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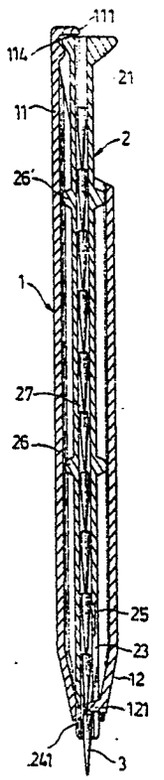
(54) Writing implement comprising leads.

(57) An writing implement which comprises an outer casing (1), an inner tube (2) inserted into said outer casing for storing a plurality of presharpened leads (3), said outer casing is integrally formed with a protrudent flexible elongated reduced neck portion (11) for releasably engaging an upper enlarged portion (21) of said inner tube (2), said neck portion is integrally formed with a lateral triangular flat protrusion (111) for partially covering said upper enlarged portion of said inner tube for preventing said presharpened leads from slipping out of said inner tube, said outer casing is integrally formed with a dependent leg (12) for insertion into said inner tube through a longitudinal slot (23) provided at the lower end of said inner tube, said leg is integrally formed with an inward hook-shaped portion (121) which will be forced to extend into said slot and slide on a longitudinal slide side wall provided at the upper end of said slot on the merits of the elasticity of the material per se for allowing said leads to fall down when said inner tube is moved downward, and will return to its original position just above said lead to be pushed, and said lead will be pushed into a writing position when said inner tube is moved upward.

Fig 4



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USEFUL WRITING IMPLEMENT

BACKGROUND OF THE INVENTION

The present invention relates to a useful writing implement and, more particularly to an improved writing implement which utilizes an integral hook-shaped leg which is integrally formed on an outer casing, and laterally inserted into an inner tube through a longitudinal slot provided at the lower end of the inner tube in order to allow the expelling and feeding of presharpened pieces of pencil lead.

In my U.S. Patent No. 4320982, a coil spring which has a lower end formed into a hook which slides along the slot formed between the clamping halves of the inner tube, is used for the expelling and feeding of presharpened pieces of pencil lead into the space between said two clamping halves. However, such a coil spring is integrally formed with an unsymmetrical hook-shaped end which can not be mass-produced, and is easily removed from the slot of the inner tube if the latter is slightly rotated by mistake, because said slot is very thin and said hook-shaped end is unsymmetrical. This will cause the entire writing implement becomes unusable.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide an improved compact construction in a presharpened pencil that comprises only two or three parts which can be easily mass-produced by means of molding.

It is a further object of this invention to provide, an outer casing having an integral inward hook-shaped leg for insertion into an inner tube for serving as a lead expelling means, and also having a protrudent flexible elongated reduced neck portion for engagement of the upper end of the inner tube for serving as a cap means.

According to this invention, the writing implement comprises an outer casing, an inner tube inserted into the outer casing, for storing a plurality of presharpened leads arranged in series. The upper end of the outer casing is integrally formed with a protrudent flexible elongated reduced neck portion for releasably engaging the upper enlarged portion of the inner tube. The neck portion is provided with a lateral flat protrusion for partially covering the upper open end of the inner tube, for preventing said presharpened leads from slipping out of the inner tube. The lower end of the outer casing is integrally formed with a dependent leg which is laterally inserted through a longitudinal slot provided at the lower end of the inner tube into the inner tube in order to allow the expelling and feeding of presharpened pencil leads.

This invention will become fully apparent from the detailed description with reference to the accompanying drawings which are given by way of illustration only, and thus are not limitative of this invention.

BRIEF DESCRIPTION OF THE DRAWING

Fig. 1 is an exploded view of one embodiment of the writing implement according to the present invention;

Fig. 2 is a longitudinal sectional view of the writing implement in Fig. 1;

Fig. 3 is similar to Fog. 2, but showing the inner tube which has been moved to a lower position;

Fig. 4 is similar to Fig. 3, but showing the inner tube which has been moved to a upper position, and showing the lead which has been exposed;

Fig. 5 is similar to Fig. 3 but showing the exposed lead which has been broken;

Fig. 6 is similar to Fig. 3, but showing the exposed lead which is pushed into the inner tube by means of the table top;

Fig. 7 is a longitudinal sectional view of the writing implement of the second embodiment according to the present invention;

Fig. 8 is similar to Fig. 7 but showing the inner tube which has been moved to a lower position;

Fig. 9 is a diagram of the plastic spare tube according to the present invention;

Fig. 10 is a perspective view of Fig. 7;

Fig. 11 is a cross section taken along lines A-A of Fig. 5;

Fig. 12 is an enlarged view of circle B of Fig. 5,

Fig. 13 is similar to Fig. 11, but showing the lower reduced tube channel which is additionally provided with a plurality of longitudinal small guide protrusions.

Fig. 14 is similar to Fig. 12, but showing the lower reduced tube channel which is additionally provided with a plurality of longitudinal small guide protrusions.

As shown in Figs. 1 and 2, the writing implement of the present invention mainly comprises an outer casing 1 and an inner tube 2 for storing a plurality of presharpened leads 3 arranged in series, which is inserted into the outer casing 1. The outer casing 1 is made of a plastic material by

molding in a tube with an upper open end for receiving the inner tube therefrom and a lower frusto-conical end. The upper end of the outer casing is integrally formed with a protrudent flexible elongated reduced neck portion 11 having a recess 114 for releasably engaging the upper enlarged portion 21 of the inner tube 2. The neck portion 11 is integrally formed with a lateral triangular flat protrusion 111 for covering the upper open end of the inner tube for preventing the presharpened leads from slipping out of the inner tube. Hence, no additional cap means is required.

The lower frusto-conical end of the outer casing 1 is integrally formed with a V-shaped groove at the side wall thereof, which is oppos ing the longitudinal axis of the neck portion 11, in order to form a dependent leg 12 which is integrally formed with an inward hook-shaped portion 121 for lateral insertion into the inner tube 2 through a longitudinal slot 23 provided at the lower end of the inner tube 2 in order to expel part of the lowermost presharpened pencil lead from the lower end of the inner tube by means of movement of the inner tube as shown in Fig. 4. The hook-shaped portion 121 of the leg 12 will be forced to extend into the slot 23 on the merits of the elasticity of the material per se by the slide side wall of the inner tube when the inner tube is moved downward.

The inner tube 2 is also made of a plastic material in a tube. The interior of the inner tube is provided with a channel 27 for storing a plurality of pencil leads 3 arranged in series. The lowermost end of channel 27 is formed into a lower reduced tube channel 22 having a slightly smaller diameter for preventing the lowermost piece of pencil lead 3 from passing therethrough, so that the lead 3 is held within the inner tube 2. Through the uppermost open end of tube channel 27, new leads are fed into inner tube 2. As shown in Figs. 11 and 12, the lower outer peripheral wall 24 of the inner tube 2 is longitudinally integrally formed with a longitudinal groove 241 at a position confronting the longitudinal slot 23 for serving as a center of bending of the lower outer peripheral wall 24 which has a C-shaped cross-section by forming a longitudinal slot 23, in order that the channel 22 can be slightly expanded by the pencil lead 3 when the latter passes therethrough. The upper closed end of slot 23 has a longitudinal slide groove wall 25 formed for sliding of the hook-shaped portion 121 of leg 12 thereon. The outer peripheral wall of the inner tube 2 is integrally formed with an upper annular protrusion 26' and a lower annular protrusion 26 for serving as the guides for sliding on the inner wall of the outer casing 1. As shown in Figs. 13 and 14, the lower reduced tube channel 22 may be provided with a plurality of longitudinal small guide protrusions 221 on the inner wall thereof which are spaced in equal distance, for easily holding or guiding a pencil lead which is to be held or expelled from the inner tube.

Figs. 2 through 5 show the various stages involved in operating the present invention. The lead pieces are stored in a front-to-end fashion with the sharpened end of each piece being pointed towards the writing end of the present pencil. Fig. 2 shows the pencil before being used. When the user starts to pull inner tube 2 downwardly with his thumb by the upper enlarged portion 21 as shown in Fig. 3. At this time, the lowermost end of channel 27 is fully projected outside outer casing. When the slide groove wall 25 reaches the hook-shaped portion 121, the latter will be forced to extend into the slot 23 on the merits of the elasticity of the material per se, and will slide on the slide groove wall 25 until the upper enlarged portion 21 reaches the end wall of the upper open end of the outer casing 1. At this time, the lowermost end piece of pencil lead in the inner tube 2 is no longer blocked by the hook-shaped portion 121 and is subsequently released. It falls automatically through the foremost end of tube channel 27 by its gravity. However, since the lowermost tube channel 22 is slightly smaller in diameter than lead 3, the lead is thus retained therein as shown in Fig. 3. The user then pushes the inner tube 2 upwardly with the same thumb until its upper enlarged portion 21 engages with the recess 114 of the outer casing 1. As a result, the lowermost end of channel 27 is withdrawn into the outer casing 1, and the hook-shaped portion is removed from the slide side wall 25 and inserted into the tube channel through slot 23. When the inner tube 2 is returned to its original upper position and its upper enlarged portion 21 is engaged with the neck portion 11 of the outer casing 1, the lowermost piece of lead will be completely pushed by the hook-shaped portion 121 into the lowermost end of the tube channel 22, and its sharpened end will be exposed for writing as shown in Fig. 4. Since the outside diameter of lead 3 is slightly larger than the inner diameter of the lowermost end of the tube channel 22 and extremely tight grip on the exposed lead can be obtained. When the lowermost piece of lead 3 has become blunt due to use and has to be replaced by second piece of lead 3, the above process may be repeated. As a result, the second piece of lead is pushed into the channel 22, and expels the blunt used lead completely out of inner tube 2 by the aid of the expansion of the slot 23.

In the present invention, the pencil lead, used or not used, can be withdrawn into the inner tube by simply pushing the front end of the exposed pencil lead against any surface such as a table top as shown in Fig. 6.

Shown in Fig. 7 is the second embodiment of

the present invention, it differs from the above embodiment in that first, an integral tube extension 11′ having a lateral opening 14 is used instead of the neck portion 11; second, a coil spring 4 is further provided between the annular protrusion 26 which is integrally formed on the inner tube 2 and the upper inner periphery of the lower frusto-conical end of the outer casing 1, for forcing the inner tube back to its original position without the aid of thumb after the inner tube has been moved to a lower position; third, an eraser block 112 is provided on the upper end of the integral tube extension 11′, and the outer casing 1 is further integrally formed with a clip member 13.

Fig. 9 shows an embodiment of a plastic spare tube 5 filled with a plurality of presharpened pencil leads. By slightly laterally moving the lateral flat protrusion 111 and putting the opened end of spare tube 4 onto the upper opening of the inner tube 2, the lead pieces will fall into the inner tube one by one so as to fill it completely. However, should the user prefer, the lead may be inserted individually into the inner tube 2 without using plastic spare tube 5.

The leads used in the present invention will not be limited to pencil leads. Other working implements which can utilize the construction of the present invention and, therefore, are within the scope thereof including colored pencils, crayons, paraffin pencils, and the like.

Claims

1. An useful writing implement comprising an outer casing, an inner tube inserted into said outer casing for storing a plurality of presharpened leads, characterized in that said outer casing is integrally formed with a protrudent flexible elongated reduced neck portion for releasably engaging an upper enlarged portion of said inner tube, and a dependent leg for insertion into said inner tube through a longitudinal slot provided at the lower end of said inner tube, said leg is integrally formed with an inward hook-shaped portion which will be forced to extend into said slot and slide on a longitudinal slide groove wall provided at the upper end of said slot on the merits of the elasticity of the material per se for allowing said leads to fall down when said inner tube is moved downward, and will return to its original position just above said lead to be pushed, and said lead will be pushed into a writing position when said inner tube is moved upward.

2. The writing implement of claim 1, wherein said inner tube is formed with a lower reduced tube channel having a diameter smaller than the diameter of said presharpened lead for expandably holding the same.

3. The writing implement of claim 2, wherein said inner tube is longitudinally integrally formed with a longitudinal groove on the lower outer peripheral wall thereof at a position confronting said longitudinal slot, for serving as a center of bending of said lower outer peripheral wall.

4. The writing implement of claim 2 and 3, wherein said lower reduced tube channel is provided with a plurality of longitudinal small guide protrusions on the inner wall thereof, for easily guiding of said presharpened leads.

5. The writing implement of claim 1, wherein said neck portion of said outer casing is integrally formed with a lateral triangular flat protru sion for partially covering said upper enlarged portion of said inner tube for preventing said presharpened leads from slipping out of said inner tube.

6. The writing implement of claim 1, wherein said neck portion is provided with a recess for releasably engaging said upper enlarged portion of said inner tube.

7. The writing implement of claim 1, wherein said inner tube is integrally formed with upper and lower annular protrusions for serving as the guides for sliding on the inner wall of said outer casing.

8. An useful writing implement comprising an outer casing, an inner tube inserted into said outer casing for storing a plurality of presharpened leads, and a coil spring disposed between a lower annular protrusion formed on said inner tube and the upper inner periphery of a frusto-conical end of said outer casing for forcing said inner tube back to its original upper position after said inner tube has been moved to a lower position, characterized in that said outer casing has an integral tube extension having a lateral opening for receiving an upper enlarged portion of said inner tube, and a dependent leg for insertion into said inner tube through a longitudinal slot provided at the lower end of said inner tube, said leg is integrally formed with an inward hook-shaped portion which will be forced to extend into said slot and slide on a longitudinal slide groove wall provided at the upper end of said slot on the merits of the elasticity of the material per se for allowing said leads to fall down when said inner tube is moved downward, and will return to its original position just above said lead to be pushed, and said lead will be pushed into a writing position when said inner tube is moved upward by means of said coil spring.

9. The writing implement of claim 8, wherein said inner tube is longitudinally integrally formed with a longitudinal groove on the lower outer peripheral wall thereof at a position confronting said longitudinal slot, for serving as a center of bending of said lower outer peripheral wall.

10. The writing implement of claim 8, wherein

said inner tube is formed with a lower reduced tube channel having a diameter smaller than the diameter of said presharpened lead for expandably holding the same.

11. The writing implement of claims 9 and 10, wherein said lower reduced tube channel is provided with a plurality of longitudinal small guide protrusions on the inner wall thereof, for easily guiding of said presharpened leads.

12. The writing implement of claim 8, wherein said inner tube is integrally formed with upper and lower annular protrusions for serving as the guides for sliding on the inner wall of said outer casing.

13. The writing implement of claim 8, wherein said integral tube extension in said outer casing is used as a cover for covering said upper enlarged portion of said inner tube for preventing said presharpened leads from slipping out of said inner tube, and provided with an eraser block 112 on the upper end thereof.

14.The writing implement of claim 8, wherein said inner tube is further integrally formed with an upper annular protrusion for serving as a guide for sliding on the inner wall of said outer casing in association with said lower annular protrusion.

Fig. 10

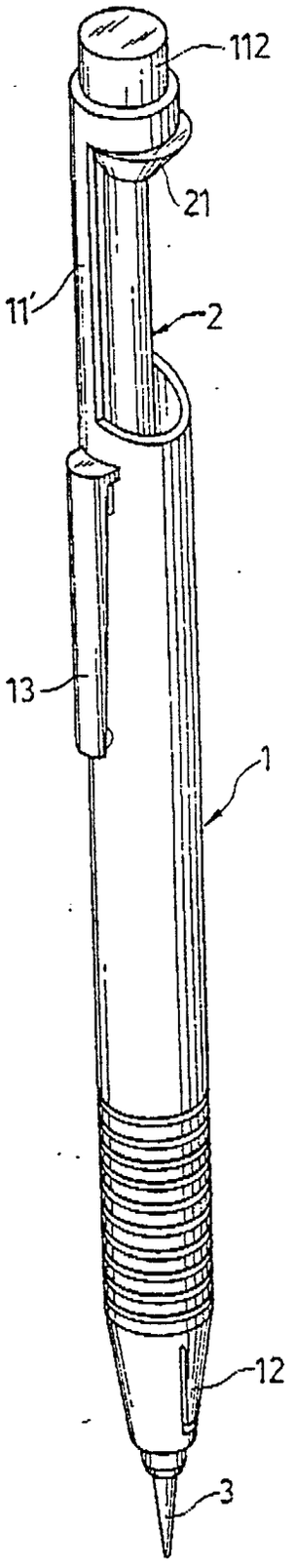
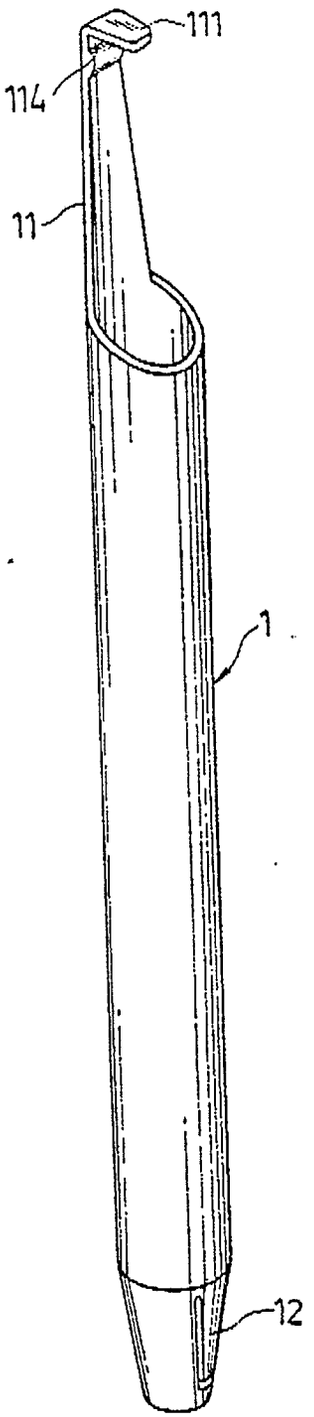


Fig. 1



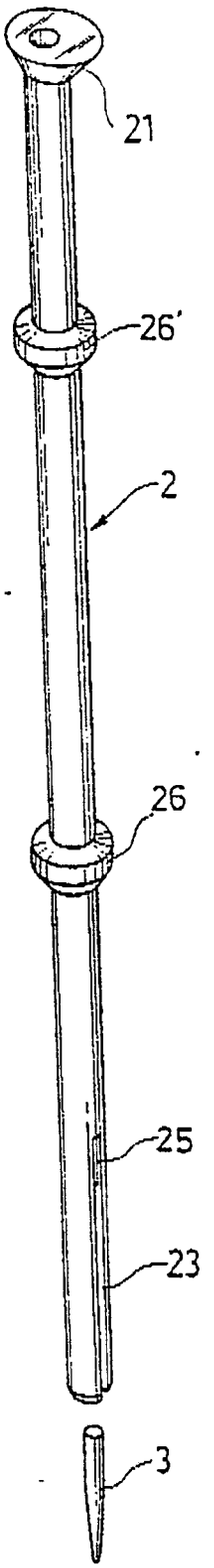


Fig.2

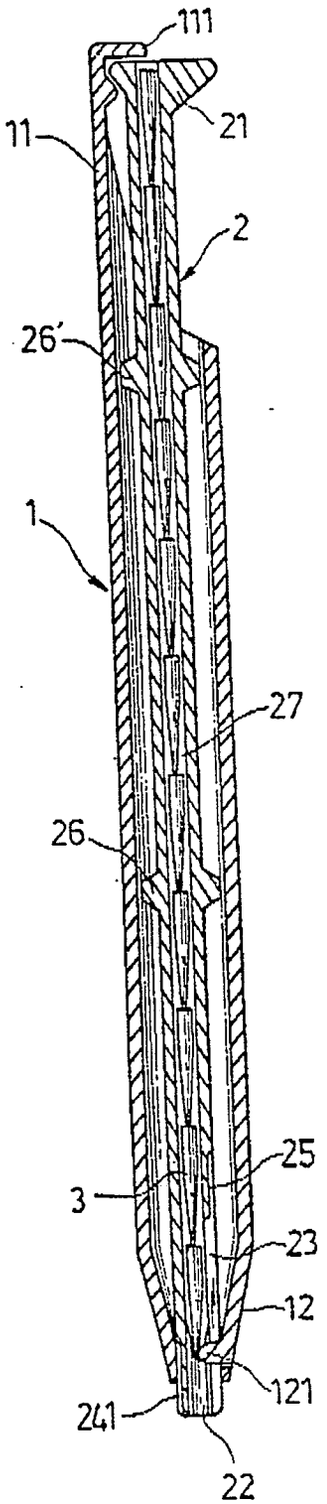


Fig.3

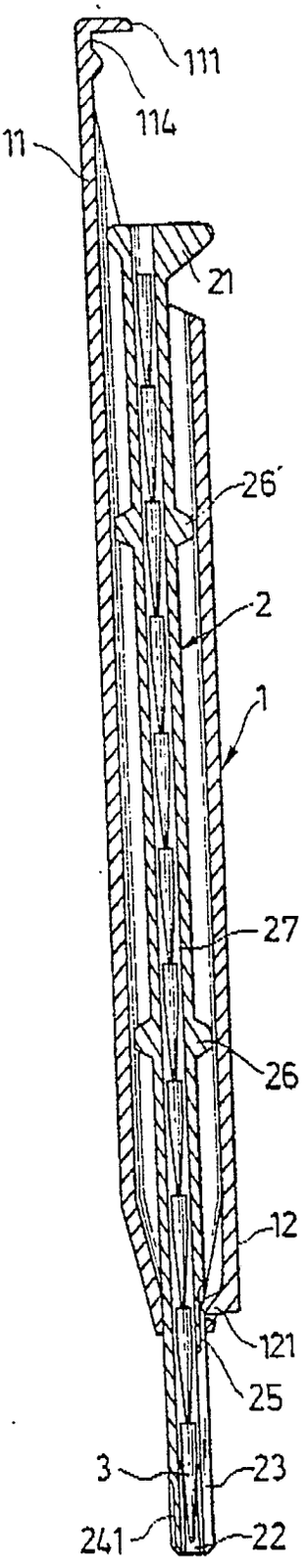


Fig.4

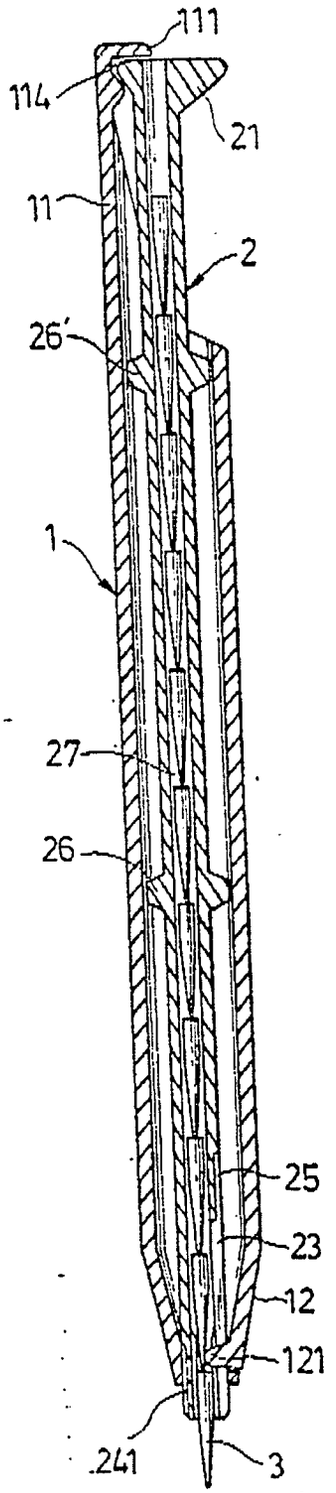


Fig.5

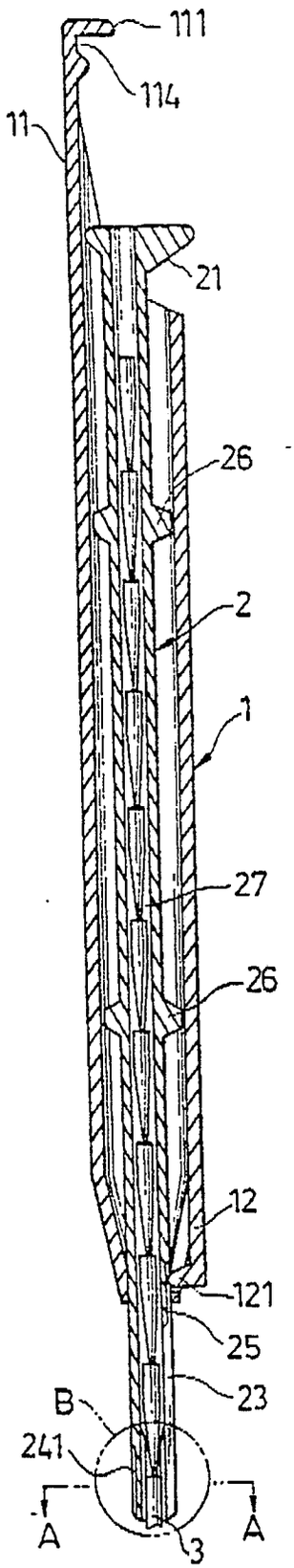


Fig.8

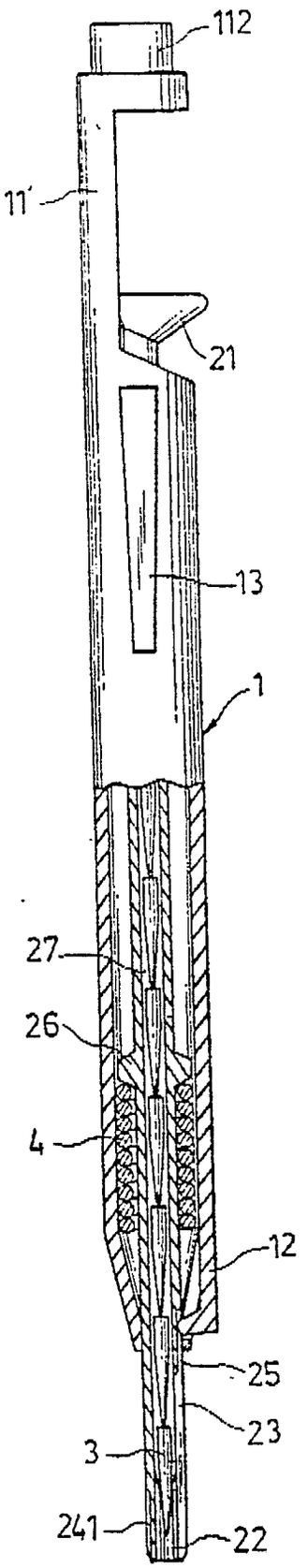


Fig.7

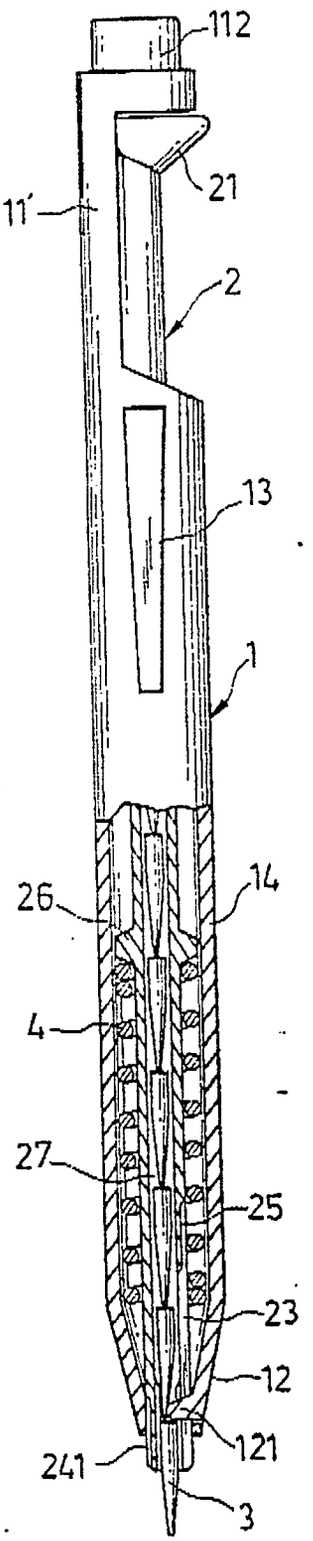


Fig.6

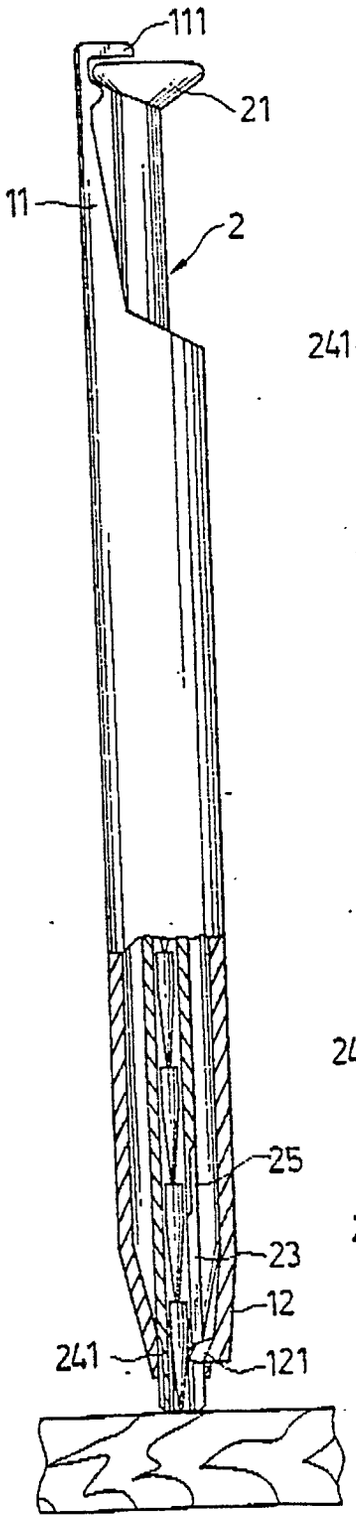


Fig.11

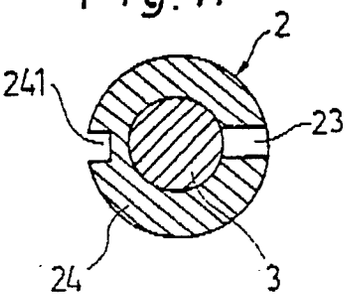


Fig.12

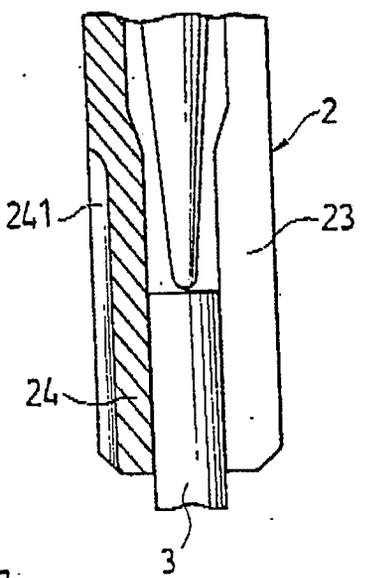


Fig.9

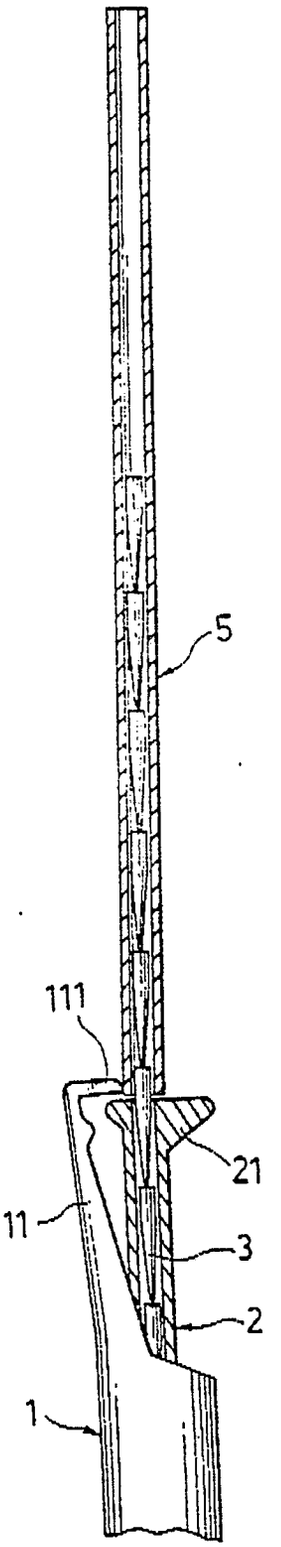


Fig. 13

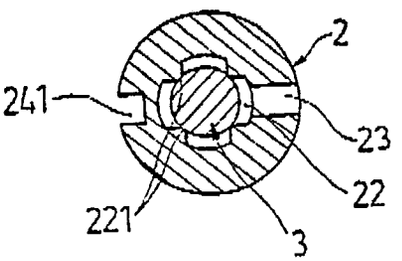
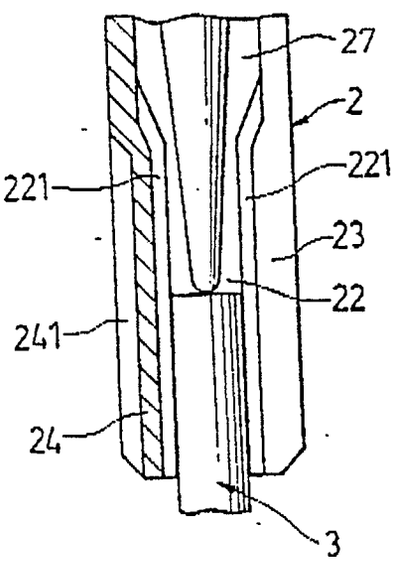


Fig. 14



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 11 4829

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.4)
X	US-A-1378174 (KAISER) * page 1, line 30 - page 2, line 6 *	1, 2, 8, 10	B43K21/00 B43K24/02
A	US-A-2881735 (CRAIG) * column 1, line 68 - column 2, line 24 *	1, 8	
A	US-A-4515492 (SHAN) * column 2, line 51 - line 55 *	7, 12	
A	DE-C-137288 (GOLDSMITH) * the whole document *	8	
A	DE-C-67601 (FORNANDER)		
A	US-A-2076470 (LEIMER) * page 1, column 1, line 46 - page 2, column 1, line 73 *	1, 8, 13	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B43K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11 APRIL 1989	LAMMINEUR P.C.G.

CATEGORY OF CITED DOCUMENTS

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