United States Patent

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[54] **BALLPOINT PEN LIGHT**
6 Claims, 2 Drawing Figs.

[52] **U.S. Cl.** ..... **240/6.46,** 240/2 I, 240/10.66, 240/10.68
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[50] **Field of Search** ..... 240/6.46, 10.66, 10.68, 2 I

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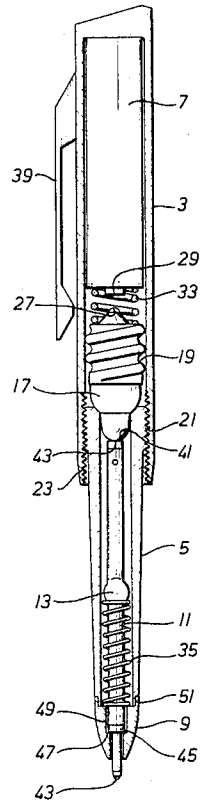
ABSTRACT: A ballpoint pen construction having self-contained electrical illuminating source and structural couplings whereby the ballpoint cartridge may be extended for use either with or without utilization of the illumination means, thereby conserving the energy in the power source when the pen is in operation and the illumination is unnecessary.



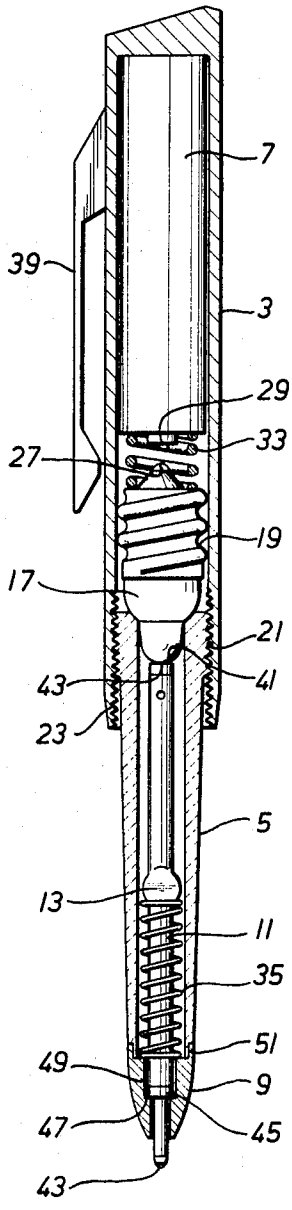


FIG. 1

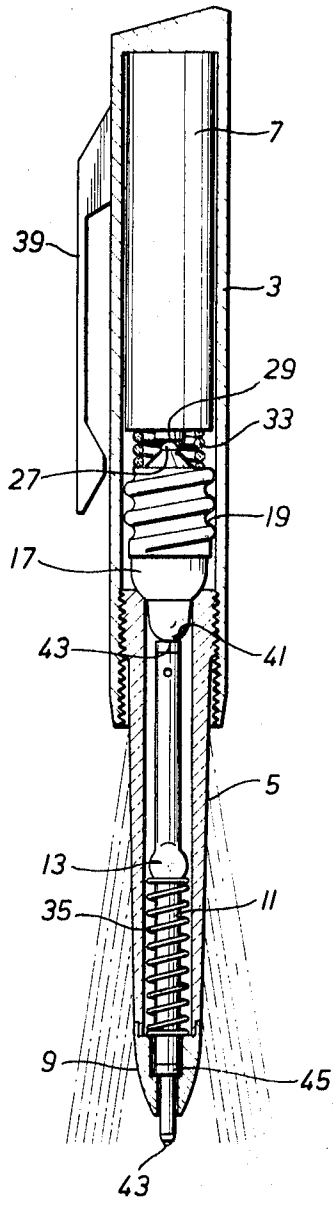


FIG. 2

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BALLPOINT PEN LIGHT

BACKGROUND OF THE INVENTION

This invention pertains to ballpoint pen names of the type which commonly embodies a source of illumination therein for facilitating writing in a darkened environment.

On occasion, it is found necessary to take notes or write when sufficient light is not available to see the paper and the writing thereon. Also in numerous occupations, writing in a dark environment is necessary in carrying out the work. Such is the case for example where notes are taken in connection with demonstrations or lecture by means or motion pictures or slides in environments that are completely darkened. Since it is desirable to hold the paper or clipboard with one hand while writing with the other, the use of a flashlight or other illumination instrument is not feasible since the light therefrom would interfere with the lecturer and also because the person taking notes would find use of a flashlight cumbersome if not extremely difficult. Numerous other occasions arise when it would be helpful to have available a pen containing as an integral part thereof, illuminating means. Although numerous forms of illuminating pens have been designed heretofore, a common characteristic of such pens is their inability to be used as a writing instrument without actuation of the illumination means itself. As a result, whenever the pen is actuated to an extended position the illumination circuit is closed. During daytime use or other periods where environmental light is present, the power source or battery of the pen is being consumed without need or advantage. Although it is known that in the past various efforts have been made to provide an illuminated writing instrument which can be used with or without operation of the source of light, such instruments have been characterized by complicated construction and difficulty in use, and have not, in any regard, become commercially successful.

SUMMARY OF THE INVENTION

In accordance with the circumstances set forth hereinabove and in pursuance of elimination of the shortcomings with respect thereto, it is a general object of this invention to provide a compact and simple pen construction having a minimum of parts and which can be used in the same manner as a conventional ballpoint pen and wherein the writing end is illuminated so as to facilitate its use in a darkened environment by directing the light rays onto the paper in an area which is uniformly concentrated around the writing end of the pen.

It is a further object of this invention to provide a pen having a hollow tubular casing which includes an illuminating source therein, a light-transmitting tip member and barrel in which the pen can be extended to an operating position independently of actuation of the source of illumination.

Still a further object of this invention is to provide a flashlight-type ball pen carrying its own source of illumination and power and in which there is provided means for quickly and effectively extending the ball pen either with or without actuation of the light source.

A still further object of this invention is to provide a ballpoint pen construction in which there is a hollow tubular casing containing a light source and a source of current for the light, the light source being automatically energized upon extension of the ball pen writing cartridge tip from the casing by manually twisting the casing portion with respect to the light-transmitting barrel.

Still another feature and object of the invention is a provision of a pen wherein the light source is arranged internally so that on extension of the ball pen tip can be used in the dark or so that upon selective movement of the casing with respect to the barrel, the pen can be used without the light source so as to thereby conserve energy of the battery and prolong overall operational use.

These and numerous other features and objects of the invention will become more readily apparent upon a careful reading of the following detailed disclosure, claims and drawings wherein like like numerals denote like parts in the various views and wherein;

DETAILED DESCRIPTION OF THE DRAWINGS

FIG. 1 shows in cross section the improved ballpoint pen light of the invention when it is in a first operative position in which the ballpoint is extended without actuation of the source of illumination.

FIG. 2 shows the improved ballpoint pen light of the invention when in a second operative position in which the ballpoint is extended into operative position while the source of illumination is simultaneously operated.

DETAILED DESCRIPTION OF THE INVENTION

With reference now to the drawings there is shown in FIG. 1 a pen generally comprising a casing 3 which may be made of plastic or other appropriate material, a light-transmitting barrel 5, affixed to the casing in relatively movable relationship, a tip member 9 fixedly disposed on the end of the barrel and a writing cartridge 11 conventionally positioned within the barrel so as to be capable of protruding through the tip member. The casing 3 is characterized by a generally cylindrical configuration which is closed at one end and has a conventional pocket clip 39 affixed to the casing or integral therewith. The open end of the casing 3 is further characterized by a plurality of internal threads 23 which are adapted to mate with the cooperating threads 21 on the external surface of barrel 5. The threads 21 and 23 extend a sufficient longitudinal distance along the pen so as to provide adequate gripping engagement of the two bodies when they are in any of their various relative positions. As explained hereinafter relative movement of the casing and barrel by means of the threads produces a number of beneficial features.

Power for operation of the light source in the pen is supplied by a conventional dry cell battery 7 which is positioned in abutting relationship against the backwall of the casing 3. A pole 29, also of conventional design, extends in proximate relationship to the terminal contact 27 of lamp 7, the lamp being disposed intermediate the battery 7 and the writing cartridge 11. The forward end of the lamp is characterized by lens 41 which is normally disposed in abutting relationship to the rearward tip 43 of the cartridge. Uniformly disposed about the axis of the pen and intermediate the battery 7 and lamp 17 is rear coil spring 33. It may be readily visualized that a precalculated spring constant may be imparted to spring 33 so as to maintain the terminal contact 27 of lamp 17 in spaced relationship to pole 29 of the battery 7 so that under specified circumstances the ball pen can be utilized without bringing the lamp and battery into contact.

The writing cartridge 11 is also of conventional construction and is characterized by a ballpoint tip 43 which extends rearward towards the flange 45 which is adapted to abut against the limiting shoulders 47 of tip member 9. The flange 45 extends backward through axial bore 49 of the tip member and into the body of the writing cartridge itself. Intermediate the length of the writing cartridge 11 is the cartridge crimp 13 which is adapted to serve as an abutting member for limiting movement of forward coil spring 35. The forward coil spring 35 is designed to exhibit a weaker resilient tendency or spring constant than the rear spring 33. The spring 35 is normally disposed to exert a pressure against crimp 13 by reason of the limiting abutment of the springs at its forward end against the counter board tip 51 of tip member 9. It will thus be visualized that spring 35 will normally tend to move the cartridge 11 to a retracted position within the barrel so that point 43 is entirely housed within the tip member.

Operation of the improved pen light of the invention is simple and efficient upon recognition of its three modal configurations. The first of course is a configuration in which the pen

is retracted and the light circuit open. The second occurs with the light circuit open and the pen moved into extended or writing position. The third is achieved with the pen in writing position and the light circuit closed so that utilization of the pen can occur in darkness.

The first configuration is achieved by rotating the casing **3** in a direction opposite to that of the barrel **5** so as to move the two in opposite axial directions, thus permitting the writing cartridge **11** to be moved inwardly of the barrel **5** by reason of the force exerted by spring **35** upon cartridge crimp **13**. This requires but a simple twist of the casing-barrel bodies and may be done with one hand. The second configuration is achieved by turning the casing-barrel bodies in the opposite direction so as to thread them towards one another. In so doing the tip **43** of cartridge **11** is brought into contact with the lamp lens **41** and the bearing force of such lamp lens is caused to exert a compression of the spring **35** until the ball point **43** is forced to protrude from the tip member **9**. Due to the relatively weaker inherent characteristic of spring **35** by comparison to spring **33** it will be recognized that the cartridge **11** will be moved against the force of spring **35** before the lamp is caused to compress the spring **33**. The greater compressive resistance of spring **33** thus maintains the terminal contact **27** of lamp **17** out of contact with the battery pole **29**. If it is desired to bring the lamp source into operation the casing and barrel may be given an additional turn with respect to one another so as to move the barrel threads **21** farther rearward on the threads **23** of casing **3**. In so doing it will be recognized that coil spring **35** will not be additionally compressed because of the limiting relationship occurring by the abutting contact of flange **45** of the cartridge on the shoulder **47** of the tip **9**. Thus such relative movement of the casing-barrel causes only compression of rear coil spring **33** and thus brings the terminal contact **27** of the lamp **17** into abutting relationship with the pole **29** of battery **7** thereby closing the circuit and providing illumination for writing purposes. In this regard it may be noted that the lower portion of barrel **5** will project a more concentrated beam pattern while the side portions project a circular less intense beam onto the writing surface around the concentrated central beam. This modal configuration is appropriately shown in FIG. **2**. Inspection of FIG. **2** will clearly reveal that the battery, lamp, and writing cartridge are all in abutting contact so as to thereby form a structural relationship within the casing-barrel which is both durable and resistant to shock or other types of adverse use. If the pan is in the configuration of FIG. **2** and the casing and barrel are separated just enough to extinguish the lamp, the pen will light only when the user presses the point on the writing surface. It will be readily recognized that the lamp may be turned off simply by reverse twisting the casing-barrel so as to relieve the pressure on coil spring **33** and thereby enable the spring to force the lamp and battery in opposite directions away from each other. Continued rotation of the casing-barrel causes retraction of the ball pen into the cartridge due to the initiation of the compressive action of spring **35** on cartridge crimp **13**.

From the foregoing it will be readily recognized that while I have disclosed a particular construction for the extension and retraction of the writing cartridge and for the operation of the illumination lamp, it is apparent that other means for doing the same and for duplicating the essential functions of this invention may be used without departing from the spirit thereof and from the scope of the appended claims.

Therefore, what is claimed and desired to be secured by the United States Letters Patent is:

1. A writing instrument-flashlight combination comprising:
- first and second elongated housing means movably affixed to each other so that axial translation can be manually imparted to move them towards or away from one another,
- a retractable writing cartridge disposed in the first housing means,
- an illumination bulb disposed adjacent the end, of the writing cartridge,
- a source of power positioned in spaced relation to the illumination bulb,
- first restraining means normally maintaining the illumination bulb in spaced relation to the source of power,
- a second restraining means biasing the cartridge toward a normally retracted position,
- the first and second restraining means being so characterized that moving the first and second elongated housings toward each other first compresses the second restraining means to allow the cartridge to be fully extended,
- while further moving together of the first and second elongated housings compresses the first restraining means to allow the illumination bulb and the source of power to come together to light the bulb.

2. A writing instrument-flashlight combination in which the writing point may be retracted or extended for use independently of the operation of the light and in which the light may selectively be actuated for simultaneous use with the writing instrument comprising:
- first and second elongate housing means movably affixed to each other so that axial translation can be manually imparted to move them towards or away from one another,
- a retractable writing cartridge disposed in said first housing means,
- an illumination bulb disposed adjacent the end of the writing cartridge,
- a source of power positioned in spaced relation to the illumination bulb,
- first restraining means normally maintaining said illumination bulb in spaced relation to said source of power until each said first and second elongate housing means are moved towards one another a sufficient distance to overcome said restraining means and thereby bring the source of power into operative contact with the bulb,
- said second restraining means being operatively disposed with respect to said cartridge to bias it toward a normally retracted position,
- said second restraining means further being of lesser strength than said first restraining means so that the relative movement of said first and second housing means toward each other causes cartridge to be moved in an extended position of use.

3. The structure of claim **2** wherein additional movement of said first and second housing means after the cartridge has moved to an extended position overcomes said first restraining means so as to bring said source of power into contact with said illumination bulb.

4. The structure of claim **3** wherein said first housing means is of light-transmitting material and is adapted to project a central concentrated light beam and a larger dimmer pattern of illumination exteriorally thereof.

5. A writing instrument-flashlight combination in which the writing point may be retracted or extended for use independently of the operation of the light and in which the light may selectively be actuated for simultaneous use with the writing instrument comprising:
- first and second elongate housing means movably affixed to each other so that axial translation can be manually imparted to move them towards or away from one another,
- a retractable writing cartridge disposed in said first housing means,
- an illumination bulb disposed adjacent the end of the writing cartridge,
- a source of power positioned in spaced relation to the illumination bulb,
- first restraining means to normally maintaining said illumination bulb in spaced relation to said source of power until each said first and second elongate housing means are moved towards one another a sufficient distance to overcome said restraining means and thereby bring the source of power into operative contact with the bulb,
- said first restraining means being of springlike characteristic and positioned intermediate said bulb and source of power and wherein the bulb forward end abuts the rearward end of said cartridge,

said cartridge being normally biased toward said bulb by second restraining means operatively disposed in contacting relation to said first housing means,

said first restraining means being stronger than said second restraining means so that relative movement of each said housing means toward each other produces extension of the cartridge to a writing position prior to the contacting of the source of power and said illumination bulb.

6. The structure of claim 5 wherein said first housing means is of light-transmitting material and is adapted to project a central concentrated light beam and a larger dimmer pattern of illumination exteriorally thereof when the pen is being used on a writing surface.