May 30, 1961 E. ROESLER ET AL 2,986,119

WRITING INSTRUMENTS

Filed Feb. 11, 1957

Fig. 1

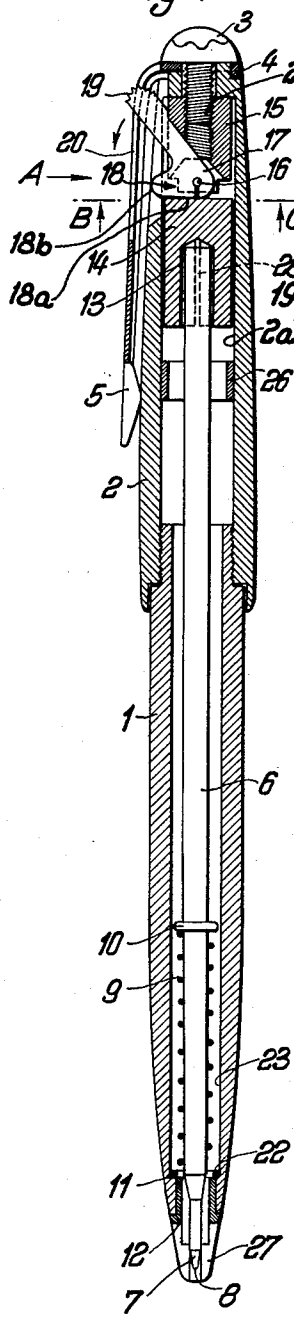


Fig. 2

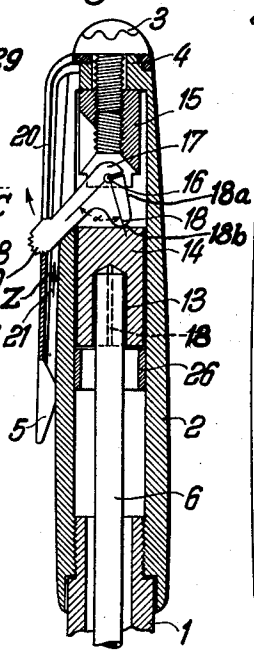


Fig. 3

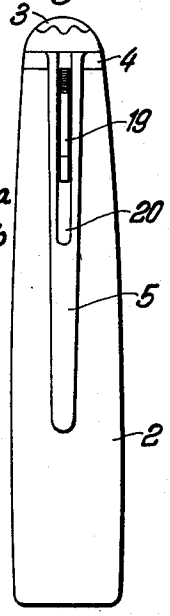


Fig. 4

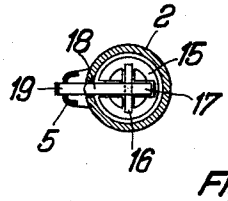


Fig. 5

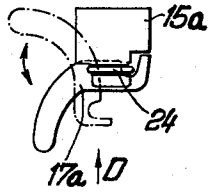


Fig. 6

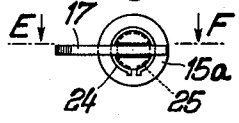
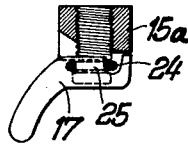


Fig. 7



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2,986,119

WRITING INSTRUMENTS

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5 Claims. (Cl. 120—42.03)

The present invention concerns a writing instrument having a writing point carrier which is axially displaceable in the barrel by means of a tilting lever against the pressure of a spiral spring, the tilting lever being in contact with a supporting piston through a lifting arm.

With regard to propelling pencils, fountain pens and writing instruments having a ball point, it is often desirable to withdraw the writing point, that is to say the nib or ball, into the profile of the barrel during non-use in order to prevent damage to the writing point and soiling of the clothing and the like by the writing fluid. Such constructions having an axially displaceable writing point carrier are known in the case of writing instruments and ball pens in which the writing point carrier is actuated by means of a push member sliding in a slot on the barrel.

Usually these devices are provided with notches in the writing position and the retracted position. The axial displacement has also been effected by a press button which is arranged at the end of the writing instrument and actuates an advancing mechanism consisting of a pin inserted into guide cams, the holder of the writing means simultaneously executing an axial rotary movement (German Patent No. 80,470 and United Kingdom Patent No. 635,144). These press button advancing mechanisms not only had the disadvantage that the length of the instrument was extended owing to the fact that the press button and the clip could not be attached to the extreme end of the instrument so that the latter projected by this amount from the pocket, but the guiding mechanism, which ensured the rotation and the forward and back thrust, was also subjected to great wear and tear and in addition the instrument was difficult to assemble.

Therefore, tilting lever mechanisms have been used in ball pens wherein the rear end of the writing fluid reservoir, pressed backwardly by means of a spiral spring, was covered by a supporting piston on which rested the lifting arm of a tilting lever pivotable about a pin, and the control arm of the tilting lever projected out of the profile of the barrel so that, in the retracted position of the reservoir, it was disposed on the barrel as a clip. The lifting arms of the tilting lever extended to the control arm at an oblique angle (United States Patent No. 2,427,-068). This construction had the disadvantage that the control lever, particularly in the case of a pocket consisting of relatively thick material, was swung out so that the grip on the edge of the pocket ceased and also the writing point was advanced out of the body of said point, thus causing handkerchiefs to be soiled by the writing fluid.

In contrast to this, the present invention provides a writing instrument, having a writing point carrier axially displaceable in the barrel, by means of a tilting lever, against the pressure of a spiral spring, the tilting lever resting by means of a lifting arm on a supporting piston, characterised in that the lifting arm is arranged at an

acute angle to the control arm of the tilting lever and the tilting lever is able to slide by means of the free end of its control arm in a guide slot in the cap or, preferably, in the clip, so that, when the writing point carrier is in the retracted position it points towards the end of the writing instrument.

In a preferred form of construction, the tilting lever may be pivotably journalled at its center of rotation on a ring which is preferably resiliently located in an annular groove of a bearing sleeve connected to the head of the cap. The end of the spiral spring in the front part of the barrel is preferably enlarged sufficiently to be in contact with the wall of the bore of the barrel with a wringing or interference to fit. The supporting piston is also preferably provided to the length of its bore with one or more axial slots and the supporting piston is limited in its axial movement by a spring ring arranged in the bore of the barrel. The body of the point preferably has axial slot so that the writing point is clamped with a resilient action.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is an axial section through a ball point equipped writing instrument according to the present invention with the ball point in its retracted position.

Fig. 2 is a fragmentary axial section showing part of the instrument of Fig. 1 in its advanced position;

Fig. 3 illustrates the cap of Fig. 1, as seen in the direction of the arrow A of Fig. 1;

Fig. 4 is a section taken on the line B—C of Fig. 1;

Fig. 5 is a detail showing the mounting of the tilting lever on a spring ring connected to the bearing sleeve;

Fig. 6 shows the structure of Fig. 5 as seen in the direction of the arrow D of Fig. 5; and

Fig. 7 is a section taken on the line E—F of Fig. 6.

As shown in Figs. 1 to 4, the writing instrument with its ball tip, constructed in accordance with the present invention, consists of a barrel **1** the rear portion of which has screwed thereon a cap **2** closed by a button **3** in a manner known per se. A ring **4** of a clip **5** is clamped between said button **3** and cap **2**.

A reservoir tube or writing point carrier **6** which contains the writing fluid is axially displaceably journalled in barrel **1** and cap **2** in a manner known per se. The front portion of tube **6** carries a writing point **7** with the ball point **8**. Tube **6** is provided with a collar **10** against which rests one end of a spiral spring **9**, the other end of which rests against a shoulder **11** in the point body **12** of the barrel **1**. Spring **9** is so tensioned that it is adapted to retract reservoir **6**. The point body **12** is preferably provided with axial radial slots **27** so that it holds the writing point **7** resiliently whereby lateral deflection of said writing point is prevented during use.

The rear end of the reservoir **6** is located in a known manner in a bore **13** of a piston **14** which is axially displaceable in the bore **2***a* of the cap **2**. The axial movement of piston **14** is limited by a spring ring **26** arranged in the bore **2***a* of cap **2**. The piston **14** is preferably provided with one or more axial slots **28** extending approximately over the length of the bore **13**.

A bearing sleeve **15**, connected to the button **3** by a screw connection **29**, is secured above the supporting piston **14**. This bearing sleeve **15** carries a pin **16** on which a tilting lever **17** is pivotably journalled. Tilting lever **17** has a lifting arm or cam **18** for engagement with the supporting piston **14** and also has a control arm **19** extending at an acute angle with regard to arm **18**. Arm **18** projects out of the profile of the cap **2** through and is guided in a longitudinal slot **20** of clip **5**.

In the retracted position of the ball point as shown in

Fig. 1, the control arm 19 occupies its tilted upward position in which the straight surface 18*a* of lifting arm or cam 18 is in engagement with piston 14, thereby permitting spring 9 through the intervention of reservoir or writing point carrier 6 to press the piston 14 upwardly to thereby withdraw writing point 7 with the ball point 8 into and locate the same within the point body 12. In order to move the ball point 8 into writing position, the control lever 19 must be pivoted downwardly into the position shown in Fig. 2. The cam area 18*b* of lifting arm or cam 18 will then press upon the piston 14 and through the latter will push the carrier 6 with the writing point 7 and the ball point 8 out of the point body 12 so that the instrument is ready for writing.

If the writing instrument should in this position accidentally be placed into the pocket of the wearer, in other words, if the wearer should have forgotten to retract the writing point before placing the writing pen into his pocket, the material of the pocket will during the placement of the pen into the pocket be pushed in the direction of the arrows Z between the cap 2 and the clip 5 into the gap 21 so as to press against the control lever 19 and guide lever 19 upwardly into the retracted position shown in Fig. 1. The writing point 7 is automatically returned when the writing instrument is inserted into the pocket, thus reliably avoiding soiling of the pocket with writing fluid or damage to the sensitive ball point 8 or to the nib. At the same time the clamping action of the clip 5 is in no way adversely affected so that the instrument cannot be lost.

In the preferred form of construction the front end 22 of the spiral spring 9 is enlarged so that it is disposed in the bore of the barrel with a press or friction fit. This prevents the spiral spring 9 from falling out when the reservoir or writing point carrier 6 is changed, since it remains located in the bore 23 of the barrel. It is only necessary to introduce the new reservoir or carrier 6 and to screw the instrument together again in the usual manner.

As shown in Figs. 5 to 7, the tilting lever 17 may be replaced by a lever 17*a* and may be journalled on a ring 24 in a bearing sleeve 15*a* to be received in cap 2. This ring 24 is preferably resilient, i.e. constructed as a spring ring, and it is located in an annular groove 25 of the bearing sleeve 15*a*. As will easily be noted, such an arrangement brings about a considerable simplification in the assembly and dismantling of the instrument.

The construction of the tilting lever in accordance with the present invention represents not only a simplification but also an absolute reliability of the advancing mechanism, while the full clamping action of the clip will be maintained.

We claim:

1. In combination in a writing instrument: a barrel, a writing point carrier axially displaceable within said barrel from a retracted position into a writing position and vice versa, a hollow cap connected to said barrel and provided with a longitudinal slot, a piston displaceably mounted in said cap for engagement with said carrier, spring means engaging said carrier and continuously urging the same into its retracted position while maintaining said carrier in engagement with said piston, a clip connected to said cap and having a longitudinal slot in alignment with said slot in said cap, pivot means supported within said cap, and a lever tiltably supported by said pivot means and having a manually operable arm, one portion of said arm extending through both of said slots and being movable from an upward position into a downward position and vice versa, the other portion of said arm being located within said cap and having connected thereto a cam with a first working area and a second working area for engagement with said piston in said writing position and said retracted position respectively, the nearest distance between said pivot means and said first working area being considerably greater than the nearest distance between said pivot means and said second working area, said arm when in said downward position blocking said clip and making said first working area effective for holding said writing point carrier in said writing position, said arm when in its upward position unblocking said clip while making said second working area effective to thereby permit said spring means to move said writing point carrier into its retracted position.

2. A writing instrument according to claim 1, in which the ends of said slot in said cap form abutment means for respectively defining the upward and downward position of said arm.

3. A writing instrument according to claim 1, which includes abutment means arranged within said cap below said piston for limiting the movement of said piston in the direction toward the front of said writing instrument when said barrel is disconnected from said cap to thereby prevent said piston from dropping out of said cap when the latter is disengaged from said barrel.

4. In combination in a writing instrument: a barrel, a writing point carrier axially displaceable within said barrel from a retracted position into a writing position and vice versa, a hollow cap connected to said barrel and provided with a longitudinal slot, a pisston displaceably mounted in said cap for engagement with said carrier, spring means engaging said carrier and continuously urging the same into its retracted position while maintaining said carrier in engagement with said piston, a clip connected to said cap and having a longitudinal slot in alignment with said slot in said cap, insert means mounted within said cap at the rear portion thereof, a pin supported by said insert means and extending in a direction transverse to the longitudinal direction of said writing instrument, a lever tiltably supported by said pin and having a manually operable arm, one portion of said arm extending through both of said slots and being movable from an upward position into a downward position and vice versa, the other portion of said arm being located within said cap and having connected thereto a cam with a first working area and a second working area for engagement with said piston in said writing position and said retracted position respectively, the nearest distance between said pin and said first working area being considerably greater than the nearest distance between said pin and said second working area, said arm when in said downward position blocking said clip and making said first working area effective for holding said writing point carrier in said writing position, said arm when in its upward position unblocking said clip while making said second working area effective to thereby permit said spring means to move said writing point carrier into its retracted position, and abutment means forming part of said writing instrument for defining said upward and downward positions of said manually operable arm.

5. In a combination in a writing instrument: a barrel, a writing point carrier axially displaceable within said barrel from a retracted position into a writing position and vice versa, a hollow cap connected to said barrel and provided with a longitudinal slot, a piston displaceably mounted in said cap for engagement with said carrier, spring means engaging said carrier and continuously urging the same into its retracted position while maintaining said carrier in engagement with said piston, a clip connected to said cap and having a longitudinal slot in alignment with said slot in said cap, sleeve means mounted within said cap at the rear portion thereof, said sleeve means being provided with an annular groove, a spring ring mounted in said groove, said lever tiltably supported by said spring ring and having a manually operable arm, one position of said arm extending through both of said slots and being movable from an upward position into a downward position and vice versa, the other portion of said arm being located within said cap and having connected thereto a cam with a first working area and

a second working area for engagement with said piston in said writing position and said retracted position respectively, the nearest distance between the tilting point of said lever means and said first working area being considerably greater than the nearest distance between said tilting point and said second working area, said arm when said downward position blocking said clip and making said first working area effective for holding said writing point carrier in said writing position, said arm when in its upward position unblocking said clip while making said second working area effective to thereby permit said spring means to move said writing point carrier to its retracted position and abutment means forming part of said writing instrument for defining said upward and downward position of said first arm.

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