

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in Self-Filling Ball Point Pens

I, BALTHASAR GÖTZ, of Langfeldstrasse 6, Erlangen-Bruck (Bayern), Germany, a citizen of Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to insertable points for self-filling ball point pens which are filled with liquid drawn in at the ball end by suction in the usual manner. The points of such writing devices consist of small delicate parts which, as experience has shown, readily become fouled and constantly acquire further dust and fibrous particles introduced by the rolling movement of the ball. The consequence of this is that after being used for some time these pens become choked up at the ball and will not write, the supply of writing liquid to the ball being interrupted. Even in the case of removable tips, accumulated fouling of this kind could not be removed without taking the ball itself out of the tip, and therefore cleaning has heretofore been possible only by the dismantling in special workshops in which the ball is removed from its mounting.

The invention now provides means by which firstly, the space immediately adjacent to the ball can be freed from such particles of foreign matter by the ordinary filling operation and secondly, if this is insufficient the whole pen point can be freed from all particles of foreign matter by one or more scavenging operations without removal of the ball. This problem is solved according to the invention by constructing the point in such a manner that it comprises a separate liquid path which causes the stream of liquid sucked in to reverse its direction and thereby pass into a turbulent or eddying state at or in the vicinity of the member in which the ball is mounted, and also accelerates this stream by a special nozzle effect. Further inventive ideas consists in

the advantageous construction and arrangement of the various parts.

One embodiment of the invention, chosen by way of example, is illustrated in the accompanying drawings, in which:—

Fig. 1 is a longitudinal section, and Fig. 2 is a cross section thereof.

The ball end 1 of the holder or pen body is provided with the known internal thread 2 for screwing in the insertable point 3 which in a known manner carries at its end the tube 4 for the writing ball 5. The ball 5 receives its writing liquid through the relatively wide bore 6 which continues in the insertable point 3 and may be provided with ink guides reducing the cross section or the like. Filling of the pen has heretofore been effected through the thread 2 which was provided at a suitable point with a channel 7 opening directly into, the main bore 6. This channel is provided in the thread on the holder as well as in that on the point 3.

According to the invention there is provided in the wall of the insertable point 3 a separate channel 8 connected to the known channel 7, by the transverse bore 9. This channel is provided in a thickened part 10 of the wall and has a cross-section area of, for instance, 1.5 square millimetres which, however, preferably tapers to about 1 square millimetre at the outer or bottom end 8' whereby the stream of liquid is accelerated just at the point where it emerges from the channel. Since insertable points are normally manufactured by a spraying process, this channel may be produced by the insertion of a tapered metal body which is subsequently withdrawn, the aperture through which it was withdrawn being later sealed by means of a plug 11.

The channel 8 provides a circuitous path for the liquid which is sucked in, thereby inducing a scavenging action of the stream of liquid on the ball mounting. With normal filling speed and normal piston dimensions, the channel 8 and the

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tapered part 8¹ thereof produce a jet speed of about 150 millimetres per second, which will clear the whole space behind the ball of all accumulated particles of foreign matter. Since the jet is forced to turn round, violent eddies are produced which, as tests have shown, penetrate even to the corners of the mounting so that even firmly lodged foreign matter is dislodged and carried away. The same effect occurs also when the liquid is forced out of the pen, and therefore repetition of the filling operation will absolutely ensure production of the desired effect. If it is desired to avoid introduction of dirt particles into the ink with which the pen is filled, the filling operation should be preceded by a suitable scavenging operation with water.

Alternatively, the channel 8 may be replaced by a groove, made in the inner surface, which is covered by the tongue of a separate inserted member and thereby becomes a scavenging channel having the same effect.

The circuitous path of the stream of liquid, due to the channel 8, also has the additional effect that certain abrupt movements habitually made by the writer will never cause the pen to produce a blot, since when the whole of the liquid contents are urged forward they do not merge directly at the channel in the thread; instead, this channel will be relieved by the column of liquid in the channel 8, which also is driven forward by the same force, whereby a complete damming effect will be produced in the front part of the insertable member, the liquid in the channel 8 acting in opposition to the direction of movement of the liquid in the channel 6.

What I claim is:—

1. An insertable point for a self-filling ball point pen filled with liquid from the ball end, characterised by the feature that

the point is so constructed as to comprise a channel forming a reverse liquid path, for scavenging purposes, which channel causes the stream of liquid sucked in to turn round and be directed at the back of the member in which the ball is mounted.

2. An insertable point as claimed in Claim 1, characterised by the feature that the reversed liquid path is formed by a channel running from the front to the rear, of the insertable point.

3. A ball point pen having an insertable point as claimed in Claim 2, characterised by the feature that the rear end of the channel communicates with the atmosphere through a suitable bore and that the filling of the pen is effected through this bore and through a channel in the threaded connection between the point and the pen body.

4. An insertable point as claimed in Claim 2, characterised by the feature that the reverse liquid path is formed by a bore in the wall of the insertable member, this bore being open at the end facing the ball.

5. An insertable point as claimed in Claim 2, characterised by the feature that the reversed liquid path is formed by a groove in the wall of the insertable member, which groove is covered by an insertable inner tongue and is open at the ball end.

6. An insertable point as claimed in Claim 2, characterised by the feature that the front opening is of smaller cross-sectional area than the remainder of the channel, in order to produce acceleration of the stream of liquid by a nozzle effect.

7. The improved insertable point for a self-filling ball point pen filled with liquid from the writing end, substantially as hereinbefore described and illustrated in the accompanying drawings.

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1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

Fig. 1

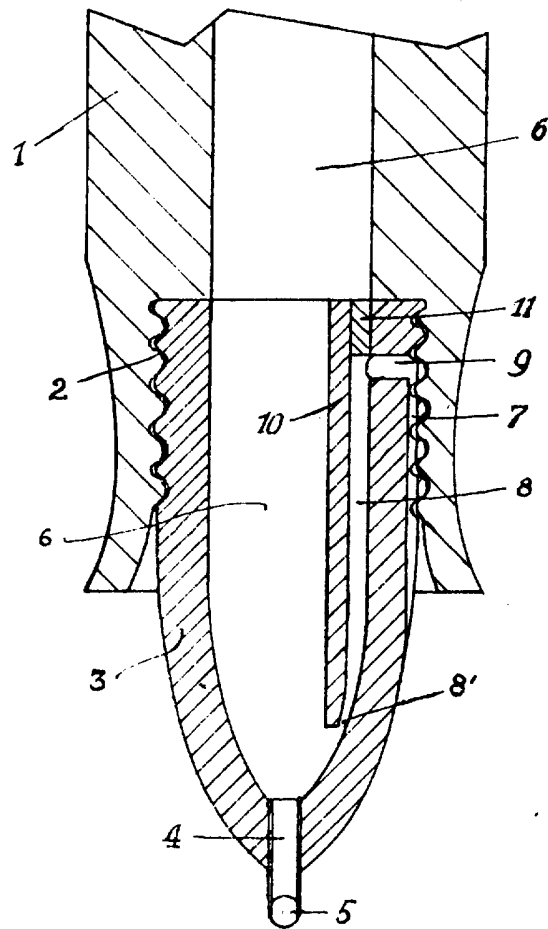


Fig. 2

