

[54] **WRITING DEVICE HAVING A  
RETRACTABLE WRITING ELEMENT**

[75] Inventor: **Jacques Levain**, Paradiso, Switzerland

[73] Assignee: **Plastica Sudamericana**, Buenos Aires, Argentina

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[58] Field of Search.....401/109-112, 113,  
401/114

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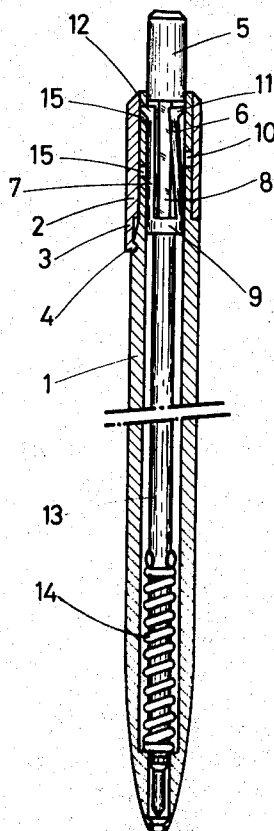
*Primary Examiner*—Lawrence Charles

*Attorney*—Irving M. Weiner

[57] **ABSTRACT**

A writing device comprising a retractable writing element equipped with a co-axial release spring and housed in a sheath topped with a push rod adapted to act directly on the upper end of the writing element. The sheath is formed by injection molding with an upper ring provided with a click tongue, the sheath and tongue being joined by a single breakable sprue of material the point of injection. The sheath is formed at its upper end with a cylindrical portion having a diameter smaller than that of the sheath but equal to the inner diameter of the ring. The device is provided with a push rod formed integral with diametrically opposed locking members adapted to cooperate with other locking member, also diametrically opposed, which are provided on the inner face of the small diameter portion at the upper end of the sheath, the locking members on one of the elements having two diametrically opposed stubs, formed on elastic tongues, which can be recessed and the locking members on the other element comprising two shaped cuts adapted to receive said stubs.

**15 Claims, 19 Drawing Figures**



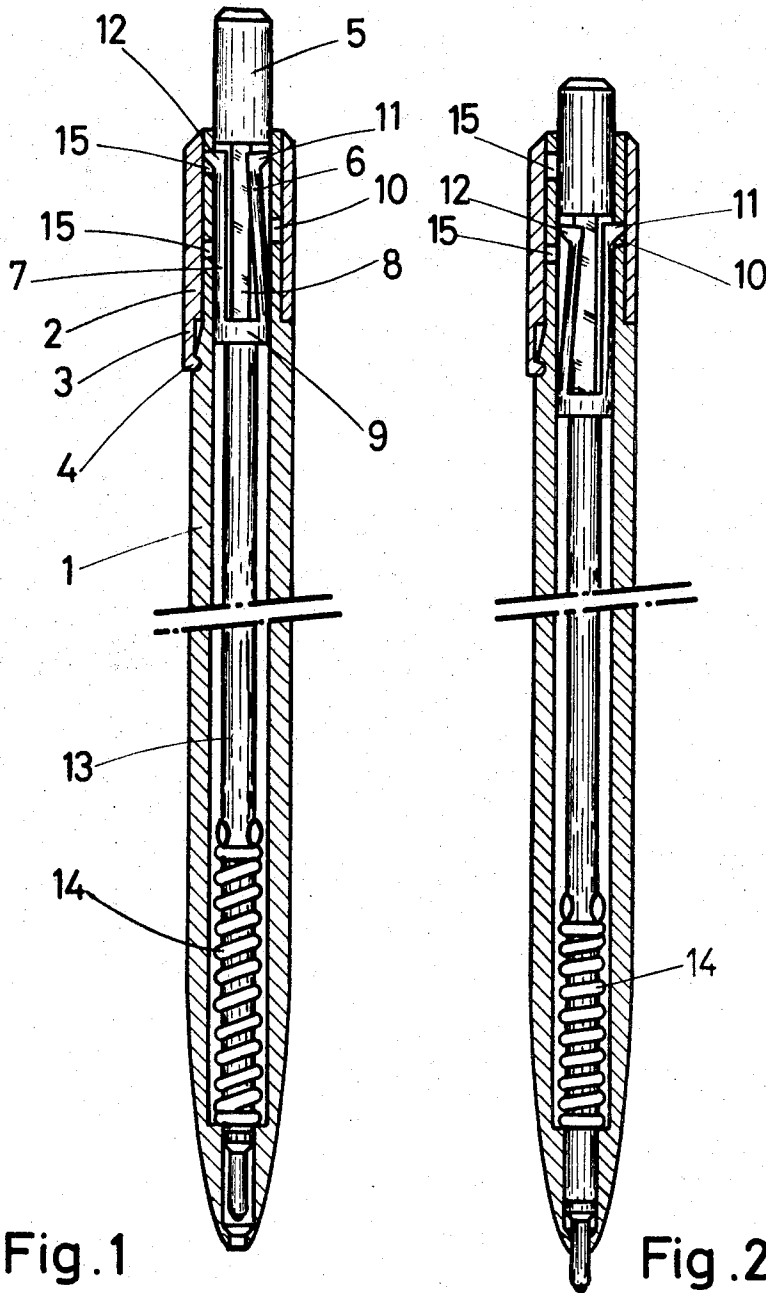


Fig. 1

Fig. 2

INVENTOR  
JACQUES LEVOIN

BY *Jerry M. Weiner*  
ATTORNEY



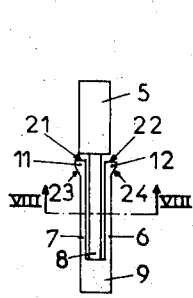


Fig. 7

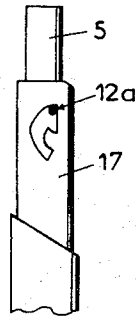


Fig. 9

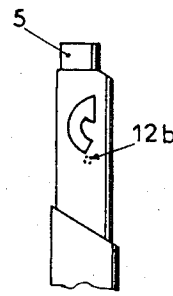


Fig. 10

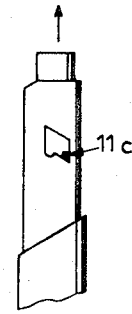


Fig. 11

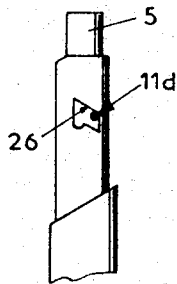


Fig. 12

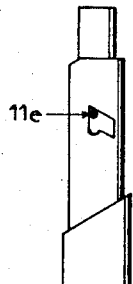


Fig. 13

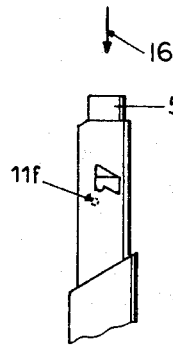


Fig. 14

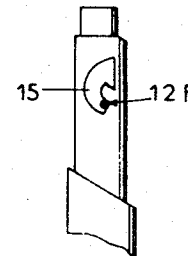


Fig. 15

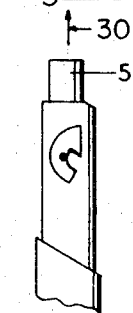


Fig. 16

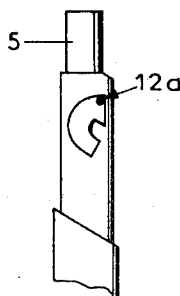


Fig. 17

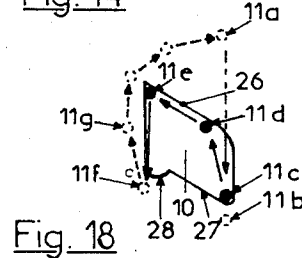


Fig. 18

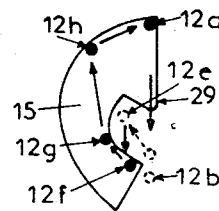


Fig. 19

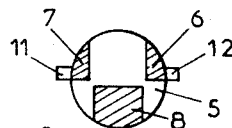


Fig. 8

## WRITING DEVICE HAVING A RETRACTABLE WRITING ELEMENT

This invention relates to writing devices and more particularly to writing devices such as ball-point or fountain pens and propelling pencils, having only one retractable writing element.

Writing devices of this kind provided with a mechanism for locking the writing element either in extended operating position or in retracted storage position, are well known. However, the known locking mechanisms suffer from the serious drawback that they include many parts which are difficult to assemble. Moreover, they suffer from the further drawback that they cannot be completely assembled by machine and this is a major reason why the manufacturing cost of retractable ball-point pens and mechanical pencils remains relatively high at the present time.

An object of this invention is to eliminate the aforesaid drawbacks and to provide a pen or pencil, with a retractable writing element, which can be completely assembled by machine for a very low cost.

In accordance with the foregoing and other objects the present invention contemplates the provision of a writing device, such as a ball-point pen or a propelling pencil, which includes a retractable writing element equipped with a co-axial release spring and which is housed in a sheath topped with a tripping push rod which acts directly on the upper part of the writing element. The writing device according to this invention has the following features: its plastic sheath is injection-molded together with an upper ring equipped with a click and spring tongue retained only by an injection sprue which can be broken up upon removal from the mold; the upper part of the sheath is also cylindrical, but its diameter, smaller than the rest of the sheath, is equal to the inner diameter of the ring; the push rod is formed with diametrically opposed locking members which may cooperate with other diametrically opposed locking members provided on the inner face of the small diameter portion at the top of the sheath; these locking members may comprise, on one of the elements, two diametrically opposed recessing stubs which are held by elastic tongues, while on the other element, two shaped cuts are provided to receive these stubs.

According to a first method of fabricating the writing device according to the invention, the stubs are integral with the push rod and the cuts are formed on the inside of the sheath.

Since the sheath-ring assembly is made in one piece in an injection molding process, all that is necessary after removing same from the mold is to push the ring axially in order to break its connection with the sheath and to drive it in until the tongue engages the hole. The pen can thus be assembled automatically by machine. Thereafter, the writing element and its spring are introduced into the sheath, the push rod is introduced and its stubs recess momentarily due to their elasticity. These assembly operations are very simple and do not require delicate maneuvers for positioning or assembling the components. The whole pen may therefore be completely manufactured and assembled by machine.

Of course, the ring may include a clip to facilitate securing the pen or pencil in place when carried in a pocket.

The shaped cuts have closed profiles the upper edges of which are described by the upper faces of the stubs which come to rest on them. On the other hand, the inner faces of the stubs are slanted which cause them to recess while resting on the lower edges of the cuts, when the user drives in the push rod with his thumb. One of the shaped out cuts is made with a simple slanted and transversal bar, the top part of which defines the operating position of the writing element, whereas underneath this top part a notch is provided to facilitate the recessing of the corresponding stub when the rod is pushed in. On the other hand, the other cut has a C shape. The upper part of the C shape retains the corresponding stub for the writing element to remain in the retracted storage position, whereas the lower part of the C shape receives the same stub when the push rod is in its lower most position, that is to say before letting this rod go back to the storage position. To facilitate the return of this finger if it is desired to move the writing element from the storage to the operating position, a notch is provided underneath the upper end of C shape. Thus, axial shifts imparted to the push rod by either the user's thumb or the spring release are accompanied by rotation of this rod because of the guiding effect provided by the stubs which engage in the cuts.

Other features which may be included in accordance with the invention will be described hereinafter and referred to in the appended claims.

The invention will now be more particularly described with reference to the accompanying drawings which shows by way of example, embodiments of the invention and in which:

FIG. 1 is a longitudinal section of a ball-point pen designed and assembled according to the invention with the writing element shown in the storage position.

FIG. 2 is a view similar to FIG. 1 but with the writing element shown in the operating position.

FIG. 3 is a longitudinal view showing the sheath of the pen as it appears immediately after the molding operation, integral with its ring.

FIG. 4 is a longitudinal view showing the sheath after breakage of the injection point K and with the ring driven into the sheath.

FIG. 5 is a longitudinal section view showing the writing element with its associated spring inserted in the body of pen.

FIG. 6 is a longitudinal view of the assembled pen, complete with push rod.

FIG. 7 is a view of the push rod.

FIG. 8 is a cross-section view taken along the line VIII—VIII in FIG. 7.

FIGS. 9 to FIG. 17 are views showing various faces of the pen, on one side or the other, and illustrate successive phases in the operation of the pen.

FIG. 18 is a diagram showing how one of the shaped out cuts is described by its retractable stub.

FIG. 19 is a diagram similar to FIG. 18 showing the other shaped out cut and its associated stub.

Referring to the drawings FIG. 1 shows the pen with cartridge 13 in the storage position, and illustrates the manner in which ring 2 seats in place on sheath 1. Ring 2 is secured to sheath 1 by engagement of the stub 4 formed on the inner face of click tongue 3 with a recess formed in sheath 1. A cartridge 13 with its release

spring 14 is disposed in contact with the heel 9 of the push rod 5. The flexible spindles 6 and 7 with their stubs 11 and 12 are secured to the push rod and the spindle 8 links heel 9 directly to the push rod 5.

Two diametrically opposed recesses, 10 and 15, are formed on the inner face of cylinder 17 which is integral with sheath 1 but which has a smaller external diameter. Shoulder 19 connects cylinder 17 and sheath 1 (see FIG. 3).

The stub 12 of spindle 7 is restrained against downward movement by the upper part of recess 15 while the spindle 6 is pressed down towards the central axis because its stub 11 is pressed against the inner face of sheath 1.

It can be seen in FIG. 2 that when the writing element 13 is in the operating position, the stub 11 engages in recess 10 while the spindle 7 is pressed down towards the central axis because its stub 12 is pressed against the inner face of sheath 1.

FIG. 3 and 4 show how it is possible to fabricate as a single unit sheath 1 with recesses 15 and 10 along with ring 2 which has a tongue 3 and which is connected by a sprue of material at injection point K to sheath 1 or cylinder 17.

Upon removal from the mold, a pressure applied in the direction of arrow F serves to break the sprue at injection point K and cylinder 17 and enters the cavity 18 of ring 2. The click tongue 3 allows the boss 20 of injection point K to enter the recess or hole 16 provided in sheath 1 and when the ring 2 comes into contact with shoulder 19 it functions in the manner of an extraction plate (FIG. 4).

FIG. 7 which is a view of the push rod 5 shows heel 9 with its flexible spindles 7 and 6 equipped with their stubs 11 and 12 and also shows rod or spindle 8 which links heel 9 to the push rod 5.

FIG. 8 which is a cross section of the push rod shows the location of the flexible spindles 6 and 7 formed at their outer ends with their respective stubs 11 and 12 as well as the rod 8 which links heel 9 to push rod 5. Each stub has a transversal upper face 21 or 22 and a slanting lower face 23 or 24 which facilitates its recessing upon elastic bending of tongue 6 or 7 (FIGS. 1 and 2).

FIGS. 10 and 15 show recesses on the inner face of cylinder 17 which can be cut out throughout the thickness of this cylinder: in any case they are covered by ring 2 when this ring is in place after the sprue of material at injection point K has been broken off. (FIG. 4).

Thereafter, writing element 13 is inserted into the sheath 1 along with its spring 14 (FIG. 5). The push rod 5 is then simply driven in in the direction of arrow 25 (FIG. 6). Stubs 11 and 12 recess automatically due to their slanting lower faces 23 and 24 (FIG. 7) before elastically engaging into cuts 10 and 15.

Cut 10 wherein stub 11, for example, can move is formed of a simple slanting and straight ramp which comprises an upper edge 26 and a lower edge 27. In front of the highest point of the upper edge 26, the lower edge 27 is cut out along the notch 28 (FIG. 18).

Cut 15 (FIG. 19) has a C profile and is formed in front of its highest point 12a, with a downwardly directed notch 29.

In operation of the pen, when the writing element is in its retracted storage position, stub 12 occupies upper

position 12a in cut 15. The corner 22 of stub 12 rests on the upper edge of cut 15 (FIGS. 1 and 9). Simultaneously stub 11 occupies its retracted position 11a (FIGS. 1 and 18).

Applying pressure on the push rod 5, the user brings the stubs 11 and 12 down to positions 11b and 12b (FIGS. 10, 18 and 19) where they are recessed below their respective cuts 10 and 15. The user frees push rod 5 which is driven up by spring 14. Stub 11 is then projected into cut 10 in position 11c (FIG. 11) then, coming up again, it engages on its upper edge 21 the upper edge of cut 10 (FIG. 12). Push rod 5 moves up while rotating, because the stub 11 is moving along the edge 26 up to the higher position 11e. At that moment stub 12 occupies recessed position 12e (FIG. 19) and the writing element then remains in its extended, writing position. (FIGS. 2 and 13).

To bring the writing element back to its retracted, storage position, the user again drives in push rod 5 (FIG. 14, arrow 16). Stub 12 moves down and enters into the lower part of cut 15 by elastic release (FIGS. 15 and 19, position 12f) whereas stub 11 recesses at the level of the bottom of notch 28 to return to position 11f (FIGS. 14 and 18). If the user releases push rod 5, the mechanism will move up (FIG. 16, arrow 30) under the pressure of spring 14. The upper edge 22 of finger 12 which is held on the convex area of cut 15 moves up to position 12g (FIGS. 16 and 19) while simultaneously causing the rotation of the push rod 5. Thereafter stub 11 moves to recessed position 11g which allows it to move up again without meeting cut 10. Stub 12 then engages the upper edge of cut 15 (position 12h, FIG. 19) which it follows up to position 12a while causing push rod 5 to rotate in the opposite direction, stub 11 meanwhile returning to position 11a. The writing element is then again in its retracted, storage position (FIGS. 1, 9 and 17).

It will of course be appreciated that pens made in accordance with this invention may be equipped with a clip 28 of a known type (FIG. 3) attached to or formed integrally with the ring 2.

What is claimed is:

1. A writing device comprising a retractable writing element equipped with a co-axial release spring and housed in a sheath topped with a push rod adapted to act directly on the upper end of the writing element, wherein said sheath is formed of injected plastic together with an upper ring provided with a click tongue, said sheath and said ring being joined by a single breakable sprue of material at the injection point; means defining a hole disposed in said sheath adapted to receive a portion of said click tongue to secure said upper ring to said sheath; said sheath formed at its upper end with a cylindrical portion having a diameter smaller than that of the sheath but equal to the inner diameter of said ring; a push rod formed integral with diametrically opposed locking members adapted to cooperate with other locking members, also diametrically opposed, which are provided on the inner face of the small diameter portion at the upper end of the sheath, the locking members on one of the elements having two diametrically opposed stubs formed on plastic tongues, which can be recessed and the locking members on the other element comprising two shaped cuts adapted to receive said stubs.

2. A writing device according to claim 1, wherein said stubs are formed integral with said push rod and said cuts are formed on the inside of said sheath.

3. A writing device according to claim 1, wherein said ring is provided with a clip to enable the writing device to be secured in a pocket.

4. A writing device according to claim 1, wherein each of said cuts has a closed profile the upper edges of which are described by the upper faces of stubs recessing therein, the lower faces of these stubs being slanted causing them to recess upon engaging the lower edges of said cuts when the push rod is driven through the sheath.

5. A writing device according to claims 1, wherein one of said shaped cuts is made with a single slanted transversal bar the upper end of which defines the operating position of the writing element, and below this end a notch is provided to facilitate recessing of the corresponding stub when the push rod is pressed before it moves into its recessed position.

6. A writing device according to claims 1 wherein said other cut is of C shape the upper part of which maintains the corresponding stub in the recessed position of the writing element, whereas its lower end received the same stub in the lowermost position of the push rod, prior to releasing the push rod for return to its recessed position.

7. A writing device according to claim 6, wherein a notch is formed below the upper end of said C shaped cut.

8. A writing device according to claim 2, wherein said ring is provided with a clip to enable the writing device to be secured in a pocket.

9. A writing device according to claim 4, wherein one of said shaped cuts is made with a single slanted

transversal bar the upper end of which defines the operating position of the writing element, and below this end a notch is provided to facilitate recessing of the corresponding stub when the push rod is pressed before it moves into this recessed position.

10. A writing device according to claim 4, wherein one of said shaped cuts is of C shape, the upper part of which maintains the corresponding stub in the recessed position of the writing element, whereas its lower end receives the same stub in the lowermost position of the push rod prior to releasing the push rod for return to its recessed position.

11. A writing device according to claim 5, wherein the other of said shaped cuts is of C shape, the upper part of which maintains the corresponding stub in the recessed position of the writing element, whereas its lower end receives the same stub in the lowermost position of the push rod, prior to releasing the push rod for return to its recessed position.

12. A writing device according to claim 9, wherein the other of said shaped cuts is of C shape, the upper part of which maintains the corresponding stub in the recessed position of the writing element, whereas its lower end receives the same stub in the lowermost position of the push rod, prior to releasing the push rod for return to its recessed position.

13. A writing device according to claim 10, wherein a notch is formed below the upper end of said C shaped cut.

14. A writing device according to claim 11, wherein said notch is formed below the upper end of said C shaped cut.

15. A writing device according to claim 12, wherein said notch is formed below the upper end of said C shaped cut.

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