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(54) **PEN WITH DETACHABLE MEANS FOR EXTRACTING NIB AND METHOD OF EXTRACTING NIB USING SAID MEANS**

STIFT MIT ABLÖSBAREM MITTEL ZUM HERAUSZIEHEN DER SPITZE UND VERFAHREN ZUM  
HERAUSZIEHEN DER SPITZE UNTER VERWENDUNG DES MITTELS

STYLO A DISPOSITIF AMOVIBLE D'EXTRACTION DE LA POINTE ET PROCEDE D'EXTRACTION  
DE LA POINTE UTILISANT CE DISPOSITIF

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**EP-A1- 0 657 306 US-A- 4 952 088**

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## Description

### Field of the Invention

**[0001]** The invention relates to a pen of the type stated in the preamble to claim 1. Moreover the invention relates to a method for removing a pen point according to the preamble to claim 11.

### Background Art

**[0002]** A type of pen which occurs frequently on the market has a pen body with an ink stick which is removably arranged therein and which at its one end has a pen point and is insertable and extractable through the open end of the pen body. An ink cartridge with a pen point is referred to as ink stick. Access is gained to the ink stick by removing a nose cone which is screwably arranged on the front part of the pen body and which, when being unscrewed, leaves such a long part of the cartridge behind that the user can remove the cartridge by hand from the pen body when, for instance, exchanging the cartridge. The nose cone has a plurality of drawbacks. It must be unscrewed, which makes the exchange of the ink cartridge difficult. The nose cone is a loose part which can easily be lost when exchanging the ink cartridge. Moreover the nose cone makes the manufacture of the pen more expensive.

**[0003]** US-4,952,088 shows how a clip arranged on the cap of the pen can be used for form-fit engagement with a specially adapted nose cone, the clip/cap serving as a lever to unscrew the nose cone from the pen body. A problem of the clip according to US-4,952,088 is that the pen point must be specially designed or alternatively must be combined with a nose cone. Moreover, the possibilities of designing the pen are limited by the construction of the clip.

**[0004]** EP-0 657 301 A1 shows how a pen point can be extracted from a pen body with the aid of an engaging means arranged on the cap. The engaging means is designed for form-fit engagement with a specially adapted groove in an adaptor sleeve mounted around the pen point. Some problems of the engaging means according to EP-0 657 301 A1 are its restriction of the possibilities of designing the pen, the risk of it getting stuck, for instance, in the user's clothes, and the necessary cooperation with a specially adapted adaptor sleeve.

**[0005]** Besides conventional writing materials, also so-called digital pens have recently been developed, which contain sensors and electronics for digital recording of what is being written by means of the pen on a base. Different types of sensors can be arranged in the pen for determining its position, for instance acceleration sensors, as disclosed in US-A-5,434,371 and US-A-6,130,666, optical sensors, as described in US-A-5,294,792, US-A-5,852,434 and WO 00/73983, pressure sensors, as described in US-A-6,104,388, or mechanical sensors, as described in US-A-5,294,792 and US-A-

6,130,666. For reasons of security, the pen body of such digital pens is frequently designed to prevent access to the interior of the pen and the sensitive components therein. The ink stick is therefore inserted into a duct extending into the pen body from its writing end. Like in ordinary pens of this type, it is difficult for the user to exchange the ink stick, whether the pen has a nose cone or not.

### Summary of the Invention

**[0006]** Thus the present invention relates to a pen of the type described by way of introduction, which solves the above problems, the pen having obtained the features as defined in the characterising clause of claim 1.

**[0007]** The present invention further relates to a method for removing a pen point of the type described above, the method having obtained the features as defined in the characterising clause of claim 11.

### Brief Description of the Drawings

**[0008]** Embodiments of the invention according to its different aspects are evident from the dependent claims and the following description, reference being made to accompanying schematic drawings.

Fig. 1 is a longitudinal sectional view of an embodiment of a pen according to the invention.

Figs 2A-2C are side views of releasable clips according to different embodiments of the invention.

Fig. 3 is a perspective view of a clip with a hole in its flat side.

Figs 4A-C are plan views of clips with holes according to three different embodiments.

Figs 5A-5B are a sequence of perspective views to illustrate an embodiment of a method for removing a pen point according to the invention.

Fig. 6 is side view of one more embodiment of a pen according to the invention with inner parts indicated by dashed lines.

Fig. 7 is a side view of a removable cap according to an embodiment of the invention.

Fig. 8 is an end view of a removable cap provided with a clip having a hole for engagement with a pen point.

### Detailed Description of Embodiments of the Invention

**[0009]** With reference to Fig. 1, an embodiment of a pen according to the invention is shown, comprising a pen body 1, an ink cartridge arranged in the pen body and having a pen point 3 and a part, such as a clip 4, which is removably arranged on the pen body 1.

**[0010]** The ink cartridge 2 and the pen point 3 may form an ink stick which is exchangeable in its entirety. Alternatively, the pen point 3 can be inserted into the ink cartridge 2 and define a distinguishable part, filling of the

ink cartridge 2 being allowed after removal of the pen point 3.

**[0011]** In the embodiment according to Fig. 1, the pen point 3 or the ink stick in its entirety can be releasably arranged in the pen body 1 in various ways.

**[0012]** According to one embodiment, it is possible to use some kind of fit between complementary elements which may be arranged projecting from the inner wall of the pen body 1 and/or from the pen point/ink stick, and which may cooperate to cause locking or anchoring of the pen point or ink stick, which anchoring can be released under the action of a pulling force exerted on the pen point 3. Such elements may comprise, for instance, flaps, beads etc. Alternatively, it is possible to form the inside of the pen body so that the pen point or ink stick is kept in place by press fit, which can also be neutralised under the action of a pulling force.

**[0013]** Various examples of means for adequate exertion of the above-mentioned pulling force follow below. In all cases, these means are included in a part which is removably arranged on the pen body 1. A common feature of the following exemplifying embodiments is that they allow squeezing engagement with the pen point, so that the pen point can be extracted from the pen body, for instance for exchanging the ink stick or for filling the ink cartridge. The application of the pulling force can, via the squeezing engagement, be executed independently of the nature of the pen point. If the pen point has, for instance, an essentially smooth peripheral surface, the squeezing engagement may result in a frictional force which is sufficient to allow application of the pulling force. If the pen point instead has a profiled peripheral surface, the component or components applying squeezing forces may engage arbitrary protrusions, grooves, flaps etc. on the peripheral surface.

**[0014]** The accompanying drawings illustrate several examples of how the squeezing engagement can be performed.

**[0015]** According to Figs 2A and 3-5, the clip can be provided with a hole in the form of a through hole. According to Figs 2C and 7, the clip and a protective cap, respectively, can be provided with a hole in the form of a blind hole. By "blind hole" is meant a non-through hole.

**[0016]** The shown holes in the form of through holes and blind holes may have a constant cross-section in depth. Alternatively, this cross-section may vary (not shown) over the depth of the hole. Thus, the hole can be tapering or widening in depth. The openings of a through hole may also be of different configurations, for instance different sizes or shapes.

**[0017]** According to Fig 8, the squeezing engagement can be performed by interaction between two parts, such as the cap 11 and the clip 4 in Fig. 8.

**[0018]** According to the embodiments where the means arranged on the movable part 4 is a hole 5, this is formed so that it may be caused, by squeezing action, to engage the pen point 3 for extraction thereof. The hole 5 is dimensioned, so that by exerting a force, for instance

a frictional force, it may temporarily hold the pen point 3 to allow removal thereof from the pen body. The hole may have different shapes. A simple embodiment is shown in Fig. 3, where the hole is essentially circular. According to an alternative embodiment, shown in Fig. 4A, the hole is elongate and has wedge-shaped end portions. In the embodiment according to Fig. 4B, the hole is formed as a triangle, and in the embodiment according to Fig. 4C, the hole has the form of a "keyhole".

**[0019]** With reference to Fig. 5, it is shown how a hole 5 as described above can be used to remove the pen point 3, and thus optionally the entire ink stick, from the pen body. The pen point 3 is caused to engage in the hole 5 by inclination/angling of these two relative to each other. In step B, the pen point 3 is placed in the hole. In step C, the pen body is angled so that the pen point 3 is fastened in the hole 5, and in step D the pen point/ink stick is extracted. The actions that are taken in step C are modifiable according to the appearance or function of the hole.

**[0020]** The clip 4 may be formed as a separate elongate holding part 7 (Fig. 2), which at one end is attached to the pen body or a protective cap and which at its other end possibly has a bend 6 or bead which acts to better hold the pen in place when carried, for instance, in a user's pocket. The elongate holding part 7 of the clip may be elongate, for instance rectangular, in cross-section, so that a flat side is formed, as is evident from Figs 3-5.

**[0021]** According to an embodiment, which is shown in Fig. 2A, the clip has a fixing flange 8, which makes an angle with the elongate holding part 7 of the clip. The angle may be right, but other, larger or smaller, angles are feasible. The fixing flange 8 can be releasably anchored to the pen body 1 at the rear end thereof, for instance by means of a screw, a locking pin, a snap connection, via a press fit or some other fixing means having an equivalent function. Alternatively, the fixing flange 8 may correspondingly be releasably anchored in a groove extending transversely of the longitudinal direction of the pen, which groove may be formed in the pen body 1 or the protective cap 11. The clip in Fig. 2A has a hole 5 in the fixing flange 8, in the form of a through hole or a blind hole for the above engagement with the pen point 3. Alternatively (not shown), the hole 5 may be formed in the holding part 7.

**[0022]** According to an embodiment as shown in Fig. 2C, there is a hole 5 in the form of a blind hole in the clip, so formed that the pen point 3 can be caused to engage the boundary surfaces of the hole. Also in this embodiment, the hole may have a cross-section varying in depth.

**[0023]** With reference to Fig. 6, one more embodiment of a pen according to the invention is shown, in which the part 4, which is removably arranged on the pen body 1, is a protective cap 11 with a clip 4. This clip may, like in the embodiments described with reference to Figs 1-4, have a hole 5 on its flat side in the form of one or more through holes or blind holes. Such a clip may be formed in one piece with the protective cap 11, or as a separate

part.

**[0024]** An alternative is shown in Fig. 7, viz. a cap 11 with an engaging hole 5 in its one, normally closed end. It will be appreciated that the hole 5 can either be a blind hole or a through hole, and that the hole 5 can be arranged in an arbitrary position in the cap 11.

**[0025]** With reference to Fig. 8, which shows one end of a cap with a clip 4, seen from the open end of the cap, there may be formed according to a further alternative, on the underside of the clip 4 at its distal end, a projection with a hole 5 for engaging the pen point projecting from the pen body. Alternatively or besides (not shown), the projection can be formed on the pen body to define said hole 5. For removing the pen point or the ink stick, the pen point can be inserted into the hole 5, after which the cap 11 and the pen body 1 are angled to each other to provide the engagement similarly to the above embodiments involving a through hole or a blind hole.

**[0026]** Finally, it should be emphasised that the invention is not limited to the embodiments described and may be varied within the scope of the appended claims.

## Claims

1. A pen comprising a pen body (1) and a pen point (3) releasably arranged in the pen body (1), and a part (4) removably arranged on the pen body (1), wherein the part (4) has a hole (5) which has the form of a through hole or a blind hole and is arranged to provide for insertion of the pen point (3), **characterized in that** the releasable arrangement of the pen point in the pen body and the hole are formed so that subsequent angling of the pen point (3) and the hole (5) relative to each other brings the hole into squeezing engagement with the pen point (3), allowing the pen point (3) to be removed from the pen body (1) by the action of a pulling force exerted on the pen point (3) by the part (4), via the squeezing engagement:
2. A pen as claimed in claim 1, **characterised in that** the pen point (3) together with an ink cartridge (2) forms an ink stick, which is arranged to be removed from the pen as the pen point (3) is being removed.
3. A pen as claimed in claim 1 or 2, **characterised in that** the part (4) is a clip or a cap (11) protecting the pen point (3).
4. A pen as claimed in claim 3, **characterised in that** the hole (5) is a through hole on the flat side of the clip (4).
5. A pen as claimed in claim 4, **characterised in that** the hole is elongate.
6. A pen as claimed in claim 4, **characterised in that** the hole is triangular.

7. A pen as claimed in claim 4, **characterised in that** the hole has the form of a keyhole.

8. A pen as claimed in claim 1, **characterised in that** the hole (5) is arranged in a cap (11) protecting the pen point (3).

9. A pen as claimed in claim 1, **characterised in that** the part (4) which is removably arranged on the pen body (1) comprises a clip (4) with an elongate holding part (7) extending along a portion of the pen body (1), and a fixing flange (8) making an angle with the holding part (7), the fixing flange (8) being releasably arranged on the pen body (1) at the rear end thereof.

10. A pen as claimed in claim 9, **characterised in that** the hole (5) is formed in the fixing flange (8).

11. A method for removing a pen point (3) in a pen comprising a pen body (1) and a part (4) removably arranged on the pen body (1), comprising the step of inserting the pen point (3) into a hole in the part (4), wherein the hole (5) has the form of a through hole or a blind hole and is arranged to provide for insertion of the pen point (3), **characterized in that** the releasable arrangement of the pen point in the pen body and the hole are formed so that subsequent angling of the pen point (3) and the hole (5) relative to each other brings the hole into squeezing engagement with the pen point (3), and the method further comprises the steps of  
angling the pen point (3) and the hole (5) relative to each other to bring the hole into squeezing engagement with the pen point (3), and  
removing the pen point (3) from the pen body (1) by the action of a pulling force exerted on the pen point (3) by the part (4), via the squeezing engagement.

## Patentansprüche

1. Schreibstift mit einem Schreibstiftkörper (1) und einer lösbar im Schreibstiftkörper (1) angeordneten Schreibstiftspitze (3) und einem entfernbar am Schreibstiftkörper (1) angeordneten Teil (4), wobei das Teil (4) ein Loch (5) hat, das die Form eines Durchgangslochs oder eines Sacklochs hat und so angeordnet ist, dass die Schreibstiftspitze (3) eingeführt werden kann, **dadurch gekennzeichnet, dass** die lösbare Anordnung der Schreibstiftspitze im Schreibstiftkörper und das Loch so ausgebildet sind, dass das Loch (5) durch nachfolgende winkelförmige Anordnung der Schreibstiftspitze (3) und des Lochs zueinander in Quetscheingriff mit der Schreibstiftspitze (3) kommt, wodurch die Schreibstiftspitze (3) durch die Wirkung einer durch das Teil (4) mittels des Quetscheingriffs auf die Schreibstiftspitze (3) ausgeübten Zugkraft vom Schreibstiftkörper

per (1) entfernt werden kann.

2. Schreibstift nach Anspruch 1, **dadurch gekennzeichnet, dass** die Schreibstiftspitze (3) zusammen mit einer Tintenpatrone (2) einen Tintenstift bildet, der so angeordnet ist, dass er vom Schreibstift entfernt wird, während die Schreibstiftspitze (3) entfernt wird. 5
3. Schreibstift nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Teil (4) ein Clip oder eine Kappe (11) ist, die die Schreibstiftspitze (3) schützt. 10
4. Schreibstift nach Anspruch 3, **dadurch gekennzeichnet, dass** das Loch (5) ein Durchgangsloch an der flachen Seite des Clips (4) ist. 15
5. Schreibstift nach Anspruch 4, **dadurch gekennzeichnet, dass** das Loch länglich ist. 20
6. Schreibstift nach Anspruch 4, **dadurch gekennzeichnet, dass** das Loch dreieckig ist. 25
7. Schreibstift nach Anspruch 4, **dadurch gekennzeichnet, dass** das Loch die Form eines Schlüssel-lochs hat. 30
8. Schreibstift nach Anspruch 1, **dadurch gekennzeichnet, dass** das Loch (5) in einer Kappe (11) angeordnet ist, die die Schreibstiftspitze (3) schützt. 35
9. Schreibstift nach Anspruch 1, **dadurch gekennzeichnet, dass** das entfernbar am Schreibstiftkörper (1) angeordnete Teil (4) einen Clip (4) mit einem länglichen Halteteil (7), das sich entlang einem Abschnitt des Schreibstiftkörpers (1) erstreckt, und einen Befestigungsflansch (8) umfasst, der mit dem Halteteil (7) einen Winkel einnimmt und lösbar am hinteren Ende des Schreibstiftkörpers (1) angeordnet ist. 40
10. Schreibstift nach Anspruch 9, **dadurch gekennzeichnet, dass** das Loch (5) im Befestigungsflansch (8) ausgebildet ist. 45
11. Verfahren zum Entfernen einer Schreibstiftspitze (3) in einem Schreibstift mit einem Schreibstiftkörper (1) und einem entfernbar am Schreibstiftkörper (1) angeordneten Teil (4) mit folgendem Schritt: 50

Einführen der Schreibstiftspitze (3) in ein Loch im Teil (4), wobei das Loch (5) die Form eines Durchgangslochs oder eines Sacklochs hat und so angeordnet ist, dass die Schreibstiftspitze (3) eingeführt werden kann, **dadurch gekennzeichnet, dass** die lösbare Anordnung der Schreibstiftspitze im Schreibstiftkörper und das Loch so 55

ausgebildet sind, dass das Loch (5) durch nachfolgende winkelförmige Anordnung der Schreibstiftspitze (3) und des Lochs zueinander in Quetscheingriff mit der Schreibstiftspitze (3) kommt, wobei das Verfahren ferner folgende Schritte umfasst:

winkelförmiges Anordnen der Schreibstiftspitze (3) und des Lochs (5) zueinander, um das Loch in Quetscheingriff mit der Schreibstiftspitze (3) zu bringen, und Entfernen der Schreibstiftspitze (3) vom Schreibstiftkörper (1) durch die Wirkung einer durch das Teil (4) mittels des Quetscheingriffs auf die Schreibstiftspitze (3) ausgeübten Zugkraft.

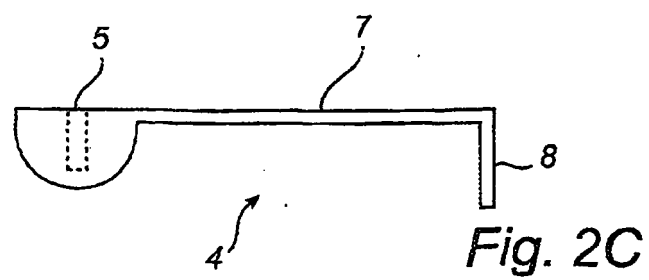
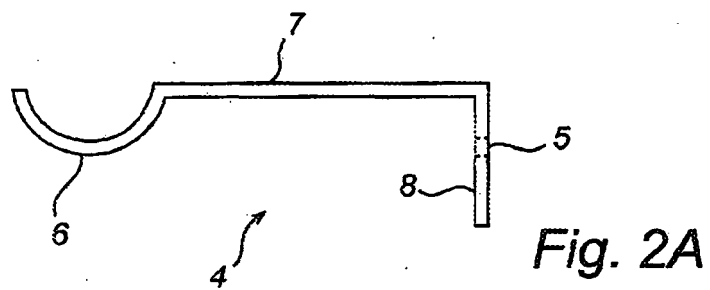
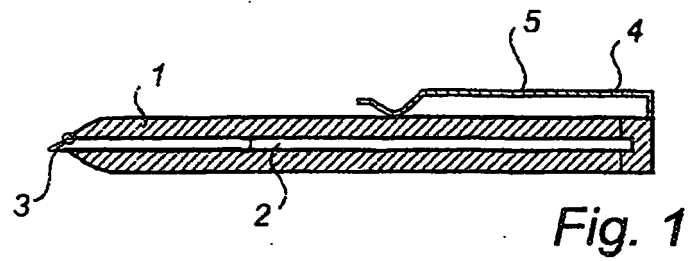
## Revendications

1. Stylo comprenant un corps (1) de stylo, une pointe (3) de stylo disposée de façon à pouvoir être dégagée dans le corps (1) de stylo et une pièce (4) disposée de façon amovible sur le corps (1) de stylo, dans lequel la pièce (4) comporte un trou (5) qui a la forme d'un trou débouchant ou d'un trou borgne et est disposé pour assurer l'introduction de la pointe (3) de stylo, **caractérisé en ce que** la disposition dégageable de la pointe de stylo dans le corps de stylo et le trou sont formés de telle sorte qu'une orientation ultérieure de la pointe (3) de stylo et du trou (5) l'un par rapport à l'autre amène le trou à s'enclencher par pression avec la pointe (3) de stylo, permettant à la pointe (3) de stylo d'être retirée du corps (1) de stylo sous l'action d'une force de traction exercée sur la pointe (3) de stylo par la pièce (4), via l'enclenchement par pression.
2. Stylo selon la revendication 1, **caractérisé en ce que** la pointe (3) de stylo forme avec une cartouche (2) d'encre une recharge d'encre, qui est disposée pour être retirée du stylo lorsqu'on en retire la pointe (3) de stylo.
3. Stylo selon la revendication 1 ou 2, **caractérisé en ce que** la pièce (4) est une agrafe ou un capuchon (11) protégeant la pointe (3) de stylo.
4. Stylo selon la revendication 3, **caractérisé en ce que** le trou (5) est un trou débouchant sur le côté plat de l'agrafe (4).
5. Stylo selon la revendication 4, **caractérisé en ce que** le trou est allongé.
6. Stylo selon la revendication 4, **caractérisé en ce que** le trou est triangulaire.

7. Stylo selon la revendication 4, **caractérisé en ce que** le trou a la forme d'un trou de serrure.
8. Stylo selon la revendication 1, **caractérisé en ce que** le trou (5) est disposé dans un capuchon (11) protégeant la pointe (3) de stylo. 5
9. Stylo selon la revendication 1, **caractérisé en ce que** la pièce (4) qui est disposée de façon amovible sur le corps (1) de stylo comprend une agrafe (4) avec une partie de maintien (7) allongée s'étendant le long d'une partie du corps (1) de stylo et une flasque de fixation (8) faisant un angle avec la partie de maintien (7), la flasque de fixation (8) étant disposée de façon à pouvoir être dégagée sur le corps (1) de stylo à l'extrémité arrière de celui-ci. 10 15
10. Stylo selon la revendication 9, **caractérisé en ce que** le trou (5) est pratiqué dans la flasque de fixation (8) 20
11. Procédé pour retirer une pointe (3) de stylo dans un stylo comprenant un corps (1) de stylo et une pièce (4) disposée de façon amovible sur le corps (1) de stylo, comprenant l'étape consistant à introduire la pointe (3) de stylo dans un trou dans la pièce (4), le trou (5) ayant la forme d'un trou débouchant ou d'un trou borgne et étant disposé pour assurer l'introduction de la pointe (3) de stylo, **caractérisé en ce que** la disposition dégageable de la pointe de stylo dans le corps de stylo et le trou sont formés de telle sorte qu'une orientation ultérieure de la pointe (3) de stylo et du trou (5) l'un par rapport à l'autre amène le trou à s'enclencher par pression avec la pointe (3) de stylo, 25 30 35  
le procédé comprenant en outre les étapes consistant à  
orienter la pointe (3) de stylo et le trou (5) l'un par rapport à l'autre pour amener le trou à s'enclencher par pression avec la pointe (3) de stylo, 40  
et  
retirer la pointe (3) de stylo du corps (1) de stylo sous l'action d'une force de traction exercée sur la pointe (3) de stylo par la pièce (4), via l'enclenchement par pression. 45

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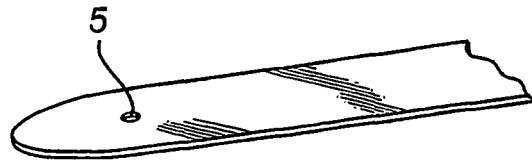


*Fig. 3*

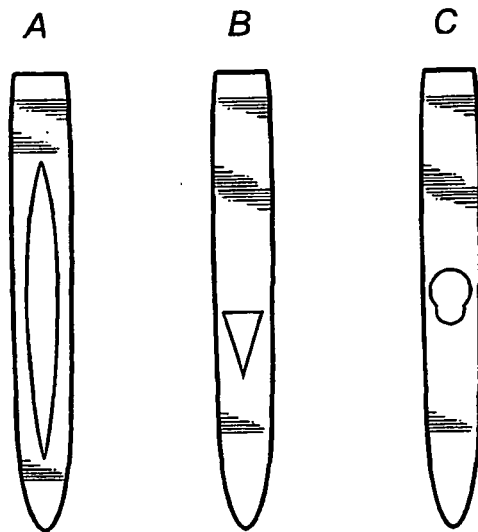


*Fig. 4*

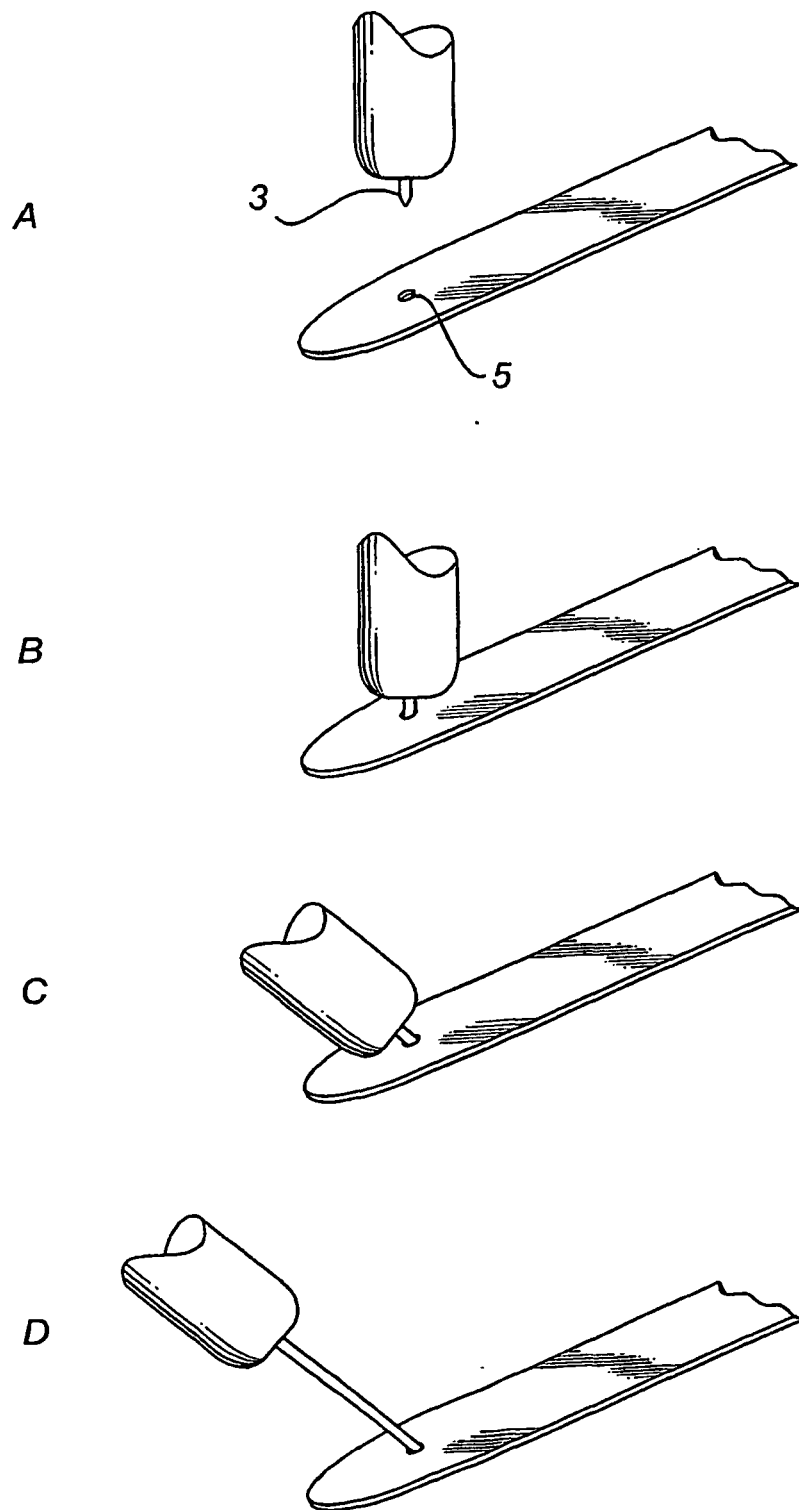


*Fig. 5*

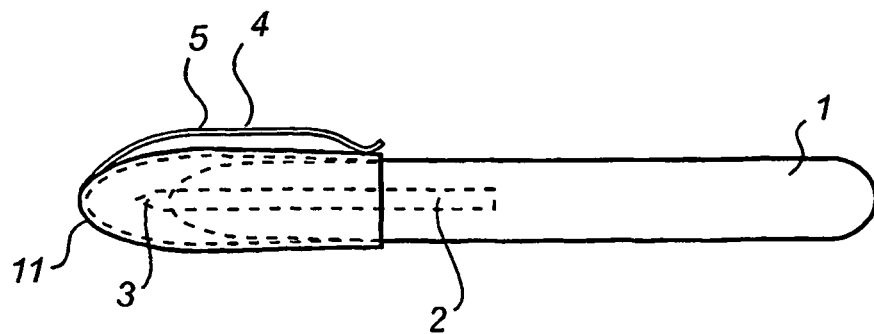


*Fig. 6*

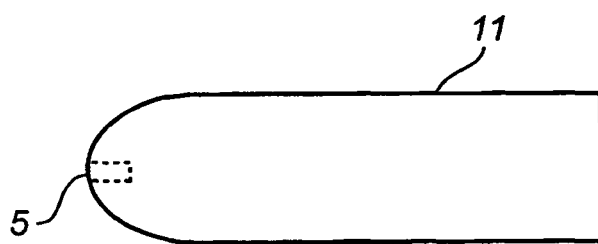


*Fig. 7*

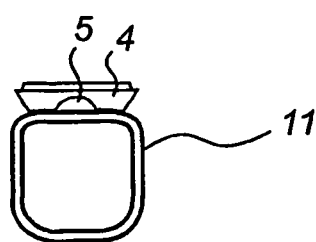


*Fig. 8*

**REFERENCES CITED IN THE DESCRIPTION**

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