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(54) Dispenser for delivery pasty compounds.

(57) A dispenser for delivering a pasty compound (3) comprises a tubular housing (1) and a plug-in cartridge (2) associated therewith in an axially displaceable fashion, the section (1') of the cartridge that projects beyond one end of the housing having an actuating surface (4) and the delivery mouthpiece (6). A plunger (9) is moved stepwise in the direction of the mouthpiece upon actuation. The advance of the plunger, which is guided by the plug-in cartridge, is achieved by means of displacement of said cartridge against a support plate (10) of the housing, which plate is resettable in the direction of the delivery mouthpiece. The resetting may be achieved by means of a locking connection (80/81) between the plunger and the support plate, the latter being seated on a column (5) that is extensible, the column being constituted by parts that can be telescoped with respect to one another.

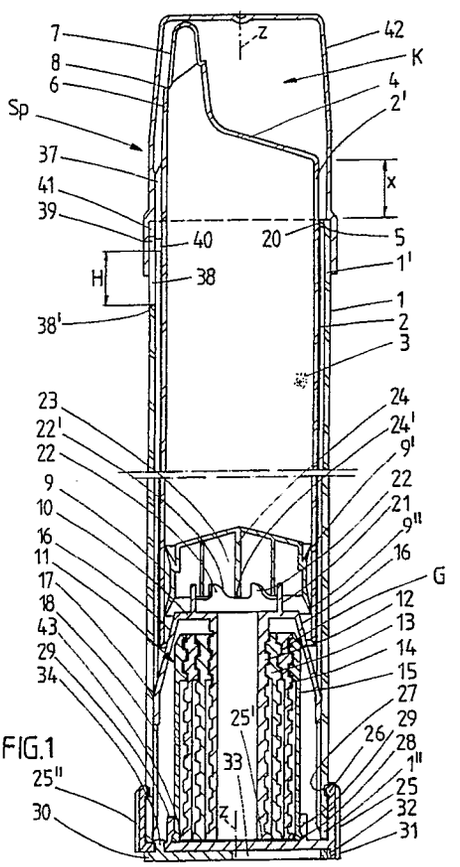

FIG.1

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DISPENSER FOR DELIVERING PASTY COMPOUNDS

Field of the invention

The invention relates to a dispenser for delivering pasty compounds, comprising a tubular housing, an insert assigned thereto in an axially displaceable fashion, of which the section projecting beyond one housing end has an actuating surface and the delivery mouthpiece, and comprising a plunger moving stepwise in the direction of the mouthpiece upon being actuated.

Background to the invention

A dispenser of this type is known from EP-A-0,248,278. There, the insert consists of a bag containing the pasty compound. In order to achieve a non-deformable actuating surface, the section projecting beyond the housing end there is covered by a cap-shaped actuating button, which is mounted peripherally in a one-armed fashion. The piston is reset with each actuating stroke. For this purpose, said piston cooperates with two pairs of serrated slats, of which one is realised as a pair of transport serrated slats and the other is realised as a pair of support slats. The latter is integrally formed on the inside of the housing. The construction is relatively complicated, and changing the collapsible bag, which is formed from foil, is disadvantageous.

It is an object of the present invention to improve the construction and manipulation of a dispenser according to the generic type.

Summary of the invention

The present invention provides a dispenser for delivering pasty compounds, comprising a tubular housing, an insert associated therewith in an axially displaceable fashion, of which the section projecting beyond the end of the housing includes an actuating surface and the delivery mouthpiece, and comprising a plunger (which term includes a piston) moving gradually or stepwise in the direction of the mouthpiece upon being actuated, characterized in that the insert is configured as a plug-in cartridge guiding the plunger and the advance of the plunger is achieved by means of displacement of the plug-in cartridge against a support plate of the housing that is adjustable or resettable in the direction of the delivery mouthpiece.

The expression 'pasty compound' herein covers pasty substances in general, e.g. pasty compositions or masses for instance toothpastes and the like.

Description of preferred embodiments

A dispenser of the generic type of increased utility value is achieved as a result of the invention: in this regard, the advantage resides above all in the simple construction as well as in the ease of manipulation. To be precise, it is proposed for this purpose that the insert is configured as a plug-in cartridge guiding the plunger and the advance of the plunger is achieved by means of displacement of the plug-in cartridge against support means, particularly a support plate of the housing, resettable in the direction of the mouthpiece. The ejection thus takes place not from the level of a column in a collapsible bag, but via a hard component. Such a component can, moreover, also be better inserted into the dispenser. Moreover, there is no need for the additional actuating cap, since the plug-in cartridge itself possesses sufficient natural stiffness or inherent strength in the region of the delivery or discharge mouthpiece. Again, special hinging is eliminated.

The pressing out or discharge of the pasty compound takes place against the plunger, which is held by an adjustable or resettable abutment; the tubular plug-in cartridge thus runs over the plunger it incorporates, which is not adjusted or reset here with each actuating step, but always advances in sizeable steps or jumps. The corresponding stroke can thus be used as a way of subdividing for a plurality of delivery portions. Not until then does the support plate move up. A threaded resetting or adjustment of the support plate proves to be advantageous here. Because of the prevailing frictional relationships, its thread need not even be so flatly rising (i.e. have such a flat pitch) that it is located in the self-locking region. In this regard, particular advantage is seen in an embodiment wherein the resetting thread is formed by a telescopic thread, the telescopic section of which carries the support plate, which is rotationally locked or secured against torsion both in the housing and in the plug-in cartridge, and the telescopic drive section of which is connected to a rotary manipulator or handle at the lower end of the housing. Such a telescopic thread has the advantage of a particularly space-saving construction, so that in terms of volume the corresponding resetting mechanism requires very little space.

Providing the rotary manipulator at the lower end of the housing meets the corresponding psychological expectations of the user. In addition, it means that the entire housing body is available as a holding manipulator. In accordance with the customary mode of rotation to the right, the resetting thread generally has a left-hand thread. The rotary manipulator is preferably configured as a cap

clipped onto the lower housing end. Given a reversible clip or clip-lock design, it is possible, for example for cleaning purposes, for the mechanism to be conveniently moved (released) and reassigned (reattached). However, this also has other advantages of a technical production nature to the extent that different component parts are possible, for example with respect to the thread lead or pitch. Furthermore, it proves to be advantageous that the cap base possesses a swivelling or swing-out crank arm. It is possible in this way for the support plate which is gradually adjusted or reset stepwise via the rotary manipulator to be returned easily in one go via the crank without always reapplying one's hand. Moreover, it is favourable that the crank arm is configured as a disc (or disc-type) arm. Such a disc forms a neat termination of the dispenser on the base side, and also creates balanced conditions for standing the dispenser erect. If it is arranged that the disc arm has a manipulation aperture or grip opening, that is to say a hole, this disc can be rotated about its swivelling axis like a dial, which swivelling axis is advantageously diametrically opposite the manipulation aperture. Naturally, it is sensible with regard to the swivelling axis to choose as peripheral a position as possible, doing so in the interest of the use of as large a lever arm as possible for such a disc arm.

With regard to the mechanism it proves to be advantageous that in order to form a rotary lock in the housing, the support plate possesses at least one resilient tongue, to which a stop shoulder extending on the housing inner wall in the longitudinal direction is assigned. Such a mechanical rotary lock or security against torsion is also already substantially assisted by the prevailing frictional forces between the plug-in cartridge and the housing. The corresponding embodiment is optimized by a plurality of tongues and stop shoulders arranged in an angularly symmetric fashion. Such stop shoulders can be taken into account on the tubular housing along with other things as early as during production. The necessary rotary lock between support plate and plunger is provided by form-locking or positive engagement on the underside of the plunger with respect to the plug-in cartridge. Such a rotary lock with respect to the underside of the plunger is formed by a toothed rim or crown on the support side of the support plate. Moreover, such teeth have the advantage of stiffening the support plate which, on the other hand, can in turn be configured with very thin walls. It is favourable if the teeth of the toothed rim possess locating bevels, and the plunger is fitted with individual receiving compartments for the teeth. The result is a type of claw coupling between the two components to be rotationally locked. In order to be able as far as possible to dispense with any frictionally gripping assignment of the plug-in cartridge, a favourable embodiment is achieved by means of rotary lock of the plug-in cartridge with respect to the housing. This rotary lock of the plug-in cartridge with respect to the housing can be achieved by a slot/rib engagement orientated in the longitudinal direction of the housing. With such a design the advantage of a stroke limitation can be achieved by providing that the plug-in cartridge carries a rib on its circumferential surface, and the housing has a slot which is open towards the upper end rim or leading edge and extends at least over the stroke travel. Such an embodiment can be developed still further to form an axial security, simply by means of a lock between the rib and slot in the outwardly directed basic or initial position of the plug-in cartridge. Like the insertion of a fresh plug-in cartridge, the removal of the evacuated (emptied) plug-in cartridge takes place only by intentionally overriding the said lock. Finally, the locking then further forms a type of overload protection if, acting in an insufficiently sensitive fashion, the user continues to crank beyond the region that exceeds the projection of the upper cartridge end and is defined by a palpable stop.

An advantageous alternative proposal consists in that the resetting of the support plate is achieved from a locking connection between the plunger and the support plate seated on a column extendable in the axial direction. During the delivery actuation, which takes place stepwise, the plunger thus docked onto the column carries along the column supporting the plunger, also doing so stepwise and extending said column. Thus, the operationally normal manipulation of the customary dispenser obtains, except that the ejection now takes place from a plug-in cartridge. The locking connection can be undone when the column is fully extended. It proves to be advantageous that the column consists of a plurality of parts that can be extended telescopically with respect to one another and are ratchet-secured. In this variant too, the corresponding telescopic construction provides the benefit of as large a storage space as possible by comparison with only a relatively small proportion for the dispenser mechanism. With regard to the ready-to-deliver position of the dispenser mechanism, which now obtains here at each actuating step, it proves to be advantageous that a sprung foot ring that moves the plug-in cartridge back to the basic position in each case is assigned to the foot of the column. Since the empty weight and the filled content of the plug-in cartridge contribute to facilitate actuation depending upon the state of use of the dispenser, the spring effecting the resetting can be designed correspondingly stronger, so that the resetting of the plug-in cartridge remains guar-

anteed in each case. Moreover, it is favourable that the parts of the column can be returned into the shortened column length by a crank drive. Thus, here only one way, to be precise the way back, is covered by a crank movement, since the way out for achieving the extended column length is executed through the carrying along by means of the plunger. Moreover, it is proposed that the crank drive is arranged covered at the lower end of the dispenser housing. The customary basic construction of the dispenser, which has a pleasing exterior and is mostly slim, is thus retained. A foolproof construction is achieved by means of an overload protection in the crank drive. Furthermore, it is preferred that the telescopic movement of the parts of the column be achieved by a threaded engagement of these parts with one another in conjunction with rotary locking of the part of the column adjacent to the plunger. In this arrangement, a very steep thread can be chosen which need not even be located in the self-locking region. The column can be returned into its shortened column length correspondingly quicker. The left-hand thread obtains. It is expedient to construct the internal thread for the threaded engagement on resilient tongues of the parts forming the column, the resilient avoidance capability of which tongues represents the overload protection and provides the above-mentioned ratchet function. With regard to these parts, it is sufficient to make use of plastic material having the appropriate restoring property. The tongues may be simply produced by lugs cut free in the wall of the cylindrical parts forming the column. In this case, such axial slots run out from the end of each part directed towards the plunger apart from the upper end part near the plunger. In practical terms, the rotary lock exists by virtue of a tongue, which is directed radially outwards from the said part of the column, i.e. that near the plunger, and is in form-locking longitudinal engagement with respect to the housing inner wall on at least one side. Furthermore, it is proposed that the locking connection between the plunger and support plate is realised as a pushbutton connection between a male part of the support plate and a female cavity of the plunger. The position occupied by the male part in the basic position with shortened length is such that given operationally correct assignment of the plug-in cartridge the appropriate docking on is reliably and necessarily brought about. An advantageous foolproof assignment can hold in that, for example, a slip-on protective cap brings about the final position by being appropriately applied to the cartridge head. Furthermore, it is favourable that the foot ring is rotationally locked by being form-locked with respect to the housing wall. A practically reliable assignment of the plug-in cartridge is further produced by a clip-shaped undergrip between the rim of the plug-in cartridge and the housing inner wall in the basic position of the plug-in cartridge. The appropriate longitudinal engagement is achieved in an advantageous way by means of a longitudinal rib of the housing wall, which longitudinal rib merges at the lower end just above the foot ring into a radially projecting protuberance that serves the rim of the plug-in cartridge as an undergrip. It is expedient for there to be located on the housing inner wall two longitudinal ribs diametrically opposite one another, or also three thereof, so that a balanced, vibration-free guidance of the plug-in cartridge in the housing obtains. The protuberances possess a structure that can be overridden, but an intentional tensile force is required in order for the plug-in cartridge that can be gripped at the projecting head end to be moved out of its assigned position or to be brought into the same. Moreover, there is an advantageous proposal consisting in that the crank drive is formed by a ratchet disc having a fold-out crank arm. Finally, an advantageous design is achieved by means of two resilient tongues bent in opposite directions as a rotary lock for the part of the column that carries them. In conclusion, a favourable proposal consists in different lead angles of the threads, with the highest degree of lead at the end of the column relatively remote from the crank. The rise is identical stepwise.

The above-described invention is explained in more detail below with reference to two illustrative embodiments depicted in the drawings, wherein:

- Fig. 1 shows a vertical section of the dispenser constructed according to the invention with an inserted plug-in cartridge, to be precise in the basic position of use, still sealed by a protective cap, in accordance with the first illustrative embodiment;
- Fig. 2 shows the dispenser with protective cap removed, to be precise in the same mode of representation;
- Fig. 3 shows the dispenser subsequent to the carrying out of a complete actuating stroke of the plug-in cartridge, likewise in section;
- Fig. 4 shows the resetting of the support plate by one step via a rotary manipulator on the base side;
- Fig. 5 shows the dispenser, illustrating the almost completely extended first stage of the telescopic thread;
- Fig. 6 shows the upper section of the dispenser in side view, representing the rotary lock between the plug-in cartridge and housing; and
- Fig. 7 shows a bottom view of Fig. 3, with the hand crank of the rotary manipu-

lator swivelled out.

Fig. 8 shows the dispenser in accordance with the second illustrative embodiment, to be precise in a side view, sealed by a protective cap ;

Fig. 9 shows the associated plug-in cartridge in a reproduction on its own with the delivery mouthpiece sealed by a plug;

Fig. 10 shows the bottom view of the plug-in cartridge looking towards the plunger of the plug-in cartridge, which simultaneously forms a cover on the base side;

Fig. 11 shows a longitudinal section of the dispenser with partly broken open plug-in cartridge, representing the basic position of the dispenser mechanism;

Fig. 12 shows a representation corresponding to Fig. 11, but in the actuating position;

Fig. 13 shows the dispenser with the column completely extended and the crank arm folded out for the purpose of retracting, i.e. shortening the length, of said column;

Fig. 14 shows the associated bottom view, but with the crank arm folded in, and with the crank arm folded out, as reproduced with dashed and dotted lines;

Fig. 15 shows a cross-section of the dispenser, to be precise looking onto the support plate (without plug-in cartridge);

Fig. 16 shows the section in accordance with the line XVI-XVI in Fig. 13, in an enlarged reproduction; and

Fig. 17 shows the section in accordance with the line XVII-XVII in Fig. 16.

The dispenser Sp depicted in the first illustrative embodiment comprises a tubular housing 1, which accommodates as an inserted part a plug-in cartridge 2 that is accessible for actuation. The plug-in cartridge 2 contains the pasty compound 3 to be delivered.

The accessibility for actuation results from the projection on the upper side of the section 2' at that location of the plug-in cartridge 2. The extent of projection is denoted by x, and defined by a top, forming an actuating surface 4, of the plug-in cartridge 2 and the upper end rim 5 of the housing end 1' at that location of the housing 1.

The actuating surface 4 falls away outwards to the right at a relatively acute angle, and merges on the left-hand side into a delivery mouthpiece 6. In the original state, the latter ends in a closed cutting tip 7 with a predetermined cutting orientation edge 8. The latter extends in the direction opposite to the slope of the cartridge top or actuating surface 4.

The lower termination, on the base side, of the plug-in cartridge 2 forms a plunger 9. This is a pot-shaped structure with axially spaced lips 9', 9". A puncture diaphragm (not represented in more detail) can be provided at the back of the plunger 9 for the purpose of hermetically safeguarding the product.

By exerting a pressure in the direction of the arrow P, the plug-in cartridge 2 is displaced relative to the plunger 9 supported fixed in the dispenser Sp; the cartridge shell runs over the plunger in the direction of the arrow y.

The plunger 9 itself encounters its abutment on a support plate 10 of a resetting mechanism 11. Thus, the advance of the plunger 9 is effected by displacing the plug-in cartridge 2 against the support plate 10 of the resetting mechanism 11, which support plate can be reset stepwise in the direction of the delivery mouthpiece 6.

The resetting of the support plate 10 takes place via a thread. The latter is denoted throughout as the resetting thread G. In order to keep the proportion of the axial length of the resetting mechanism as small as possible with respect to the useful space of the dispenser Sp, use is made of a telescopic thread consisting of a telescopic terminal section 12 acting directly on the plunger 9, two telescopic intermediate sections 13, 14 and an external telescopic drive section 15. The telescopic intermediate sections 13, 14 and the telescopic drive section 15 are of the same axial length, while the internal telescopic terminal section 12 projects somewhat beyond the remainder of the threaded spindle package in the axial direction in the basic position in accordance with Fig. 1. It is rooted in the centre of the support plate 10, which is assigned rotationally locked both in the housing 1 and in the plug-in cartridge 2.

The telescopic terminal section 12 is also of a tubular configuration, and is thus perforated over its entire length.

At least one resilient tongue 16 set radially outwards is provided to lock the support plate 10 rotationally in the housing 1. The drawing shows two tongues 16 mounted diametrically opposite one another and directed away from the rim of the plate 10. With regard to a balanced support, a tripartite division would also be sensible, although in the case of the chosen cylindrical, tubular construction of the housing 1 an effect favourable in terms of force also proceeds via two tongues 16 diametrically opposite one another. The free end of the tongues 16, which fall away outwards at an acute-angled slope is bent away in a parallel alignment

with respect to the corresponding housing inner wall 17, so that an abrasion-free guidance results, in particular no hooking together takes place when the telescopic section is retracted. It would even be sensible to chamfer the outer edge. The sloping sections of the tongues 16 are aligned on the longitudinal central axis z-z of the dispenser. They converge towards the plunger 9. The rotationally locked counterpart of the housing consists of at least one stop shoulder 18. In this regard, as well, care is taken to provide a multiplicity of stop shoulders 18 arranged in an angularly symmetric fashion, so that each tongue 16 encounters a shoulder 18.

In practical terms, these stop shoulders 18 are narrow ribs which are integrally formed and extend longitudinally along the housing inner wall 17 and thus project radially over the cylindrical inner wall, being directed inwards. They point to the longitudinal central axis z-z. On the base side, that is to say on the end diverted from the delivery mouthpiece 6, the ribs forming the stop shoulders taper off in a wedge, while above they merge into an inwardly directed annular collar 20, which somewhat exceeds the wall thickness of the housing 1 there and defines the minimum inside diameter of the housing 1. The flank of said annular collar directed towards the cartridge side forms the immediate guide surface in conjunction with the crest of the ribs forming the stop shoulders 18.

The support plate 10 is rotationally locked by form-locking engagement on the underside of the plunger 9 with respect to the plug-in cartridge 2. This is a type of claw coupling. For this purpose, a toothed rim 21 extends from the top side of the support plate 10 concentrically with respect to the plate rim, but offset inwards thereto. This is an annular wall, halfway up which the teeth 22 of the toothed rim 21 start upwards. The rotationally locking driving engagement on the piston 9 is formed on the underside of the latter by individual receiving compartments 23 for the said teeth 22. In this arrangement, the dividing walls 24, which form the individual compartments 23, are axially orientated and form a type of lattice are supported with their downwardly directed end faces 24', where they define the actual axial support plane. They reach into the gaps between the teeth 22 and bear on the corresponding horizontal tooth base. As may be seen from the drawings, the teeth 22 have a sawtooth profile, i.e. they have a locating bevel 22', which are all located on the same side of the teeth.

The other, lower end of the telescopic thread, more precisely the telescopic drive section 15, is connected to a rotary manipulator 25. The latter is located at the lower end 1" of the housing 1.

The rotary manipulator 25 is configured as a cap clipped onto the lower housing end. A horizontally aligned, continuous or interrupted clipping rib 26, which projects into a corresponding, but continuous clipping groove 27, is located on the inside of the cap space in the vicinity of the upper cap rim. The clipping rib 26 and clipping groove 27 are located in a horizontal plane so that there is no load during turning. A rotary drive results in relation to the adjoining telescopic drive section 15. Here, too, a clipping point 28 can be useful, it being possible for a tooth system located in the longitudinal direction of the dispenser to engage between the two parts in order to achieve the rotary lock.

In this regard, the connecting zone is produced by a plug-in collar 29, which is integrally formed on the cap base 25' of the rotary manipulator 25 and grips the end of the telescopic drive section 15 there in a form-locking fashion.

The circumferential wall of the cap forming the rotary manipulator 25 has longitudinal serrations 25" to enhance the grip for the purpose of actuating the resetting mechanism 11.

Over and above this direct application of rotation, one that is more favourable as a lever, above all for rapid return cranking of the support plate 10, consists in that a swivelling crank arm 30 is mounted on the cap base 25' on the underside. In the position when not in use, said crank arm disappears in the cross-sectional contour of the cap, to be precise in a receptor 32 partially walled around by a standing rim 31 of the cap. The standing rim is interrupted only to the extent that it permits the free swivelling of the crank arm 30. The fact that the underside of the crank arm 30 is flush in the same plane with the surface on which the standing rim 31 is put down guarantees that the dispenser Sp, which is capable of being set aside erect, is put down reliably.

In practical terms, the crank arm 30 is realised as a disc arm, this being done with the use of the contour size predetermined by the cap. The disc arm, which is basically of a circular configuration, possesses a decentral manipulation aperture 33. The inside diameter thereof corresponds approximately to the radius of the disc arm, but does not intersect the periphery of the disc. The manipulation aperture 33 is diametrically opposite a swivel axis 34 of the crank arm 30. The swivel axis is located as near as possible to the wall of the housing 1, so that it is possible to use as large as possible a lever arm length for the crank arm. In the folded-out position (cf. Fig. 6), the rim of the crank arm 30 comes against a rotary drive stop 35 of the standing rim 31 of the cap-shaped rotary manipulator 25.

A circumferential standing rim length of more than 180° remains between the stop 35 and a drive-in opening edge 36 of the standing rim 31.

The inside diameter of the circular manipula-

tion aperture 33 corresponds at least to that of the index finger of person's operating hand.

The swivel axis 34 extends in space parallel to the longitudinal central axis z-z of the dispenser.

With regard to the right-handedness of the mode of actuation of the crank arm 30, use is made of a left-hand thread for the telescopic thread, to put it more precisely for the resetting thread G. The thread lead is in the self-locking region.

A rotary lock is also implemented between the housing 1 of the dispenser Sp and the plug-in cartridge 2. This rotary lock of the plug-in cartridge 2 with respect to the housing 1 is achieved by means of a slot/rib engagement orientated in the longitudinal direction of the housing 1.

For this purpose, the plug-in cartridge 2 has a rib 37 on its circumferential surface in the region of the section 2'. Said rib projects, directed radially outwards, into a corresponding longitudinally orientated slot 38 of the housing 1. The length of this slot takes account of the maximum stroke travel H of the dispenser head K.

This slot/rib engagement is employed in order to construct a reversible locking connection between the housing 1 and the plug-in cartridge 2. For the purpose of locking, the slot 38 reaches as far as the upper end rim 5 of the housing 1, that is to say it opens outwards. Two locking cams 39 standing out from the slot flanks of the slot 38 are located in front of the outlet. Said locking cams engage behind a locking head 40, which projects beyond the thickness of the rib 37 measured in the circumferential direction of rib 37. Locating bevels 41, which delimit a funnel-shaped inlet opening, are situated in front of the locking cams 39, which constrict the slot width. The locking point against separation of the two parts, that is to say the housing 1 plus plug-in cartridge 2, between the rib 37 and slot 38 is the upper end zone of the slot 38. The delimitation in the inward direction is defined by the lower slot base 38' which is transversely rounded.

The function and mode of operation of the dispenser are as follows: by exercising a compressive force in the direction of arrow P on the actuating surface 4 of the plug-in cartridge 2, the latter is displaced axially in the direction of the arrow y in the housing 1. Since in this process the plunger 9 is held fixed via the support plate 10, the reduction in the volume of the plug-in cartridge 2 that takes place brings about the discharge of the pasty compound 3 via the delivery mouthpiece 6. The corresponding actuation can take place with complete passage of the stroke travel H, which, seen in the axial direction, corresponds to the extent of the projection x, or instead by means of stepwise depression the passage can take place correspondingly in stages. The compound 3 (after prior removal of the cutting tip 7 and, of course, removal of a protective cap 42 covering the dispenser head K) emerges in strands.

If, now, the dispenser is to be conditioned for a second stroke travel, all that is required is for the manipulator 25 to be turned clockwise, in order once again to move the plug-in cartridge 2 from the pressed-in position into the projecting position in accordance with Fig. 4. This final position is defined by the locking cams 39. In this process, the plunger 9 and, correspondingly, also the support plate 10 is displaced by the stroke travel H on the mouthpiece side. A new actuation of the dispenser can be carried out. Thus, via the resetting mechanism 11 the support plate 10 is gradually displaced to successively new levels with the extension of the telescopic thread. The rotary drive of the plug-in cartridge 2 or plunger 9 is prevented for the reasons explained, so that an operationally correct extension results.

After the complete evacuation of the plug-in cartridge 2, the latter needs only to be removed by overriding the locking position, and this can easily be done by gripping the section 2'. In this regard, this section can even be roughened in order to increase the grip. The idea here is to have ribs or serrations that are orientated approximately horizontal. The telescopic thread may be cranked back before or after by means of the crank arm 30, so that the exchange cartridge, which is plugged in from above as with a "muzzle-loader" runs properly guided on the support 10, and this occurs with the implementation of the coupling, described above in detail, via the toothed rim 21.

In the case of the resilient tongues 16 that entered the plug-in cartridge 2, there is likewise no rotary movement for the plunger and the support plate, because of the static friction between the plunger 9 and the inner wall of the plug-in cartridge 2, which for its part is, after all, rotationally locked.

The particular extension length of the telescopic sections is limited by the small collars or annular shoulders 43 projecting beyond the thread.

The dispenser Sp depicted in the second illustrative embodiment comprises a tubular housing 1, which accommodates as an inserted part a plug-in cartridge 2 accessible for actuation. The plug-in cartridge 2 contains the pasty compound 3 to be delivered.

The accessibility for actuation results from the projection on the upper side of the section 2' at that location of the plug-in cartridge 2. The extent of the projection is denoted by x, and defined by the top, forming an actuating surface 4, of the plug-in cartridge 2 and the upper end rim 5 of the housing end 1' there of the housing 1.

The actuating surface 4 falls away outwards to

the right at a relatively acute angle, and merges on the left-hand side into a delivery mouthpiece 6. The latter is sealed by a removable plug 44 (cf. Fig. 9).

A plunger 9 forms the lower termination, on the base side, of the plug-in cartridge 2. Said plunger is a pot-shaped structure with axially spaced lips 9', 9".

By exerting a pressure in the direction of arrow P, the plug-in cartridge 2 is displaced relative to the plunger 9, which is supported fixed in the dispenser in each case. In this process, the cartridge shell runs over the plunger 9 in the direction of the arrow y.

The plunger 9 encounters an abutment on a support plate 10 of a resetting mechanism 11. The advance of the plunger 9 is thus effected by displacement of the plug-incartridge 2 against the support plate 10 of the resetting mechanism 11, which support plate is reset stepwise in the direction of the delivery mouthpiece 6.

The resetting of the support plate 10 results from a locking connection between the plunger 9 and the support plate 10 that is seated on a column S capable of being extended in the axial direction. The column S consists of a plurality of parts 45, 46, 47 and 48 that can be extended telescopically with respect to one another. The said parts are of relatively short axial length, so that the proportion of the length of the resetting mechanism 11 is held as small as possible overall with respect to the useful space of the dispenser Sp. The circumferential wall of the basically cylindrical parts 45 to 47 has an external threads G'. These are threads with a structure of saw-tooth type (cf. Fig. 17), one flank 49' of the thread 49 being aligned perpendicular to the longitudinal central axis z-z of the dispenser Sp, while the other thread flank 49" extends at an acute angle thereto. These thread flanks converge towards the dispenser head K. The threads 49 are multiple-threaded, and have different lead angles from one part to another. The lead angle of the part 45, which is located nearer the dispenser head K and has the smaller diameter, is 10°, that of the part 46 embracing the latter is 8° and that of part 47 embracing the latter is 6°.

The threads of the matching internal thread, which are located inside the overreaching parts 46, 47, 48 are denoted by 50. Said threads also possess a saw-tooth structure, but with the opposite orientation, so that a thread flank 50' obtains extending perpendicular to the longitudinal central axis x-x, and a thread flank 50" diverging in the opposite direction towards the headpiece K. Approx. four threads 50 are located one above another. At issue here is a multi-threaded thread.

In the extended state of the column S there is still a sufficient overlap length of the parts 45 - 48, which guarantees the axial or radial stability. A complete extension is not possible, since the lower rim of the parts 45 - 47 forms a stop collar 51 in each case, which comes against the thread 50 located at the very bottom.

The represented saw-tooth structure of the threads 47, 50 leads to a locking effect that prevents the shortening of the column S by purely axial telescoping of the parts 45 - 48; however, in the sense of an extension of the column S the result is an extension free of obstructions up to the final position. Each stage reached thus forms a support abutment for the support plate 10 and the plunger 9, respectively.

The corresponding ratchet effect is achieved by means of longitudinal slots 52, which extend from the upper ends of the parts 46 - 48 and terminate at the same level. Said longitudinal slots cut free a wall section of the shell-shaped parts, so that resilient lugs 53 are present. The angular spacing of the longitudinal slots 52, which is preserved in the circumferential direction or is different, as the case may be, permits the production of a more or less hard locking effect of the end overlapping regions of the parts 46 - 48, the configuration of which parts resemble a crown or battlement.

The column S that has been extended through being carried along via the plunger 9 can, by using the engagement of the external thread G' in the thread 50 of the internal thread - this being a left-handed thread -, once again be returned into the shortened column length, to be precise by means of a crank drive 54. The latter is assigned to the lower end 1" of the housing 1 of the dispenser Sp. It (54) has a crank arm 30 that can be folded radially out of its concealed position. Said arm swivels about a horizontal hinging axis 55. Said axis extends in the most peripheral direction possible, so that a large useful arm length obtains.

The crank arm 30 has a crankpin 56 for the purpose of actuation. When the crank arm 30 has been brought into the final folded-out position, said pin extends outside the dispenser cross-section parallel in space to the longitudinal central axis z-z. When brought into the concealed position, the crankpin 56 is accommodated in the central cavity 57 of the column S.

Furthermore, a so-called ratchet disc 58 is a component of the crank drive 54. Said disc is an annular collar, integrally formed on the part 48 with the largest cross-section, which is accommodated by being guided in a matching recess 59 in the lower end 1" of the housing 1. As may be seen from the bottom view in accordance with Fig. 14, a peripheral section of the said ratchet disc 58 forms a ratchet finger 60. It is produced simply by an angularly shaped free cut 61 and possesses a slight outwardly directed pretensioning. An outwardly directed locking head 62, which is integrally

formed on the free end of the ratchet finger 60, cooperates with a fixed toothed-space rim 63, the tooth spaces of which follow in close sequence in the circumferential direction, and in which the locking head 62 engages with a locking effect. The ratchet free cut 61 is chosen so wide that the locking head 62 can move to avoid and, in the case of left-hand rotation in the direction of the arrow F, the ratchet disc 58 can be turned, shortening the column S. Rotating in the opposite direction of the arrow F is, by contrast, blocked.

As may be seen from Fig. 11, the free end of the crank arm 30 has a manipulation lip 65, which stands out from the base of its storage recess 64 on the dispenser side. Said lip may conveniently be taken up by means of a finger nail. The hinging axis 55 can produce a snap effect, so that the concealed position of the crank arm 30 is secured.

Reducing the column length, i.e. moving back to its minimum axial length, requires rotary locking of the end member of the column S, that is to say of the part 45 most remote from the crank. This rotary locking is realised by means of a tongue 66 directed radially outwards from the said part 45 of the column S. Reference is made to Fig. 15. The latter shows a paired assignment of tongues 66. They extend in opposite directions from the central support plate 10 of the resetting mechanism 11, being radially directed at first. Approximately half way along their length they continue in a clearly curved whip shape tapering at the end. This curved section bears the reference symbol 66'. The relatively sharp curvature of the arcuate section 66' merges into a less strongly curved end section 66". The radius of curvature of the latter corresponds essentially to that of the cylindrical inner wall of the housing 1. The curved end section 66" proceeds in the direction of the arrow F, and encounters its longitudinal engagement, which is form-locked on at least one side, with the housing inner wall 1"' on a longitudinal rib 67 integrally formed thereon. The free front end of the tongues 66 is supported on the corresponding side flank of the longitudinal rib 67 in a rotationally locking fashion. The end sections 66" bear resiliently on the housing inner wall 1"', and disappear protectively, when the cartridge is assigned, into the cavity of the plug-in cartridge 2. As may be seen from the same Figure named, this longitudinal rib 67 is likewise provided in pairs, that is to say is expediently arranged in mutual diametrical opposition. Said longitudinal rib 67 extends from a projecting shoulder 68 of the upper end 1' of the housing. The rib is positioned such that its inwardly directed narrow edge 68' is flush in the same plane with the cylindrical mouth 69 on the mouthpiece side of the housing 1. The longitudinal rib or longitudinal ribs 67 can terminate below at the level of a horizontal roof step 70 of the recess 59.

In this way, the longitudinal rib 67 can also further be used for a form-locking engagement providing a rotary lock for a foot ring 71 at the level of the column package and mounted thereon. Said foot ring is seated on the circumferential wall of the part 48 of the column S with the largest cross-section, which circumferential wall is stepped approximately halfway up to form a shoulder. The foot ring 71 is internally turned. In conjunction with the circumferential wall of the stepped lower part 48 and the abovementioned shoulder it forms a spring chamber 72. Located in said chamber is a return spring 73, which loads the foot ring 71 in the direction of its higher position that defines the end stop.

The upper, horizontal, circumferential end rim 74 of the foot ring 71 serves as the support surface for the plug-in cartridge 2 when inserted. On the inside, and concentrically, the foot ring 71 continues in the direction of the head piece K of the dispenser to form a short centring projection 75. The latter moves into the end of the cartridge shell, which is slightly expanded in a funnel-shaped fashion (cf. Fig. 11).

The lower end of the pot-shaped foot ring 71, which is configured in practice like the rim of a bell, is guided on the widened section of the cylindrical circumferential wall of the part 48 with the largest cross-section. As the plugged-in cartridge is axially displaced, the lower rim 76 of the foot ring 71 moves, delimiting the stop, against the upper side, which forms an annual shoulder, of the axially secured ratchet disc 58. This corresponds to the maximum stroke travel H of the dispenser head K.

For the purpose of incorporating the foot ring 71 in a rotationally locking fashion, the latter has, for its part, on the side of its circumferential wall longitudinal grooves 77, which extend continuously in the axial direction and are open towards the housing inner wall 1"' (cf. Fig. 16).

As may further be seen from the representation of the drawing, the two longitudinal ribs 67, which form parts of the rotary lock, are developed to obtain a clip-shaped undergrip between the lower plug-in cartridge rim and the housing inner wall 1"'. The point is that in the basic position of the plug-in cartridge 2, the said plug-in cartridge rim is located below two protuberances 78 ranged at the same level. The latter project in a radial direction beyond the narrow edge 67' of the longitudinal ribs 67. These are nose-shaped projections with locating bevels on both sides, which can be overridden by an intentional slipping-on movement. Thus, it is possible for the plug-in cartridge 2 to be axially displaced relatively easily in the interior of the housing 1, or also for the dispenser to be placed on its head without the plug-in cartridge 2 slipping

out. The flexibility of the cartridge material opens up the advantageous possibility of a light resilient avoiding movement when the abovementioned protuberances 78 are overrun. The locking collar, which is formed on the outside of the cartridge rim and snaps below the protuberance 78, bears the reference symbol 79.

Even when the parts 45 - 48 have been moved in as far as possible, there is no danger of destruction of the resetting mechanism or back-cranking device of the column S, since the crank drive 54 possesses an overload protection in the form of the resilient lugs 53 explained above.

The locking connection between the support plate 10 and the plunger 9 of the plug-in cartridge 2 to be assigned is implemented as a pushbutton connection. For this purpose, the support plate 10 has a male part 80. The latter is located in the centre of the said support plate, so that to this extent there is no need to observe a special angle of position between the plug-in cartridge 2 to be assigned and the housing 1. The male part 80 is configured as a cross-slotted pin with a head-shaped, circumferential swelling 80'. In conformity with this swelling, the plunger 9 has a female cavity 81 with a matching undercut for the swelling 80'. The locking forces are in conformity with the maintenance of the proper operational assignment, but can be overridden by intentional removal of the plug-in cartridge 2.

For functioning and mode of operation of this dispenser Sp are as follows:

Through the exertion of a compressive force in the direction of the arrow P on the actuating surface 4 of the plug-in cartridge 2, the latter is displaced axially in the direction of the arrow y in the housing 1. Since, in this process, the plunger 9 is held fixed over the support plate 10 by the column S, the reduction in the volume of the plug-in cartridge that occurs produces the discharge of pasty compound 3 via the delivery mouthpiece 6. The corresponding actuation can take place with the complete passage of the stroke travel H, which, seen in the axial direction, corresponds to the extent of the projection x. However, it is also possible, for example, for only a subsection of the stroke travel H to be passed. The downward displacement of the plug-in cartridge 2 takes place against the restoring force of the spring-loaded foot ring 71, which pushes the plug-in cartridge 2 back into its basic position once again after the actuating surface 4 has been released. Since the plunger 9 adheres to the level of the column of pasty compound and is thus guided with a frictional grip on the cartridge inner wall, the column S is carried along by being coupled to the plunger. The column S thus creates the next higher support plane for the plunger. This continues until the column reaches the extended final position visible from Fig. 13, or this final position is not produced, in practical terms, until extraction of the plug-in cartridge. The male part 80 then projects somewhat beyond the upper end rim 5 of the housing 1. Any instability with reference to the observance of the axiality of the individual parts with respect to one another is absorbed by the resilient tongues 66. To be precise, with their free ends the latter also form a support element with a centring effect.

In order to condition the next position of readiness of the dispenser Sp, the lever arm 30 of the crank drive 54 is folded out, and the column S is screwed back to its minimum length. There now follows the insertion of a new plug-in cartridge 2, the plunger 9 of which automatically enters into locking connection with the support plate 10 and male part 80, respectively. The lever arm 30 is folded back. The dispenser is once again ready.

For brevity, in the description of the second illustrative embodiment those elements adopted from the first illustrative embodiment have not been discussed again in the text; their arrangement and functioning will however be apparent to those skilled in the art.

Description of further preferred embodiments

There has been described above a dispenser for delivering pasty compounds, comprising a tubular housing, an insert assigned thereto in an axially displaceable fashion, of which the section projecting beyond one housing end has an actuating surface and the delivery mouthpiece, and comprising a plunger moving stepwise in the direction of the mouthpiece upon being actuated, which insert is configured as a plug-in cartridge guiding the plunger and the advance of the plunger is achieved by means of displacement of the plug-in cartridge against a support plate of the housing resettable in the direction of the delivery mouthpiece and arranged on the end of a telescopic column of shortenable length, the support plate and plunger being in form-locking engagement with respect to one another, and a foot ring, to which there is assigned a return spring which moves the plug-in cartridge back into the basic position.

During the stepwise delivery actuation, the plunger docked to the column carries along the column, which supports the plunger and is therefore locked in the opposite direction with respect to the abutment formation, doing so equally in a stepwise fashion and with lengthening of the column. The column length can then be reduced once again via a crank drive on the base side, so that a fresh cartridge can be introduced into the housing of the dispenser, which is appropriately open above. The cranking back of the parts of the tele-

scopic column, which are ratchet-secured with respect to one another, can, however, be regarded as tedious.

It would, therefore, be an advantage to facilitate the realisation of the length-shortened telescopic position, i.e. to reduce significantly the actuation time spent on the shortening of the column to a fraction.

This object can be achieved by arranging that the parts of the column that can be displaced telescopically with respect to one another can be telescoped in a rotation angle setting.

As a result of such a configuration, it is extremely simple operationally to effect the shortening of the column. It becomes possible to do without the crank device used so far. The structural means are simple and expedient. In practical terms, the procedure is such that the parts of the column, which can be displaced telescopically with respect to one another, can be telescoped in a rotation angle setting. If the column - which is, as before, accessible for rotation from the base of the dispenser and whose upper part is rotationally locked, e.g. as described with reference to Figures 8 to 17 - is rotated in one direction, the parts are in locking engagement; if rotation is done in the opposite direction, they come out of locking engagement. Depending upon the circumferential length of the locking engagement, in practice this does not even require a full circular rotation angle. It is advantageous in this connection that the rotation angle settings of the telescopic parts are limited by stops. Consequently, both functional settings are exactly defined and can be detected by the operator by means of a stop which virtually cannot be exceeded. Furthermore, it proves to be advantageous that the inner wall and circumferential wall of the telescopic parts are composed of ratcheting profiled parts and smooth sliding sections, which are located one after another in the circumferential direction. Ratcheting profiled parts of conventional type suffice in this regard. There is no need for threaded engagement between the parts. This also leads to a simplified configuration, to be precise also from the point of view of production engineering, i.e. injection moulding engineering. The rotary lock with respect to the housing is achieved via the uppermost telescopic part. In this arrangement, the corresponding support is no longer tied to a direction. Instead, the procedure can be such that the rotary lock is achieved by means of a resilient tongue directed radially outwards, which is in longitudinal engagement with respect to at least one longitudinal rib of the housing inner wall, which longitudinal rib reaches as far as the upper end rim of the housing and by means of form-locking engagement in a foot ring collar of the plug-in cartridge likewise locks the latter rotationally. The longitudinal rib thus fulfils a double function. As soon as the plug-in cartridge has overrun the resilient tongue, that is to say moves out of the region of the rotary lock, the corresponding rotary lock via the said foot ring collar obtains. A further advantageous function with respect to the rotary lock also consists in that the rib entry cross-sections at the foot ring collar form an individuating index for the plug-in cartridge. It is achieved in this way that the dispenser, which is, as far as the dispenser mechanism is concerned, coordinated with a certain degree of pastiness, can also always be fitted only with the correct plug-in cartridges. Finally, the rotary lock is continued when the support plate possesses teeth, which project upwards in the form of a crown and engage with the plunger. Finally, a further advantageous proposal consists in that the lowermost telescopic part is continued into a rotary manipulator for changing the rotation angle setting of the other telescopic parts with respect to one another.

The above-described invention is explained in more detail below with reference to an illustrative embodiment depicted in the drawings, wherein:

- Fig. 18 shows a dispenser according to the invention in a longitudinal section representing the maximum extended length of the column, to be precise when the telescopic parts are locked with respect to one another;
- Fig. 19 shows an identical sectional representation, but with the telescopic parts in the unlocked setting, so that the column can be telescoped starting from the head end;
- Fig. 20 shows the upper section of the column reproducing the docking means on the plunger side and the means of rotary locking;
- Fig. 21 shows the plug-in cartridge in a perspective individual representation;
- Fig. 22 shows the dispenser, once again in vertical section with the plug-in cartridge now assigned, to be precise in the basic position of the dispenser mechanism;
- Fig. 23 shows the same, but in the actuated position;
- Fig. 24 shows the section in accordance with the line VII-VII in Fig. 18;
- Fig. 25 shows the section in accordance with the line VIII-VIII in Fig. 19 (both sections are substantially enlarged with respect to the reference figures); and
- Fig. 26 shows a vertical section in the region of an overlap zone of two telescopic parts.

The dispenser depicted comprises a tubular

housing 1, which accommodates as an inserted part a plug-in cartridge 2 that is accessible for actuation. The plug-in cartridge 2 contains the pasty compound 3 to be delivered.

The accessibility for actuation results from the projection on the upper side of the section 2' at that location of the plug-in cartridge 2. The extent of projection is denoted by x, and defined by a top, forming an actuating surface 4, of the plug-in cartridge 2 and the upper end rim 5 of the housing end 1' at that location of the housing 1.

The actuating surface 4 falls away outwards to the right at an acute angle, and merges on the left-hand side into an appropriately exposed delivery mouthpiece 6 which can be closed by a plug in a conventional manner.

The lower termination, on the base side, of the plug-in cartridge 2 forms a plunger 9. This is a pot-shaped structure with axially spaced lips 9', 9".

By exerting a pressure in the direction of the arrow P, the plug-in cartridge 2 is displaced relative to the plunger 9 supported fixed, in each case, in the dispenser. In this case the cartridge shell runs over the plunger 9 in the direction of the arrow y.

The plunger 9 itself encounters its abutment on a support plate 10 of a resetting mechanism 11.

The resetting of the support plate 10 results from a locking connection between the plunger 9 and the support plate 10, which is seated above on a telescopic column S extendable in the axial direction.

The telescopic column S consists of a plurality of telescopic parts 45, 46, 47 and 48, which can be extended telescopically with respect to one another. The said parts, which are approximately of the same length, have a relatively small axial length, so that the proportion of length of the resetting mechanism 11 with respect to the useful space of the dispenser Sp as a whole is kept as low as possible.

The circumferential wall of the basically cylindrical parts 45 to 47 has toothed profiled parts 81. These constitute a saw-tooth like structure. Engaging in these outer toothed profiled parts are toothed profiled parts 82, which lie on the inner wall of the overreaching telescopic parts 46, 47 and 48. These toothed profile parts 82 also constitute a saw-tooth structure. Engagement is form-locking. Reference is made to Fig. 26, page 12/18 from which the oppositely directed orientation of the saw-tooth structures clearly emerges. The teeth of the outer toothed profiled parts 81 have a flank 81' which extends perpendicular to the longitudinal central axis z-z of the dispenser Sp, while the other flank 81" extends at an acute angle thereto. The upper flanks 81" converge in the direction of the dispenser head K. One flank 82' of the inner toothed profiled parts 82 is located, in turn, perpendicular to the longitudinal central axis z-z. The flanks 82" diverging in the opposite direction with respect to the dispenser head K extend, once again, at an acute angle. Approx. four horizontally aligned profiled teeth of the inner toothed profiled part 82 extend on the inner wall of the telescopic parts 46, 47, 48. The result is that in the extended state of the telescopic column S there is always a sufficient overlap length of the parts 45 to 48, which guarantees the axial or radial stability. Complete extension is not possible, since in each case the lower edge of the telescopic parts 45 to 47 forms a stop collar 51, which projects beyond the circumferential wall and moves against the lowermost profiled tooth of the overreaching telescopic part. On the circumferential wall of the telescopic parts 45, 46 and 47 the external toothed profiled part 81 extends practically over the entire axial length of said parts.

In accordance with the toothed structure represented, the extension of the telescopic column S takes place by means of ratcheting overrunning of the toothed profiled parts 81, 82 in engagement, to be precise as far as the maximum final position. By contrast, given the described engagement by means of toothed profiled parts no shortening of the telescopic column can be carried out because of the obtaining one-sidedly working ratchet lock, in which the horizontally aligned flanks 81' and 82' encounter one another in a locking fashion. Each stage reached thus forms a support abutment for the support plate 10, and the plunger 9, respectively.

The corresponding ratchet effect is achieved by means of longitudinal slots 52, which originate from the upper end of the telescopic parts 46 to 48 and end at the same level. Said slots cut wall sections of the shell-shaped parts 46 to 48 free, so that resilient lugs 53 are obtained. Such longitudinal slots 52 are located mainly in the region of the sections of the parts 46 to 48 that have toothed profiles, and effect a final overlap region of the said parts that is configured like a crown or battlement.

The toothed profiled parts 81, 82 provided only partly by area in the circumeferential direction are used at their minimum axial length for the purpose of crank-free return of the telescopic column S, to be precise in such a way that the parts 46 to 48 of the telescopic column S that can be displaced telescopically with respect to one another can be telescoped in a rotation angle setting. For this purpose, the toothed profiled parts 82 arranged on the inner wall are moved out of toothed engagement to the outer toothed profiled parts 81, until they are located congruently with respect to smooth sliding sections 84 of the respective telescopic parts 45, 46, 47. The smooth sliding sections 84 alternate in the circumferential direction

with the toothed profiled parts. For this purpose, for example, an angle of, for instance, 90° can be used, in each case, for each circumferential sector. The respective final rotation angle setting of the telescopic parts with respect to one another is limited by stops. For this purpose, a stop finger 85 originates from the area of the inner toothed profile 82 (cf. Fig.20). This finger cooperates with a longitudinal stop edge 86, which aligns the axial-linear alignment of the toothed profiled parts 81/82. Extending on the other side of the smooth sliding section 84 is a longitudinal stop edge 87 which defines the exit from the tooth system of the toothed profiled parts 81/82.

The smooth sliding sections 84 already result in practice from omitting the exposed external toothed profiled parts 81, so that the longitudinal stop edges 86, 87 extending parallel to one another are in essence the front ends of the profiled teeth.

In order to promote the toothed interguidance, the so-called pawling of the toothed profiled parts 81 and 82, the profiled teeth of the inner toothed profiled part 82 can come to a point in the circumferential direction. This leads to thread groove funnels having a yielding effect between the profiled teeth. For the purpose of reliable engagement and disengagement of the tooth system, the uppermost telescopic part 45, which carries the plate 10 that represents the abutment and is virtually formed by the top of the part 45, is rotationally locked with respect to the housing 1. The rotary lock is produced by a resilient tongue 88 directed radially outwards. This is a basic body like a transverse yoke. Said body extends diametrically and merges at the end into two fork-shaped guide claws 89. The latter are in longitudinal engagement with longitudinal ribs 67 of the housing inner wall 1''', which are likewise arranged in pairs.

When seen in profile, the resilient tongue 88 extends essentially in the form of a trapeze, the bevels that fall away being mainly occupied by the guide claws 89. The latter diverge at an angle of approx. 45° and end at a distance in front of the said housing inner wall 1'''. Thus, no interlocking with an obstructing effect occurs with the housing 1. The claw mouth has a larger radial length than is required for the longitudinal engagement.

The two longitudinal ribs 67, which are diametrically opposite, reach as far as the upper end rim 5 of the housing 1. Their inner edge is chamfered. Beneath a projection shoulder 68 provided there in the upper end 1' of the housing 1, the longitudinal rib 67 has a greater height. In the basic position, the guide claws 89 end directly below the said projection shoulder 68, which is achieved by a simple offsetting of the wall, and forms on the side of the circumferential wall a horizontal stop shoulder for a protective cap (not represented in more detail).

The longitudinal ribs 67, which are advanced upwards correspondingly far, also already form at the very beginning a rotary lock for the plug-in cartridge 2 to be inserted starting from there. The means on the side of the plug-in cartridge consists of two rib entry cross-sections 90 in diametrical opposition. These rib entry cross-sections 90 are realised on a foot ring collar 91 constructed on the lower end of the plug-in cartridge 2. Said foot ring collar projects correspondingly beyond the cylindrical circumferential wall of the tubular plug-in cartridge 2. Apart from the explained rotary lock between plug-in cartridge 2 and housing 1, this measure also further provides an individuating index for the plug-in cartridges.

The rotary lock is transmitted to the resetting mechanism 11 via the plunger 9, which is itself rotationally inhibited. For this purpose, the support plate 10 has teeth 22 directed upwards in a crown-shaped arrangement, which teeth form a type of toothed crown or toothed rim 21. Given optimum observance of the direction of rotary loading, the teeth 22 can also have a saw-tooth structure instead of, as represented, being provided with a uniformly sloping flank angle. The teeth 22 are in rotationally locking engagement with respect to the receiving compartments 23 on the corresponding underside of the pot-shaped plunger 9. This engagement situation emerges particularly clearly from Fig. 5. The toothed rim 21 can be constructed directly at the plate 10 or, alternatively, on the spring tongue 88 connected therewith.

The locking connection between support plate 10 and the plunger 9 of the plug-in cartridge 2 to be assigned is implemented as a push-button connection. For this purpose, the support plate 10 has a central male part 80. It is configured in the form of a cross-slotted pin, which has a practically barrel-like basic configuration and forms a swelling 80' located halfway up. Corresponding to this swelling, the plunger 9 has a female cavity 9''' with matching undercut for the swelling 80'. The locking forces are coordinated to preserve the operationally correct assignment, but can be overridden by intentional removal of the plug-in cartridge 2.

The lower end of the telescopic column S, more precisely the telescopic part 48, is continued to form a rotary manipulator 92 which is accessible from outside. The functional positions explained above, that is to say the locked plate support position of the column S and the ready-to-use position with shortened length, are produced via said rotary manipulator. The rotary manipulator 92 on the lower end 1'' of the housing 1 is used equally to fasten the resetting mechanism 11 in the housing 1, to be precise by forming a clipping flange 93 on the rotary manipulator 92. The clip-

ping flange 93 projects into a corresponding guide groove 94 running horizontally on the lower rim of the housing 1, of which the wall is strengthened and which is covered there by the cap-shaped structure of the rotary manipulator 92 on the inside, end-side and outside. The lower rim of the housing 1, on the one hand, and the lower end edge of the two longitudinal ribs 67, on the other hand, have the effect of limiting the plugging in for this telescopic part 48.

Furthermore, the longitudinal ribs 67 are used to produce a rotationally locking form-locking engagement for a foot ring 71 that can be displaced axially to the limit of the height of the column package. Said ring is seated on the circumferential wall of the part 48 with the largest cross-section of the column S, which circumferential wall is stepped upwards approximately halfway up forming a shoulder. The foot ring 71 is internally turned. Together with the circumferential wall of the stepped lower part 48 and the abovementioned shoulder, it forms a spring chamber 72. Located therein is a return spring 73, which loads the foot ring 71 in the direction of its higher, stop-limited position. The upper, horizontal, circumferential end rim 74 of the foot ring 71 serves as a support surface for inserted plug-in cartridge 2. The foot ring 71 then continues on the inside and concentrically in the direction of the head piece K of the dispenser Sp to form a short centring projection 75. The latter moves into the end of the cartridge shell, which is slightly expanded in the form of a funnel (cf. Fig.22). In the plugged-in state, the rim of the plug-in cartridge is located below two protuberances 78 arranged at the same level. The latter, directed radially inwards, project beyond the narrow edge 67' of the longitudinal ribs 67, which otherwise extends straight. These are nose-shaped projections with locating bevels on both sides, which can be overridden by an intentional slip-on movement. Thus, the plug-in cartridge 2 can be displaced axially relatively easily from the interior of the housing 1, and the dispenser can also be stood on its head without the plug-in cartridge 2 slipping out. The flexibility of the cartridge material opens up the advantageous possibility of a light, resilient movement of avoidance during overrunning of the abovementioned protuberances 78. The locking cam (cf. Fig.22), which is integrally formed on the cartridge rim on the outside and snaps under the protuberances 78, bears the reference symbol 79 and is seated on the base of the rib entry cross-section 90 (cf. also Fig.21).

The dispenser Sp functions as follows: By exerting a compressive force in the direction of arrow P on the projecting plug-in cartridge 2, the latter is displaced in the housing 1 axially in the direction of the arrow y against the force of the return spring 73 in a stop-limited fashion in that the lower rim 76 encounters an annular step fixed in the housing. Since, in this process, the plunger 9 itself is held fixed above the support plate 10 via the column S, the reduction in volume of the plug-in cartridge 2 that takes place causes the discharge of pasty compound 3 via the delivery mouthpiece 6 (cf. Fig.23).

The corresponding actuation can take place with the complete passage of the limited stroke travel which, seen in the axial direction, corresponds to the extent of the projection x. However, it is also possible, for example, for only a subsection of the stroke travel to be passed. The downwards displacement of the plug-in cartridge 2 takes place against the restoring force of the spring-loaded foot ring 71, which restoring force pushes the plug-in cartridge 2 back into its basic position once again after release of the actuating surface 4. Since the plunger 9 adheres to the level of the column of the pasty compound 3 and is thus also guided with a frictional grip on the cartridge inner wall, the column S is carried along to produce a respectively stepwise extension using the ratchet action explained via the coupling of said plunger to said column. The column S thus creates for the plunger 9 the next higher support plane. This is continued until the column S reaches the extended final position visible from Fig. 1, or this final position is not produced in practical terms until extraction of the plug-in cartridge 2. The male part 80 then projects somewhat beyond the upper end rim 5 of the housing 1. Any instability with reference to the observance of the axiality of the individual parts 45-48 with respect to one another is absorbed by the resilient tongue 88. In practice, the latter also forms with its guide claws 89 a support element with a centring effect.

For the purpose of conditioning the next position of readiness of the dispenser Sp, the rotary manipulator 92 is now rotated such that the inner toothed profiled part 82 departs from the region of action of the corresponding outer toothed profiled part 81 in such a way that the smooth sliding sections 84 are now located opposite the inner toothed profiled parts. The column S collapses, shortening its length. Given guidance that is more intensive frictionally, telescoping takes place simply with the aid of the fresh plug-in cartridge 2, which presses the plate 10 in the direction of the rotary manipulator 92. The fresh plug-in cartridge is rotationally locked immediately via the rib entry cross-sections 90. The resilient guide claws 89 of the tongue 88 enter a position of withdrawal with respect to the longitudinal ribs 76, which otherwise guided them. The corresponding position of concealment emerges from Fig.22. However, the pushbutton-like coupling between plunger 9 and

male part 80 of the plate 10 rotationally locked via the plunger 9 is produced when the lowest point is reached or even as early as in the course of the plug-in movement.

Once the coupling position and plug-in position of the plug-in cartridge 2 are reached, the rotary manipulator 92 needs only to be rotated back once again by the angular amount required for the purpose of engaging the inner toothed profiled part 82 in the outer toothed profiled part 81.

It will of course be understood that the present invention has been described above purely by way of example and that modifications of detail can be made within the scope of the invention.

The dependencies of the subsidiary claims hereinafter do not imply any limitation as to the possible combinations of the features mentioned in those claims: the optional and the preferred features of the invention revealed in the preceding description, the drawings and the claims can be of importance both individually and also in any combination for the implementation of the invention.

Claims

1. A dispenser for delivering pasty compounds, comprising a tubular housing, an insert assigned thereto in an axially displaceable fashion, of which the section projecting beyond one housing end has an actuating surface and the delivery mouthpiece, and comprising a plunger moving stepwise in the direction of the mouthpiece upon being actuated, characterized in that the insert is configured as a plug-in cartridge guiding the plunger and the advance of the plunger is achieved by means of displacement of the plug-in cartridge against a support plate of the housing resettable in the direction of the delivery mouthpiece.

2. A dispenser according to claim 1, characterized by a threaded resetting of the support plate.

3. A dispenser according to claim 2, characterized in that the resetting thread is formed by a telescopic thread, the telescopic terminal section of which carries the support plate, which is rotationally locked both in the housing and in the plug-in cartridge, and the telescopic drive section of which is connected to a rotary manipulator at the lower end of the housing.

4. A dispenser according to claim 2, characterized in that the resetting thread is a left-hand thread.

5. A dispenser according to claim 3, characterized in that the rotary manipulator is configured as a cap clipped onto the lower housing end.

6. A dispenser according to claim 5, characterized in that the cap base possesses a swivelling crank arm.

7. A dispenser according to claim 6, characterized in that the crank arm is configured as a disc arm.

8. A dispenser according to claim 7, characterized in that the disc arm has a manipulation aperture which is diametrically opposite the swivelling axis of the crank arm.

9. A dispenser according to claim 1, characterized in that in order to form a rotary lock in the housing, the support plate possesses at least one resilient tongue, to which a stop shoulder extending on the housing inner wall in the longitudinal direction is assigned.

10. A dispenser according to claim 9, characterized by a plurality of tongues and stop shoulders arranged in an angularly symmetric fashion.

11. A dispenser according to claim 1, characterized in that the support plate is rotationally locked by form-locking engagement on the underside of the plunger with respect to the plug-in cartridge.

12. A dispenser according to claim 11, characterized in that the rotary lock with respect to the underside of the plunger is formed by a toothed rim on the support side of the support plate.

13. A dispenser according to claim 12, characterized in that the teeth of the toothed rim possess locating bevels, and the plunger is fitted with individual receiving compartments for the teeth.

14. A dispenser according to claim 1, characterized by a rotary lock of the plug-in cartridge with respect to the housing.

15. A dispenser according to claim 14, characterized in that the rotary lock of the plug-in cartridge with respect to the housing is achieved by a slot/rib engagement orientated in the longitudinal direction of the housing.

16. A dispenser according to claim 15, characterized in that the plug-in cartridge carries a rib

on its circumferential surface, and the housing has a slot which is open towards the upper end rim and extends at least over the stroke travel.

17. A dispenser according to claim 16, characterized by locking between the rib and slot in the outwardly directed basic position of the plug-in cartridge.

18. A dispenser according to claim 1, characterized in that the resetting of the support plate is achieved from a locking connection between the plunger and the support plate seated on a column extendable in the axial direction.

19. A dispenser according to claim 18, characterized in that the column consists of a plurality of parts that can be extended telescopically with respect to one another and are ratchet-secured.

20. A dispenser according to claim 18, characterized in that a sprung foot ring that moves the plug-in cartridge back into the basic position is assigned to the foot of the column.

21. A dispenser according to claim 19, characterized in that the parts of the column can be returned into the shortened column length by a crank drive.

22. A dispenser according to claim 21, characterized in that the crank drive is arranged covered at the lower end of the housing of the dispenser.

23. A dispenser according to claim 21, characterized by an overload protection in the crank drive.

24. A dispenser according to claim 19, characterized in that the telescopic movement of the parts of the column is achieved by a threaded engagement of the parts with one another in conjunction with rotary lock of the part of the column adjacent to the plunger.

25. A dispenser according to claim 24, characterized in that the threaded engagement is formed by resilient lugs of the parts forming the column, the resilient avoidance capability of which lugs represents an overload protection.

26. A dispenser according to claim 24, characterized in that the rotary lock is achieved by means of a resilient tongue, which is directed radially outwards from the said part of the column and is in form-locking longitudinal engagement with respect to the housing inner wall on at least one side.

27. A dispenser according to claim 27, characterized in that the locking connection is achieved as a pushbutton connection between a male part of the support plate and a female cavity of the plunger.

28. A dispenser according to claim 20, characterized in that the foot ring is rotationally locked by means of form-locking engagement with respect to the housing wall.

29. A dispenser according to claim 1, characterized by a clip-shaped undergrip between the rim of the plug-in cartridge and the housing inner wall in the basic position of the plug-in cartridge.

30. A dispenser according to claim 20, characterized in that a longitudinal engagement is achieved by means of a longitudinal rib of the housing wall, which longitudinal rib merges at the lower end just above the foot ring into a radially projecting protuberance that serves the rim of the plug-in cartridge as an undergrip.

31. A dispenser according to claim 21, characterized in that the crank drive is formed by a ratchet disc having a fold-out crank arm.

32. A dispenser according to claim 18, characterized by two resilient tongues bent in opposite directions as a rotary lock for the part of the column that carries them.

33. A dispenser according to claim 24, characterized by different lead angles of the thread, with the highest degree of lead at the part of the column remote from the crank.

34. A dispenser for delivering a pasty compound, comprising a tubular housing, an insert assigned thereto in an axially displaceable fashion, of which the section projecting beyond one housing end has an actuating surface and the delivery mouthpiece, and comprising a plunger moving stepwise in the direction of the mouthpiece upon being actuated, which insert is configured as a plug-in cartridge guiding the plunger and the advance of the plunger is achieved by means of displacement of the plug-in cartridge against a support plate of the housing resettable in the direction of the delivery mouthpiece and arranged on the end of a

telescopic column of shortenable length, the support plate and plunger being in form-locking engagement with respect to one another, and a foot ring, to which there is assigned a return spring which moves the plug-in cartridge back into the basic position characterized in that the parts of the column which can be displaced telescopically with respect to one another, can be telescoped in a rotation angle setting.

35. A dispenser according to claim 34, characterized in that the rotation angle settings of the telescopic parts are limited by stops.

36. A dispenser according to claim 34, characterized in that the inner wall and the circumferential wall of the telescopic parts are composed of ratcheting toothed profiled parts and smooth sliding sections, which are located one after another in the circumferential direction.

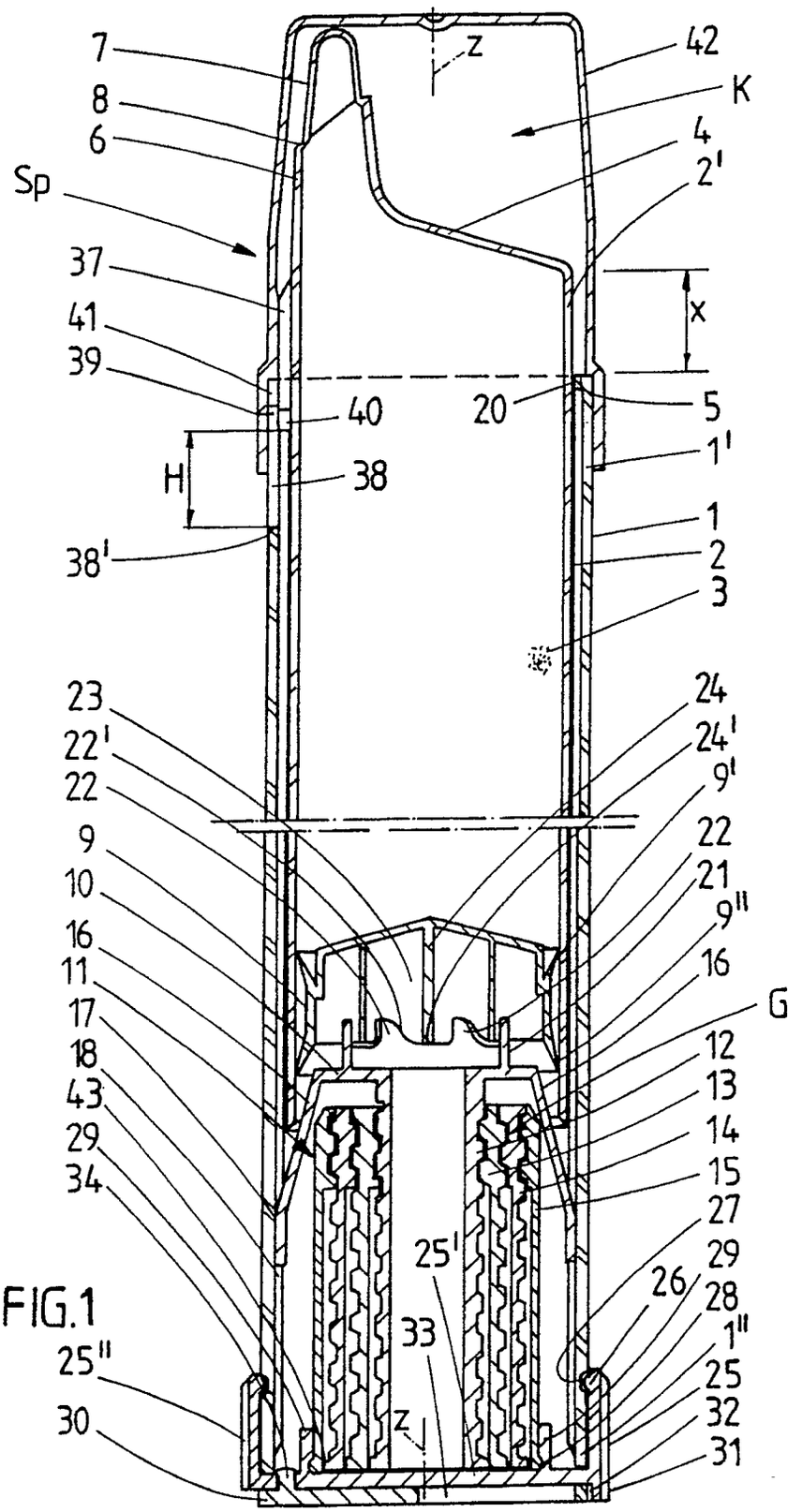
37. A dispenser according to claim 34, characterized in that the uppermost telescopic part is rotationally locked with respect to the housing.

38. A dispenser according to claim 37, characterized in that the rotary lock is achieved by means of a tongue directed radially outwards, which is in longitudinal engagement with respect to at least one longitudinal rib of the housing inner wall, which longitudinal rib reaches as far as the upper end rim of the housing and by means of form-locking engagement in a foot ring collar of the plug-in cartridge likewise locks the latter rotationally.

39. A dispenser according to claim 38, characterized in that the rib entry cross-sections at the foot ring collar form an individuating index for the plug-in cartridge.

40. A dispenser according to claim 34, characterized in that the support plate possesses teeth, which project upwards in the form of a crown and engage with the plunger in a rotationally locking fashion.

41. A dispenser according to claim 34, characterized in that the lowermost telescopic part is directly continued into a rotary manipulator for changing the rotation angle setting of the other telescopic parts.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38'
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18
43
29
34
25"
30
Z
42
K
4
2'
x
20
5
1'
1
2
3
24
24'
9'
22
21
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16
G
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27
29
26
28
1"
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32
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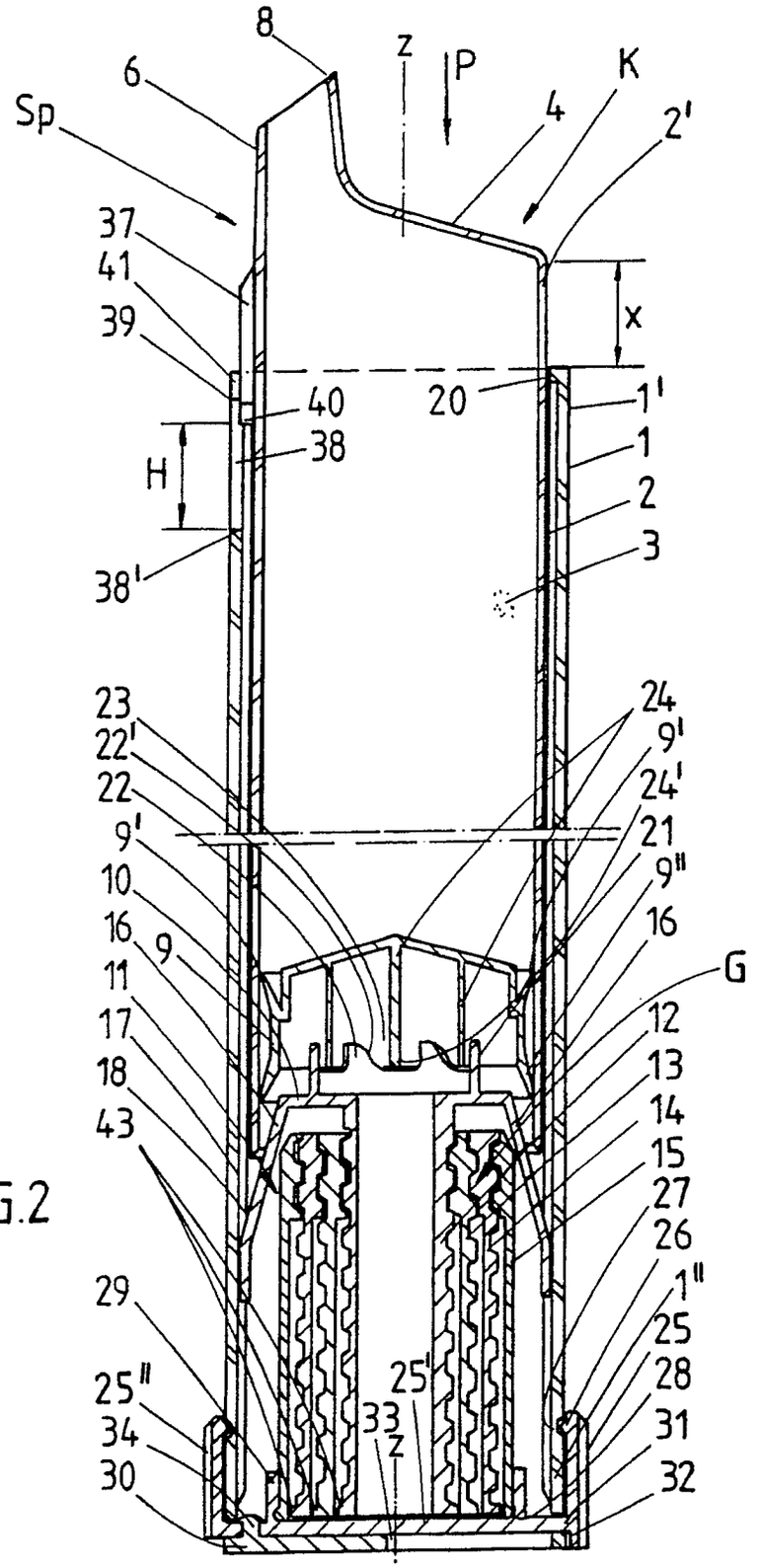
25'
33

FIG.1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1'
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1
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38'
23
24
22'
9'
24'
22
21
9'
9"
10
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16
9
G
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25'
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33
z
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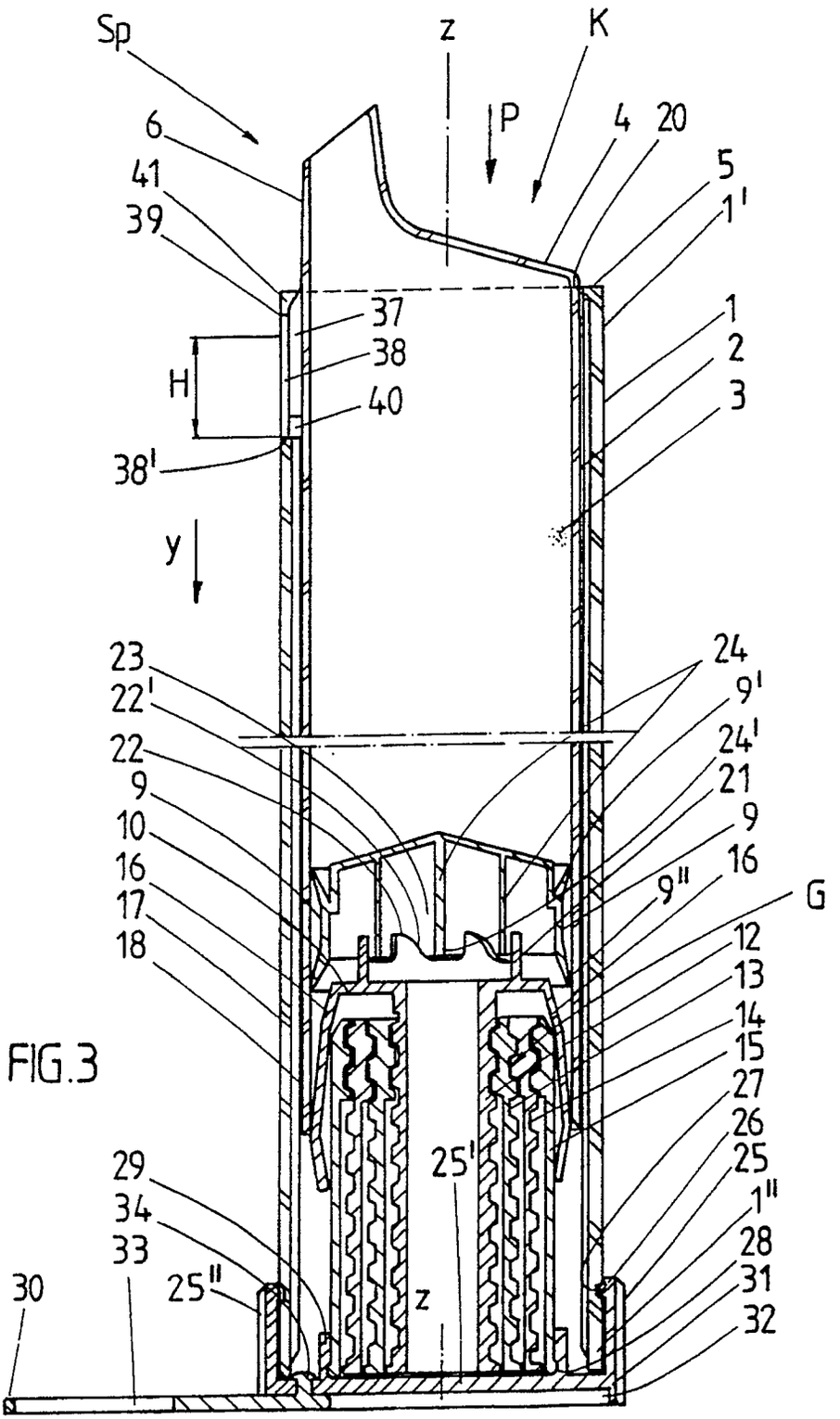
30
32

FIG.2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41
1'
39
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1
38
2
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3
38'
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24
22'
9'
24'
22
21
9
10
9
16
16
17
9"
G
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29
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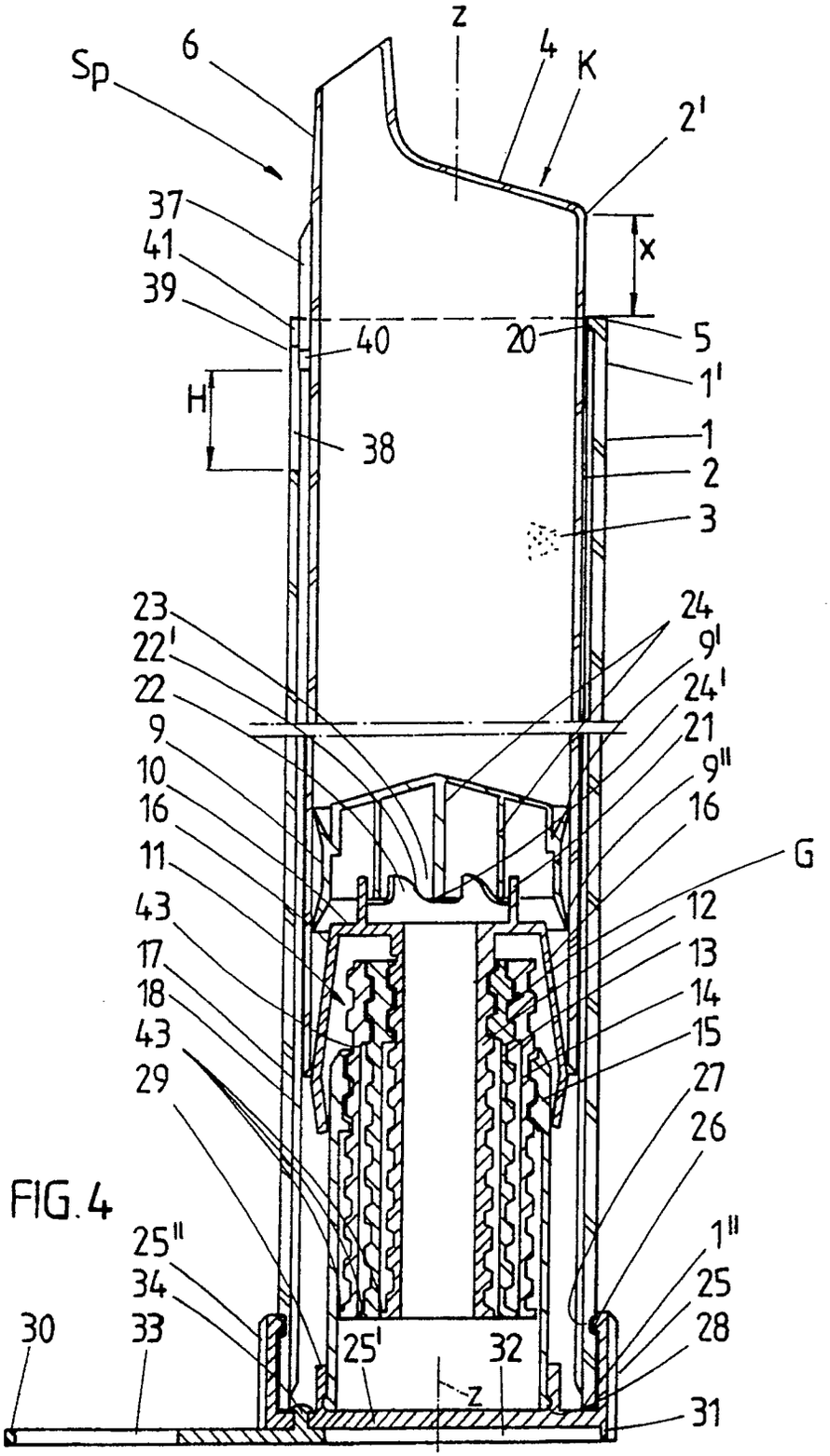
25
34
1"
33
28
25"
z
31
30
32

FIG.3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22'
22
9
10
16
11
43
17
18
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29
24
9'
24'
21
9''
16
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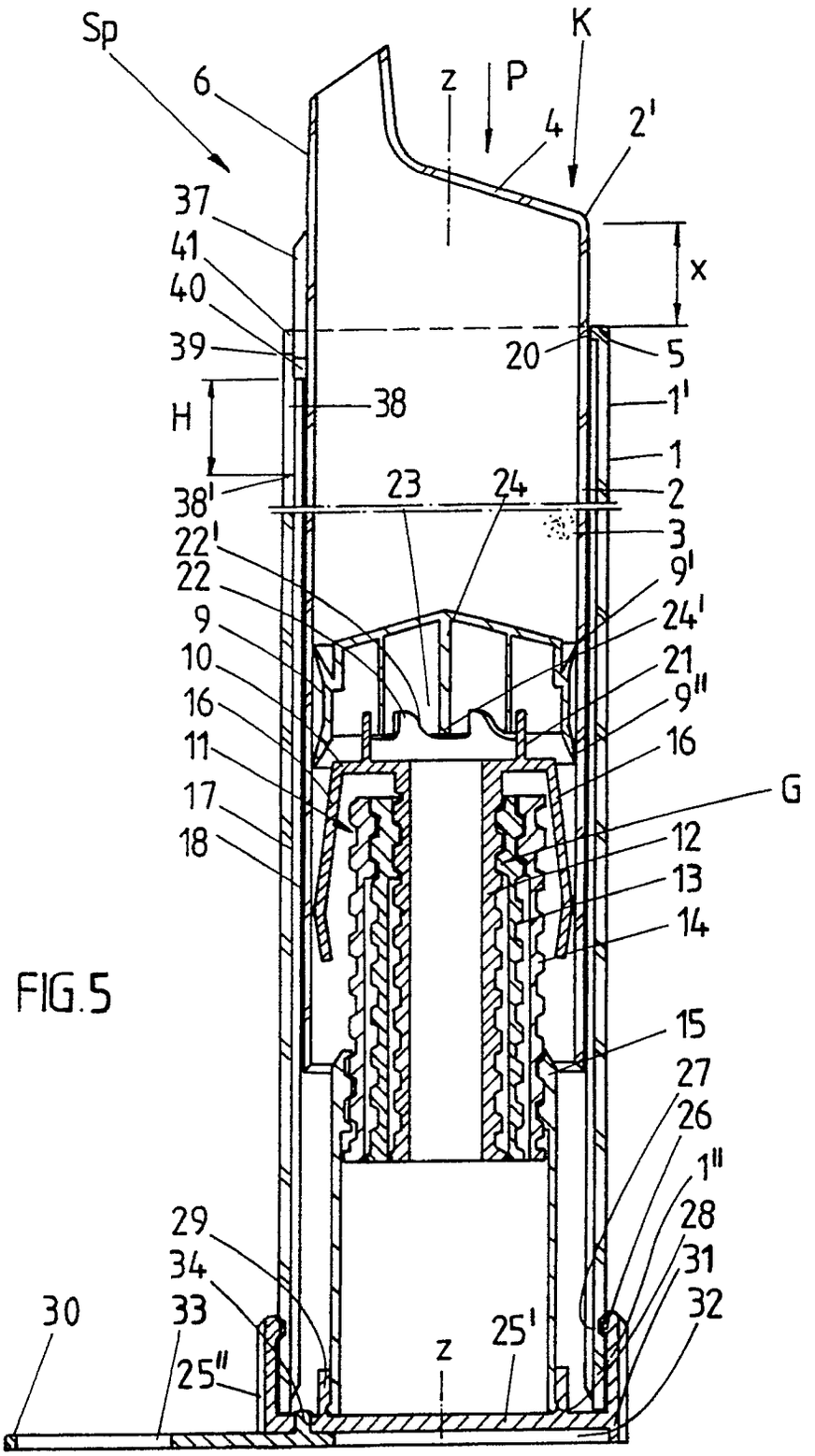
30
25'
32
z

FIG. 4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24
22'
22
9
10
16
11
17
18
9'
24'
21
9''
16
G
12
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1''
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31
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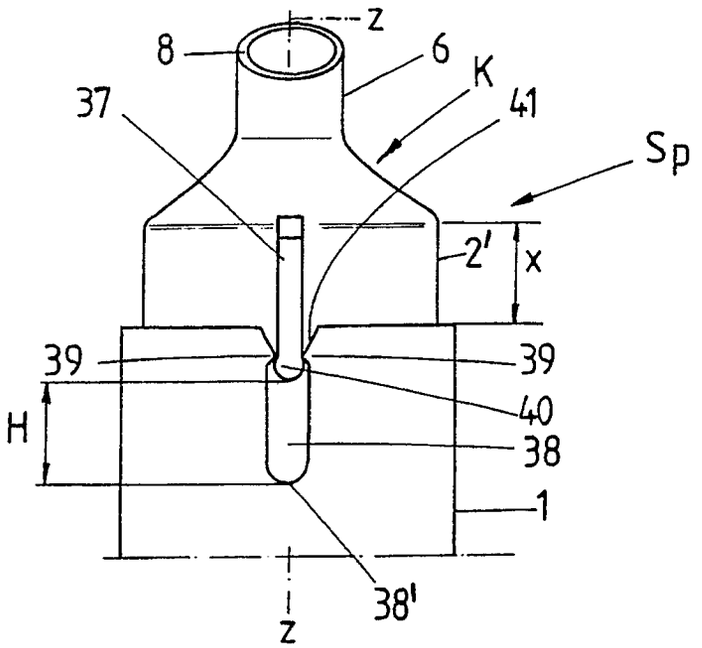
29
34
33
25''
30
z
25'

FIG.5

FIG.6



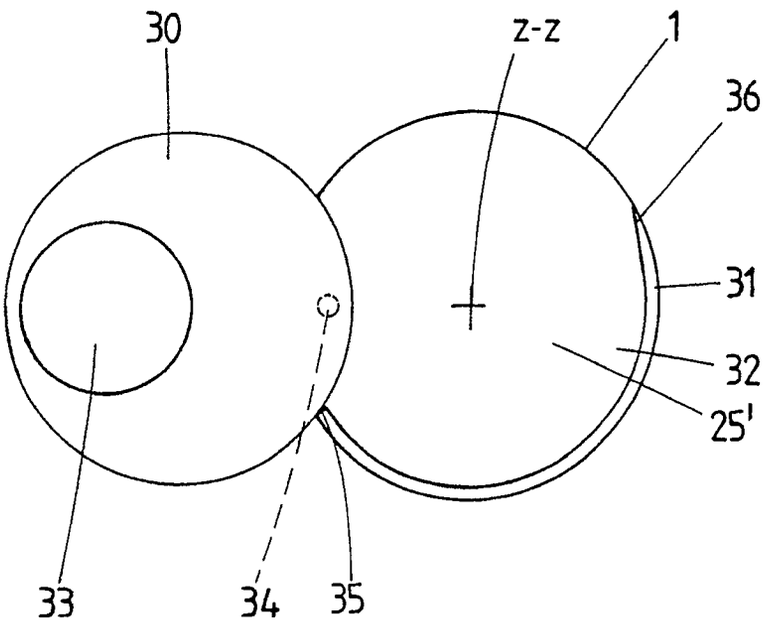


FIG.7

FIG.10

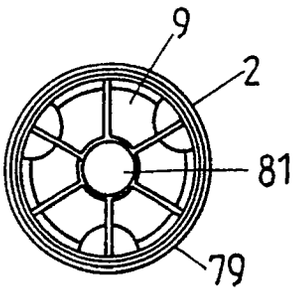


FIG.8

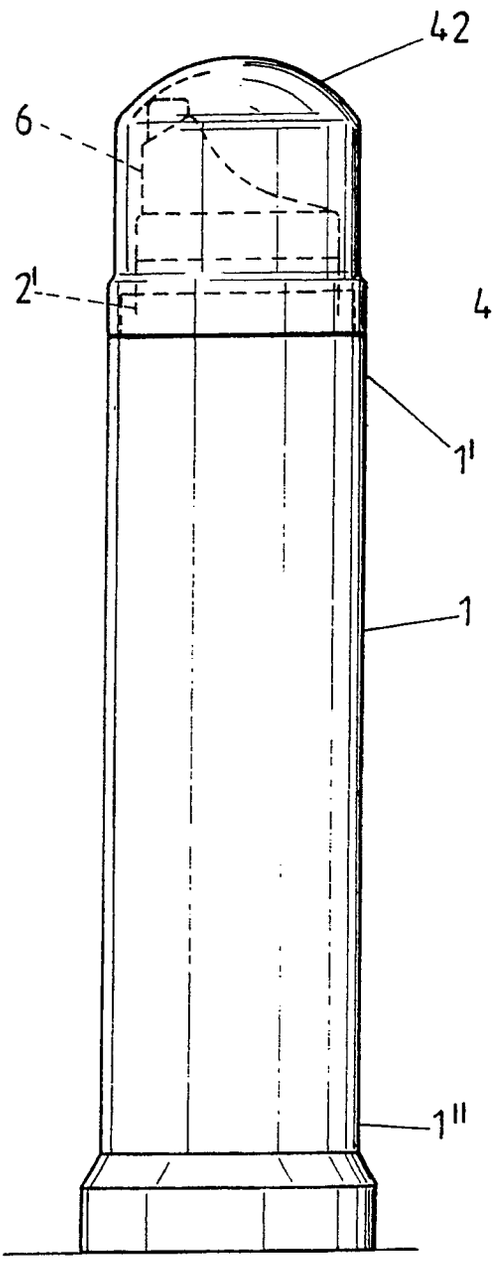


FIG.9

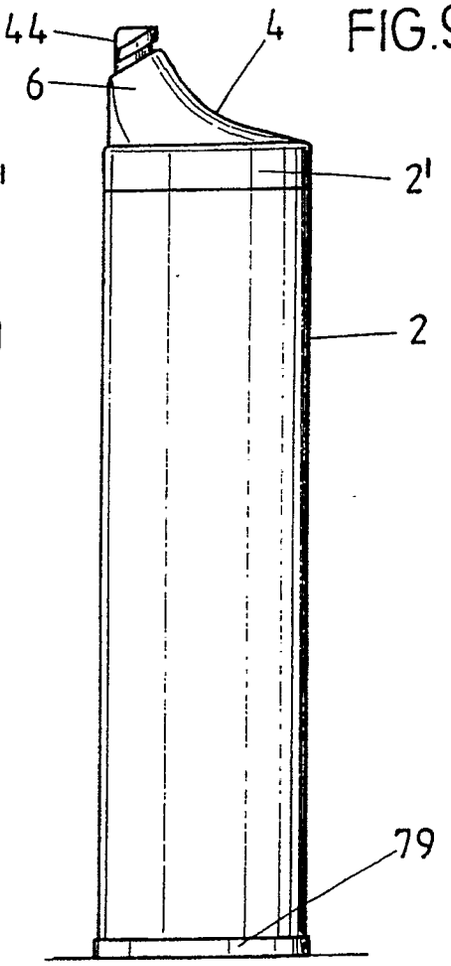
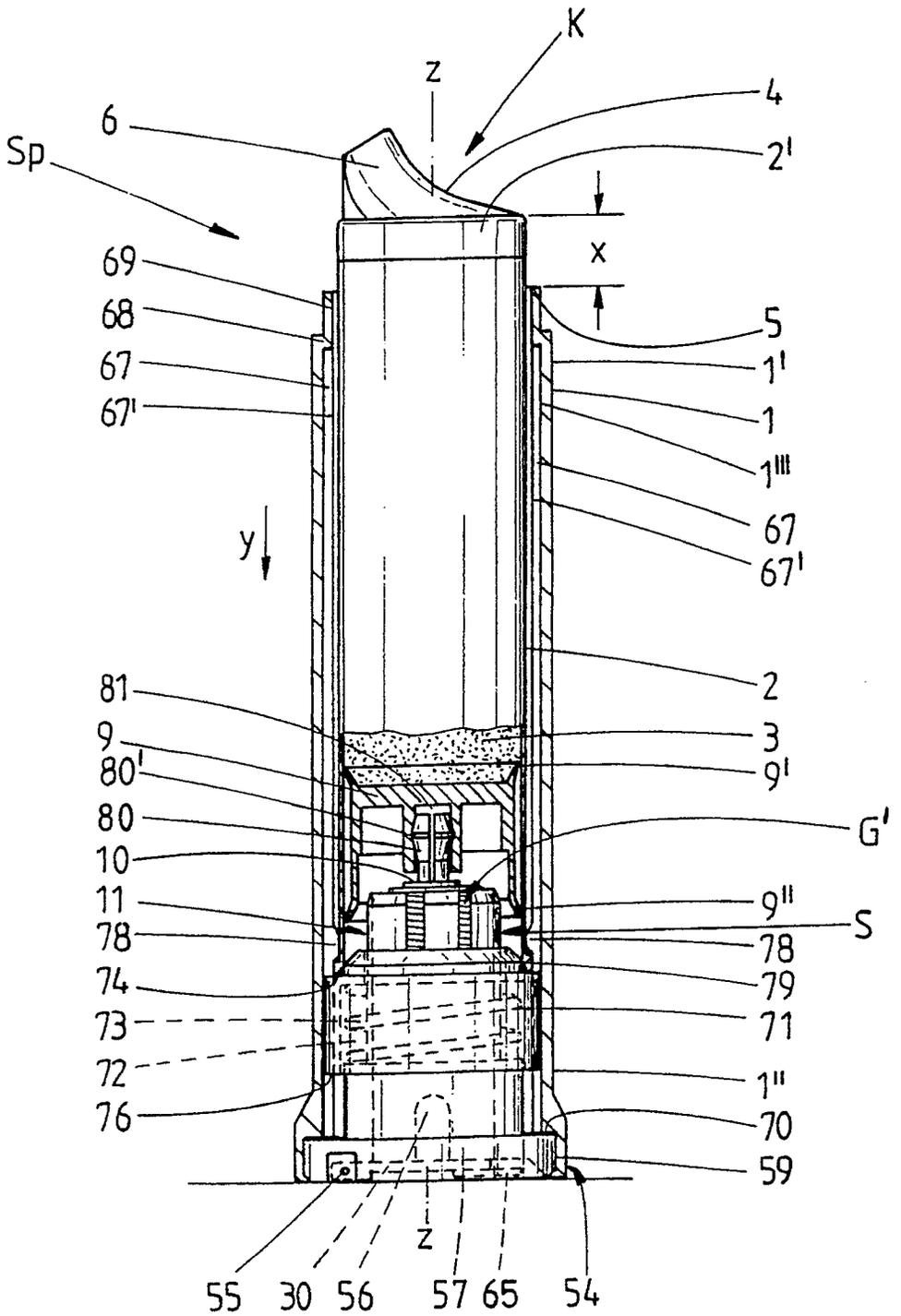


FIG. 11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69
68
5
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67'
y
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81
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9
9'
80'
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9''
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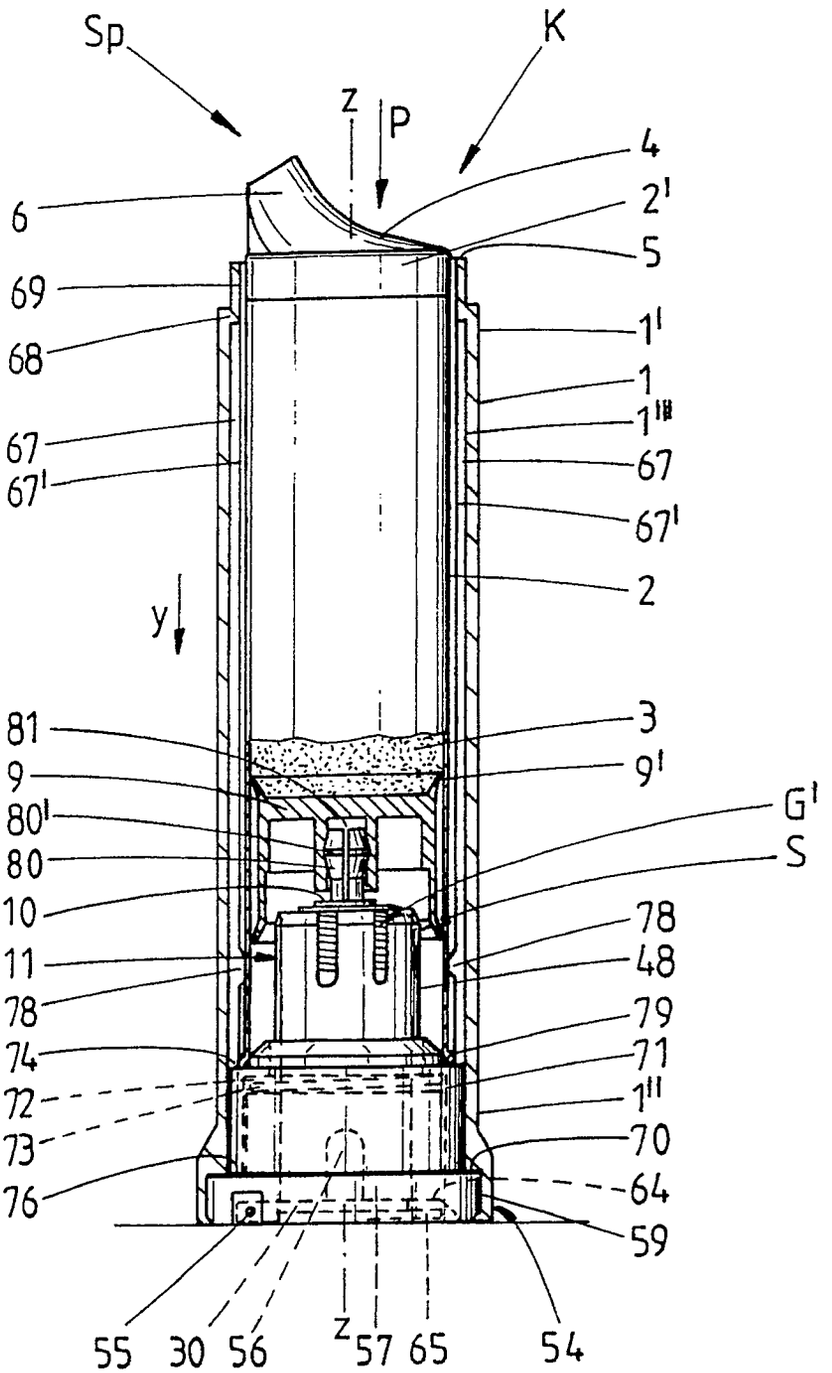
FIG.12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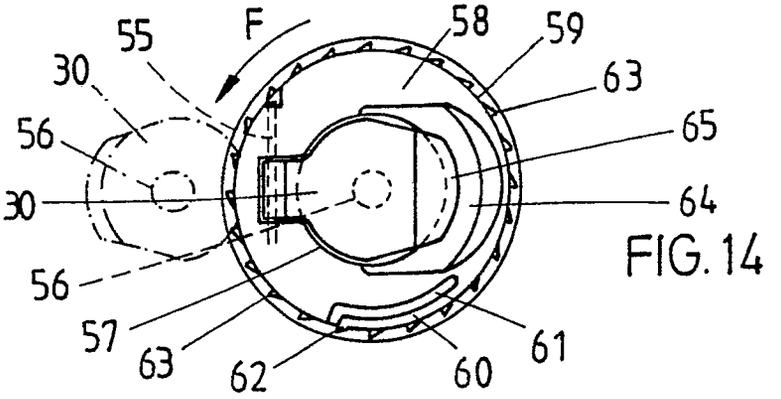
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FIG. 14

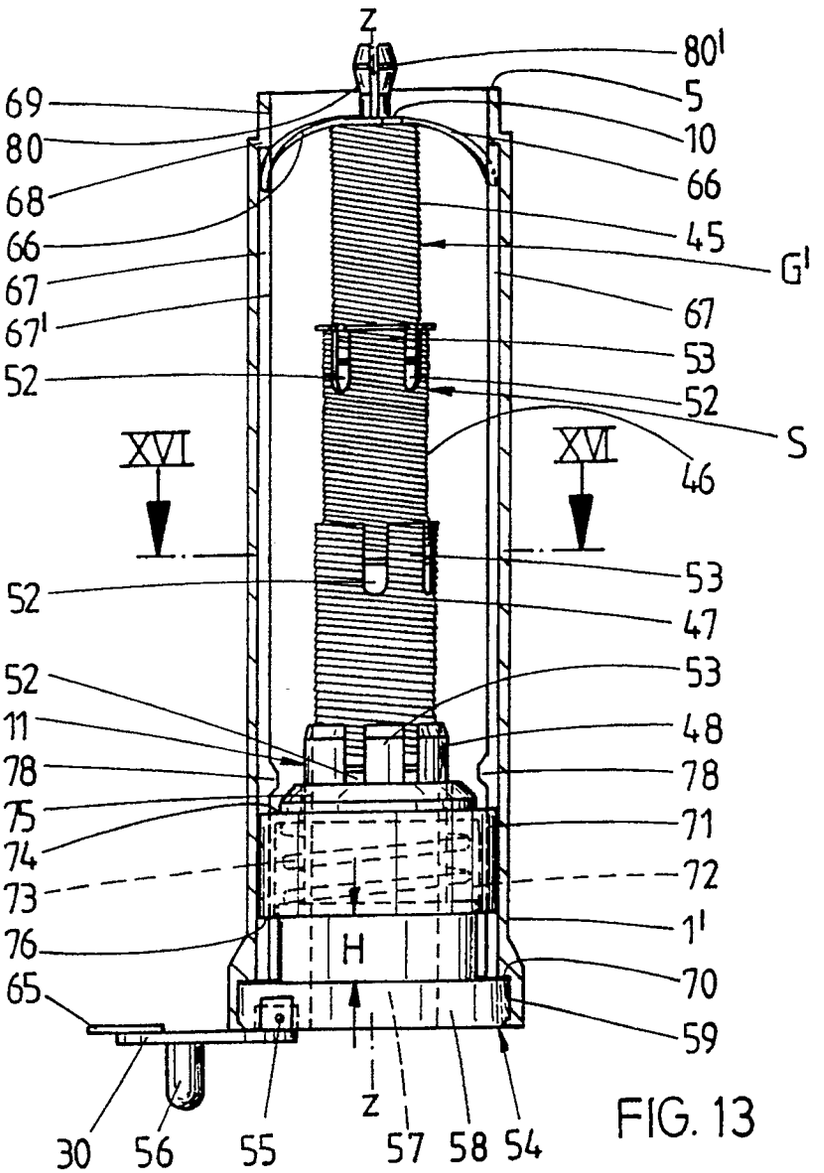
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FIG. 13

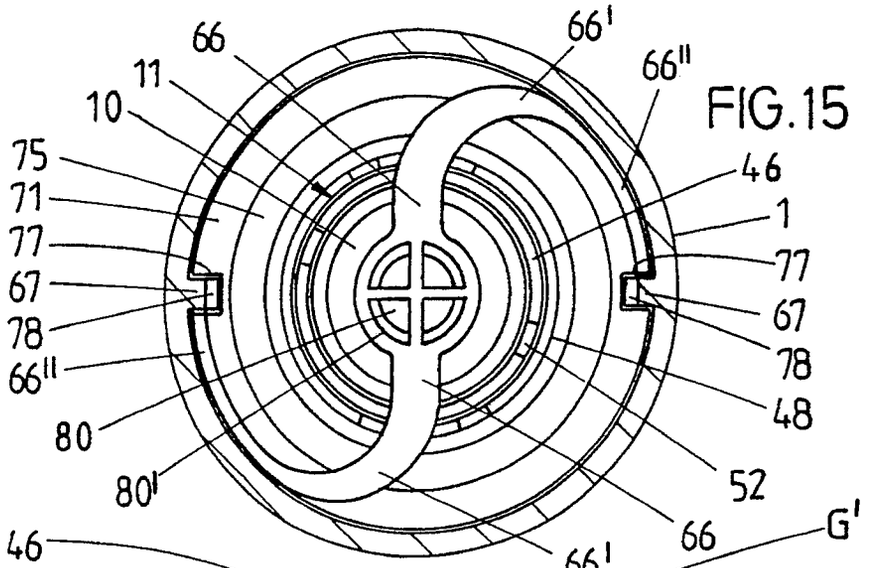

FIG.15

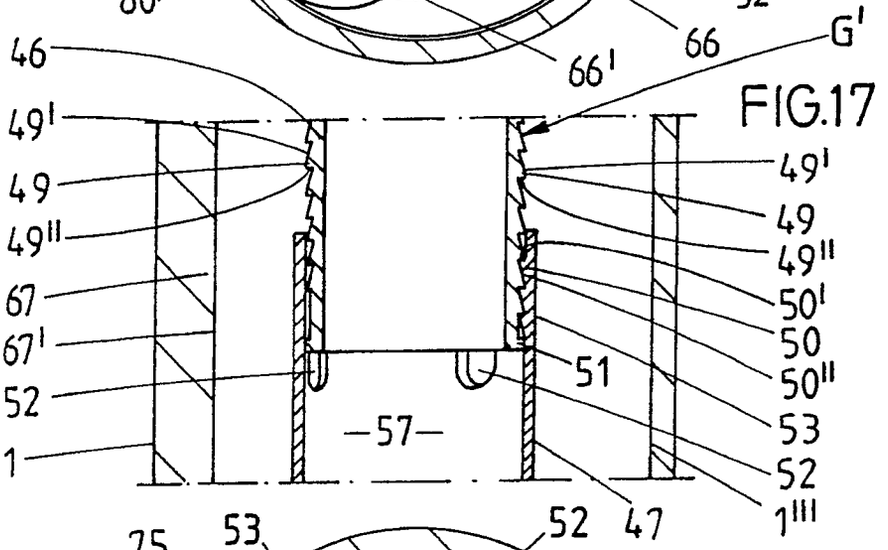

FIG.17

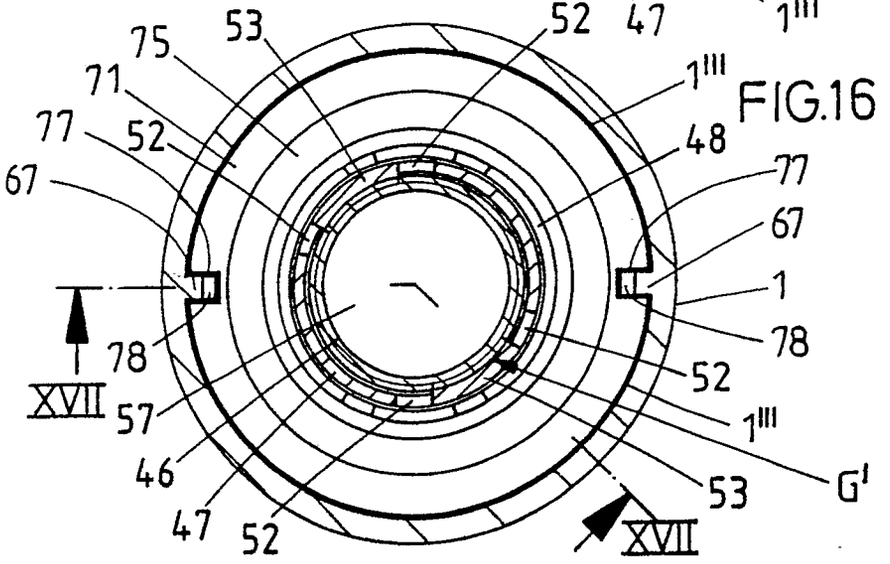

FIG.16

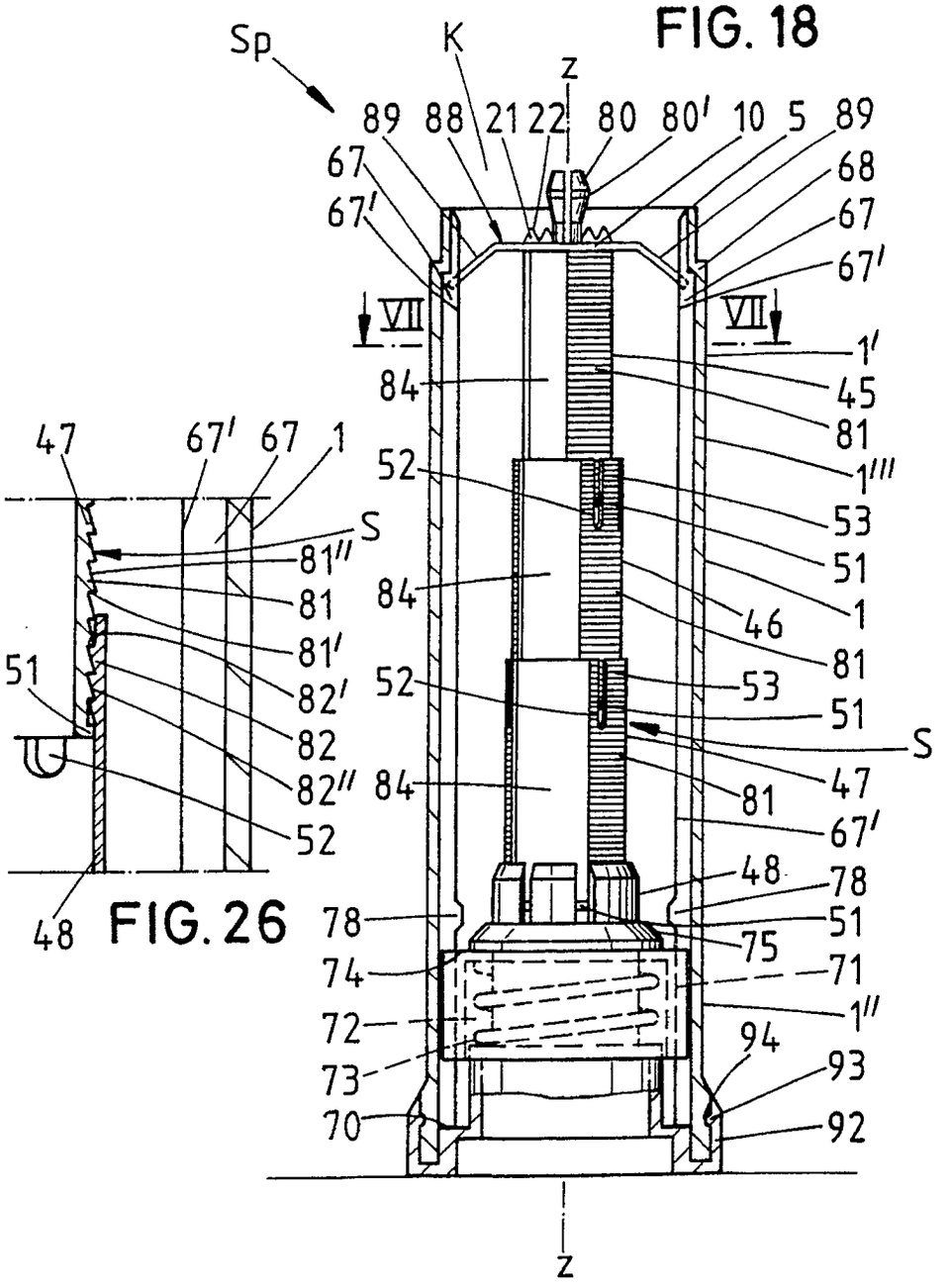
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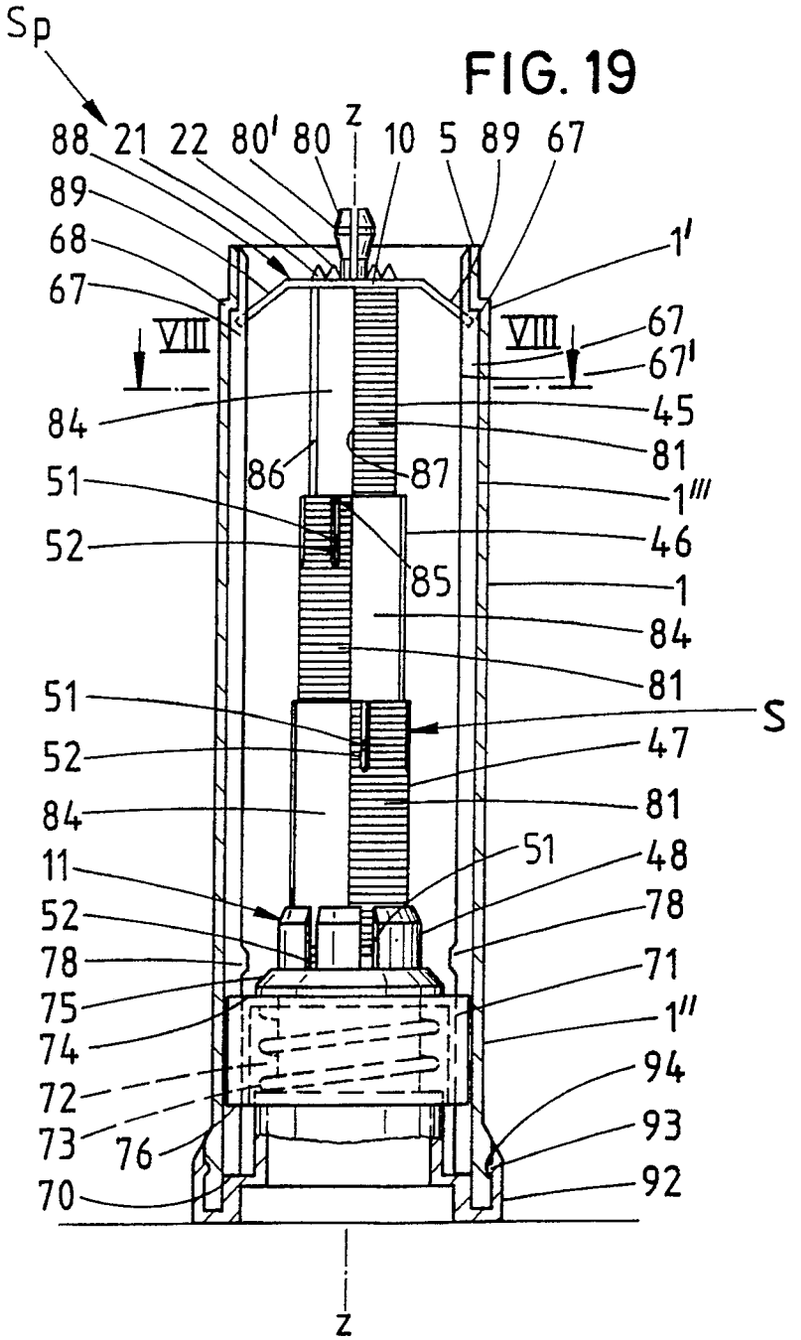
FIG. 18

FIG. 26

FIG. 19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87
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1'''
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FIG. 20

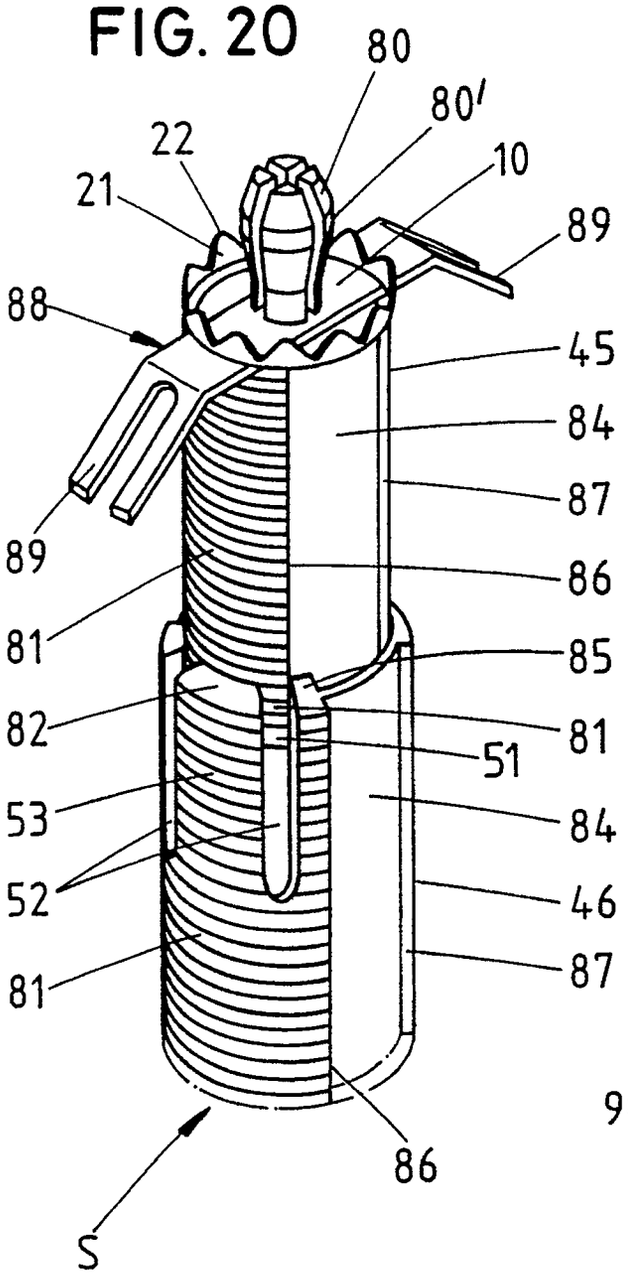
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FIG. 21

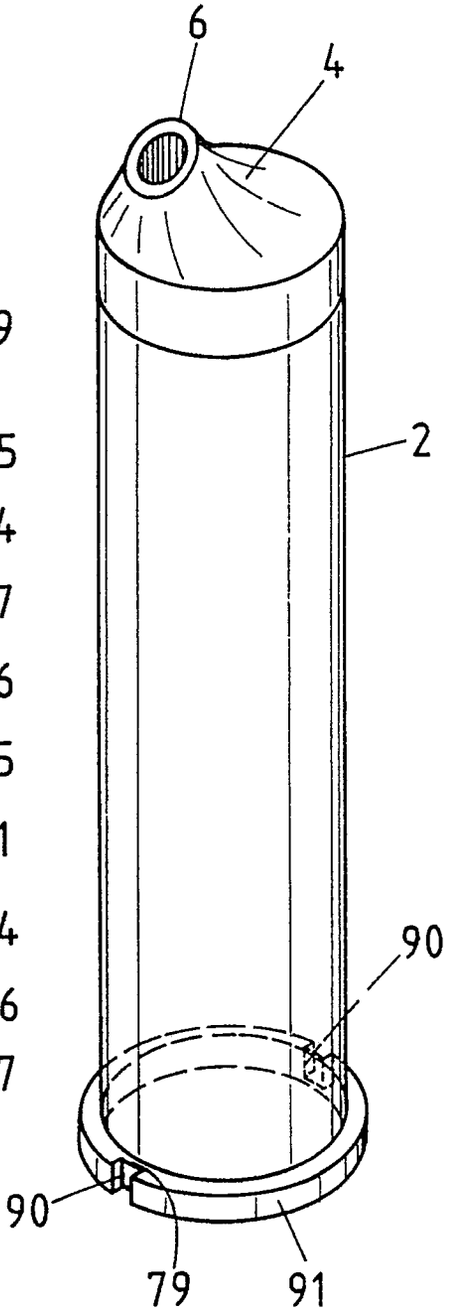
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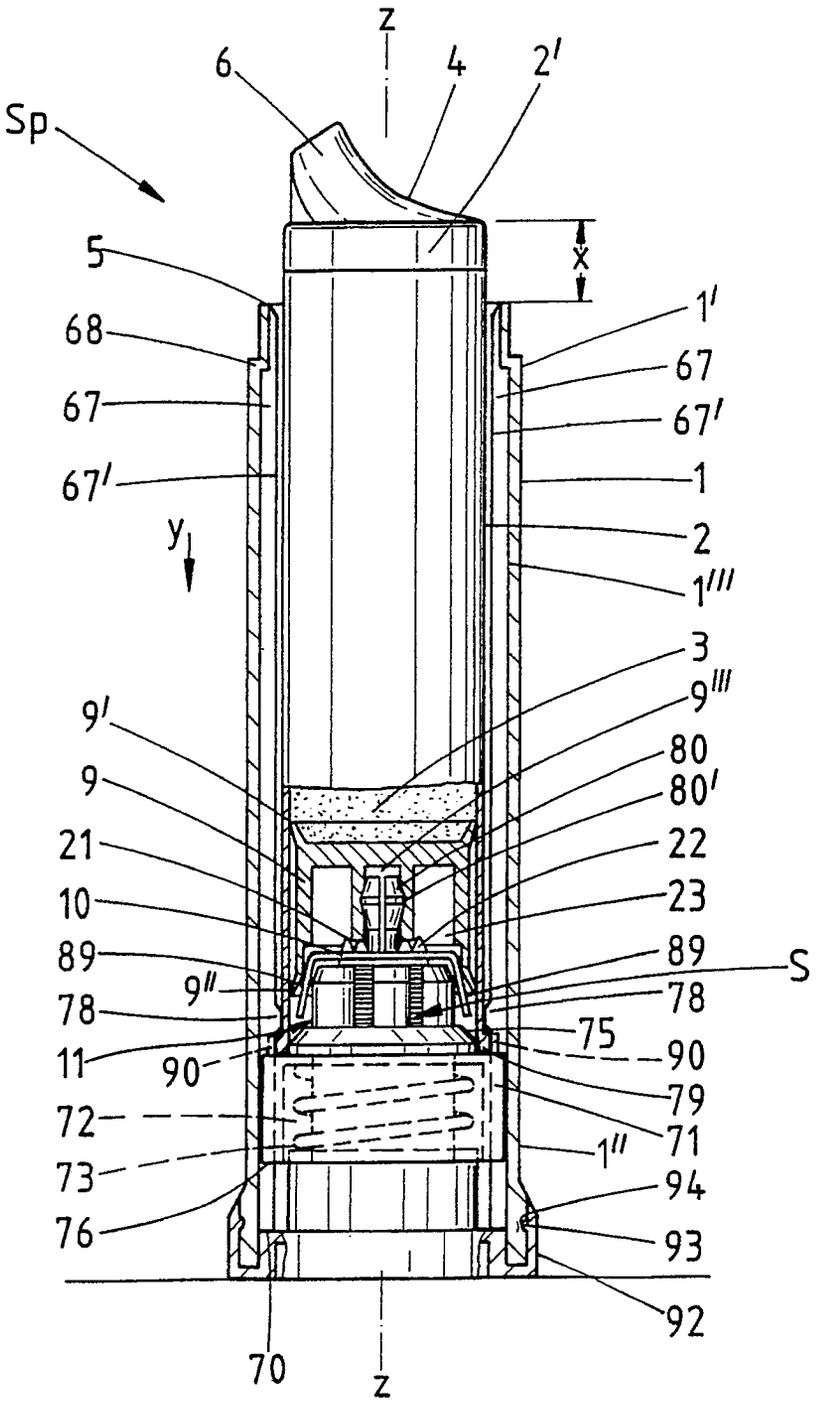
FIG. 22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68
67
67'
67'
1
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9'
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z

FIG. 23

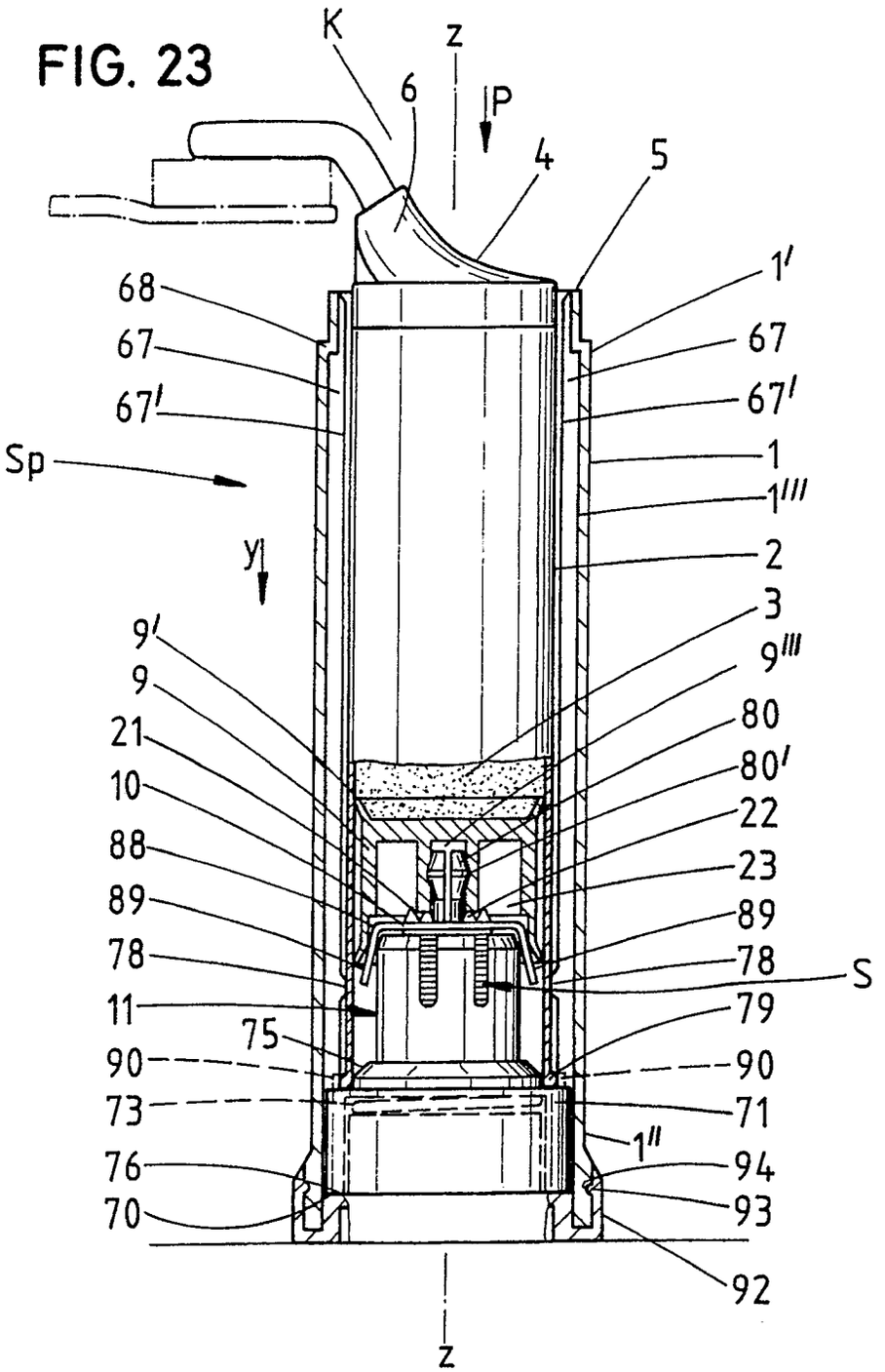
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FIG. 24

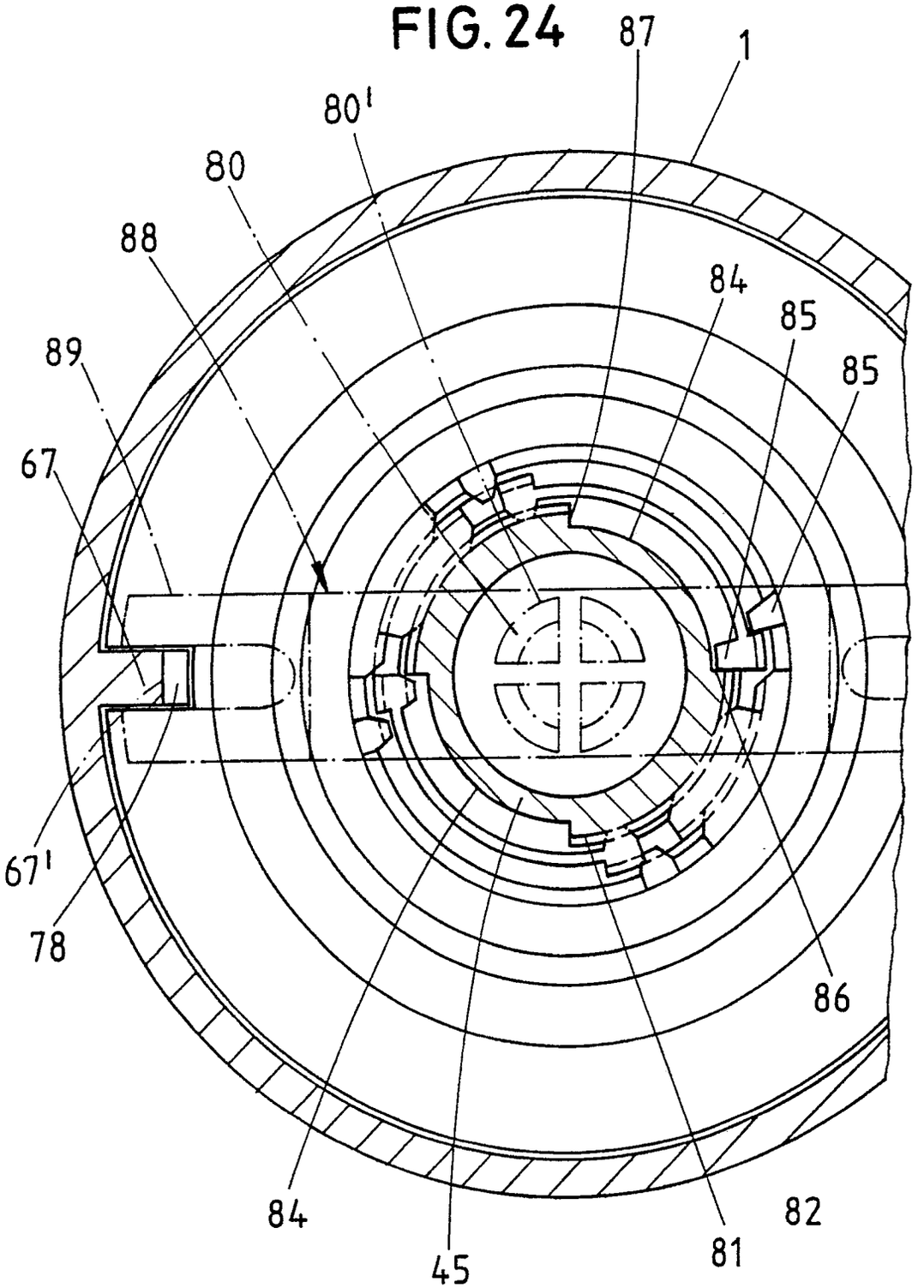
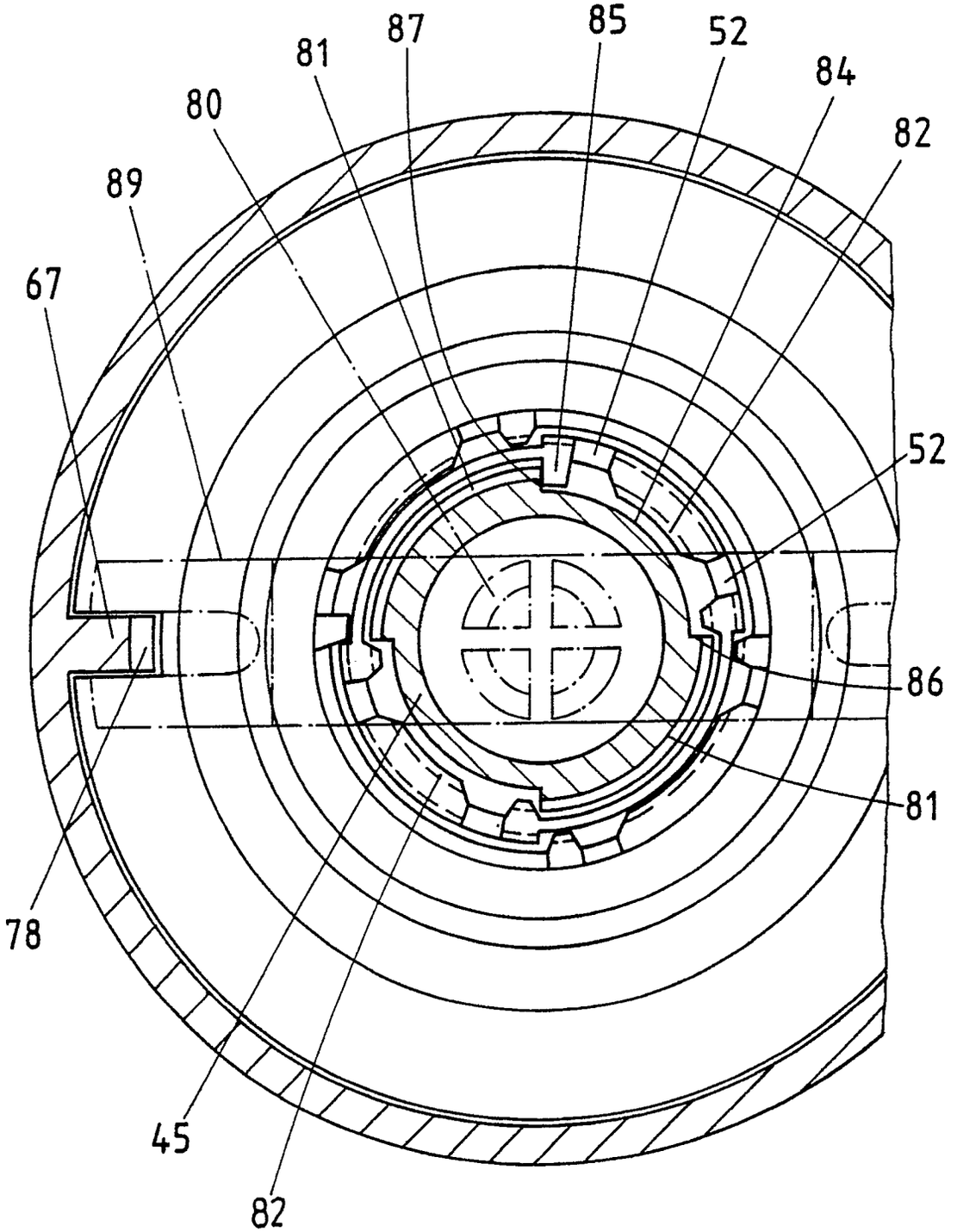


FIG. 25



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 31 3733

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	FR-A-7 475 92 (SEGAL) * Page 1, lines 19-26; page 1, line 59 - page 2, line 4; figures 1,2 *	1,34	B 65 D 83/00
A	US-A-2 748 991 (McCARTHY) * Column 1, line 65 - column 2, line 13; column 2, lines 32-46; figures *	1,34	
A	EP-A-0 053 329 (BLENDAX-WERKE) * Page 9; figures 1,2 *	1,34	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 65 D
B 67 D
A 47 K

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	08 February 91	MARTINEZ NAVARRO A

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same catagory
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P: intermediate document
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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