May 12, 1970 E. HECHTLE 3,510,977

ROTATABLE DISPLAY PEN

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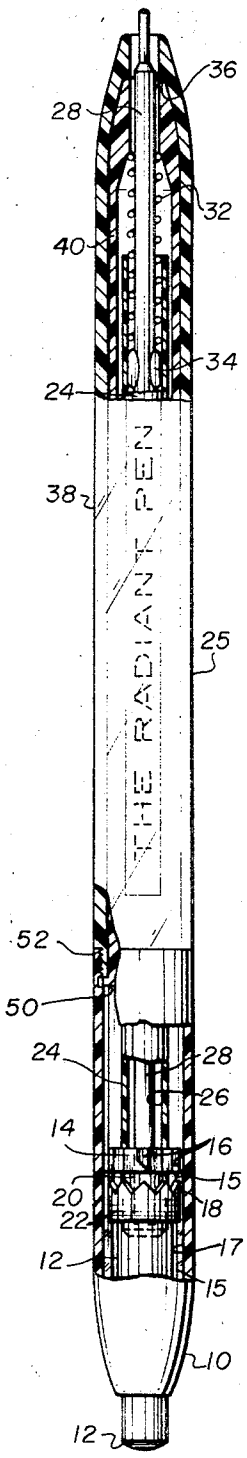


FIG. 1

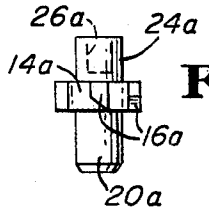


FIG.5

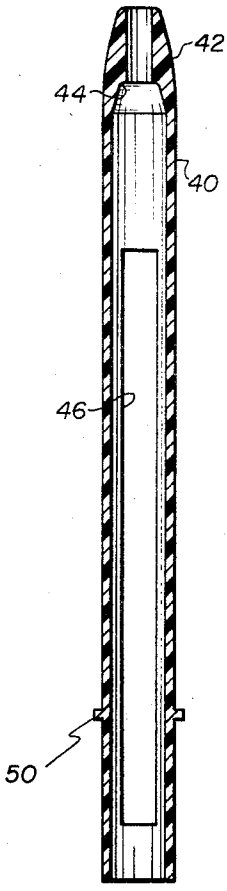


FIG. 2

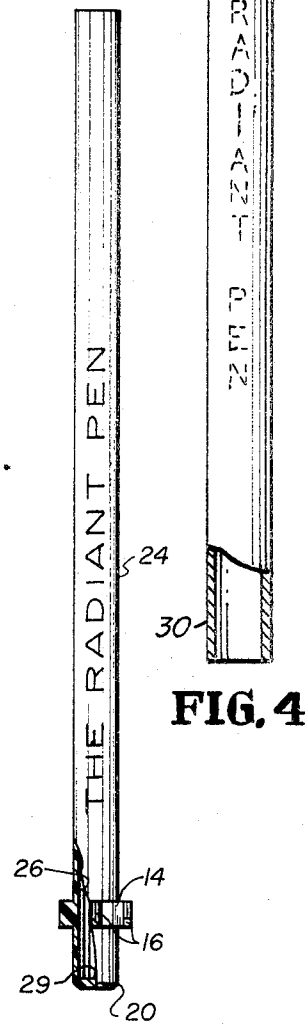


FIG. 3

FIG. 4

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ROTATABLE DISPLAY PEN

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Continuation-in-part of application Ser. No. 680,132, Nov. 2, 1967. This application Feb. 20, 1968, Ser. No. 706,989

Int. Cl. G09f 3/00

U.S. Cl. 40—334 10 Claims

ABSTRACT OF THE DISCLOSURE

A pushbutton type display writing instrument having a cap, containing a pushbutton mechanism, a transparent outer barrel completely enclosing an apertured screen seated therein through which aperture a rotatable display member is partially visible, said display member being integrally formed or connected to a rotatable ratchet member positioned in the cap and forming a part of the pushbutton mechanism.

This invention relates to display writing instruments and more particularly to writing instruments provided with an opening in an opaque wall of the same through which a rotating display member may be segmentally and successively brought into and out of view.

This is a continuation-in-part of application Ser. No. 680,132 filed Nov. 2, 1967, and now abandoned.

Writing instruments of this type are known. However, when a viewing opening is used, it has been placed in the outside barrel of the instrument. Sometimes a transparent plastic window has been set into the opening to make it dustproof or the barrel has been made completely transparent so that the rotating display is visible throughout 360°.

Accordingly, it is an object of the invention to provide a writing instrument of the rotating display type which does not require inset transparent windows; that is easy to assemble, and may be used in conventional writing elements.

These and other objects are obtained and new results achieved, as will be readily apparent from a consideration of the writing instrument described in the following specification, claims and accompanying drawing in which:

FIG. 1 is a front elevation, partly in section, of a ballpoint pen incorporating the invention;

FIG. 2 is a front elevation, longitudinally sectioned of the opaque tubular screen having an opening through which the rotating display area is visible;

FIG. 3 is a front elevation, partly in section of a combined display and rotating drive part of the protract-retract mechanism;

FIG. 4 is a front elevation, partly in section, of a separate display part;

FIG. 5 is a front elevation, of a rotating drive part for use with the separate display part of FIG. 4.

Generally the invention comprises a transparent housing or barrel in a writing instrument in which has been seated a separate opaque tubular screen having an opening, through which may be viewed the successive segments of a display which is rotated into view by successive operations of the protract-retract mechanism.

The protract-retract mechanism preferably employed is illustrated in detail in the patent issued to me on Nov. 29, 1966, No. 3,288,115.

The writing instrument of the invention comprises an opaque cap member **10**, a pushbutton plunger **12**, and a ratchet **14**. Cap teeth **15**, and cap slots **17**, alternately support and contain teeth **16** of the ratchet **14**.

When the plunger **12** is depressed, and the mechanism is in the protract position, the tapered teeth **18** of the plunger engage the tapered teeth **16** of the ratchet, lifting the ratchet to a position above the cap teeth, freeing the ratchet teeth from the cap and causing them to slide on the plunger teeth in a circumferential direction dictated by the direction of the respective tapers on the teeth. When the plunger is retracted, the ratchet teeth are allowed to engage the cap teeth and are rotated thereby sufficiently to enter slots **17** of the cap constituting the retract position of the writing instrument. The next push of the plunger will lift the ratchet teeth **16** from the cap slots until the ratchet teeth are above the cap teeth **15**, freeing the ratchet teeth once more, and rotating them in the same circumferential direction to place them in a new position over the cap teeth. When the plunger is retracted again, the ratchet teeth fall on the cap teeth **15** which are similarly tapered to move the ratchet teeth slightly, until they are secure in position between the cap teeth corresponding to the protract position of the writing instrument.

The ratchet **14** is provided with a pin **20** for centering the ratchet with respect to the plunger, in the recess **22** thereof.

An elongated display element **24** in the form of a tube is formed on the other side of the ratchet, extending from the cap, in the assembled position, for substantially the entire length of the hollow transparent barrel **25**. The display element is hollow as at **26**, for freely receiving the writing element or cartridge **28** therein, on the frictionless seat **29**. The writing element may be a ball-pointed cartridge as illustrated. Accordingly when the plunger **12** causes the ratchet **14** to rotate the display element will rotate therewith visible through the transparent barrel.

The display element **24** may possess an inner diameter just sufficient to contain the cartridge therein. This will provide the smallest diameter pen, as is shown. Where a larger diameter pen is acceptable, the display element may possess an inner diameter sufficient to include the spring **32** and the cartridge abutments. The cartridge is thus always urged by the spring against the ratchet in the seat **29**, maintaining it in position while allowing the ratchet to rotate under direction of the plunger teeth.

The spring **32** would normally seat itself upon the inner shoulder **36** of the conventional barrel. This would mean that the barrel, normally transparent in a display pen, would have to be opaque to avoid exposing the spring, and to be provided with a transparent or open window into which the segment of the display area would successively flash into view.

The end of the cartridge and spring may be hidden, if desired by providing an opaque inner tubular screen **40**, terminating in a tapered outer shoulder **42** which may fit against the tapered inner shoulder **36** of the transparent barrel **25**, as shown. The screen **40** may be formed with a shoulder **44** on the inner surface thereof to support the spring **32**. By seating the spring on the inner shoulder **44**, the screen can be firmly anchored and prevented from movement in the barrel when the display element **24** is rotated. The inner screen is opaque, to keep the writing element and spring from being visible through the barrel at the tapered tip, as well as allow the segmental display area only to be seen.

The opaque tubular screen is cast with one or more slots or openings **46** to segmentally expose the desired display area of the display element **24**. If more than one slot is used, the space between slots should be sufficient to hide the display message intended to be flashed into view when the mechanism is rotated. By fixing the position of the display element with respect to the rachet, the display area will always be in the same position with respect to the barrel and random positioning is avoided.

Thus by depressing the plunger successively, the display message can be segmentally rotated in and out of view.

Advantage can also be taken of the longitudinal movement of the ratchet when it is alternately protracted and retracted, with respect to the inner screen slots, for display purposes.

The number of teeth on the plunger (eight are shown) will cause a similar number of intermittent movements of the display element in each complete rotation. Accordingly, eight display segments may be utilized for the pen illustrated.

A modified, separate, tubular display element **30** is shown in FIG. 4. The ratchet **14***a* shown in FIG. 5 is tightly secured to the display element **30** as will be described hereafter. The ratchet is provided with a pin **20***a* for centering the ratchet with respect to the plunger in the recess **22** thereof. A post **24***a* is positioned on the other side of the ratchet, together with a recess **26***a* therein for receiving the writing element **28**. The ratchet post **24***a* is used to press-fit, or otherwise secure, as with an adhesive, the display member **30** thereto. Accordingly when the plunger causes the ratchet to rotate through teeth **16***a*, the display member will rotate therewith.

This display element and the ratchet member when made integral and formed in one piece, is sounder structurally, and thus need not be made relatively thin so as to provide an outside diameter not greater if desired, than the conventional pen. This is especially true even when the inner apertured screen is employed. Thus the mold forming the outer surface of the conventional barrel may also be used in manufacturing the present invention.

By forming a small radially extending flange **50** on the end of the slotted screen shown in FIG. 1 it may be positioned between the cap **10** and barrel **25** making it easy to change the position of the slotted screen with respect to the barrel.

In the final assembly the pen barrel is conventionally coupled to the cap by means of the threads **52**. The various parts are preferably molded of plastic materials.

I have thus provided the transparent housing of a writing instrument with a display element preferably integrally formed with the rotating display member of the protract-retract mechanism. The result is a saving not only in the cost of assembly, but in material costs. By making the parts integral, the display element can no longer come loose. Split display tubes, a frequent occurrence formerly, are avoided. The manufacturing variations between two different parts, making a perfect fit difficult in plastic is now avoided. There is also a printing advantage in that perfect registration is at all times possible with respect to the ratchet position. Printing is also easier due to the ability to seat the ratchet part and the display element. By eliminating the double thickness required hitherto between the separate display tube and ratchet hub, the parts can be made sturdier without extra diameter, even if an inner apertured screen is employed to give segmental viewing and screening of the ratchet spring and cartridge through the transparent barrel.

It should be understood however that the invention is not confined to the particular form or use shown and described, the same being merely illustrative, since the invention may be carried out in other ways without departing from the spirit of the invention, and therefore I claim broadly the right to employ equivalent instrumentalities coming within the scope of the appended claims, and by means of which objects of my invention are obtained and the new results accomplished.

I claim:

1. A writing instrument having a transparent housing containing a writing element and having a protract-retract mechanism provided with an inner rotating member for seating the writing element, a spring for urging the writing element against the seat; a tubular display unit extending from said rotating member and rotatable therewith; a tubular apertured screen seated in said housing and enclosing said tubular display unit whereby the display area may be viewed through said apertured screen as the display unit is rotated with the rotating member.

2. The writing instrument of claim **1** wherein the spring is seated on the screen for preventing accidental rotation thereof.

3. The writing instrument of claim **1** wherein the screen is adjustable inside the housing to correlate the spring opening with the display material on the display unit.

4. The writing instrument of claim **1** wherein the tubular apertured screen comprises a molded plastic tube having not less than one longitudinally extending slot in the walls thereof.

5. The writing instrument of claim **1** wherein the tubular display unit is integrally formed in one piece with said rotating member.

6. The writing instrument of claim **1** wherein the screen possesses a seat on the inner wall thereof for the spring.

7. The writing instrument of claim **4**, wherein one end of the screen is tapered to permit maximum insertion into the housing of the writing instrument.

8. The writing instrument of claim **5** wherein the length of the tubular display unit is sufficient to include most of the writing element.

9. The writing instrument of claim **5** wherein the display element has an inner diameter larger than the diameter of the spring.

10. The writing instrument of claim **5** wherein the protract-retract mechanism includes a ratchet member which possesses oppositely positioned ratchet teeth for engaging the cap.

References Cited

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