

Oct. 27, 1959

F. L. GORDO ET AL
TANDEM WRITING INSTRUMENTS
Filed Dec. 18, 1956

2,910,045

FIG. 1.

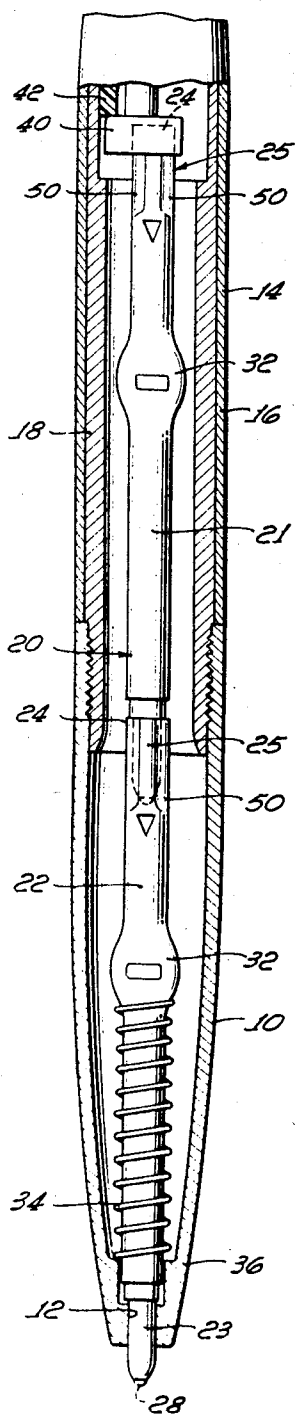


FIG. 3.

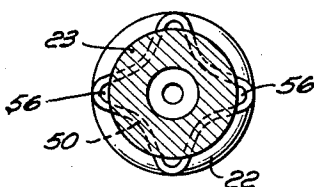


FIG. 4.

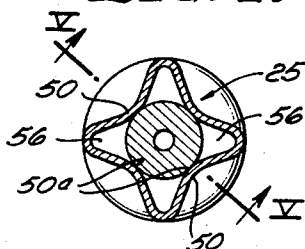


FIG. 2.

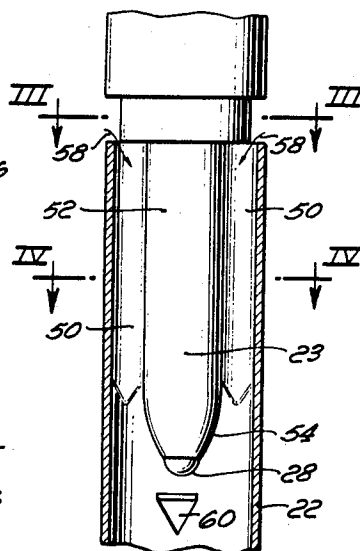


FIG. 5.

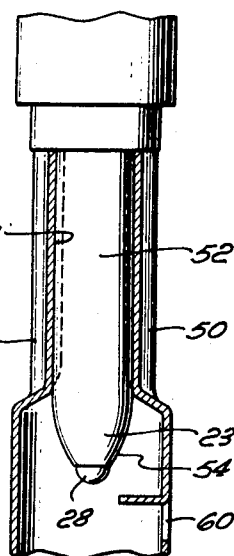
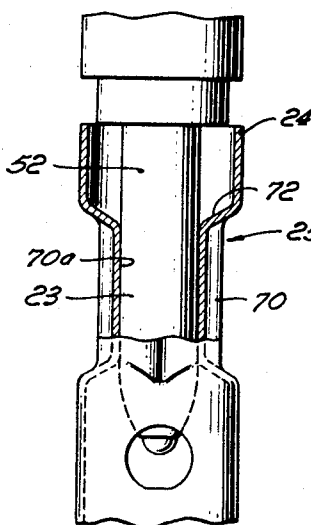


FIG. 6.



INVENTOR.
FRED L. GORDO
JOSEPH C. WIDMONT, JR.
[Signature]
ATTORNEY.

1

2,910,045

TANDEM WRITING INSTRUMENTS

Fred L. Gordo, Pacific Palisades, and Joseph C. Widmont, Jr., Los Angeles, Calif., assignors to Paper Mate Manufacturing Company, Culver City, Calif., a corporation of Delaware

Application December 18, 1956, Serial No. 629,050

5 Claims. (Cl. 120—42.1)

The present invention relates generally to writing implements. In particular, the present invention relates to writing implements employing a tubular ink cartridge provided with a ball-pointed writing tip at one end and an open end at the other, with the cartridge so mounted in the implement that the writing tip is automatically retractable. Even more particularly, the present invention relates to a writing implement containing a plurality of ink cartridges connected in coaxial alignment within the implement by means formed as an integral part of the tubular ink cartridges. The present invention is an improvement over the inventions described and claimed in copending application Serial No. 538,135, filed October 3, 1955, by Frank H. Seyer.

Conventionally, ball point writing instruments comprise a cylindrical barrel open at one end and containing an elongated tubular ink cartridge retractably mounted in the barrel so that the writing tip may be projected into a writing position. In writing with the instrument, the ball is caused to pick up ink from a supply carried in the cartridge and then deposit or lay it down upon the surface over which the ball is rolled. Although ball-pointed writing instruments of this type have been successfully used for many years, their use is not entirely free from difficulty. For example, if the free universal rotation of the ball in the writing tip is prevented for any reason, the pen will not write. This may occur if the ball is struck a sharp blow or dropped or otherwise caused to be jammed into a non-rotative position in its seat in the writing tip. Thereafter, the pen is useless until a new cartridge is purchased and the writing cartridge is replaced, such purchase sometimes subjecting the user to annoyance and inconvenience.

The inexpensive materials advantageously employed in the construction of the tips frequently are unable to endure long periods of wear. Accordingly, the pen may cease to function altogether even though ink supply in the cartridge is far from exhausted. Moreover, manufacturers of such pens are constantly faced with recurrent demands for instruments of varying length, or which will supply ink of different colors, or which provide writing tips with ball points of varying diameter and writing traces of different width. In the main, such demands have heretofore been ignored due to the difficulty or impracticability of providing all such advantages in a single writing instrument.

Generally stated the present invention relates to a tandem writing cartridge for use in a ball point pen comprising a pair of tubular ink cartridges each provided with a writing tip at one end (of a diameter smaller than the ink cartridge) and connector means formed as an integral part of an opposite open end and adapted to receive and hold a writing tip in coaxial alignment. Preferably the structure of the connecting means also provides free access of air to the ink supply in the lower of the two ink cartridges. By means of this construction, the present invention makes possible a tandem writing unit having substantially the same general dimensions and

2

configuration as standard writing cartridges, permitting such units to be received for projection and retraction in existing ball point pen constructions. Moreover, each cartridge is provided with a writing tip which may advantageously be constructed of less expensive material, as each of the tips will be required to deliver, but a portion of the total ink supply. The construction of the writing unit also makes possible the use of inks of various constructions, or colors, in each of the cartridges, or the use of various size balls in the writing tip.

It is an object of the present invention therefore to provide means by which a pair of tubular ink cartridges may be secured or connected in coaxial alignment within a writing implement, such connecting means forming an integral part of said ink cartridges.

Another object of the present invention is to provide a unitary device for use in a writing implement by which more than one writing tip is always available for use within the implement so that a damaged or inoperative tip will not render the entire device inoperative.

Another object of the invention is to provide a unified tandem writing device by which the wear of a ball point tip is reduced so that the likelihood that the device will function throughout the life of the ink supply is substantially increased.

Other objects and advantages of the invention will be apparent from the following description and from the drawings in which:

Fig. 1 is a view in section and in elevation of a writing implement embodying the invention;

Fig. 2 is an enlarged fragmentary view in section of the writing implement of Fig. 1, showing details of the integral connecting structure;

Fig. 3 is a horizontal section along the lines III—III of Fig. 2;

Fig. 4 is a horizontal section along the lines IV—IV of Fig. 2;

Fig. 5 is a view in section and an elevation along the lines V—V of Fig. 4; and

Fig. 6 is a like view embodying a modified form of the invention.

Briefly, the present invention relates to a tandem writing instrument 20 for use in ball point pen comprising a pair of tubular ink cartridges 21 and 22, each provided with a relatively small diameter writing tip 23 at one end and an opposite open end 24, and connecting means 25 forming an integral part of each of said cartridges and adapted to resiliently grasp and hold the writing tip of the other cartridge in coaxial alignment. Desirably, the formed means 25 are inwardly extending deformations or indentations formed in the upper end portion of the relatively thin wall of each cartridge, preferably by the use of a crimping die, to constrict the end portion and provide inwardly facing cartridge wall surfaces spaced slightly less than the outer diameter of a writing tip 23 and adapted to resiliently receive and grasp a writing tip along circumferentially spaced zones. By the means 25, the two cartridges may be readily connected to form a tandem writing unit, with the writing tip of one cartridge held and protected in telescoped fashion in the open end of the other, the entire unit having the same axial dimensions as standard writing cartridges. As a result, it is possible for the unit to be received for retraction and projection in existing ball point pen constructions, with both writing tips at all times pointed downwardly and with an open end cartridge portion 24 positioned for effecting cooperation with the usual retracting mechanism.

Referring now to the drawings in detail, an exemplary writing instrument is shown comprising a barrel or housing having a lower portion 10 provided with a downwardly directed port 12 adapted to receive the writing tip

3

of a writing instrument, and an upper barrel portion 14 which may include an outer shell 16 and an inner member or positioning element 18. The shell 16 may be fitted or cemented onto the positioning element, and the positioning element may be threadedly connected to the lower barrel portion, as illustrated in Fig. 1.

Housed within the barrel of the device is the writing instrument 20 consisting of the two ink cartridges 21 and 22, referred to above. Each of the cartridges 21 and 22 is provided with a crimped enlargement or stop 32 spaced in the writing tip so that a spring 34 may be trapped between the writing unit and the lower or front end 36 of the barrel body. The spring normally urges the coaxially connected writing unit 20 into a retracted position. A plunger (not shown), comprising part of a suitable projecting or retracting mechanism, is generally provided to move the writing instrument from a retracted or nonwriting position within the barrel to a projected or writing position externally of the barrel. In the illustrative apparatus of Fig. 1, the upper end 24 of the cartridge 21 is shown housed in an adapter or cam follower 40 which, by engagement with a shoulder or stop 42 provided on the inner wall of the barrel portion 14 acts to hold the unit 20 in a projected position in the manner more particularly described in copending application Serial No. 374,497, filed August 17, 1953, now Patent No. 2,865,331, issued December 23, 1958, by James L. Marcotte. However, any other suitable retracting mechanism might also be used in conjunction with the tandem cartridge of the invention, for example, the mechanisms described in United States Patent No. 2,624,314, issued to Walter B. Spatz. Accordingly, the details of the particular retracting mechanism employed are not further described or illustrated.

In a preferred embodiment of the invention, illustrated in Figs. 1 to 5, the writing instrument 20 comprises two cartridges held together in telescoped coaxial relation by means of a plurality of laterally displaced crimped indentations 50 provided in circumaxial relation in the upper metallic or plastic composition wall of the cartridge adjacent the open end 24. These crimped indentations function to carry the side wall of the cartridge inwardly to form a plurality of circumferentially spaced zones or wall areas 50a which are effective portions of an inscribed circle of slightly less diameter than the diameter of a writing tip 23, but of a greater diameter than the writing ball 28, as indicated by the dotted outlines in Fig. 5. Although the longitudinal or axial dimensions of the indentations 50 will vary somewhat, as will appear, they should be of sufficient dimension to resiliently grasp and hold the writing tip of the other cartridge firmly in coaxial alignment. By way of illustration, the axial dimension of the indentations shown in Fig. 5 are substantially equal to that of the shank portion 52 of the writing tip 23.

In the use of the tandem writing instrument 20, just described, the two cartridges 21 and 22 are first assembled by forcing the tip of one of the cartridges into the open end of the other. In so doing, the taper rim 54 of the writing tip comes into contact with the indentations 50 gradually expanding them apart into the full line position shown in Fig. 4 and Fig. 5. Thereafter the writing tip may be readily shoved the remainder of the way into the open end 24 of the cartridge where it becomes resiliently grasped and held. After assembly, free passage of air to the supply of ink or writing fluid in the ink cartridges 21, 22, is provided through the passages 56 formed by the upper wall portion of the cartridge adjacent and between the indentations 50 and radially outwardly of a writing tip, the passages 56 serving as an air vent to the interior of the cartridge body, as indicated by the arrows 58 in Fig. 2. If desired, additional (or alternative) air passages may be milled, punched or otherwise provided, as at 60, in the upper wall 24 of the cartridge. It will be understood by those

4

skilled in the art that if uninterrupted passage of air to the ink supply is not provided, a vacuum may result in the upper end of the cartridge, preventing further use of the device.

Fig. 6 illustrates a modified form of the invention in which the connecting means 25 is formed as a plurality of indentations 70 spaced inwardly from the open end 24 of the cartridge. Although with this form of the invention the area of resilient holding contact between the indentations 70 and the shank portion 52 of the writing tip is somewhat reduced, other advantages result from the provision of a tapering surface 72 guiding the writing tip into the upper end of the cartridge. For example, assembly of the separate writing cartridges into a writing unit may be more easily accomplished, and greater protection is provided the writing tip during the act of assembly.

From the above description it will be apparent that the means 25 (formed as an integral part of each of the writing cartridges 21, 22) makes possible a rigid and coaxial tandem cartridge assembly, thereby permitting a considerable saving in material and handling costs. Moreover, the interconnecting formed means 25 permit the writing tip 23 of one cartridge to be firmly but removably held in the open end of the other, both writing tips of the assembled unit then pointing in the same direction. As a result, no matter which of the two cartridges so assembled has its writing tip in writing position, the other cartridge always presents an upwardly directed open end for co-operation with engaging portions of a retracting mechanism, as represented by the cam follower 40 previously described.

It will be further understood that two ball pointed writing tips are always available, in the pens of the invention, so that if one is dropped or damaged, or otherwise rendered inoperative, the pen may be disassembled and the positions of the separate cartridges reversed, presenting the undamaged point in writing position in the lower part of the barrel. If desired, the writing fluid in these separate cartridges may be of different concentrations or color; or the dimensions of the ball points 28 may vary so that a writing instrument adapted to different uses may be provided. A further advantage results in the fact that the writing tip may be fabricated of less expensive materials and give excellent writing service since two writing tips are available for the life of the ink supply instead of the usual one, without any increase in the size of the bulk of the barrel of the writing instrument. It will also be noted that the resilient grasping holding function of the interconnecting means 25 at all times acts to protect the non-writing or housed tip from damaging impacts.

To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. For example, although four crimped indentations 50 are provided in the illustrated apparatus, a larger or smaller number of such indentations might be provided with equal success, e.g., 2, 3, 5, 6 or more indentations about the upper end of the cartridges. Accordingly it should be understood that the disclosures and description herein are purely illustrative and are not intended to be in any sense limiting.

We claim:

1. In a writing instrument including a pair of tubular ink containing cartridges each provided with a writing tip at one end and an opposite open end the provision of: means for connecting said cartridges in coaxial structurally rigid alignment, said connecting means including crimped longitudinally extending indentations formed in the tubular walls of said ink cartridges adjacent each of said open ends, said indentations providing circumferentially spaced inner zones and outer zones, said inner zones of said indentations serving to resiliently grasp and frictionally hold a writing tip, and said outer zones of said

5

identations providing air passageway means lying parallel to a writing tip grasped by said inner zones, said air passage means providing communication with and an air vent for the interior of the associated cartridge.

2. A structurally rigid writing unit of predetermined length for use in a writing instrument comprising in combination: a pair of tubular ink containing cartridges each including a cartridge body provided at one end with an open end portion and at the other end with a writing tip circular in section and a shoulder at said writing tip of reduced section as compared to the cartridge body; each open end portion having a non-circular cross-section providing circumaxially related spaced inwardly facing surfaces for frictional grasping of the writing tip of one cartridge, each open end portion having laterally displaced axially directed faces for seating against said shoulder on said writing tip of said one cartridge, whereby said pair of cartridges are held in coaxially rigid relation and in predetermined longitudinal relation.

3. A structurally rigid writing unit of predetermined length for use in a writing instrument comprising in combination: a pair of tubular ink-containing cartridges, each including a cartridge body provided at one end with an open end portion and at the other end with a writing tip and a shoulder at said writing tip of reduced section as compared to the cartridge body; each open end portion having a non-circular cross-section providing circumferentially related spaced inwardly facing surfaces for frictional grasping of the writing tip of one cartridge, each open end portion having laterally displaced axially directed faces for seating against said shoulder on said writing tip of said one cartridge, whereby said pair of cartridges are held in coaxially rigid relation and in predetermined longitudinal relation; said axially directed faces of said non-circular cross-section of the open end portion of each cartridge body extending radially outwardly of a writing tip and defining air passageway means radially outwardly of a writing tip grasped by said open end portion and an air vent for the interior of the cartridge body.

6

4. A structurally rigid writing unit of predetermined length for use in a writing instrument comprising in combination: a pair of tubular ink-containing cartridges, each including a cartridge body provided at one end with an open end portion and at the other end with a writing tip and an annular shoulder at said writing tip of reduced circular section as compared to the cartridge body; each open end portion having a non-circular cross-section providing circumferentially related spaced inwardly facing surfaces for frictional grasping of the writing tip of circular section of one cartridge, each open end portion having laterally displaced axially directed faces for seating against said annular shoulder on said writing tip of said one cartridge, whereby said pair of cartridges are held in coaxially rigid relation and in predetermined longitudinal relation; said non-circular cross-section being spaced inwardly from the end of said open end portion.

5. A structurally rigid writing unit for use in a writing instrument, said unit including a pair of tubular ink-containing cartridges, each including a cartridge body and a writing tip of reduced section at one end of the body, each cartridge body having an open end portion, the provision of: means for interconnecting said cartridges comprising laterally displaced formed means provided in circumaxial relation at the open end portion of each cartridge body to frictionally resiliently grasp and hold a writing tip carried by the other cartridge; said writing tip being provided with a shoulder of smaller diameter than the open end portion of said cartridge body and said formed means including formed portions disposed radially outwardly of said shoulder to provide a vent in communication with the interior of the cartridge body.

References Cited in the file of this patent

UNITED STATES PATENTS

2,261,991	Gerster	Nov. 11, 1941
2,778,336	Liguori	Jan. 22, 1957

FOREIGN PATENTS

286,888	Switzerland	Mar. 2, 1953
---------	-------------	--------------