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(54) **SEALABLE INTERNALLY FED APPLICATOR SYSTEM**

(57) Applicator system (1) for applying at least one flowable substance, with a body (2) forming at least one reservoir (5; 6) for storing at least one substance to be applied, a pump device for expelling the at least one substance out of the reservoir (5; 6), and a duct system (16, 17, 18, 19, 20, 21) for feeding the at least one pumped substance from the reservoir (5; 6) out of the body through the applicator (15) to at least one mouth (27) of the applicator (15), and a detachable applicator (15) for applying the at least one substance whereas the applicator system (1) comprises a movable valve (12, 13) that can be moved from an open to a closed position and vice versa by means of moving the applicator (15) relative to the body (2).

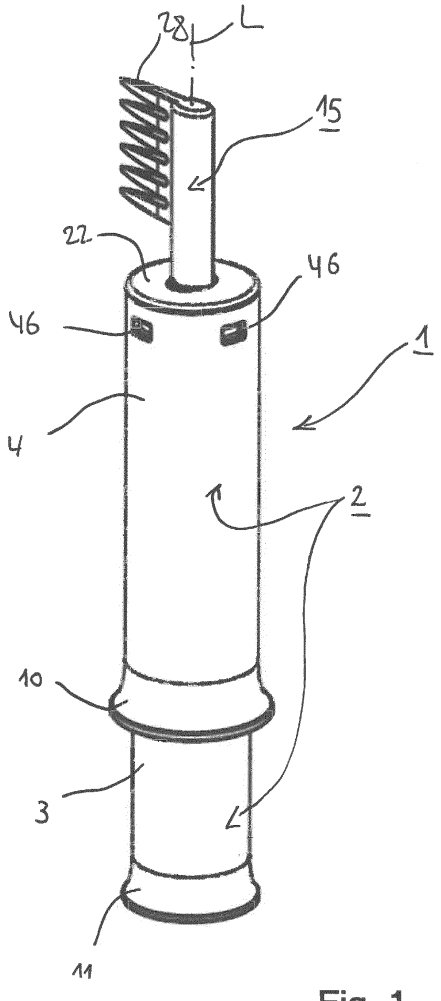

Fig. 1

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Description

[0001] The invention concerns an internally fed applicator system for applying at least one flowable substance to portion of the body or skin area to be treated according to the preamble of claim 1.

TECHNICAL BACKGROUND

[0002] Internally fed applicator systems are known in different constellations.

[0003] Most internal fed applicator systems offer one single applicator for applying the substance to the target area.

[0004] Problems occur with such systems as soon as the storage container stores more than one single portion of the substance to be applied so that the applicator system is used only from time to time with long pauses in between. In this case the known applicator systems suffer from the drawback that the internally feeding ducts run the risk to clog during the long pause between one and the next application. The risk of clogging increases if the applicator systems are stored between one and the next application while the applicator is detached and disposed or (in some cases) cleaned. As soon as the applicator is detached, the internally feeding ducts are subjected to drying under the effect of the ambient. The risk of clogging rises extremely if at least one of the substances is a trigger substance that starts the chemical reaction of the mixture when being in contact with ambient air, ambient humidity or ambient US radiation.

[0005] The said problem is further exacerbated if the substance to be applied is a two or more component substance that has to be prepared within the applicator right before application.

THE OBJECT OF THE INVENTION

[0006] It is an object of the invention to provide an internally fed applicator system that allows to apply from time to time a restricted portion of the substance to be applied while the majority of the substance is stored in standby within the applicator system over a longer period without becoming deteriorated or clogging the internal feed system.

THE INVENTIVE SOLUTION

[0007] The inventive solution proposed to that end is an internally fed applicator system according to claim 1.

[0008] Proposed is an applicator system for applying at least one flowable substance, preferably in the shape of a fluidal or viscous substance on the basis of water, alcohol, oil, fat, wax and/or silicone. This is a substance to be applied. The applicator system comprises a body forming at least one reservoir for storing at least one substance to be applied.

[0009] Moreover, a pump device for expelling the at least one substance out of the reservoir is comprised. Preferably, the expression "pump device" is to be understood in a broad sense, so that it comprises not only syringe/plunger systems and cylinder/plunger systems, but also squeezable containers or bags or peristaltic systems, for example. In addition, a duct system for feeding the at least one pumped substance from the reservoir out of the body through at least one applicator

[0010] (belonging to the system) to the at least one mouth of the said applicator is comprised.

[0011] Finally, a detachable applicator for applying the at least one substance is provided. In most cases the applicator is a disposable "one-way" applicator made of one or more plastic materials by means of injection molding and - maybe - mounting the according parts.

[0012] According to its first aspect the invention is characterized in that the applicator system comprises a movable valve that can be moved from an open to a closed position and vice versa by means of moving the applicator relative to the body. That means that the applicator itself is an operation organ or "handle" for the valve. For that purpose the applicator is designed that way that it can be directly coupled to the valve body, preferably for rotating it from close to open position and vice versa.

[0013] Such a system is easy to operate and seals the ducts (at least those ducts that are not part of the disposable applicator or applicator head itself) of the system securely against the detrimental effect of the ambient air etc. and prevents clogging.

PREFERRED EMBODIMENTS

[0014] In a preferred embodiment the valve comprises a valve seat and a valve body. The valve body and/or the valve seat are designed such that they can be and are made of plastic material. The valve body comprises a coupling for fixing the applicator. The coupling is preferably designed as an annular notch into which an annular extension of the applicator is stuck.

[0015] This design has the advantage that the ducts can be shut off directly upstream of the applicator, so that the duct portion that is exposed to the detrimental effect of ambient air etc. even after closing the valve is extremely short.

[0016] Preferably, the valve body has at least one internal duct that is movable

- from a first position in which its - at least one - internal duct interconnects the at least one duct coming from the reservoir with the duct through the applicator
- to a second position in which its body blocks the interconnection between the at least one duct coming from the reservoir and the duct through the applicator.

[0017] A valve body that is designed that way works very reliably even if substances to be applied are very

viscous.

[0018] A preferred embodiment provides that the valve body has two separate internal ducts for conducting different substances to a central output duct. The central output duct is embodied in the valve body where said separate internal ducts meet without coming into any fluidal contact with one another, since the central output duct preferably embodies two parallel but separated tracks that do not stand in fluidal communication with one another.

[0019] Such a design with a central output duct provides for a very good preparation of the substances for the mixing (without having had contact before) within the applicator by means of a static mixer integrated into the applicator. The substances are kept completely separate from one another within the valve body.

[0020] Preferably, the valve body is rotatably borne by the valve seat. A rotationally operated valve provides for an excellent fail safeness even under difficult operation conditions and can easily control two or more different conducts for two or more substances to be mixed before the output to the application surface.

[0021] Preferably a rotation control is provided, so that the valve body cannot be rotated back and forth for more than totally 130° and better not more than totally 120°. In most ideal cases said rotation is limited to 90°. The aforementioned values apply to applicator systems using two different substances to be mixed before output on the application surface. For applicator systems using more than two of such substances a value of less than 75° is the optimum. That way it is made sure that it is not possible to unwantedly introduce the first substance into the region of the second substances and vice versa. With other words: That way an unwanted mixing of the substances within the valve is avoided, even if the valve is not operated with outermost care.

[0022] It is of a particular interest if the movable valve can be moved from an open to a closed position and vice versa by means of moving the applicator relative to the body. Such a design allows a convenient operation of the valve without any additional tool and without smudging one's fingers.

[0023] Preferably, at least one internal duct of the valve body extends from the jacket of the valve body to the center of the valve body.

[0024] It is preferred to embody an applicator system that comprises at least two different applicators. Preferably at least one thereof embodies an internal static mixer. This at least one applicator can be coupled according to the discretion of the user to the duct system in order to be internally to be fed with the at least two substances that way, that the at least two substances uniformly mix within this at least one applicator. In case an applicator with no internal duct belongs to the system this applicator can be coupled the same way in order to be firmly hold and comfortably handled during the application

[0025] In addition the following has to be communicated:

Mostly the applicators are disposable. Preferably that means that the applicators are made of plastic material by injection moulding. Ideally the applicators are made of not more than two parts that are mounted to each other after having been moulded. Said parts are the applicator body itself (flocked or unflocked) and the static mixer.

[0026] Further design aspects for further improving the invention are disclosed by the rest of the sub claims.

[0027] Further technical effects, advantages, and improvement options are disclosed by the following description of preferred embodiments on the basis of the figures.

LIST OF FIGURES

[0028]

Figure 1 shows another review to an applicator system according to 1st embodiment of the invention.

Figure 2 shows a longitudinal section through the applicator system according to figure 1.

Figure 3 shows a longitudinal section through the applicator system according to figure 1, but turned for 90°.

Figure 4 shows an enlarged view onto the housing and applicator portion of the applicator system shown by figure 3.

Figure 5 shows a longitudinal section through the 2nd embodiment of the applicator system.

Figure 6 shows an enlarged view onto the housing and applicator portion of the applicator system shown by figure 5.

Figure 7 shows a front view to 3rd embodiment of an inventive an applicator system:

Figure 8 shows a perspective view of the backside of the applicator system according to figure 7.

Figure 9 shows a view from above to the applicator system according to figure 7.

Figure 10 shows a longitudinal intersection through an applicator system according to figure 7.

Figure 11 shows a horizontal intersection through the yoke of an applicator system according to figure 7.

Figure 12 shows a vertical intersection (cutout) for the yoke of the applicator system according to Figure 7.

Figure 13 is the first picture of a sequence showing

the possible form fit interaction between the applicator 15 and the snap-on cap 22.

Figure 14 is the second picture of a sequence showing the possible form fit interaction between the applicator 15 and the snap-on cap 22.

Figure 15 is the third picture of a sequence showing the possible form fit interaction between the applicator 15 and the snap-on cap 22.

Figure 16 shows another applicator to be used as a component of the inventive system.

Figure 16a shows a lateral view of Fig. 16.

Figure 17 shows another applicator to be used as a component of the inventive system.

Figure 17a shows a lateral view of Fig. 17.

Figure 18 shows another applicator to be used as a component of the inventive system.

Figure 18a shows a lateral view of Fig. 18.

FIRST INVENTIVE EMBODIMEMT

[0029] A first embodiment of the inventive applicator system is shown by Figures 1 to 4. Particular reference is made to Figure 1.

THE RESERVOIR

[0030] Here, the body 2 forming the reservoir(s) is embodied as a combination of a plunger 3 and a syringe 4. The interplay of the plunger 3 and the syringe 4 embodies two reservoirs 5 and 6. Each of the reservoirs 5, 6 contains one substance to be applied.

[0031] Preferably, the substances stored apart from one another are different in regard to their colour or their chemical and/or physical composition.

[0032] The plunger 3 and the syringe 4 may be equipped with a protruding stopper 10 and 11. The stoppers 10, 11 improve the finger gripping when pressing the plunger 3 and the syringe 4 together in order to expel the substances out of their reservoirs 5, 6.

[0033] It is preferred that the syringe 4 is equipped with a guiding tube 7, as shown by Fig. 3. Said guiding tube 7 interacts with an according guiding tube 8 of the plunger 3. That way the guiding properties of the plunger 3 are improved.

THE COUPLING OF THE APPLICATOR TO THE VALVE

[0034] At its end - that is located opposite to the end with an opening 9 for introducing the plunger 3 - the syringe 4 forms a housing section HS with a valve seat 12. The valve seat 12 accommodates, preferably in a rotatable fashion, the valve body 13.

[0035] Preferably, the valve body is positioned directly upstream of the applicator 15, without any additional duct that is formed outside of the valve body and that interconnects the valve body 13 and the applicator 15. Instead, the applicator is directly stuck into or onto the valve body 13.

[0036] The details of this valve seat 12 and the valve body 13 are shown by Fig. 4.

[0037] The valve body 13 forms a coupling portion 14. The coupling portion 14 can be designed that way that the applicator 15 can be coupled to the valve body 13 so that it is firmly hold by the valve body 13 even under the influence of the forces of the application.

[0038] In most cases the applicator 15 is fixed to the valve body 13 by means of an elastic form fit connection. Normally, such a form fit connection is realised as a snap-in connection.

[0039] In the specific case shown here by Fig. 4, a coupling portion 14 alone is not responsible for holding the applicator 15 sufficiently firm.

[0040] For reason of supporting the coupling portion 14 embodied in the valve body 13, a snap-on cap 22 is provided. The snap-on cap 22 has a central hole that holds the applicator 15. This holding of the applicator is realized by means of the form fit between the borders confining the central hole of the snap-on cap and an annular groove 23 provided in the (shaft of the) applicator 15. As one sees the borders extend into an annular groove 23 in the applicator 15.

[0041] A more detailed view how the producing and loosing of said form fit can take place is depicted by Figs. 13 to 15. The following design is advantageous:
The applicator 15 can be stuck onto the coupling potion 14 of the valve body 13 by means of a straight movement along the longitudinal axis L, see the straight arrow. Hereinafter the applicator 15 is turned for substantially 90° (in clockwise direction here), as visualized by Fig. 14. The valve body 13 remains stationary, it does not move during this locking process.

[0042] Grace to this turning the (local) left-hand sided and righthand sided annular grooves 23 become engaged with the borders confining the central hole of the snap-on cap 22, see what is visualized by Fig. 15.

[0043] As a summary one can say that it is a preferred embodiment if the shaft of applicator 15 is not completely cylindrical but locally flattened, at least between the feed-in opening of the applicator 15 and the area for interaction with the snap-on cap 22. Said area for the form fit interaction of the applicator 15 with the snap-on cap 22 is positioned above the valve body 13.

[0044] The snap-on cap 22 is designed that way that it can securely be snapped onto a complementary portion of the syringe 4 or, more exactly, onto a complementary portion of the housing HS formed by the syringe, as shown by Figure 4.

[0045] For that purpose, the snap-on cap 22 may have hooks 45 that snap into recesses or windows 46 of said housing HS as soon as the snap-on cap 22 has reached its final position, see what is shown by Fig. 4 and Fig. 1. Moreover, the snap-on cap 22 secures the valve body 13 against extraction out of the valve seat 12.

[0046] Regardless how the snap-in connection between the applicator 15 and the valve body 13 is realized, it is in each case preferred that the interconnection between the valve body 13 and the applicator 15 is fluid tight. In case of the construction shown by Fig. 4, said tightness can be provided by the annular extension 25 of the applicator 15. Said annular extension 25 is stuck over the cylindrical flange CF of the valve body 13.

[0047] More preferably, the valve body 13 even forms an annular groove so that the annular extension 25 of the applicator 15 is caught with its outer jacket JA as well as with its inner jacket. If a proper dimensioning and layout is provided, the interconnection can be designed that way that the annular extension 25 undergoes an elastic compression when being stuck over the cylindrical flange 26.

[0048] Preferably, the detaching of the applicator 15 shown is possible with the bare hands of the user, without using any tool, regardless whether a snap-on cap 22 is used or not.

[0049] It is preferred that the interconnection that is formed between the valve body 13 of the applicator 15 allows itself the transfer of torque. That way the valve body 13 can be rotated by rotating the applicator 15. An optimized technical design provides that such a torque proof interconnection is realized by means of at least one protrusion or at least one tooth extending from the valve body 13 and gripping into a complementary recess of the applicator 15, or vice versa. Such a construction provides for positive locking fit in the direction of rotation.

THE FUNCTION OF THE VALVE

[0050] As can be seen from Fig. 4, the valve body 13 is equipped with two fully internal ducts 16 and 17.

[0051] Preferably, said ducts 16, 17 extend from the jacket portion of the valve body 13 into the interior of the valve body 13.

[0052] The said jacket portion of the valve body 13 has preferably a conical shape. That way it is easier to grant tightness without burdensome narrowing of the tolerances, and to perform a very compact change of direction of the duct formed that way.

[0053] In the center of the valve body 13 said ducts 16 and 17 preferably meet a central output duct 18. This central output channel 18 is embodied along the rotational axis L of the valve body 13. In most cases said ducts 16 and 17 extend orthogonally to the rotational axis L of the valve body 13.

[0054] The central output channel 18 is in fluidal connection with the duct 19 embodied in the applicator 15, more particular, embodied fully in the interior of the applicator 15.

[0055] When the valve body 13 takes the position shown by Fig. 4, the mouth of said ducts 16 and 17 - which are embodied in the jacket portion of the valve body 13 - communicate with the ducts 20 and 21 in the syringe 4 or, more generally spoken, in the body forming the reservoir.

[0056] That means that each pressure onto the plunger 3 expels the substances to be applied out of the reservoirs 5, 6. The substances flow through their ducts 20 and 21 in the syringe and enter through according mouth openings into the ducts 16 and 17 of the valve body 13. After having passed the ducts 16 and 17 of the valve body 13, the substances are fed into the central output channel 18 of the valve body 13. Nevertheless it is preferred that the two substances do not yet meet or mix here, for that purpose the central output chancel 18 provides two parallel but fully separated ducts.

[0057] Hereinafter the substances flow into the duct 19 embodied in the applicator 15. In most cases the two substances are still kept apart for some distance within the duct 19. That way they will meet for first time when they arrive directly at the static mixer embodied within the applicator 15.

Finally, after being mixed, the substances to be applied leave the internal area of the applicator system through the at least one mouth 27 of the applicator 15.

[0058] The central output channel 18 has, as already described, in most cases two different tracks or ducts, too, that do not stand in any fluidal communication with one another. The reason for this is that it is in most cases not allowed that the different substances to be applied mix with one another before they have reached the applicator. Each mixing with one another would start a chemical reaction that has to be started completely out of the reusable parts of the applicator system in order to avoid clogging or detrimental effects in regard to the rest of the stored substances.

[0059] For that reason the mixer is completely integrated into the disposable applicators.

[0060] A very interesting optional point is that even the duct 19 within the applicator 15 is designed that way that it forms in its beginning for some millimeters an entrance with two completely different and separated tracks that keep the at least two substances to be applied separated within the applicator until they enter into the static mixer within the applicator.

[0061] The reason for this is rather simple: That way it is made sure that the disposable applicator can be pulled off from the valve body 13 without smudging the valve body 13 unintendedly with a mixture of the two or more substances to be applied, that could start to harden within the valve 13 - so that the valve 13 is clogged when some time later the next application will be started.

[0062] The valve body 13 is rotatably hold by the valve seat 12, so that the valve body 13 can be rotated around the axis L by means of rotating the applicator 15. As soon as the valve body 13 is turned for example 90°, the situ-

ation is as shown by Figure 2. That means the internal ducts 16 and 17 of the valve body 13 are not any longer in fluidal communication with the ducts 20 and 21 in the syringe 4 or - more generally spoken - in the body forming the reservoir. Instead, the valve body 13 blocks or seals the ducts 20 and 21, so that it is not possible to expel substances from the reservoir or reservoirs 5, 6.

[0063] Ideally, the valve and/or the valve seat realize at least one rotation stopper where the rotation of the valve body 13 comes to an end as soon as the valve body is in its position where the ducts fully opened

THE APPLICATOR

[0064] It is very preferred that the duct 19 embodied in the applicator 15 is equipped with a static mixer 24 that mixes the substances expelled into the interior of the applicator during their flow along the interior of the applicator. The static mixer normally consists of a number of stationary hurdles that deflect the stream of the different substances repeatedly, back and forth, so that the local direction of flow changes. That leads to a mixing of the jointly flowing substances. The static mixer as such can be of one of the types as disclosed by prior published, granted patents EP 0730913 or EP 0885651. The designs of the mixers as such and their physical embodiment and their fixation within or integration into an outer guiding tube is included into this application be reference.

[0065] Another optional detail is shown by Fig. 4. The duct 19 embodied in the applicator 15 branches after completion of the mixing so that the mixed substances are locally dispensed trough several mouths 27 of the applicator at a number of places between the bristles or teeth of the applicator. That way a more uniform loading of the applicator with the substances to be applied is made sure.

SECOND INVENTIVE EMBODIMENT

[0066] The second embodiment is very similar to the first embodiment so that all things described above for the first embodiment apply to the second embodiment, too, as long as nothing different is notified in the following.

[0067] The difference is that for the second embodiment no combination of a classical combination of a syringe and a plunger is used in order to form the body which serves as a reservoir. Instead, the body is constructed as a pump whose piston is driven by means of a screw driving mechanism.

[0068] The main body portion 29 forms two reservoirs 5 and 6, too.

[0069] The main body portion 29 holds a threaded spindle 30 within each reservoir 5 and 6. Each threaded spindle 30 carries a piston 31 that rides with its female thread on the male thread of said spindle 30. At the distal end each spindle 30 carries a sprocket 32. Moreover, the main body portion 29 bears at its distal end a tubular sleeve 34 with an internal toothing 35. This tubular sleeve 34 is rotatably hold by the main body portion 29. For that purpose the tubular sleeve 34 preferably possesses a tubular extension 36 that is stuck into the central guiding tube 37 of the main body portion 29.

[0070] The internal toothing 35 and the sprockets 32 engage. That way the sprockets 32 are rotated as soon as the user turns the tubular sleeve 34. As soon as the sprockets 32 rotate, the threaded spindle 30 screws the pistons 31 in direction to the proximal i. e. in direction toward the applicator, for example. That way the substance to be applied is expelled out of its reservoir 5 or 6.

[0071] The valve mechanism and the way how to fix the applicator, for example to the valve body 13, are fully the same as described above for the first embodiment.

[0072] The Figures for this embodiment illustrate that the applicator system 1 can be easily equipped with a different applicator 15. In this particular case, that is not mandatory, the interlocking between the snap-on cap 22 and the applicator 15 takes place as explained on the basis of Figs. 4 to 16

THIRD INVENTIVE EMBODIMENT

[0073] The third embodiment is very similar to the first and the second embodiment, too. For that reason, all things described above apply to the third embodiment, too, as long as nothing different is notified in the following.

[0074] The difference is that for the third embodiment a piston pump is used in order to feed the substances to be applied via the valve body 13 into the applicator 15. For that reason, the main body portion 29 forms a kind of bottle, in the case here a twin bottle with two different reservoirs 5 and 6. Each of the bottles preferably carries a bottleneck that is not shown in detail here. Through the bottleneck a sucking tube 38 is sunk into each reservoir 5 and 6. On each bottleneck a said soap pump 39 is fixed. For that purpose the soap pumps 39 may have a threaded cap each with which each soap pump is screwed onto the bottleneck assigned to it.

[0075] An interesting difference is the yoke 40 that is stuck over the expelling tubes 41 of the soap pumps 39. That way the expelling tubes 41 of the soap pumps 39 feed the pumped substances into the yoke 40. For that purpose, the yoke 40 is equipped with internal ducts 42 and 43. The yoke 40 embodies a valve seat 12 as it is known from the first and the second embodiment. In the same manner as in the first and the second embodiment, the valve seat 12 accommodates a valve body 13. The valve body 13 is designed as already described. In Figure 11 it is displayed in its open position. In this position of the valve body 13 there is a continuous, uninterrupted duct between each of the soap pumps and the internal duct 19 of the applicator 15 that ends into at least one mouth 27 of the applicator.

[0076] As already described, it is possible to couple at least one and preferably different applicators to the valve body 13 in a manner that allows to turn the valve body 13 by turning the applicator. That way the valve body 13

can be brought into its closed position, as described before.

[0077] Again, the applicator 15 is preferably equipped with a static mixer 24 that thoroughly mixes the substances to be applied that are fed by means of their ducts into the central output channel 18 in order to be conveyed from there to the internal duct 19 of the applicator.

APPLICATORS THAT MAY BELONG TO THE SYSTEM

[0078] In many cases the invention is very advantageous if only one and the same applicator is used as a one-way applicator being disposed after application.

[0079] That way the stored contents keeps always fresh and in usable condition.

[0080] Moreover a number of cases are conceivable in which the use of a number of different applicators is very helpful.

[0081] For that purpose one or more of the applicators disclosed hereinafter can be used in addition.

[0082] Figure 16 discloses an internally fed applicator in the shape of a frontal comb 47. Preferably all or at least a number of its tines 48 have an internal duct for dispensing the product to be applied through an orifice 49 at the end of the respective tine 48.

[0083] The shaft 50 of this applicator accommodates a mixer which is of the type as explained before. Moreover the shaft 50 is embodied preferably in a way that it is fit for coupling to the snap-on cap, for example, as explained before. The features allowing this coupling action are not depicted here. Once again the applicators are preferably designed such, that the 2 different substances to be mixed enter into the shaft 50 without being mixed before so that the substances come for first time in contact when they directly reach the mixer.

[0084] It is preferred that the tines 48 being equipped with the internal ducts show a concave outer end with one or better opposite two lateral openings - so that their orifice 49 is not obstructed when the outer end of the tine comes in contact with the skin or the hairs.

[0085] Moreover it is preferred that those tines 48 that are not provided with internal ducts show an outer end having a chisel-like shape. Such a design improves the combing effect.

[0086] It can be an option, to position directly alternating a tine 48 with an internal duct and a tine with no internal duct as shown by Fig. 16.

[0087] Figure 17 discloses another alternative applicator. Compared to the applicator according to figure 16 this applicator may exhibit the only difference that no tines 48 are provided but bristles, in the shape of a bristle covering 51. The single bristles are flexible and there are in most cases no internally fed bristles. Instead, even if an internal feeding is provided, such an internal feeding is accomplished by means of orifices that open out into the area of the roots of the bristles.

[0088] Once again the shaft 50 of this applicator may accommodate the mixer of the type explained before if any mixer is used.

[0089] Moreover the shaft 50 is designed preferably in a way that it is fit for coupling to the snap-on cap 22, as explained before, for example. This is not depicted here.

[0090] Figure 18 discloses another alternative applicator. This applicator may carrying no tines 48 or bristles but a blank, plane, convex or - at least slightly - concave surface 52. Said surface 52 may be flocked. It is a surface for spreading and smearing cosmetics.

[0091] This applicator can be internally fed, too. In other cases such an applicator has no internal feeding. It is mounted to the device and used after prior outputting of cosmetics to the skin or hairs.

MICELLANEOUS

[0092] Fully independent from the claims presented by now - or in full or partial combination therewith - protection is sought for the following:
An internally fed applicator system according for applying at least one flowable substance, preferably in the shape of a fluidal or viscous substance on the basis of water, alcohol, oil, fat, wax and/or silicone. This is a substance to be applied. The applicator system comprises a body forming different reservoirs for storing at least two substances to be applied. Moreover, it comprises a pump device for expelling the at least two substances out of the reservoirs and a duct system for feeding the at least two pumped substances from the reservoir out of the body through the applicator to at least one outputting mouth of an applicator.

[0093] It is a characteristic of this solution that the applicator system comprises at least two different applicators. At least one of the applicators - and preferred all thereof - possess an internal static mixer. The applicators can be coupled according to the discretion of the user to the duct system in order to be internally fed with the at least two substances that way, that the at least two substances uniformly mix, but preferably only within the applicators (only) and preferably not before they have reached the applicators.

LIST OF REFERENCE NUMBERS

[0094]

1	applicator system
2	body
3	plunger
4	syringe
5	reservoir
6	reservoir
7	guiding tube syringe
8	guiding tube plunger
9	opening of syringe
10	protruding stopper
11	protruding stopper

12 valve seat
13 valve body
14 coupling portion
15 applicator
16 duct of valve body
17 duct of valve body
18 central output channel
19 duct embodied in the applicator
20 duct within the syringe
21 duct within the syringe
22 snap-on cap
23 annular groove
24 static mixer
25 annular extension
26 cylindrical flange
27 mouth of the applicator
28 bristle or tooth or prong
29 main body portion
30 threaded spindle
31 piston
32 sprocket
34 tubular sleeve
35 internal toothing
36 tubular extension
37 central guiding tube
38 sucking tube
39 soap pump
40 yoke
41 expelling tubes 41
42 internal duct
43 internal duct
44 not awarded
45 hook of the snap-on cap
46 window for nesting the hook of the snap-on cap
47 not assigned
48 tine
49 orifice
50 shaft
51 bristle covering
52 blank application surface

JA outer jacket
CF cylindrical flange
L longitudinal axis or axis of rotation
HS housing section

Claims

1. Applicator system (1) for applying at least one flowable substance, with a body (2) forming at least one reservoir (5; 6) for storing at least one substance to be applied, a pump device for expelling the at least one substance out of the reservoir (5; 6), and a duct system (16, 17, 18, 19, 20, 21) for feeding the at least one pumped substance from the reservoir (5; 6) out of the body through the applicator (15) to at least one mouth (27) of the applicator (15), and a detachable applicator (15) for applying the at least one substance **characterized in that** the applicator system (1) comprises a movable valve (12, 13) that can be moved from an open to a closed position and vice versa by means of moving the applicator (15) relative to the body (2).

2. Applicator system (1) according to claim 1, **characterized in that** the valve (12, 13) comprises a valve seat (12) and a valve body (13), **characterized in that** the valve body (13) comprises a coupling portion (14) for fixing the applicator (15), whereas the coupling portion (14) is preferably designed as an annular notch into which an annular extension (25) of the applicator (15) is stuck.

3. Applicator system (1) according to claim 1 or 2, **characterized in that** the valve body (13) has at least one internal duct (16; 17) and that the valve body (13) is movable from a first position in which its at least one internal duct (16; 17) interconnects the at least one duct (20, 21) coming from the reservoir (5; 6) with the duct (19) through the applicator (15) to a second position in which the valve body (13) blocks the interconnection between the at least one duct (20, 21) coming from the reservoir (5; 6) and the duct (19)through the applicator (15) .

4. Applicator system (1) according to claim 3, **characterized in that** the valve body (13) has two separate internal ducts (16, 17) for conducting different substances to a central output channel (18) embodied in the valve body (13) where said separate internal (16, 17) ducts meet.

5. Applicator system (1) according to one of the preceding claims, **characterized in that** the valve body (13) is rotatably borne by the valve seat (12).

6. Applicator system (1) according to one of the preceding claims, **characterized in that** a movable valve (12, 13) can be moved from an open to a closed position and vice versa by means of moving the applicator (15) relative to the body (2)

7. Applicator system (1) according to one of the preceding claims, **characterized in that** at least one internal duct (16; 17) of the valve body (13) extends from the jacket of the valve body (13) to the center of the valve body (13).

8. Applicator system (1) according to claim 7, **characterized in that** the jacket of the valve body (13) has a conical shape where the ducts (16, 17) start, that extend from the jacket of the valve body (13) to the center of the valve body (13).

9. Applicator system (1) according to claim 8, **charac-**

terized in that the longitudinal axes (L) of the ducts (20, 21) form a preferably right angle with the longitudinal axes (L) of the ducts (16, 17) of the valve body.

10. Applicator system (1) according to one of the preceding claims, **characterized in that** the valve seat (12) is embodied in a yoke (40) that interconnects the expelling tubes (41) of two or more pumps (39) that feed the pumped substances into the yoke (40) if the yoke (40) is pressed down, so that the expelling tubes (41) feed the internal ducts of the yoke (40), which, in turn, feed the internal ducts (16, 17) of the valve body (13) when it is in open position.

11. Applicator system (1) according to one of the preceding claims, **characterized in that** the applicator system (1) comprises at least two different applicators (15) with preferably at least one thereof embodying an internal static mixer (24), and which can be coupled according to the discretion of the user to the duct system (16, 17, 18, 20, 21) in order to be hold internally to be fed with the at least two substances that way, that the at least two substances uniformly mix within the at least one applicator (15) .

12. Applicator system (1) according to one of the preceding claims, **characterized in that** one of the applicators (15) carries bristles or prongs (28) and has a multiplicity of outputting mouths (27) that dispense the mixture of the substances to be applied between the bristles or prongs 20) .

13. Applicator system (1) according to one of the preceeding claims **characterized in that** at least one of the applicators (15) carries a flocking.

14. Applicator system (1) according to one of the preceding claims **characterized in that** at least one of the applicators (15) carries a bare smudging surface without bristles, prongs, fingers or a flocking.

15. Applicator system (1) according to one of the preceding claims **characterized in that** at least one of the applicators (15) is a smearing or spreading applicator only and no internally fed applicator with a passage for substance to be applied passing through the applicator while at least one another alternative applicator is internally fed.

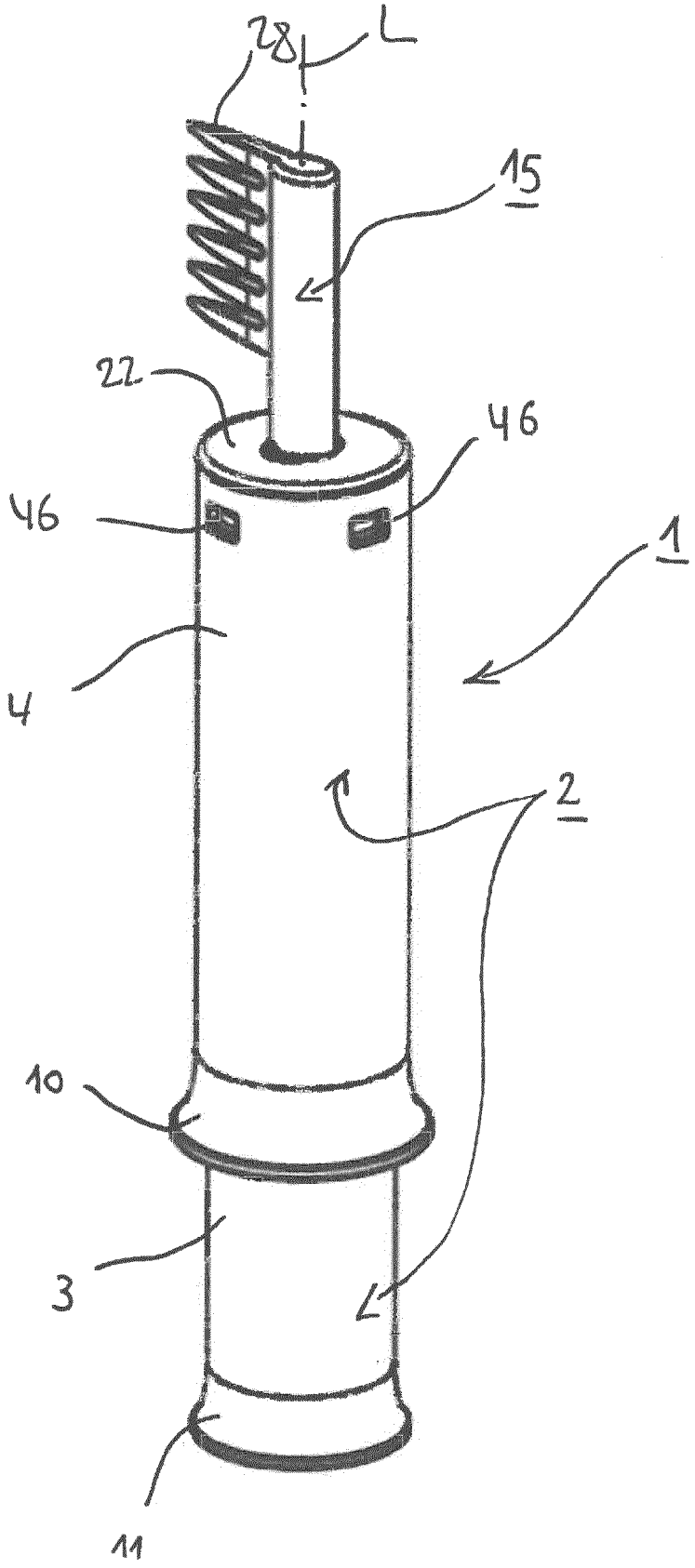

Fig. 1

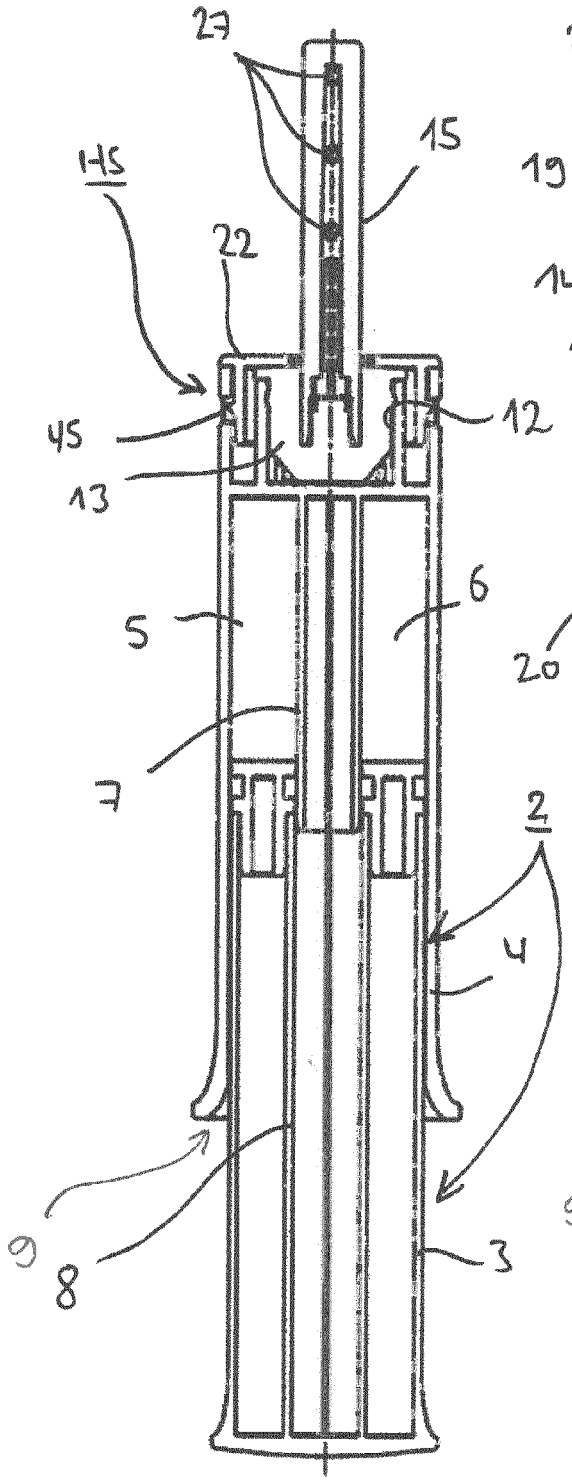
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Fig. 2

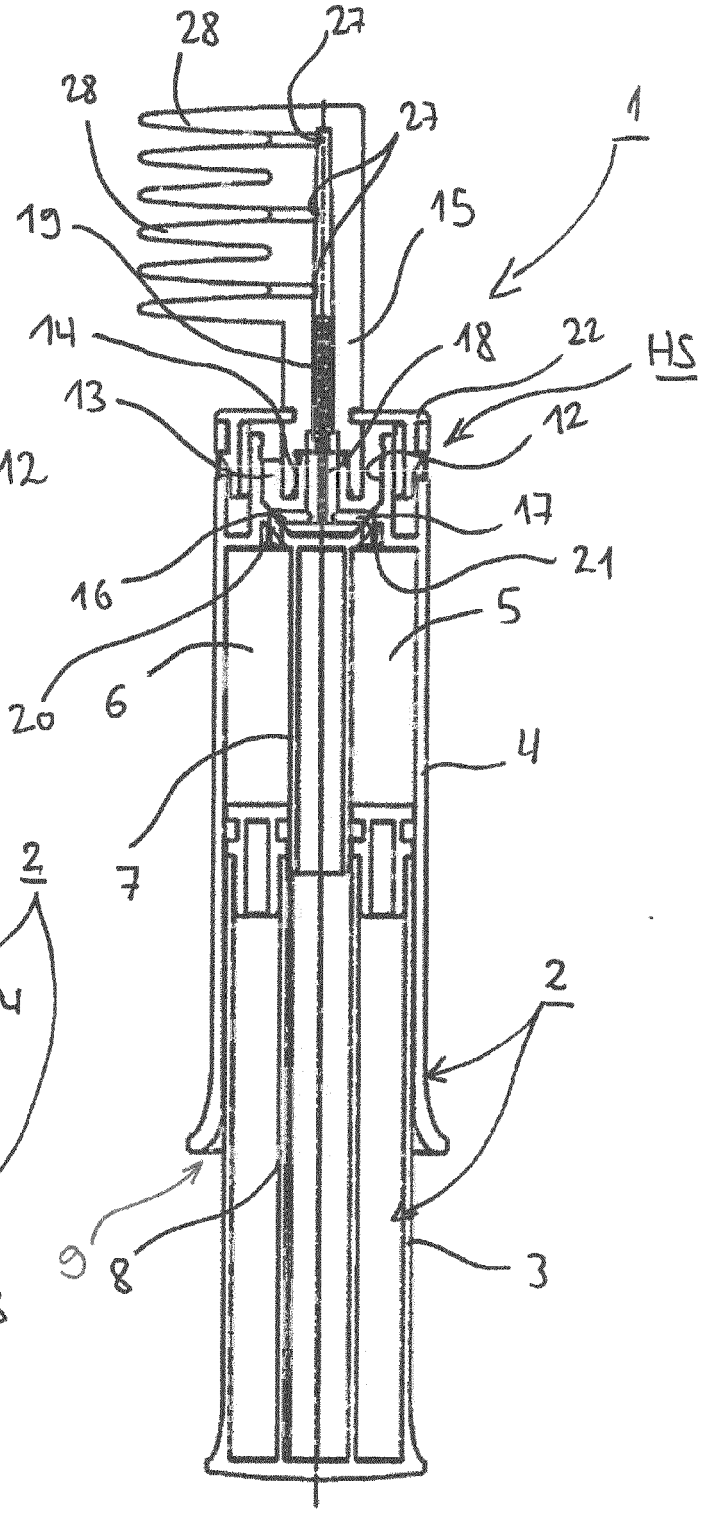
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Fig. 3

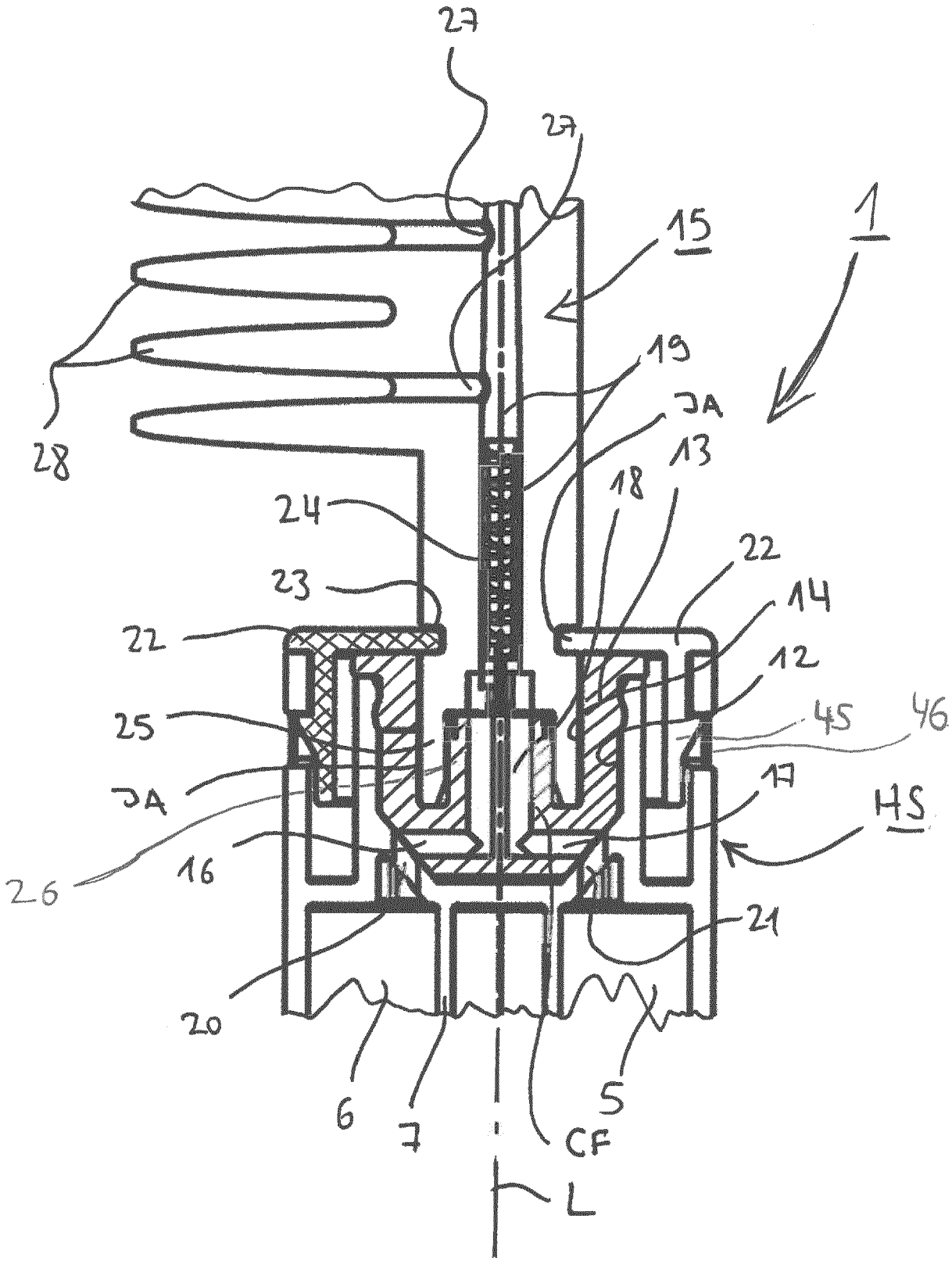
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Fig. 4

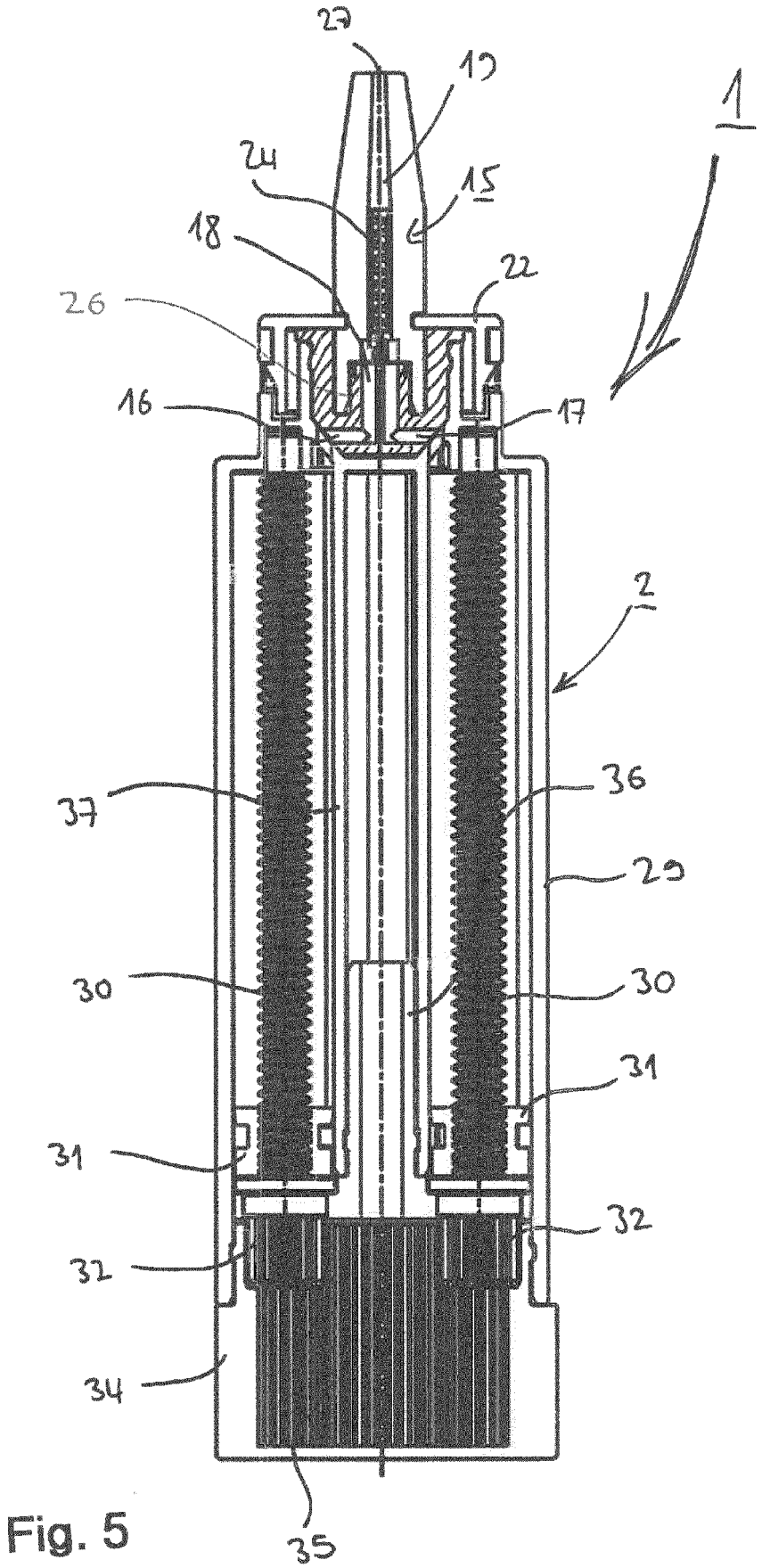

Fig. 5

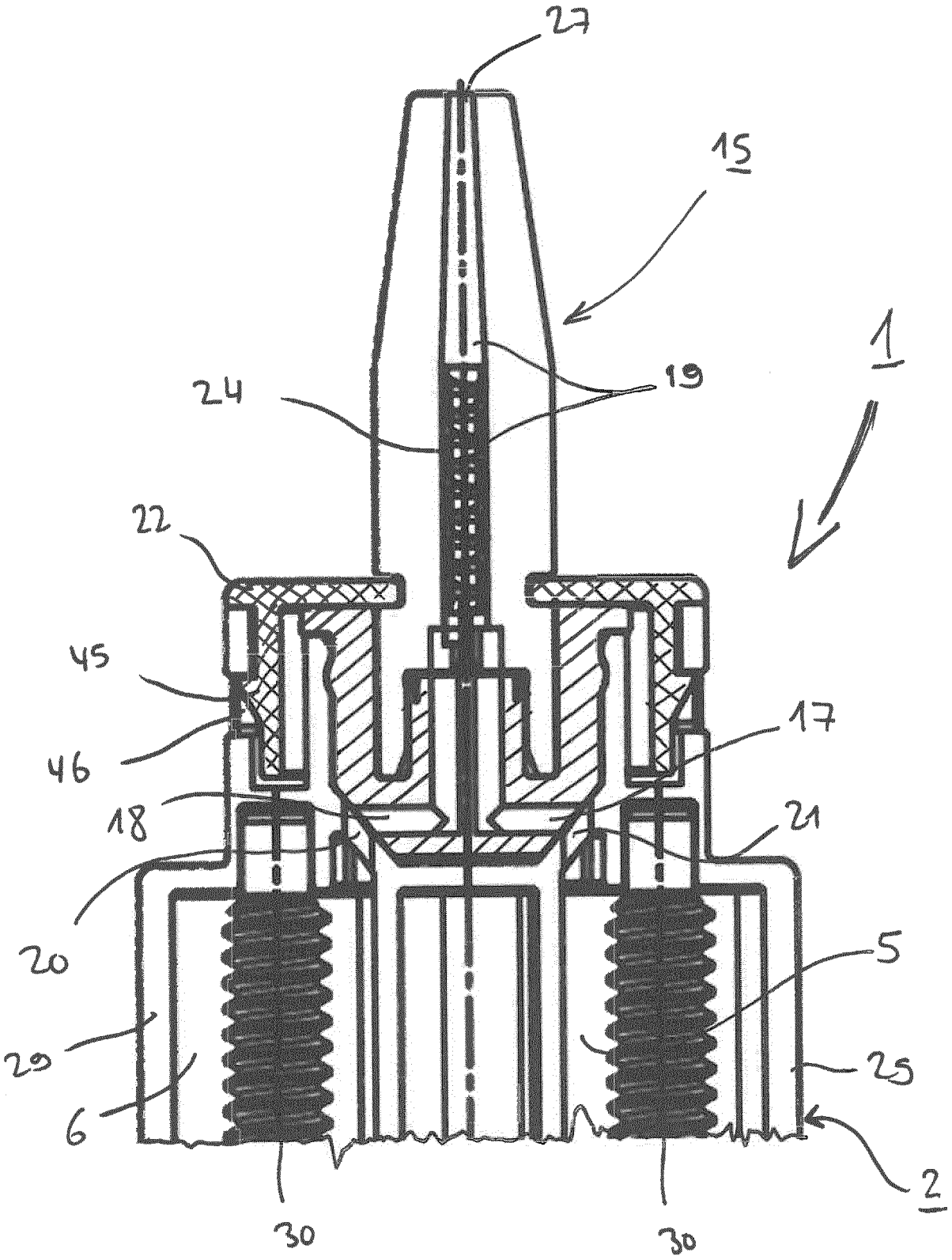

Fig. 6

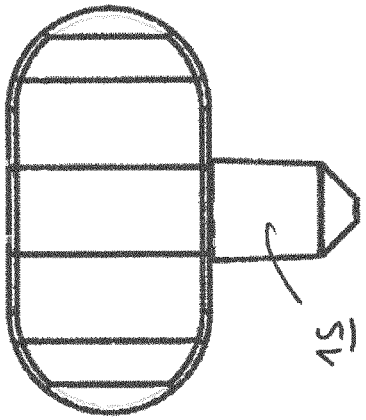

Fig. 9

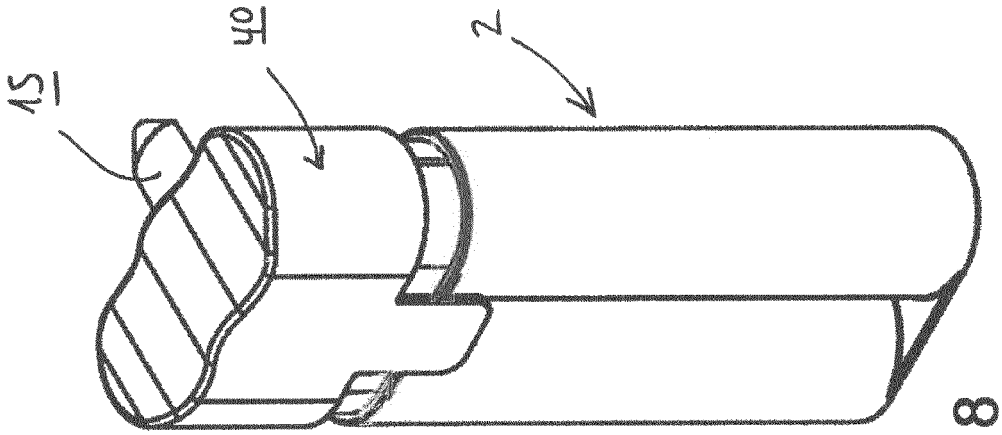

Fig. 8

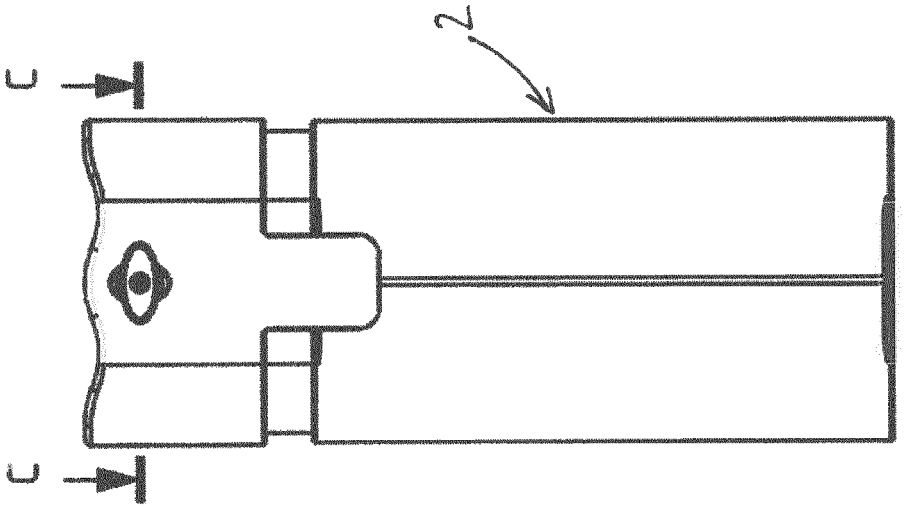

Fig. 7

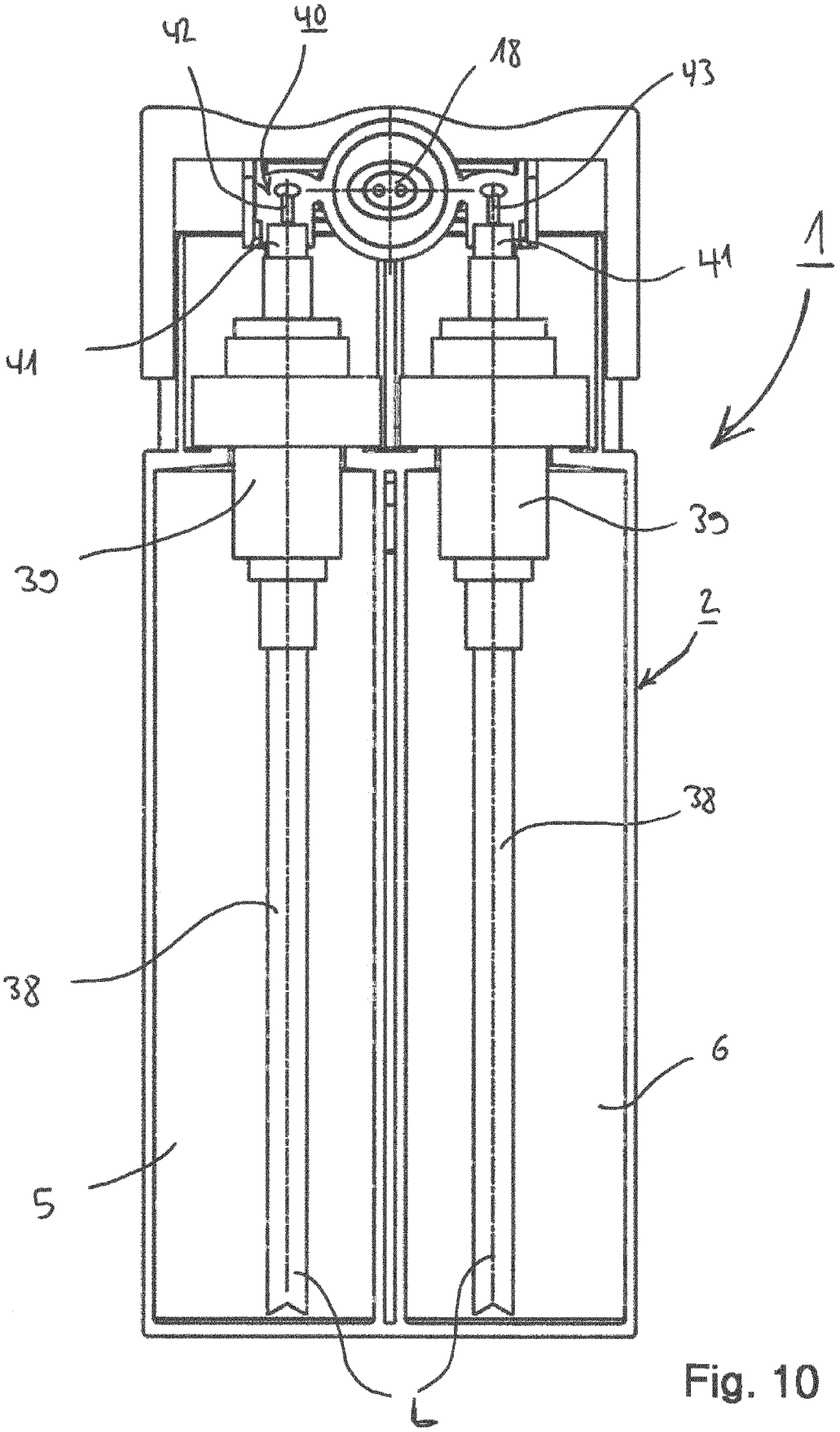

Fig. 10

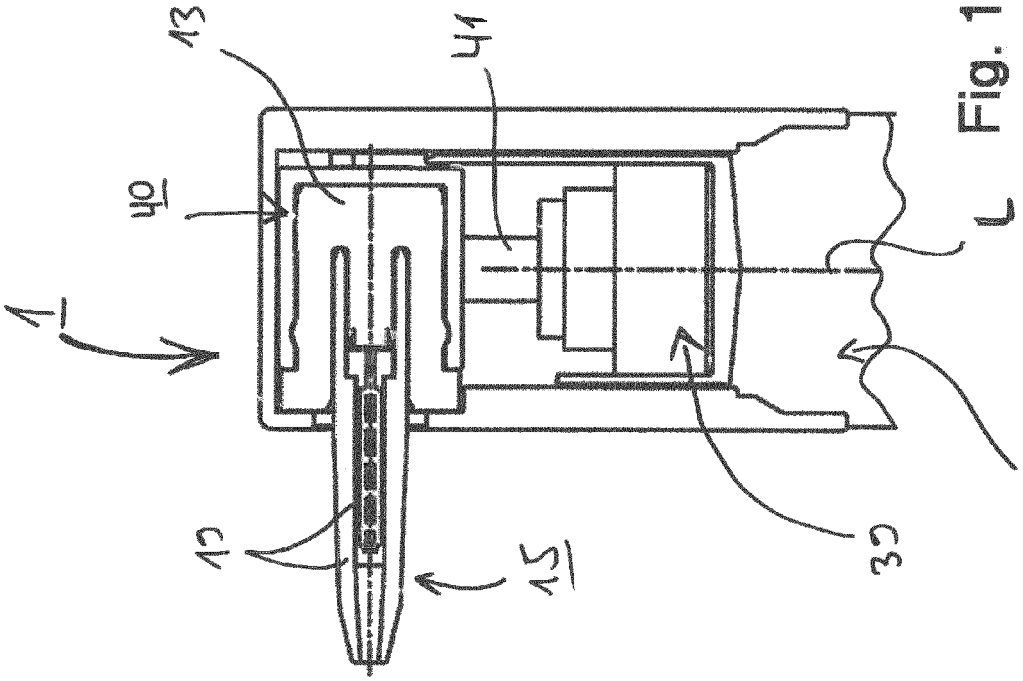

Fig. 12

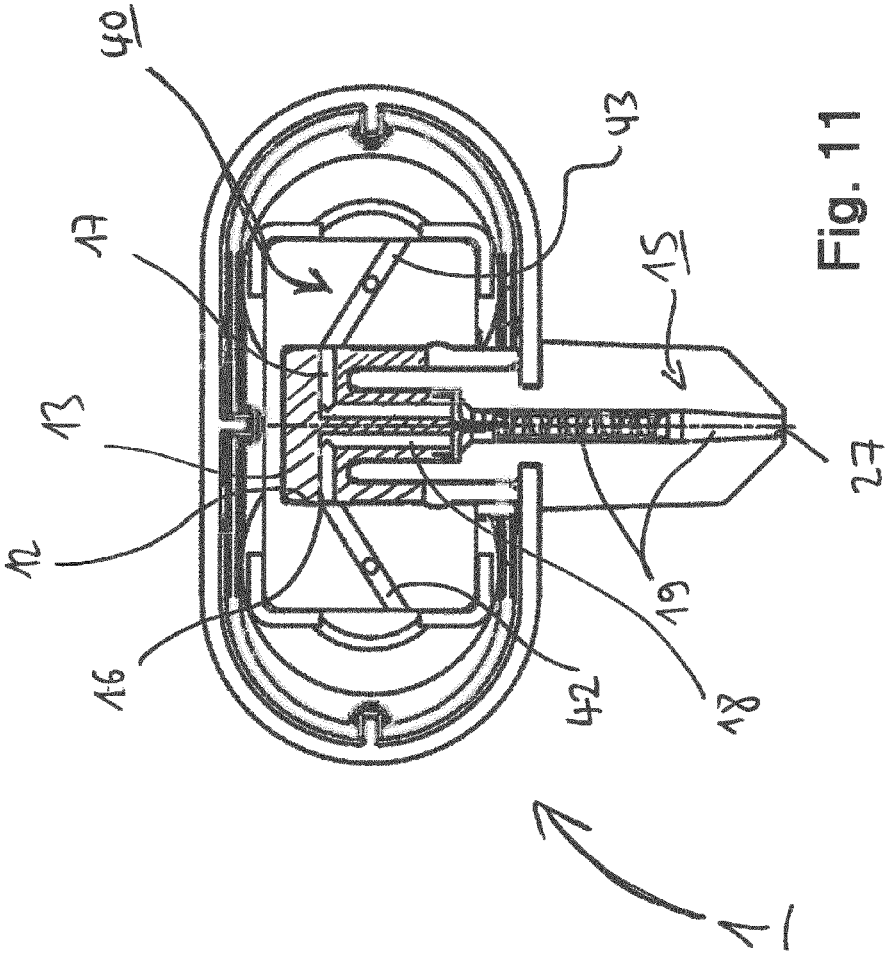

Fig. 11

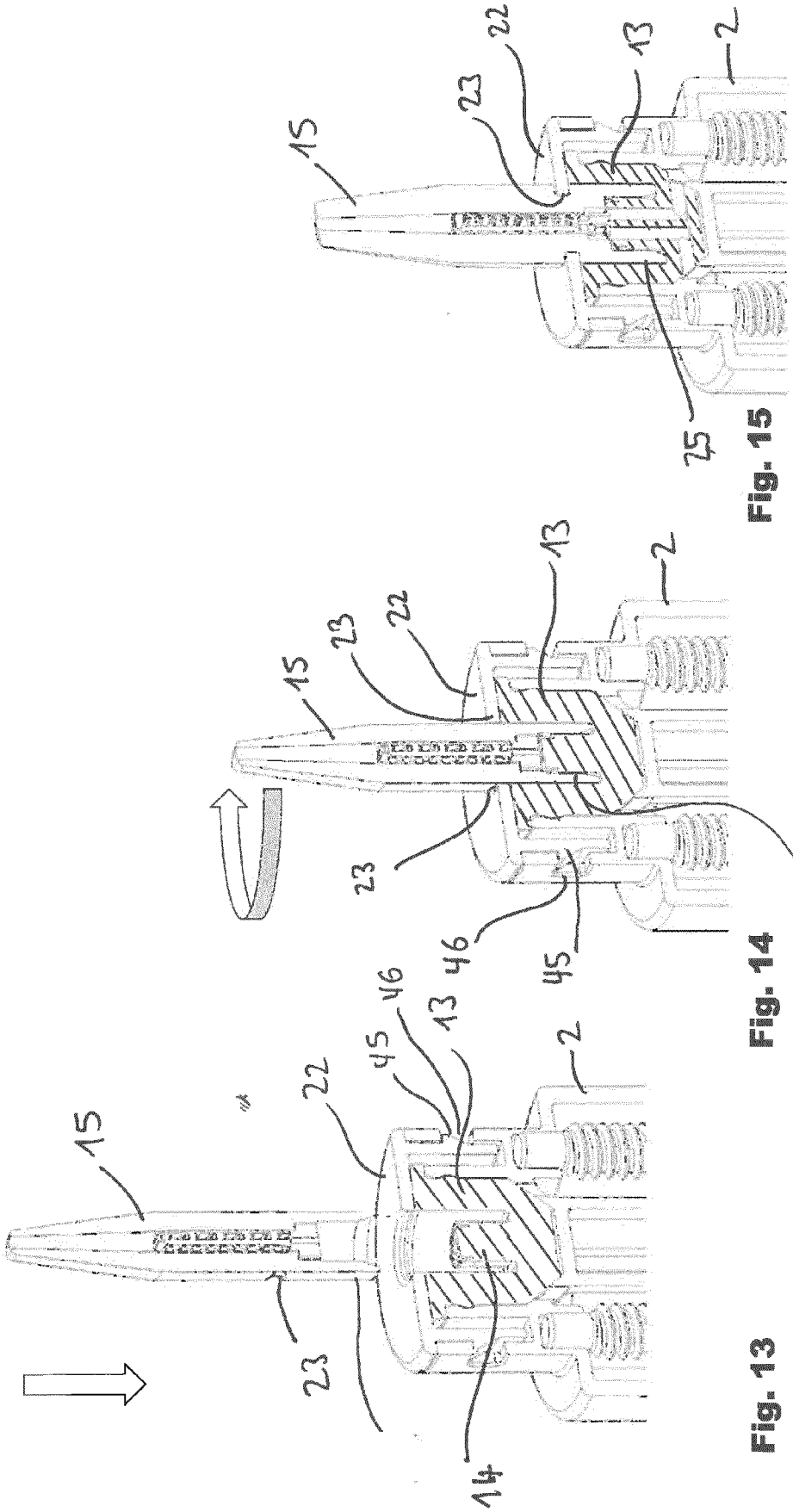

Fig. 15

Fig. 14

Fig. 13

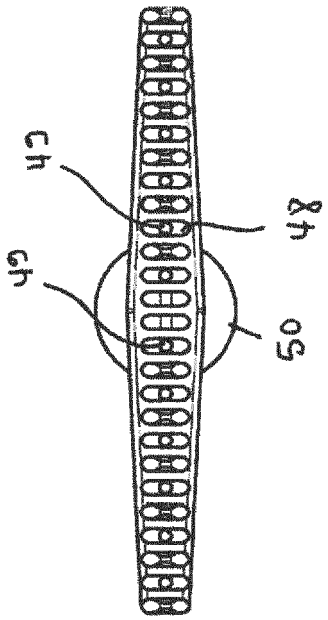

Fig. 16a

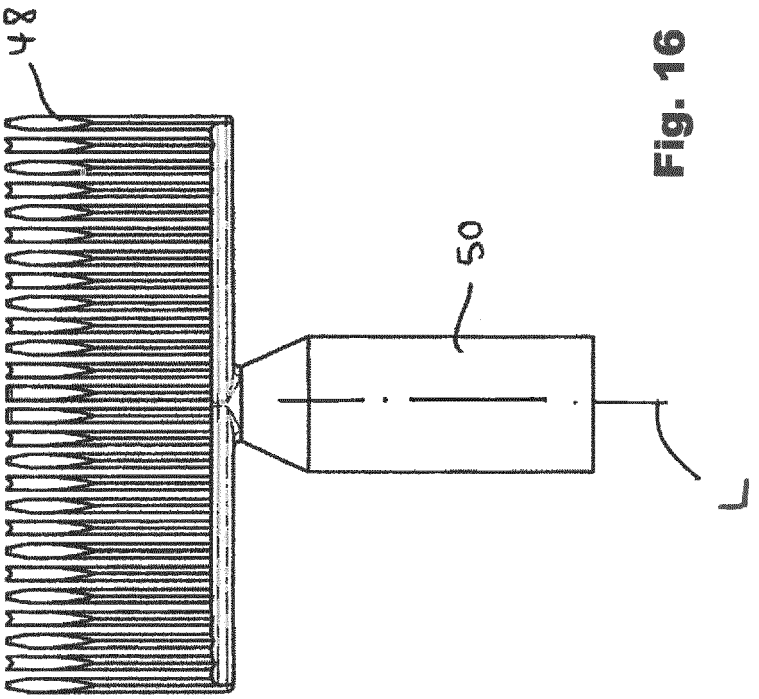

Fig. 16

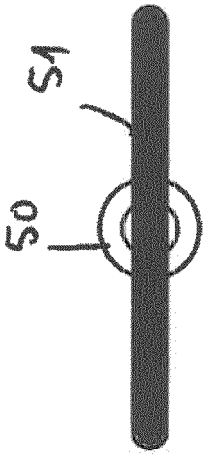

Fig. 17a

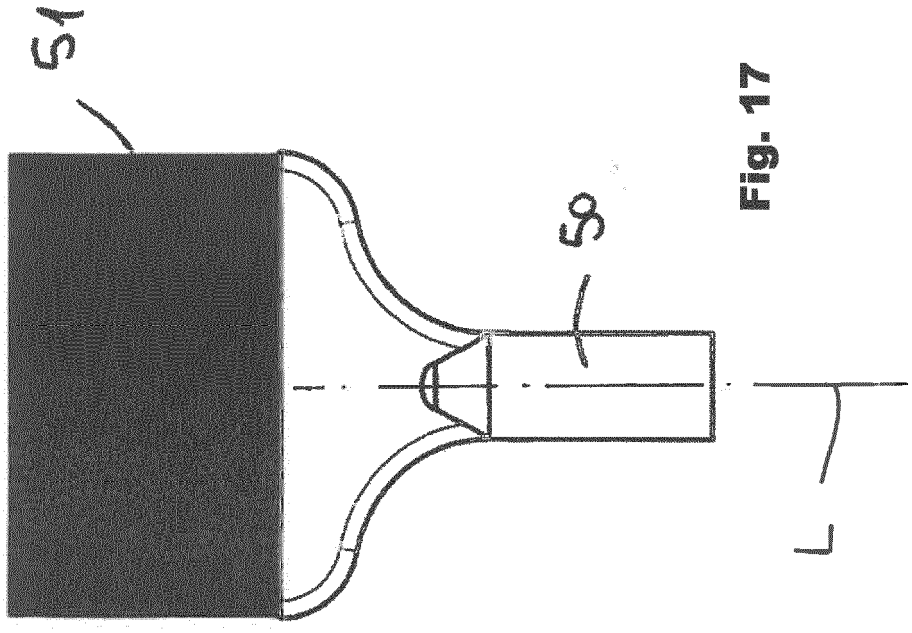

Fig. 17

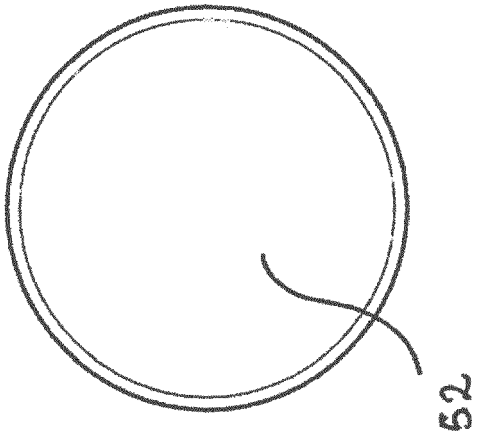

Fig. 18a

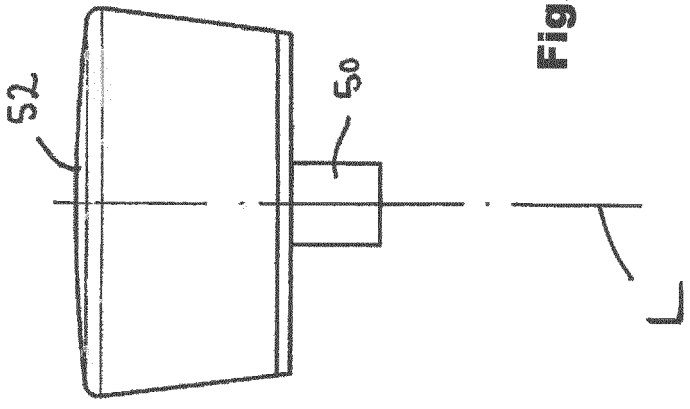

Fig. 18

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EUROPEAN SEARCH REPORT

Application Number
EP 18 21 3604

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2 819 723 A (ROGER MEYER) 14 January 1958 (1958-01-14) * column 3, line 25 - column 4, line 25; figures 4, 5 * * column 4, line 35 - line 52; figure 8 *	1-7,9, 11,12,15	INV. B05B11/00 B05B11/02
X	US 4 209 027 A (MORGANROTH SHILA [US]) 24 June 1980 (1980-06-24) * column 28, line 32 - column 30, line 37; figures 30, 30a *	1-3,5-7, 9,11,12, 14	
X	US 2006/283471 A1 (KIMURA YOSHINOBU [JP] ET AL) 21 December 2006 (2006-12-21) * paragraph [0037] - paragraph [0073]; figures 1-7 *	1-3,5-7, 9,12	
X	US 2004/221864 A1 (CAPRISTO MICHAEL [US]) 11 November 2004 (2004-11-11) * paragraph [0058] - paragraph [0063]; figures 1-4 *	1-3,5,6, 12	
			TECHNICAL FIELDS SEARCHED (IPC)
A	JP 2004 154459 A (KAO CORP) 3 June 2004 (2004-06-03) * paragraph [0013] - paragraph [0017]; figures 1-4 *	1-15	B05B A45D B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 June 2019	Daintith, Edward

CATEGORY OF CITED DOCUMENTS

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18-06-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2819723 A	14-01-1958	NONE	
US 4209027 A	24-06-1980	NONE	
US 2006283471 A1	21-12-2006	JP 4481087 B2	16-06-2010
		JP 2005334559 A	08-12-2005
		US 2006283471 A1	21-12-2006
		WO 2005104664 A2	10-11-2005
US 2004221864 A1	11-11-2004	US 2004221864 A1	11-11-2004
		US 2005211261 A1	29-09-2005
		WO 2005096874 A2	20-10-2005
JP 2004154459 A	03-06-2004	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

- EP 0730913 A **[0064]**
- EP 0885651 A **[0064]**