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UNIVERSAL TYPE REFILL CARTRIDGE FOR BALL POINT PENS

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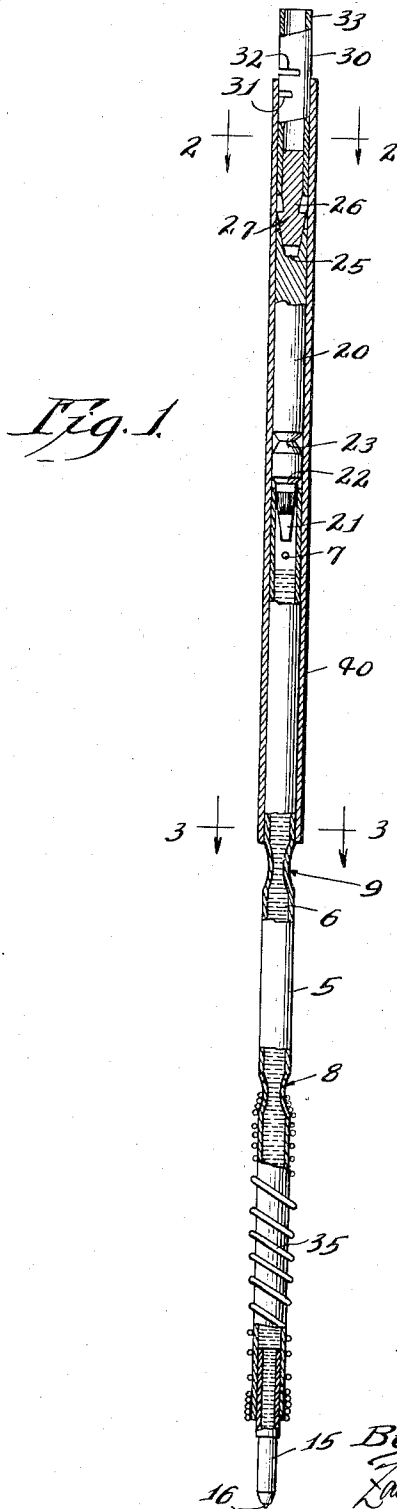


Fig. 2.

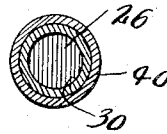
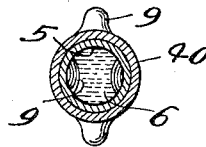


Fig. 3.



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UNIVERSAL TYPE REFILL CARTRIDGE FOR BALL POINT PENS

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Continuation of abandoned application, Serial No. 397,347, December 10, 1953. This application November 1, 1954, Serial No. 465,961

7 Claims. (Cl. 120—42.4)

This invention relates to refill cartridges for ball point pens which are universal in character, i. e. it fits many different models and brands of ball point pens.

This application is a continuation of my prior, copending application for "Universal Type Refill Cartridge for Ball Point Pens," Serial Number 397,347, filed December 10, 1953, now abandoned.

There are on the market today a large number of ball point pens of different designs produced by different manufacturers. All of these pens employ an ink filled cartridge which is provided with a ball point mounted at one end of the cartridge. The different manufacturer's pens vary in size and shape and each pen is designed to accommodate an ink filled cartridge which is specifically constructed for that particular pen. Thus many different sizes of ball point refills are required to meet the public demand to refill the many different brands and styles of ball point pens on the market.

The shortcomings of this situation and the inconvenience it causes the public and the pen dealers are obvious. No one retailer is likely to stock refill cartridges of all the numerous manufacturers of ball point pens. Often a customer has to visit several retail establishments before finding a refill cartridge which fits his particular make and style of pen. Also, manufacturers occasionally discontinue pens of a certain style and simultaneously discontinue producing refill cartridges for that style. In some instances manufacturers have gone out of business entirely and thus refill cartridges for the pens formerly produced by such manufacturers become unavailable.

One object of this invention is to provide a refill cartridge which can be used successfully with substantially all ball point pens now on the market. In particular, the refill cartridge of the invention is usable with ball point pens now being sold under the following trade-marks or trade names, among others:

Paper Mate Deluxe	DriRite
Paper Mate Regular	Fisher
Eversharp Retractable	Marlowe
Eversharp Reporter	Papermatic
BB Rol Rite	Penmaster
Scripto Press Button	PermaMatic
Flo Ball	Redipen
Tuckersharpe	Redi-Rite
Kan-Dar	Royal Ben
Haverstick, St. Louis	Stratford
Brown & Bigelow	Universal
Wearever	Venus
Charmline	Windsor
Conklin	

Still another object of the invention is to provide a universal type refill cartridge which is suited for mass production methods and for manufacture and distribution at low cost.

Other objects and advantages of the invention and the details thereof will become apparent as the description proceeds, reference being had to the accompanying drawing which illustrates one practical form of the invention.

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It is to be understood, however, that the description and drawing are illustrative only and that the scope of the invention is to be measured by the appended claims.

In the drawing:

Fig. 1 is a side elevational view, partly in section, of a universal refill cartridge embodying the invention;

Fig. 2 is an enlarged sectional view on line 2—2 of Fig. 1, and

Fig. 3 is an enlarged sectional view on line 3—3 of Fig. 1.

The illustrated refill cartridge comprises an elongated ink holding tube 5 which is about two-thirds the length of the complete cartridge. The numeral 6 indicates a supply of ink within tube 5. A suitable vent opening 7 is provided near one end of tube 5, the upper end, looking at Fig. 1, since it is necessary that the ink reservoir communicate with atmosphere.

One or more stops are provided on the exterior of tube 5 in the region generally midway between the tube ends.

In the form of the invention illustrated two stops are provided, namely, a lower stop 8 and an upper stop 9, the two stops being spaced from one another by a short distance along the tube. Stops 8 and 9 may be formed in various ways but it has been found particularly economical to form the stops by deforming tube 5 slightly as illustrated in Fig. 1. The inward deformations made in opposite sides of the tube produce outward deformations on sides of the tube in quadrature relation with the inward deformations. The outward deformations of the stop 9 are illustrated in Fig. 3, and it is, of course, these deformations which provide the stop function presently to be mentioned.

A ball point assembly 15 having a writing ball 16 is suitably associated with the end of tube 5 opposite the end containing vent opening 7. Looking at Fig. 1, assembly 15 is associated with the lower end of tube 5. In the form of the invention there shown, the upper end of assembly 15 telescopes tube 5 with a press fit and the lower end projects beyond the tube end to position ball 16 properly for writing.

The opposite or upper end of tube 5 is plugged by a closure structure which includes an elongated closure stud 20 having a reduced lower end 21 which telescopes the end of tube 5 with a press fit. Closure stud 20 is reduced in cross section at one or more axial points to provide a corresponding number of planes of weakness. In the illustrated form of the invention there are two such points of reduced cross section which provide two planes of weakness. These planes are designated by the numerals 22 and 23. Greater cross sectional reduction preferably is made at plane 23 so that plane 23 will be somewhat weaker than plane 22. The reason for this will be mentioned presently.

The upper end of closure stud 20 is provided with an axial bore 25 which receives a coupling pin 26 in telescoping relation. Coupling pin 26 may have a reduced cross section, as shown at 27 to provide a plane of weakness which preferably is somewhat weaker than the aforesaid plane 23.

An extension tube 30 telescopes the free end of coupling pin 26, and this tube, like closure stud 20, has a reduced cross section at one or more axial points to provide a corresponding number of planes of weakness. In the form of the invention shown there are two such points of reduced cross section and they are formed by transverse slots 31 and 32. It will be noted that slot 32 is somewhat deeper than slot 31 so that the plane of weakness provided by slot 32 is somewhat weaker than the plane at slot 31. Preferably, the plane at slot 31 is somewhat weaker than the aforesaid plane 27 in coupling pin 26.

From the foregoing it will be seen that the closure

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structure comprising closure stud 20, coupling pin 26 and extension tube 30 is provided with a plurality of planes of weakness, and these respective planes decrease in strength from tube 5 toward free end 33 of the structure.

A spiral spring 35 surrounds the lower end of tube 5 and extends, when uncompressed, between lower stop 3 and a plane passing generally through the free end of ball point assembly 15. Spring 35, as illustrated in Fig. 1, is shown compressed somewhat and its lower end terminates a short distance above the aforesaid plane.

Spring 35 is left on the cartridge and is used when the cartridge is installed in certain makes of pens. In the case of other makes of pens, spring 35 is not needed, and in those cases the spring is removed and discarded.

An external elongated sleeve member 40, shown in section throughout in Fig. 1, surrounds the upper end of tube 5 and most of the closure structure. In the form of the invention shown, sleeve member 40 extends generally between upper stop 9 and a plane passing through slot 32 in extension tube 30.

Sleeve member 40 has two functions. One, it functions as a shim or adapter to establish a proper fit between the cartridge and certain makes of pens. In the case of pens not requiring such an adapter, sleeve member 40 is removed from the cartridge before the latter is installed.

Second, sleeve member 40 functions as a convenient tool for breaking off a portion of the closure structure on the plane of weakness which is indicated by the cartridge length desired. Sleeve member 40 is merely telescoped over the closure structure until its telescoped end lies adjacent the plane of weakness which designates the proper length for the cartridge. Slight lateral movement of sleeve member 40 breaks off a portion of the closure structure at this plane of weakness, thereby conditioning the cartridge for proper fit in the particular pen.

The original length of the cartridge is such and the respective planes of weakness are so located that a cartridge may be given the proper length required for any one of substantially all refillable ball point pens, thus giving the cartridge of the invention a universal quality.

In applying the cartridge of this invention to a particular pen, the pen is disassembled and the spent cartridge is then used as a guide to designate the proper length for the refill cartridge after which the refill cartridge is broken off as aforesaid to that length. Thereafter, the refill cartridge is installed in the pen in the manner indicated by the installation of the original cartridge, leaving on compression spring 35 if needed, or discarding the spring if not needed. Likewise, sleeve member 40 is used as a shim if needed or discarded if not needed.

The aforesaid feature of providing the respective planes of weakness with progressively decreasing strength in the direction toward the free end of the cartridge cooperates to insure that the cartridge will break off at the desired point, that is, the point designated by the predetermined location of the end of sleeve member 40, rather than at one of the more inwardly located planes of weakness.

From the above description it is thought that the construction and advantages of my invention will be readily apparent to those skilled in the art. Various changes in detail may be made without departing from the spirit or losing the advantages of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A universal type refill cartridge for ball point pens comprising an ink holding tube, a ball point assembly telescoping the lower tube end and extending therefrom, an elongated closure structure telescoping the upper tube end and extending therefrom, said structure being reduced in cross-section at spaced points to provide planes of weakness.

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2. A universal type refill cartridge for ball point pens comprising an elongated cartridge structure, one end portion of said cartridge structure including an ink holding tubular portion and a ball point assembly mounted on the free end of said tubular portion, the other end portion of said cartridge structure being weakened at spaced points to provide planes of weakness whereby said cartridge structure easily may be broken off to predetermined length, and an elongated sleeve member telescoping said other end portion of said cartridge structure so that an end of said sleeve member may coincide with any desired one of said planes of weakness whereby said sleeve member may have the function of serving as a tool for breaking said cartridge structure at said plane of weakness.

3. The combination of claim 2 wherein said sleeve member has an outer diameter of size whereby said sleeve member serves as a shim to fit the cartridge to certain pens.

4. A universal type refill cartridge for ball point pens comprising an elongated cartridge structure, one end portion of said cartridge structure including an ink holding tubular portion and a ball point assembly mounted on the free end of said tubular portion, the other end portion of said cartridge structure being weakened at spaced points to provide planes of weakness whereby said cartridge structure easily may be broken off to predetermined length, a member having a bore closely embracing said other end portion of said cartridge structure and slidable therealong so that the mouth of said bore may coincide with any desired one of said planes of weakness whereby said member may have the function of serving as a tool for breaking said cartridge structure at said plane of weakness.

5. A universal-type refill cartridge for ball-point pens comprising an elongated cartridge structure having a ball-point assembly at one end thereof, a thin ink-holding tubular portion adjacent to and communicating with said ball-point assembly, a stop between the ends of the cartridge adapted to engage a spring for urging the cartridge in one direction, the tubular portion having a vent opening beyond the ink level therein, the end portion of the said cartridge structure beyond the ink level being provided with a plurality of planes of weakness of progressively decreasing strength in a direction toward the free end of the cartridge so that the cartridge structure may be broken off selectively at any of the plurality of planes of weakness to provide a refill cartridge of selected length and of a strength sufficient in the weakened planes to withstand writing pressure and pressure of and against the spring.

6. The universal-type refill cartridge as claimed in claim 5 wherein the planes of weakness are non-uniformly spaced.

7. The universal-type refill cartridge as claimed in claim 5 wherein the planes of weakness of progressively decreasing strength are formed as notches cut through the tubular wall and extending inwardly of the tube wall to different depths, the deepest notches being closest to the free end of the cartridge and the shallowest notch being closest to the region of the ink supply.

References Cited in the file of this patent

UNITED STATES PATENTS

1,066,333	Snyder	July 1, 1913
2,247,937	Bittorf et al.	July 1, 1941
2,476,571	Vierling	July 19, 1949
2,734,484	O'Sullivan	Feb. 14, 1956

FOREIGN PATENTS

794,863	France	Dec. 26, 1935
968,946	France	May 10, 1950
1,020,925	France	Nov. 26, 1952