

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements relating to Cartridge-Filled Fountain Pens

We, GUNTHER WAGNER VERWALTUNGS-GESELLSCHAFT M.B.H., sole responsible partner of the firm Günther Wagner, of 292 Podbielskistrasse, Hanover, Germany, a German Company, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to cartridge-filled fountain pens, of the kind in which an exchangeable, ink-containing cartridge is formed with a neck, which, on insertion into the barrel of a pen, connects with an ink-feed tube. Although with such a pen filling with ink is greatly facilitated by exchanging an empty cartridge for a full cartridge, or by refilling the empty cartridge, it is still desirable to warn the writer that the cartridge should be exchanged or refilled.

It is an object of the invention to provide a fountain pen, having an exchangeable cartridge, with an ink reserve space in the cartridge itself.

According to the invention, an ink-feed tube of the pen projects so as to extend through an end of the cartridge and into the interior of the cartridge so that the space around the ink-feed tube forms an ink reserve space in the cartridge. In this manner, the interior itself of the cartridge being utilised to provide an ink reserve space, it is not necessary to provide the fountain pen with additional spaces to hold reserve ink.

A further object of the invention is to bring the reserve ink into use in a simple manner. For this purpose, according to a further feature of the invention, the ink reserve space is opened into the ink-feed tube by longitudinal or turning movement of the cartridge relatively to the pen barrel. According to another feature of the invention, a transfer valve, operable by movement of the cartridge, is provided between the ink reserve space and the ink-feed tube. A suitable valve can be formed by a longitudinal recess in the inner surface of the neck of the cartridge and a transverse port in the ink-feed tube coacting

therewith.

In order to locate the cartridge in alternate positions, with the ink reserve space in or out of use, coacting abutments can be provided on the pen barrel and on the cartridge.

Several constructional embodiments of the invention are shown, by way of example, in the accompanying drawing, in which:—

Fig. 1 is a longitudinal section through the portion of a fountain pen containing an exchangeable cartridge, and

Figs. 2 and 3 are views similar to Fig. 1 of other constructional forms.

Into the rear end 1 of the barrel of a fountain pen, is screwed a core 2 on to which is screwed a cap 3, of which only part is shown, which encloses an exchangeable cartridge 4. The cartridge 4 has a flexible portion 5 and a firm portion 7 which is extended to form a neck 6. In the constructional form shown in Fig. 1, the neck 6 is screwed into a corresponding internally screwthreaded socket 8 provided in the core 2. The core 2 has extending therethrough, an ink-feed tube 9, through which the ink is conveyed from the cartridge to the nib or writing point.

The end of the ink-feed tube 9 is so long that not only does it extend through the neck 6 but also projects therefrom, by the length  $a$ , into the interior of the cartridge 4. The end of the ink-feed tube is sharpened for piercing a resilient wall 10, originally closing the cartridge, when the latter is screwed into the core 2.

The annular space around the end of the ink-feed tube 9, projecting into the cartridge, constitutes an ink reserve space 11.

When the ink reserve space 11 is to be brought into use, the cartridge, after removal of the cap 3, is unscrewed until the end face of the ink-feed tube 9 approximately coincides with the end face of the interior of the cartridge 4. When this position is reached, a projecting spring hook 12 encounters a shoulder 13 of the cartridge. Obviously, the space inside the cap 3 must be long enough to permit the cap to be screwed on the core 2 even with the cartridge so-unscrewed.

In the constructional form shown in Fig. 2, a transfer valve is provided between the ink-feed tube 9 and the interior of a cartridge 14. This valve is constituted by a transverse port 15 in the ink-feed tube 9 and an internal longitudinal groove 16 in the neck 17 of the cartridge 14. In the position shown in Fig. 2, the transverse port 15 is closed by the neck 17. If the cartridge is turned far enough for the transverse port 15 to open into the longitudinal groove 16, then ink can flow out of the ink reserve space 11 into the ink-feed tube 9.

The constructional form shown in Fig. 3 is in general like that of Fig. 2, with the difference that a neck 18, without a screwthread, is pushed into a socket of a core 19. In this construction, the cartridge is held in the barrel by the cap 3, which bears axially against the rear end of the cartridge, for instance through an interposed spring.

WHAT WE CLAIM IS:—

1. A fountain pen having an exchangeable ink-cartridge formed with a neck insertable into the barrel of the pen to connect with an ink-feed tube, in which the ink-feed tube of the pen projects so as to extend through an end of the cartridge and into the interior of the cartridge so that the space around the ink-

feed tube forms an ink reserve space in the cartridge. 30

2. A fountain pen as claimed in claim 1, in which the ink reserve space is opened into the ink-feed tube by longitudinal or turning movement of the cartridge relatively to the pen barrel. 35

3. A fountain pen as claimed in claim 2, having a transfer valve, operable by movement of the cartridge, between the ink reserve space and the ink-feed tube. 40

4. A fountain pen as claimed in claim 3, in which the valve is formed by a longitudinal recess in the inner surface of the neck of the cartridge and a transverse port in the ink-feed tube coacting therewith. 45

5. A fountain pen as claimed in any of claims 1 to 4, in which coacting abutments are provided on the barrel and on the cartridge to locate the cartridge in alternate positions with the ink reserve space in or out of use. 50

6. A cartridge-filled fountain pen substantially as described with reference to any figure of the accompanying drawing.

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COMPLETE SPECIFICATION

1 SHEET

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

