(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 458 326 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **91108340.0**

(22) Date of filing: **23.05.91**

(51) Int. Cl.[5]: **B43K 27/12**, B43K 25/00, B43K 24/08

(30) Priority: **24.05.90 JP 53600/90**

(43) Date of publication of application: **27.11.91 Bulletin 91/48**

(84) Designated Contracting States: **DE FR GB**

(71) Applicant: **Tokai Corporation**
2181-7, Enokiyado Kita-hassaku-cho
Midori-ku Yokohama(JP)

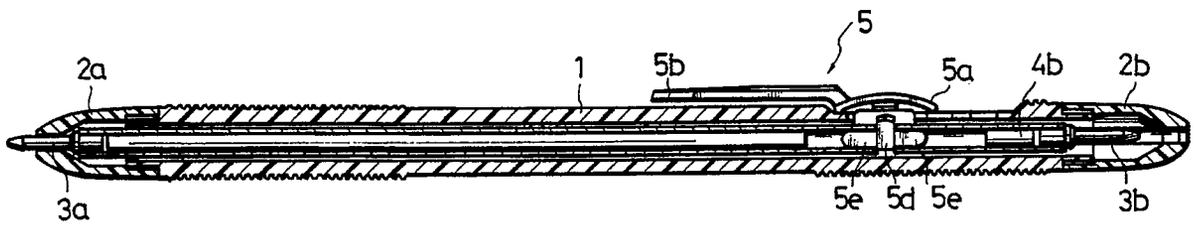
(72) Inventor: **Shike, Tsutomu, c/o Tokai Corp.**
Main Factory, 3-4, Subashiri Shimobara
Oyama-cho, Suntou-gen, Shizuoka-ken(JP)
Inventor: **Suzuki, Takayuki, c/o Tokai Corp.**
Main Factory, 3-4, Subashiri Shimobara
Oyama-cho, Suntou-gen, Shizuoka-ken(JP)
Inventor: **Ichikawa, Toshihiro, c/o Tokai Corp.**
Main Factory, 3-4, Subashiri Shimobara
Oyama-cho, Suntou-gen, Shizuoka-ken(JP)

(74) Representative: **Vossius & Partner**
Siebertstrasse 4 P.O. Box 86 07 67
W-8000 München 80(DE)

(54) Automatic writing instrument.

(57) The invention relates an automatic writing instrument comprising a hollow barrel (1) having a longitudinal slot and lateral sub-slots made therein, a clip slider (5) slidably fitted in the longitudinal slot, and a writing stick (3a,3b) connected to the clip slider (5) so that forward and backward advance of the clip slider in the longitudinal slot may cause the writing stick to appear and disappear from either end (2a,2b) of the barrel (1). The clip slider (5) is fitted in the longitudinal slot so that it may be caught by a selected lateral slot in its stress-free, floating condition, thereby preventing the writing stick (3a,3b) from sliding in the barrel(1), and so that it may be yieldingly depressed in the barrel, thereby releasing the clip slider (5) from the selected lateral sub-slot to permit the writing stick (3a,3b) to slide in the barrel-(1). The operation can be effected by a single hand. Advantageously, the automatic writing instrument uses no springs to hold the writing stick in the barrel, thus making it easy to assemble parts into a writing instrument.

FIG. 12



EP 0 458 326 A1

The present invention relates to an improvement in or relating to writing instruments such as ball-point pens, felt-tip pens, markers etc. The present invention relates particularly to an automatic writing instrument which is designed so as to permit the switching from locking to unlocking position simply by depressing its clip, and drive its writing stick forward or backward simply by pushing and sliding its clip in forward or backward direction. Advantageously, such an automatic writing instrument requires a least number of parts to be assembled together.

Two-colored ball-point pens, felt-tip pens, or markers each having a thumb-thrust slidably fitted in a slot made in its hollow barrel are shown in Japanese Utility Models 57-11081(A) and 62-172091(A). The hollow barrel contains two cartridges, which are fixed to the opposite sides of the thumb thrust, and are resiliently connected to and supported from the opposite ends of the barrel. Each end of the barrel has a small hole to permit the ball-point of each cartridge to appear in response to the forward or backward advance of the thumb-thrust.

Such automatic writing instrument, however, requires the use of springs to resiliently hold its thumb-thrust and cartridges in its hollow barrel. Disadvantageously, the use of extra springs increases the number of parts to be assembled, and hence complication in assembling, and accordingly manufacturing cost.

In view of the above one object of the present invention is to provide an automatic writing instrument using no springs, thus reducing the number of parts to be assembled, making it easier to assemble automatic writing instruments, and accordingly reducing the manufacturing cost.

To attain this object an automatic writing instrument according to the present invention comprises: a hollow barrel having a longitudinal slot and lateral sub-slots made therein; a clip slider slidably fitted in the longitudinal slot; and a writing stick connected to the clip slider so that forward and backward advance of the clip slider in the longitudinal slot may cause the writing stick to appear and disappear from either end of the barrel; the clip slider being so designed that it may be caught by a selected lateral slot in its stress-free, floating condition, thereby preventing the writing stick from sliding in the barrel, and so that it may be yieldingly depressed in the barrel, thereby releasing the clip slider from the selected lateral sub-slot to permit the writing stick to travel in the barrel. The clip slider may comprise a thumb-thrust which is in the form of arch; a clip integrally connected to the rear end of the thumb-thrust; a guide piece integrally connected to the bottom of the thumb-thrust, and adapted to be slidably fitted in the longitudinal slot; and a lateral catch integrally connected to said guide piece to fit in a selected lateral sub-slot when the clip slider is put in its stress-free, floating condition. The clip slider may comprise further thrust rods extending axially from the lateral catch in opposite directions.

With this arrangement the writing stick can be easily released from the locking position simply by depressing the clip slider down, thereby permitting the forward or backward sliding of the clip slider in the longitudinal slot to cause the writing stick to appear from either end of the barrel. This operation can be effected with a single hand.

The clip slider is retained normally in its locking position in which its lateral catch is caught by a selected lateral sub-slot, thereby preventing the sliding of the clip slider in the longitudinal slot of the hollow barrel. The clip slider can be released from its locking position simply by depressing the thumb-thrust, thereby permitting the sliding of the clip slider in the longitudinal slot of the hollow barrel. The clip slider will be put in normal, locking position when the thumb-thrust resiliently returns to its stress-free, original shape subsequent to the cease of depression of the thumb-thrust.

Thanks to use of no springs an automatic writing instrument according to the present invention is simple in structure, compared with the conventional automatic writing instruments, and accordingly assembling work is less complicated, and the manufacturing cost is lowered.

Other objects and advantages of the present invention will be understood from the following description of an automatic writing instrument according to the present invention, which is shown in accompanying drawings.

Fig. 1 is a plane view of an automatic writing instrument according to the present invention;

Fig. 2 is a side view of the automatic writing instrument;

Fig. 3 is a longitudinal section of the automatic writing instrument, partly omitted;

Fig. 4 is a perspective view of a clip slider;

Fig. 5A is a cross section of the automatic writing instrument taken along the line 5A-5A in Fig. 1;

Fig. 5B is a cross section of the automatic writing instrument taken along the line 5B-5B in Fig. 1;

Fig. 6 is a plane view of a part of the automatic writing instrument with its clip slider removed;

Figs. 7 to 9 show, in section at an enlarged scale, the manner in which the clip slider works;

Fig. 10 is a cross section of the automatic writing instrument, showing the locking position in which the clip slider cannot move;

Fig. 11 is a cross section of the automatic writing instrument, showing the unlocking posi-

tion in which the clip slider can move;

Fig. 12 is a longitudinal section of the automatic writing instrument, partly omitted, and showing the position in which the writing stick projects from the left end of the instrument;

Fig. 13 is a longitudinal section of the automatic writing instrument, partly omitted, and showing the position in which the writing stick is pulled in the hollow barrel, and cannot be used;

Fig. 14 is a longitudinal section of the automatic writing instrument, partly omitted, and showing the position in which the writing stick projects from the right end of the instrument; and

Fig. 15 is an exploded view of the automatic writing instrument.

The accompanying drawings show a two-colored ball-point pen according to the present invention which comprises a hollow barrel 1 having round caps 2a threadedly engaged with its opposite ends, and two cartridges 4a and 4b having ball points 3a and 3b detachably fixed to one ends of these cartridges. Each cap 2a has a small hole at its top, thereby permitting the ball point to appear from the barrel 1. Each of longer and shorter cartridges 4a and 4b contain a different color ink. The longer cartridge 4a contains ink of the color which is used much more frequently than that contained in the shorter cartridge 4b.

The hollow barrel 1 is made of a synthetic resin, and its opposite ends have threads (Fig. 15) to permit thread engagement of opposite caps 2a therewith. As best seen from Figs. 6 and 15, the barrel 1 has a longitudinal slot 11 and three lateral sub-slots 11b. These lateral sub-slots 11b are arranged at predetermined intervals. The clip slider 5 can be fitted in the longitudinal slot 11a. The longitudinal slot length limits the sliding stroke of the clip slider 5.

As best seen from Fig. 4, a clip slider 5 comprises a thumb thrust 5a which is in the form of arch, a clip 5b integrally connected to the rear end of the thumb thrust 5a, a guide piece 5c integrally connected to the bottom of the thumb thrust 5a, and adapted to be slidably fitted in the longitudinal slot 11a, a lateral catch 5d integrally connected to the guide piece 5c to fit in a selected lateral sub-slot 11b when the clip slider 5 is put in its stress-free, floating condition, and thrust rods 5e integrally connected to the opposite sides of the lateral catch 5d and extending therefrom in opposite longitudinal directions.

Longer and shorter cartridges 4a and 4b contain inks of different colors, and the thrust rods 5e are inserted in the rear open ends of these cartridges.

The longer cartridge 4a is filled with an ink of the color which is supposed to be frequently used, and the shorter cartridge 4b is filled with another ink of the color which is supposed to be less frequently used so that the different inks in these cartridges may be used up simultaneously.

As shown in Fig. 7, the automatic writing instrument is normally put in its locking position. Specifically, the opposite shoulders of the lateral catch 5d are caught by a selected lateral sub-slot 11b (Fig. 10) to prevent the sliding of the clip slider 5 in the longitudinal slot 11a. The clip slider 5 can be released from its locking position simply by depressing the thumb-thrust 5a of the clip slider 5 until the shoulders of the lateral catch 5d are disengaged from the lateral sub-slot 11b (Fig. 11). In this unlatched position (Fig. 8) the clip slider 5 can be pushed forward or backward until the ball point 3a or 3b projects from either cap 2a or 2b. When stopping depression of the thumb-thrust 5a, the clip slider 5 can return resiliently to its stress-free, original arch shape, thus allowing the shoulders of the lateral catch 5d to enter a selected lateral sub-slot 11b, and putting the clip slider 5 in its locking position, as seen from Fig. 9. In this position the automatic ball-point pen is ready to be used for writing.

The ball point 3a appears from the cap 2a with the clip slider 5 caught by the left sub-slot 11b (Fig. 12) whereas the ball point 3b appears from the cap 2b with the clip slider 5 caught by the right sub-slot 11b (Fig.14). Both ball points 3a and 3b are pulled in the hollow barrel 1 with the clip slider 5 caught by the center sub-slot 11b (Fig. 13).

As may be understood from the above, an automatic writing instrument according to the present invention can be switched from its locking to unlocking position simply by pushing the clip slider 5, and a desired color ball point can be selectively used simply by pushing the clip slider forward or backward. The operation can be effected with a single hand. The use of longer and shorter cartridges 4a and 4b permits the inks of different colors to be used up simultaneously, thus avoiding the situation in which one cartridge is emptied while the other cartridge contains a remaining amount of ink, as would be the case with the use of two cartridges of equal length.

The automatic two-color ball pointed pen described above can be modified within the spirit of the present invention, as for instance follows: A swingable shield lid or flap may be attached to each cap of the barrel to open or close in response to the sliding of the clip slider. In place of cartridges a bundle of filaments having ink soaked therein may be used to fit the kind of a writing instrument. The present invention can be equally applied to felt-tip pens, markers or any other writing instrument, and therefore the present invention should not be limited to a two color ball-point pen described herein and shown in the accompanying

drawings.

Claims

1. An automatic writing instrument comprising:
a hollow barrel having a longitudinal slot and lateral sub-slots made thereon;
a clip slider slidably fitted in said longitudinal slot; and
a writing stick connected to said clip slider so that forward and backward advance of said clip slider in said longitudinal slot may cause said writing stick to appear and disappear from either end of said barrel;
said clip slider being adapted to be caught by a selected lateral slot in its stress-free, floating condition, thereby preventing said writing stick from sliding in said barrel, and to be yieldingly depressed in said barrel, thereby releasing said clip slider from said selected lateral sub-slot to permit said writing stick to slide in said barrel.

2. An automatic writing instrument claimed in Claim 1, wherein said clip slider comprises a thumb-thrust which is in the form of arch; a clip integrally connected to the rear end of said thumb-thrust; a guide piece integrally connected to the bottom of said thumb-thrust, and adapted to be slidably fitted in said longitudinal slot; and a lateral catch integrally connected to said guide piece to fit in a selected lateral sub-slot when said clip slider is put in its stress-free, floating condition.

3. An automatic writing instrument claimed in Claim 1 or 2, wherein said clip slider further comprises thrust rods extending axially from said lateral catch in opposite directions.

4. An automatic writing instrument claimed in Claim 1 or 2, wherein said clip slider is so constructed that: its lateral catch may be fitted in a selected lateral sub-slot in normal, locking position, thereby preventing the sliding of said clip slider in said longitudinal slot; said clip slider may be released from locking position when said thumb thrust is depressed in said longitudinal slot, thereby permitting the sliding of said clip slider in said longitudinal slot; and said clip slider may be put in normal, locking position when said thumb-thrust resiliently returns to its stress-free, original shape subsequent to the cease of depression of said thumb-thrust.

FIG. 1

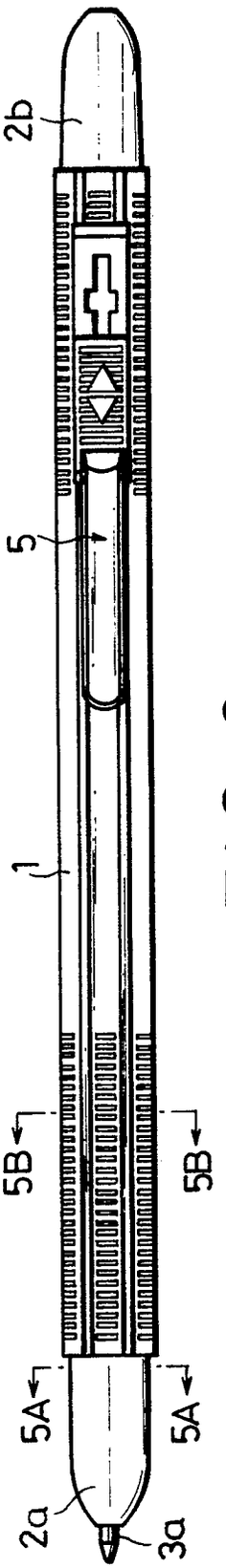


FIG. 2

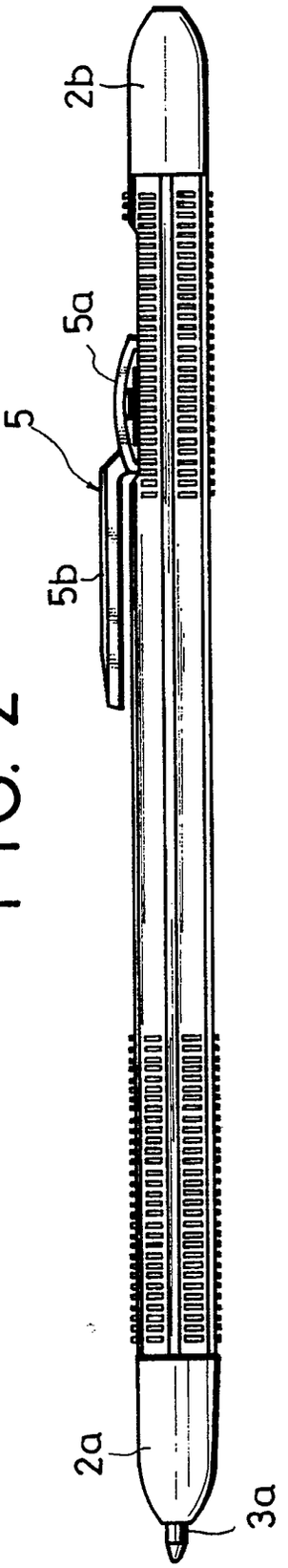


FIG. 3

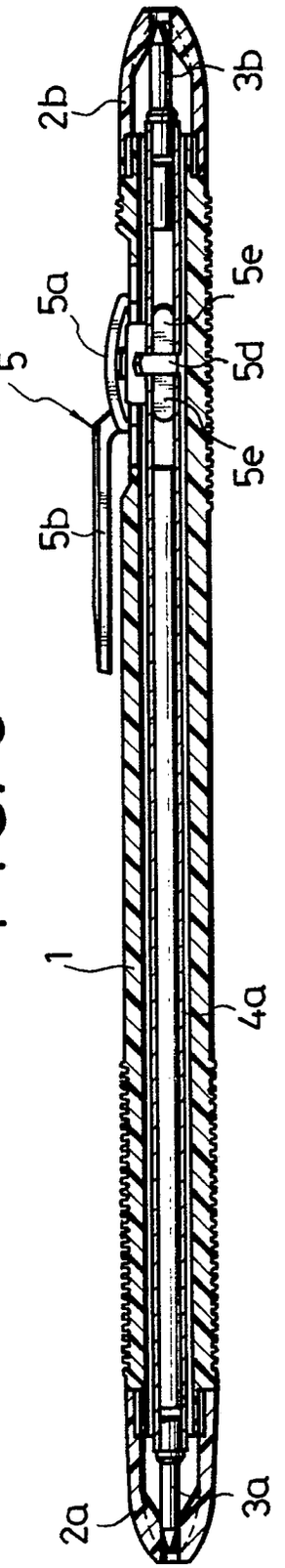


FIG. 4

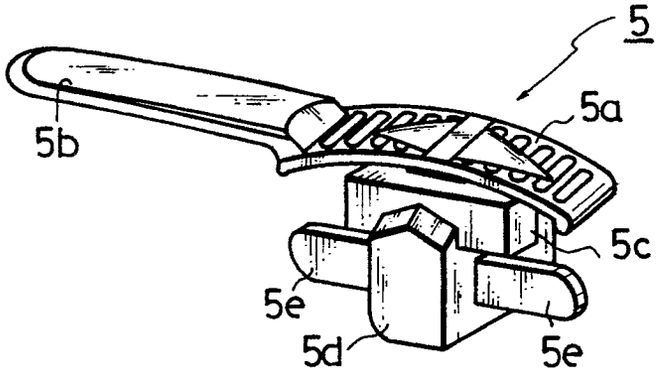


FIG. 5A

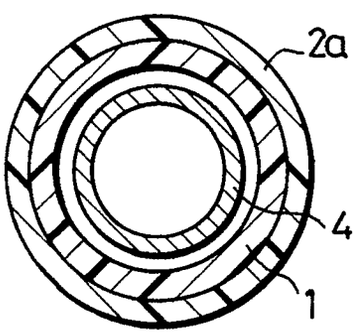


FIG. 5B

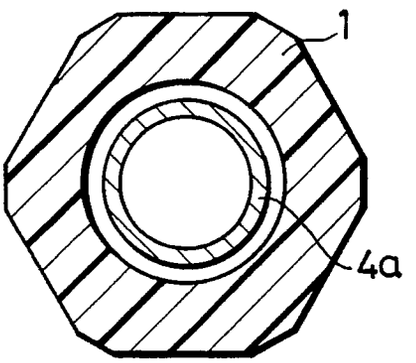


FIG. 6

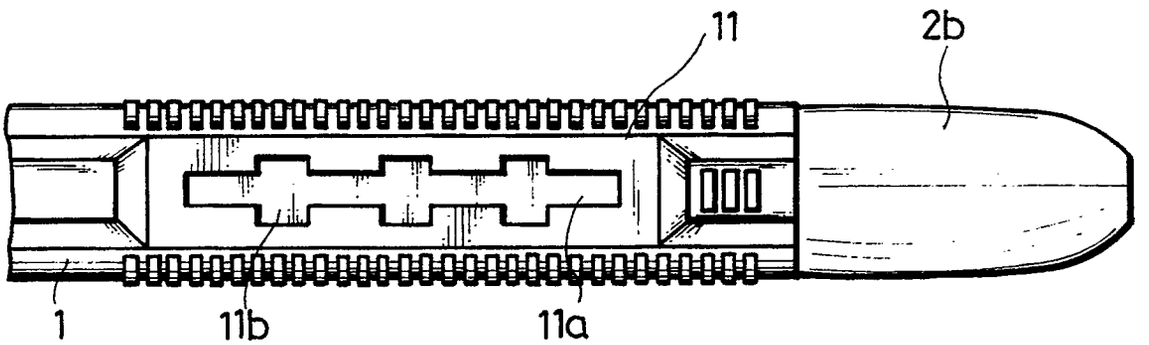


FIG. 7

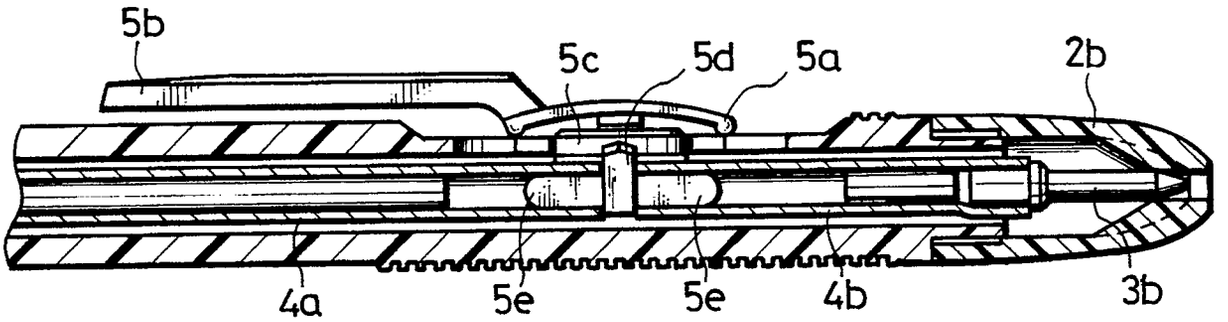


FIG. 8

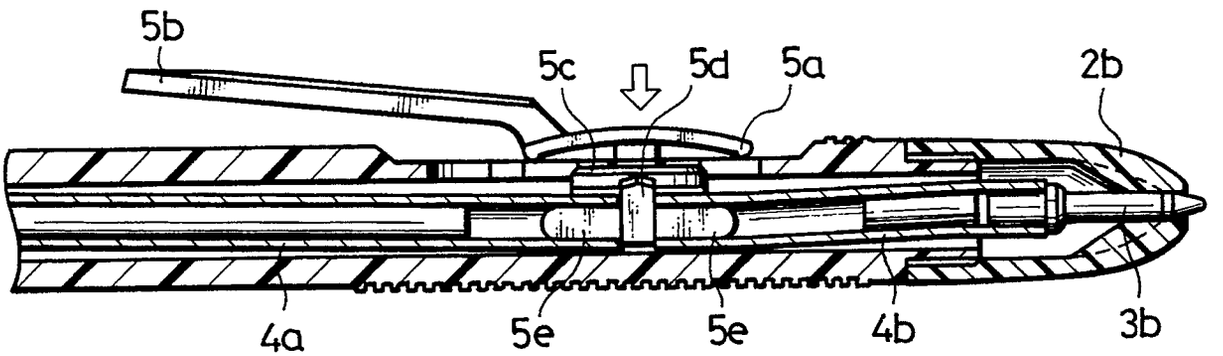


FIG. 9

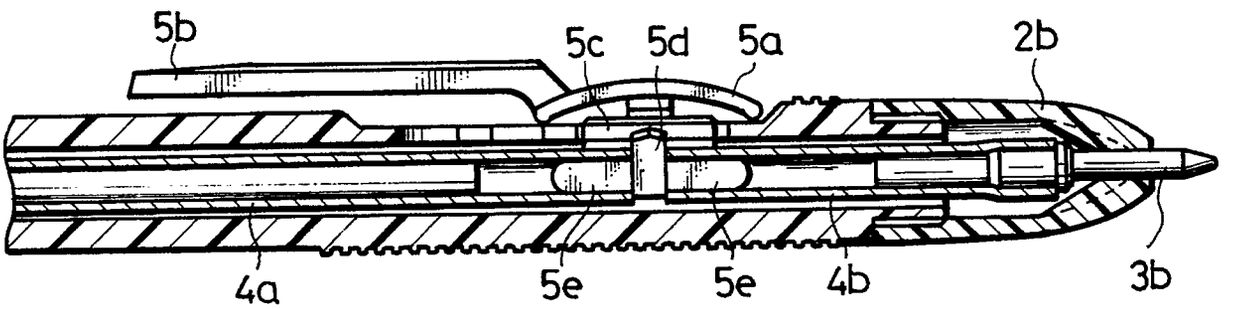


FIG. 10

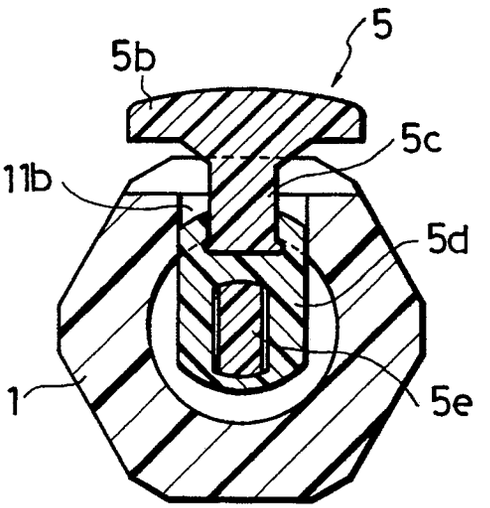


FIG. 11

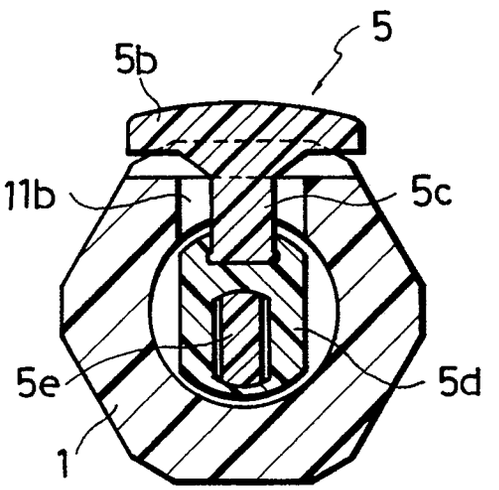


FIG. 12

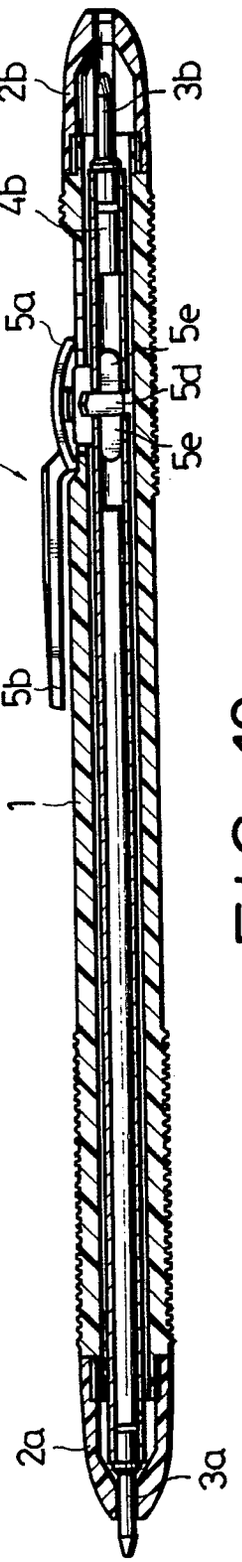


FIG. 13

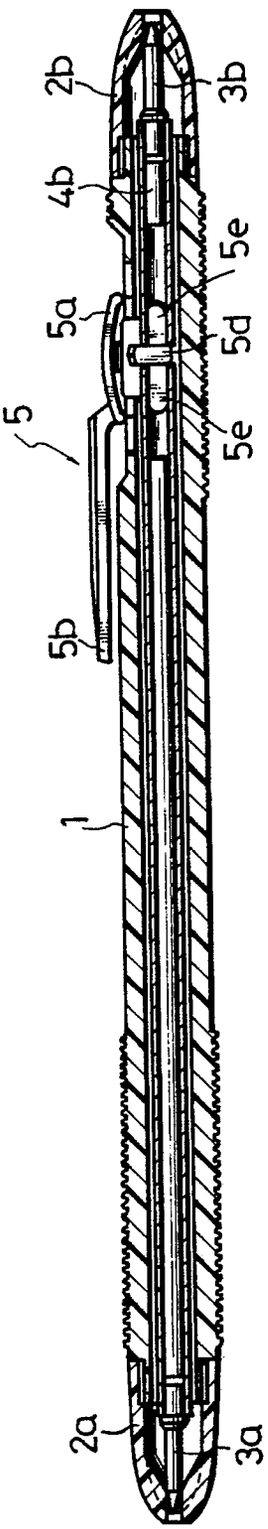


FIG. 14

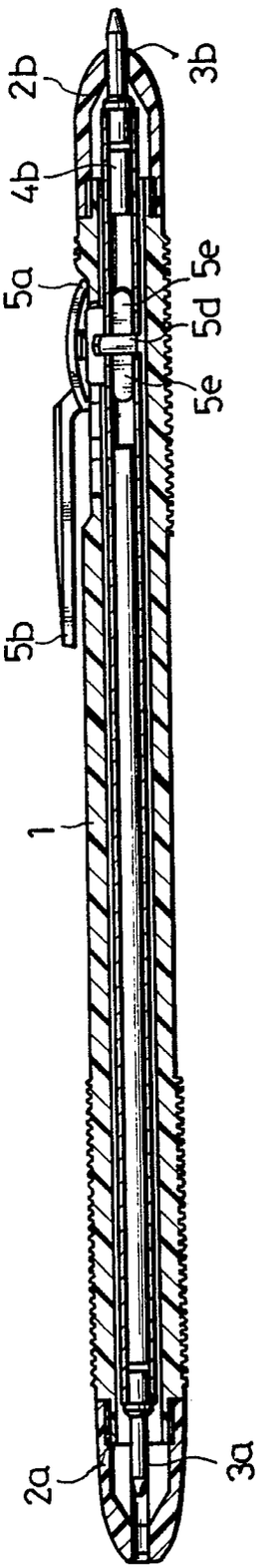
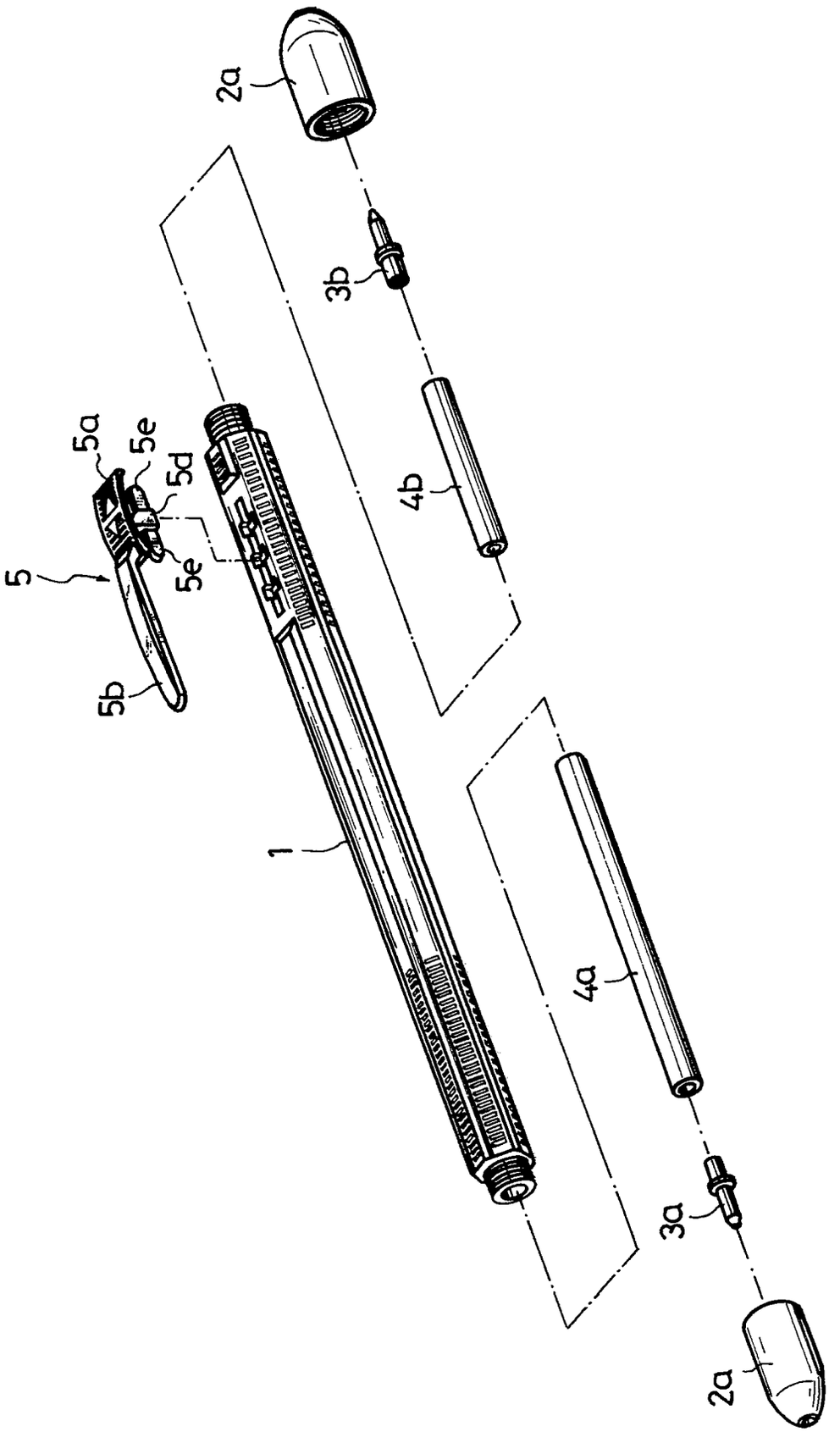


FIG. 15



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 10 8340

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	US-A-4 717 275 (BURKHARDT) * column 2, line 40 - column 4, line 58; figures *	1-4	B 43 K 27/12 B 43 K 25/00 B 43 K 24/08
Y	GB-A-2 131 355 (THE GILLETTE COMPANY) * page 1, line 61 - line 117; figures *	1,3	
Y,D	JP-U-5 711 081 (-) * the whole document *	1,3	
A	US-A-2 259 133 (HARPER) * column 1, line 55 - column 2, line 8; figures 1,3,9 *	1,2,4	
A	US-A-1 428 077 (CLARK) * page 1, line 40 - page 2, line 34; figures *	1,2,4	
A	US-A-3 025 834 (AARON) * column 3, line 24 - line 36; figures 1,2,6 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 43 K

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	16 September 91	PERNEY Y.J.

CATEGORY OF CITED DOCUMENTS

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