April 27, 1965 W. J. DE GROFT 3,180,320

INK CARTRIDGE AND SPACER DEVICE

Filed Dec. 29. 1961

Fig. 1.

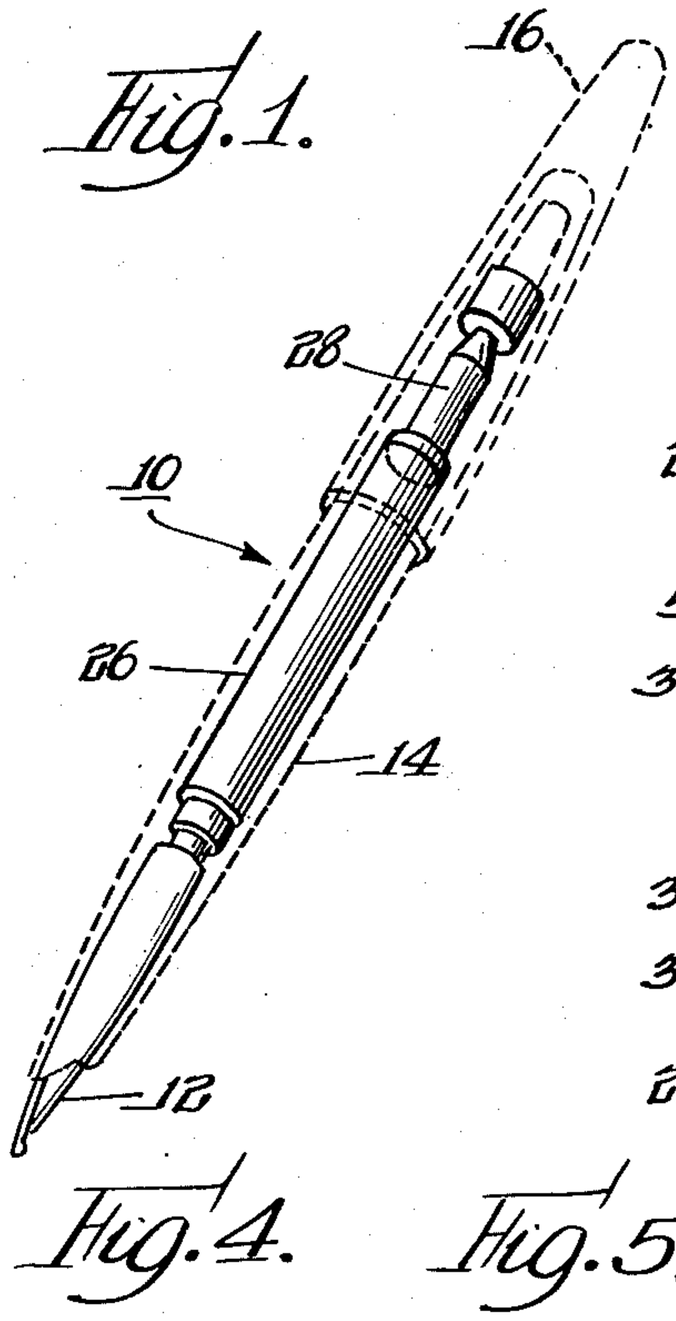


Fig. 2.

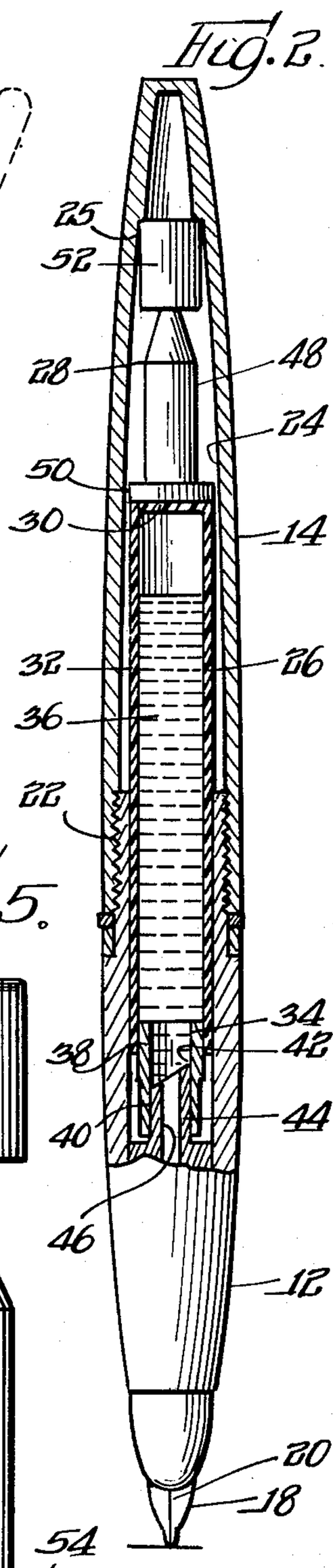


Fig. 3

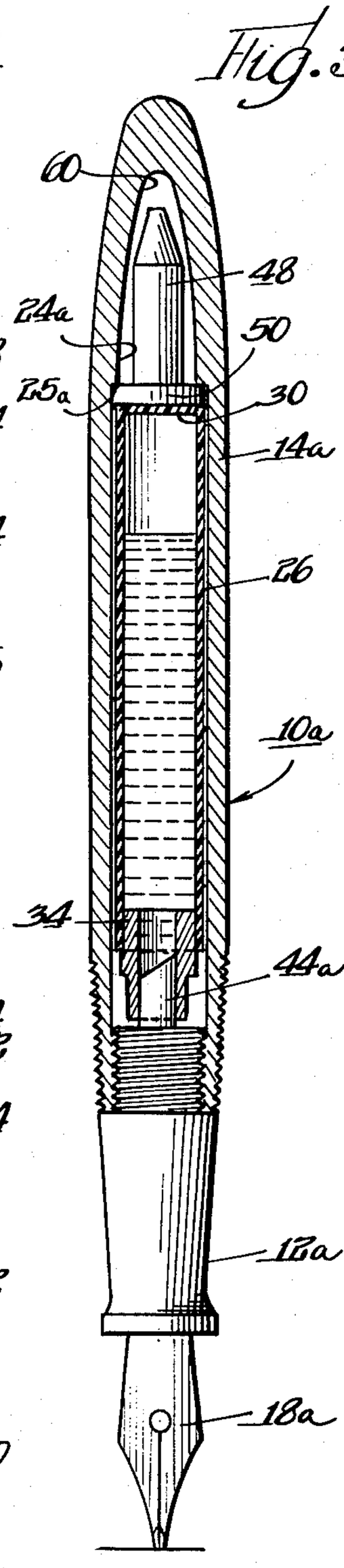


Fig. 4.

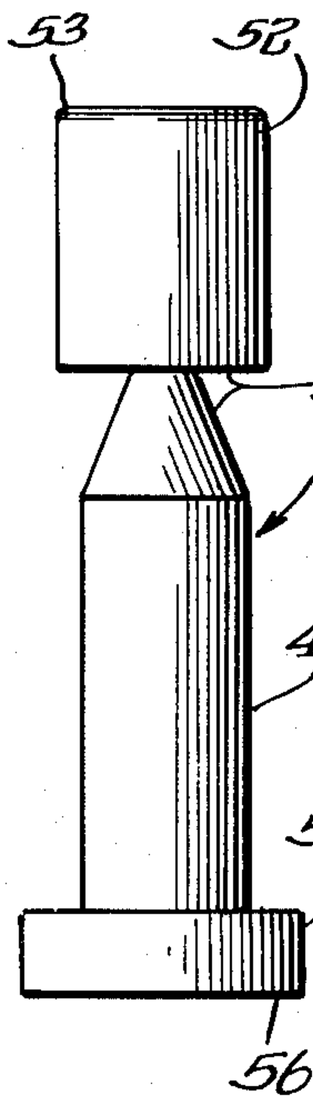
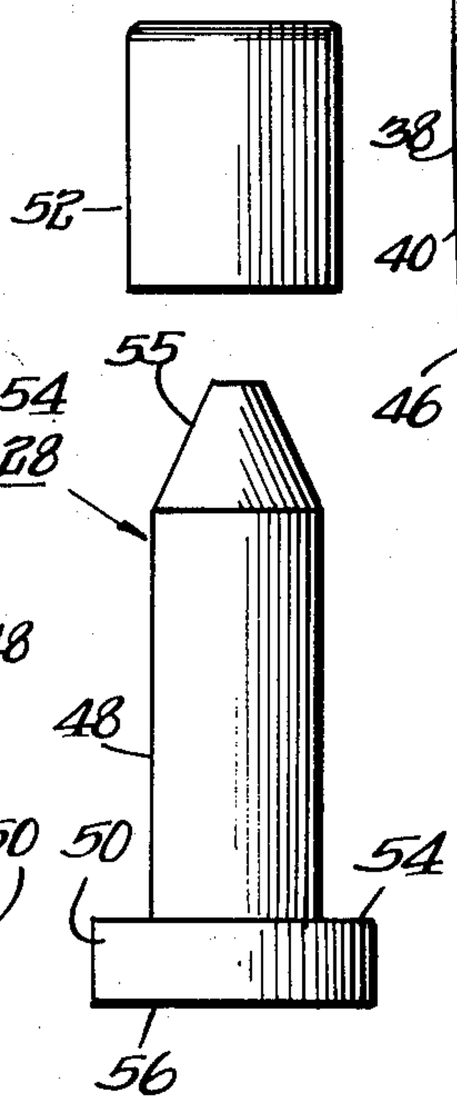


Fig. 5.



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INK CARTRIDGE AND SPACER DEVICE

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This invention pertains generally to writing instruments and relates particularly to an improved arrangement for cartridge-type fountain pens.

The great popularity and success of the ballpoint pen may be said to have compelled makers of the conventional fountain pen to re-examine their product. To remain in the highly competitive field, the pen manufacturers introduced an improved writing instrument now generally known as the cartridge fountain pen.

It is widely understood that the cartridge fountain pen is priced to sell at a figure well below that for which the conventional fountain pen is sold. In other words, the cartridge pen is priced to be competitive with certain ballpoint pens rather than to be competitive with the higher priced fountain pens.

In lieu of accommodating a collapsible rubber bag or an ink filled bladder, the barrel of the cartridge pen is adapted to receive a disposable ink filled capsule or cartridge. For reasons of styling, certain pen makers provide their pens with elongated and tapered barrels. Hence, cartridges to be received within such tapered barrels must be correspondingly tapered. These specially shaped or tapered ink cartridges are not usable with pens of other makers, many of whose pens in turn employ other specially shaped cartridges. This state of affairs requires retail vendors of cartridge-type pens to maintain a stock of cartridges for each of the various makes of pen.

On the other hand, one who uses cartridge fountain pens regularly may have occasion to own at the same time different makes of pens, each pen requiring a different size and length of ink cartridge. Such a pen owner, of course, will experience the inconvenience of having to maintain a supply of each of the different cartridges for each writing instrument, or alternatively, to let certain pens lay idle while using only one pen.

Because of the variety of cartridge pen makes on the market today it has been difficult, and indeed challenging, to discover a type of ink cartridge that is interchangeably suited for use in any one of the cartridge pens. Therefore, an important object of this invention is to provide an ink cartridge and spacer combination which is readily adapted for use in a variety of cartridge-type fountain pens.

Another object of the invention is to provide a spacer device for insertion into the barrel of a cartridge-type pen, which device enables a specified ink cartridge to be used interchangeably in a variety of pens.

Still another object is to provide means to adapt a universal type ink cartridge for use in a variety of cartridge fountain pens, which means incorporates provisions for ready detachment of a portion thereof thereby to facilitate use of such universal cartridge in other pens.

A further object of the preesnt invention is to provide an improved ink cartridge insertable in the barrel of a cartridge pen, and when associated with an improved spacer means, adapted operatively for use in a variety of cartridge pens.

Further features of the present invention relate to the particular arrangement and interrelationships of the several elements of the invention whereby the above-outlined and additional operating features are attained.

The invention, both as to its organization and mode of use, together with further objects and advantages, will

best be understood by reference to the following specification taken in connection with the accompanying drawings wherein like reference numerals designate like parts throughout, in which:

FIGURE 1 is a perspective view showing in outline a cartridge-type fountain pen, a cap of the pen being shown in the usual position for writing, i.e., arranged telescoped over the end of the pen barrel, in which barrel there is shown a universal type ink cartridge and a spacer device embodying the features of the present invention;

FIG. 2 is an enlarged longitudinal sectional view of the cartridge pen shown in outline in FIG. 1;

FIG. 3 is a longitudinal sectional view of a second configuration of the cartridge pen having operatively disposed therein the universal cartridge and spacer device of the present invention, the spacer device being shown in the condition existing after an expendable portion thereof has been detached;

FIG. 4 is a greatly enlarged elevational view of the spacer device included in the instant invention; and

FIG. 5 is an elevational view of the spacer device illustrating particularly the detachment feature, the expendable portion being shown slightly disposed from the principal portion of the spacer.

There is shown in FIG. 1 of the drawings a cartridge fountain pen generally designated by the numeral **10** and including a point holder **12**, a barrel **14** having a cap **16** telescopically arranged over one end in the normal position for writing. The fountain pen construction shown in FIGS. 1 and 2 is one exemplification of the product marketed by the Parker Pen Company of Janesville, Wisconsin. As shown in FIG. 2, the point holder **12** is provided with a writing nib **18** having an ink channel **20** whereby to feed ink by capillary action to the writing surface. The point holder **12** is threadably united to the barrel **14** at mutual thread engaging portions **22** disposed at the inner end of the point holder **12**.

The hollow barrel **14** and the associated point holder **12** define a cartridge receiving chamber **24** which tapers towards the closed end of the barrel **14**. The rearmost extent of the cartridge chamber **24** is defined by an annular stop or cartridge abutment **25** which serves to arrest a cartridge member (not shown) expressly designed for the tapered end portion of the barrel **14**.

Within the receiving chamber **24** there is shown a universal type cartridge **26** and a spacer device **28** made in accordance with and embodying the principles of the present invention. The cartridge **26** includes a circular end wall **30** joined to the cylindrical sidewalls **32** opposite an inserted plug or cap **34**. The cartridge **26** is formed of easily moldable plastic materials wherein the end wall **30** and sidewalls **32** are formed as a unit and wherein the plug **34** is inserted after a supply of ink **36** has been introduced into the cartridge while yet leaving an air space therein.

The plug member **34** has a collar **38** received within the lower portion of the cartridge sidewall **32**. Extending outwardly from the collar **38** and integrally joined thereto is a narrower neck portion **40**. A central passageway **42** extends through the neck **40** and the collar **38** into the interior of the cartridge **24** thereby affording egress for ink from the cartridge into the pen holder **18**.

Prior to being inserted into the pen **10** in the operative position, the plug **34** is provided with a thin membrane (not shown) blocking the passageway **42** and sealing the cartridge **26**. A chisel shaped cutter or nozzle **44** integral with the point holder **12** is received into the passageway **42** and pierces the sealing membrane as the point holder is threaded on the barrel **14**. A central opening **46** in the cutter **44** permits ink **36** to flow from the cartridge into the pen nib **18**.

To operatively position the universal cartridge 24 within the pen 10 and particularly to position the plug element 34 and the closure membrane to properly receive the cutter nozzle 44, the spacer device 28 is arranged within the cartridge chamber 24 inwardly of the cartridge 26. Considering the spacer device 28 in detail, referring now to FIGS. 2 and 4, it is seen that the spacer 28 is generally elongated and comprises a cylindrical shaft portion 48 having an annular flanged base 50 at one end and a bulbous head portion 52 at the other. The base portion 50 is of a diameter complementary to the rear wall 30 of the cartridge 26 thereby to abut firmly and positively locate the cartridge in the barrel 14. The diameter of the head portion 52 is smaller than that of the base 50 and is complementary to the diameter of the annular cartridge stop or abutment 25 integrally formed with the sidewalls of the barrel 14. The axial length of the spacer 28 is selected so as to position the cartridge 26 and particularly the plug 34 in operative association with the point holder 12 whereby when the point holder 12 is threaded onto the barrel 14 the cutter nozzle 44 will pierce the sealing membrane within the plug and permit ink to flow into the point holder 18.

To afford interchangeability of the cartridge 26 and various other of the varieties of cartridge pens, the spacer device 28 may be shortened in length by detaching the head portion 52. More specifically, a weakened connection defined by a V-shaped annular recess 54 in the shaft 48 unites the head portion 52 to the shaft 48, the shaft 48 tapering inwardly in a conical direction towards the head 52. Upon bending the head portion 52 with respect to the shaft 48 ready detachment is effected whereby the head portion 52 being expendable may be discarded. The spacer 28 is then in the condition as shown in FIG. 5. In this condition the spacer 28 is expressly adapted for use in a second make of fountain pen shown in FIG. 3.

The fountain pen shown in FIG. 3 is typical of the structure made under the "Wearever" trade name by David Kahn, Inc. of North Bergen, New Jersey. This writing device has component parts similar in function to those shown in FIG. 2. For this reason the respective corresponding parts will be designated with similar numerals as are used in FIG. 2 with suffix letters "*a*" added.

The cartridge receiving chamber 24*a* in the pen 10*a* is shorter than that shown in the pen 10 of FIG. 2. The pen shown in FIG. 3 is designed to accommodate an ink-filled cartridge (not shown) shorter than the cartridge adapted for the pen shown in FIG. 2 but yet somewhat longer than the ink-filled lengths of the universal cartridge 26. Therefore to accommodate the universal cartridge 26 within the chamber 24*a* an insert must be provided between the annular stop 25*a* and the rear wall 30 of the cartridge 26. The base flange 50 is dimensioned longitudinally wherein a shoulder-like portion 54 opposite the planar basal surface 56 engages the abutment or stop 24*a* thereby positioning the plug member 34 properly for engagement with the cutter nozzle 44*a*. The head portion 52 being detached, the tapered portion 55 of the shaft 48 extends freely within a cavity 60 of the closed end of the barrel 14*a*. In this condition the planar surface 56 firmly engages the cartridge 26 in operative association with the barrel and the point holder 12*a*.

From the foregoing it follows that there has been provided a spacer and cartridge combination which may be used interchangeably with any one of a variety of fountain pens. Specifically this combination of spacer and universal cartridge is adapted for Shaeffer, Parker, Esterbrook, Wearever and Eversharp brands of cartridge pens which are marketed throughout the United States. When assembling the spacer 28 and cartridge 26 in either the Parker, Esterbrook and Eversharp pens the spacer 28 is dropped into the barrel 14 with the head portion 52 extending down. Next the cartridge 26 is placed in the barrel with the plug 34 extending outwardly and the point holder 12 is thereafter threaded into position.

When the universal cartridge 26 is used with the Wearever pen, the head portion 52 is detached from the spacer device 28 at the weakened connection 54 as shown in FIG. 5. Next, the spacer 28 with the tapered portion 55 extending downwardly is dropped into the barrel 14*a* (shown in FIG. 3) wherein the shoulder portions 54 engage the cartridge stop 25*a*. The universal cartridge 26 is next inserted into the barrel 14*a* with the plug portion faced outwardly. As the point holder 12*a* is threadably received onto the barrel 14*a* the cutter nozzle 44*a* passes into and opens the passageway 42*a* of the plug 34 affording an ink channel from the cartridge 26 to the pen nib 18*a*.

It is apparent from the foregoing that a user of any one of the variety of cartridge pens marketed today need equip himself only with the spacer 28 and cartridge device 26 of the instant invention for use in any one of the different makes of pens he may own. The dimensions and proportions of the spacer device 28 are selected whereby to position the shoulder portion 53 on the head portions 52 with respect to the planar surface 56 of the base 50 operatively to position the cartridge with respect to the holder valve.

The principles of this invention may be embodied in various modifications and adapations which, from the principles herein outlined, will become readily apparent to those skilled in the art. It is accordingly understood that this invention is not limited to the particular embodiments described and illustrated, and various omissions, substitutions and changes may be made by those skilled in the art without departing from the teachings of this invention.

What is claimed is:

1. A spacer device for adapting a variety of cartridge-type fountain pens to operatively accommodate a universal ink cartridge having a flat end wall to be disposed innermost in such pens, each pen being designed to receive a selected, non-universal cartridge against a stop member within the barrel of said pen, said device comprising: an elongated shaft having at one end a laterally enlarged circular base, said base including a substantially flat abutment surface for engaging abuttingly the flat inmost end wall of the universal ink cartridge, and a bulbous head, said head being enlarged with respect to said shaft to a degree less than said base and presenting at one end a circular shoulder spaced from said base for engaging the stop member in certain ones of the variety of cartridge pens, said head being joined coaxially to a second end of said shaft by a weakened connection for ready detachment of said head from said shaft.

2. A combination for use in a variety of fountain pens of the cartridge-type, each pen having a hollow barrel including a radially inwardly extending stop surface adjacent one end and being adapted to receive at the opposite end a point holder including cartridge-wall piercing means, such barrel defining an elongated cartridge-receiving chamber of a selected length between such stop surface and such cartridge-wall piercing means, such stop surface being adapted to position the front wall of a specified cartridge for puncturing by such piercing means, said combination comprising: a universal ink cartridge having a predetermined length less than such selected length whereby the rear wall thereof is spaced apart from such stop surface upon insertion of said universal ink cartridge in such chamber; and a spacer device for filling the gap between such stop surface and the rear wall of said universal ink cartridge, said spacer device comprising a disk-like member including a front surface complementary in area and conformation to said rear wall of said universal ink cartridge for abutting engagement therewith, and said spacer device further including shaft means projecting oppositely from said front surface and of lesser diameter than said disk-like member to present a circular formation

facing oppositely from said front surface and including a transversely extending abutment surface coextensive with at least diametrically disposed portions of said stop surface for stopped and balanced engagement with such stop surface, said transversely extending abutment surface being spaced from said front surface a distance equal to the difference between such selected length and said predetermined length for maintaining the front wall of said universal cartridge in engagement with such piercing means.

3. A combination for use in a variety of fountain pens of the cartridge-type, each pen having a hollow barrel including an internal stop member adjacent one end and being adapted to receive at the opposite end a point holder including cartridge-wall piercing means, such barrel defining an elongated cartridge-receiving chamber of a selected length between such stop member and such cartridge-wall piercing means, such barrel having rearwardly of such stop member a rear cavity of reduced diameter, such stop member being adapted to position a specified cartridge having a length corresponding to such selected length and thereby to present the front wall of such specified cartridge for puncturing by such piercing means, said combination comprising: an ink cartridge having a length less than such selected length whereby the rear wall thereof is spaceable apart from such stop member upon insertion of said universal ink cartridge in such chamber; and a spacer device for filling the gap between such stop member and said rear wall of said universal ink cartridge, said spacer device having a circular formation shaped for firm engagement with such stop member, said spacer device

further comprising a disk-like member, a circular head member spaced axially apart therefrom, and an interconnecting shaft member projectable into such rear cavity, said disk-like member including a front surface complementary in area and conformation to said rear wall of said universal ink cartridge for abutting engagement therewith, said head member and said disk-like member including respective circular shoulders disposed radially outwardly of said shaft opposite said front surface, a selected one of said circular shoulders defining said formation, there being a weakened section between said shaft member and said head member readily rupturable to permit separation of said head member and projection of the shaft member into said rear cavity.

4. The combination as claimed in claim 2, wherein said spacer device includes a head member carried by said shaft means and of lesser diameter than said disc-like member and presenting a circular corner portion for firm engagement with said stop surface.

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