classic bottles have a disadvantage in that the liquid moves and splashes inside them. In addition to the undesirable sound effect, a continual change is present in the centre of gravity of the entire bottle, and the sportsperson has to balance this manually. A further disadvantage of today's standard sports bottles consists in the fact that users must suck the majority of the liquid, which disturbs the rhythm of their breathing. An advantage lies in the fact that the water is squirted from the bottle under pressure, and therefore it is not necessary to incline the head during drinking. It is also possible to determine precisely the remaining amount of liquid in the container at any moment and in any position.

Disclosure of the Invention

[0007] The basis of the invention is a closed pressurised container furnished with at least one inbuilt flexible element. In the following text, the part of the container into which the flexible element is inserted, is referred to as a pressurised container. The attachment of the flexible element to the pressurised container is resolved by the usual suitable methods of securing sufficient pressure and tightness, e.g. by a screw thread, lever stopper etc. In order to ensure the functionality of the pressurised container according to this design, it is not of decisive importance as to whether the screw thread is made on the inside or outside of the pressurised container, but with regard to limiting clogging of the screw thread it is understandably an advantage for the screw thread to be made on the outer side of the pressurised container.

[0008] The body of the flexible element is capable of exerting pressure on the inner walls and the content of the pressurised container, or on the inner walls or volume of the flexible element itself.

[0009] If the designation "pressurised bottle" is stated in this description, it concerns the final product, i.e. a combination of a pressurised container with a flexible element as described in this technical design.

[0010] The body of the flexible element copies the inner wall of the container and through its expansion reduces the internal space of the pressurised container. The flexible element, through its expansion progressively creates an essentially memory container with a reducing volume, which via the external walls compresses the volume of the pressurised container in the required direction. The designation "memory" in this case means that the flexible element is made of a suitable material which remember its original shape, to which it attempts to return of its own accord, in the case that no external forces act upon it. The flexible element, which is essentially an elastic memory construction, then creates a separate closed container or is capable of separating the internal content (medium) of the pressurised container from itself, in which it is capable of expansion and contraction inside the pressurised container, as is evident from the attached images.

[0011] In an alternative version of this technical design, the part of the flexible element designated for attaching the flexible element to the pressurised container is formed by the head of the flexible element, furnished with a screw thread for anchoring the flexible element to the pressurised bottle. The head of the flexible element further incorporates a release valve containing a lever and spring. The spring represents any element capable of compression and returning to the original shape after the release of pressure generated by the shift of the release valve. The head of the flexible element also incorporates an outlet hole and also a suitable neck. The neck of the head of the flexible element, enabling comfortable drinking of the liquid, is not an essential element for the functionality of this design, and may be replaced by other suitable equivalents, such as a drinking tube etc. The

head of the flexible element also contains an appropriate securing top of the flexible element in order to secure the body of the flexible element in its compressed shape if the body of the flexible element is expanded in its resting state. For this purpose the body of the flexible element is suitably furnished with a catch. The body of the flexible element also contains a suitable base made of solid material, ensuring effective compression of the liquid from the space beneath the body of the flexible element in the direction towards the collecting tube. This design is presented e.g. in Fig. 3a to 3q. The body and base of the flexible element enable discharge in the direction of the collecting tube, as is evident e.g. from Fig. 3f. In another version the liquid can be forced out directly into the outlet hole of the pressurised container.

[0012] The walls of the body of the flexible element are formed for example by springs inserted or cast into a plastic casing, rubber balloon, plastic piston etc. This technical design incorporates various versions of the body of the flexible element, which in different physical versions fulfil the same function as described above. These versions are described in further detail in examples and illustrated in the attached images.

[0013] The technical design illustrated in Fig. 1a to 1q is composed of a pressurised container furnished with an internal screw thread for attaching the flexible element. The body of the flexible element in this case is formed by a spring, which is cast into a plastic casing. The body and base of the flexible element contain discharge in the shape of the collecting tube, as is evident e.g. from Fig. 1h.

[0014] The walls of the flexible element copy the shape of the inner walls of the pressurised container. The spring is extended in resting, i.e. here expanded shape, and after compression acts as a compressive spring. The plastic casing of the flexible element is of a flexible membrane shape, in order to enable expansion and compression of the spring, but at the same time, together with the spring, to form a separate closed container.

[0015] If the body of the flexible element is contracted in its resting state, this is referred to as a compressed or contracted state. In the opposite case, i.e. if it is extended, i.e. expanded, in its resting state, we also refer to compression upon bringing it into its compressed or contracted state.

[0016] In one version of the memory container, the flexible element is in an expanded shape in the resting state, and upon its contraction pressure is generated, later released through its outer walls, or in other words the walls of the memory container, onto the internal space of the pressurised container. Securing of the flexible element in its compressed shape may be ensured e.g. by the above-mentioned catch.

[0017] In another version of the memory container, the flexible element is created in inverse form, i.e. the flexible element is contracted, thus compressed, in resting state. This design is presented in Fig. 2a to 2p or Fig. 4a or 4p. A securing top for example may serve as a catch for securing the flexible element in expanded state. In this case the flexible element must first of all be stretched, i.e. drawn into extended state, secured with a catch and filled with liquid. Stretching may be performed e.g. by a guide pin inbuilt into the external wall of the body of the flexible element and moving in a guide groove created within the wall of the pressurised container, as can be seen e.g. in Fig. 2e, 2f, 2k, 2l, 4e, 4f, 4k and 4l. In an expedient version for a balanced distribution of force for stretching the body of the flexible element, the design contains at least one pair of guid pegs and one pair of guide paths. The internal walls of the flexible element in this case serve for retention of the liquid. In this version the hole in the neck of the head of the flexible element is furnished with a stopper instead of a securing top, which in this version is created in the base of the pressurised container, as can be seen from the attached images. However, stretching of the flexible element is possible also by other suitable methods, for example wire/string attached to the base of the flexible element.

[0018] In an alternative version of the memory container according to Fig. 5a to 5o and 6a to 6p, the flexible element is created in such a manner that the liquid is forced out by the flexible element from the base of the container, thus the flexible element is attached on the opposite end of the pressurised container to that where the release valve is located, which is opposite the above-described design of the components of the pressurised container and is not therefore created on the head of the flexible element. This design also does not contain a collecting tube, since this is superfluous.

[0019] The above-described design can be applied to any closed container, e.g. a drinking bottle, containers for various cleaning and chemical agents, sprinklers, cosmetics etc.

[0020] In a suitable version gas, especially air may be pumped into the internal space of the memory container, i.e. the body of the flexible element, e.g. compressed air by an appropriately located pump or piston, and the expansive effect of the body of the flexible element may be increased by increasing the pressure within the internal space of the body of the flexible element. This is therefore a combination of a mechanical principle and the principle of compressing liquid by overpressure. The pulling or compressive force of the flexible element is dimensioned in the production of the entire pressurised bottle with regard to the requirements upon use, i.e. mainly a strong current, i.e. large through flow, is desirable for forcing out the liquid from the internal space of the bottle.

[0021] The materials from which the pressurised container or flexible element are to be produced are not unequivocally determined. The choice of suitable materials depends mainly on the medium which the bottle is intended to store.

[0022] According to this technical design, it is possible to use the following basic construction materials of the pressurised container, according to the requirements of the internal medium:

- metals and alloys thereof, e.g. stainless steel, aluminium etc.
- plastics
- vulcanite or silicon
- glass
- wood

[0023] According to the internal medium (chemical agents, contact with foodstuffs, contact with drinking water), it is possible to use for example the following as the basic construction materials of the expansive body, i.e. the flexible element:

- metal springs in plastic, textile or rubber casings
- plastic springs in plastic, textile or rubber casings
- flexible rubber casings
- flexible plastic casings
- flexible textile fibres (waterproof)

[0024] The flexible element may be formed e.g. by a spring with a casing or sealing, a rubber casing, or casing with a memory function.

[0025] In example 6 the base of the flexible element is furnished with sealing along the sides, which after insertion into the container seals around the perimeter to the wall of the container, as a result of which it is not necessary for the flexible element to contain a casing.

Disclosure of Figures

[0026]

Fig. 1a illustrates a pressurised container according to this technical design according to alternative A, with demarcated plane of cross-section A;
Fig. 1b illustrates a pressurised container according to this technical design according to alternative A, with demarcated plane of cross-section B;
Fig. 1c illustrates cross-section A-A through the pressurised container according to alternative A with compressed flexible element;
Fig. 1d illustrates cross-section A-A through the pressurised container according to alternative A with expanded flexible element;
Fig. 1e illustrates cross-section B-B through the pressurised container according to alternative A with compressed flexible element;
Fig. 1f illustrates cross-section B-B through the pressurised container according to alternative A with expanded flexible element;
Fig. 1g separately illustrates a pressurised container with a collecting tube, with demarcated cross-section E and cross-section through the pressurised container E-E;
Fig. 1h separately illustrates a pressurised container with a collecting tube, with demarcated cross-section F and cross-section through the pressurised container F-F;
Fig. 1i separately illustrates a compressed flexible element according to alternative A;
Fig. 1j separately illustrates a compressed flexible element according to alternative A with a securing top;
Fig. 1k illustrates a pressurised container filled with liquid;
Fig. 1l illustrates a flexible element according to alternative A with demarcation of the direction of contraction;
Fig. 1m separately illustrates a compressed flexible element according to alternative A;
Fig. 1n illustrates the method of placing the compressed flexible element into a pressurised container filled with liquid;
Fig. 1o illustrates a compressed flexible element according to alternative A placed into a pressurised container filled with liquid with affixed securing top;
Fig. 1p illustrates a compressed flexible element according to alternative A placed into a pressurised container filled with liquid with released securing top;
Fig. 1q illustrates an expanded flexible element according to alternative A with demarcation of the flow of liquid from the pressurised container;
Fig. 2a illustrates a pressurised container according to this technical design according to alternative B, with demarcated plane of cross-section A;
Fig. 2b illustrates a pressurised container according to this technical design according to alternative B, with demarcated plane of cross-section B;
Fig. 2c illustrates cross-section A-A through the pressurised container according to alternative B with contracted flexible element;
Fig. 2d illustrates cross-section A-A through the pressurised container according to alternative B with expanded flexible element;
Fig. 2e illustrates cross-section B-B through the pressurised container according to alternative B with contracted flexible element;
Fig. 2f illustrates cross-section B-B through the pressurised container according to alternative B with expanded flexible element;
Fig. 2g separately illustrates a pressurised container without a collecting tube, with a guide path and demarcated cross-section E and cross-section through the pressurised container E-E;
Fig. 2h separately illustrates a contracted flexible element according to alternative B;
Fig. 2i separately illustrates an expanded flexible element according to alternative B;
Fig. 2j illustrates a compressed flexible element according to alternative B with demarcation of insertion into the pressurised container;
Fig. 2k illustrates a pressurised container according to alternative B with a contracted flexible element with demarcation of deployment of a guide peg;
Fig. 2l illustrates a pressurised container according to alternative B with an expanded flexible element

with demarcation of deployment of a securing top;
Fig. 2m illustrates a pressurised container according to alternative B with expanded flexible element filled with liquid;
Fig. 2n illustrates a pressurised container according to alternative B with expanded flexible element filled with liquid with demarcation of insertion of stopper;
Fig. 2o illustrates a pressurised container according to alternative B with expanded flexible element filled with liquid with demarcation of release of securing top;
Fig. 2p illustrates a pressurised container according to alternative B with demarcation of compression of the flexible element partially filled with liquid and with demarcation of forcing of the liquid from the container;
Fig. 3a illustrates a pressurised container according to this technical design according to alternative C, with demarcated plane of cross-section A;
Fig. 3b illustrates a pressurised container according to this technical design according to alternative C, with demarcated plane of cross-section B;
Fig. 3c illustrates cross-section A-A through the pressurised container according to alternative C with compressed flexible element;
Fig. 3d illustrates cross-section A-A through the pressurised container according to alternative C with expanded flexible element;
Fig. 3e illustrates cross-section B-B through the pressurised container according to alternative C with compressed flexible element;
Fig. 3f illustrates cross-section B-B through the pressurised container according to alternative C with expanded flexible element;
Fig. 3g separately illustrates a pressurised container with a collecting tube, with demarcated cross-section E and cross-section through the pressurised container E-E;
Fig. 3h separately illustrates a compressed flexible element according to alternative C;
Fig. 3i separately illustrates a compressed flexible element according to alternative C with demarcation of placing of a securing top;
Fig. 3j separately illustrates an expanded flexible element according to alternative C with placing of a securing top and cross-section through the flexible element;
Fig. 3k separately illustrates a pressurised container filled with liquid;
Fig. 3l separately illustrates an expanded flexible element according to alternative C;
Fig. 3m separately illustrates a compressed flexible element according to alternative C;
Fig. 3n illustrates the method of placing the compressed flexible element according to alternative C into a pressurised container filled with liquid;
Fig. 3o illustrates a compressed flexible element according to alternative C placed into a pressurised container filled with liquid;
Fig. 3p illustrates a compressed flexible element according to alternative C placed into a pressurised container filled with liquid and demarcation of release of securing top and the direction of forcing out of the liquid;
Fig. 3q illustrates an expanded flexible element according to alternative C with demarcation of forcing of the liquid from the pressurised container;
Fig. 4a illustrates a pressurised container according to this technical design according to alternative D, with demarcated plane of cross-section A;
Fig. 4b illustrates a pressurised container according to this technical design according to alternative D, with demarcated plane of cross-section B;
Fig. 4c illustrates cross-section A-A through the pressurised container according to alternative D with contracted flexible element;
Fig. 4d illustrates cross-section A-A through the pressurised container according to alternative D with expanded flexible element;
Fig. 4e illustrates cross-section B-B through the pressurised container according to alternative D with contracted flexible element;
Fig. 4f illustrates cross-section B-B through the pressurised container according to alternative D with expanded flexible element;
Fig. 4g separately illustrates a pressurised container without a collecting tube, with a guide path and demarcated cross-section E and cross-section through the pressurised container E-E;
Fig. 4h separately illustrates a contracted flexible element according to alternative D;
Fig. 4i separately illustrates an expanded flexible element according to alternative D;
Fig. 4j illustrates a compressed flexible element according to alternative D with demarcation of insertion into the pressurised container;
Fig. 4k illustrates a pressurised container according to alternative D with a contracted flexible element with demarcation of deployment of a guide peg;
Fig. 4l illustrates a pressurised container according to alternative D with an expanded flexible element with demarcation of deployment of a securing top;
Fig. 4m illustrates a pressurised container according to alternative D with expanded flexible element filled with liquid;
Fig. 4n illustrates a pressurised container according to alternative D with expanded flexible element filled with liquid with demarcation of insertion of stopper;
Fig. 4o illustrates a pressurised container according to alternative D with expanded flexible element filled with liquid with demarcation of release of securing top;
Fig. 4p illustrates a pressurised container according to alternative D with demarcation of contraction of the flexible element partially filled with liquid and with demarcation of forcing of the liquid from the contain-

er;

Fig. 5a illustrates a pressurised container according to this technical design according to alternative E, with demarcated plane of cross-section A;

Fig. 5b illustrates a pressurised container according to this technical design according to alternative E, with demarcated plane of cross-section B;

Fig. 5c illustrates cross-section A-A through the pressurised container according to alternative E with compressed flexible element;

Fig. 5d illustrates cross-section A-A through the pressurised container according to alternative E with expanded flexible element;

Fig. 5e illustrates cross-section B-B through the pressurised container according to alternative E with compressed flexible element;

Fig. 5f illustrates cross-section B-B through the pressurised container according to alternative E with expanded flexible element;

Fig. 5g separately illustrates a pressurised container with a release valve, lever and spring created in the lower part of the pressurised container;

Fig. 5h separately illustrates a compressed flexible element according to alternative E;

Fig. 5i illustrates an expanded flexible element according to alternative E with demarcation of the direction of expansion;

Fig. 5j separately illustrates a pressurised container with a release valve, lever and spring created in the lower part of the pressurised container filled with liquid;

Fig. 5k separately illustrates a flexible element with demarcation of the direction of contraction;

Fig. 5l illustrates a pressurised container according to alternative E with compressed flexible element, with demarcation of the deployment of the securing top;

Fig. 5m illustrates a pressurised container according to alternative E with compressed flexible element, with demarcation of deployment into a pressurised container filled with liquid;

Fig. 5n illustrates a pressurised container according to alternative E with compressed flexible element and pressurised container filled with liquid with demarcation of the release of the securing top and expansion of the flexible element;

Fig. 5o illustrates a pressurised container according to alternative E with an expanded flexible element and demarcation of the forcing of liquid from the container;

Fig. 6a illustrates a pressurised container according to this technical design according to alternative F, with demarcated plane of cross-section A;

Fig. 6b illustrates a pressurised container according to this technical design according to alternative F, with demarcated plane of cross-section B;

Fig. 6c illustrates cross-section A-A through the pressurised container according to alternative F with compressed flexible element;

Fig. 6d illustrates cross-section A-A through the pressurised container according to alternative F with expanded flexible element;

Fig. 6e illustrates cross-section B-B through the pressurised container according to alternative F with compressed flexible element;

Fig. 6f illustrates cross-section B-B through the pressurised container according to alternative F with expanded flexible element;

Fig. 6g separately illustrates a pressurised container with a release valve, lever and spring created in the lower part of the pressurised container;

Fig. 6h separately illustrates a compressed flexible element according to alternative F with demarcation of deployment of a securing top;

Fig. 6i separately illustrates an expanded flexible element according to alternative F;

Fig. 6j separately illustrates a pressurised container with a release valve, lever and spring created in the lower part of the pressurised container filled with liquid;

Fig. 6k separately illustrates a flexible element with demarcation of the direction of contraction;

Fig. 6l separately illustrates a flexible element, with demarcation of the deployment of the securing top;

Fig. 6m illustrates a pressurised container according to alternative F with compressed flexible element, with demarcation of deployment into a pressurised container filled with liquid;

Fig. 6n illustrates a pressurised container according to alternative F with compressed flexible element and pressurised container filled with liquid;

Fig. 6o illustrates a pressurised container according to alternative F with demarcation of the release of the securing top and expansion of the flexible element;

Fig. 6p illustrates a pressurised container according to alternative F with demarcation of the forcing of liquid from the container;

Fig. 7a illustrates a pressurised container according to this technical design according to alternative G, with demarcated plane of cross-section A;

Fig. 7b illustrates a pressurised container according to this technical design according to alternative G, with demarcated plane of cross-section B;

Fig. 7c illustrates cross-section A-A through the pressurised container according to alternative G with compressed flexible element;

Fig. 7d illustrates cross-section A-A through the pressurised container according to alternative G with expanded flexible element;

Fig. 7e illustrates cross-section B-B through the pressurised container according to alternative G with compressed flexible element;

Fig. 7f illustrates cross-section B-B through the pressurised container according to alternative G with expanded flexible element;

Fig. 7g separately illustrates a pressurised container with a release valve, lever and spring created in the lower part of the pressurised container;
Fig. 7h separately illustrates a compressed flexible element according to alternative G furnished with bridging of flow of liquid in the head of the flexible element to the outflow of liquid into the collecting tube of the pressurised container;
Fig. 7i separately illustrates a compressed flexible element according to fig. 7h rotated by 90 degrees;
Fig. 7j separately illustrates an expanded flexible element according to alternative G;
Fig. 7k separately illustrates a compressed flexible element according to alternative G furnished with bridging of flow of liquid with demarcation of deployment of the flexible element into the empty pressurised container;
Fig. 7l illustrates a pressurised container according to alternative G with compressed flexible element filled with liquid with demarcation of deployment of a securing top;
Fig. 7m illustrates a pressurised container according to alternative G with flexible element forcing out liquid;
Fig. 8 schematically illustrates type versions of a pressurised container with sealing elements in order to secure liquid-resistance into the internal or external space of the flexible element, in which the arrow designates whether the flexible element is pulling or compressive;
Fig. 9 schematically illustrates type versions of a pressurised container without sealing elements, in which the arrow designates whether the flexible element is pulling or compressive;

Examples of embodiment

Example 1

Alternative A

[0027] The technical design illustrated in Fig. 1a to 1q is composed of a pressurised container 1 furnished with an external screw thread 11 for affixing the flexible element 2. The flexible element 2 is made of a spring 21, which is cast into a plastic casing, which creates the walls of the body 22 of the flexible element 2. The walls of the body 22 of the flexible element 2 copy the shape of the internal wall of the pressurised container 1. The spring 21 is extended in resting, i.e. expanded state, and after compression acts as a compressive spring. The plastic casing forming the body 22 of the flexible element 2 is of a flexible membrane shape furnished with springs 21 in the place of the break of the membrane, in order to enable the spring to expand and contract, but at the same time together with the spring formed a separate closed container. The lower part of the flexible element is ended with a solid base 26, onto which a catch 27 is affixed on the internal wall in an inward direction, serving in combination with the securing top 25 to secure the flexible element in its compressed state.

[0028] The upper part of the flexible element contains the following components:

- head 29 with internal screw thread 28 for affixing flexible element 2 to pressurised bottle 1;
- release valve 24 furnished with lever 241 and spring 242;
- securing top 25 of flexible element inserted in hole 251;
- neck 23 of flexible element with outlet hole 231;

[0029] A component of the pressurised container is a collecting tube 12 serving for inflow of liquid from the base 26 of the flexible element 2 to the outlet hole 231 in the neck 23 of the flexible element 2. Fig. 1h illustrates the channel 221 of the body 22 of the flexible element and the base 26 in the shape of a collecting tube 12, which flows into the collecting tube 12.

[0030] The use of a pressurised container according to this version of the design resides in the fact that first of all the pressurised container is filled with the required liquid. The flexible element 2, or its flexible body 22, is compressed (from expanded into compressed state) and the pressure of the spring is secured with a securing top 25, which secures the position of the catch 27 created in the lower part of the flexible element. Subsequently the flexible element is screwed onto the filled pressurised bottle and the pressure of the spring is released by rotation of the securing top 25. In this manner the spring exerts constant pressure on the internal volume of the container. It is then possible to discharge the liquid from the container under pressure into the external environment via the release valve 24.

Example 2

Alternative B

[0031] The technical design illustrated in Fig. 2a to 2p is composed of a pressurised container 1 furnished with an external screw thread 11 in the open top part. The flexible element 2 is made from flexible material, in this case rubber, which together with the head 29 of the flexible element and the bottom base 26 at the same time forms a separate closed container. The rubber membrane is contracted in resting state and after stretching forms a "pulling piston". The rubber membrane is sufficiently flexible as to be capable of both expansion and contraction.

[0032] The rubber element 2 in the upper part contains the following components:

- head 29 with internal screw thread 28 for affixing the flexible element 2 to the pressurised bottle 1;
- stopper 30 with hole 251 for impregnation of flexible

element 2;
- release valve 24 furnished with lever 241 and spring 242;
- neck 23 of flexible element with outlet hole 231;

[0033] The flexible element 2 in the lower part is furnished with a catch 27, which after rotation of the securing top 25 deployed in the lower wall of the pressurised container 1 enables securing of the flexible element 2 in tightened state.

[0034] At least one guide path 31 created in the wall of the pressurised container 1 and at least one guide peg 32 moving in the guide path 31 serve for tightening of the flexible element 2.

[0035] The use of a pressurised container according to this version of the design resides in the fact that first of all the flexible element 2 is stretched following deployment of the guide peg 32, or pair of guide pegs 32 and filled with the required liquid via the hole 251. The liquid and pressure generated by the rubber membrane which forms the side wall 22 of the flexible element 2 is secured in the internal area of the flexible element 2 by screwing the impregnating top 30. The thus filled flexible element 2 is inserted into the pressurised container 1 and screwed onto the screw thread 11 of the pressurised container 1. It is then possible to discharge the liquid from the container under pressure into the external environment via the release valve 24.

Example 3

Alternative C

[0036] The technical design illustrated in Fig. 3a to 3q is essentially identical to alternative A as described in example 1, with the difference that the body 22 of the flexible element is made of flexible plastic material of a membrane shape with a memory function, which is expanded in resting state.

Example 4

Alternative D

[0037] The technical design illustrated in Fig. 4a to 4p is essentially a combination of alternative A and alternative B as described in examples 1 and 2, in which the body of the flexible element 2 is made of the same material as in example 1, but is contracted in resting state according to the model in example 2.

Example 5

Alternative E

[0038] The technical design illustrated in Fig. 5a to 5o is based on alternative A, but with the difference that the release valves, i.e. the neck 23 of the flexible element with outlet hole 231 and release valve 24 furnished with a lever 241 and spring 242 are made on the base of the pressurised container 1 instead of on the head 29 of the flexible element 2. The head 29 of the flexible element therefore contains only the screw thread 28 and hole 251 for inserting the securing top 25.

[0039] The use of a pressurised container according to this version of the design, as in example 1, resides in the fact that the pressurised bottle 1 is first of all filled with the required liquid. The body 22 of the flexible element is compressed (from expanded to contracted state) and the pressure of the spring is secured with the securing top 25, which secures the position of the catch 27 created in the lower part of the flexible element. Subsequently the flexible element is screwed onto the filled pressurised bottle and the pressure of the spring is released by turning the securing top 25, as shown in Fig. 5n.

Example 6

Alternative F

[0040] The technical design illustrated in Fig. 6a to 6p is essentially identical to alternative E as described in example 5, with the difference that the body of the flexible element 2 is made from an open spring 21, which is expanded in resting state. The base 26 of the flexible element upon contact with the wall of the pressurised container contains sealing elements 33 in order to ensure the impermeability of liquid to the construction of the spring 21.

Example 7

Alternative G

[0041] The technical design illustrated in Fig. 7a to 7m is essentially a combination of alternative B as described in example 2 and alternative E as described in example 5, with the proviso that the base 26 of the flexible element is fitted with a catch 27 in order to ensure the liquid-resistance outside the body 22 of the flexible element, in which the liquid is inlet through the hole 251 for the securing top 25 via the head 29 of the flexible element 2. The liquid may be forced out via the bridging 34 of the flow of liquid created in the head 29 of the flexible element for outflow of liquid into the collecting tube 12 of the pressurised container, as shown in Fig. 7m and 7l.

Industrial utilization

[0042] The invention is usable for personal use as a device for filling liquids, especially for sportspeople, also for drivers of motor vehicles, in which the bottle upon drinking does not obscure the user's view, but this design is usable everywhere it is necessary to create constant overpressure in the container without the use of further gases, liquids or complex mechanisms.

List of reference marks:

[0043]

1 - pressurised container
11 - screw thread
12 - collecting tube
2 - flexible element
21 - spring
22 - body of flexible element
221 - channel
23 - neck
231 - outlet hole
24 - release valve
241 - lever
242 - spring
25 - securing top
251 - hole
26 - base
27 - catch
28 - screw thread
29 - head of flexible element
30 - stopper
31 - guide path
32 - guide peg
33 - sealing element
34 - bridging

Claims

1. Container with flexible element containing a pressurised container, spring, collecting tube and top, **characterized by that** the flexible element (2) is connected to the pressurised container (1), in which the flexible element (2) is formed by a base (26) and body (22), or is formed by a base (26) and spring (21), of by a base (26) and body (22) containing a spring (21), in which the base (26), body (22) and spring (21) adjoin to the inner walls of the pressurised container (1), and/or the flexible element (2) is furnished with at least one sealing element (33), which is inserted at the edges of the base (26) for preventing the penetration of liquid above or below the base (26), in which the body (22) of the flexible element (2) is made of a material with memory and/or rubber and/or plastic and/or textile, and the pressurised container (1) also contains a head (29), in which the head (29) of the flexible element (2) or pressurised container (1) is furnished with a securing top (25) and a catch (27) created in the base (26) of the flexible element (2) in order to secure the position of the base (26), in which the head (29) further contains a hole (251) for inserting the securing top (251) or stopper (30), in which the head (29) of the flexible element (2) or pressurised container (1) contains an outlet hole (231) with a neck (23) and release valve (24) controlled by a lever (241) and spring (242).

2. Container with flexible element according to claim 1, **characterized by that** the internal wall of the pressurised container (1) contains a collecting tube (12) for drainage of liquid into the outlet hole (231).

3. Container with flexible element according to any of claims 1 to 2, **characterized by that** for tightening of the flexible element (2) the pressurised container (1) is furnished with a wire or string or at least one guide path (31) and the flexible element (2) is fitted with at least one guide peg (32) shifting throughout the entire length of the guide path (31).

4. Container with flexible element according to any of claims 1 to 3, **characterized by that** the flexible element (2) is connected to the pressurised container (1) with the help of a lever stopper or a screw thread (11) on the internal wall of the pressurised container (1) and a screw thread (28) on the internal wall of the head (29) of the flexible element (2).

5. Container with flexible element according to any of claims 1 to 4, **characterized by** that the head (29) of the flexible element contains bridging (34) for directing the flow of liquid into the pressurised container (1).

6. Container with flexible element according to any of claims 1 to 5, **characterized by that** it contains a pump and/or piston for pumping gas into the internal space of the pressurised container (1) or flexible element (2) in order to increase the expansive effect of the flexible element (2).

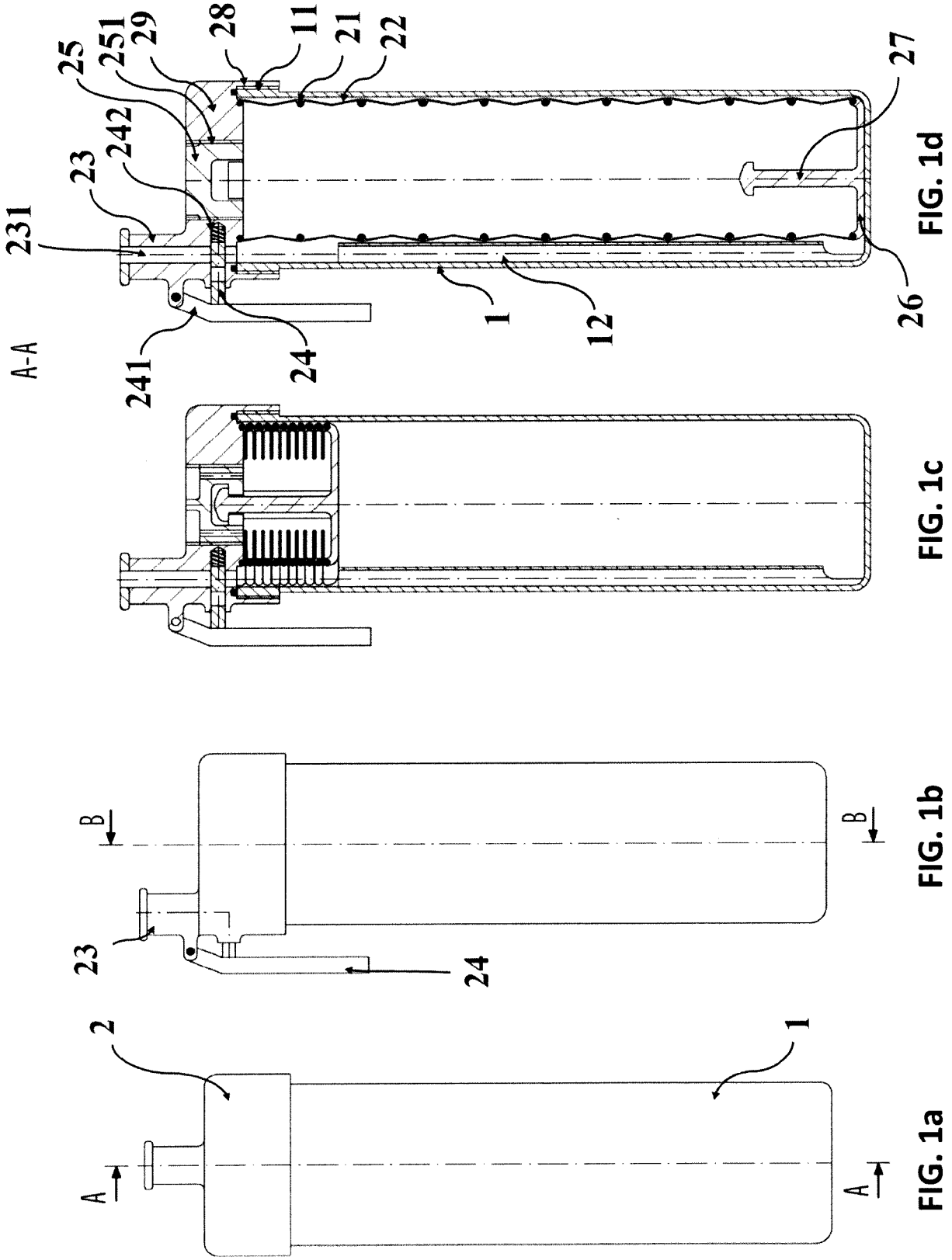


FIG. 1a

FIG. 1b

FIG. 1c

FIG. 1d

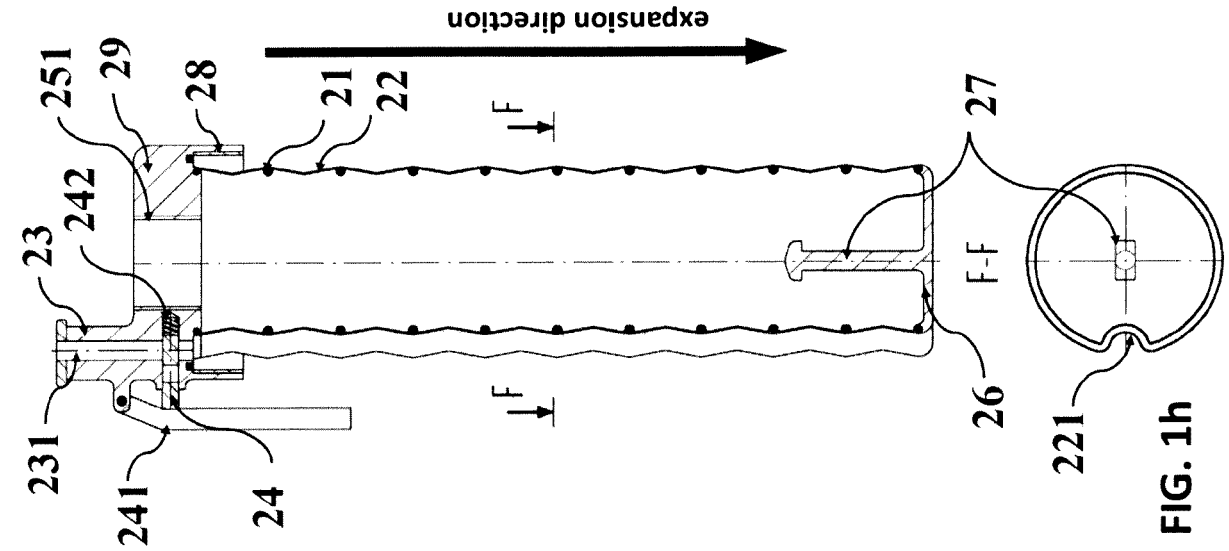


FIG. 1h

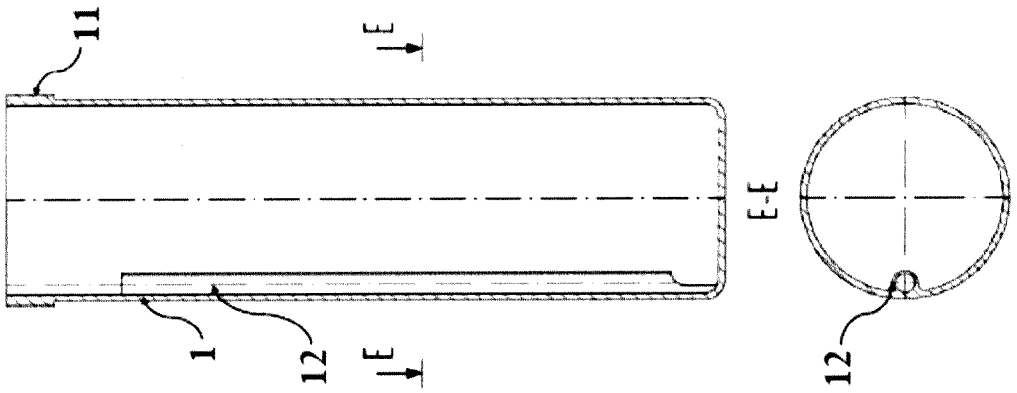


FIG. 1g

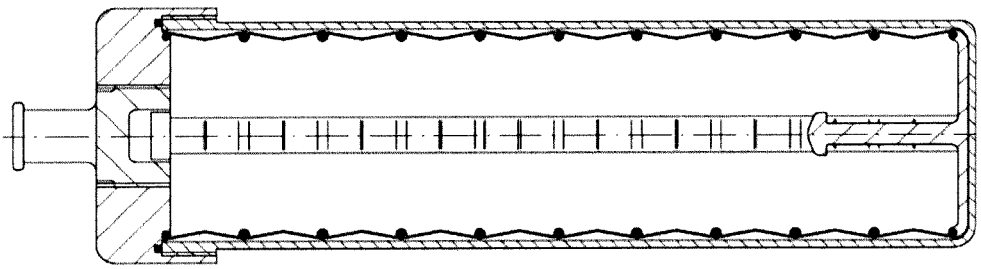


FIG. 1f

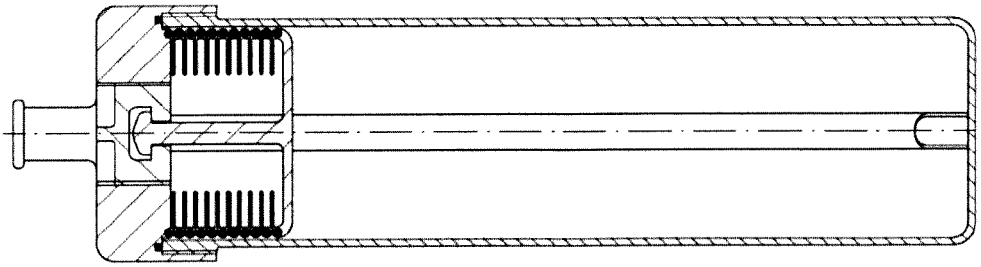


FIG. 1e

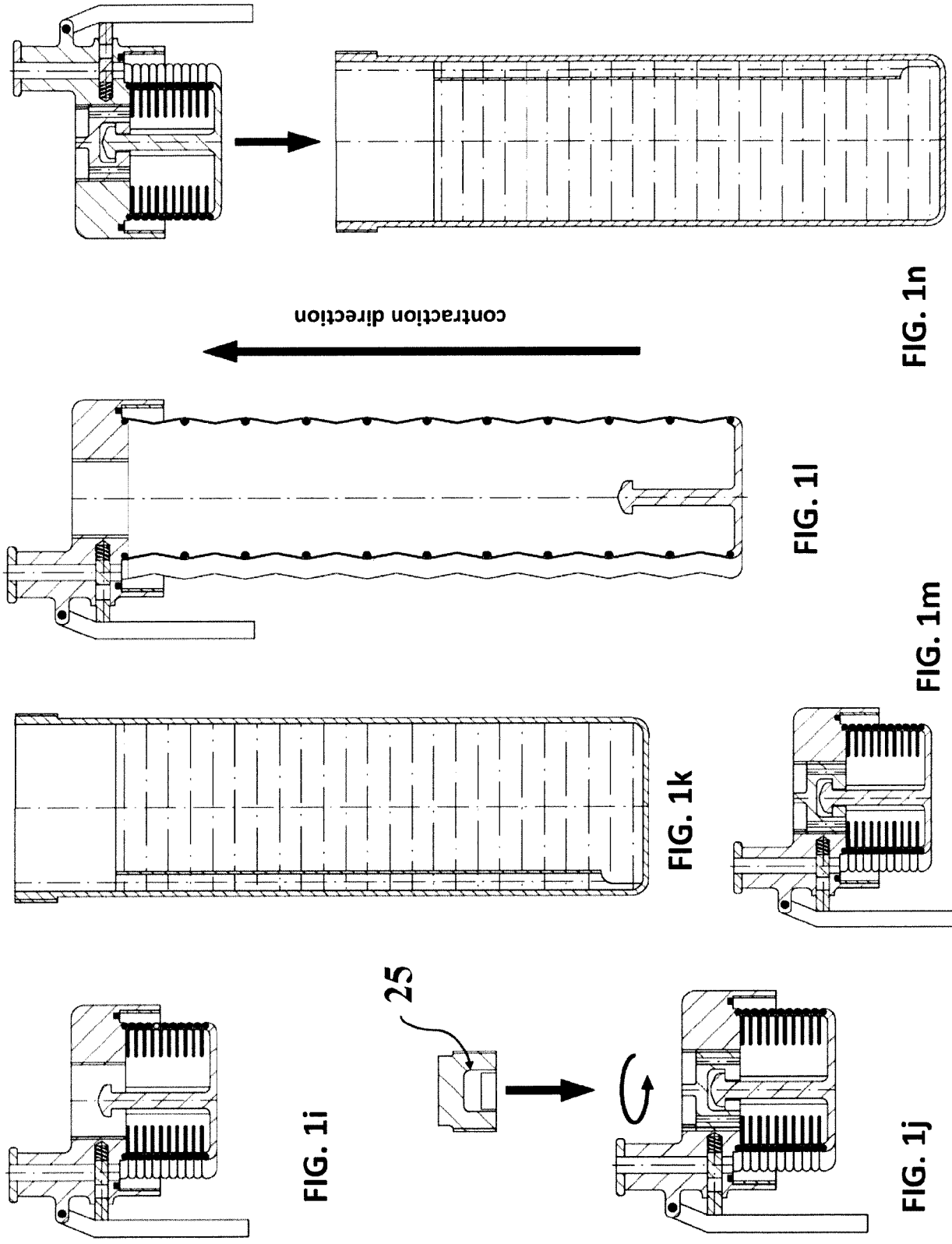


FIG. 1i

FIG. 1j

FIG. 1k

FIG. 1l

FIG. 1m

FIG. 1n

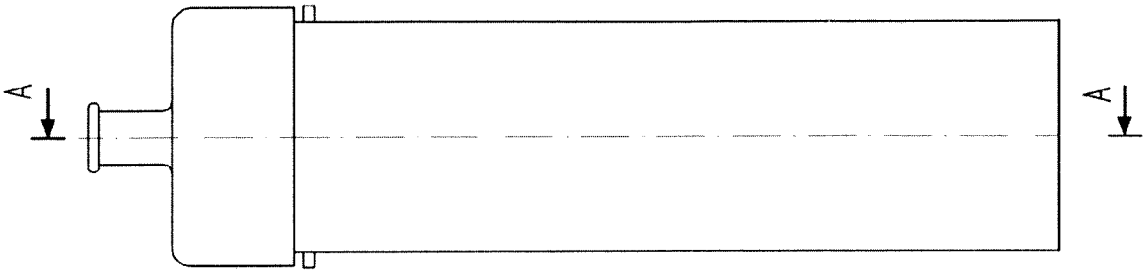


FIG. 2a

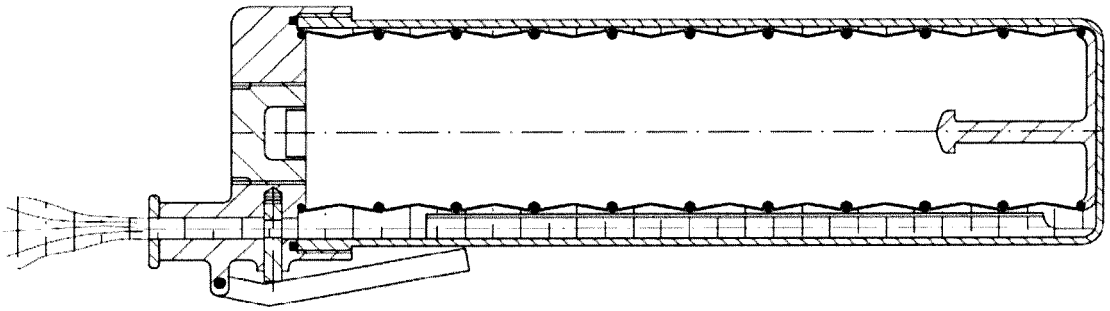


FIG. 1q

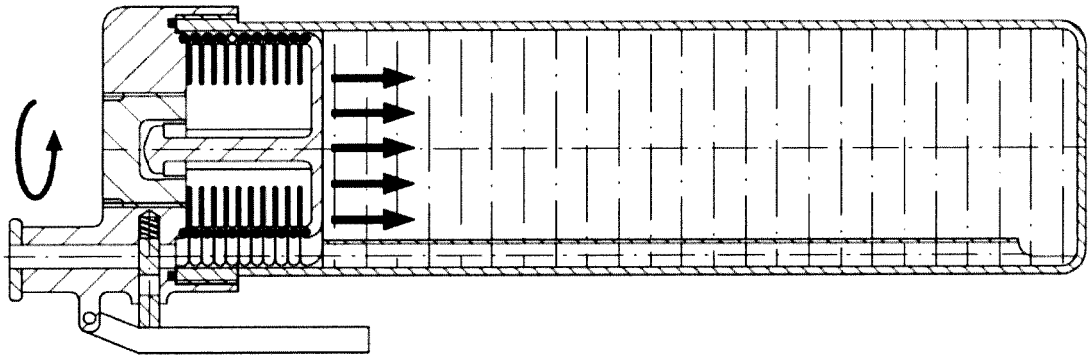


FIG. 1p

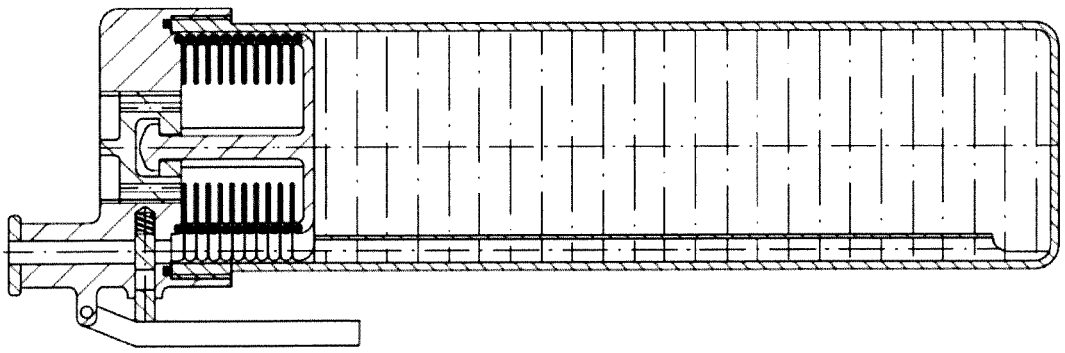


FIG. 1o

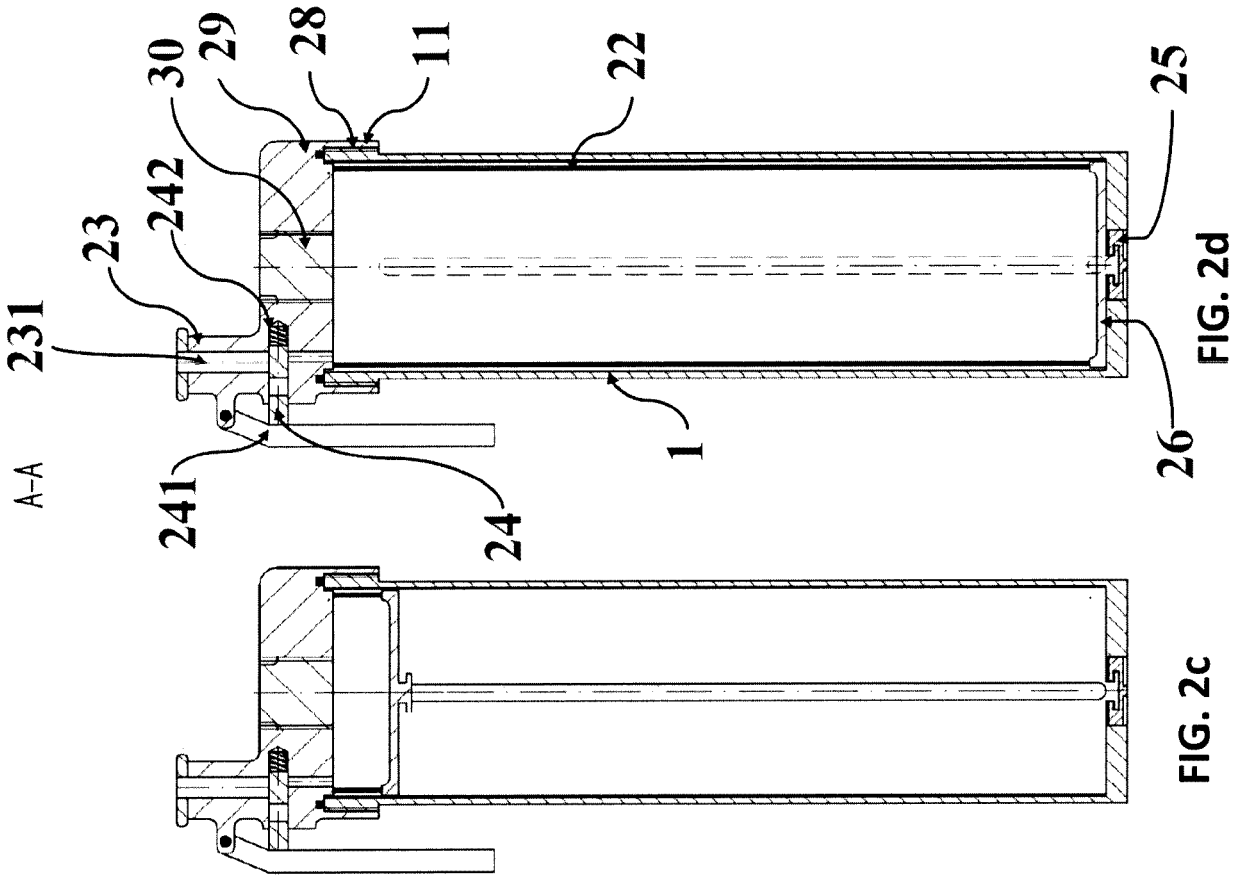


FIG. 2d

FIG. 2c

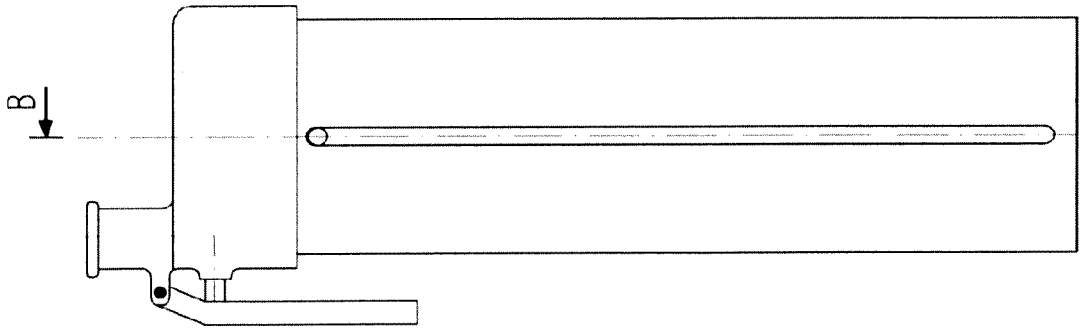


FIG. 2b

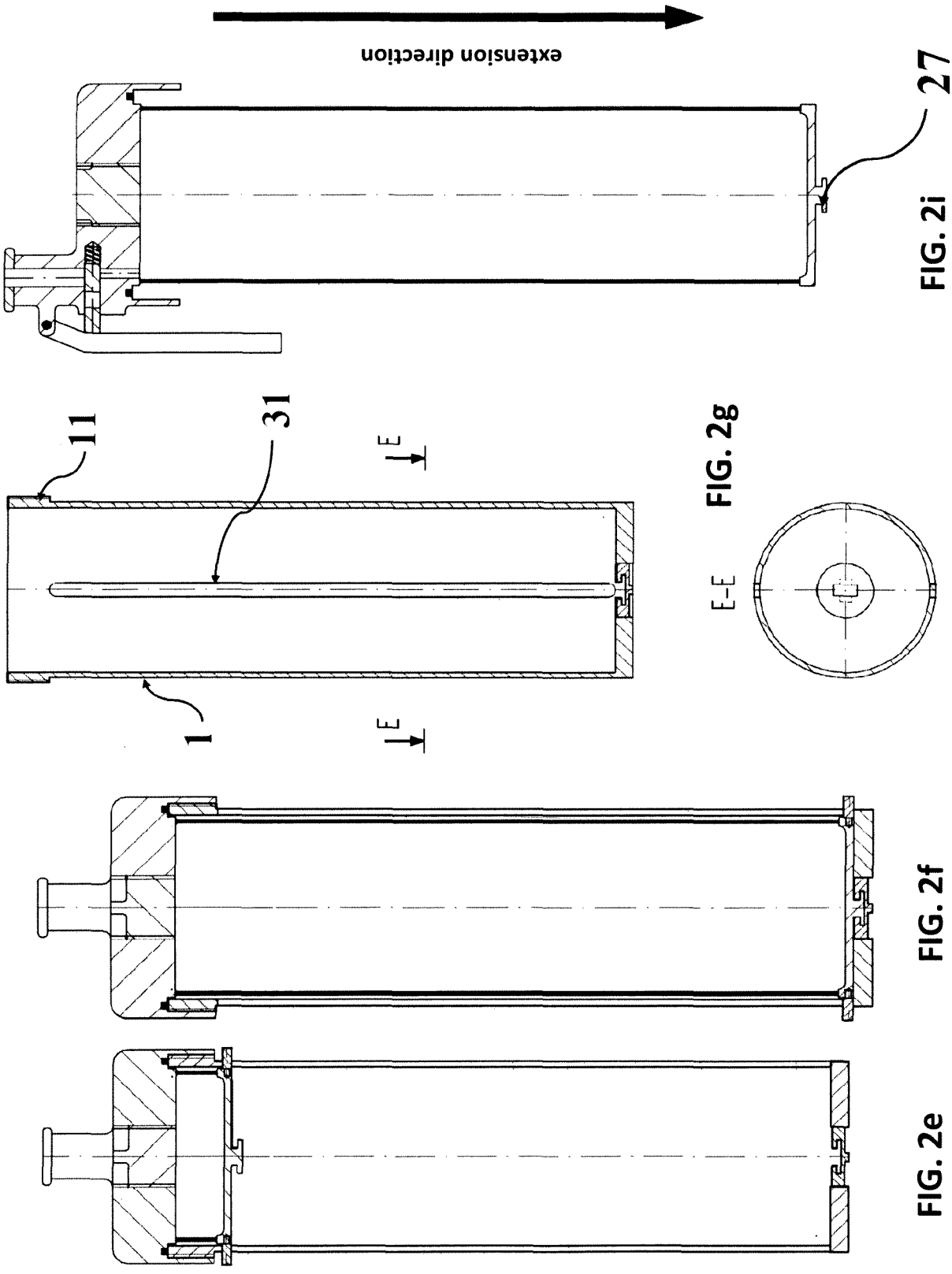


FIG. 2i

FIG. 2g

FIG. 2f

FIG. 2e

FIG. 2m

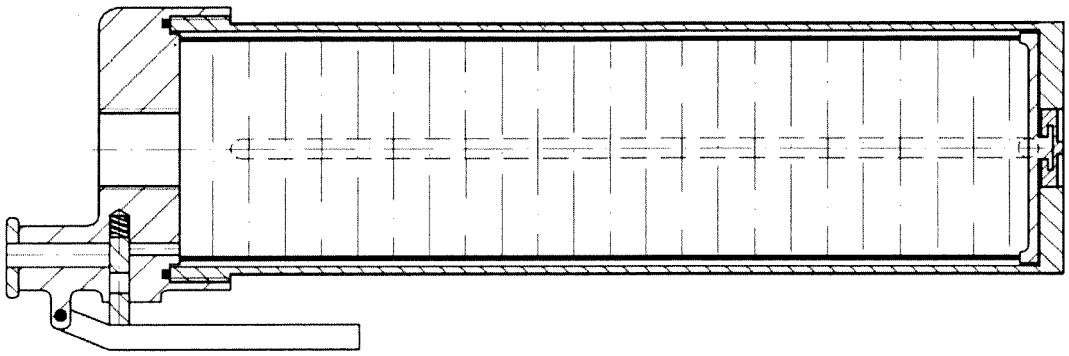
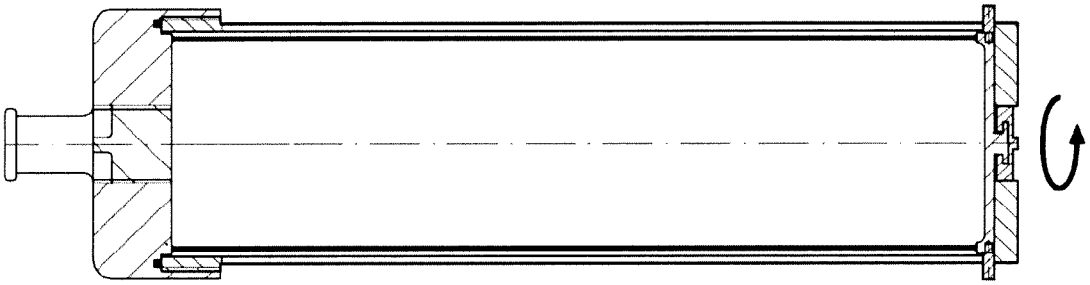


FIG. 2l



extension direction

FIG. 2j

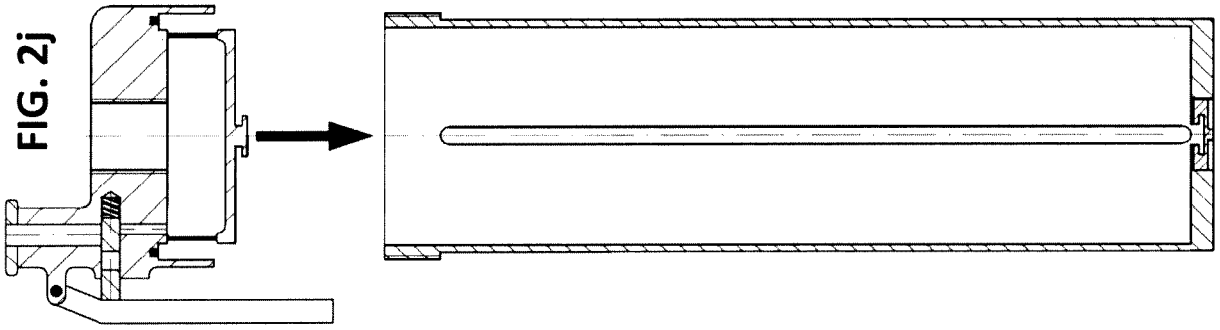


FIG. 2h

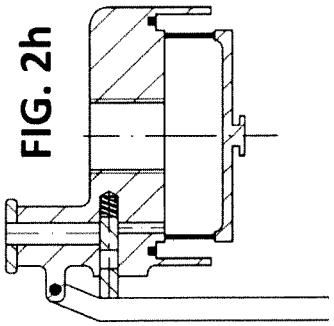
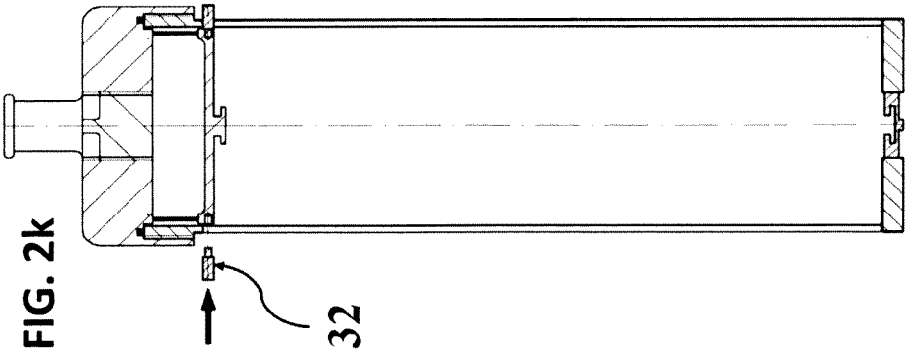


FIG. 2k



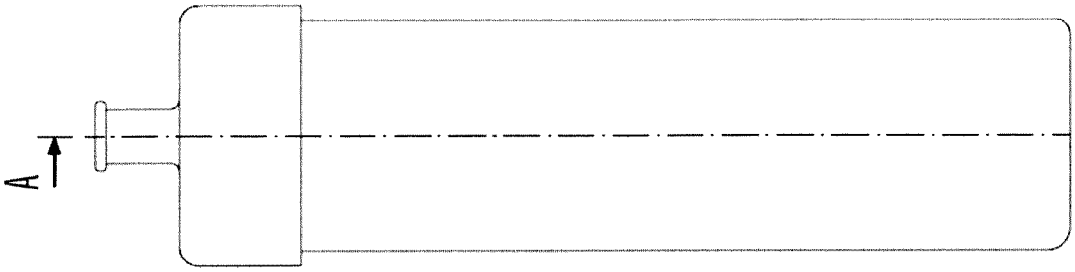


FIG. 3a

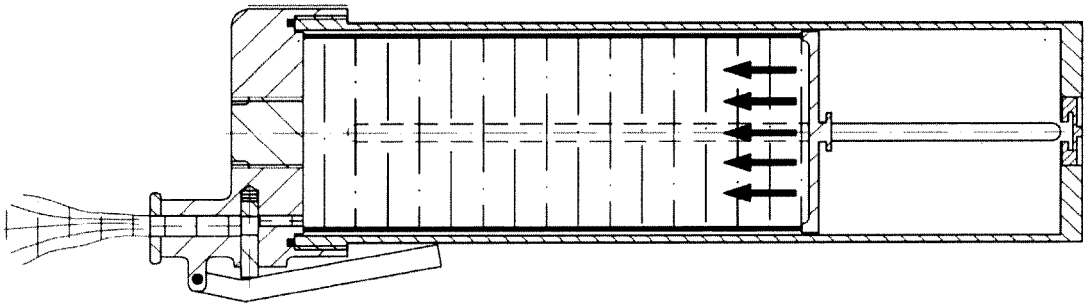


FIG. 2p

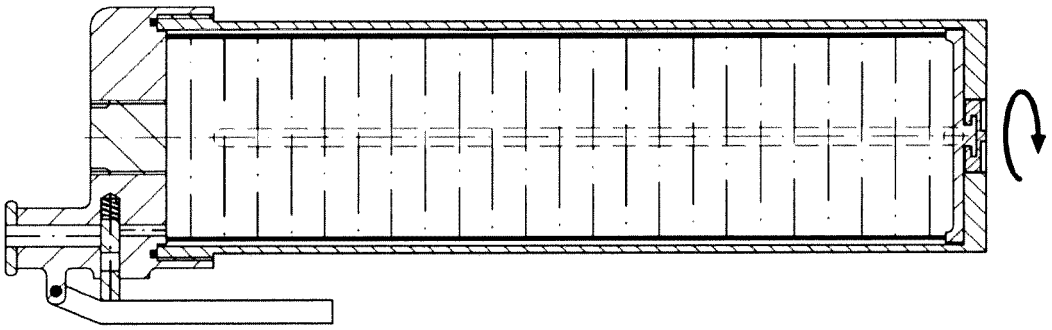


FIG. 2o

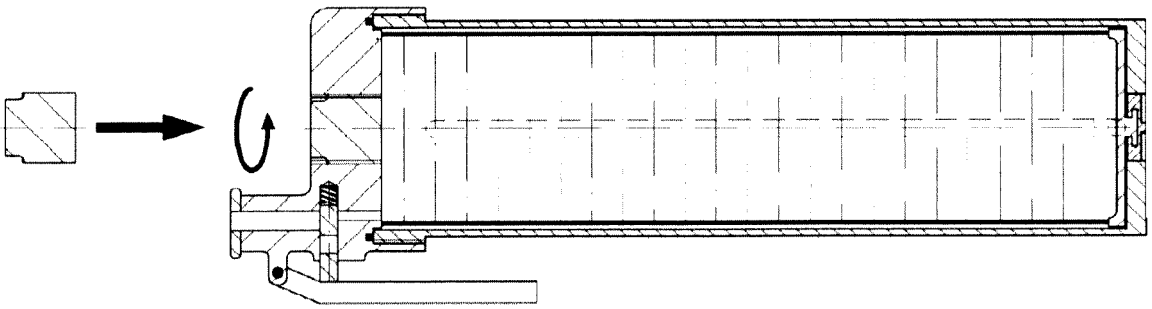


FIG. 2n

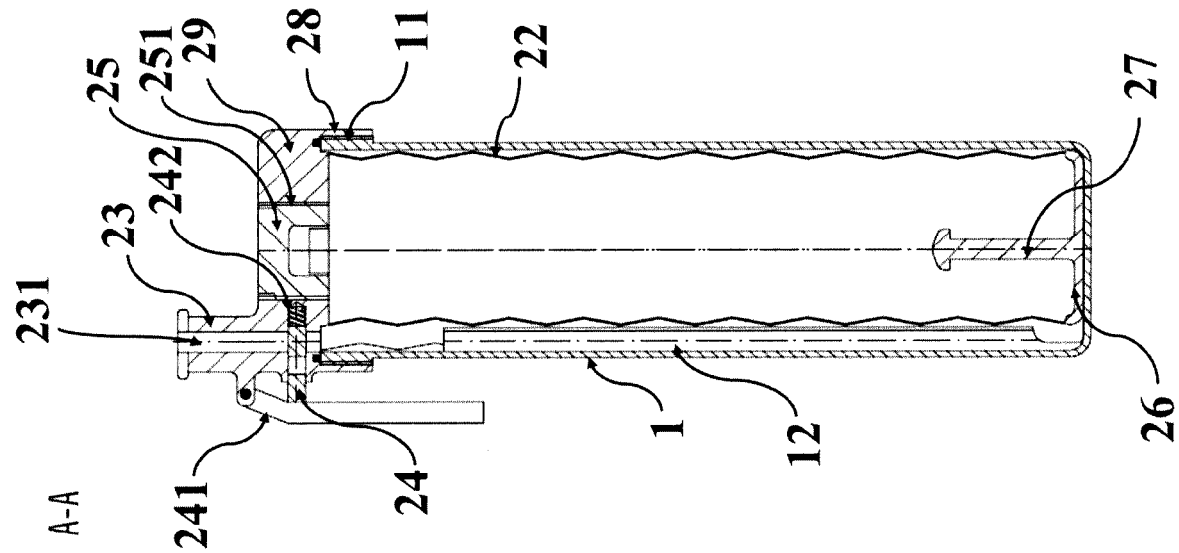


FIG. 3d

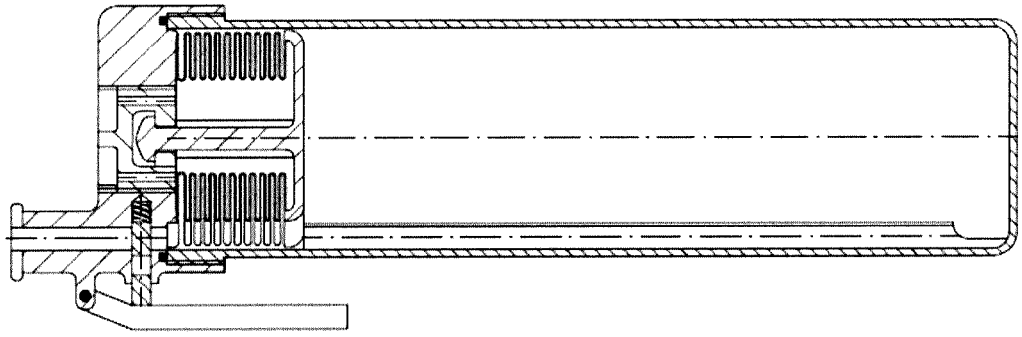


FIG. 3c

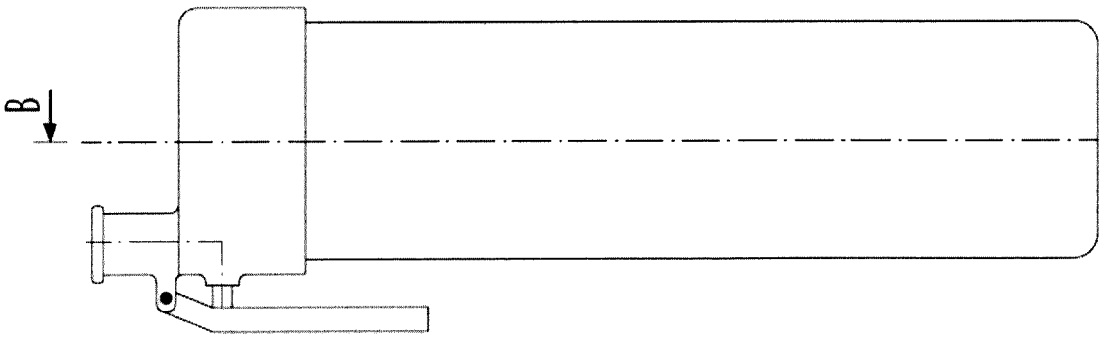


FIG. 3b

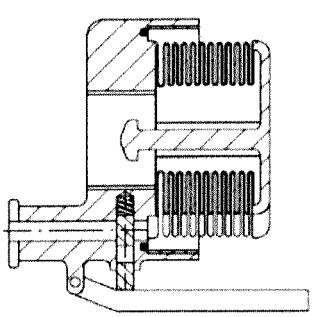


FIG. 3h

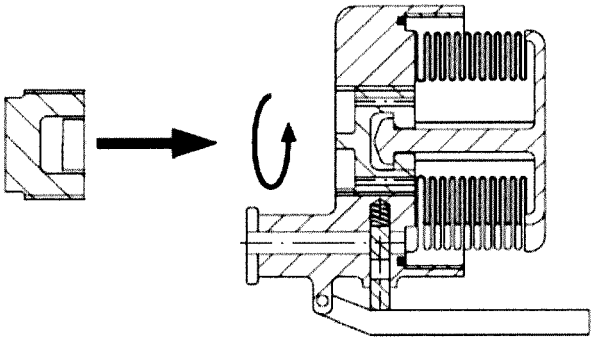


FIG. 3i

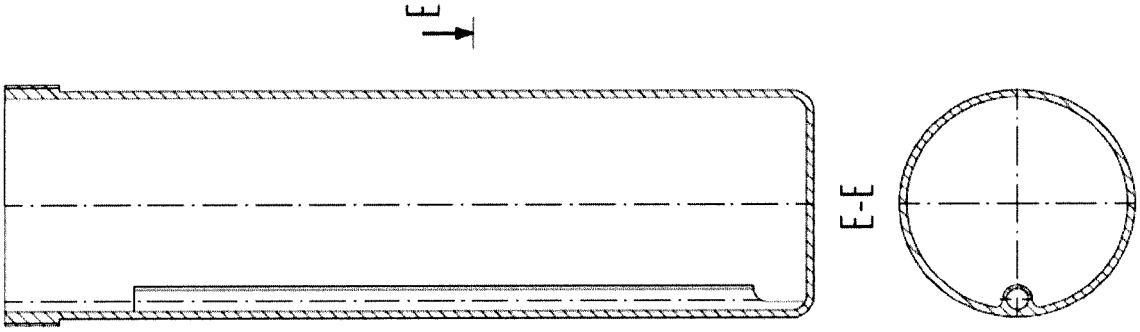


FIG. 3g

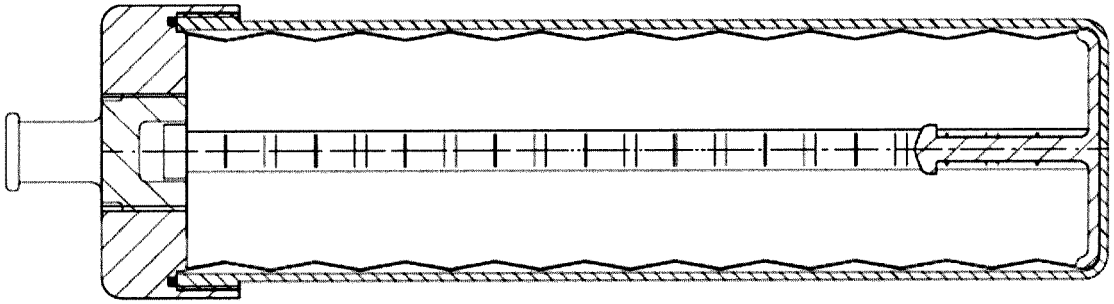


FIG. 3f

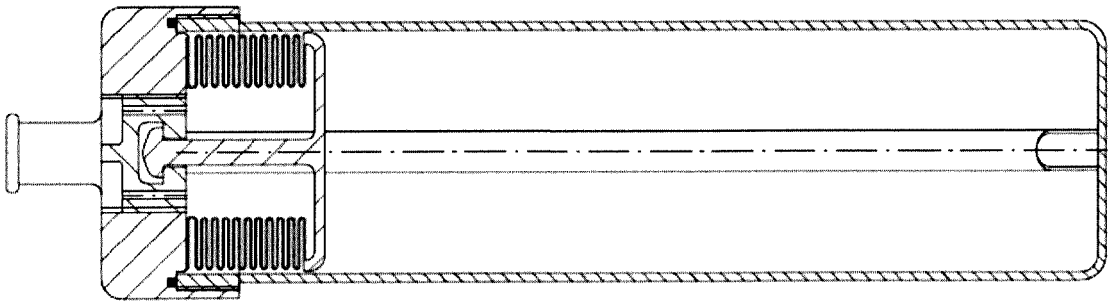


FIG. 3e

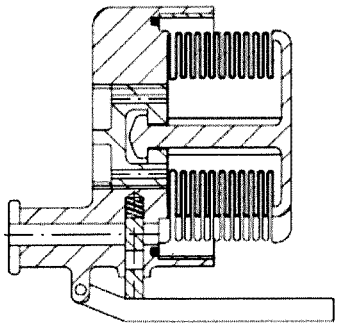


FIG. 3m

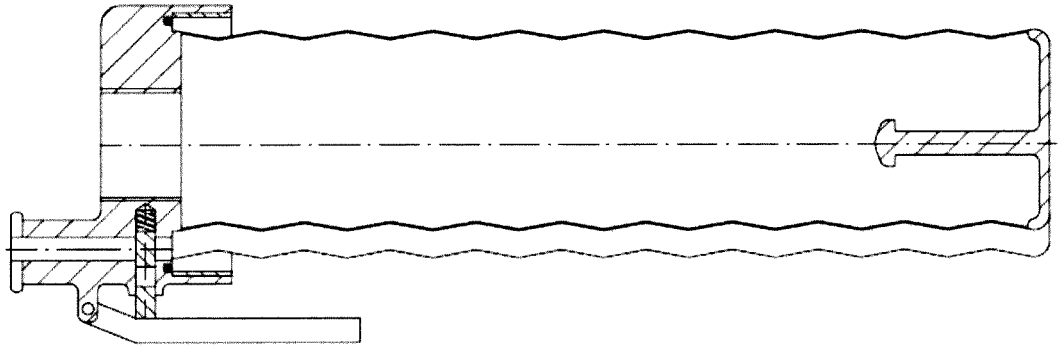


FIG. 3l

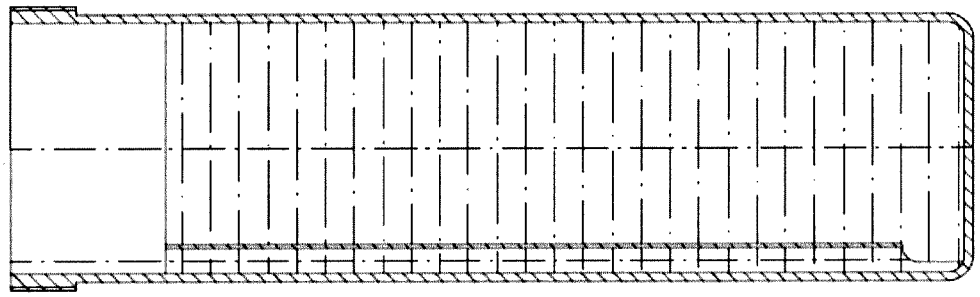


FIG. 3k

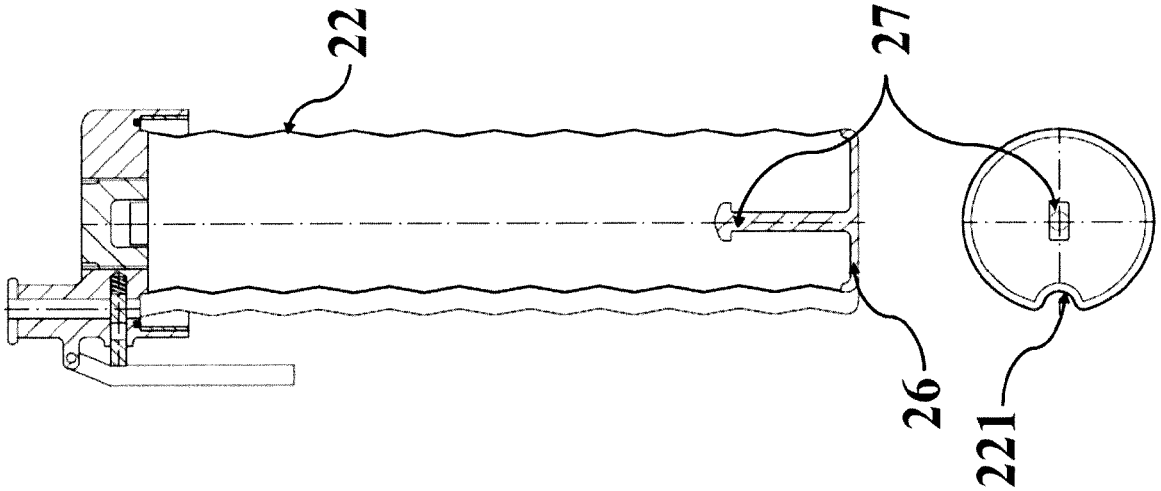


FIG. 3j

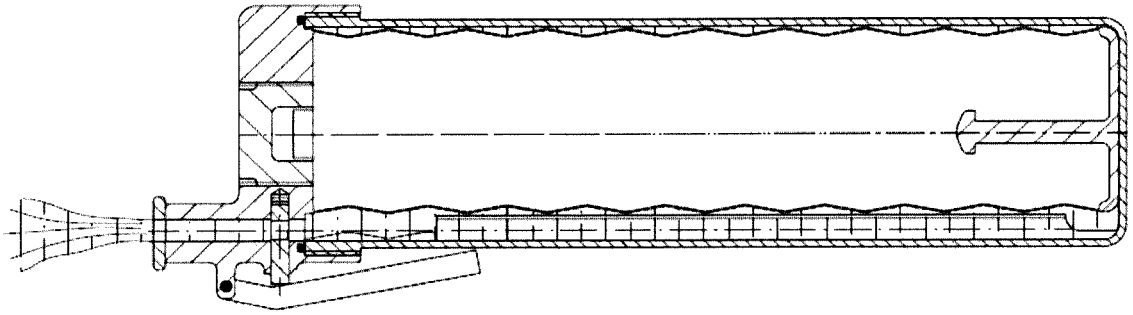


FIG. 3q

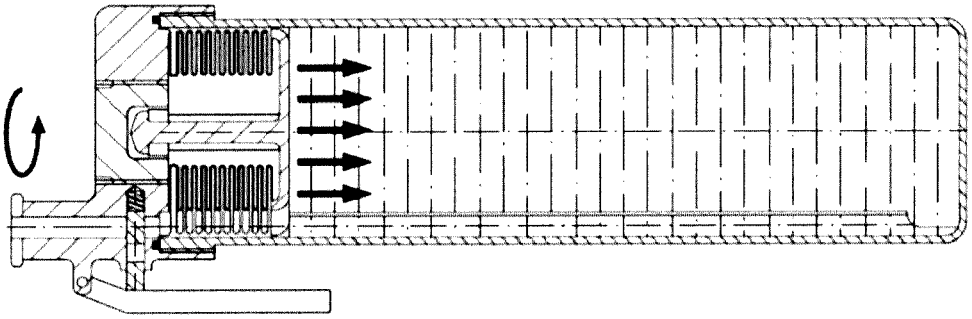


FIG. 3p

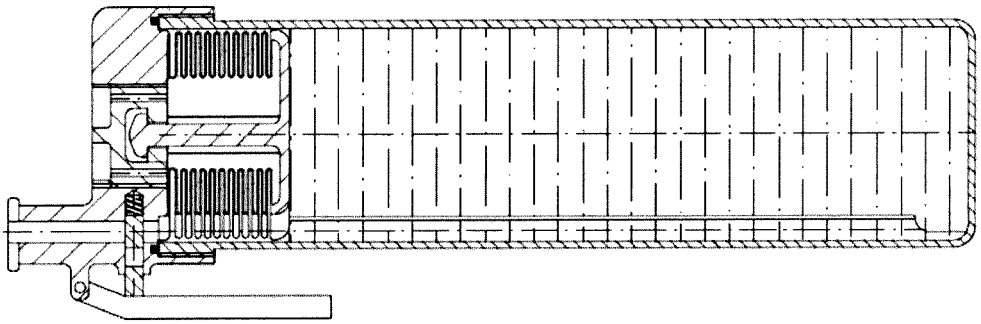


FIG. 3o

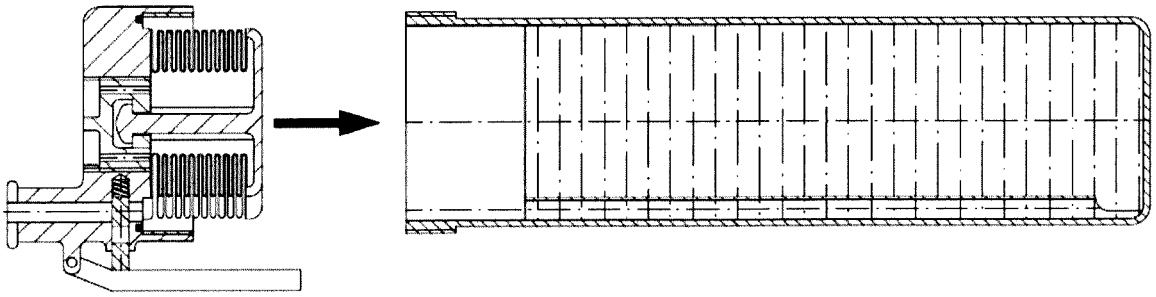


FIG. 3n

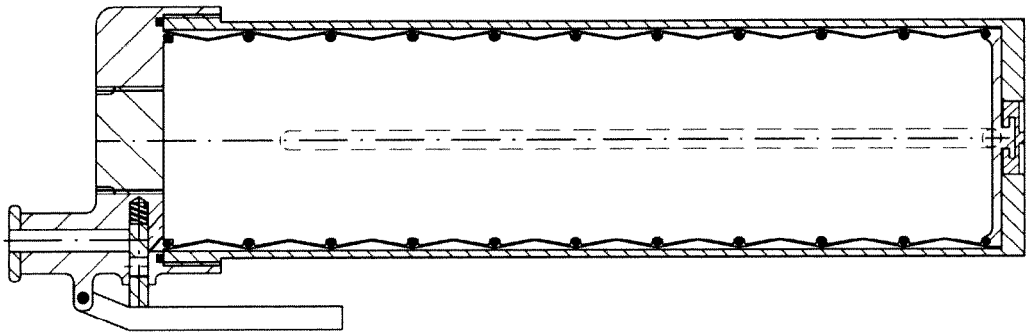


FIG. 4d

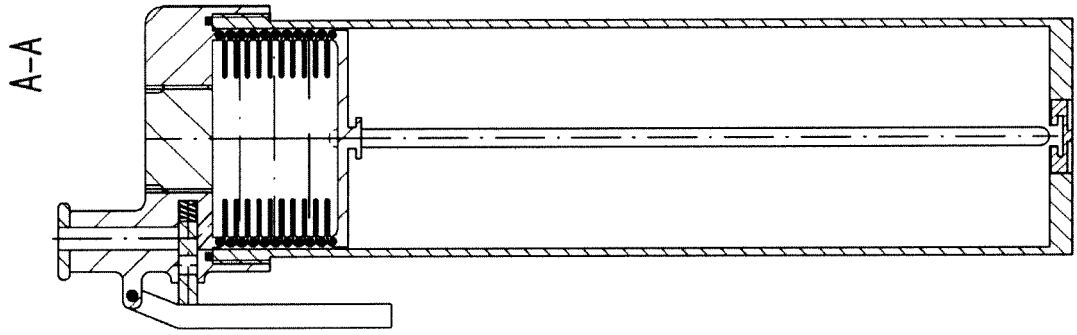


FIG. 4c

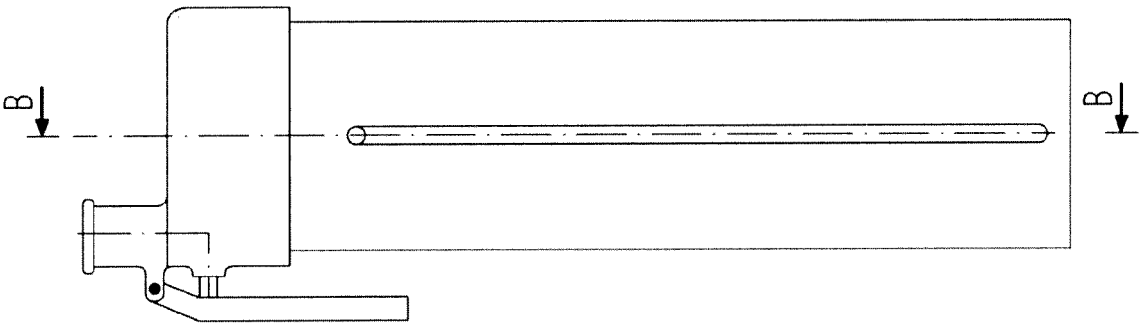


FIG. 4b

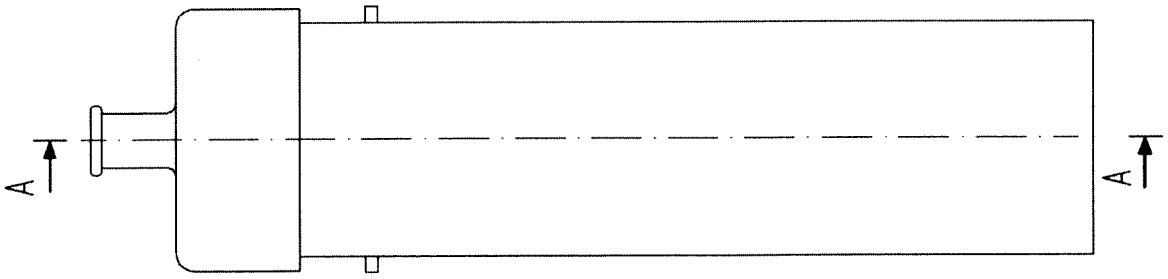
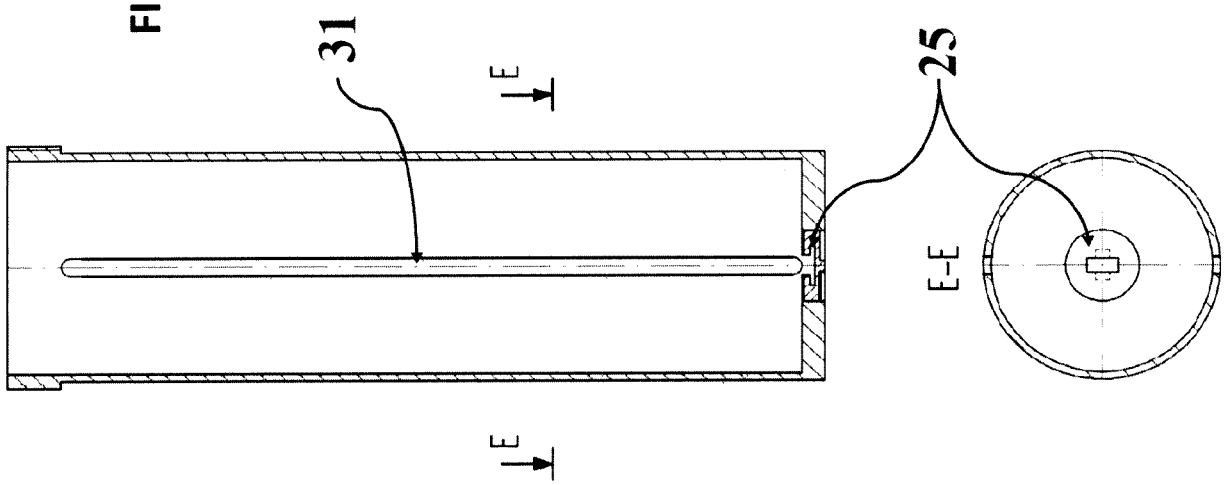


FIG. 4a

FIG. 4g



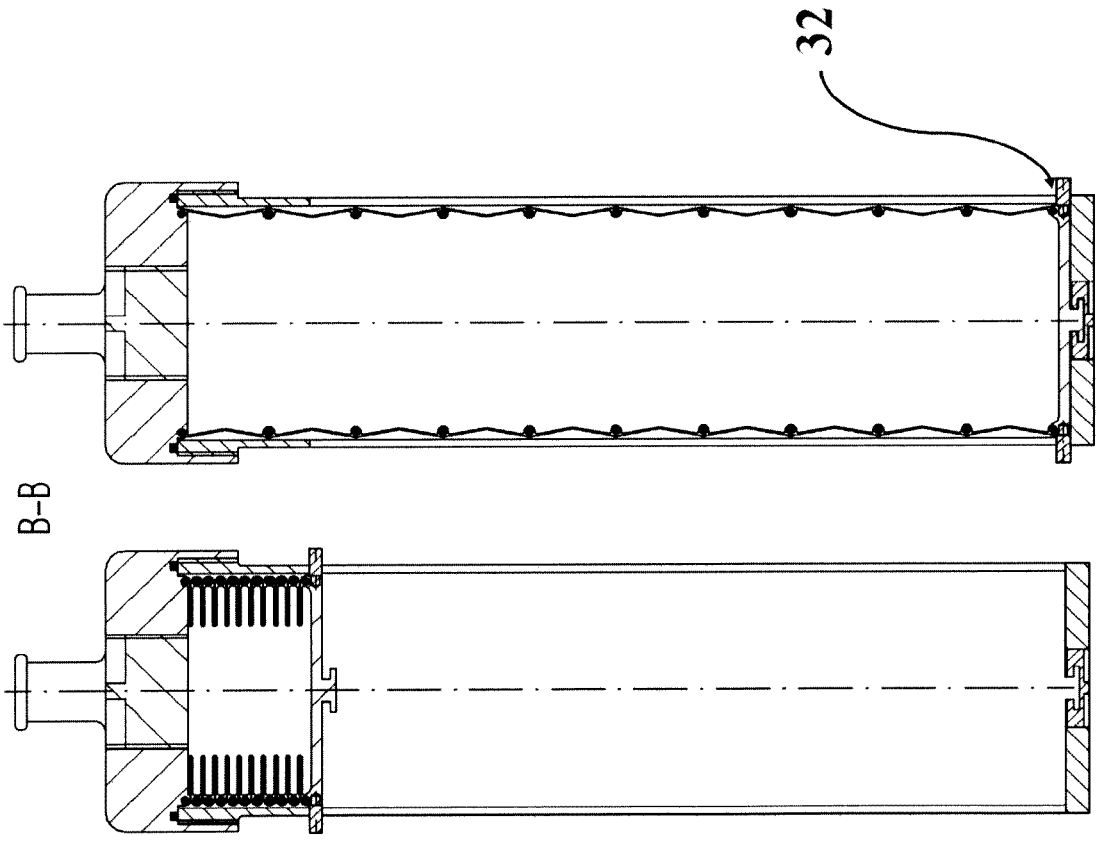


FIG. 4f

FIG. 4e

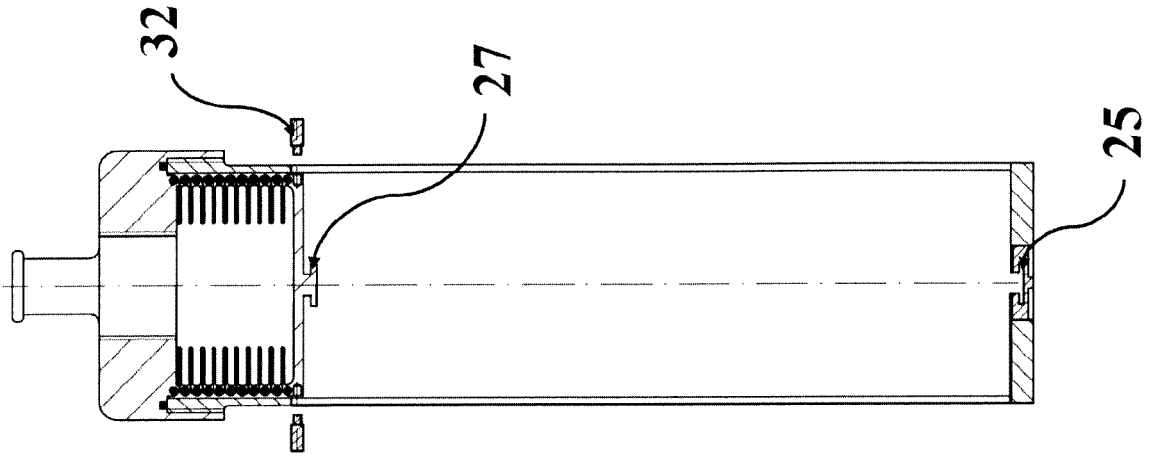


FIG. 4k

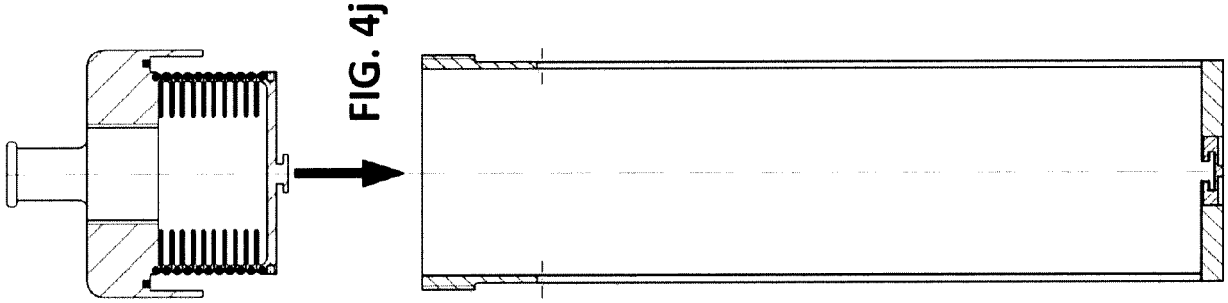


FIG. 4j

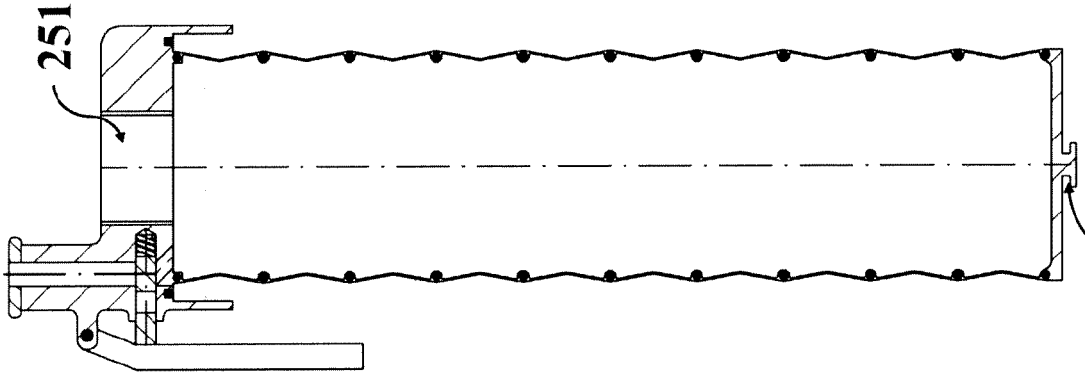


FIG. 4i

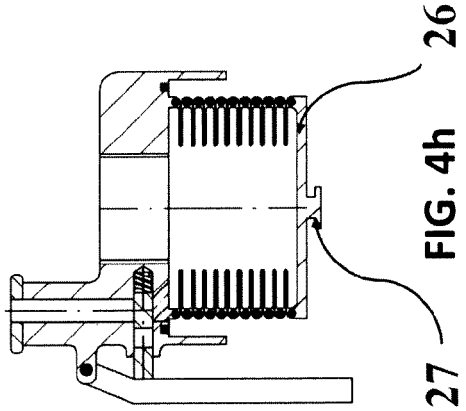


FIG. 4h

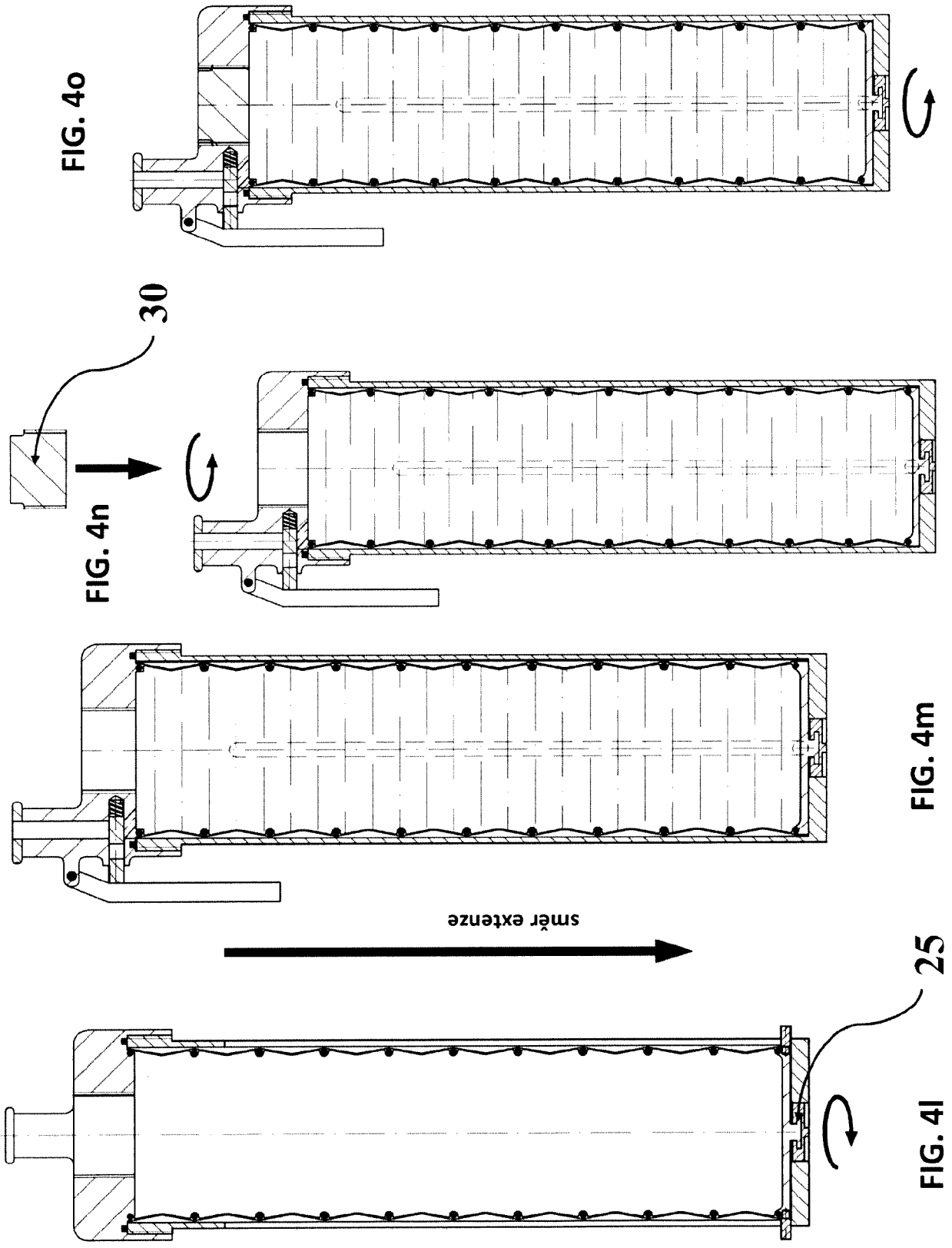


FIG. 4o

FIG. 4n

FIG. 4m

FIG. 4l

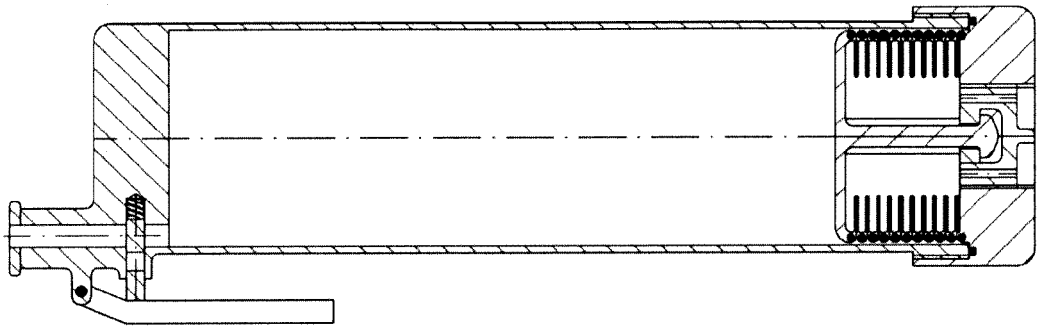


FIG. 5c

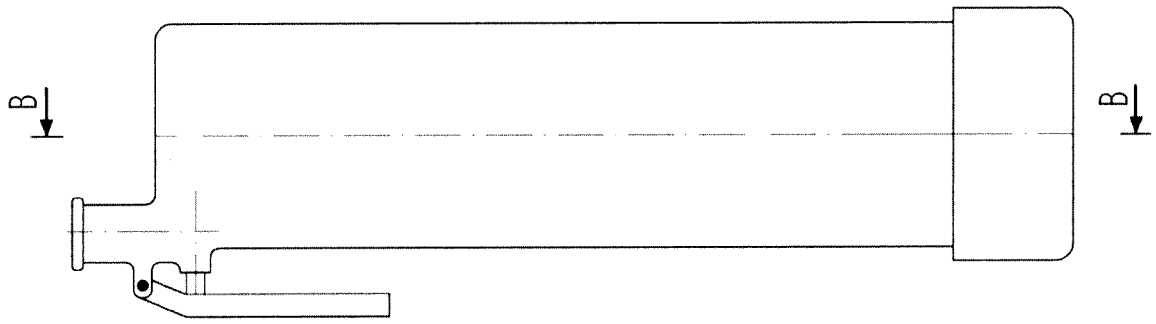


FIG. 5b

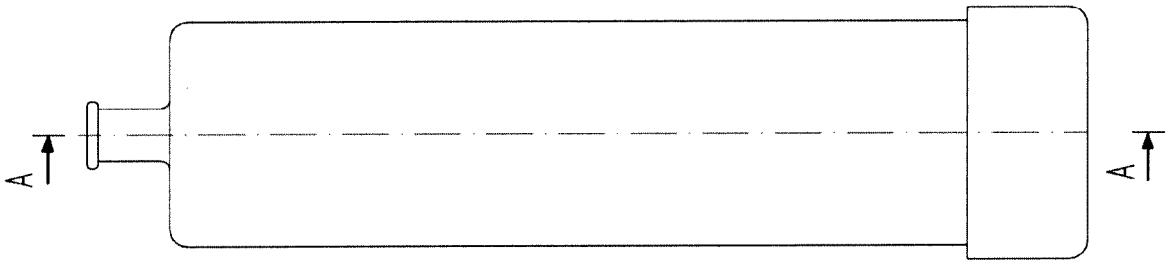


FIG. 5a

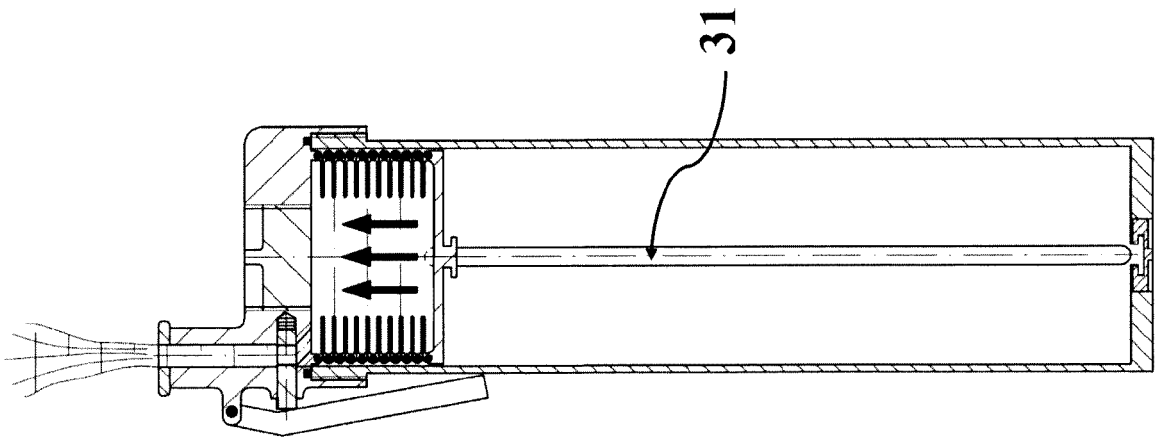


FIG. 4p

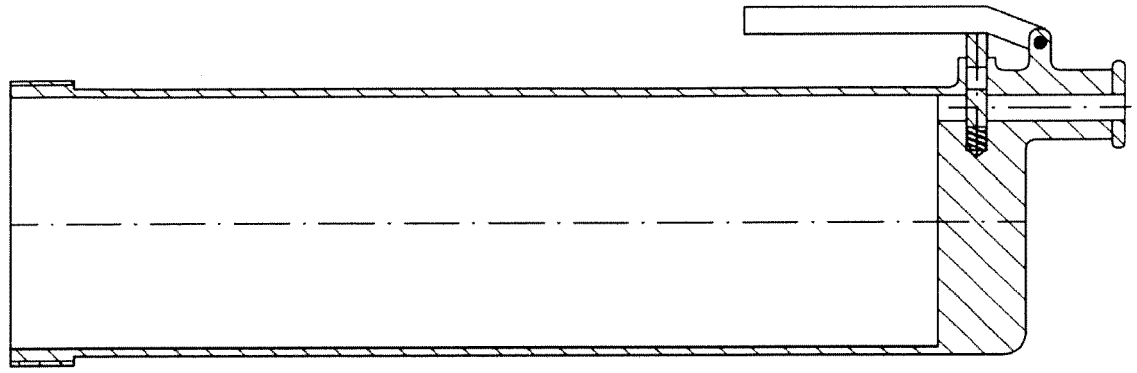


FIG. 5g

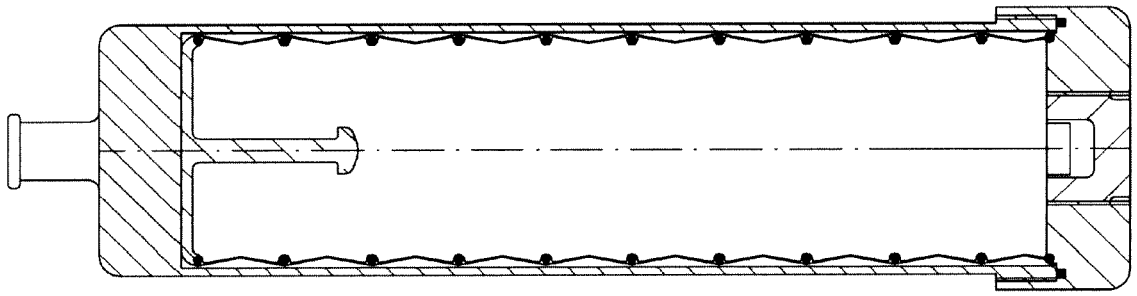


FIG. 5f

B–B

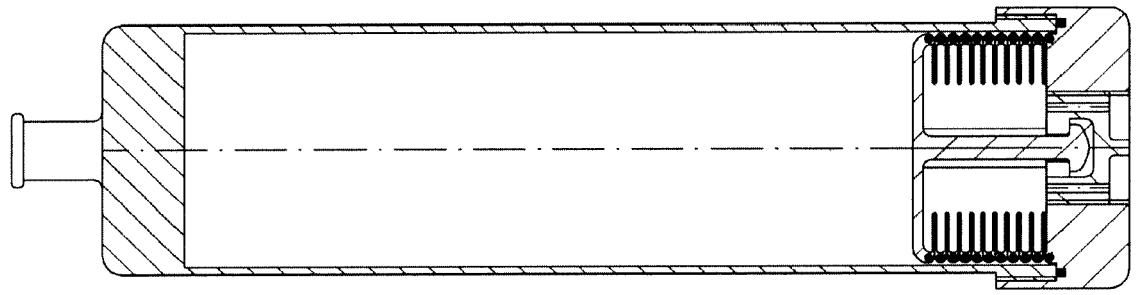


FIG. 5e

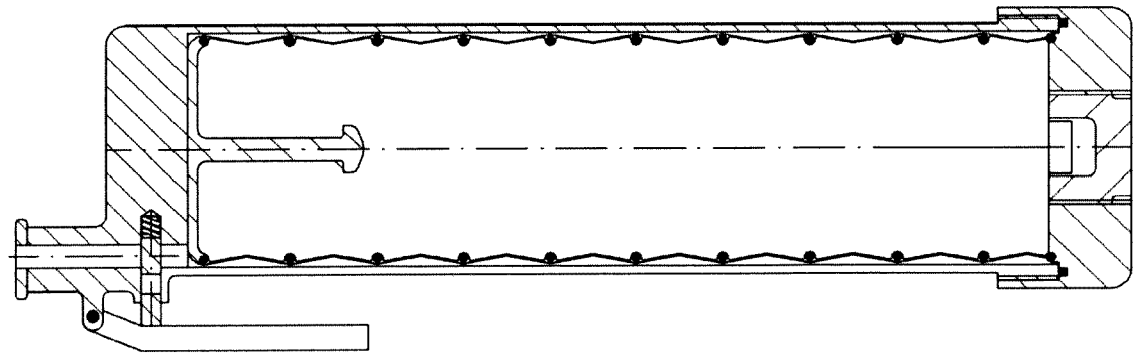


FIG. 5d

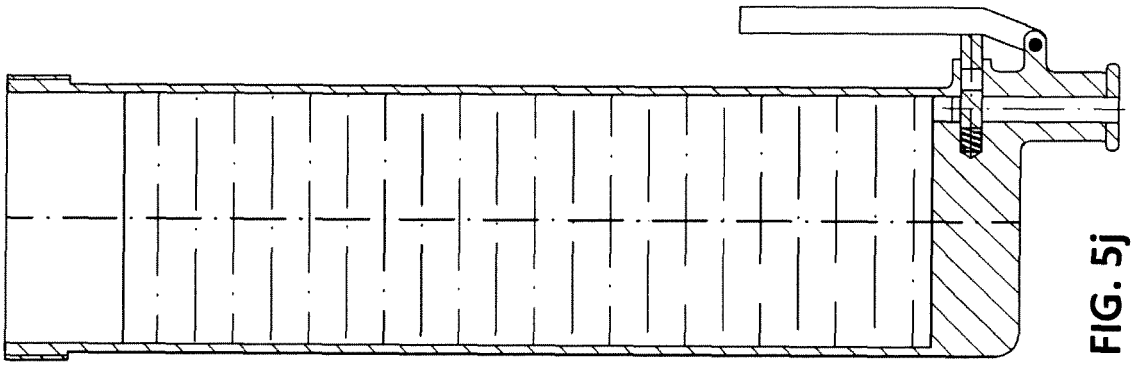
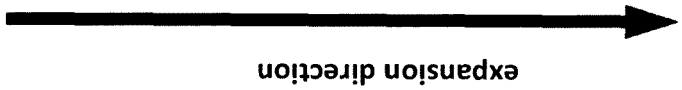


FIG. 5j



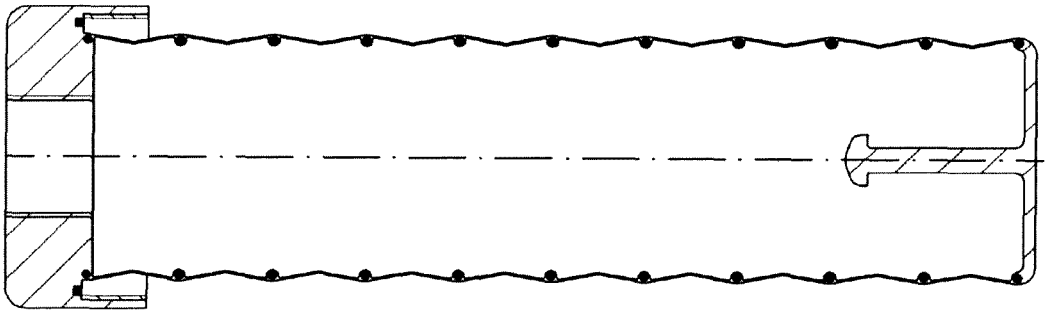


FIG. 5i

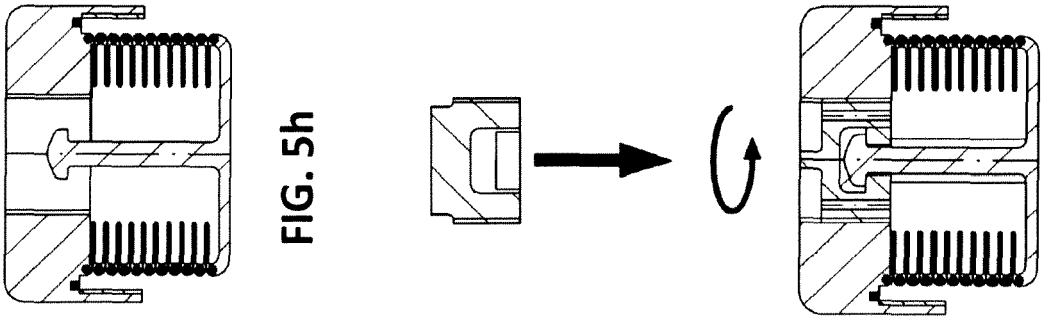


FIG. 5h

FIG. 5l

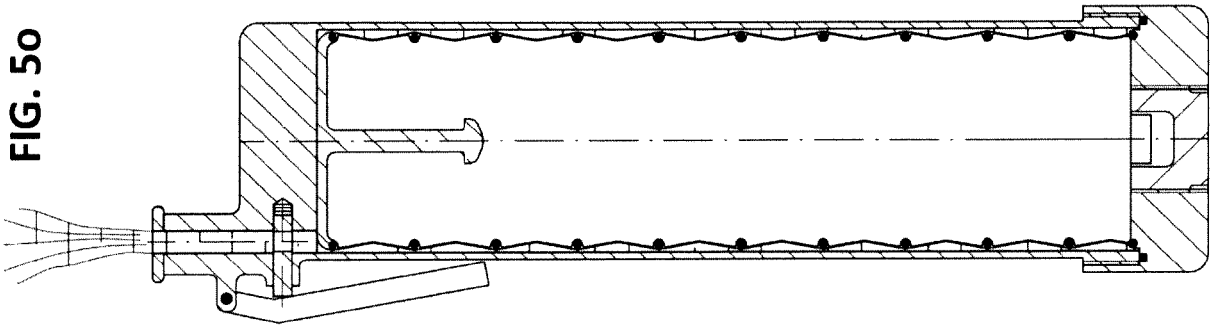


FIG. 5o

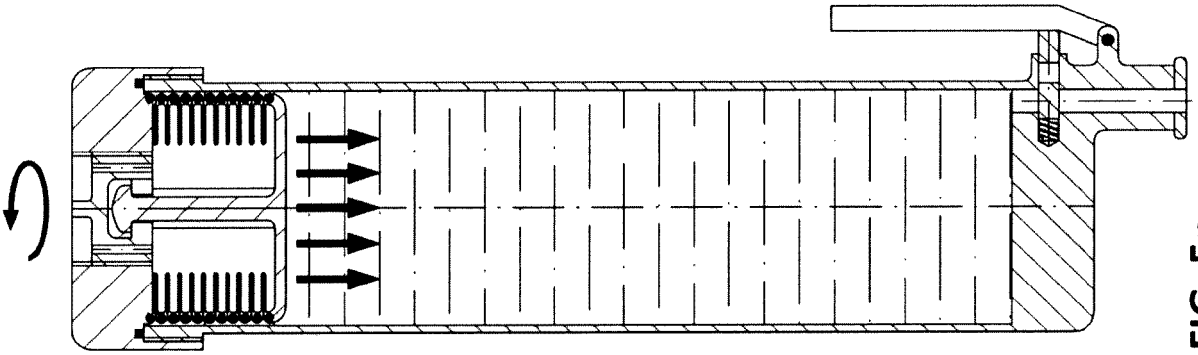


FIG. 5n

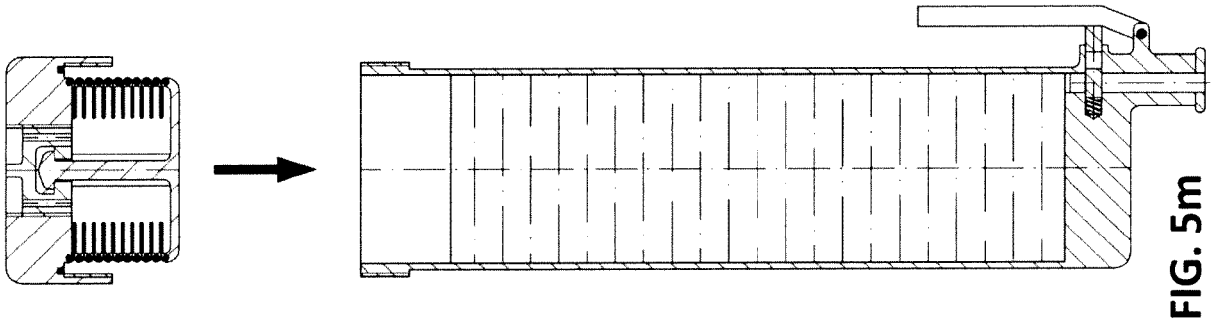


FIG. 5m

contraction direction

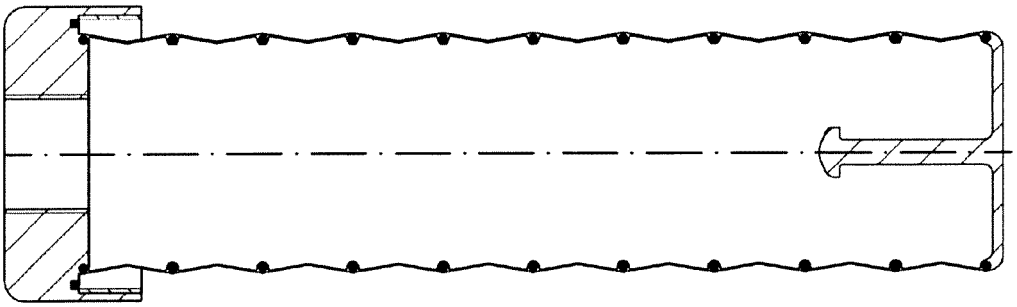


FIG. 5k

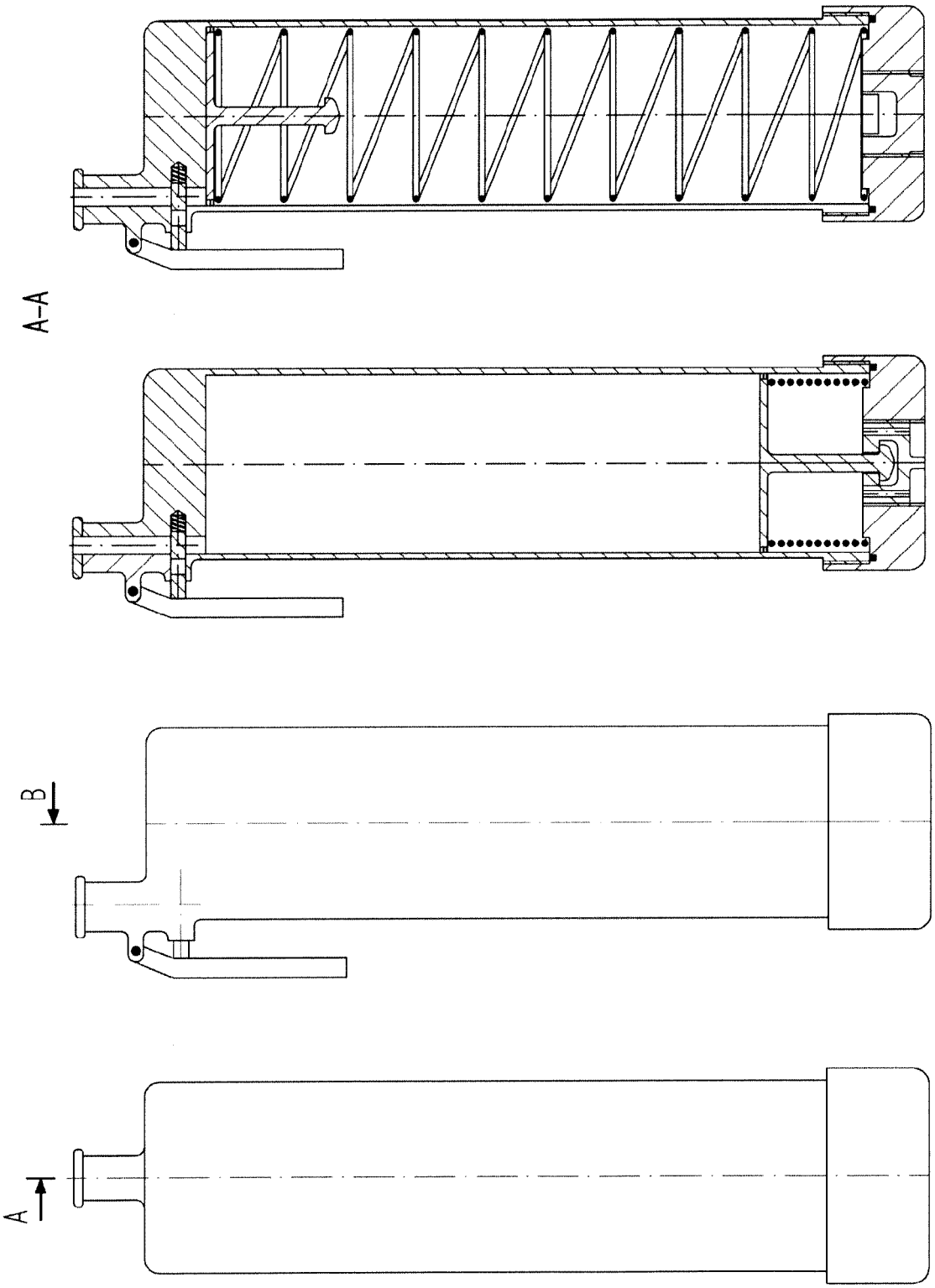


FIG. 6d

FIG. 6c

FIG. 6b

FIG. 6a

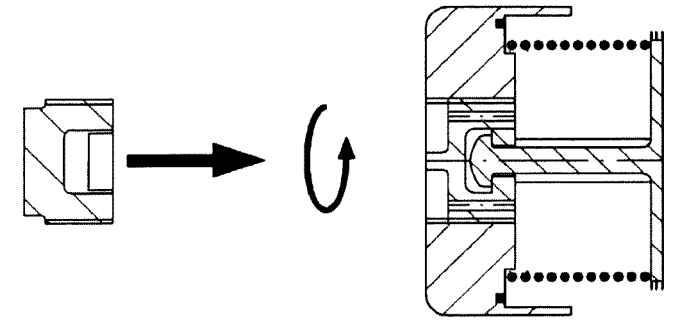


FIG. 6h

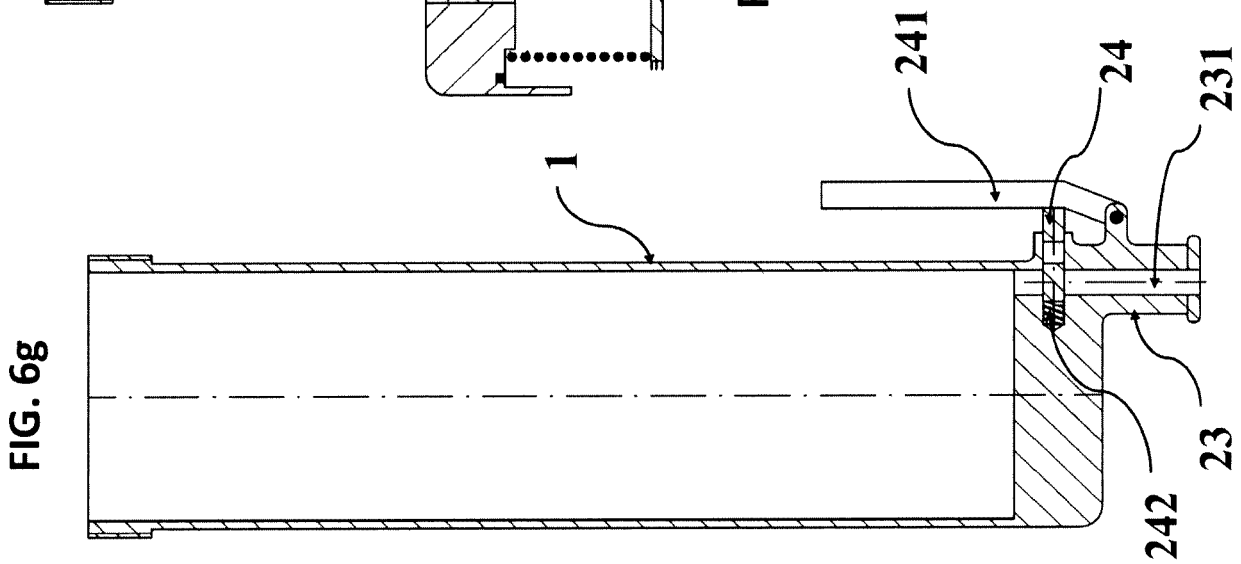


FIG. 6g

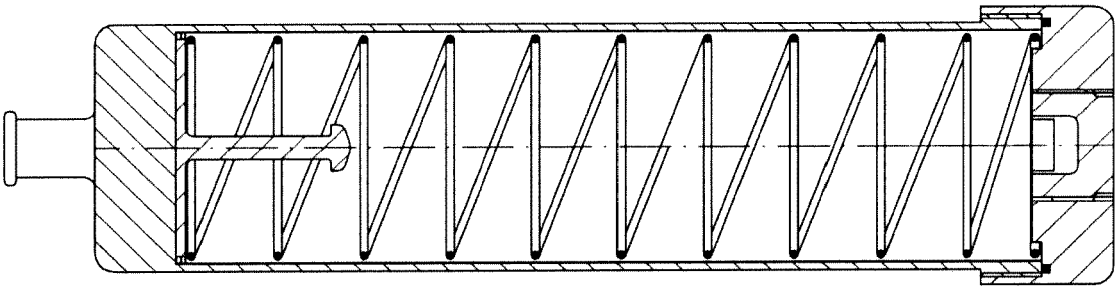


FIG. 6f

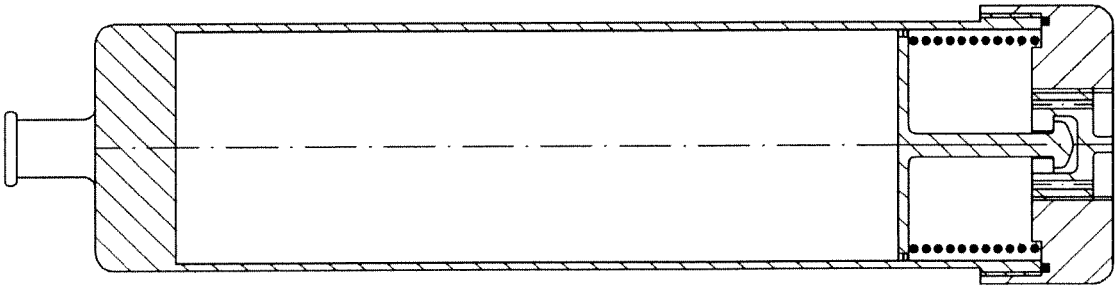


FIG. 6e

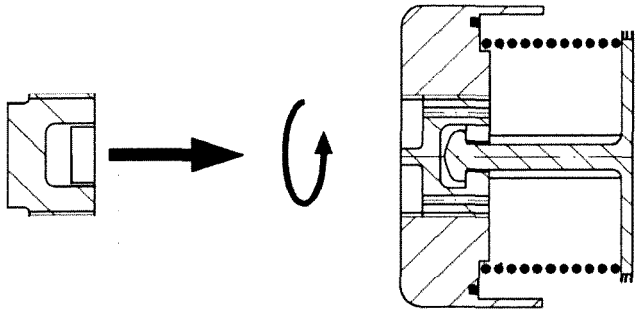


FIG. 6l

contraction direction

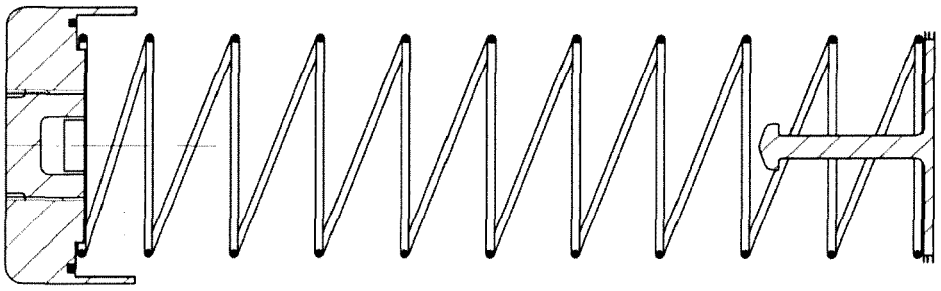


FIG. 6k

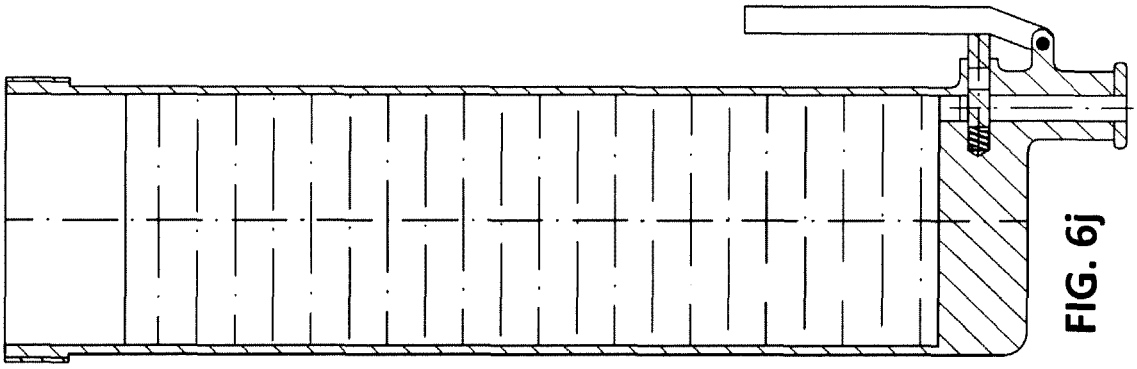


FIG. 6j

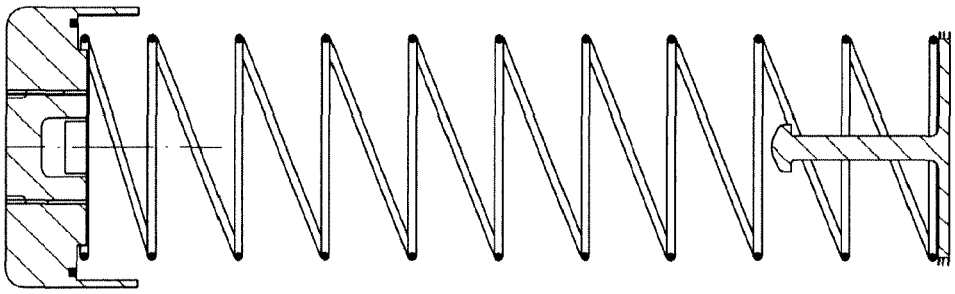
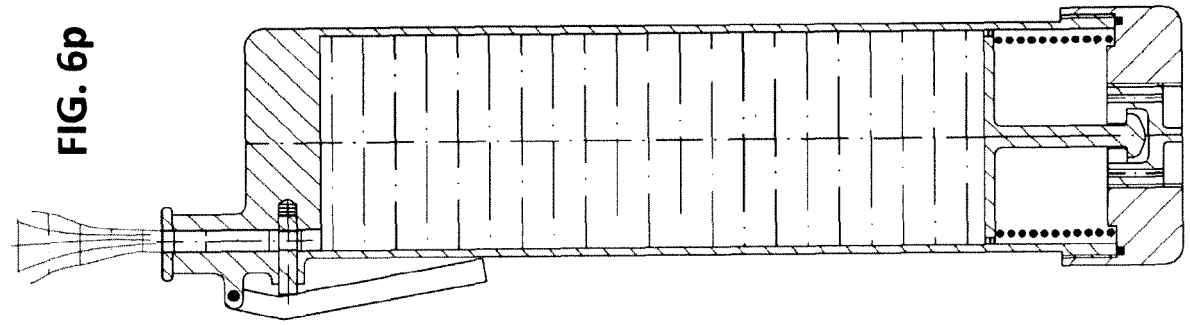


FIG. 6i

FIG. 6p



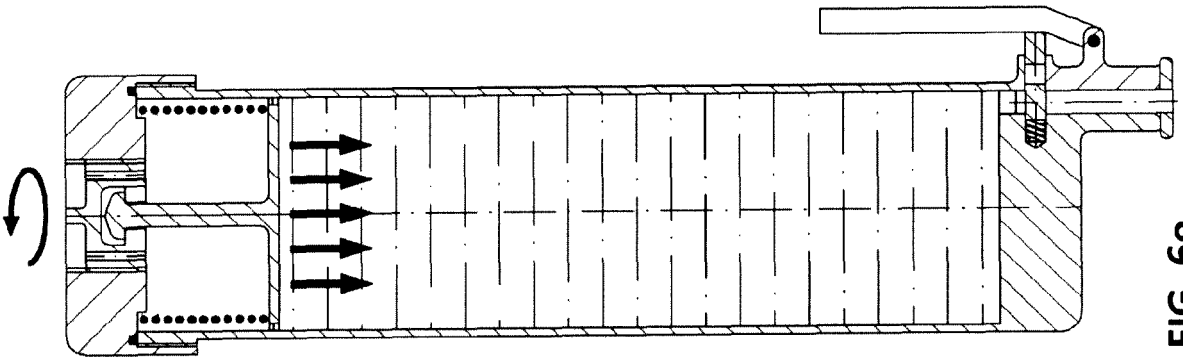


FIG. 6o

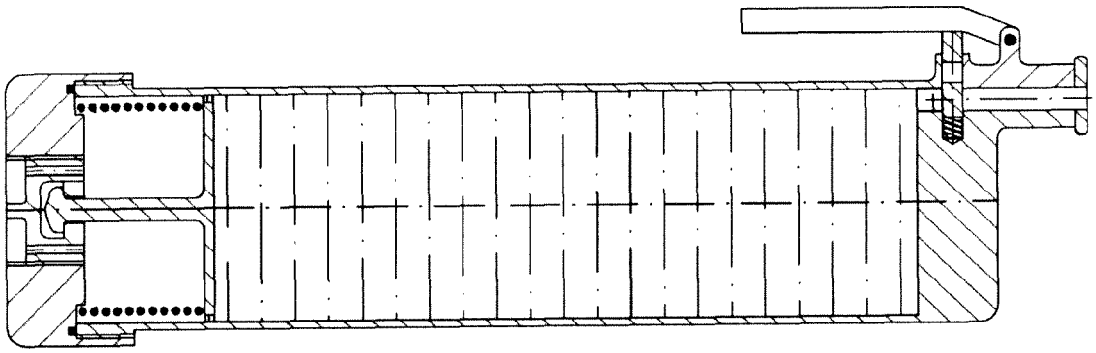


FIG. 6n

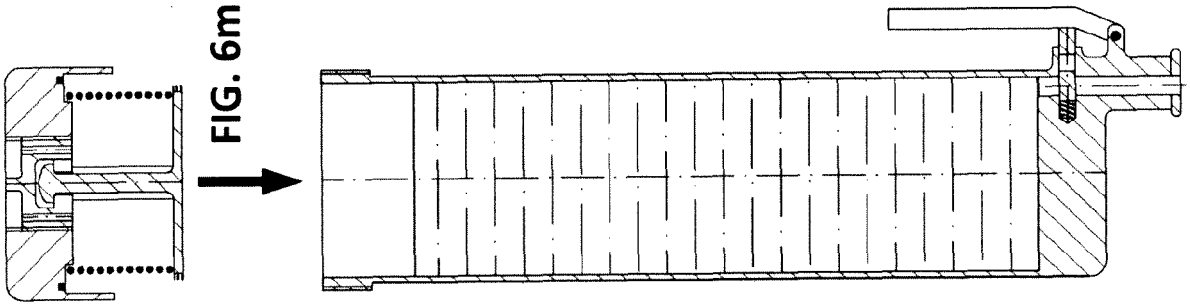


FIG. 6m

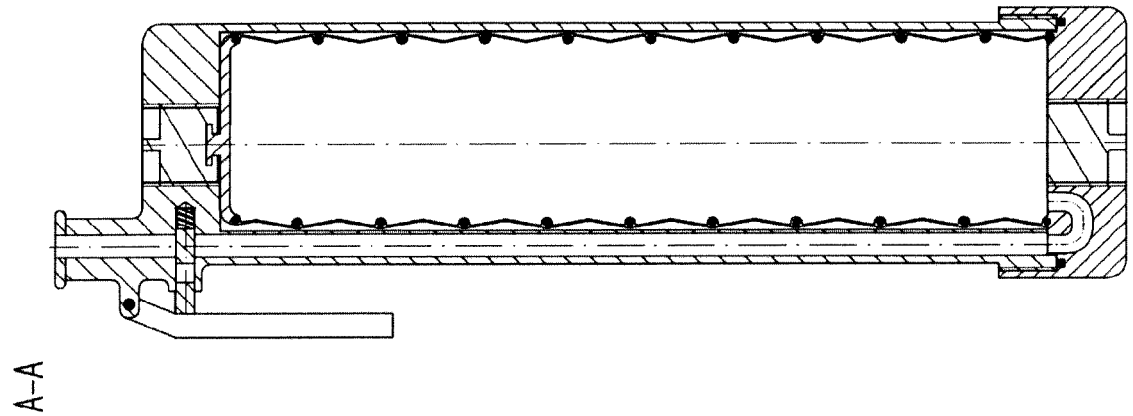


FIG. 7d

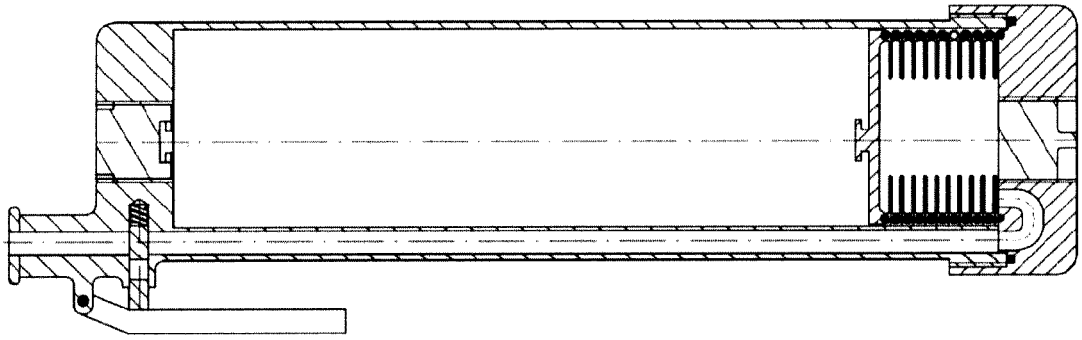


FIG. 7c

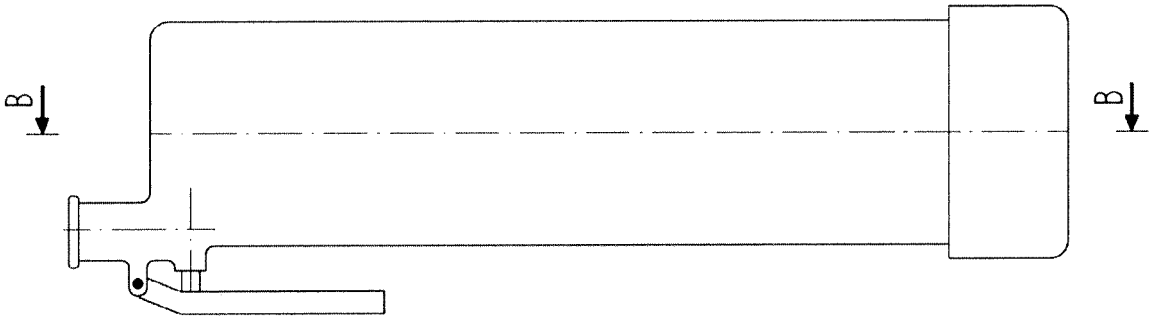


FIG. 7b

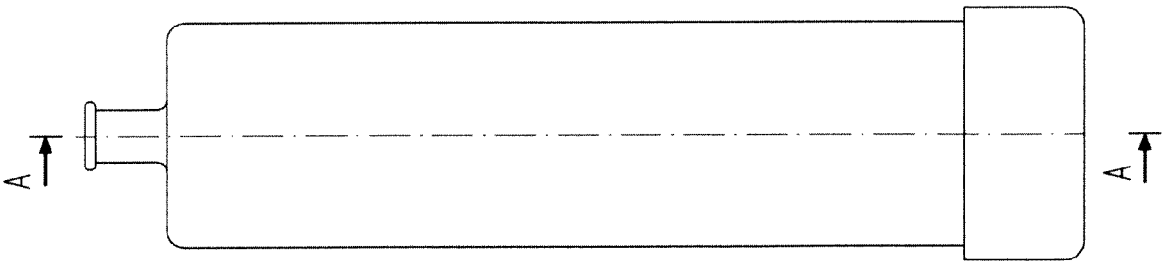


FIG. 7a

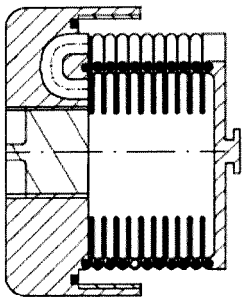


FIG. 7h

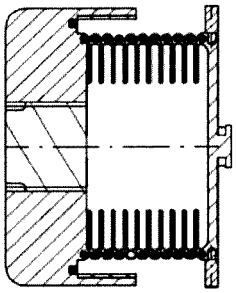


FIG. 7i

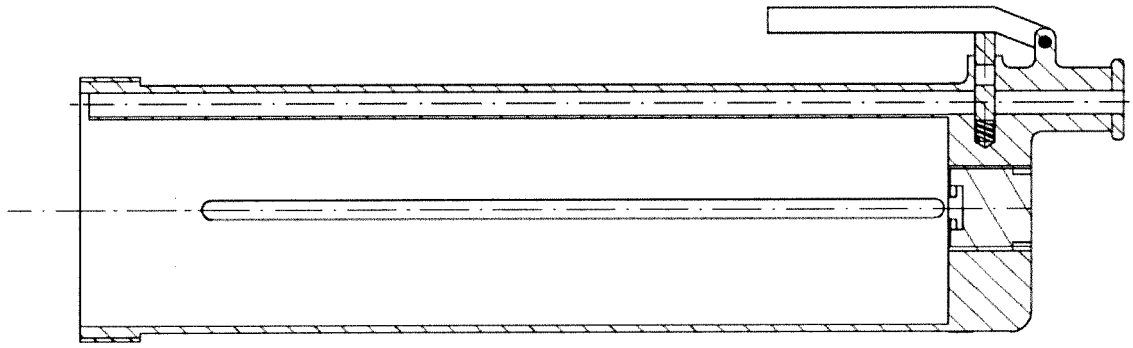


FIG. 7g

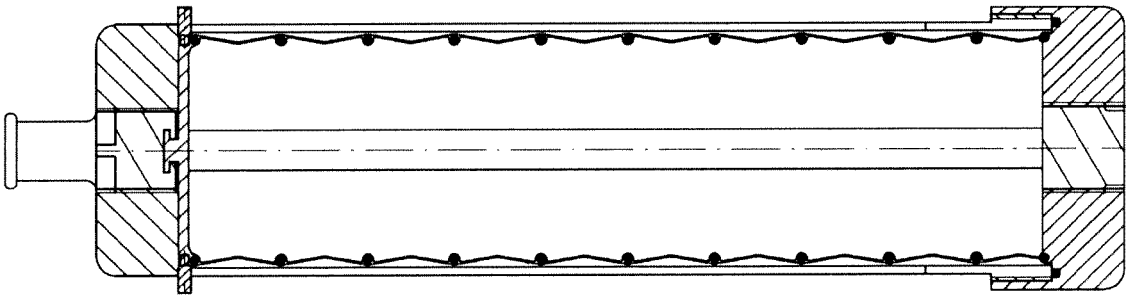


FIG. 7f

B-B

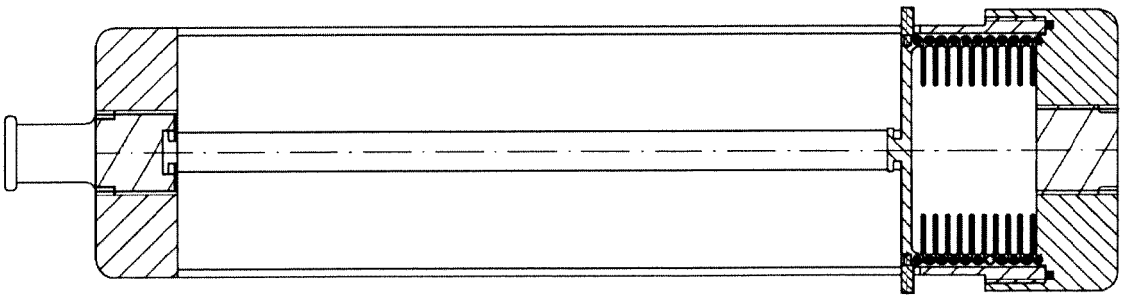


FIG. 7e

FIG. 7m

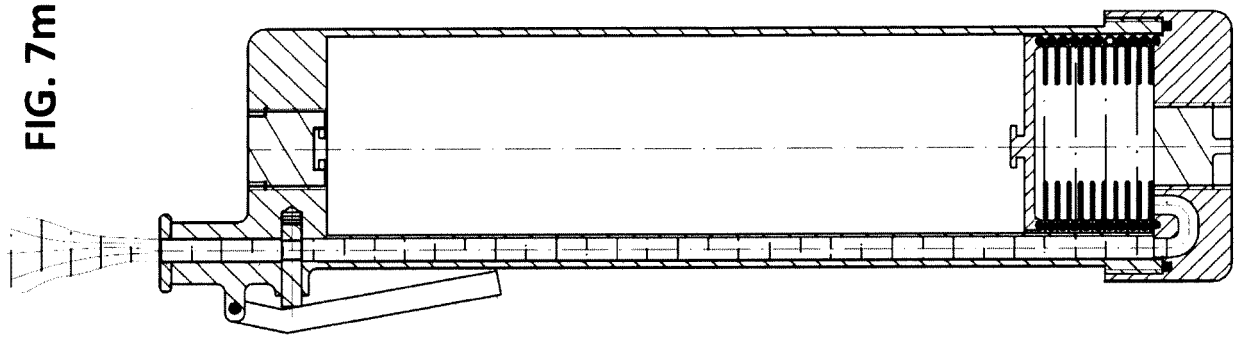


FIG. 7l

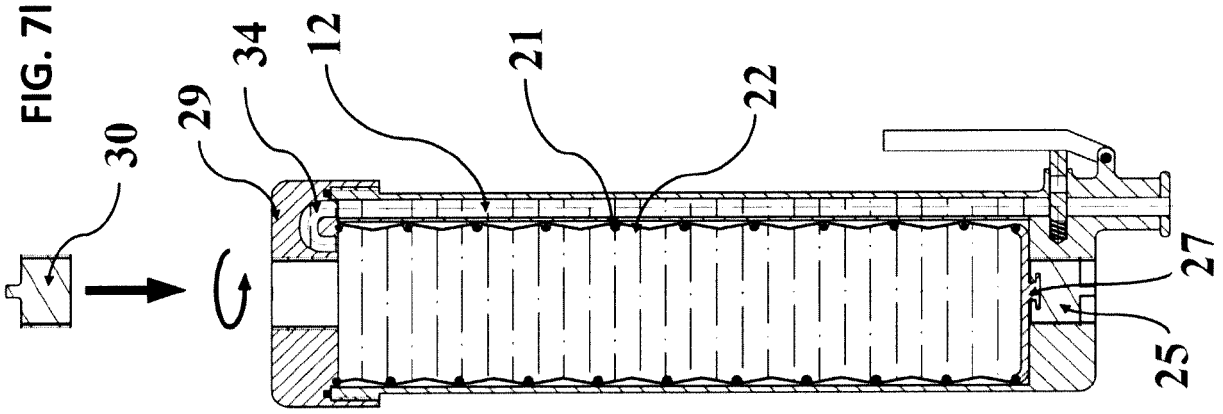
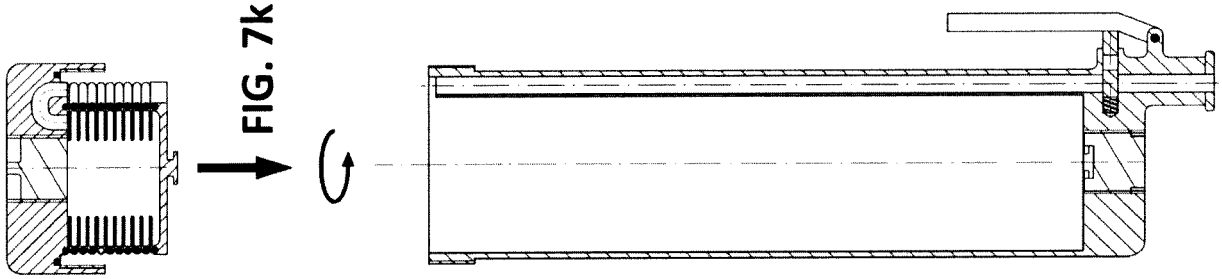


FIG. 7k



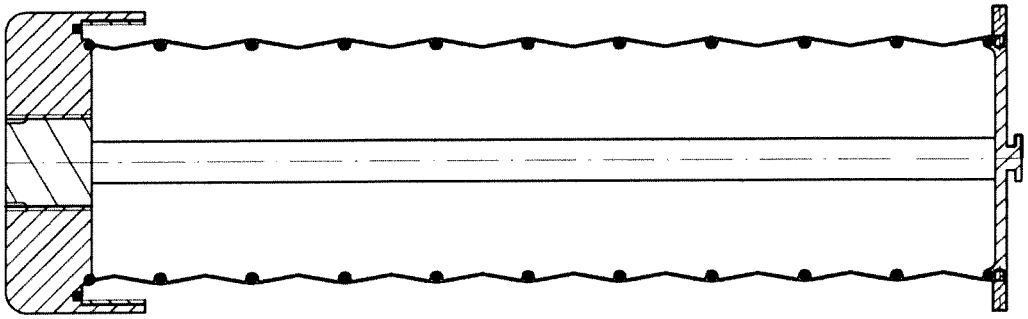


FIG. 7j

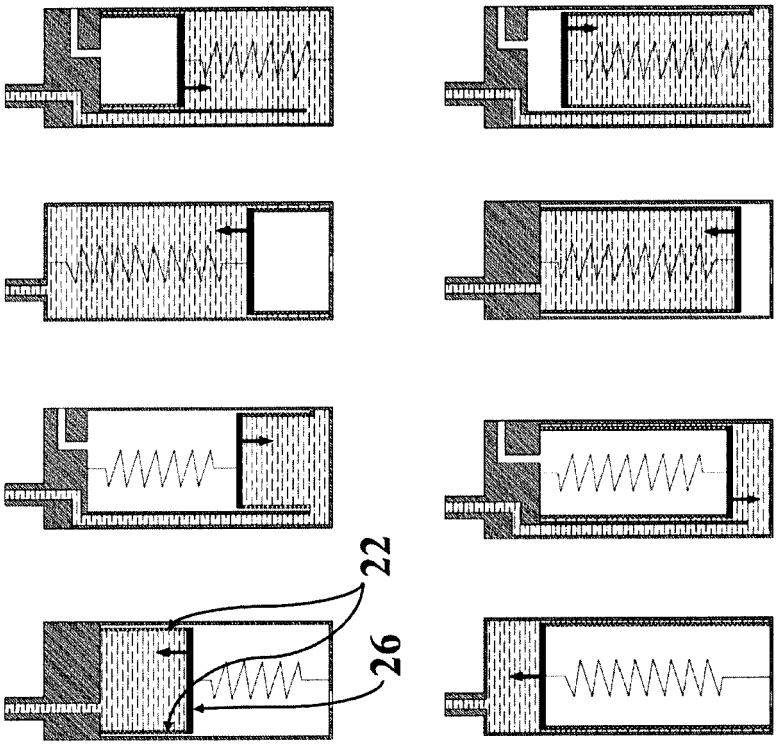


FIG. 9

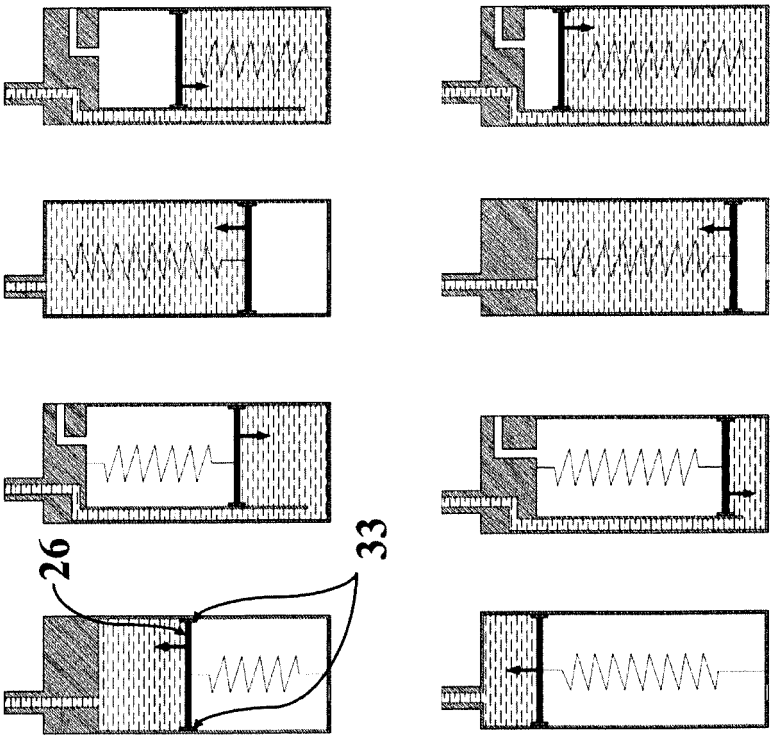


FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 17 46 6007

DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 2008/210711 A1 (RIESLE MARTIN [DE]) 4 September 2008 (2008-09-04) * paragraph [0026] - paragraph [0045] *	1,4	INV. B65D83/00
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A	US 3 838 796 A (COHEN M) 1 October 1974 (1974-10-01) * column 2, line 18 - column 3, line 46; figures *	1,3,4	
Y	GB 28875 A A.D. 1910 (SAUNDERS SAMUEL EDGAR) 7 December 1911 (1911-12-07) * figure 1 *	1,4	
A	EP 0 330 928 A2 (COLGATE PALMOLIVE CO [US]) 6 September 1989 (1989-09-06) * figures 1, 2 *	2	
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A	EP 1 792 847 A1 (LINDAL VENTIL GMBH [DE]) 6 June 2007 (2007-06-06) * paragraph [0019] *	6	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 September 2017	Bridault, Alain

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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T : theory or principle underlying the invention
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D : document cited in the application
L : document cited for other reasons

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