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(54) **Combined writing tool.**

(57) A combined writing utensil comprising: a holder; through holes provided on the holder; guide grooves communicating with respective through holes; reservoirs inserted in respective guide grooves; sliders of identical structure provided for each respective reservoir, each having an axial air hole and an outside hole communicating with it; front stops; resilient means provided between respective guide grooves and respective front stops; a casing mounted on the holder for covering the reservoirs; a cap; and a cam provided inside the cap having inclined edges on an inside thereof to allow the sliders to alternately slide, thereon against or by the force of the resilient means to extend a selected point of the reservoirs out of an opening of the casing, and having a retainer to keep the selected point of the reservoirs out. Any of the points can be extended irrespective of its set position. It also can be set at any desired position. The utensil further comprises a rotation stop in a rear portion of one partition of the guide grooves of the holder. The rotation stop can abut a convex ridge provided on an inside of the cap to keep the cap from turning.

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Field of the Invention

The present invention relates to a combined writing utensil. More particularly, it concerns a combined writing utensil which can have any point of a plurality of writing reservoirs of same type or different types and of same color or different colors successively extended from the opening of a casing by turning a cap in one or the other direction until it is put to a stopper.

Background of the Invention

There are many applications for a combined writing utensil. As an example, the one disclosed in the Japanese Utility Model Publication No. 56-15031 is devised as follows. An upper shaft case can be turned either right or left around a shaft. One mechanical pencil element and two ball-point pen elements are alternately shifted to a writing position. If the mechanical pencil element is set in a writing position, the upper shaft casing can move in an axial direction a certain distance relative to the lower shaft casing to extend the lead out. If the ball point pen element is set in a writing position, the upper shaft casing is prevented from moving in an axial direction. The prior combined writing utensil described above has the disadvantage that only mechanical pencil can be moved by knocking, it is not possible to select a desired set positions for both the mechanical pencil element and ball-point pen elements. It also has the disadvantage that the mechanical pencil element and the two ball-point pen elements are each connected with a rod through a connection sleeve. The mechanical pencil and ball-point elements use different sliders for the respective rods. These result in a large number of parts, complicated structure, and thus high fabrication cost.

Brief Description of the Invention

In view of the foregoing, it is an object of the present invention to provide a combined writing utensil that any of a plurality of writing reservoirs can be moved by a knocking action irrespective of their set position and can be set at desired positions.

Briefly, the foregoing object is accomplished in accordance with aspects of the present invention by a combined writing utensil, which by referring to the accompanying drawings, comprises in combination: a holder 1 having a plurality of through holes 2. A plurality of guide grooves 3 communicate with respective through holes 2. A plurality of writing reservoirs 4 are inserted in respective guide grooves in holder 1. A plurality of sliders 7 identical in structure are provided for each respec-

tive writing reservoirs, each reservoir having an axial air hole and an outside hole communicated with it and a plurality of front stops 6. A plurality of resilient means 8 are provided between respective guide grooves and respective front stops 6; a casing 9 mounted on the holder for covering the reservoirs; a cap 10; and a cam 14 provided inside the cap having inclined edges 11 and 13 provided on an inside thereof to allow the sliders to alternately slide against or by the force of resilient means 8 to extend a selected point of the reservoirs out of the opening in the end casing 9, and having retainer 12 to hold the selected reservoir point.

The combined writing utensil of the present invention further comprises in combination: a rotation stop provided on holder 1; and a convex ridge provided inside the cap for limiting rotation of the cap to any side of the rotation stop.

Alternatively, the combined writing utensil of the present invention is characterized by a turning stop provided in a rear portion of one of partitions for the guide grooves of holder 1.

In operation, if cap 10 is turned in one direction relative to casing 9, ink reservoir 4a and slider 7b can move forward along through hole 2a and guide groove 3a against resilient spring 8a as slidably advanced by inclined edge 11 of cam 11 provided inside cap 10. Slider 7a is retained on retainer 12. Point 4a₁ of ink reservoir 4a projects out of opening 9a of casing 9. This allows writing. If convex abutment 16 (Fig 3) of cap 10 does not abut rotation stop 15 of holder 1, cap 10 can continue to turn further clockwise. Slider 7a is detached from retainer 12. Ink reservoir 4a and slider 7a can be move backward along with the inclined edge 13 by the force of resilient spring 8a. Point 4a₁ of ink reservoir 4a can retract into opening 9a of casing 9.

If cap 10 is turned further in the same direction, points 4a₁, 4b₁, and so forth of reservoirs 4a, 4b, and so forth are alternately extended and retracted from opening 9a of casing 9. Writing can be done with an extended point.

For a mechanical pencil lead reservoir, lead can be extended by knocking on cap 10 to write as with the prior one. Even the ball-point pen ink reservoirs knocking can be done as with the mechanical pencil lead reservoir. But, as knocking is not needed, knocking capability is not made for it. If an additional mechanical pencil lead reservoir replaces any of the ball-point pen ink reservoirs, the knocking capability can be made operational.

In order to supply lead or to replace a ball-point pen ink reservoir, casing 9 should be removed from holder 1, or cap 10 should be pulled off to remove the reservoirs out of their sliders. A reservoir should be pulled out backward together with its spring and slider. Lead should be supplied

to the mechanical pencil lead reservoir. The lead reservoir then should pass through the through hole of holder 1 together with the resilient member and the slider. For any ink reservoir, the ink reservoir should be pulled out of the slider. The ink reservoir filled with ink is replaced by passing it from the through hole of holder 1 through the resilient member to engage the slider. Instead, an ink reservoir filled with ink should be inserted forward together with the resilient member and slider into the guide groove and through hole.

If the cap 10 is turned in one or the other direction until it abuts rotation stop 15, points 4a₁, 4b₁, and so forth of the respective 4a, 4b, and so forth are alternatively extended out of opening 9a of casing 9 as each slides along inclined edges 11 or 13. Retainer 12 holds the point projected. In turn, the points are gradually retracted along inclined edges 11 or 13 by the resilient members 8a, 8b, and so forth.

Brief Description of the Drawings:

Fig. 1 is an exploded perspective view illustrating construction of a first embodiment according to the present invention for a combined writing utensil;

Fig. 2 is a longitudinal cross-sectional view of the combined utensil;

Fig. 3 is a cross-sectional view of a cap of the present invention; and

Fig. 4 illustrates a holder for the present invention.

Fig. 5 is an exploded perspective view illustrating a construction of a second embodiment according to the present invention for a combined writing utensil;

Fig. 6 is a longitudinal cross-sectional view of the combined utensil;

Detailed Description of the Invention

In Figs. 1 and 2 show holder 1 having a plurality of, say three, through holes 2a to 2c and guide grooves 3a to 3c communicating therethrough arranged to form an equilateral triangle. Inserted in through holes 2a to 2c and guide grooves 3a to 3c communicating therethrough the rear portions of a plurality of, three in this embodiment, are writing reservoirs, including two ball-point pen ink reservoirs 4a and 4c (refills) of different colors, such as blue and red, and one mechanical pencil lead reservoir 4b.

Sliders 7a to 7c are provided for the rear portions of reservoirs 4a to 4c which can move axially in respective guide grooves 3a to 3c against or by the force of springs 8a to 8c provided between sliders 7a to 7c and front stops 6a to 6c of

guide grooves 3a to 3c. Holder 1 also has casing 9 screwed thereto which covers the front portions of reservoirs 4a to 4c. Holder 1 further has cap 10 screwed on the rear outside thereof in one or the other direction until it abuts rotation stop 15.

Each of sliders 7a to 7c, as shown in Fig. 2, has air hole 29a provided in the axial direction and an outside hole 29b communicating therewith. Slider 7b provided on the rear portion of lead reservoir 4b needs no air hole and the outside hole. However, it is made identical in construction as sliders 7a and 7c for ball-point pen ink reservoirs 4a and 4c in order to reduce the number of different parts and to allow changing the setting position of reservoirs 4a to 4c. It should be noted that as no sleeves are used for connecting the reservoirs 4a to 4c to any rods, the number of parts can be reduced, and the construction can be made simple, resulting in substantially reduced production cost.

In the embodiment rotation stop 15 is provided in one partition of guide groove 3a to 3c for holder 1. Alternatively, rotation stop 15 may be provided in a rear portion of one partition of guide grooves 3a to 3c for holder 1. Rotation stop 15 can abut convex abutment 16 provided on the inside of cap 10, as shown in Fig. 3, to keep cap 10 from turning. Cap 10 is permitted to turn in one or the other direction toward the front end until the convex abutment 16 meets rotation stop 15.

Cap 10 has a bamboo-shoot-like cam 14 on its inside surface. The bamboo-shoot-like cam 14 has inclined edges 11 and 13 which allow any of points 4a₁ to 4c₁ of reservoirs 4a to 4c to be selectively extended or retracted from the end opening 9a of casing 9 as sliders 7a to 7c alternately slide against or by the force of springs 8a to 8c. Bamboo-shoot-like cam 14 also has retainer 12 for holding any of the selected points 4a₁ to 4c₁ of reservoirs 4a to 4c extended from opening 9a.

Holder 1 has on a rear end thereof an anchor-like end 21 having a slit 20. Cap 10 has on the inside thereof retaining hole 22 for mating with anchor-like end 21. In the embodiment shown in Fig. 2, eraser rest 23 is demountably inserted inside the rear portion of cap 10. Deflection preventing member 17 of eraser rest 23 fits in the center of anchor-like end 21. Eraser rest 23 is positioned in a jig hole 24 at the end of cap 10. A jig inserted into jig hole 24 is used to release the anchor-like end 21 from retainer 22 of cap 10. Alternatively, the eraser rest may be screwed onto cap 10.

Deflection preventing member 17 may be made by a poured and hardening filler, for example, a bonding agent, into the center of the anchor-like end 21, or may be formed on the eraser rest itself.

There is further provided clip 25 the base of which fits in a receiving hole 28 provided on a rear

portion of cap 10, an eraser 26 inserted in eraser rest 23, and eraser cover 27 fitted on eraser rest 23.

In the construction described cap 10 can turn in one direction, or more specifically clockwise with reference to casing 9 when convex abutment 16 of cap 10 is not abutting rotation stop 15 of holder 1, or when all of points 4a₁ to 4c₁ of reservoirs 4a to 4c are retracted. Turning cap 10 is not prevented. Blue ball point pen ink reservoir 4a and slider 7a for it can be moved forward against spring 8a along with through hole 2a and guide groove 3a as advanced by inclined edge 11 of bamboo-shoot-like cam 14 provided inside cap 10. Slider 7a is retained by retainer 12 of cam 14. Point 4a₁ of ink reservoir 4a projects out of opening 9a of casing 9 (see Fig. 2). This allows writing in blue. In this operation, point 4c₁ of lead reservoir 4c and slider 7c for it are moved backward along with inclined edge 13 by the force of spring 8c.

If cap 10 is turned further clockwise, slider 7a is detached from retainer 12 of cam 14. Ink reservoir 4a and slider 7a for it are moved backward along with inclined edge 13 by the force of spring 8a. Point 4a₁ of ink reservoir 4a is withdrawn into opening 9a of casing 9.

If cap 10 is turned further, more clockwise, the next mechanical pencil ink reservoir 4b and slider 7b for it are moved forward along with through hole 2b and guide groove 3b against the force of spring 8b as advanced by inclined edge 11 of cam 14 provided inside cap 10. Slider 7b is retained on retainer 12 of cam 14. Point 4b₁ of ink reservoir 4b projects out of opening 9a of casing 9 (see Fig. 2). If cap 10 is knocked, core lead is driven out to a predetermined length for writing as in a conventional mechanical pencil. In this operation, convex abutment 16 of cap 10 abuts rotation stop 15 of holder 1, which limits clockwise turning.

If mechanical pencil ink reservoir 4b is frequently used, it is not necessary to withdraw point 4b₁ but only the core lead need be driven in for carrying by pressing on the end of it while cap 10 is knocked.

In order to retract point 4b₁ of mechanical pencil ink reservoir 4b, cap 10 is turned counterclockwise. Then, slider 7b is released from retainer 12 of cam 14. Ink reservoir 4b and slider 7b for it moves backward along with inclined edge 11 of cam 14 by the force of spring 8b. Point 4b₁ of ink reservoir 4b is withdrawn into opening 9a of casing 9 along with inclined edge 11 by the force of spring 8b.

If cap 10 is turned further counterclockwise, blue ink reservoir 4a and slider 7a for it move forward along with through hole 2a and guide groove 3a as advanced by inclined edge 13 of cam 14 against spring 8a. Slider 7a is held at retainer

12 of cam 14. Point 4a₁ of ink reservoir 4a is projects out of opening 9a of the casing 9. This allows writing in blue.

If the cap 10 is turned further counterclockwise, slider 7a can be released from retainer 12 of cam 14. Ink reservoir 4a and slider 7a for it moves backward along with inclined edge 11 of cam 14 by the force of spring 8a. Point 4a₁ of ink reservoir 4a is withdrawn from opening 9a of casing 9 along with inclined edge 11 by the force of spring 8a.

If cap 10 is turned still further counterclockwise, red ink reservoir 4c and slider 7c for it move forward along with through hole 2c and guide groove 3c against the force of spring 8c as advanced by inclined edge 13 of cam 14. Slider 7c is held by retainer 12 of cam 14. Point 4c₁ of the ink reservoir 4c projects out of opening 9a of casing 9. This allows writing in red. In this operation, the convex abutment 16 of cap 10 abuts rotation stop 15 of holder 1, which limits counterclockwise turning.

As described in detail so far, points 4a₁ to 4c₁ of reservoirs 4a to 4c can be alternately extended from opening 9a of casing 9 as advanced by inclined edges 11 or 13 of bamboo-shoot-like cam 14 when cap 10 is turned clockwise or counterclockwise until convex abutment 16 meets rotation stop 15. Retainer 12 at the end of cam 14 can hold any of points extended, allowing writing with it. In turn, any of points 4a₁ to 4c₁ of reservoirs 4a to 4c can be withdrawn as these can be moved by inclined edges 11 or 13 by the respective force of springs 8a to 8c.

Of course, even if any of the ball-point pen ink reservoirs are in use, knocking can still be achieved as in the case of the mechanical pencil. As no knocking is needed for the ball-point pen ink reservoirs, the knocking capability is not operational for them. If an additional mechanical pencil reservoir is provided in place of any of the ball-point pen ink reservoirs, the knocking capability can be made operational. This means that any desired combination of mechanical pencil and ball-point pens can be set up.

In order to supply lead or to replace a ball-point pen ink reservoir 4a or 4c, cap 10 should be turned strongly counterclockwise relative to casing 9. This turns cap 10 and holder 1 together to unscrew and remove casing 9 from holder 1. Reservoirs 4a, 4b, and 4c can be pulled out of sliders 7a to 7c. For the mechanical pencil; lead should be supplied to the mechanical pencil lead reservoir 4b. Lead reservoir 4b then should be passed from through hole 2b of holder 1 through spring 8b to mate with slider 7b. For any of ink reservoirs, the ink reservoir 4a or 4c should be pulled out of slider 7a or 7c. Ink reservoirs 4a or 4c filled with ink may be replaced by passing then from through hole 2a

or 2c of holder 1 through spring 8a or 8c to mate with slider 7a or 7c. This completes supplying lead or replacing ink reservoirs 4a or 4c.

Alternatively, supplying lead or replacing ink reservoir 4a or 4c can be made in the following way. Eraser cover 27 and eraser rest 23 should be removed. Cap 10 may be pulled out of holder 1 having casing 9 screwed thereto. Reservoirs 4a, 4b, or 4c may be pulled out backward together with springs 8a, 8b, or 8c and slider 7a, 7b, or 7c. Slider 7b should be removed. Lead should be supplied to lead reservoir 4b. Slider 7b should mate with lead reservoir 4b. This assembly may be inserted through guide groove 3b of holder 1 into through hole 2b. Or, used ink reservoirs 4a or 4c should be pulled out of slider 7a or 7c. Springs 8a or 8c should be removed. Instead, reservoir 4a or 4c filled with ink may be inserted forward together with respective springs 8a or 8c and sliders 7a or 7c into guide grooves 3a or 3c and through holes 2a or 2c.

Fig. 5 is an exploded perspective view illustrating a construction of a second embodiment according to the present invention for a combined writing utensil. Fig. 6 is a longitudinal cross-sectioned view of the assembled utensil. In this second embodiment, rotation stop 15a is provided in a rear portion of one of the partitions for guide grooves 3a, 3b, 3c of holder 1; and convex abutment 16a is provided inside cap 10 for limiting rotation of cap 10 abutting the rear side of rotation stop 15a.

An advantage of the present invention is as follows. In such an alternative way for supplying lead or replacing an ink reservoir, eraser cover 27 and eraser rest 23 should be removed, an jig is inserted into jig hole 24 to engage the anchor like end 21 by pressing to bend anchor-like ends 21 inward by contacting slit 20 to release ends 21 from retainer 22 of cap 10, then cap 10 can be easily removed. This can be done without forcibly withdrawing cap 10. If failure is caused in any of sliders 7a to 7c on fabrication, then cap 10 can be pulled out to expose it for trouble shooting.

Another advantage of the present invention is as follows. Although springs 8a to 8c are abutting respective front stoppers 6a to 6c, reservoirs 4a to 4c are not abutting front stops 6a to 6c, but pass through respective holes 2a to 2c. Therefore any of reservoirs 4a to 4c can be knocked irrespective of their set positions. This allows any desired selection of set positions for reservoirs 4a to 4c so that the reservoir used most frequently can be set at the most convenient position. For mechanical pencil lead reservoir 4b, the lead can be made longer as no retaining members, such as a connection sleeve and rod, are used. For ball -point pen ink reservoirs 4a and 4c, the quantity of ink to fill them can be increased, resulting in longer service life.

An additional advantage of the present invention is that the number of parts and number of different parts can be reduced so that the whole product can be fabricated in a simple construction at the lowest cost. This is due to the identical structure of sliders 7a to 7c having axial air hole 29a and outside hole 29b communicating with them irrespective of the kind of reservoir and to the use of no of retaining members, such as connection sleeves and rods, for reservoirs 4a to 4c.

A further additional advantage of the present invention is that as rotation stop 15 and convex ridge 16 can stop rotation of cap 10, it is ready to select a desired reservoir by turning cap 10, particularly in for quick selection of a frequently used reservoir.

This invention is not to be limited to the embodiments shown in the drawings and described in the description, but only in accordance with the scope of the appended claims.

Claims

1. A combined writing utensil, comprising in combination:
 - a holder;
 - a plurality of through holes provided on the holder;
 - a plurality of guide grooves communicating with respective through holes;
 - a plurality of reservoirs inserted in respective guide grooves;
 - a plurality of sliders of identical structure provided for respective reservoirs, each having an axial air hole and an outside hole communicating with them;
 - a plurality of front stops;
 - a plurality of resilient means provided between respective guide grooves and respective front stops;
 - a casing mounted on the holder for covering the reservoirs;
 - a cap; and
 - a cam inside the cap having inclined edges on the inside thereof to allow the sliders to alternately slide against or by the force of the resilient means to extend a selected point of the reservoirs out of an opening of the casing, and including a retainer for keeping the selected reservoir point out.
2. A combined writing utensil according to claim 1, further comprising in combination:
 - a rotation stop provided on the holder; and
 - a convex ridge provided inside the cap for limiting rotation of the cap to either side of the rotation stop.

3. A combined writing utensil according to claim 1, further comprising in combination:
 - an anchor-like end provided on a rear portion of the holder; and
 - retainer means provided inside the cap for engaging the anchor-like end.
4. A combined writing utensil according to claim 2, further comprising in combination:
 - an anchor-like end provided on a rear portion of the holder; and
 - retainer means provided inside the cap for engaging with the anchor-like end.
5. A combined writing utensil according to claim 3, further comprising in combination:
 - an eraser rest provided on a center portion of the anchor-like end or a deflection preventing means inserted into the anchor-like end.
6. A combined writing utensil according to claim 4, further comprising in combination:
 - an eraser rest provided on a center portion of the anchor-like end or a deflection preventing means inserted into the anchor-like end.
7. A combined writing utensil according to claim 1, further comprising in combination:
 - a rotation stop provided in a rear portion of one of said partitions for the guide grooves of the holder; and
 - convex ridge provided inside the cap for limiting rotation of the cap to either side of the turning stop.
8. A combined writing utensil comprising;
 - a holder for writing reservoirs;
 - a plurality of longitudinal grooves in said holder;
 - a stop abutment adjacent one end of said holder having a plurality of through holes in alignment with said longitudinal grooves;
 - a plurality of writing reservoirs, each of said writing reservoirs being inserted through said holes into a respective longitudinal groove;
 - a plurality of slider means mounted in each of said longitudinal grooves, each of said sliders having an axial air hole communicating with said plurality of reservoirs and an outside hole;
 - a plurality of resilient means mounted in said longitudinal grooves between said slider means and said stop abutment;
 - casing means mounted on the end of said holder adjacent said stop abutment for covering said plurality of reservoirs;

a cap secured on the other end of said holder opposite said casing;

cam means in said casing having inclined edges, said cam means alternately advancing or withdrawing a selected slider and reservoir against the force of said resilient means to extend or retract a selected reservoir point out of an opening in the end of said casing; and

retainer means for retaining a selected reservoir point in an extended position.

9. The writing utensil according to claim 8 including;
 - rotation stop means on said holder; a convex ridge on the inside surface of said cap for limiting rotation of said cap; whereby said cap can be rotated in either direction until said convex ridge abuts said rotation stop means.
10. The writing utensil according to claim 8 including; an anchor-like end on the rear end of said holder; retainer means inside cap for engaging said anchor-like end to retain said cap on said holder.
11. The writing utensil according to claim 9 including; an anchor-like end on the rear end of said holder; retainer means inside cap for engaging said anchor-like end to retain said cap on said holder.
12. The writing utensil according to claim 10 including; an eraser rest mounted on the end of said anchor-like end of said holder; said eraser rest having an deflection preventing member inserted in the center of and held by said anchor-like end.
13. The writing utensil according to claim 11 including; an eraser rest mounted on the end of said anchor-like end of said holder; said eraser rest having an deflection preventing member inserted in the center of and held by said anchor-like end.
14. The writing utensil according to claim 8 including; rotation stop means in a position between one of said longitudinal grooves adjacent the rear end of said holder; a convex ridge on the inside of said cap for limiting the rotation of said cap; whereby said cap can be rotated either way until it abuts said rotation stop.

FIG. 1

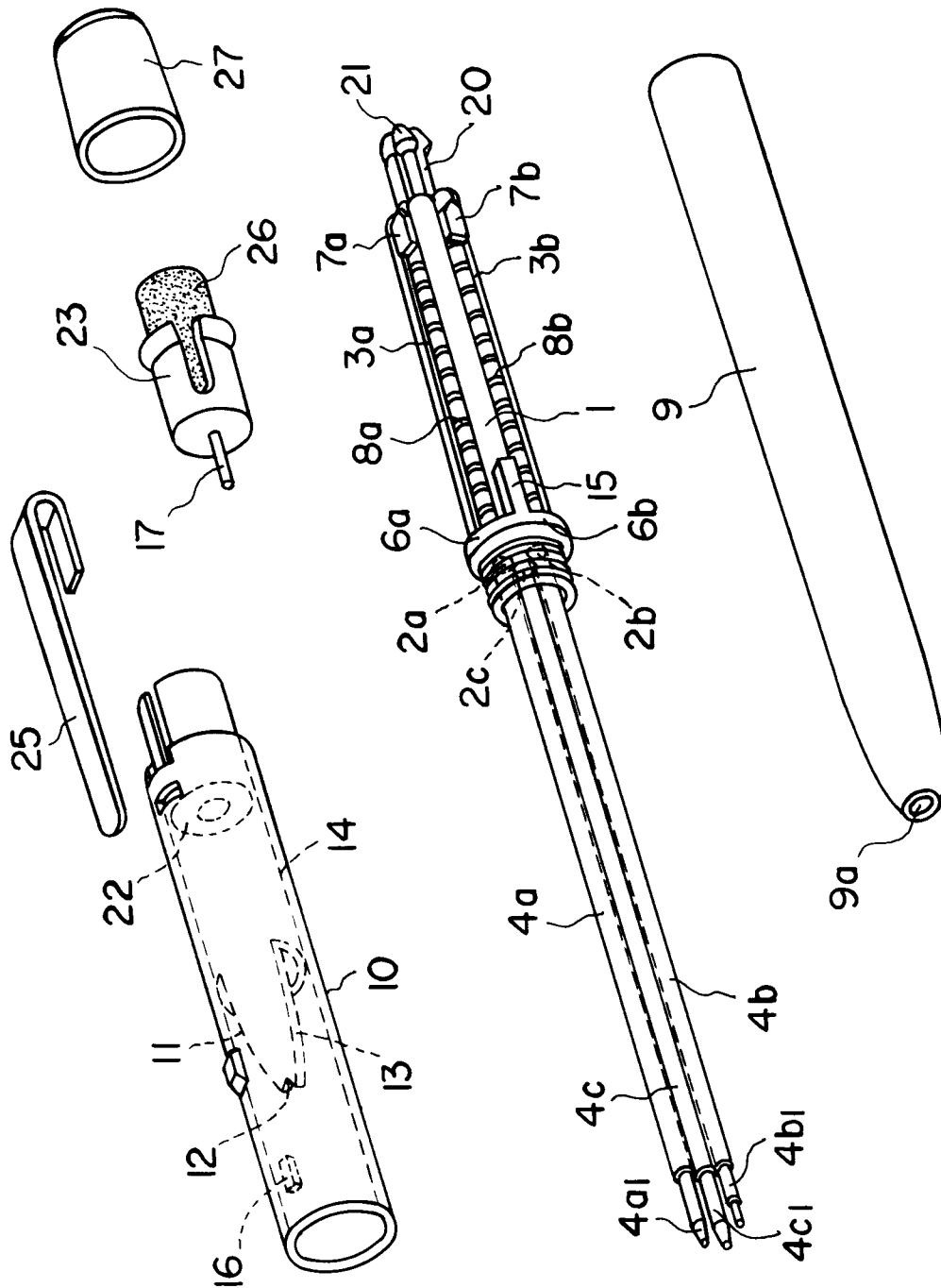


FIG. 2

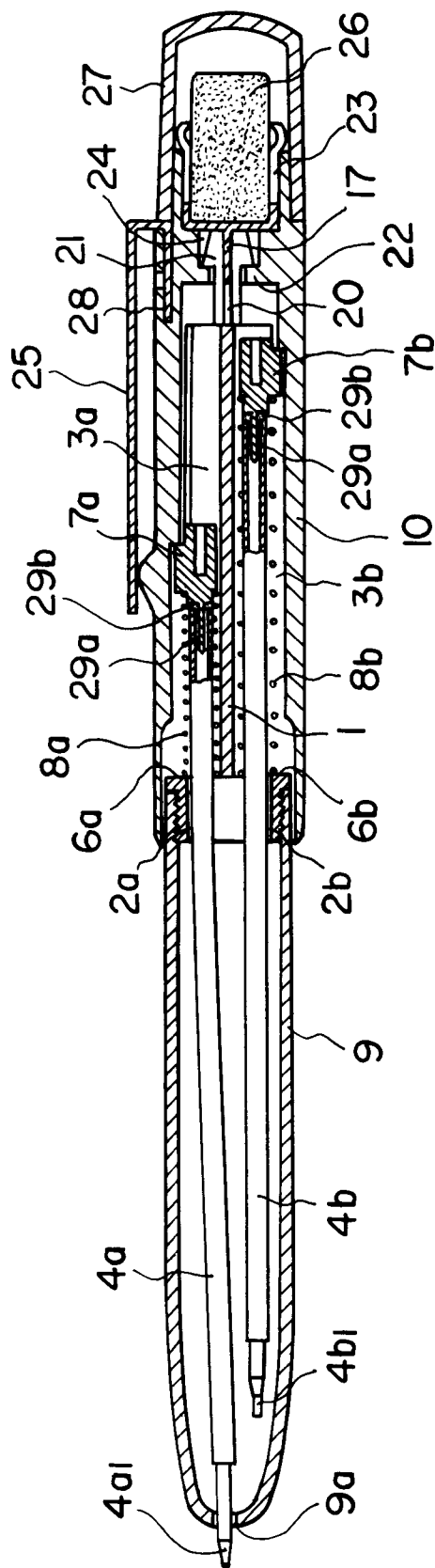


FIG. 3

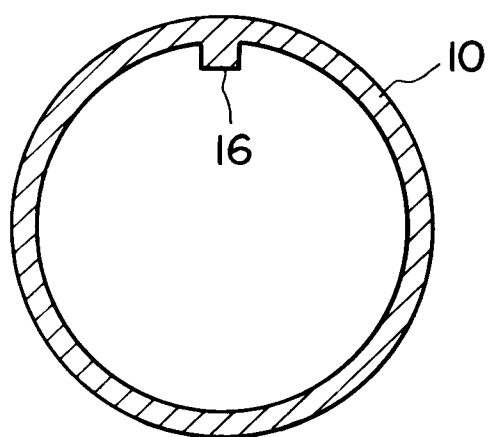


FIG. 4

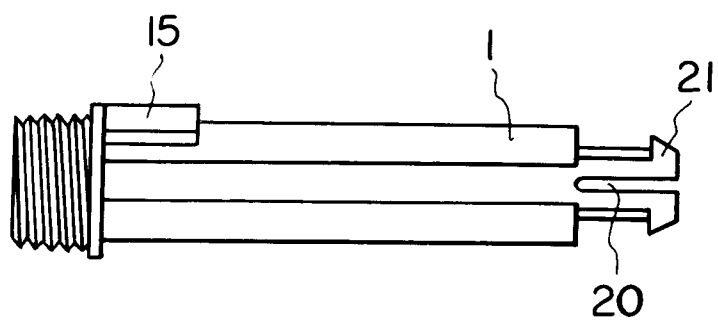


FIG. 5

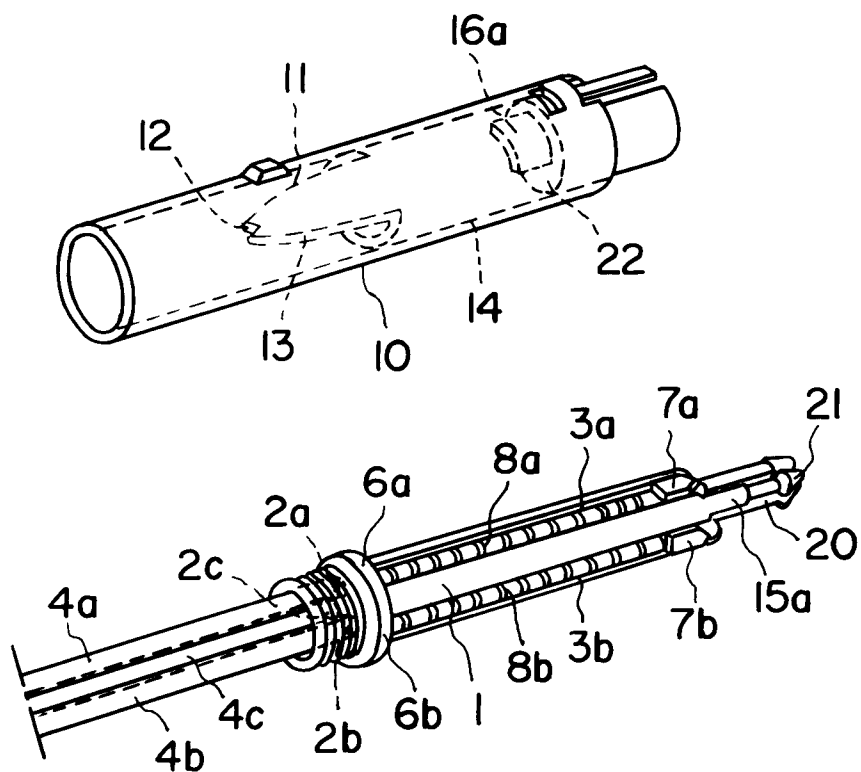
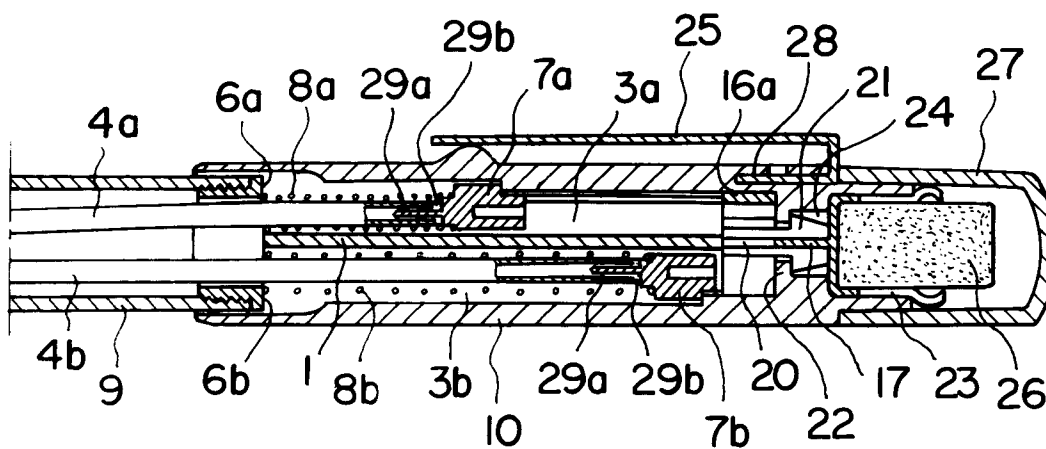


FIG. 6





European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 91 11 8632

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)
Y	EP-A-0 322 550 (SCHLEIF) * column 2, line 51 - column 4, line 50; figures * ---	1-11, 14	B43K24/14 B43K7/02
Y	EP-A-0 257 883 (KOTOBUKI & CO) * column 6, line 47 - column 10, line 50; figures 1-13 * ---	1-11, 14	
A	FR-A-1 002 930 (JIF) * figure 1 * ---	1, 8	
A	FR-A-2 551 000 (THE PARKER PEN COMPANY) * page 2, line 36 - page 3, line 5; figure 3 * ---	1, 8	
A	DE-A-1 947 777 (THE PARKER PEN COMPANY) * page 9, paragraph 2; figure 2 * -----	5, 6, 12, 13	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B43K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15 APRIL 1992	Examiner PERNEY Y.
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 I : 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			