

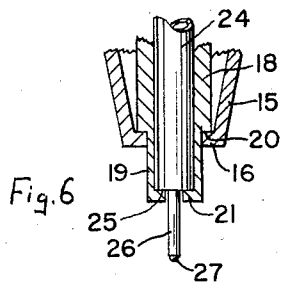
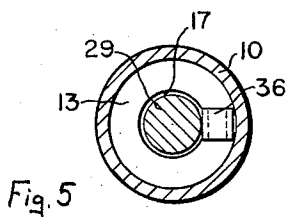
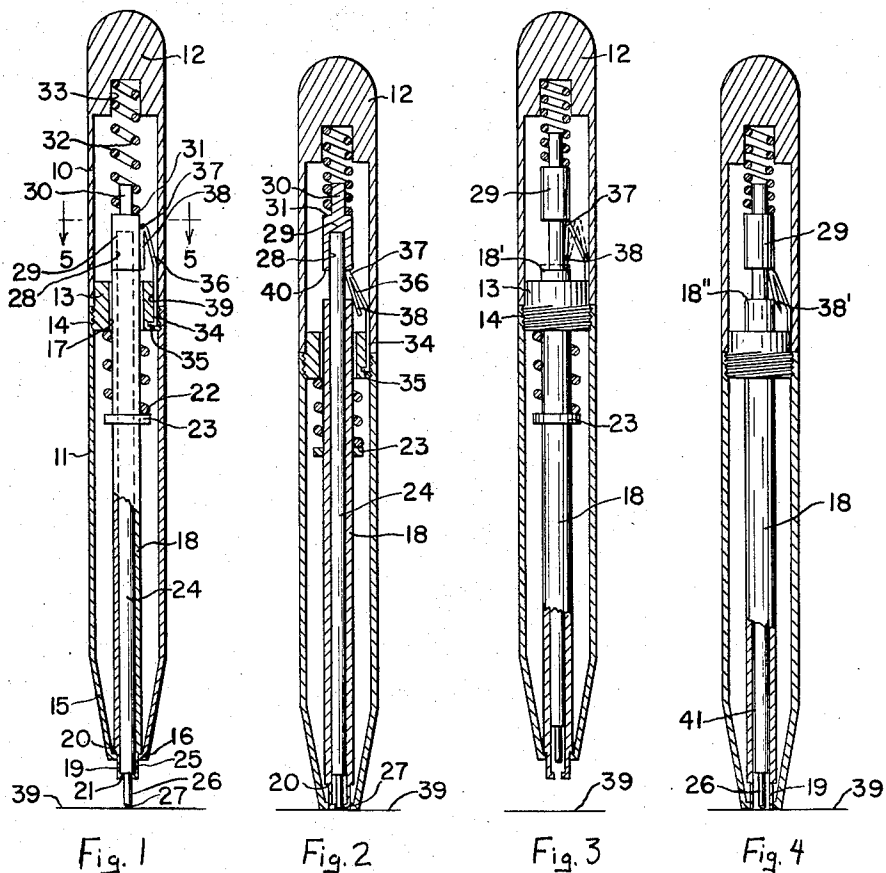
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PROTRACTION-RETRACTION MECHANISM FOR WRITING INSTRUMENTS

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PROTRACTION-RETRACTION MECHANISM FOR WRITING INSTRUMENTS

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This invention relates to writing instruments having a retractable writing element. Particularly, the invention relates to a retraction-protraction mechanism for a ball point writing instrument, whereby the ball point may be either moved into a concealed, non-writing position or projected into an exposed, writing position.

In my ball point instrument, the ball point may be maintained in its projected position solely by means of a spring. The point may be retracted by holding the instrument substantially vertical against a rigid surface and then pressing downwardly on the instrument so that the point moves inwardly into the barrel against the action of the spring. A latching or locking mechanism is thereby actuated which holds the ball point in a retracted position. A release mechanism is provided for subsequently releasing the retracted ball point, whereupon the ball point is returned to its protracted position by said spring means. Preferably, a portion of the release mechanism normally projects out of the writing tip end of the barrel, but projects to a lesser extent than the ball point projects when in its writing position. In this way, the release element may also be actuated by holding the barrel substantially vertical against a rigid surface, and then pressing downwardly on the barrel so that the release element is forced inwardly into the barrel, so as to release the latch mechanism when said latch mechanism is holding said ball point retracted. By this means I have provided a retraction-protraction mechanism which is conveniently operated by the user, by merely holding the barrel substantially vertical to a surface and then pressing downward to either retract or protract the point.

The invention will be further understood by the following description and the accompanying drawings which include preferred embodiments of my invention.

In the drawings:

Figure 1 is a longitudinal sectional view of the writing instrument of the invention with the ballpoint in a protracted position.

Figure 2 is a longitudinal sectional view of the writing instrument of Figure 1, wherein the point has been forced into the barrel by pressing the point downwardly onto a rigid surface.

Figure 3 is a longitudinal sectional view of the writing instrument of Figure 1, showing the point retained in a retracted position after being lifted free from the rigid surface.

Figure 4 is a longitudinal sectional view illustrating another embodiment of my invention.

Figure 5 is a cross-sectional view taken along the lines 5—5 of Figure 1.

Figure 6 is an enlarged longitudinal sectional view of the tip portion of the writing instrument of Figure 1.

Referring to the drawings in detail and particularly to Figures 1 to 3, the writing instrument has an outer casing or barrel which consists of the upper barrel section 10 and the lower barrel section 11. The upper end of the upper barrel section 10 is closed to form the head 12. The lower end of the barrel section 10 which is

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open, receives and frictionally engages the upper portion of the cylindrical plug 13. The lower portion of the plug 13 is threaded as at 14 and is threaded into the upper end of the lower barrel section 11. The lower barrel section 11, near its lower end, is tapered inwardly and forwardly to form the frusto-conical portion 15, at the tip of which is formed the inwardly projecting annular lip 16. Carried within the barrel sections 10 and 11 and extending through the bore 17 of the plug 13 is a longitudinally movable release member or sleeve member 18, having a reduced cross-section 19 at its lower end to provide a shoulder 20, which normally seats against the lip 16. The reduced section 19, normally projects outwardly through the open end of the conical portion 15 of the barrel section 11. The outer end, of the reduced section 19, may also be formed with an inwardly projecting annular lip 21. A compression coil spring 22, surrounds an upper portion of the sleeve 18. The ends of the spring 22, are retained between the bottom of the plug 13 and a collar 23 rigidly attached to the outer surface of the sleeve 18. The spring 22 urges the sleeve 18 downwardly relative to the barrel so as to maintain the shoulder 20 of the sleeve normally seated against the lip 16. Freely slidable longitudinally and carried within said sleeve 18, is a writing unit comprising a point and cartridge unit including: a writing fluid cartridge or reservoir tube 24, which is reduced at its lower end to form the shoulder 25 and the short terminal tube 26, the writing element or ball 27 carried at the lower end of said tube 26, and means for feeding ink from said reservoir to said writing element. When the ball point is extended into its writing position, the shoulder 25 seats against the lip 21 of the sleeve, while the short terminal tube 26 projects through the outer tip of said sleeve 18. The top of the reservoir tube 24 is insertible in the bore 28 extending partly through the cylindrical latch element 29. The top portion of the reservoir tube 24 is thereby frictionally engaged and carried by the latch element 29. The upper portion of the cylindrical latch element 29, is reduced in cross-section to form the upwardly projecting stem 30 and the shoulder 31. Surrounding the stem 30, is the compression coil spring 32, whose lower end seats against the shoulder 31, while its upper end is inserted in the bore 33 formed in the head 12.

In order to retain the ball point in its retracted position, a locking device or spring latch is provided which consists of a supporting portion 34 formed with a hook 35 at its lower end, a spring portion 36 extending upwardly and inwardly from the top of the supporting portion 34, which spring portion 36 is bent downwardly near its intermediate portion 37 to form the spring terminal 38. A recess 39 is provided in the plug 13, which recess receives the supporting portion 34, and its hook 35, of the spring latch. The supporting portion of the spring latch is therefore firmly fixed between the plug 13 and the barrel, although the spring portion 36—37—38 is still movable.

In writing use, the ballpoint may be maintained in its protracted or writing position solely by action of the spring 32. Since the writing instrument is pressed against the paper at an angle during normal writing use, it will be apparent that there is little or no tendency for the point to be forced upward against the action of the spring and into the barrel. However, when the writer, for example, holds the writing instrument substantially vertical to the paper and presses downward towards the tip of the writing instrument, i.e. exerts a downward pressure parallel to the longitudinal axis of the instrument, the ballpoint readily moves inwardly into the barrel. Figure 1 shows the writing instrument in a protracted position, preparatory to retracting the point. In Figure

2, the writing instrument has been pressed downwardly against a rigid surface 39 so as to force both the sleeve 18 and point 27 inwardly into the barrel. As the bottom 40 of the latch element 29 is moved upwardly, past the spring latch, the intermediate portion of the spring latch moves inwardly and under the bottom 40 of the latch element thereby preventing downward movement of the latch element 29, and concurrently retaining the cartridge unit with its ballpoint in a retracted position. At this point it will be noticed that the spring terminal 38 is pressing against the upper side of the sleeve 18. However, when the instrument is lifted from the surface 39, as in Figure 3, the sleeve 18 is forced downwardly relative to the barrel, thereby freeing the terminal portion 38 of the spring which then moves inwardly to the position shown in solid lines in Figure 3. Figure 3, therefore illustrates the instrument in a retracted position. It will be apparent that when the instrument is again pressed downwardly against a surface, the sleeve 18 is again forced inwardly into the barrel as shown by the dotted line, and in doing so, the upper end 18' of the sleeve engages the end of the terminal portion 38 of the spring, thereby causing the spring to move to the position shown in dotted lines in Figure 3, i.e., the intermediate portion 37 of the spring moves towards the side of the barrel thereby releasing the latch element 29, which moves downwardly past the spring portion 37, so that when the instrument is lifted again from the surface 39, the ball point is returned to its protracted position.

In Figure 4 is shown another embodiment of my invention, wherein the instrument is shown in a position corresponding to the position of Figure 2, that is, the ball point has just been forced inwardly into the barrel from a protracted position by pressing the tip end of the barrel downwardly against a rigid surface. The embodiment shown in Figure 4 is substantially the same as that shown in Figures 1 to 3, except that the terminal portion of the spring is tapered as at 38' and the edge of the sleeve is rounded as at 18'', so that the inward movement of the terminal portion 38' tends to press the sleeve downwardly. Also, the inner diameter of the sleeve may be somewhat larger than the outer diameter of the cartridge so as to provide the free space 41. Figure 4, therefore, represents a method whereby the spring 22, shown in the embodiment of Figures 1 to 3, may be eliminated and wherein the sleeve 18 is returned to its normally projecting position by the action of gravity and the action of the tapered end 38' of the latch spring. The sleeve, in this case, falls downwardly under force of gravity and the action of the spring portion 38', when the instrument is lifted upwardly from contact with the surface 39. It will also be noted in Figure 4 that the lower end of the inset portion 19 is not formed with an inwardly projecting lip, as the outward projection of the tube portion 26 will be limited by the latch element 29 coming to rest on the top 18'' of the sleeve.

I claim:

1. A writing instrument having a retractable writing point, comprising a cartridge unit having a writing point at its outer end, housing means for said cartridge unit including a barrel having an open outer end, spring means disposed within said barrel and adapted to urge said cartridge unit longitudinally of said barrel to a protracted position, latching means disposed within said barrel and adapted to retain said cartridge unit in a retracted position against the action of said spring means, and a reciprocally movable release member having an outer portion which normally projects outwardly through the open lower end of said barrel and an inner portion adapted to engage said latching means whereby said cartridge unit can be released from its retracted position upon the inward movement of said release member relative to said barrel.

2. A writing unit according to claim 1, wherein said latching means comprise a latch receiver carried by said

cartridge unit and a deformable spring latch mounted within said barrel.

3. A writing instrument according to claim 1, wherein said release member is in proximate parallel relation to said cartridge unit and is reciprocally and longitudinally movable relative thereto.

4. A writing instrument according to claim 1, wherein said release member is a sleeve coaxial with said cartridge unit.

5. A writing instrument according to claim 4, which also includes a second spring means disposed within said barrel and adapted to urge said sleeve longitudinally of said barrel to its normally projected position wherein said outer portion projects through the open lower end of said barrel.

6. A ball-point writing instrument having a retractable point, comprising a cartridge unit having a writing point at its outer end, housing means for said cartridge unit including a barrel having an open lower end, spring means disposed within said barrel and adapted to urge said cartridge unit longitudinally of said barrel to a protracted position, a latch receiver carried by said cartridge unit, a latch mounted within said barrel for reciprocal movement into and out of engagement with said latch receiver against the pressure of said spring means and a latch release mounted within said barrel in proximate parallel relation to said cartridge unit for reciprocal movement with relation thereto, said release having an outer end normally projecting through the open lower end of said barrel and an inner end adapted for pressure engagement with said latch whereby said latch is moved out of engagement with said receiver as said release is moved inwardly into said barrel under the influence of pressure exerted inwardly upon the outer end of said release.

7. A ball-point writing instrument having a retractable point, comprising a cartridge unit having a writing point at its outer end, housing means for said unit including a barrel having an open lower end, spring means disposed within said barrel and adapted to urge said cartridge longitudinally of said barrel to a protracted position, a sleeve coaxial with said cartridge unit and in reciprocally movable relation thereto, said sleeve having an outer end normally projecting through the open lower end of said barrel and an inner end within said barrel, a latch receiver carried by the inner end of said cartridge unit proximate the inner end of said sleeve, and a spring latch disposed within said barrel and including a deformable spring portion adapted for self-insertion between said latch receiver and said sleeve upon the inward movement of said cartridge unit relative to said barrel, said sleeve being movable inwardly over said cartridge unit to engage and move said spring latch from its position between said latch element and said sleeve as inwardly directed pressure is exerted upon the outer end of said sleeve.

8. A ball-point writing instrument having a retractable point, comprising a cartridge unit including a ball-point at its outer end, a barrel open at its lower outer end, said cartridge unit being mounted in said barrel for protraction and retraction movement, a latch receiver carried by the inner end of said cartridge unit, a spring disposed between said latch receiver and said barrel whereby said cartridge unit is urged outwardly to a protracted position, a sleeve coaxial with said cartridge unit and having an outer end and an inner end, said outer end of said sleeve normally extending through the lower outer end of said barrel, said inner end of said sleeve being engaged by said latch receiver when said cartridge is in a protracted position and a latch disposed within said barrel and including a deformable spring adapted for self-insertion between said latch receiver and said sleeve inner end upon separation and inward movement thereof by pressure on said cartridge outer end, said sleeve being movable inwardly over said cartridge to engage said latch whereby said latch is moved out of latching engagement

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with said latch receiver when inwardly directed pressure is exerted upon the outer end of said sleeve.

9. A ball-point writing instrument according to claim 8, wherein a second spring means is disposed within said barrel and adapted to urge said sleeve longitudinally of said barrel to its normally extending position whereby the outer end of said sleeve projects through the outer end of said barrel.

10. A ball-point writing instrument having a tip-actuated retractable point comprising a cartridge unit including a ball-point at its outer end, a barrel opened at its outer lower end, a spring disposed within said barrel and adapted to urge said cartridge unit to a protracted position wherein said ball-point projects through the open lower end of said barrel, a latch receiver carried by said cartridge unit proximate its inner end, a reciprocally longitudinally movable sleeve coaxial with said cartridge unit and having an outer end and an inner end, a second spring disposed within said barrel and adapted to urge said sleeve to a normally projecting position wherein its outer end projects through the lower outer end of said

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barrel but projects to a lesser extent than said ball-point projects when in its protracted position, a deformable spring latch carried within said barrel proximate said latch receiver and adapted for engagement with said latch receiver upon the inward movement of said ball-point, cartridge, latch receiver and sleeve relative to said barrel, said deformable spring latch when engaged with said latch receiver being operable to retain said cartridge in a retracted position with its ball-point concealed within the outer end of said sleeve, said deformable spring latch being moved out of engagement with said latch receiver upon subsequent inward movement of said sleeve relative to said cartridge.

References Cited in the file of this patent

UNITED STATES PATENTS

2,773,478 Poinot ----- Dec. 11, 1956

FOREIGN PATENTS

88,655 Germany ----- Sept. 25, 1896

14,793 Germany ----- Aug. 9, 1956