

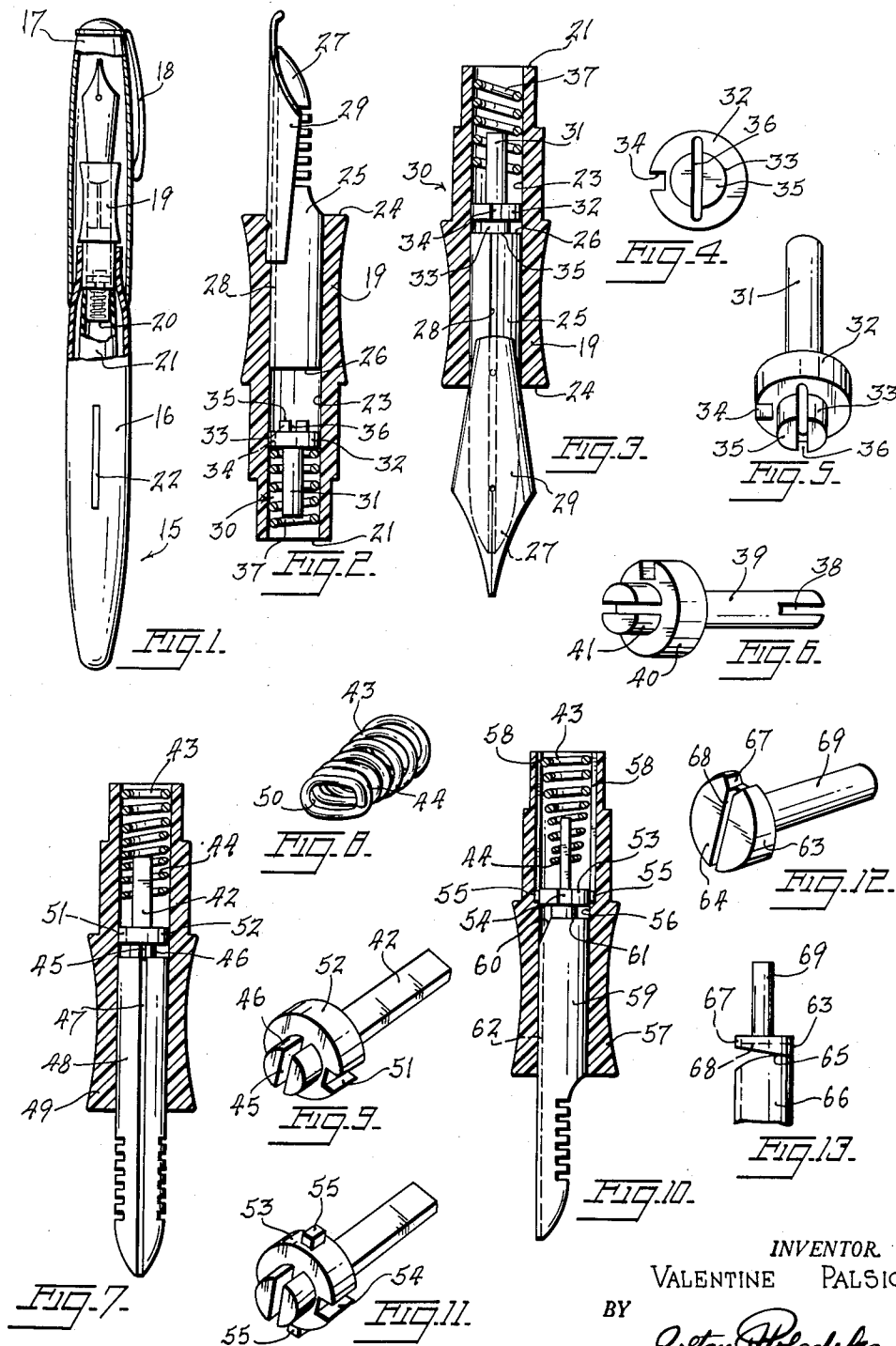
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CHECK VALVE-PINS FOR FOUNTAIN PENS

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CHECK VALVE-PINS FOR FOUNTAIN PENS

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This invention relates to new and useful improvements in fountain pen check valves.

One object of the invention is to provide a check valve construction which will fit within the ink passage in a standard feed bar holder and be slidably retained therein for regulating the flow of ink through the passage to the feed bar.

Another object of the present invention proposes limiting the travel of a check valve stem and disc to a part of the ink passageway within a feed bar holder and providing guide means to maintain the stem and disc in axial alignment with the feed bar for uniform seating on the feed bar when the fountain pen is in writing position.

Still further, the present invention proposes to provide means to space the disc away from the top of the feed bar with a peripheral part in the disc and a cross slot in the spacer for a measured restricted flow to the feed bar.

Another object of the present invention proposes constructing the check valve stem rectangular in shape and providing a flattened guide member to prevent any turning of the valve disc in its seating fall and to insure alignment of the cross slot in the spacer with the usual recess in a feed bar.

A still further object of the present invention proposes providing the feed bar holder ink passage with guide grooves with corresponding ears or projections on the valve disc and bevelling the upper corner of the feed bar adjacent the nib grooves to insure a full but measured flow.

It is a further object of the present invention to provide a check valve construction wherein the check valve disc abuts the flat end of a feed bar and to provide a tapered face on the disc with a peripheral port opening and a cross slot passage so that there is not a flush abutment of the disc and feed bar in writing position so that ink may readily flow between them.

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

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

Fig. 1 is an elevational view, with parts broken away, of a fountain pen embodying the present invention.

Fig. 2 is an enlarged sectional view of the feed bar holder, feed bar, pen point and check valve construction of the present invention.

Fig. 3 is a view similar to Fig. 2 but showing the parts in writing position, the section also being taken at right angles to that shown in Fig. 2.

Fig. 4 is a top plan view of the check valve disc and spacer shown in the several figures.

Fig. 5 is an enlarged perspective view of the part shown in Fig. 4.

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Fig. 6 is a view similar to Fig. 5 but illustrating a modified form.

Fig. 7 is a view similar to Fig. 3 with the pen point removed but illustrating a modification of the present invention.

Fig. 8 is a perspective view of the flattened guide member for the valve stem shown in Fig. 7.

Fig. 9 is a perspective view of the rectangular valve stem, valve disc and spacer shown in Fig. 7.

Fig. 10 is a view similar to Fig. 7 taken at right angles thereto but illustrating a further modification of the present invention.

Fig. 11 is a perspective view of the valve stem, disc and spacer shown in Fig. 10.

Fig. 12 is a view similar to Fig. 6 but illustrating a still further modification of the present invention.

Fig. 13 is a fragmentary view illustrating how the valve disc of Fig. 12 fits against the flat end of a feed bar.

The check valve construction of the present invention is adapted for use in any fountain pen. The first form of the invention, illustrated in Figs. 1 to 5, inclusive, is shown as used with a sack-type pen.

Pen 15, illustrated in Fig. 1, has a hollow plastic casing 16, a metal top or cover 17 with a clip 18. A feed bar holder 19 slidably fits and is frictionally retained in the casing 16 and a rubber ink sack 20 fits over the inner end 21 of the feed bar holder and lies within the hollow casing 16 so that ink may be forced out or drawn in the sack by movement of the pivoted lever 22, all as is common in fountain pen construction.

Feed bar holder 19 is of the ordinary construction with an ink passage 23 (see Fig. 2), centrally located and extending the length of the feed bar holder. One end of the feed bar passage 23, the outer end 24, is adapted to receive a feed bar 25.

Feed bar 25 has a flat end 26 and a pen point holding end 27 with an ink groove 28 extending along one side the length of the feed bar, a pen point 29 fits over the end 27 of the feed bar 25 and is frictionally held in the ink passage 23 of the feed bar holder together with the feed bar 25.

Feed bar 25 extends into the ink passage 23 a substantial distance, but the flat end surface 26 of the feed bar is spaced from the other end 21 of the feed bar holder leaving this portion of the passage 23 clear.

A check valve construction 30 is disposed in this free portion of the passage 23. The check valve 30 has a valve stem 31 with a disc 32 at one end and a spacer 22 extending from the disc. The valve stem is cylindrical in shape with a diameter substantially less than that of the ink passage 23 of the feed bar holder 19.

Disc 32 has a diameter only slightly smaller than that of the ink passage 23, fitting closely but slidably into the passage. Spacer 33 is axially aligned with the stem and disc, is cylindrical in form and has a width or diameter substantially less than that of the disc 32.

The valve stem 31, disc 32 and spacer 33, are one unit adapted to be disposed in the ink passage 23 of the feed bar holder 19 with the spacer 33 abutting the flat end 26 of the feed bar when the feed bar is removably held in the ink passage 23 of the feed bar holder and the feed bar holder is in the writing position as shown in Fig. 3 whereby regulation of the flow of ink occurs.

Disc 32 has a peripheral port or port opening 34 extending through it and the spacer 33 has an end face 35 with a slot or groove 36 across it to direct ink flow from the peripheral disc port 34 through the spacer cross slot 36 to feed bar 25. Preferably, the peripheral port 34 of the disc 32 is disposed at right angles to the cross slot 36 in the spacer 33. The peripheral port 34 in the

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disc 32 may be a simple notch cut or otherwise formed in the side of the disc.

Means, now to be described, is provided in the ink passage 23 adjacent its inner end 21 to guide the valve stem 31 and to retain the disc 32 within the passage 23 keeping the stem, disc and spacer unit from falling out the inner end 21 of the passage 23 when the feed bar holder 19 is turned up as shown in Fig. 2. This stem guide and disc retainer member 37 is a spiral coil, fitting and frictionally retained in the ink passage 23.

The spiral coil stem guide and disc retainer member 37 may be a separate part fitting any feed bar holder ink passage, or the feed bar holder may be molded or otherwise formed with the member 37 in it. The guide and retainer means 37, however, is spaced from the feed bar receiving end of the passage 23 and from the flat end 26 of the feed bar 25 in the passage to permit a limited sliding movement of the valve stem 31 through the member 37.

In this manner, the stem, disc and spacer unit will be slidably held in a limited portion of the ink passage 23 between the ink supply, i. e. sack 20, and the feed bar 25 and pen point 29. When the fountain pen is in carrying position, such as shown in Fig. 1, the feed bar holder 19 will be upwardly disposed (see Fig. 2) and the disc 32 will abut and rest on the retainer member 37. When the pen is moved to writing position, the feed bar holder will be downwardly disposed (see Fig. 3) and the disc 32 will fall downwardly until spacer 33 abuts the flat end 26 of the feed bar 25, the member 37 guiding the valve stem 31 in its downward travel to keep the stem, disc and spacer unit from turning and in axial alignment with the feed bar 25.

In the writing position of the feed bar holder shown in Fig. 3, ink can flow into the inner end 21 of the ink passage 23, through the stem guide and disc retainer 37 past stem 31, through the peripheral port 34 in the disc 32 and through cross slot 36 to the ink groove 28 of the feed bar 25. This restriction valve construction thus prevents a gush of ink from flooding the ink groove and provides a measured regulated flow.

The modification of the invention, illustrated in Fig. 6, is characterized by the provision of a transverse groove 38 in the valve stem 39, the disc 40 and spacer 41 being of the same construction as disc 32 and spacer 33 above described.

In the modification of the present invention illustrated in Figs. 7, 8 and 9, the valve stem 42 has a flat guide surface, and the stem guide and disc retainer member 43 has a corresponding flat stem guide section 44, to prevent turning of the stem 42 in its fall and to keep the cross ink feed slot 45 in spacer 46 aligned with the ink groove 47 in feed bar 48 when the spacer 45 abuts the feed bar when the feed bar holder 49 is in writing position (see Fig. 7).

The stem guide and disc retainer member 43 is a coil but one end of the coil is flattened as at 44, to provide a rectangular opening 50 slidably to receive valve stem 42, which is rectangular in shape. A peripheral port 51 is provided also in disc 52 at one end of the valve stem 42.

The modification of the present invention illustrated in Figs. 10 and 11 is characterized by the provision of further guiding means to assure proper alignment.

Valve disc 53 having peripheral port opening 54 is also provided with peripheral projections or ears 55 and the ink passage 56 of feed bar holder 57 has corresponding and mating guide grooves 58 in its walls slidably to receive the ears 55. In addition, the feed bar 59 has bevelled cut or slanting surface 60 extending from its flat end 61 and across the ink groove 62 in the feed bar.

In the modification of the present invention illustrated in Figs. 12 and 13, the valve disc 63 has a bevelled face 64 adapted to abut the flat end 65 of a feed bar 66 at one edge portion of the face 64 only (see Fig. 13). The valve disc 63 has a peripheral port opening 67 through it and

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a transverse groove 68 across its bevelled face 64. A valve stem 69 is attached to the valve disc 63 but no spacer is provided, the bevelled face 64 providing the means to space the disc from the feed bar.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming 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 fountain pen check valve construction comprising a feed bar holder having an ink passage through it, a feed bar having a flat end removably held in one end of the ink passage of the feed bar holder, a valve stem with a disc at one end of a diameter to slidably fit in the ink passage, a spacer extending from the disc and having a diameter less than the disc, said stem and disc and spacer being one unit adapted to be disposed in the ink passage of the feed bar holder with the spacer abutting the end of the feed bar retained in the ink passage in writing position, a stem guide and disc retainer member removably held in the ink passage of the feed bar holder and spaced from the feed bar to permit the valve stem to have a limited distance of travel as the feed bar holder is moved from a carrying position to a writing position and from a writing position back to a carrying position, said disc having a port opening and said spacer having a slot opening across it in vertical alignment with the feed bar passage, said feed bar having a longitudinal ink groove along one side of it, guide means on the disc and corresponding mating guide means inside the ink passage to align the cross slot opening in the spacer with the ink groove in the feed bar and to prevent turning of the disc in its travel.

2. A fountain pen check valve construction comprising a feed bar holder having an ink passage through it, a feed bar having a flat end removably held in one end of the ink passage of the feed bar holder, a valve stem with a disc at one end of a diameter slidably to fit in the ink passage, a spacer extending from the disc and having a diameter less than the disc, said stem and disc and spacer being one unit adapted to be disposed in the ink passage of the feed bar holder with the spacer abutting the end of the feed bar retained in the ink passage in writing position, a stem guide and disc retainer member removably held in the ink passage of the feed bar holder and spaced from the feed bar to permit the valve stem to have a limited distance of travel as the feed bar holder is moved from a carrying position to a writing position and from a writing position back to a carrying position, said disc having a port opening and said spacer having a slot opening across it in vertical alignment with the feed bar passage, said feed bar having a longitudinal ink groove along one side of it, guide means on the disc and corresponding mating guide means inside the ink passage to align the cross slot opening in the spacer with the ink groove in the feed bar and to prevent turning of the disc in its travel, said valve stem being rectangular in shape and the stem guide and disc retainer member being a coil having a flattened portion adapted slidably to receive the rectangular valve stem.

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