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3,333,095

ILLUMINATED PEN

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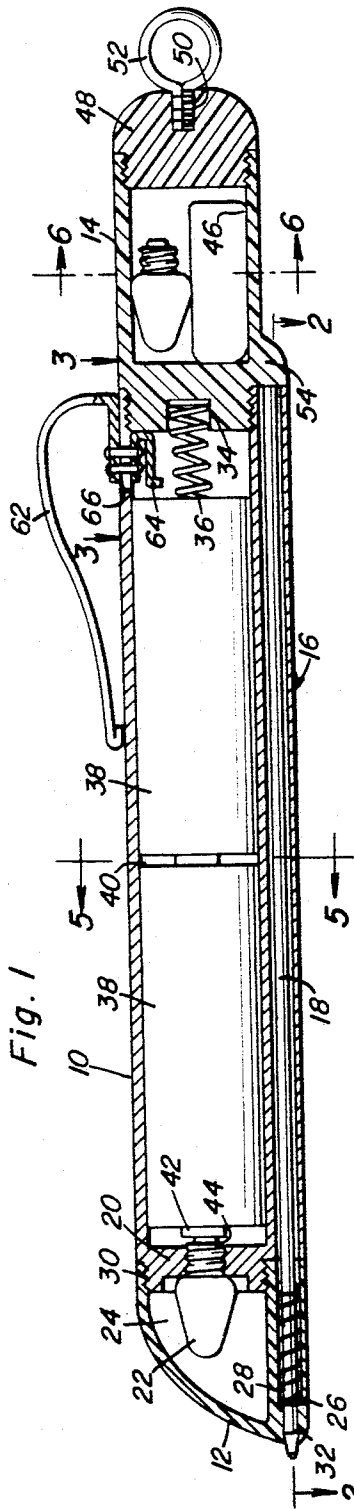


Fig. 1

Fig. 2

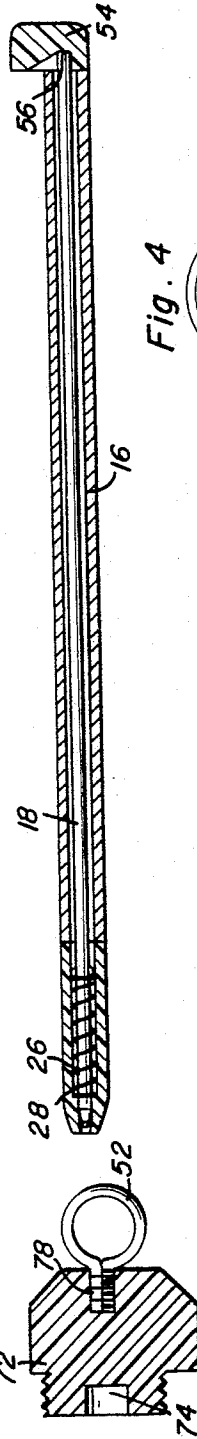


Fig. 7

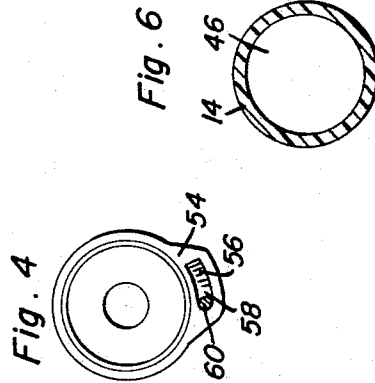


Fig. 6

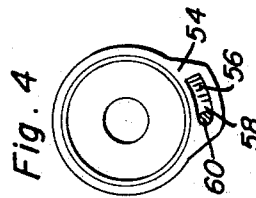


Fig. 4

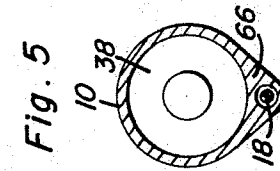


Fig. 5

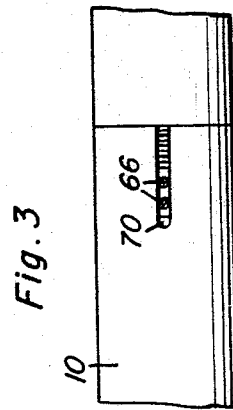


Fig. 3

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ABSTRACT OF THE DISCLOSURE

A writing instrument including a cap operated selectively extensible and retractable writing tip, and, integrally mounted on the same instrument, a battery powered light bulb adjacent the writing tip for a selective illumination of the writing surface.

This invention relates to a writing instrument and more particularly it relates to a self-illuminable writing instrument which is designed to provide light from a self-contained light source directly on the surface to which writing is to be applied.

The primary purpose of this invention is to provide a pen or pencil which can be used to write in dark or poorly lit areas.

Another object of this invention is to provide a clear plastic means through which a light from a light bulb source may shine to provide sufficient light to a surface to which writing is to be applied.

Another object of this invention is to provide a self-illuminable writing instrument which has a light bulb located at the end thereof just above the tip of the writing instrument which may use a ball point pen cartridge or other similar cartridge writing instrument. The light from the light bulb source is thrown on the writing surface without being obstructed. The writing instrument of this invention is provided with a compartment at the end thereof opposite the writing cartridge point for storing erasers, spare bulbs, short cartridges, or other accessories to be used in the writing instrument. A key ring is provided on the writing instrument for obvious use.

A further object of the present invention is to provide a self-illuminable writing instrument which is economical to manufacture, easy to operate, and easy to maintain, and is capable of illuminating the writing surface to be used without the necessity of outside illumination, and which does not have obstacles in the reflecting light source end of the pen which will obstruct or reduce the effect of the illumination.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a substantially axial sectional view of the illuminated pen of this invention;

FIGURE 2 is a cross-sectional view taken substantially along section line 2—2 of FIGURE 1 and showing the cartridge and cartridge containing compartments, of this invention, and showing the cam means on the cap for projecting the writing cartridge from the illuminated pen;

FIGURE 3 is a cross-sectional view taken substantially along section line 3—3 of FIGURE 1 and showing the slot arrangement in the barrel for manipulating the clip switch which is used to turn the light on and off in the illuminated pen;

FIGURE 4 is an end view of the cap showing the cam surface for urging the cartridge to an extended position;

FIGURE 5 is a cross-sectional view taken substantially

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along section line 5—5 of FIGURE 1 of the illuminated pen;

FIGURE 6 is a cross-sectional view of the cap taken substantially along section line 6—6 of FIGURE 1; and

5 FIGURE 7 is a substantially axial sectional view of a solid cap which may be used in this invention in lieu of the embodiment illustrated in FIGURE 1.

One preferred form of the self-illuminable pen of the present invention includes: a barrel 10 which is threaded at each end thereof and has a reflector tip 12 connected at one end and a cap 14 connected at the other end thereof by engagement with the threaded ends of the barrel. The barrel 10 is substantially cylindrical but has a lower section 16 protruding therefrom, which lower section 16 15 comprises a cartridge housing for a writing cartridge 18. An inner annular flange 20 is disposed at the writing end of the barrel 10 and has an axial threaded means therein for receiving a threaded light bulb 22. The light bulb 22 is received within a reflecting chamber 24 in reflecting tip 12. The reflecting chamber 24 has no obstructions therein thereby allowing the light from the light source, or light bulb 22 to be reflected outwardly from the illuminated pen without interference. The reflecting cap 12 has a second chamber, or cartridge chamber 26 therein which is 25 separated from the reflecting chamber 24 by a common wall 28, and is adapted to align itself axially with the cartridge chamber 16 in the barrel when the reflecting tip 12 is screwed down onto the barrel 10 by means of the thread engagement 30. A bore 32 in the reflecting tip extends into the cartridge chamber 26, to thereby allow the cartridge 18 in the cartridge chamber to be extended from the illuminated pen.

A recess 34 is provided in the cap 14 and a coil spring 36 rests in the recess and is retained therein with one end of the coil spring abutting against the base of the recess and the other end of the coil spring 36 abutting against a dry cell battery 38 which is retained within a dry cell chamber 40 in the barrel 10. Two dry cell batteries 38 35 are illustrated in FIGURE 1, however, it is to be understood that the illuminated pen of this invention is designed to operate with two dry cell batteries in a preferred embodiment; and that one skilled in the art will not be deviating from the spirit and scope of this invention by adding or subtracting the number of dry cell batteries employed in the dry cell chamber 40. The dry cell 38 adjacent to the light bulb 22 has a central contact terminal 42 thereon, which abuts against the contact point 44 of the light bulb 22, when the light bulb 22 is threaded down into the inner flange of the barrel 10, and the cap 14 with the coil spring 36 retained in the recess 34 is threaded at the other end of the barrel into an operating position. The cap 14 has a cavity 46 therein, for receiving extra light bulbs, cartridges and erasers, which may be used as accessories to this invention. The chamber 46 is threaded at 45 its outer end, and a plug 48 is threadedly received therein to close the chamber. The plug 48 has an axial threaded bore 50 therein which receives a key ring 52. A cam 54 on the lower end of the cap 14 adjacent to the barrel 10 is adapted to abut against a writing cartridge 18 which will normally project from the cartridge chamber 16 in the barrel 10, since the writing cartridge 18 is normally urged outwardly away from the reflecting tip 12 by a coil spring 26 in the cartridge chamber 28 of the reflecting tip 12. Details of the cam 54 are shown in FIGURE 2 and FIGURE 4, wherein a cammed ridge 56 runs up onto a flat surface 58 adjacent to a point recess 60, which is adapted to receive the non-writing end of the writing cartridge, and to retain the writing cartridge in 50 position.

A clip 62 is provided on the upper surface of the barrel 10, and has a contact member 64 attached thereto by

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rivets 66 which projected through a slot 70 in the barrel. The barrel 10 is made of an electrically conductive material so that when the clip 62 is moved in the slot 70 to a position whereby the contact 64 makes electrical contact with the base of the dry cell battery 38 a circuit will be completed to the light bulb 22, whereby the light bulb will be illuminated.

A second embodiment of the invention is illustrated in FIGURE 7 wherein a solid cap 72 is provided, in lieu of the cap 14. The cap 72 is substantially the same as the cap 14 except that the cavity 46 and the plug 48 used in the cap 14 are not employed. A recess 74 is provided in one end of the solid cap. An axially threaded bore 78 is provided in the other end of the cap 72, into which the key ring 52 is threaded.

The self-illuminable writing instrument of this invention may be assembled as follows: Dry cell batteries 38 are placed in the barrel 10 of the illuminable pen. A light bulb 22 is screwed into the inner flange 20 so that the contact 44 of the light bulb 22 abuts against the center contact terminal 42 of the dry cell battery 38. The reflecting tip 12 is screwed down onto the light bulb end of the barrel 10 so that the cartridge chamber 28 and reflecting tip 12 are axially aligned with the cartridge chamber 16 in the barrel 10. The threaded arrangement 30 between the reflecting tip 12 and the barrel 10 is so arranged that the cartridge chambers 28 and 16 will be axial alignment when the reflecting tip 12 is tightly screwed down onto the barrel 10. This timing may be insured by commencing the screwing of the reflecting tip 12 with the cartridge chamber 28 in the reflecting tip axially aligned with the cartridge chamber 16 in the barrel 10. The cartridge 18 is then inserted through the cartridge chamber 16 and into the cartridge chamber 28 of the reflecting tip 12. The writing cartridge 18 will not extend through the bore 32 in reflecting tip 12 since the writing cartridge will be biased outwardly away from the reflecting tip by the coil spring 26 located in the cartridge chamber 28. The cap 14 is then threaded down into the switch end of the barrel 10 with the coil spring 36 received within the recess 34 thereof. As the cap 14 is so threaded into the barrel 10 the cam 54 on the cap 14 will bias, or force, the writing cartridge 18 outwardly into extended position as is illustrated in FIGURE 1, whereby the illuminated pen may be used for writing purposes.

The operation of the self-illuminable writing instrument of this invention is simple once the instrument has been assembled. To turn on the light bulb the clip 62 is moved towards the reflecting tip 12 in its slot 70 until the contact 64 abuts against the dry cell battery 38 at which time a circuit will be completed to the light bulb 22 since the barrel 10 is formed of electrically conductive material. The circuit will be through the contact 64, through the barrel 10, through the inner flange 20, and to the threads of the light bulb 22. The contact terminal 44 on the light bulb will complete the circuit by making contact with the contact terminal 42 of the dry cell battery 38.

Since the reflecting chamber 24 of the reflecting tip 12 of this invention does not have obstructions therein it is readily obvious that this invention provides a means whereby the light rays from the light bulb can be diffused through the reflecting tip 12 onto the light source without obstruction, so that the maximum use of the light source is obtained. Once the self-illuminable pen has been assembled the cartridge 18 extending into the reflector tip 12 through the cartridge chamber 28 thereof and into the cartridge chamber 16 in the barrel 10 will serve as a safety means to prevent unnecessary or inadvertent disassembling of the reflector tip 12, since the reflector tip 12 cannot be unscrewed from the barrel 10 while the cartridge 18 is in position. The clip 62 of this invention provides a second safety feature of the illuminable pen or writing instrument disclosed herein. When

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the clip 62 is clipped to a pocket for carrying the illuminating pen, the clip will normally force the contact 64 away from the dry cells 38 thereby breaking the circuit. Thus in the event that the illuminable pen is inadvertently left on the circuit will be broken when the pen is clipped to the user's pocket.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A selectively self-illuminable writing instrument comprising: an elongate tubular body, said tubular body having a flange at one end thereof extending inwardly toward the center of said tubular body, engaging means in said flange for receiving a light bulb, and thread means on said flange for receiving a hollow reflective tip, a cylinder integral with and extending longitudinally along said elongate tubular body for receiving a writing cartridge therein, a light bulb connected to said tubular body by said engaging means in said flange, a hollow reflecting tip connected to said tubular body by the thread engaging means on said flange, said reflecting tip having a tip cylinder on one side thereof, said tip cylinder being in axial alignment with said cylinder on said tubular body when said tip is in threaded engagement with said tubular body and is tightly engaged against said tubular body, the other end of said tubular body having means therein for releasably receiving a cap means, cap means connected to said tubular body by said releasable receiving means in said tubular body, said cap means having a cam disposed on one side thereof for engaging the end of a cartridge, a writing cartridge disposed in the cylinder on said tubular member and extending through said tip cylinder in said reflecting tip, said writing cartridge having a writing tip, the tip of said writing cartridge being disposed outwardly from said reflecting tip when said cap is securely fastened to said tubular body with the cam thereof abutting against the other end of said cartridge, a flange on said writing cartridge disposed adjacent to the writing tip of said cartridge, a biasing means in said tip cylinder for urging said writing cartridge toward said cap means, a recess in said cap means receiving a spring means therein, dry-cell means in said tubular body, the contact terminal of said dry cell means engaging with an electrically conducting tip on said light bulb and the spring means in said recess in said cap means engaging the other end of said dry cell means to urge said contact tip against the electrically conducting tip on said light bulb, and a clip on the tubular body slidably disposed in a slot in said tubular body, said clip having an electrical terminal thereon disposed on the inside of said tubular body for engaging with the other end of said dry cell means, said tubular body being constructed of electrical conductive material to complete a circuit to illuminate said light bulb when said clip engages with the other end of said dry cell means.

2. The selectively illuminating writing instrument of claim 1 wherein said cap means has a chamber therein for receiving surplus light bulbs, erasers and cartridges.

3. The selectively illuminating writing instrument of claim 2 wherein said cap means has a thread means therein adjacent to said chamber, and a plug connected to said cap means by said thread means.

4. The selectively illuminating writing instrument of claim 3 wherein said plug has threaded engaging means disposed axially thereof, and a key ring threaded into said thread engaging means in said plug.

5. A selectively self-illuminating writing instrument comprising a barrel having threaded ends, a transparent

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tip threaded on one end of the barrel, a cap detachably threaded on the other end of the barrel and having a cartridge retaining cam thereon, a central flange interiorly of the barrel adjacent to the transparent tip, a reflecting chamber and a cartridge chamber in said transparent tip, a bore in said transparent tip axially aligned with said cartridge chamber and extending therefrom to the outer periphery of the transparent tip, a writing cartridge for projection from the transparent tip releasably held in the cartridge chamber and extending into said bore, a switch means slidably attached on the barrel, and an electric illuminating means within the barrel for illuminating the reflecting chamber in the transparent tip and controlled by the switch means, said switch means being manually operable from the outside of said barrel.

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