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## (54) Multi-lead writing apparatus.

(57) This invention is related to a multi-lead writing apparatus and more particularly to a writing apparatus which includes a pen-holder (11) having a vertical sliding groove (111) made thereon, along which a pusher means (13) is sliding to push one or more pencil leads or the like to protrude beyond the pen socket (12) for writing or to retreat the pencil lead or the like inside the pen-holder. According to the present invention a pencil lead or ball pen refill or the like can be fixed at each end of the pushers means.

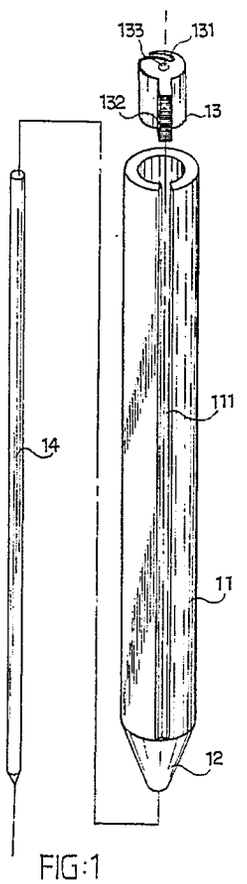


FIG:1

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# Multi-lead writing apparatus

## BACKGROUND OF THE INVENTION

Writing apparatus has a great concern with the revolution of human civilization. It helps to let human history be transmitted from generation to generation. In the modern time, writing apparatus has become a requisite in our daily life. We may frequently need to use a writing apparatus to write or to draw.

During daily life, we may use different writing apparatus for specific purpose. For example, we may use a pen or ball-pen for writing or use a pencil or crayon for drawing. Sometime, we may need a variety of writing apparatus for use at the same time. However, it is not very convenient to carry a variety of writing apparatus with oneself.

## BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic structural view of a single-lead writing apparatus embodying the present invention.

Figure 2 is a sectional view of the embodiment of Fig-1.

Figure 3 is a schematic structural view of another embodiment of single-lead writing apparatus constructed according to the present invention.

Figure 4 is a sectional view of the embodiment of Fig-3.

Figure 5 is a schematic structural view of a multi-lead writing apparatus embodying the present invention.

Figure 6 is a cross sectional view of the pen holder.

Figure 7 is a cross sectional view of the pusher means.

Figure 8 is a schematic structural view of another multi-lead writing apparatus embodying the present invention.

Figure 9 is a cross sectional view of the pen socket.

Figure 10 is a schematic structural view of a double-head multi-lead writing apparatus embodying the present invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figures 1 and 2, a writing apparatus (1) is comprised of a pen-holder, a pen socket (12), a pusher means (13) and a lead (14).

The pen-holder (11) is a hollow cylinder having a vertical groove (111) set at one side to pierce through the side wall.

The pen socket (12) is a circular cone connected with the pen-holder (11) at one end, having a guide hole (121) set at the middle to pierce therethrough so as to provide a passage for passing therethrough of the lead (14).

The pusher means (13) is a short column comprising a curved wing portion (131) and having an outer diameter slightly bigger than the inner diameter of the pen-holder (11) such that when it is set in the pen-holder (11) it will be tightly retained inside the pen-holder (11) with the wing portion (131) stopped against the inner side wall of the pen-holder (11). The pusher means (13) also comprises a push end (132) arranged in a thickness equal to the width of the vertical groove (111) of the pen-holder (11), which push end (132) is to be set to slide along the vertical groove (111). There is a reducing hole (133) piercing through the center of the pusher means (13) along axial direction, which reducing hole (133) serves as a means to firmly retain the lead (14) when the lead (14) is inserted therein.

The lead (14) is an elongated material set in the reducing hole (133) of the pusher means (13). The lead (14) may be a pencil lead or a refill or a crayon.

When is use, the pusher means (13) is inserted into the pen-holder (11), after the lead (14) is set in the reducing hole (133) of the pusher means (13), to let the outer surface be firmly retained by the inner wall surface of the pen-holder (11) and to let the push end (132) be retained in the vertical groove (111). When the pusher means (13) is pushed toward the pen socket (12), the lead (14) will protrude beyond the pen socket (12) for writing.

Please refer to the second embodiment of the present invention as shown in Figures 3 and 4, wherein the writing apparatus, similar to the said first embodiment, is comprised of a pen-holder (21), a pen socket (22), a pusher means (23), and a lead (24). Unlike the cylindrical configuration of the pusher means (13) of the first embodiment, the pusher means (23) has an I-shaped cross section, and is comprised of a seat (231) and a push end (232), wherein the seat (231) which is comprising a pierced hole (233) is set side the pen-holder (21), and the push end (232) is set outside the pen-holder (21), so as to let the seat (231) and the push end (232) firmly retain the side wall of the pen-holder (21) and to let the vertical groove (211) of the pen-holder (21) firmly retain the neck portion of the pusher means (23) between the seat (231) and the push end (232), that is, the pusher means (23) is set to slide along the vertical groove (211) to push the lead (24) to protrude beyond the pen

socket (22) for writing or to pull up the lead (24) to receive inside the pen-holder (21).

Figure 5 illustrates the third embodiment of the present invention which is comprised of a pen-holder (31), a pen socket (32), a plurality of pusher means (33) and a plurality of leads (34).

The pen-holder (31) is an elongated rod comprised of a solid central rod (311) having a plurality of radial wing bars (312) to define a plurality of vertical grooves (313) disposed thereamong and arranged in number equal to the number of the wing bars (312). The pen-holder (31) is also having a reduced bottom end for easy connection with the pen socket (32).

The pen socket (32) is a cone body having a guide hole piercing through axial center for passing therethrough of the lead (34). The bigger end of the pen socket (32) is properly arranged to match with the reduced bottom end of the pen-holder (31), such that the pen-holder (31) may be set in the pen socket (32) or screwed up with the pen socket (32) by means of screw joint.

As shown in Figure 7, the pusher means (33) includes a seat (331) having a push end (332) vertically extending upward and a tapered hole (333) made at the center for setting therein of the lead (34), wherein the tapered hole (333) may be completely piercing through the pusher means (33) or it may be blocked up at the middle part. The tapered hole (333) is properly arranged to incline inward to facilitate setting therein of the lead (34).

The lead (34) is a writing element, which may be a pencil lead or ball pen refill or crayon or any other elongated writing element, of which the outer diameter is properly arranged to match with the hole (333) of the pusher means (33).

Please refer to Figure 5 again, after a variety of leads (34) are respectively set in the holes (333) of the associated pusher means (33) the pusher means (33) are set in the respective vertical grooves (313) among the wing bars (312) to let the leads (34) and the pusher means (33) be firmly positioned. When in use, one may select the lead preferred according to specific writing purpose and push the associated pusher means (33) forward to let the selected lead (34) protrude beyond the pen socket for writing. When not in use, the pusher means (33) is pushed upward to retreat the associated lead (34) to receive inside the pen-holder (31).

The above said embodiments are most suitable for use to match with flexible leads, such as ball pen refill. Figures 8 and 9 illustrate the fourth embodiment of the present invention, which is most suitable for use to match with fragile leads, such as pencil lead or crayon. In this embodiment, the pen socket (42), as shown in Figure 8, is having several holes (421) made thereon to aim at the vertical grooves for passing therethrough of the respective leads (44), that is, the number of holes (421) is equal to the number of vertical grooves,

Please refer to the fifth embodiment of the present invention as shown in Figure 10, which has a double-head structure and is a combination of the above said embodiments. In Figure 10, the writing apparatus includes a single lead pen socket and a multi-lead pen socket respectively set at both ends of the pen-holder. According to the present invention, the writing apparatus may have a single lead pen socket respectively set at both ends or the writing apparatus may be equipped with multi-lead pen sockets at both ends. As shown in Figure 10, the pen-holder (51) is respectively connected with a pen socket (52) at both ends. The pusher means (53) has a hole (533) respectively made at both ends for setting therein of a lead (54) respectively, so as to allow one pusher means (53) control two leads (54) to slide along a vertical groove (513). Further, one vertical groove (513) may be matched with two pusher means (53) letting the pusher means (53) separately control a respective lead (54).

In the said embodiment, the pusher means (53) is firmly positioned by means of the friction force between the pusher means (53) with the two lateral walls of the associated vertical groove (513). The pusher means (53) may be arranged to clamp down on the inner and outer walls of the associated wing bar (512) to become firmly positioned by means of the friction force between the pusher means (53) and the wing bar (512).

In addition to writing elements such as pencil lead or refill or the like, eraser or some other related accessories may be attached to the pusher means for specific application. A clip or pen cap may be attached to the pen-holder to make the structure become convenient to carry with oneself. The pen-holder may be made of transparent material for easy identification of the writing elements contained therein.

In conclusion, as above described, the present invention provides various advantages as hereunder.

(1) Versatile applicability: One pen-holder may contain a variety of writing elements for alternative selection to fit for specific purpose. According to the present invention, a double-head multi-lead writing apparatus may contain as much as 12 writing elements of different color.

(2) Simple structure and long durability: The component parts are simple in structure, the writing elements used are replaceable. Therefore, the service life of the present invention is greatly extended.

(3) Compact package and inexpensive to manufacture: All the component parts are conve-

nient for mass production to reduce the manufacturing cost. One single pen-holder can contain a variety of writing elements.

As indicated, the structure herein may be various embodied. Recognizing various modifications will be apparent, the scope hereof shall be deemed to be defined by the claims as set forth below.

## Claims

1. A writing apparatus including:
- a pen-holder being a hollow cylinder having a vertical groove set at one side to pierce through the side wall;
- a pen socket being a circular cone connected to said pen-holder at one end and having a guide hole set at the middle to pierce through axial center;
- a pusher means being a short column set inside said pen-holder and retained at said vertical groove of said pen-holder, and comprising a push end integrally extended from one side, and a center hole pierced through axial center for passing therethrough of a lead;
- lead being an elongated writing element with one end set in said center hole of said pusher means.

2. A writing apparatus according to claim 1, wherein said pusher means has an I-shaped configuration to clamp down on the inner and outer wall surfaces of said pen-holder.

3. A writing apparatus including:
- a pen-holder being an elongated rod comprised of a solid central rod having a plurality of radial wing bars equilaterally disposed to define a plurality of vertical grooves thereamong;
- a pen socket being a cone body connected to said pen-holder at one end, and having a guide hole piercing through its axial center for passing therethrough of writing element;
- a plurality of pusher means in number equal to said vertical grooves, said pusher means each having a thickness slightly larger than the width of said vertical grooves such that when it is set in the associated vertical groove it can be firmly retained therein, said pusher means each also including a seat having a push end vertically extending upward and a tapered hole made at the center for setting therein of writing element;
- a plurality of leads being served as writing elements and arranged in number equal to the number of said vertical grooves or said pusher means, said leads being respectively set in the tapered hole of said pusher means.

4. A writing apparatus according to claim 3, wherein said pen socket is having a plurality of holes made thereon around its circumference to respectively match with the size and position of said vertical grooves.

5. A writing apparatus according to claim 3, wherein said pen-holder are connected with a single guide hole pen socket and a multi-guide hole pen socket respectively at both ends.

6. A writing apparatus according to claim 3, wherein said pen-holder are connected with a single guide hole pen socket respectively at both ends or said pen-holder may be connected with a multi-guide hole pen socket respectively at both ends.

7. A writing apparatus according to claim 3, wherein said pusher means is having a tapered hole for setting therein of two pieces of leads from both ends, and said vertical grooves each is having a single pusher means set therein to control two pieces of leads.

8. A writing apparatus according to claim 3, wherein said pusher means is having a tapered hole for setting therein of one piece of lead, and said vertical grooves each is having two pieces of pusher means set therein to respectively control a single piece of lead.

9. A writing apparatus according to claim 3, wherein the connection portion between the seat and the push end of each of said pusher means has a vertical thickness slightly smaller than the thickness of said wing bars of said pen-holder.

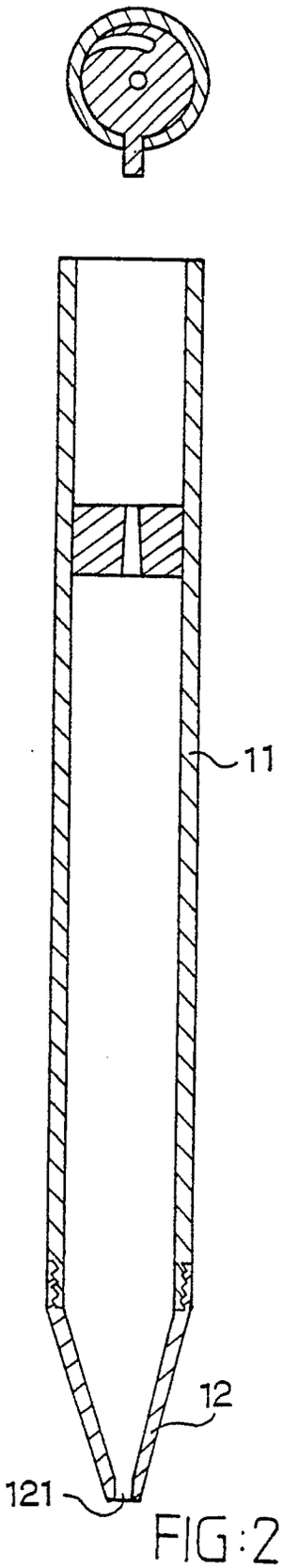


FIG:2

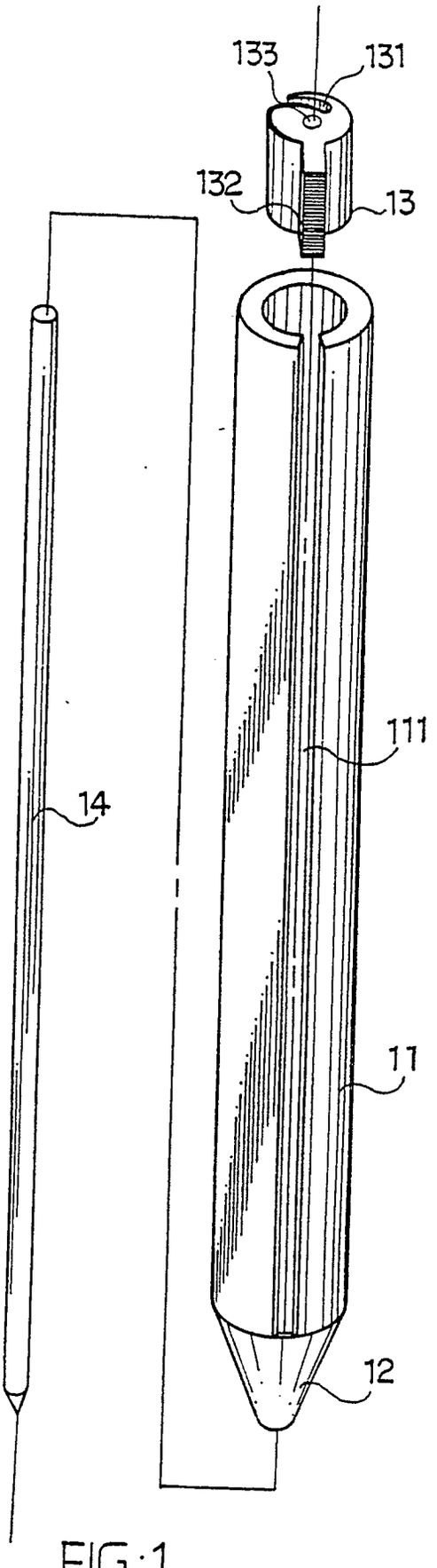


FIG:1

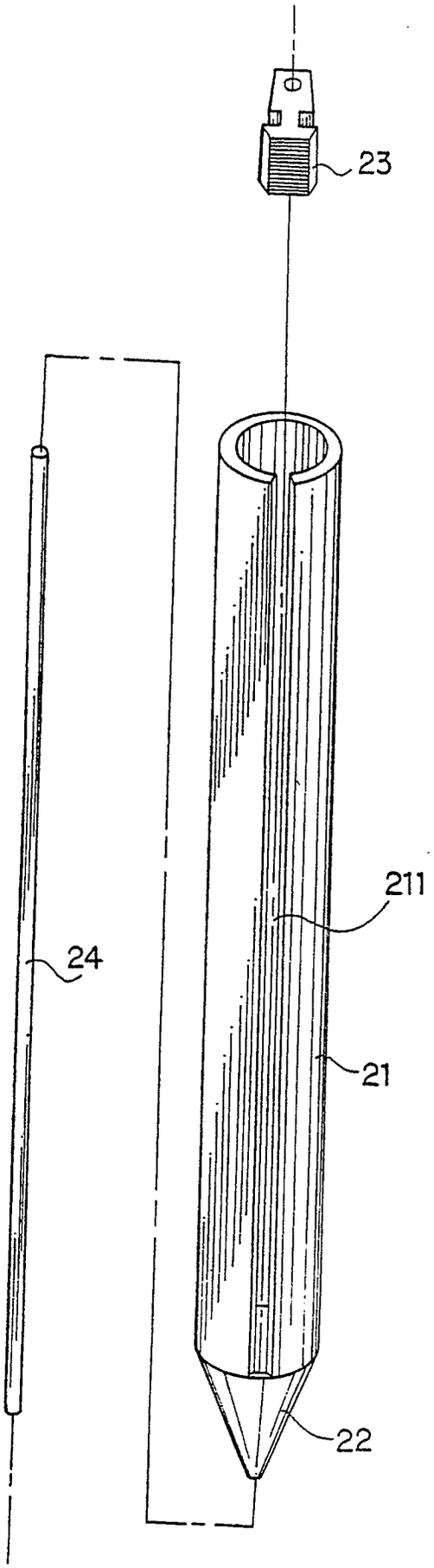


FIG:3

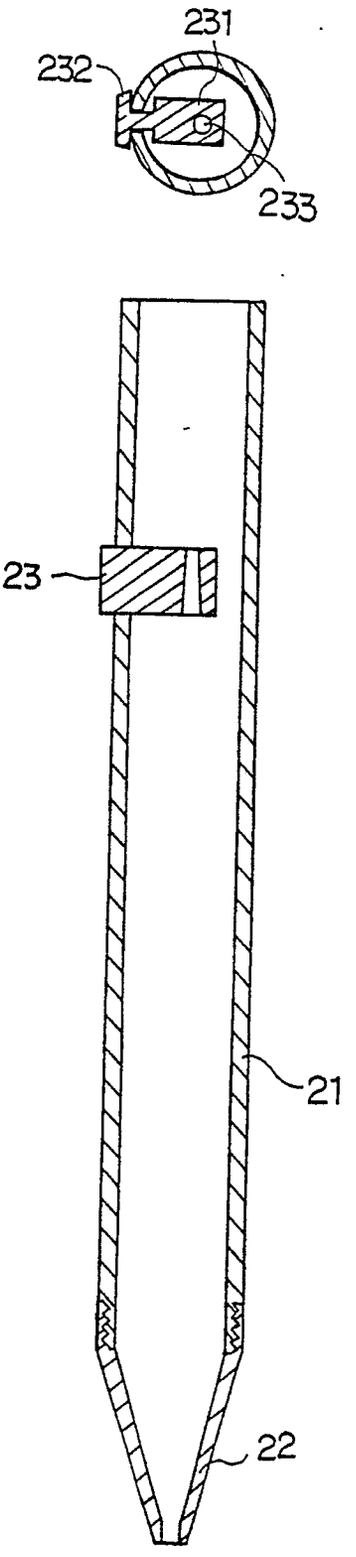


FIG:4

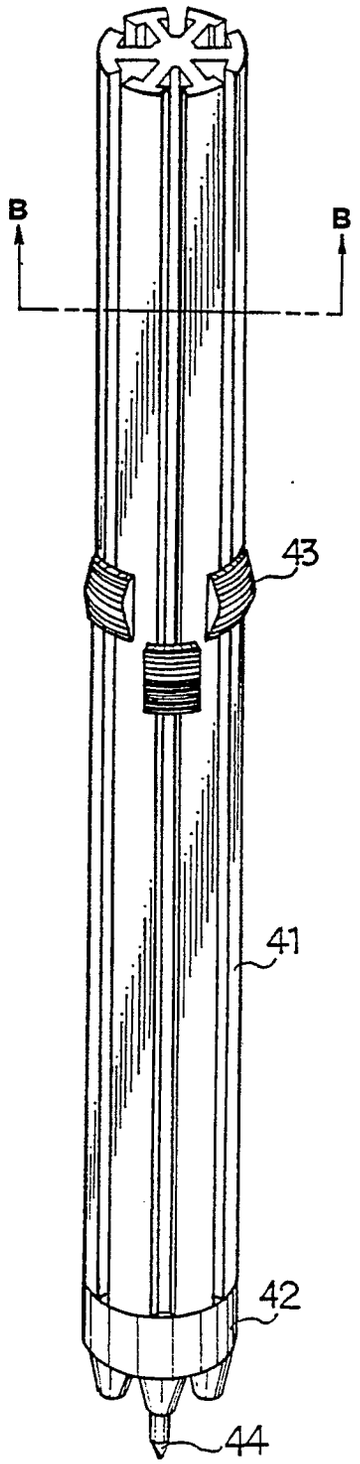


FIG:8

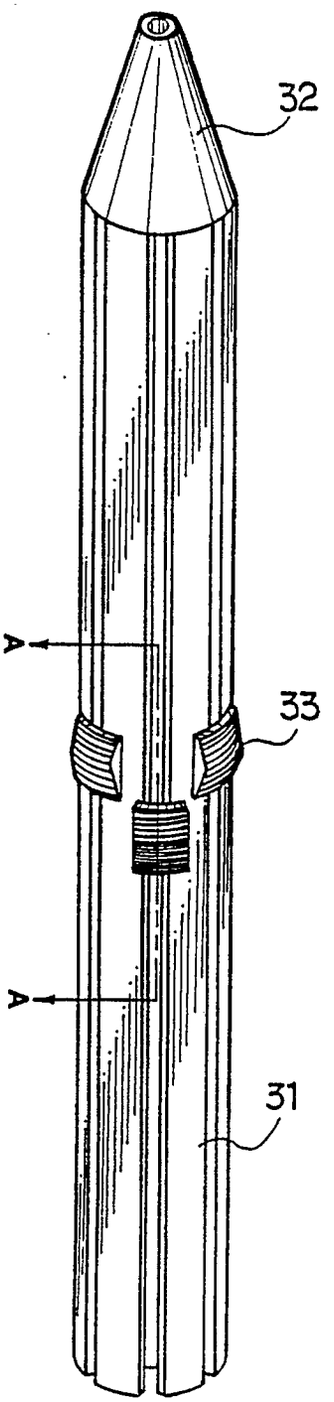


FIG:5

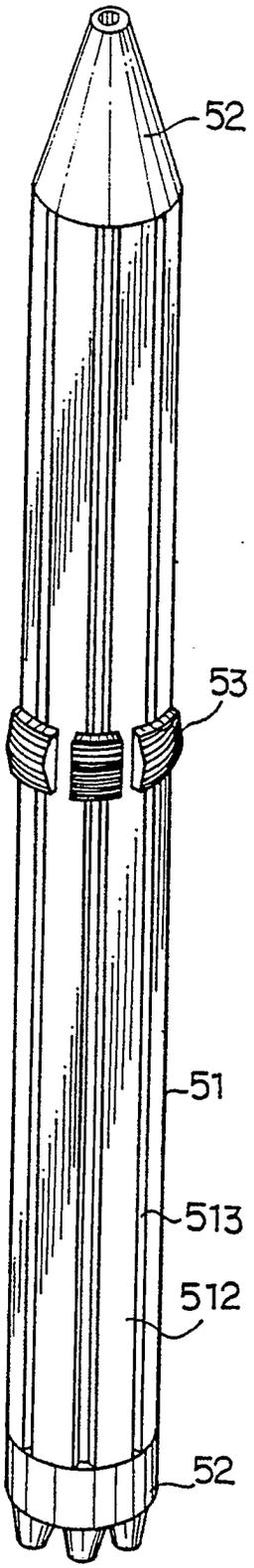


FIG:10

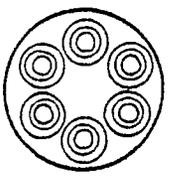

FIG:9

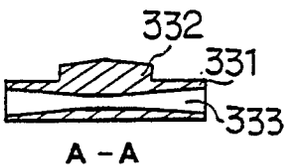


FIG:7


FIG:6

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number

EP 89 10 7426

## 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 | GB-A-2140357 (THE GILLETTE COMPANY)<br>* page 1, line 96 - page 2, line 29 * | 1 | B43K24/04<br>B43K24/12 |
| Y | | 6 | B43K21/06 |
| A | | 2, 9 | |
| X | DE-C-382737 (RUBART)<br>* the whole document * | 3 | |
| Y | | 6 | |
| Y | FR-A-925650 (BERNOS)<br>* the whole document * | 6 | |
| A | | 4 | |
| A | FR-A-1100032 (LAUDET)<br>* page 1, column 2, line 29 - page 2, column 1, line 3 * | 6, 7 | |
| A | US-A-3130712 (KAHN)<br>* column 2, line 46 - column 3, line 62 * | 3 | |
| A | CH-A-239549 (SCHOLL) | | TECHNICAL FIELDS SEARCHED (Int. Cl.5 ) |
| A | FR-A-376643 (LIPPINCOTT) | | B43K |
| A | US-A-3912401 (ZEPELL) | | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 04 DECEMBER 1989 | LAMMINEUR P.C.G. |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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