July 26, 1960 B. J. CRAIG 2,946,311

WRITING INSTRUMENT

Filed Dec. 1, 1954

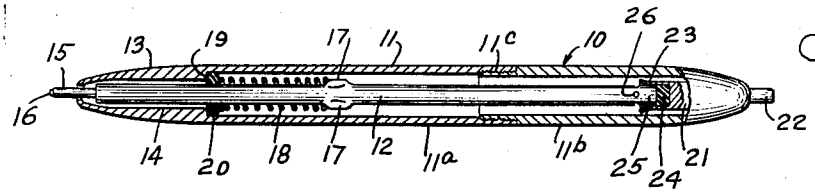


Fig. 1.

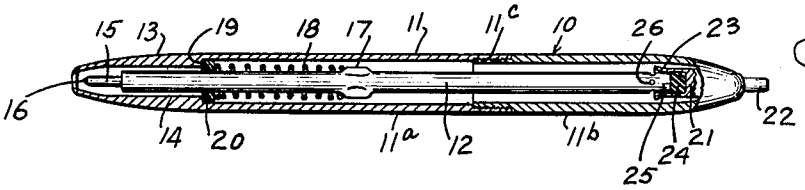


Fig. 2.

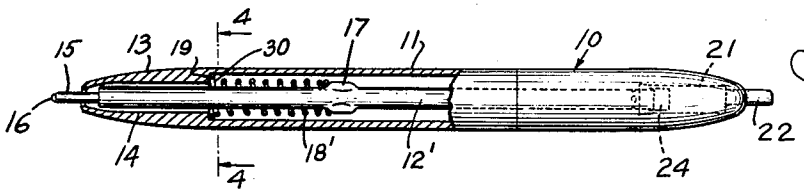


Fig. 3.

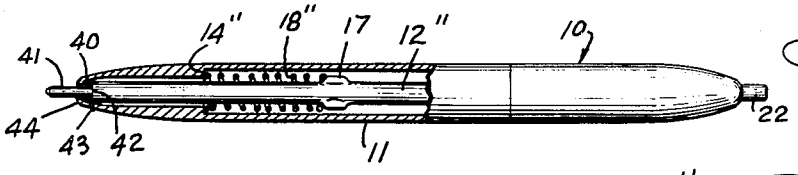


Fig. 5.

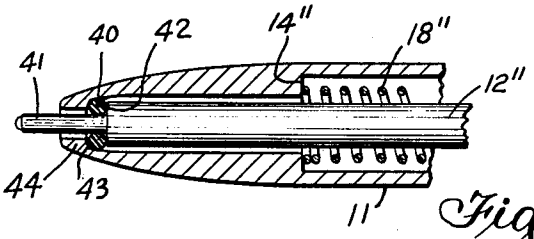


Fig. 6.

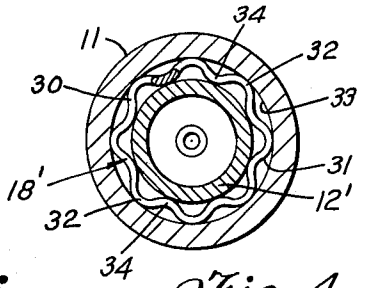


Fig. 4.

INVENTOR.

B. J. Craig.

United States Patent Office 2,946,311 Patented July 26, 1960

2,946,311

WRITING INSTRUMENT

Burnie J. Craig, 1042 La Presa Drive, Pasadena, Calif.

Filed Dec. 1, 1954, Ser. No. 472,419

1 Claim. (Cl. 120—42.03)

This invention relates to a ball point pen.

The general object of the invention is to provide an improved means for supporting the writing tip of a ball point pen on the pen barrel.

It has long been objected to ball point pens that writing therewith is harsh and tends to cramp the action of the writer. In nibbed pens the nib is flexible and may bend slightly when in contact with the surface being written upon and thus harshness is reduced.

The ball point pens heretofore made included a rigid ball mounted in a rigid tip with the rigid cartridge supported in, and/or as a part of a rigid barrel. Sometimes the cartridge was supported in the barrel so that it moved slightly in writing. This caused an objectable jarring action. Sometimes the cartridge was clamped tightly in place and there was nothing to relieve the rigidity and to provide for an uncramped free writing movement. It is accordingly an object of the present invention to provide a ball point pen which has a cushioned writing tip.

A more specific object of the invention is to provide a ball point pen wherein the writing tip is mounted to move slightly within the supporting barrel and wherein resilient means is provided for supporting the writing tip to permit such slight movement.

Another object of the invention is to provide a ball point pen having a cartridge therein and wherein means is provided to resiliently "float" the writing tip in the barrel.

Another object of the invention is to provide a ball point pen having a writing tip and having a resilient collar holding the writing tip for movement in a barrel.

Another object of the invention is to provide a ball point pen which includes a barrel and a cartridge having a writing tip thereon and wherein means is provided to resiliently support the cartridge at spaced locations.

Another object of the invention is to provide a ball point pen including a barrel and a cartridge having a writing tip thereon, and wherein means is provided to resiliently support the end of the cartridge which is remote from the tip.

Another object of the invention is to provide a retractable ball point pen which includes a barrel and a writing member and wherein novel means is provided for cushioning the writing member.

Another object of the invention is to provide a retractable ball point pen having a retractable writing tip which is retracted by a spring and wherein a part of the retracting spring resiliently supports the tip.

A more specific object of the invention is to provide a disposable ball point pen including a tip and wherein the tip includes a member which is resiliently supported within the writing barrel.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings; wherein,

Fig. 1 is a central sectional view showing a ball point pen embodying features of the invention;

Fig. 2 is a view similar to Fig. 1 with the point retracted;

Fig. 3 is a central sectional view showing a modification;

Fig. 4 is a section taken on line 4—4, Fig. 3;

Fig. 5 is a central sectional view showing a further modification; and

Fig. 6 is an enlarged fragmentary section showing the forward end of the further modification.

Referring to the drawing by reference characters, the invention is shown as embodied in a ball point pen which is indicated generally at **10**. As shown, the pen includes a barrel **11** in which an ink carrying cartridge **12** is slidably arranged. The barrel **11** preferably consists of two parts **11***a* and **11***b* which are threaded together at **11***c*. The barrel includes a tapering end portion **13** which has a hole **14** therein which is slightly greater in diameter than the diameter of the cartridge. The cartridge includes a reduced forwardly extending writing tip **15** which includes a writing ball **16**. The cartridge, as shown, includes integral lugs **17** which are engaged by one end of a spring **18**.

The barrel includes a shoulder **19** against which a resilient ring **20** engages. The ring **20** may be made of resilient rubber. The ring **20** provides resilience when the cartridge is moved laterally. One end of the spring engages the ring **20** and the other end of the spring **18** engages the lugs **17** to thus normally urge the cartridge **12** to the position shown in Fig. 2.

In the shown construction the inner end of the cartridge **12** engages a member **21** on a tip advancing and retracting device which is operated by a push button **22**. Point advancing and retracting mechanism are old and form no part of the present invention. The member **21** of the advancing and retracting mechanism includes a collar **23** within which a resilient seat **24**, which can be made of rubber, may be arranged. The inner end **25** of the cartridge **12** may move slightly laterally in the collar **23** and the inner end engages the cushion **24** to provide axial resilience. The cartridge **12** is provided with lateral bleed holes **26**. The cushions **20** and **24** provide a resilient mounting for the cartridge tip **15** and ball **16**.

In Figs. 3 and 4 a modification is shown wherein the cushion **20** is omitted and the end portion **30** of the spring **18'** is provided with sinuous, convolutions **31**. The crests **32** of the convolutions engage the inner wall **33** of the barrel and the troughs **34** of the convolutions engage the outer surface of the cartridge **12'** to thus cushion the writing tip.

In Figs. 5 and 6, the spring **18''** engages the shoulder **14''** of the barrel and the cartridge **12''** has a resilient rubber O-ring **40** surrounding the tip **41**. When the cartridge **12''** is advanced a shoulder **42** on the cartridge resiliently clamps the O-ring against a shoulder **43** in the tip **44** of the barrel so that the writing tip is cushioned.

From the foregoing description it will be apparent that in a novel and efficient manner the objections to ball point pens which have been occasioned by loose, wobbly tip mounting, and/or by rigid clamping, tip mounting have been overcome by means of the present invention which provides a smooth continuous writing effect.

Having thus described the invention, I claim:

A ball point pen including a barrel having a hole in one end, a cartridge slidably mounted in the barrel, said cartridge having a writing tip at one end, said tip projecting through said hole when the cartridge is advanced in the barrel, said hole being larger than said tip to permit lateral movement of the tip, said barrel having a shoulder therein, a spring surrounding said cartridge and having one end engaging said shoulder, said one end of the

spring including sinuous, resilient portions forming convolutions with the crests of the convolutions; engaging the interior of the barrel and the troughs of the convolutions engaging the exterior of the cartridge to cushion lateral movement of the cartridge, means on said cartridge engaging the other end of said spring, said spring normally urging said cartridge rearwardly in the barrel, and means to advance the cartridge in the barrel.

References Cited in the file of this patent

UNITED STATES PATENTS

2,734,484	O'Sullivan	Feb. 14, 1956
2,776,646	Spatz	Jan. 8, 1957

FOREIGN PATENTS

630,609	Great Britain	Oct. 18, 1949
669,464	Great Britain	Apr. 2, 1952