April 26, 1960 G. MEIER 2,934,038

BALL POINT PEN WITH INK CONTAINER OF PLASTIC MATERIAL

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Fig. 1

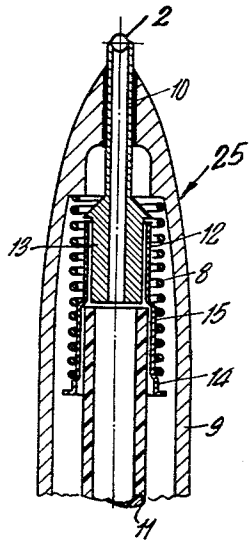
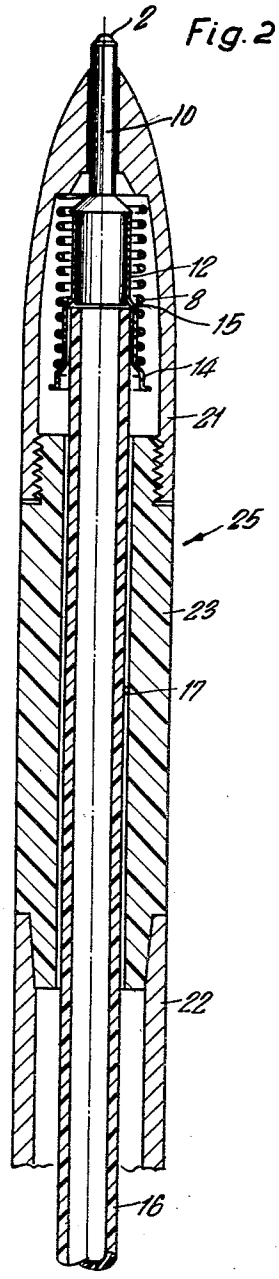


Fig. 2



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BALL POINT PEN WITH INK CONTAINER OF PLASTIC MATERIAL

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2 Claims. (Cl. 120—42.03)

The present invention relates to improvements in writing instruments, in particular ball point pens having an ink container of plastic material, said container consisting of a container head holding the writing ball and supply tube made of plastic material for holding the writing paste. In such containers the two parts are inserted into each other, i.e. the plastic tube is inserted in an extension of the container head. This extension must, thus, have a relatively large dimension, whereby in turn the conical part of the barrel in which the container head is inserted or screwed in, is provided with a relatively thin wall. It is, therefore, necessary to manufacture the cone of the barrel of elastic material or to design the extension of the container head in a rather elongated form, which measure has the drawback that a greater quantity of metal is necessary for the respective part.

It is one of the purposes of the invention to do away with these drawbacks, and to provide means affording the connection of the container head holding the writing ball with the container tube made of plastic material for the writing paste or ink by means of a thin-walled metal bushing of flexible material. It is, thus, no longer necessary to insert the parts into each other, but they rather abut against each other and the metal bushing is drawn over both the end of the tube of plastic material and the extension of the container head and is somewhat pressed on. That part of the metal bushing fitting around the tube of plastic material may, moreover, preferably be springy so that a firm and liquid-tight seal is obtained. The connection of the container head with the tube of plastic material is particularly advantageous if containers for retractable ball point pens are to be employed, in which the container is drawn back into the barrel by means of a spring. It is not necessary in this case to provide a special abutment on the tube for the spring as the metal bushing, by an extension of its rear end, is, at the same time, shaped as a spring collar. Preferably a cylindrical step or seat is provided in this case in the part of the metal bushing ahead of the spring collar, the diameter of which corresponds to the inner diameter of the spring. The spring fits thus tightly on this part of the bushing and remains on it also in case the container is taken out of the fountain pen barrel or housing, so that the risk of losing the spring is avoided.

A further essential advantage of the invention lies in the connection of the two said parts by means of a metal bushing which makes it possible to use a supply tube made of transparent plastic material with indelible or non-washable paste in retractable ball point pens. Previously such a paste could only be used, as is known, in metal tubes or in tubes of plastic material, which latter are flexible on the basis of their chemical composition corresponding to the writing paste. In a ball point pen of conventional design a flexible tube could not be used because of the much greater inner bore of the housing. Hence the tube of plastic material upon being inserted into the container head previously would bend, when

pressure resulting from action of the retraction spring is applied.

According to a further inventive concept of this invention, the plastic ink supply tube is connected with the container head in flat abutment by means of a thin-walled metal bushing but without an extension to form a spring collar and the spring is arranged, as is generally known, in the pressure mechanism in the rear end of the fountain pen. Thus the bore of the housing can be kept at a dimension which is only slightly wider than the outer diameter of the metal bushing, or, if the end of the container tube in the bushing is somewhat reduced with respect to the diameter of the container itself, then a bending of the said ink container is not possible when pressure is applied.

But also for ball point pens in which the return spring is arranged in the forward part of the barrel, the plastic tube suitable for non-washable paste, can be used in connection with the metal bushing according to the invention, which bushing is simultaneously shaped as a spring collar. In this case the barrel of the fountain pen may be preferably made of three parts by inserting between the conical point of the barrel and its rear part containing the pressure mechanism an intermediate part, the bore of which corresponds substantially to the diameter of the plastic ink container. This intermediate part may be made of transparent material so that it is possible to perceive from outside the amount of ink paste in the container tube. Still another object of the invention resides in the provision of means envisioning a seal-tight connection between the ball point carrying instrument head and a plastic ink holding tube without reducing the diameter of the latter, so that a considerable ink or ink paste supply may always be achieved in the new writing instrument.

Other objects and advantages will be apparent from a consideration of the specification and claims reference being made to the accompanying drawing.

Fig. 1 shows the front end of a retractile ball point pen in section, and

Fig. 2 shows a ball point pen according to Fig. 1 with a part of its barrel depicted in section.

Referring now more particularly to the drawing, there is disclosed a ball point pen or writing instrument **25** having a nib or ball tip **2** inserted in a head **10** of specific construction. The writing ink or paste is held in container tube **11**, which abuts the adjacent head extension end **13**.

According to Figs. 1 and 2 the writing instrument **25** has in its interior a spring **8** arranged in the front conical part **9** of said instrument. In this case head **10** is connected according to the invention with the container tube of plastic material **11** for holding an ink paste by means of a thin-walled metal bushing **12** which fits at its one end firmly over the extension **13** of head **10** and at its other end on tube **11** of plastic material. On its rear end the said metal bushing **12** is enlarged to form a springy collar **14** which serves as rear abutment for the spring **8**. Preferably the bushing **12** comprises a cylindrical step **15** forwardly of collar **14**, which step forms a seat and corresponds to the inner diameter of spring **8**, so that it fits firmly on the rearward part of the metal bushing, whereby the spring grips firmly the bushing and remains on it even when the barrel is withdrawn so that the spring cannot be lost.

As seen in Fig. 2 the bore **17** of the barrel **23** of the writing instrument must be dimensioned in such a way it is not considerably larger than the diameter of the tube so that it cannot bend when pressure is applied on the latter.

In order to make possible the use of the plastic container tube **11** also for retractile ball point pens which contain according to the embodiment in Fig. 1, the return spring **8** in the conical front barrel part, the barrel of the fountain pen is made of three parts, whereby, as shown

in Fig. 2 an intermediate part 23 is inserted between the front barrel end 21 and the rear barrel end 22 containing the usual pressure mechanism (not shown). This intermediate part 23 has an inner bore 17 which is somewhat larger than the diameter of the plastic container tube 16, so that also in this case the plastic tube cannot be subjected to bending. The rest of the design, particularly of the metal bushing 12, is the same as in the embodiment of Fig. 1. The intermediate part 23 is preferably made of transparent material in order to be able to perceive the column of the paste contained in the tube 16. The front part as well as the rear part of the barrel of the writing instrument are suitably made of opaque material in order to prevent exposure of the mechanism and of the return spring. The barrel parts 22 and 23 are shown in Fig. 2 as being separate, but they may, of course, also be made as one integral section of the barrel in spite of the different bores as shown.

Various changes and modifications may be made without departing from the spirit and scope of the present invention and it is intended that such obvious changes and modifications be embraced by the annexed claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A ball point pen construction comprising a hollow housing, an ink container disposed in said housing and having a container head provided with a ball tip extendable outwardly of said housing, a container tube abutting said container head, a bushing firmly embracing and engaging said container head and said container tube thereby to hold said container tube and said container head together, said bushing having an enlargement forming a collar, and a spring disposed about said bushing resiliently engaging said collar and said housing, a first portion of said bushing engaging said container tube being of greater diameter than the other portion of said bushing engaging said container head, said other portion being of lesser diameter than said container tube forming a stop for said container tube, said spring firmly gripping said first portion of said bushing and remaining fixed on said bushing even when said ink container is withdrawn from the housing.

2. A ball point pen comprising a housing having a central bore and an interior shoulder, an ink container disposed in said housing and including a contaner head extending through said bore, said container head being provided with a ball tip extendable outwardly of said housing and capable of being retracted within said housing, a container tube of plastic material abutting said container head, a bushing firmly embracing and engaging said container head and said container tube thereby to hold said container tube and said container head together, said bushing having an enlargement forming a collar, and a spring disposed about said bushing resiliently yieldingly engaging said collar and said shoulder, a first portion of said bushing engaging said container tube being of greater diameter than the other portion of said bushing engaging said container head, said other portion being of lesser diameter than said container tube and forming a stop for said container tube, said spring firmly gripping said first portion of said bushing said remaining fixed on said bushing even when said ink container is withdrawn from the housing.

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