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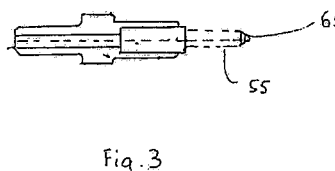
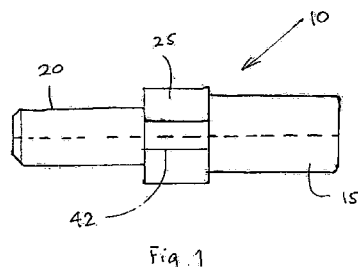
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(54) **Title:** A REFILL ADAPTOR



(57) **Abstract:** A refill adaptor for use in ball point pens essentially comprising a main body (10), comprising of a front part (15) and a rear shank portion (20). The front part (15) and said rear shank portion (20) are rigidly coupled together with a ring member (25); and said main body (10) having a capillary tube (40) throughout its length. The said front part (15) is provided with a front housing (35) for holding the refill tip (55) provided with a ball point (65) for smooth writing, said capillary tube being provided with an ink channel, the internal diameter of which is selected to be about 0.8 mm and the outer diameter of said capillary being selected as about 1.8 mm for easy flow of ink from ink reservoir to said ball point (65).

WO 2009/133568 A1

## A REFILL ADAPTOR

### BACKGROUND OF THE INVENTION

- 10 The invention relates to a refill adaptor for a ball point pen using mini tips for making ball point pen refills. More particularly, the invention relates to a refill adaptor for ball point pens of varying length to enable the use of mini tips made from about 1.50 - 1.65 mm wire diameter instead of about 2.00 - 2.30 mm wire diameter.

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### PRIOR ART

The commonly used types of ball point refills which are available in the market can be broadly classified in two categories -

20

- a) Refills using BIC (BIC is a trade name of BIC Corporation, France) style ball point pen tips, adaptor, refill tube and ink. Ordinarily the shank diameter of such adaptor is usually about 4.00 mm.
- 25 b) Refill using ball point pen tips like Pilot, D6, D4, Ohto, Zebra etc., refill tube or cartridge of about 2.70 mm - 3.00 mm. outside diameter and ink. In this refills there is no possibility to use mini- tips at present made from wire of about 1.50 mm - 1.65 mm diameter.
- 30 In the conventional ball point pen, the tips are made of wires of brass or an alloy of nickel and silver. Further the average diameter of such tips varies between about 2.00 mm and 2.30 mm. Thus the conventional ball point pen suffers from inherent disadvantages, namely it requires extra or

5 additional materials in making the tips with bigger diameter wire than what is actually required in the mini tips which is about 1.50 - 1.65 mm in diameter. Further no adaptor is available in the market, which can accommodate tips made of lesser diameter wire to make ordinary refills with the refill tube or cartridge having outside diameter of about 2.70 -  
10 3.00 mm. This enhances the cost of making known types of ball point pen refills. Several attempts have been made to overcome these difficulties but without success.

In known type of ball point pen using BIC style refills, refills are made  
15 using adaptor, BIC style ball point pen tips, refill tube and ink. However, there is no adaptor to accommodate tips made from wire in the range of about 1.50 mm to 1.65 mm in diameter available in the market. This wire of lesser diameter not only make the ball point pen much more economical compared to the conventional ball point pens due to less  
20 amount of material required, additionally such lesser diameter would allow the pen to more attractive to the customer.

It is known among persons skilled in the art that the main difference between ordinary and BIC type tipped refills are as follows:

25

- a. The tips used in BIC type is the BIC tip while the ordinary refills uses Pilot, D6, D4, Ohto, Zebra or such other type of tips usually made from about 2.00 to 2.30 mm wire, the refill tube or cartridge outer diameter being about 2.70 to 3.30 mm and tip is directly  
30 mounted or inserted in refill tube or cartridge containing ink.
- b. There is no adaptor in the ordinary type of refills enabling it to use about 1.50 -1.65 mm wire mini tips.

5

- c. The BIC tube refills are front loading while the ordinary refills are rear loading.

It has therefore been the endeavor of the Applicant to mitigate these  
10 drawbacks of the conventional ball point pens and to make an ordinary  
ball point pen refill using an adaptor for refill which enables usage of ball  
pen tips of no less technical requirement but of less material and thereby  
reducing the cost considerably.

15 OBJECT OF THE PRESENT INVENTION

It is an object of the invention to provide an adaptor which enables use of  
ball point pen tips made from about 1.50 - 1.65 mm diameter wire of  
brass or alloy of nickel and silver to make a refill for ball point pen using  
20 refill tube or cartridge of about 2.70 - 3.00 mm outside diameter.

It is also an object of the invention of the invention to provide for an  
adapter which results in reduction in the cost of the refill without any  
alteration in the existing design of ball point pens or the ink quantity  
25 necessary for adequate writing.

DESCRIPTION OF THE INVENTION

30 Accordingly, there is provided a refill adaptor for making ball point pens  
refills comprising a main body, comprising of a front portion and a rear  
shank portion, said front portion and said rear shank portion are rigidly  
coupled together with a ring member, said main body having a capillary

5 hole throughout its length , said front portion being provided with a front housing for holding the mini ball point pen tip provided with a ball for smooth writing, the capillary provides a ink channel, the internal diameter of which is selected to about 0.8 mm and the outer diameter of said capillary being selected to about 1.8 mm for free flow of ink from  
10 ink reservoir or refill tube or cartridge made from about 2.70 - 3.00 mm tube to the ball point tip .

A refill adaptor according to the invention has outside diameter of the front portion of about 2.25 - 2.30 mm and inner hole diameter of the front  
15 portion of about 1.55 mm.

A refill adaptor wherein the ball point pen tip of the refill is housed within the housing of the front part so as to hold the ball point pen tip along the longitudinal axis of the refill.

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The present invention thus, provides a new ball point pen refill using an adaptor which is much more economical. Further such adaptor also saves the cost of the material of the tip.

25 With the newly designed adaptor, one can use about 1.50 -1.65 mm diameter wire ball point pen tips in the ordinary refill where the outside diameter of the refill tube is about 2.70 - 3.00 mm, which was not possible without the present invention.

30 The advantage of the new adaptor is to use about 1.50 - 1.65 mm diameter wires ball point pen tips in the ordinary refills having outside diameter of the refill tube as about 2.70 -3.00 mm, thereby cutting cost as compared to about 2.00 - 2.30 mm diameter ball point pen tips.

## 5 BRIEF DESCRIPTION OF THE DRAWINGS

The refill adaptor of the present invention is described herein below with reference to accompanying drawings, wherein

10 Figure 1 shows a side plan of the refill adaptor of the present invention; Figure 2 shows a section of the refill adaptor of the present invention and Figure 3 shows the refill adaptor of the present invention fitted with refill tube and ball point pen tip.

15 With reference to accompanying drawings, the refill adaptor essentially comprises a main body (10) essentially comprising two parts, a front part (15) and a rear shank portion (20). The said front part (15) and rear shank portion (20) are rigidly joined together with a ring member (25) having an aperture (42).

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Figure 2 shows that the refill adaptor of the present invention is provided with a front face (30) having a hole (35), which continues from the front face of the refill adaptor and extends till the end of the rear shank (20). The internal diameter of the hole (35) is wider in the front (1.50 mm -  
25 1.55 mm) and narrower in the rear portion. The diameter of the shank (20) is about 0.8 mm while the outer diameter of the shank (20) is around 1.8 mm. The front part (15) of the refill adaptor holds the tip of the refill (55) having a ball which is provided with a uniform capillary tube (40) for holding ink as shown in Fig 3. The other end of said capillary is kept  
30 open for the uniform flow of ink through the said ink channel (40) to the ball point (65).

- 5 It will be apparent from the Drawings that the adopter is used in relation to ordinary type of refill of ball -point pens having the refill fitting hole diameter of about 2.30 - 2.40 mm for the fitment of refill in the ball point pen .
- 10 The invention has been described with reference to various specific and preferred embodiments and techniques which are provided merely to be exemplary of the invention and do not limit the scope of the invention. It should be understood that many variations and modifications will be apparent to those skilled in the art while remaining within the spirit and
- 15 scope of the invention and all such modifications and equivalents are intended to be included within the scope of the present invention.

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**5 WHAT IS CLAIMED IS:**

1. A refill adaptor for use in ball point pens refills comprising a main body (10), comprising of a front part (15) and a rear shank portion (20), said front part (15) and said rear shank portion (20) being rigidly coupled together with a ring member (25); said main body (10) having a capillary tube (40) throughout its length, said front part (15) being provided with a front housing (35) for holding the refill tip (55) provided with a ball point (65) for smooth writing, said capillary tube being provided with a ink channel, the internal diameter of which is selected to be about 0.8 mm and the outer diameter of said capillary being selected as about 1.8 mm for easy flow of ink from ink reservoir to said ball point (65) .
2. The refill adaptor as claimed in Claim 1 wherein the said front part (15) of the refill adaptor is provided with a front face (30) housing (35) for holding the ball point pen tip.
3. The refill adaptor as claimed in Claim 1 or 2 wherein said ring member (25) integrally connects said front part (15) and said rear shank portion (20) of said refill adaptor having an aperture (42) for the free flow of ink through said capillary ink channel (40).
4. The refill adaptor as claimed in any of the preceding Claims wherein said refill tip (55) is push fitted to the capillary ink channel (40) so that the entire length of the capillary ink channel is telescopically fitted to said refill adaptor without any obstruction.

- 5      5. The refill adaptor substantially as herein described and as illustrated in the accompanying drawings.

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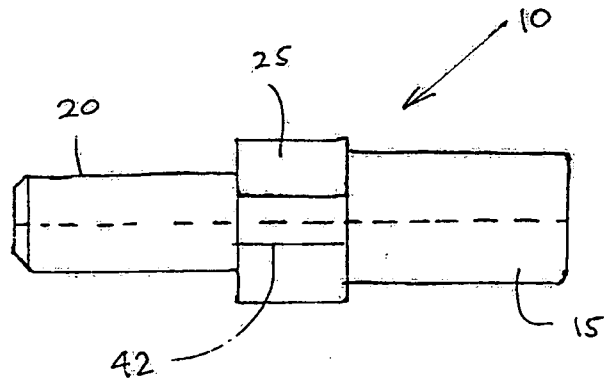


Fig. 1

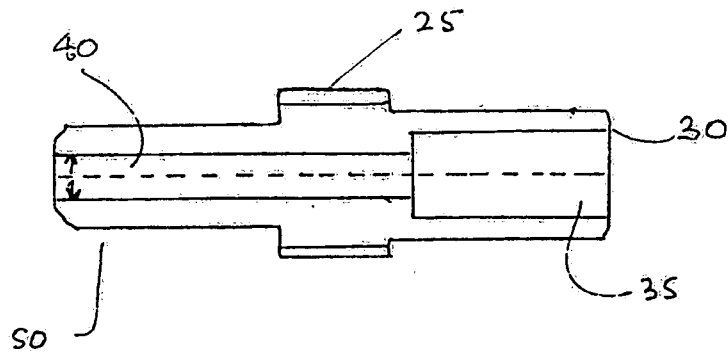


Fig. 2

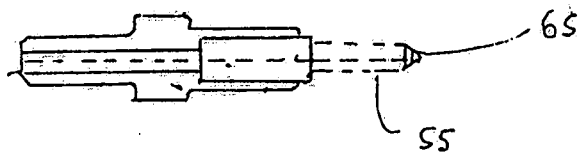


Fig. 3

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IN 2008/000575

A. CLASSIFICATION OF SUBJECT MATTER IPC <sup>8</sup> : <b>B43K 11/00</b> (2006.01) According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC <sup>8</sup> : B43K		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPODOC, WPI, ICO, TXTnn		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1795368 A2 (TOMBOW PENCIL) 13 June 2007 (13.06.2007) <i>the whole document</i>	1-5
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A	JP 9-248991 A (PILOT PEN) 22 September 1997 (22.09.1997) <i>the whole document</i>	1-5
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A	GB 688893 A (MARTIN) 18 March 1953 (18.03.1953) <i>the whole document</i>	1-5
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<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 18 December 2008 (18.12.2008)		Date of mailing of the international search report 16 January 2009 (16.01.2009)
Name and mailing address of the ISA/ AT <b>Austrian Patent Office</b> Dresdner Straße 87, A-1200 Vienna Facsimile No. +43 / 1 / 534 24 / 535		Authorized officer <b>NEUBAUER G.</b> Telephone No. +43 / 1 / 534 24 / 417

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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