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WRITING INSTRUMENT WITH CONVERTIBLE CARTRIDGE

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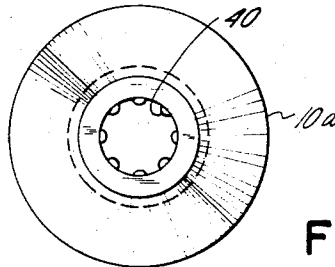
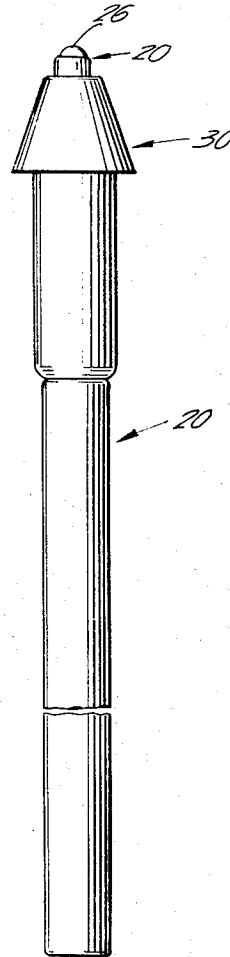
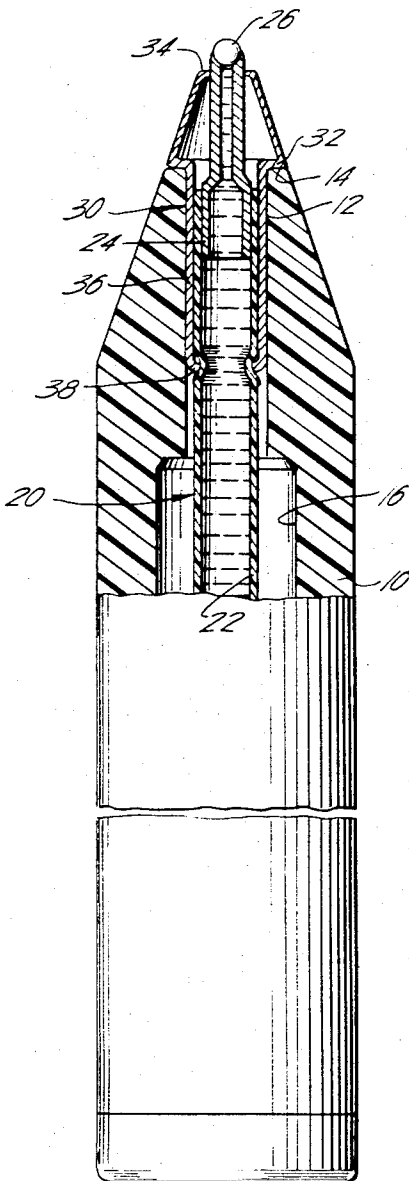


FIG. 1

FIG. 2

FIG. 3



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1

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WRITING INSTRUMENT WITH CONVERTIBLE CARTRIDGE

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ABSTRACT OF THE DISCLOSURE

A writing instrument known as a stick pen employing a standard ink cartridge and a special adaptor into which the standard cartridge is permanently crimped to convert the retractable ink cartridge into a non-retractable type required for insertion into the barrel of the writing instrument from its writing end.

My invention relates to a writing instrument known as a stick pen provided with a standard ink cartridge.

Stick pens employ non-retractable special cartridges having a shoulder engaging the end of the barrel to prevent movement of the cartridge under the writing pressure. Such a shoulder is missing in the standard ink cartridge, and it is an object of the invention to provide a writing instrument having an adaptor for converting the standard cartridge for use in a stick pen, as aforesaid.

These and other objects will become readily apparent from a consideration of the stick pen and convertible cartridge described in the following specification, pointed out in the claims, and illustrated in the enclosed drawing in which:

FIG. 1 is a longitudinal plan view of the pen partly in section, showing the converted cartridge inserted therein; and longitudinally cross-sectioned.

FIG. 2 is a view of the cartridge and adaptor.

FIG. 3 is an end view of the barrel opening.

The invention broadly comprises a stick pen barrel 10, a standard cartridge 20, and an adaptor 30 crimped to the cartridge and fitted into the barrel.

The pen barrel has an opening 12, at the writing end with an abutment 14.

The opening 12 extends into the hollow compartment 16, which may be of enlarged diameter to reduce the wall thickness of the barrel.

The cartridge 20 consists of an ink-storage tube 22 which terminates in a metal writing point 24 wedged inside the tube, containing the ball 26. Such a cartridge is generally used for retractable ball point pens, and has an outside diameter smaller than the barrel opening 12.

To enable the cartridge to be supported to the barrel with the writing tip exposed, I provide an adaptor 30 which is formed with a shoulder 32 for engaging the abutment 14. A longitudinally extending opening 34 extends through the adaptor for the metal point 24 to extend therethrough. A neck portion 36 encircles the cartridge, and is crimped thereto to secure the cartridge against movement with respect to the adaptor.

The adaptor accordingly is required to be made of material that can be cold worked. I prefer an adaptor made of sheet metal on an eyelet forming machine, which can be readily crimped, as at 38, peripherally into the cartridge tube 22.

The crimp is sufficient to withstand the writing pressure without damage to the cartridge.

As a consequence, I am able to employ a conventional writing cartridge, instead of the special cartridge with a

2

shouldered writing metal tip hitherto required, which cannot be used in retractable pens.

In FIG. 3 there is shown a pen barrel 10a made of styrene or other inexpensive material that is weaker and more subject to breakage than the more expensive varieties. To provide a tight fit of the adaptor, with such material, I prefer to extrude or mold thin and fragile "shear-ribs" 40, designed to be easily crushed when the pen adaptor is pushed into the barrel as is shown in FIG. 1. For an inside wall diameter of .160", and a barrel wall thickness of $\frac{1}{32}$ ", the ribs may be $\frac{1}{64}$ " wide and extend radially from the barrel wall, about .004" which will accommodate an adaptor having a diameter of .154". About 8 such ribs may be provided around the barrel wall. Small variations in these dimensions are not critical in the fit.

I have thus described my invention, but I desire it understood that it is not confined to the particular forms or uses shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of my invention; and therefore I claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which objects of my invention are obtained and new results accomplished since the particular embodiment herein shown and described is only one of the many that can be employed to obtain these objects and accomplish these results.

I claim:

1. A writing instrument comprising a barrel having an opening at its writing end; an ink cartridge inserted through said opening, said ink cartridge comprising a tube containing writing fluid, having a writing point wedged inside one end of said tube, said tube having a diameter less than the diameter of the barrel opening, and larger than the largest diameter of said writing point; and an adaptor having a central opening for allowing said writing point to project therethrough, an external shoulder abutting the end of the barrel, and a neck portion having an internal diameter larger than the largest diameter of the cartridge and an external diameter smaller than the internal diameter of the barrel, said neck portion crimped to the cartridge so as to prevent the cartridge from movement into the barrel when writing pressure is applied to the writing point.

2. The writing instrument of claim 1, wherein the adaptor is made of sheet metal, and the writing point of the cartridge possesses a diameter larger than the opening at the lowermost portion of the adaptor whereby the writing point acts as an inner stop when inserted into the neck portion of the adaptor into the adaptor opening.

3. The writing instrument of claim 1 wherein the barrel is made of plastic and the surface inside the opening at the writing end is provided with easily compressed shear ribs integrally formed thereon for tightly holding the cartridge in position when inserted therein, without cracking the barrel wall.

4. The writing instrument of claim 3, wherein the shear ribs extend longitudinally in the barrel.

References Cited

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LAWRENCE CHARLES, *Primary Examiner*.