April 28, 1959 F. VERTIZ 2,883,968

DOUBLE ENDED BALL POINT PEN

Filed Nov. 25, 1957

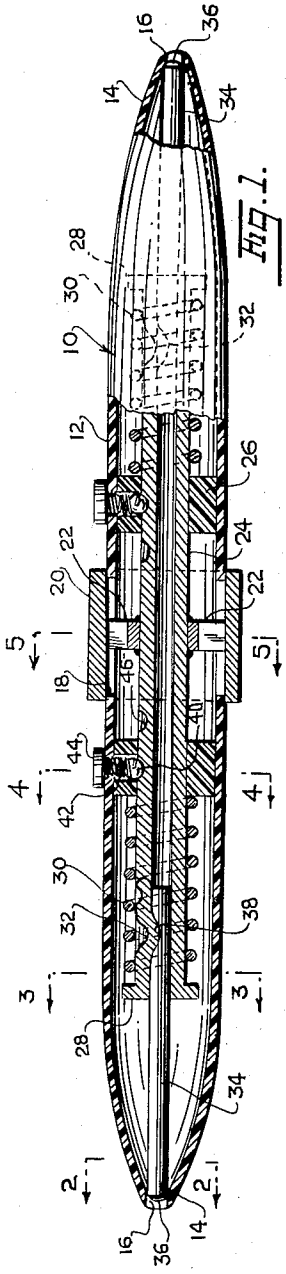


Fig. 1.

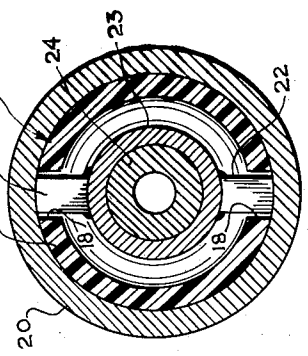


Fig. 5.

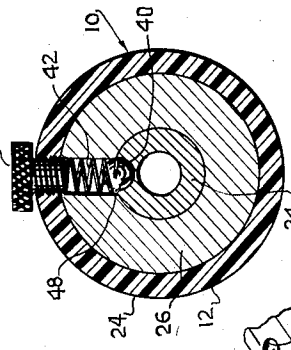


Fig. 4.

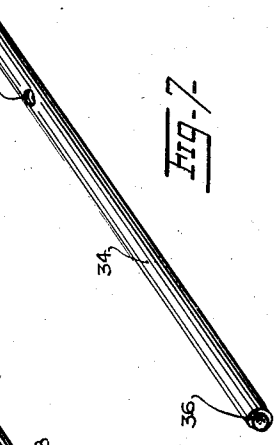


Fig. 7.

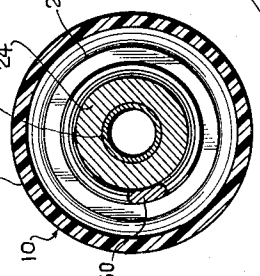


Fig. 3.

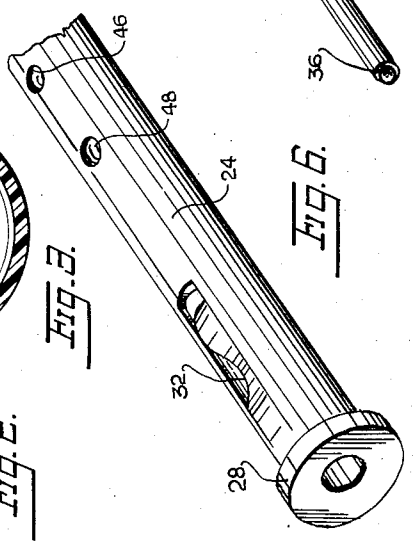


Fig. 6.

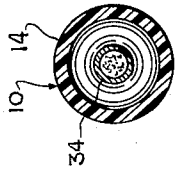


Fig. 2.

INVENTOR.

FRANCIS VERTIZ

BY

ATTORNEY

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DOUBLE ENDED BALL POINT PEN

Francis Vertiz, New York, N.Y.

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10 Claims. (Cl. 120—42.1)

This invention relates generally to ball point pens and, more particularly, has reference to a pen of this type so designed that a writing tip will be provided on both ends of the pen, said tips being selectively retractible and extendible so as to permit use of either tip, according to the desires of the particular user.

It is a matter of some inconvenience and annoyance to users of ball point pens, to run out of ink unexpectedly, in a situation that is such that the user does not have a spare refill cartridge. The present invention has as one important object the provision of a pen which will eliminate this inconvenience, to a marked degree. To this end, the ball point pen of the invention has cartridges in both ends thereof, the cartridge being removably engaged in opposite ends of a single cartridge support tube, with said tube being axially shiftable in a selected direction so as to extend or retract either cartridge. Exhausting one cartridge, accordingly, does not represent an inconvenience, since this cartridge may be swiftly retracted, with the other cartridge being extendible with equal swiftness and ease for immediate use.

Another object of importance is to provide a pen as described which will be of compact size and will not be any greater than ball point pens having writing tips only at one end thereof.

Another object of importance is to provide a double-ended ball point pen having a novel cartridge retaining tube, associated with spring means in such a way as to have a resilient, yielding resistance to movement of the tube axially in either direction, whereby to more effectively control the extension and retraction of the cartridges.

Another object of importance is to provide, in association with the double-ended cartridge retaining tube and with the resilient yielding means mentioned above, indexing means in the form of spring-loaded detents and longitudinally spaced recesses carried by the barrel and by the cartridge retaining tube respectively, such that the retaining tube will be releasably but firmly engaged in each position to which it is shifted axially of and within the barrel.

Still another object is to provide a simplified yet effective means for releasably engaging each cartridge in the associated end portion of the cartridge retaining tube.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a longitudinal sectional view of a double-ended ball point pen according to the present invention, in which a portion remains in elevation.

Figs. 2, 3, 4 and 5 are enlarged transverse sectional views on lines 2—2, 3—3, 4—4 and 5—5, respectively, of Fig. 1.

Fig. 6 is an enlarged, fragmentary perspective view showing one end portion of the double-ended refill cartridge support tube.

Fig. 7 is an enlarged perspective view of one of the refill cartridges per se.

Referring to the drawings in detail, designated generally at 10 is a double-ended ball point pen according to the present invention. This includes an elongated, cylindrical barrel 12 of plastic or similar material, the intermediate portion of which is of constant diameter, said intermediate portion merging into progressively tapering end portions 14 having at their smaller ends axially located openings 16.

Formed in the barrel 12, medially between the opposite ends thereof, are straight, longitudinally extending slots 18. In the illustrated example a pair of said slots is provided, with the slots of the pair being diametrically opposed.

A sleeve or band 20, which could be exteriorly knurled or otherwise roughened if desired, receives and is longitudinally slidable upon the intermediate portion of barrel 12, in overlying relation to slots 18. Rigidly connected to and extending radially inwardly from diametrically opposed portions of sleeve 20 are connecting arms 22, the inner ends of which are fixedly connected to a ring 23 circumposed about and fixedly secured to the midlength portion of an elongated, open-ended, straight refill cartridge support tube 24 disposed axially of barrel 12.

Fixedly mounted within barrel 12 at opposite sides of and in equidistant relation to slots 18 are relatively thick, transverse partitions 26, centrally apertured to provide bores in which are slidably engaged the respective end portions of tube 24. Partitions 26 thus constitute guides which are in supporting relation to the tube 24, guiding the same during the axial, back-and-forth movement of the tube within the barrel 12.

The opposite ends of the tube 24 terminate well inwardly from the apertured extremities of barrel 12, and are formed with outwardly directed flanges 28. Circumposed about the end portions of tube 24 are compression, coil springs 30 abutting at their opposite ends against flanges 28 and the adjacent partitions 26.

Adjacent flanges 28, leaf spring detents or tongues 32 are struck inwardly out of the material of tube 24, said tongues having intermediate their ends portions projecting radially inwardly of the tube, for a purpose to be made presently apparent.

Identical refill cartridges 34, which may be formed of lengths of small-diameter, tubular metal material, are engageable in the opposite end portions of the tube 24. The cartridges 34 contain a suitable quantity of ink, not shown, and are sealably closed at their inner ends. At their outer ends, the cartridges have ball elements 36. The construction of said cartridges is something that is well known, in and of itself, in the art to which the invention relates, and hence there is no necessity of detailing or describing at length the inner construction of the cartridges.

It is sufficient to note for the purposes of the present application that each cartridge has adjacent its inner end a recess 38 mating with the radially inwardly projecting portion of the tongue 32. Therefore, on extension of the cartridge 34 into the barrel, to engage the cartridge at its inner end in the tube 24, the inner end of the cartridge will enter the tube and will cammingly bias the tongue 32 radially outwardly until recess 38 registers with the tongue. The tongue is now permitted to assert its spring tension, and moves into the recess 38. In this way, a detent means is provided, that holds the cartridge firmly in the tube.

At opposite sides of the midlength point of the barrel, there are provided ball detent means each of which includes a ball element 40 engaged by a compression coil spring 42 which in turn is engaged against the inner end of a threaded plug 44, threadedly engaged in a suitable opening provided in the wall of the barrel 12. Partitions 26 have radial bores receiving the springs and ball elements.

Formed in the outer surface of the tube 24, at opposite sides of the midlength point thereof, are longitudinally spaced recesses 46, 48 adapted to receive the ball elements 40.

In the illustrated position of the parts, tube 24 is centered in the barrel. In this position of the parts, the ball elements 40 engage in the recesses 48 and the ball tips 36 of cartridges 34 are retracted within the openings 16. The pen may be provided with a conventional cap, not shown, to permit the same to be carried about when it is not in use, with the cartridges retracted in the manner shown in Fig. 1.

If, however, it is desired to use one of the cartridges, as for example that shown at the left in Fig. 1, one would shift the sleeve 20 in the direction of the cartridge that is to be used. Taking the example given, one would move sleeve 20 to the left in Fig 1. This bodily shifts the tube 24, and the left-hand cartridge 34, to the left in this figure of the drawing, extending the ball tip 36 beyond the end of the barrel

When the ball tip is extended, the detent 40 shown at the left side of sleeve 20 in Fig. 1 moves out of recess 48 and engages in the adjacent recess 46. This releasably holds the tube 24 in the position to which it has been adjusted, with the ball tip extended.

The ball detent at the right side of the sleeve 20 will in these circumstances not be engaged in any recess, but this has no effect on the operation of the device, since the tube is already securely though releasably latched in its new position by engagement of the left-hand ball detent in the left-hand recess 46.

When the tube 24 was shifted to the left in Fig. 1, the spring 30 at the left-hand end of the tube 24 was permitted to expand somewhat. The spring 40, however, was placed under compression, so as to resiliently, yieldably resist movement of the tube 24 to the left in Fig. 1. In this connection, when the tube is in the neutral position shown in Fig. 1, the springs can be so arranged that they would be under no tension, that is, they would be fully expanded though having their ends lightly abutting against the associated flange 28 and partitions 26. Therefore, movement of the tube in either direction would not have any effect upon the springs other than to lightly compress one spring. The other spring, since it was not compressed when the tube was in neutral position, will be merely left loose upon the tube in its uncompressed condition.

If the cartridge shown at the right in Fig. 1 is to be used, the opposite movement of the parts is effected, that is, sleeve 20 is moved from the right to its neutral, illustrated position, with the ball detent shown at the right in Fig. 1 moving out of its recess 48 and into the adjacent recess 46. Spring 30 shown at the left in Fig. 1 would be the spring placed under compression in these circumstances.

It becomes apparent, thus, that the invention is so designed as to provide a double-ended ball point, with readily replaceable cartridges at either end of the pen, both cartridges being carried by a single support tube, axially shiftable in opposite directions to extend one or the other cartridge, whichever is desired. The arrangement has value in that at a cost of little more than that of a single-ended pen, two pens in one, so to speak, are provided, thereby eliminating the inconvenience and annoyance which has heretofore persisted when a cartridge has become emptied in situations in which a spare cartridge is not available immediately.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

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

1. A double-ended ball point pen comprising a barrel assembly having openings at both ends thereof, a support tube mounted in said assembly for axial movement in opposite directions, replacement ink-supplying cartridges releasably engaged in opposite ends of said tube for extension of a selected cartridge out of an opening of the barrel assembly responsive to shifting of the tube toward said opening, balls rotatably carried on the outer ends of said cartridges, means on the tube for shifting the same, means interposed between the tube and barrel assembly resiliently, yieldingly opposing movement of the tube in each direction, and detent means releasably interengaging the tube with the barrel assembly in each position to which the tube is axially shifted.

2. A double-ended ball point pen as defined in claim 1, wherein the barrel assembly includes a barrel and partitions extending transversely of the barrel at opposite sides of the midlength point of the barrel, said partitions having center openings in which the tube is slidably engaged.

3. A double-ended ball point pen as defined in claim 2, wherein the means resiliently and yieldingly opposing movement of the tube comprises compression springs circumposed about the respective end portions of the tube.

4. A double-ended ball point pen as defined in claim 3, wherein the springs respectively abut at their opposite ends against the respective partitions and the ends of the tube adjacent said partitions, whereby each spring extends between a tube and the partition nearer said end.

5. A double-ended ball point pen as defined in claim 4, wherein said tube is movable to a neutral position in which both cartridges and balls are retracted within the barrel assembly, neither spring being compressed in said neutral position of the tube, one spring being compressed on movement of the tube in either direction to extend a cartridge ball.

6. A double-ended ball point pen as defined in claim 2, wherein said detent means are mounted in the respective partitions, said tube having a plurality of longitudinally spaced detent-receiving recesses, at least one detent means being engaged in a recess in each position to which the tube is axially moved, said recesses being arranged in pairs, one pair for each detent means, said pairs of recesses being disposed at opposite sides of the midlength of the tube.

7. A double-ended ball point pen as defined in claim 1, wherein the means for shifting the tube comprises a sleeve circumposed about and slidable upon the barrel and a connection between said sleeve and tube linking the same for conjoint slidable movement longitudinally of the barrel.

8. A double-ended ball point pen as defined in claim 7, wherein the connection between the sleeve and tube comprises arms projecting radially inwardly from the sleeve and being secured to the tube.

9. A double-ended ball point pen as defined in claim 8, wherein the barrel assembly has longitudinally extending slots through which the arms extend, limiting slidable movement of the sleeve and tube in opposite directions.

10. A double-ended ball point pen as defined in claim 1, wherein the tube is formed adjacent its opposite ends with inwardly struck spring tongues having projections extending inwardly of the tube, said cartridges having recesses in which the tongues engage to provide the releasable engagement of the cartridges in the ends of the tube.

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