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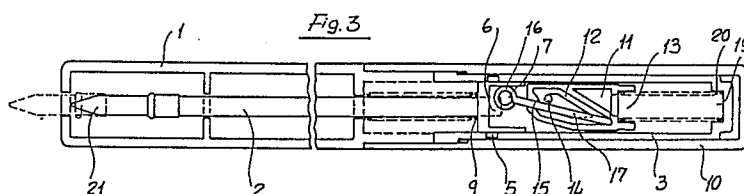
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⑤④ **Ball pen including a cam mechanism for actuating its writing tip.**

⑤⑦ There is disclosed a ball pen provided with an improved mechanism for locking the refill-writing tip assembly in a writing position or, respectively, in a withdrawn or disengaged position.

The ball pen substantially comprises an elongated pen body (1) including the pen refill (2) and extending with a small frame (3) thereon there is slidably mounted a box-like body (10) the structure of which is related to that of the small frame.

The pen refill (2) is associated with a pawl (6) which is coupled to the small frame (3) and on the inner face of the box like body there is cantilever-wise provided a profiled region (12) therealong one end of a hook element can slide, the other end of the hook member being rotatably coupled to the pawl.



Description

BALL PEN INCLUDING A CAM MECHANISM FOR ACTUATING ITS WRITING TIP

The present invention relates to a ball pen including a cam mechanism for actuating or locating the pen writing tip.

Ball pens are already known the refill member of which is resiliently counterbiased in such a way that the writing tip is able of automatically withdraw within the pen body.

In these pens the writing tip projecting and withdrawing movements are controlled by a small push-button actuating a writing tip locking and releasing mechanism, which is more or less complex.

This mechanism, on the other hand, is susceptible to frequent malfunctions.

Moreover, since the mentioned controlling push-button necessarily projects from the end portion of the pen body, it may be accidentally operated with consequent undesired foulings.

SUMMARY OF THE INVENTION

Thus, the main object of the present invention is to overcome the above mentioned drawbacks by providing a ball pen the writing tip of which can be ejected from the pen body or withdrawn therein exclusively through a complex movement.

Another object of the present invention is to provide a ball pen the refill of which can be locked at the desired position by means of a cam type of mechanism.

Still another object of the present invention is to provide a ball pen including a very reliable refill locking mechanism.

According to one aspect of the present invention the above mentioned objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a ball pen characterized in that it substantially comprises an elongated body including the pen refill and extending with a small frame thereon there is slidably engaged a box like body having a structure related to that of said small frame, said pen refill being coupled to a pawl rigidly connected with said small frame, on the inner face of said box like body there being formed, cantilever-wise, a continuous profiled region therealong one end of a hook element can be displaced, said hook element being rotatably coupled to said pawl and said pawl being urged by a spring toward said pen refill, a further urging spring being provided between said cantilever profiled region and the opposite end of said frame.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the ball pen, provided with an improved mechanism for locking the pen refill, according to the present invention, will become more apparent hereinafter from the following detailed description of a preferred embodiment thereof, being illustrated, by way of an indicative but not limitative example, in the figures of the accompanying drawings, in which:

figure 1 is a perspective view of the ball pen according to the present invention;

figures 2 and 3 respectively show a cross longitudinal vertical section view and a horizontal cross section view of the ball pen according to the present invention

and

figure 4 shows a top view of the mentioned pawl.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings, the ball pen according to the present invention consists of an elongated structure or body, having a substantially rectangular cross-section, 1 along the longitudinal axis of which there is formed a upwardly seat for housing a refill 2.

This structure, at one end, extends with a rectangular small frame 3, having a length substantially corresponding to the length of said structure and a slightly smaller cross-section, and being provided with two opposite side slots 4 extending for a given extension.

On the two mentioned slots there is slidably engaged, through respective projecting pins 5, a pawl 6 which is provided, at its top face, with a further pin 7, which is suitably arranged.

The pawl 6 is provided with a front blind hole 8 adapted to receive, by a force coupling and through the interposition of an encompassing coil spring 9, locked by a narrowed portion formed between the elongated structure and the small frame, the end portion of said refill.

As shown, said small frame 3 is slidably housed in a box-like body 10 having a length related to that of said small frame and on the base inner face of which there is applied, or formed, cantilever-wise, a rectangular cross-section small block 11.

On the top face of this small block 11, which is able of sliding under said pawl, there is formed or engraved a continuous profiled region, having a suitable extension and indicated at the reference number 12, at the free end of said small block there being provided a longitudinal cavity or recess 13.

More specifically, said profiled region has an outline which substantially corresponds to the perimetrical outline of a small tip angle isosceles triangle the base of which, being defined by a broken line, defines, on the inner side, cavity or recess 14 and, on the outer side, a projection 15 which is suitably arranged with respect to said cavity.

On the pawl top pin 7 there is rotatably engaged an eyelet end 16 of a steel or other suitably strong material wire 17 the other end of which is bent to a hoof shape, as shown at 18.

Moreover, between the cavity 13 of the small block 11 and a corresponding cavity or recess 19 formed on the small side of the frame 3, there is housed a further pressure coil spring 20.

In operation, by causing the box-like body 10 to slide along the frame 3, the hook end of the wire 17 will be firmly engaged in the recess 14 of the profiled region 12 and the pawl 6, by exceeding the counterbiassing force of the spring 9, will outwardly push the refill so as to arrange its writing tip at its writing position.

The sliding box-like body 10, in particular, will be recovered to its starting position because of the counterbiassing action of the expansion spring 20.

The disclosed pen assembly will be completed by two half covers 22, consisting of respective box-like bodies, which are firmly coupled respectively to the structure 1 and sliding body 10.

From the above disclosure and the figures of the accompanying drawings it should be apparent that the ball pen according to the invention fully achieves the intended objects.

While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof, it should be pointed out that the disclosed embodiment is susceptible to several modifications and variations all of which will come within the spirit and scope of the appended claims.

Claims

1- A ball pen characterized in that it comprises an elongated body (1) including the pen refill (2) and extending with a small frame (3) thereon there is slidably engaged a box like body (10), said pen refill (2) being coupled to a pawl (6) rigidly connected with said small frame (3), on the inner face of said boxlike body (10) there being formed, cantilever-wise, a continuous profiled region (12) therealong one end of a hook element can be displaced, said hook element being rotatably coupled to said pawl (6) and said pawl being urged by a spring (9) toward said pen refill, a further urging spring being provided between said cantilever profiled region and the opposite end of said frame.

2- A ball pen, according to the preceding claim, characterized in that said elongated body (1) consists of a substantially rectangular cross-section structure along the longitudinal axis of which there is formed an upwardly open seat adapted to house a refill member (2) said structure extending, at one end thereof, with a rectangular small frame having a length substantially equal to the length of said structure and a slightly smaller cross-section than that of said structure, said small frame including two opposite side slots (4).

3- A ball pen according to one or more of the preceding claims, characterized in that a pawl (6) is slidably engaged, through respective projecting pins (5), along said slots (4), said pawl (6) being provided, at its top face, with a further pin (7), said pawl (6) being further formed with a blind hole (8) adapted to receive, by a forced coupling and through the interposition of an

encompassing coil spring (9), locked by a narrowed portion formed between said elongated structure and small frame, the end portion of said refill member.

4- A ball pen according to one or more of the preceding claims, characterized in that said small frame (3) is slidably housed in a box-like body (10) on the inner base face of which there is cantilever-wise applied a rectangular small block (11), on the top face of said small block, adapted to slide under said pawl, there being formed a continuous profiled region (12), a cavity being longitudinally formed at the free end of said small block (11).

5- A ball pen according to one or more of the preceding claims, characterized in that said profiled region (12) has an extension which substantially corresponds to the perimetrical outline of an isosceles triangle the base of which, defined by a broken line, defines, on its inner side, a cavity (14) and, on its outer side, a projection (15) suitably arranged with respect to said cavity.

6- A ball pen according to one or more of the preceding claims, characterized in that on the top pin (7) of said pawl (6) there is rotatably coupled an eyelet end (16) of a wire (17) having its opposite end (18) so bent as to define a hook.

7- A ball pen according to one or more of the preceding claims, characterized in that a pressure coil spring (20) is arranged between the perimetrical cavity (13) of said small block (11) and a corresponding cavity (19) formed on the small side of said frame.

8- A ball pen according to one or more of the preceding claims, characterized in that said pen further comprises two half covers (22) consisting of respective box-like bodies which are firmly coupled respectively to said elongated structure (1) and sliding body (10).

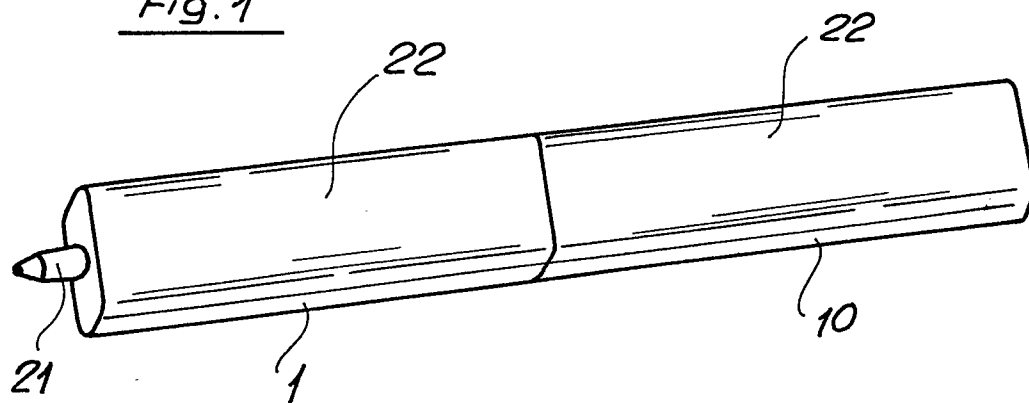
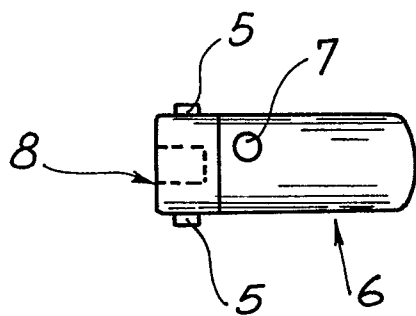
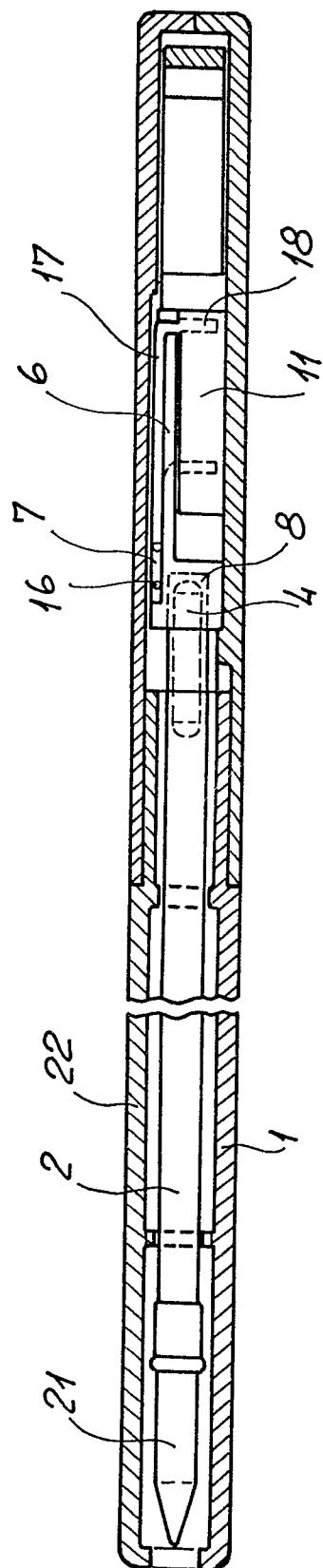
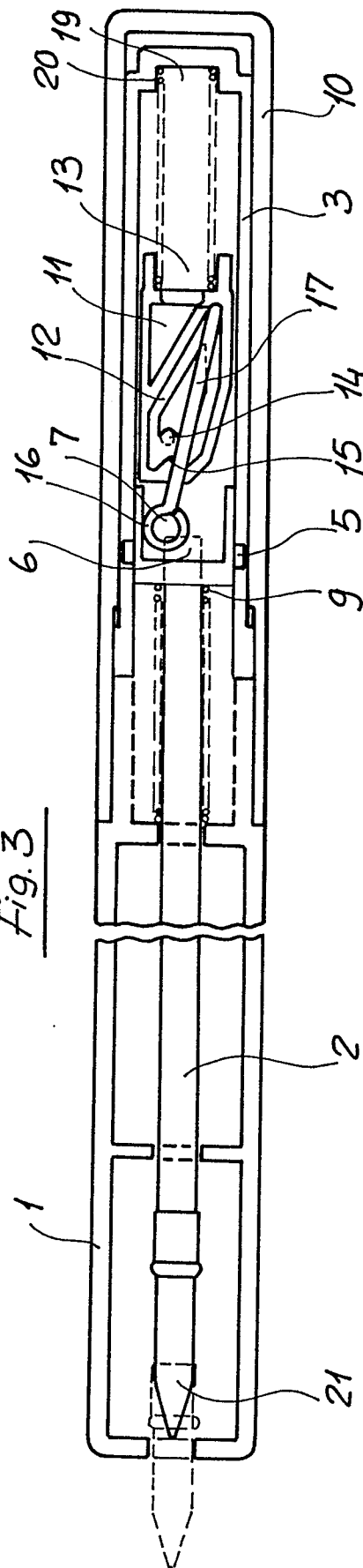
Fig. 1Fig. 4

Fig. 2Fig. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 83 0232

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)
A	GB-A- 894 355 (WPC ENTERPRISES INC.) * Page 1, line 85 - page 4, line 7 * ---	1	B 43 K 7/12 B 43 K 24/02
A	US-A-2 605 746 (KAHN) * Column 1, line 41 - column 5, line 22; in particular figures 1,2 * ---	1	
A	US-A-3 334 615 (BROSS) * Column 2, line 36 - column 3, line 37 * ---	1	
A	GB-A-2 151 990 (KATOH KINZOKU KOGYO K.K.) * Page 1, lines 16-48 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 43 K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26-07-1988	Examiner VAN OORSCHOT J.W.M.
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 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			

A B S T R A C T

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