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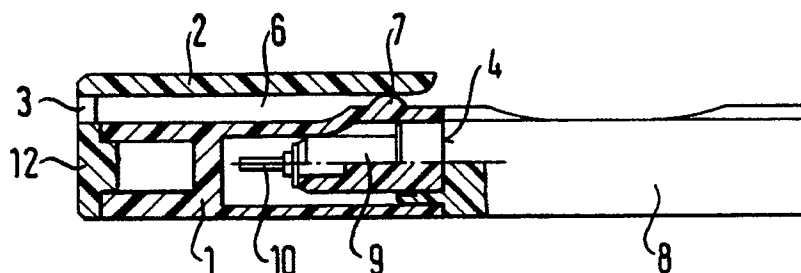
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(54) **Cap for writing instruments containing ink.**

(57) Cap for writing instruments containing ink. The cap (1) is closed on all sides apart from an open insertion end (4) and comprises a safety ventilation device, which allows a flow of air along the cap (1), if the latter has lodged in a child's windpipe when swallowed accidentally. The safety ventilation device comprises an axial ventilation path (3, 6) on the outside of the cap, which along at least one part of its axial extent has an open cross-sectional configuration, so that a covering placed around the cap (1), corresponding to the windpipe, is prevented from pressing along the entire periphery of the cap (1) against its surface. On the contrary, at any axial

point of the cap (1), a free cross-sectional area remains for the ventilation with a throughflow capacity which corresponds to the air requirement of a person. The ventilation path may comprise an axial perforation (3) in the base region (12) of a retaining clip (2) and the gap (6) between the retaining clip (2) and outer surface of the cap (1). It may also be formed by ribs extending axially and projecting radially from the outer surface of the cap (1) or by axial grooves in the surface of the cap. The cap (1) effectively prevents drying up of the tip (10) of the writing instrument (8) supplying ink.

Fig. 5



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CAP FOR WRITING INSTRUMENTS CONTAINING INK

The invention relates generally to an improvement to caps for writing instruments containing ink and in particular to a cap with a safety ventilation device in order to facilitate an air flow along the cap, if the latter has lodged in a person's windpipe, for example of a child, when swallowed accidentally.

In writing instruments which contain no ink, such as pencils and the like, hitherto in order to prevent asphyxiation as a result of accidental swallowing, an opening has been provided in the top of the cap covering the point of the pencil, so that if the cap has lodged in a child's windpipe, air for breathing may continue to flow through the cap, until medical assistance is given (see for example JP-A 39592/1986 and 118038/1977).

A transfer of this principle to a cap for writing instruments containing ink, in which an evaporation of the ink must be prevented and the writing tip must be kept continuously moist, is not readily possible, since due to this the function of the writing instrument is jeopardised. In caps which serve to seal the writing tip of writing instruments containing ink with respect to atmospheric air, the risk of asphyxiation therefore exists in the case of accidental swallowing, such as is to be feared in particular with children. Inter alia this risk has been expressed in a specification of the "British Standard Institution", which is under preparation and dated June 23rd 1989, document No. 89/38201.

In view of this it was already proposed (see EP-A-0204252, JP-A-11016/1986), to provide an airway in the cap, which however is sealed hermetically when the cap is fitted to the writing instrument. It is typical of this type of safety cap that one or more perforations is/are provided at one or more axial or peripheral points of the cap wall, which perforations thus facilitate an exchange of air between the outside and inside of the cap. One drawback of these solutions is the complicated arrangement for achieving a sufficiently tight encapsulation of the tip of the writing instrument, when the cap is fitted. It is also known (DE-A-3728896), to construct a separate tubular air passage with open axial ends and a cross-section closed peripherally all round, on the outside of the cap, in order to separate the safety function from the sealing function. This solution is not solely disadvantageous as regards the manufacturing difficulties connected therewith, but in addition conceals the risk that in the course of time the air passage is easily blocked by foreign bodies which have penetrated, such as food residues, dirt deposits and the like and therefore the safety function can be lost.

In comparison therewith, a cap of the type mentioned at the beginning should be provided by the invention, which with a simple construction, which is favourable from the manufacturing point of view, on the one hand can prevent drying up of the writing part of writing instruments containing ink, in a problem-free manner and on the other hand offers the guarantee that if swallowed, sufficient air for breathing may flow along the cap.

The cap according to the invention is characterised by the fact that with the exception of its insertion end, the cap is closed on all sides and the safety ventilation device comprises at least one axial ventilation path on the outside of the cap, which along at least part of its axial extent has a peripherally open cross-sectional configuration such that in conjunction with a covering placed around the cap, a cross-sectional area is defined in each radial plane for the ventilation with a through-flow capacity corresponding to the air requirement of a person.

The high sealing function of the cap according to the invention with respect to the writing part of a writing instrument inserted therein results from the fact that with the exception of its insertion end, in contrast to the known solutions with a safety function, the cap is closed on all sides, i.e. it is free from perforations leading into the inside of the cap. The cap therefore corresponds in its sealing function to the caps used hitherto in writing instruments without a safety ventilation device. The existing caps can therefore be replaced without modification of the writing instruments, by safety caps according to the invention. According to the invention, the ventilation path extends exclusively on the outside of the cap and indeed in the form of an air passage, which has an open cross-sectional configuration, i.e. when considered in a radial plane is not closed on its periphery such as for example in the case of a tube, but is open and thus accessible from outside. However, on the other hand, the passage also has such a cross-sectional configuration that if a wrapper is wrapped around the cap, an air way with a cross-sectional area, which is adapted to the air requirement of a person, is always available. In other words, if the cap is swallowed, the basically open air passage on the outer side of the cap cannot be blocked by the windpipe, since the covering corresponding to the windpipe only covers the open side of the air passage or thus closes the latter peripherally, so that a path always remains for the flow of air for breathing along the cap. The construction of the safety ventilation device according to the invention has advantages both as regards manufacturing

techniques, since it is not necessary to form any cavities which are not easily accessible, as well as an improved safety function, in that the regions which are critical for this, can be checked at a glance as regards their functional state, for example for blocking deposits and the like. A further advantage of the cap according to the invention is the relatively high freedom as regards the respective design of the cap.

A cap according to a preferred embodiment of the invention comprises a substantially plate-shaped retaining clip, which is attached close to the closed axial end of the cap and whereof the spring deflection with respect to the cap is limited by maintaining a minimum spacing with respect to the cap surface. According to the invention, in its base attachment region, the retaining clip comprises a perforation aligned substantially axially, so that a ventilation path is provided, which comprises the perforation and the gap below the retaining clip which is open (in the peripheral direction of the cap). The free end of the retaining clip, i.e. the end remote from the base attachment region, is located on or at a short distance from the insertion end of the cap. In cases where the base attachment region provides a connection between the retaining clip and cap extending substantially radially, the perforation may be constructed so that it forms a pair of web-like areas in the base attachment region, which provide a resilient connection between the retaining clip and cap.

If the cap with the aforescribed construction is placed on a writing instrument containing ink, for example a fountain pen, then the sensitive writing part arrives in an interior space, which as in the case of conventional caps, is sealed hermetically with respect to the atmosphere at the time of insertion of the writing instrument. The writing instrument consequently remains in a usable state without any risk of drying-up, so that one can immediately begin to write after removing the cap. If a child should accidentally swallow the cap, there is no danger that the cap will block the windpipe, since the axial perforation in the base attachment region and the gap between the retaining clip and the surface of the cap cannot be closed by the windpipe. The resilient connecting webs in the base attachment region contribute to preventing injuries to the windpipe or gullet by the retaining clip of a swallowed cap or at least to substantially alleviate such injuries, since due to this the retaining clip acquires adequate flexibility.

According to another embodiment of the invention, at least one axial rib projecting substantially radially from the outer side of the cap may be provided. In this case, the ventilation path is defined by the side faces of the ribs and the adjoining surface of the cap. The effect of the rib is that

when the cap is swallowed, the windpipe is kept away from its surface in certain regions, so that an air passage remains, which has a quasi tent-shaped cross-section, when considered in a radial plane. The rib may also have a substantially T-shaped or mushroom-shaped cross-section and consequently defines an airway, which is open in the peripheral direction. A development of this embodiment also provides that a pair of axial ribs arranged in parallel one beside the other at a short distance apart are provided, which define a channel-like ventilation path therebetween. In conjunction with a covering placed around the cap (corresponding to a windpipe), these ribs may form a pair of airways on the outside of the ribs and an airway with a channel-shaped cross-section formed between the ribs. In order to avoid the risk of injury by the ribs, it may also be provided the outer side faces of the pair of ribs pass substantially continuously, for example tangentially into the surface of the cap. In this case, the airway is defined by the region between the pair of ribs.

A further embodiment of the invention provides a plurality of axial indentations or grooves provided in the outer surface of the cap and spaced apart peripherally. These grooves, which extend from one axial end to the other axial end of the cap, have a similar effect to the aforementioned ribs, in that they prevent a covering placed around them or the inner wall of the windpipe along the entire periphery of the cap from bearing in a tight manner against its surface. According to one development of the invention, the grooves may co-operate with a substantially plate-shaped retaining clip, which is defined laterally by an adjoining pair of axial grooves. A transverse connection between the adjoining pair of grooves is additionally created by the gap between the retaining clip and cap surface.

One common feature of all the embodiments of the invention is that, when considered in any radial plane of the cap, the cross-sectional area of the ventilation paths created is greater than or equal to approximately 3.4 mm², in order to ensure the minimum necessary air requirement of a person, in particular of a child, along the cap. A further common feature consists in that the ventilation path ends at a distance less than or equal to approximately 2 mm from the insertion end of the cap, since otherwise it is not ensured that even at the insertion end of the cap, the windpipe is kept at a suitable distance from its surface.

The invention will be described in detail hereafter with reference to the embodiments and the drawings. In the drawings, identical or similar parts bear the same reference numerals.

Figure 1 is a longitudinal sectional view of a safety cap according to a first embodiment of the invention with associated writing instrument

in fragmentary view,

Figures 2, 3 and 4 show the safety cap according to Figure 1 in general view, plan view and view from the left,

Figure 5 is a longitudinal sectional view of a safety cap according to a second embodiment of the invention with associated writing instrument in fragmentary view,

Figures 6, 7, 8 show the safety cap according to Figure 5 in general view, plan view and view from the left,

Figure 9 is a longitudinal sectional view of a safety cap according to a third embodiment of the invention,

Figures 10, 11, 12 show the safety cap according to Figure 9 in general view, plan view and view from the left,

Figure 13 is a longitudinal sectional view of a safety cap according to a fourth embodiment of the invention,

Figures 14, 15, 16 show the safety cap according to Figure 13 in general view, plan view and view from the left,

Figure 17 is a perspective view of a safety cap according to a fifth embodiment of the invention, Figures 18 and 19 show the safety cap according to Figure 17 in partly cutaway general or plan view,

Figure 20 is a perspective view of a safety cap according to a fifth embodiment of the invention, Figures 21 and 22 show the safety cap according to Figure 20 in plan view or partly cutaway general view,

Figure 23 is a perspective view of a safety cap according to a sixth embodiment of the invention,

Figures 24, 25, 26 show the safety cap according to Figure 23 in partly cutaway general view, plan view and view from the left,

Figure 27 is a perspective view of a safety cap according to a seventh embodiment of the invention,

Figures 28, 29, 30 show the safety cap according to Figure 27 in plan view, partly cutaway general view and view from the left,

Figure 31 is a longitudinal sectional view of a safety cap according to an eighth embodiment of the invention,

Figures 32, 33, 34 show the safety cap according to Figure 31 in general view, plan view and view from the left, Figure 34 in addition showing the course of a covering H placed around the cap.

Hereafter reference will be made to Figures 1 to 15, which show the first to fourth embodiments of the invention.

In Figures 1 to 4, in which the first embodiment of the invention is illustrated, the cap bears the

general reference numeral 1. The cap 1 has a substantially tubular or cylindrical shape with an outer diameter of normally up to 16 mm. The cap is closed at one axial end, whereas the other axial end is provided with an insertion opening 4. The writing part 9 of the writing instrument 8 supporting the writing point 10 is inserted by way of the insertion opening 4. A retaining clip 2 extending coaxially to the cap 1 is attached by its base region 12 to the closed top of the cap 1. As shown, the base region 12 may be curved and contains a perforation 3 aligned substantially axially.

The airway of the present embodiment comprises the perforation 3 and the gap 6 connected thereto between the retaining clip 2 and the outer surface of the cap 1. The airway should have a cross-sectional area of at least 3.4 mm², preferably greater equal to 6.8 mm², at any axial point along the cap. The retaining clip 2 extends along the outside of the cap 1 as far as a point close to the insertion opening 4. In order that an adequate airway is guaranteed between the edge of the insertion opening 4 and the free end of the retaining clip 2, the spacing m of the free axial end of the retaining clip 2 from the insertion opening 4 should amount to less than 2 mm.

The reference numeral 5 relates to the inside of the cap, which when the writing part 9 is inserted, is sealed with respect to the atmosphere by a peripheral region of the writing instrument 8. The reference numerals 13 relate to web-like areas, which are formed by the perforation 3 provided in the base attachment region 12 of the retaining clip 2 and which connect the retaining clip 2 resiliently to the cap.

The cap 1 with the inserted writing instrument 8 can be clipped to an article of clothing by means of the retaining clip 2.

If a child accidentally swallows the aforescribed cap 1, then even if the cap penetrates the child's windpipe and becomes lodged there, the perforation 3 in the base attachment region 12 and the gap 6 between the retaining clip 2 and outer surface of the cap 1 form an airway, so that the air passage necessary for the child to breathe is ensured and the danger of asphyxiation does not exist. Furthermore, since the retaining clip extends close up to the insertion opening 4 of the cap, even close to this end of the cap, the airway is not closed by the windpipe. Since the retaining clip is held resiliently by the connecting webs 13, even in the case of contact of the tip of the retaining clip 2 with the gullet or windpipe, the danger of asphyxiation is substantially reduced.

The reference numeral 7 relates to a projection, which keeps the retaining clip at a suitable distance from the surface of the cap 1.

The second embodiment of the invention is

illustrated in Figures 5 to 8. The difference from the embodiment according to Figures 1 to 4 consists in that the retaining clip 2 is attached by way of a radial base attachment region 12 to the top of the cap 1. The retaining clip 2 extends along the cap 1. Provided in the attachment base region 12 of the retaining clip 2 is an axial perforation 3, which is in axial alignment with the gap 6 between the retaining clip 2 and outer side of the cap, so that an airway is formed, which extends as far as the insertion opening 4 of the cap 1. As in the aforementioned embodiment, resilient connecting webs 13 are formed in the base attachment region 12 of the retaining clip 2 on both sides of the perforation 3, which connecting webs facilitate clipping of the cap to an article of clothing and at the same time alleviate the danger of injury to the windpipe, if the cap is accidentally swallowed. Reference can be made to the aforescribed embodiment for further details.

The third embodiment of the invention is illustrated in Figures 9 to 12. This embodiment differs from the embodiment according to Figures 5 to 8 substantially solely in that between the gap 6 and the perforation 3 in the base attachment region 12, an enlarged air space 14 is provided at the top of the cap 1. The perforation 3 can consequently be offset somewhat radially with respect to the gap 6. The resilient connecting webs 13 are provided in the base region 12 at the sides of the perforation 3.

The fourth embodiment of the invention is illustrated in Figures 13 to 16. In this embodiment, the base attachment region 12 of the retaining clip 2 is constructed as an annular wall part extending axially, close to the closed top of the cap 1, which defines an axial through passage 3 together with the cap surface. The through passage 3 and the gap 6 below the retaining clip 2 form the axial airway.

The fifth to eighth embodiments of the invention are described hereafter with reference to Figures 17 to 30, which are all based on the presence of one or more ribs on the cap surface extending axially and projecting substantially radially, which ensure that if the cap is swallowed, the windpipe cannot come into contact with its surface along the entire periphery.

Figures 17 to 19 show the fifth embodiment of the invention. The reference numeral 101 relates to the cap, which is substantially cigar-shaped and whereof the outer diameter normally amounts to no more than 16 mm. The reference numeral 102 relates to a pair of projecting ribs formed on the outer surface of the cap 101, which extend axially along the cap at diametrically opposed points of its periphery. The reference numeral 105 designates a flat portion of the surface of the cap 101 associated with each rib 102, close to its closed top end. The

open insertion end of the cap 101 bears the reference numeral 104. As illustrated, an outer annular end face may remain between the insertion opening 104 and the facing end of the ribs 102, which end face has an axial length which should not exceed 2 mm. The flat portions 105 allow a reduction in the height of the ribs 102.

If the cap 101 is fitted to a writing instrument containing ink (not shown), as in the aforescribed embodiments, the interior of the cap is hermetically sealed and consequently drying-up of the writing point is effectively prevented. If the cap 101 is accidentally swallowed, an axial airway remains between the side faces of each rib 102 and the adjacent outer surface of the cap 101 on account of the spreading action of the ribs, which is indicated at 106. In conjunction with a covering placed around it, the airway creates a cross-sectional area for the passage of air, which due to suitable dimensions of the ribs 102 is designed such that it amounts to at least 3.4 mm^2 , preferably 6.8 mm^2 at each axial point of the cap 101.

Figures 20 to 22 show the sixth embodiment of the invention. This embodiment differs from the aforescribed fifth embodiment substantially solely due to the fact that instead of a pair of diametrically opposed ribs, a pair of axial ribs 102 lying parallel one beside the other with a suitable short spacing is provided. The ribs 102 therefore define between them an axial air passage 106 with a suitable cross-sectional area in addition to the airways along the outer side faces of the ribs 102. For further details, reference can be made to the embodiment according to Figures 17 to 19.

Figures 23 to 26 show the seventh embodiment of the invention. In this embodiment, provided on the outer surface of the cap 101 is a rib 102 extending axially, with a substantially T-shaped or mushroom-shaped cross-section. The rib 102 has a flat, plate-like upper part 108, which is connected by way of a radial web 109 to the surface of the cap 101. Provided on both sides of the web 109 are gaps 106 between the plate-shaped upper part 108 and the cap surface, which define axial airways. The cap 101 itself has a substantially cylindrical configuration with a closed end and an open insertion end 104 for the writing part of a writing instrument.

Air may also flow through the air gap below the plate-like upper part 108 on both sides of the web 109 of the rib 102 extending from the top end as far as the insertion end 104 of the cap 101, if the cap lodges in the windpipe as a result of being swallowed accidentally. Since, under these circumstances, the surface of the plate-like upper part 108 bears against the inner wall of the windpipe, the risk of injury is substantially reduced.

Figures 27 to 30 show the eighth embodiment

of the invention. This embodiment is a modification of the embodiment according to Figures 20 to 22, in which the outer side faces 110 of the pair of ribs 102 extending in parallel one beside the other at a distance apart are shaped so that they pass tangentially or continuously into the outer surface of the cap 101, so that the airway is defined substantially solely by the passage 106 enclosed between the ribs 102. The shaping of the side faces 110 of the ribs 102 together with the chamfering of the axial ends of the ribs reduces the danger of injury to the windpipe or gullet, if the cap 101 is swallowed accidentally. The cap 101 in the present embodiment may have a substantially cylindrical shape.

A ninth embodiment of the invention is illustrated in Figures 31 to 34. The reference numeral 201 relates to a substantially cylindrical cap with a closed axial top and an open insertion end bearing the reference numeral 204. The outer diameter of the cap 201 normally amounts to no more than 16 mm. Attached close to the top end of the cap 201 is a retaining clip 202, which is held by way of a projection 207 formed on the surface of the cap 201, at a suitable distance from the surface of the cap 201. If the writing part of a writing instrument (not shown) is inserted in the insertion opening 204 of the cap 201, consequently the interior of the cap 201 is hermetically sealed. If desired, there may be provided within the cap 201 an additional inner cap, which receives the front part of the writing instrument.

The reference numeral 206 relates to indentations or grooves in the outer surface of the cap 201, which extend along the cap from its top end to the insertion opening 204 and are distributed peripherally at a suitable distance from each other. The free end of the retaining clip 2 may terminate at a distance m from the insertion opening 204, which distance should not amount to more than 2 mm.

A covering H placed around the cap 201 is indicated by the broken line in Figure 34. The course of the covering H corresponds substantially to that of the inner surface of the windpipe in the region of a swallowed cap 201. As shown in Figure 34, axial airways are formed between the covering H and the grooves or indentations 206, through which airways air for breathing may flow, since at these points direct contact of the windpipe with the surface of the cap 201 is prevented. The cross-sectional area of the airway should amount to at least 3.4 mm^2 . In this respect it should be pointed out that a pair of indentations or grooves 206 are provided adjoining the retaining clip 202 laterally, so that the gap between the retaining clip 202 and the surface of the cap 201 may serve as a transverse passage for an airflow between the adjoining

pair of grooves 206.

Although a covering H is shown solely in Figure 34, it will be understood that similar coverings can also be shown in the other embodiments, in order to define the free cross-sectional areas, which remain for a person to breathe, if this person has accidentally swallowed a cap of the type according to the invention. The cross-sectional area available as a whole for the ventilation in a radial plane of the cap does not need to be the same along the cap between the axial ends. It is important that a cross-sectional area for the ventilation is available at each axial point of the cap, which area has a throughflow capacity which corresponds at least to the minimum air requirement of a person. Experiments have shown that the minimum cross-sectional area should amount to 3.4 mm^2 , preferably 6.8 mm^2 . Furthermore it is important that the axial airways on the outside of the cap according to the invention have axial, open ends, which cannot be closed by a covering H placed around them, respectively by the inner wall of the windpipe of a person.

Claims

1. Cap for writing instruments containing ink, in which, at one end, a region of the writing instrument can be inserted, with a safety ventilation device for facilitating an air flow along the cap, if the latter has lodged in a person's windpipe when swallowed accidentally, characterised in that
 - a) the cap (1, 101, 201) is closed on all sides with the exception of the insertion end (4, 104, 204), and
 - b) the safety ventilation device comprises at least one axial ventilation path (6, 106, 206) on the outside of the cap, which along at least part of its axial extent has an open cross-sectional configuration, such that in conjunction with a covering (H in Figure 34) placed around the cap, a cross-sectional area in each radial plane is defined for the ventilation with a throughflow capacity corresponding to the air requirement of a person.
2. Cap according to Claim 1 with a substantially plate-like retaining clip attached close to its other axial end, whereof the spring deflection with respect to the cap is limited by a stop, whilst maintaining a minimum spacing with respect thereto, characterised in that in its base attachment region (12), the retaining clip (2) comprises a perforation (3) aligned substantially axially and that the ventilation path comprises the perforation (3) and the region (6)

between the retaining clip (2) and the outer surface of the cap (1).

3. Cap according to Claim 2, characterised in that the free end of the retaining clip (2) is located on or at a short distance from the insertion end (4) of the cap (1). 5
4. Cap according to Claim 2 or 3, characterised in that the perforation (3) in the base attachment region (12) produces, a pair of web-like regions (13), by which the retaining clip is resiliently connected to the cap (1). 10
5. Cap according to Claim 1, characterised by at least one axial rib (102) projecting from the outside of the cap, the ventilation path (106) being defined by the side faces of the rib and the adjoining regions of the surface of the cap (101). 15
20
6. Cap according to Claim 5, characterised in that a pair of axial ribs (102) arranged parallel to each other at a short distance apart is provided, which between them form an air passage (106). 25
7. Cap according to Claim 6, characterised in that the outer side faces (110) of the pair of ribs (102) pass substantially continuously into the peripheral surface of the cap (101). 30
8. Cap according to Claim 5, characterised in that the rib (102) has a substantially T-shaped or mushroom-shaped cross-section. 35
9. Cap according to Claim 1, characterised by a plurality of axial indentations or grooves (206) provided in the outer surface of the cap (201) and spaced apart peripherally. 40
10. Cap according to Claim 9, characterised in that a substantially plate-like retaining clip (202) is defined laterally by an adjoining pair of axial indentations or grooves (206). 45
11. Cap according to one of the preceding Claims, characterised in that the cross-sectional area of the ventilation path (6, 106, 206) at any axial point of the cap (1, 101, 201) is greater than or equal to approximately 3.4 mm². 50
12. Cap according to one of the preceding Claims, characterised in that the ventilation path (6, 106, 206) terminates at a distance less than or equal to approximately 2 mm from the insertion end (4, 104, 204) of the cap (1, 101, 201). 55

Fig. 1

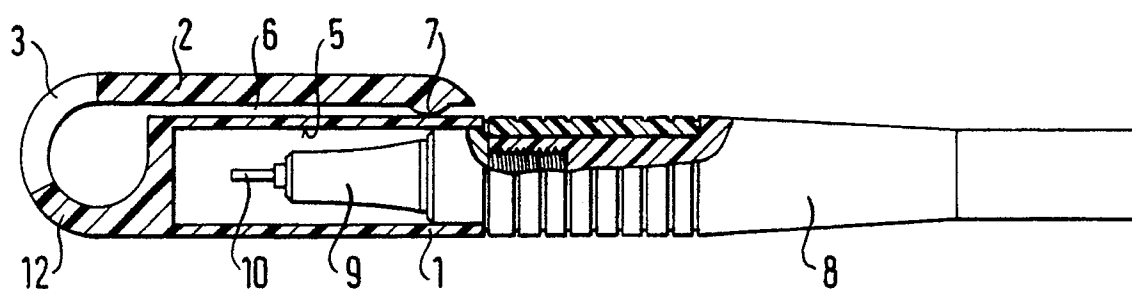


Fig. 2

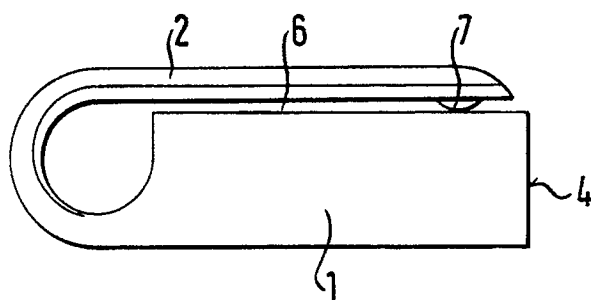


Fig. 4

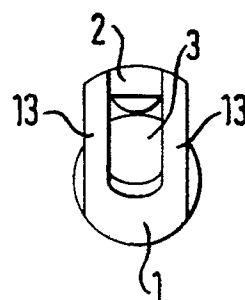


Fig. 3

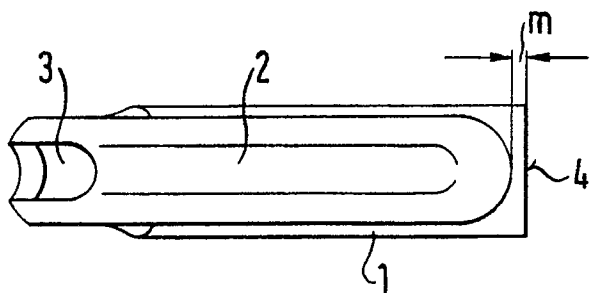


Fig. 5

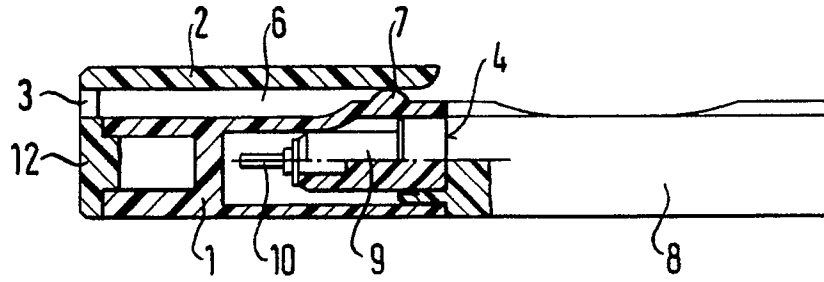


Fig. 6

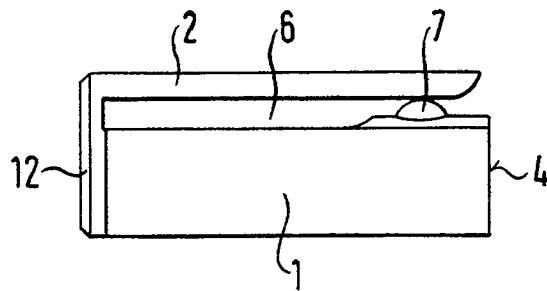


Fig. 8

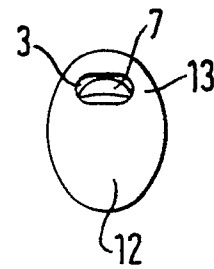


Fig. 7

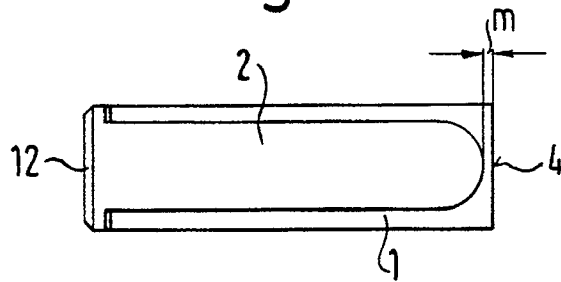


Fig. 9

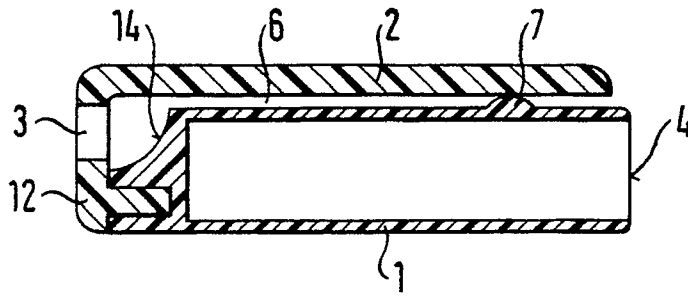


Fig. 10



Fig. 12

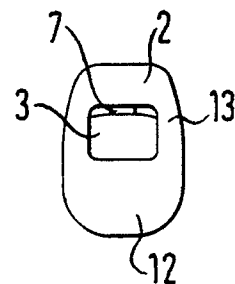


Fig. 11

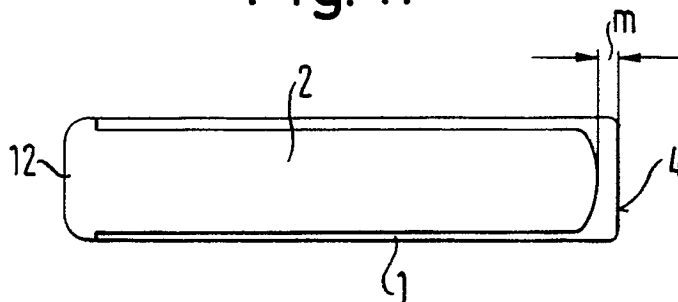


Fig. 13

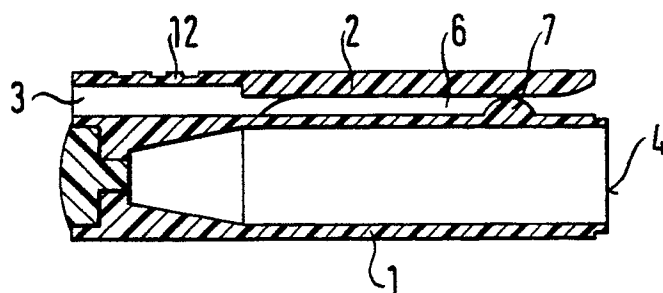


Fig. 14

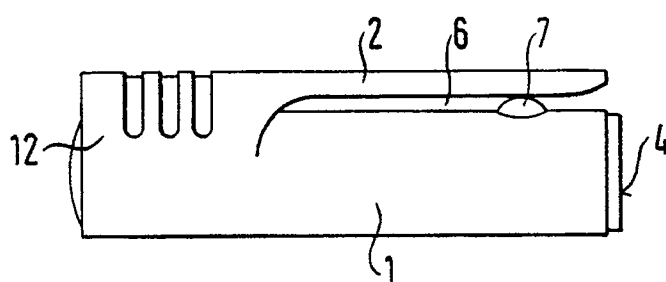


Fig. 16

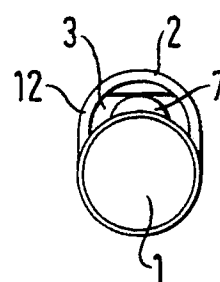


Fig. 15

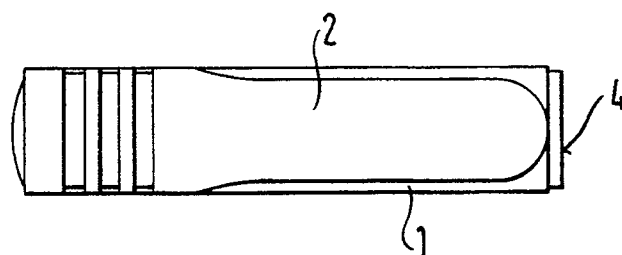


Fig. 17

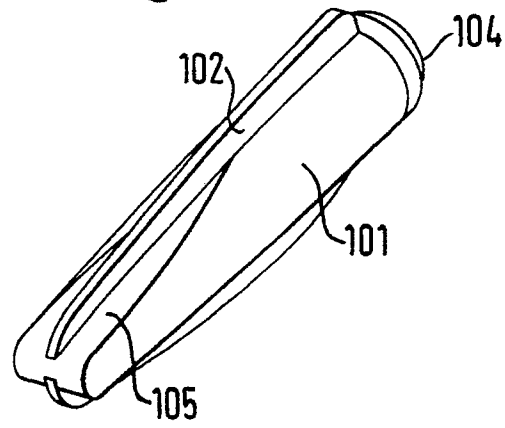


Fig. 18

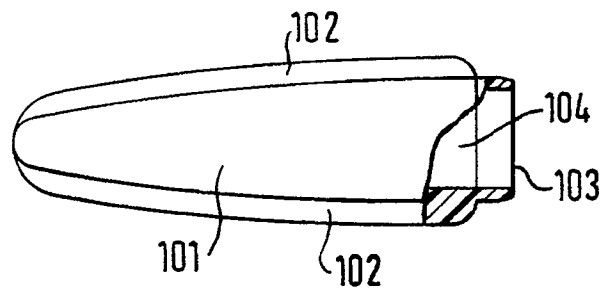


Fig. 19

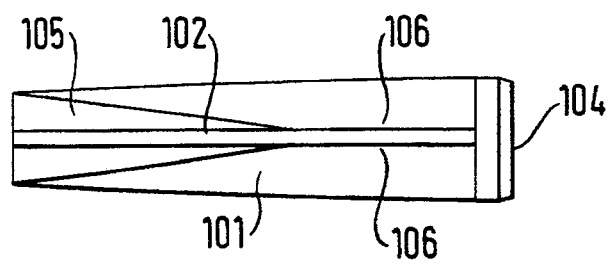


Fig. 20

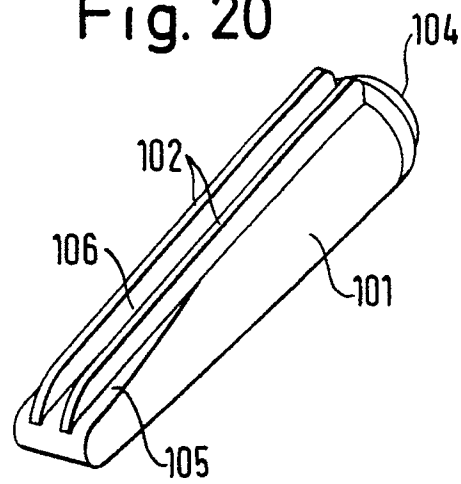


Fig. 22

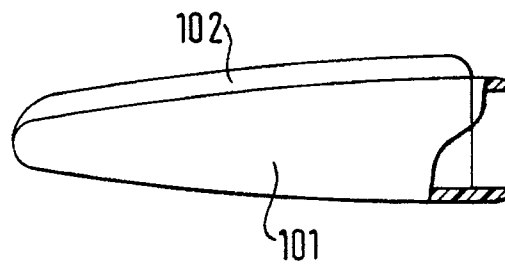


Fig. 21

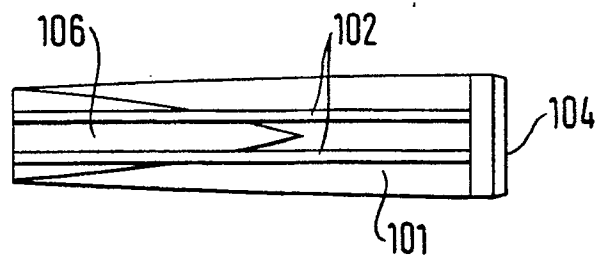


Fig. 23

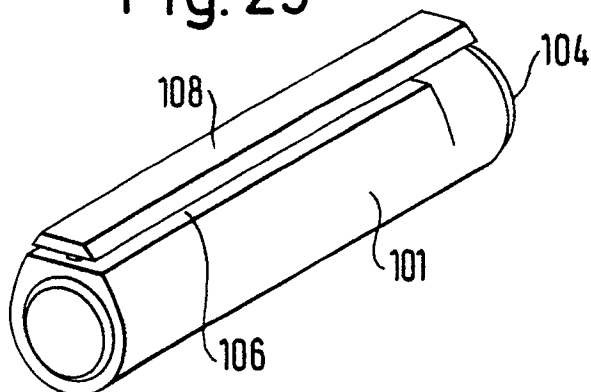


Fig. 24

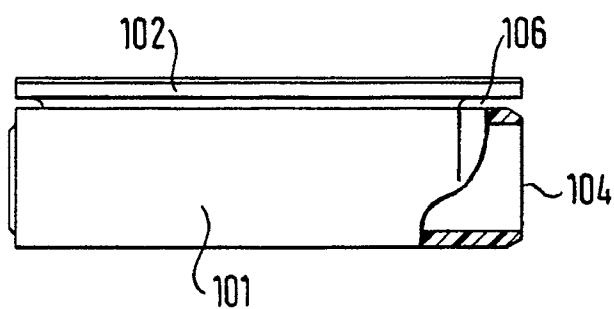


Fig. 26

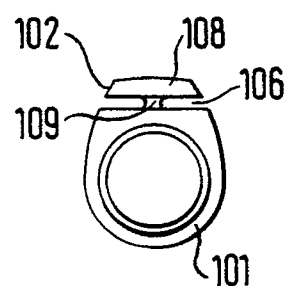


Fig. 25

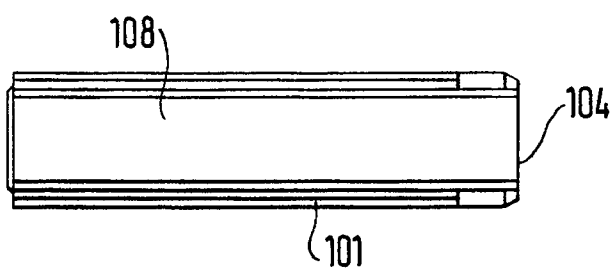


Fig. 27

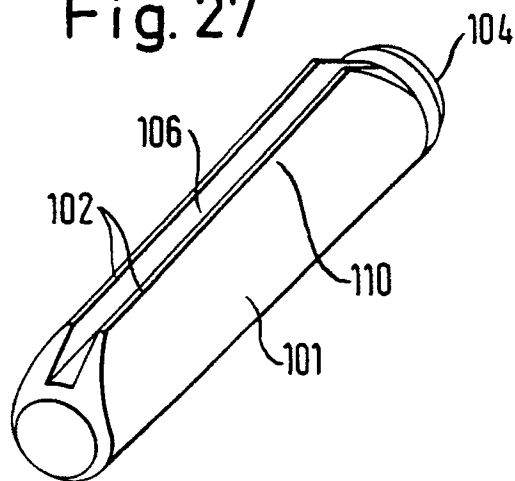


Fig. 29

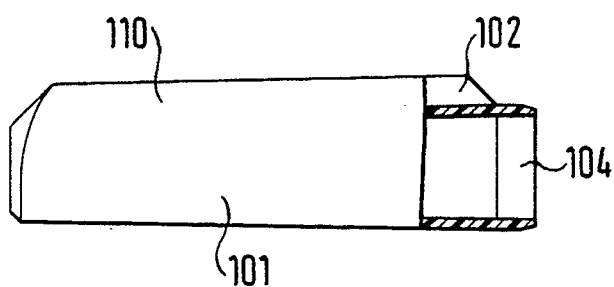


Fig. 30

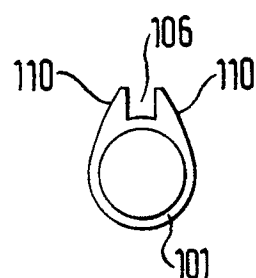


Fig. 28

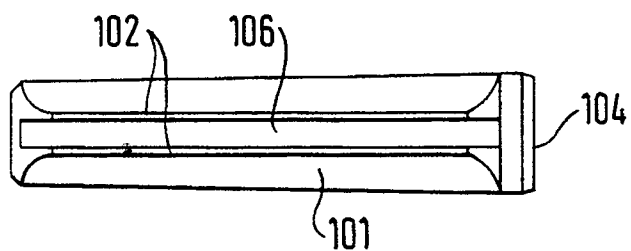


Fig. 31

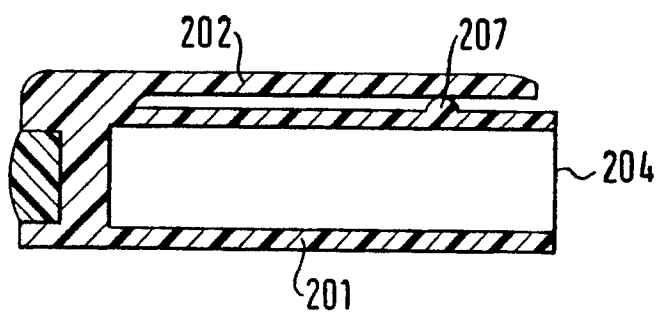


Fig. 32

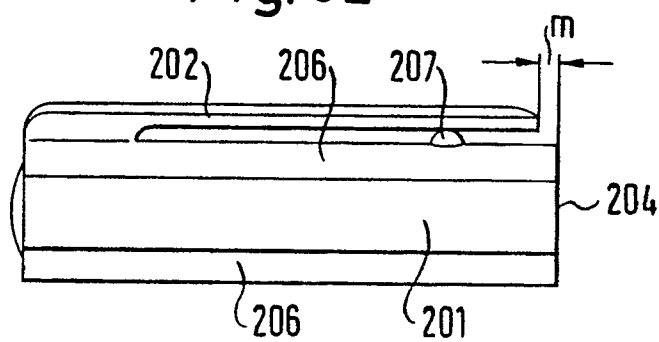


Fig. 34

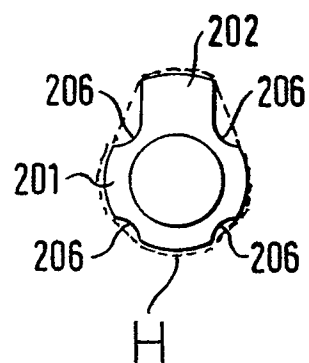
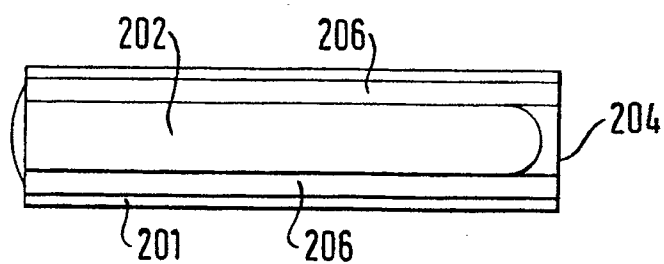


Fig. 33





EUROPEAN SEARCH REPORT

EP 90 10 4659

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)
X,A	EP-A-0 319 311 (ASHPOLE) * the whole document * - - -	1-3,5,8, 12,4	B 43 K 9/00
X,A	DE-U-8 908 065 (STAEDTLER) * page 3, line 6 - page 4, line 14 * - - -	1,5,9,11,6	
A	GB-A-2 174 374 (PLATIGNUM) * the whole document * - - -	1,5,6	
E	DE-U-8 907 626 (STAEDTLER) * page 3, line 26 - page 4, line 23 * - - -	1,5,6,8	
E	EP-A-0 395 797 (FABER-CASTELL) * column 4, lines 20 - 36 * - - - - -	1,5,6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 43 K
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of search 05 March 91	Examiner LAMMINEUR P.C.G.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			