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AUTOMATIC BALL-POINT PEN

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The present invention relates to automatic ball-point pens which can be refilled.

The ball-point pen in use at the present time are of a rather complicated construction being composed of different parts, and the replacement of the ink charge in them is also a somewhat troublesome operation entailing the dismantling and remounting together of component parts distinct from the pen.

The simplicity of the present invention is an automatic ball-point pen without inconveniences referred to inherent in the recognised ball-point pens.

The ball-point pen according to the invention, is characterised or individuated by the fact that it comprises an external sheath fitted with two small open slots diametrically opposite to each other, and a plunger carrying in a self-evident manner, the ink charge and the writing device (refill); this plunger is regulated by two distinct control components contrived as one sole part under the form of two diametrically opposed projections, one to bring the pen into action and the other to release it from the working position, which projections are designed to engage with one edge of the respective small open slots under pressure exerted by a spring such as normally fitted in an automatic pen. One of these slots is large enough to permit the fittings of the plunger with its refill through it in a sideways direction to the axis of the pen by making use of the flexibility or capability of bending of the refill.

This construction of the pen allows, first of all, for the maximum of constructional simplicity inasmuch as the entire pen is made up of only two parts namely the external sheath or case and the plunger with its refill, to the exclusion of any other additional part, that is of course, including the usual helicoidal spring essential to the working of every automatic ball-point pen. Likewise the production dies used in making the two parts composing the ball-point pen are simpler and less fragile or brittle than those employed in the manufacture of the well-known ball-point pens.

The simplicity of the production dies is especially apparent in the instance, in which according to one form of embodiment of the present invention, the clip of the pen forms an integral piece with the plunger instead of with the external sheath of the pen, as is usual.

The invention will be understood better from the following detailed description, given solely under the heading of an example and therefore not restrictive, of one form of embodiment and with reference to the single drawing attached, in which:

FIGURE 1 is an axial section of a ball-point pen according to the invention;
FIGURE 2 is a cross sectional view taken on line 2—2 of FIGURE 1;
FIGURE 3 is a view in perspective of the pen, showing as it is in the act of replacing the refill, and

FIGURE 4 is a partial view in section of the pen in projected or writing position.

Examining first of all FIGURES 1 and 2, it is apparent that the pen includes an external sheath 1 possessing at the top two small open slots or ports 2, 3 diametrically opposite, of which the first is obviously larger and longer than the second. Inside the sheath there is fitted the usual writing component 4 with its own ink supply (the refill) and its tube which can be bent being flexible.

Writing component 4 is connected with the top of the pen in corresponding slots 2, 3 in a body 5 forming the plunger of the ball-point pen. At the side of this body facing the small slot 2 there protrudes a clip 6, which as shown at 6' is knurled, forming an integral component with the body 5, and on the opposite side facing small slot 3 there is a tooth 7. The body 5 is recessed at the top into two diametrically opposite rabbets 8, 9. In the hollow space between the refill and the external sheath of the pen the normal helical spring 10 is inserted and, at one end, it rests against a shaped rabbet 11 in the sheath 1. FIGURE 1 shows the pen when not in use. In this position the recessed rabbet 8 in the body 5 is in contact with the top edge of the small slot 2 and held locked in that position by the spring 10. When required for use in writing it is enough to press clip 6 downwards and sideways towards the inside of small slot 2. Then the body 5 travels downwards compressing spring 10 until the position is reached where lateral pressure exerted on clip 6 causes the recessed rabbet 9 to spring into the small slot 3 thus locking this rabbet or shoulder with the top edge of the small slot under pressure of spring 10 which acts to maintain this engagement. When the pen is no longer required for writing it can be put out of action by pressing sideways on the tooth 7 causing the rabbet 9 to become disengaged from the small slot 3 and the body 5 springs upwards until the rabbet or recessed shoulder 8 comes into contact with the top edge of the other small slot 2. It is anticipated that eventually the tooth 7 will function as a rabbet thus dispensing with the rabbet 8 of the clip.

The operations of dismantling and re-assembling the pen in order to change the refill are extremely simple. To take out the refill the clip 6 is pressed downwards and pulled sideways away from the small slot 2 until the whole body 5 slides out of the slot. Once the tooth 7 has cleared the top edge of the small slot 2 (FIGURE 3) the complete refill can be extracted from this same slot by making use of the flexibility of the refill. It does not matter whether the spring 10 stays outside the sheath or is pulled out with the refill. When the refill in the body 5 has been replaced, the new refill is inserted into the pen by the inverse operation namely inserting it inside the spring 10 sticking out sideways from the slot 2 and pushing the whole unit by acting on the plunger 5 until the lower end of the plunger has cleared the edge of slot 2 and, under the action of spring 10 is lodged in its appropriate seat formed in the lower point of the sheath 1.

Although only one form of embodiment of the invention has been represented here, it is obvious that many variants and modifications may be adduced without departing from the ambit of the same invention.

I claim:

1. A ball-point pen, comprising a flexible refill which
may be removed from the sheath or introduced in it respectively and may be controlled to shift it from a writing position to a position of non-use against the action of a spring, and a sheath provided with two diametrically opposite slots, one of said slots being large enough to enable the refill to pass through it, the refill having a head portion having two projections each extending through one of said slots for shifting the refill into and out of the writing position respectively, one of said projections having a pair of abutments alternately engageable with an end wall of its corresponding slot for determining the writing and the non-writing positions respectively.

2. A pen according to claim 1, in which the projection extending through the slot enabling the passage of the refill is the clip of the pen, said clip having an abutment adapted to engage one end of said slot.

3. A pen according to claim 2, characterised by the fact that the clip is knurled on said abutment.

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