

PATENT SPECIFICATION

Application Date: March 11, 1937. No. 7209/37.

491,876

Complete Specification Left: Oct. 25, 1937.

Complete Specification Accepted: Sept. 12, 1938.



PROVISIONAL SPECIFICATION

Improvements in or relating to Fountain Pens

We, MENTMORE MANUFACTURING CO. LIMITED, a Company registered under the laws of Great Britain, of Tudor Grove, Well Street, Hackney, London, E.9, and
5 WILLIAM FREDERICK JOHNSON, a Subject of the King of Great Britain, of 13, Merrick Square, London, S.E.1, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to fountain pens and has for its object to provide improvements whereby an undesirably full flow of ink from the ink-container to the nib of the pen may be obviated. Such an
15 increased flow is often experienced when the reserve of ink in the ink-container is depleted and is known as flooding.

20 According to the invention this defect may be overcome by the employment of a feed-bar having an ink-feed channel formed over part or all of its length, with capillary grooves and by forming in the feed-bar or in the adjacent portion of the pen-barrel a duct communicating at one
25 end with the feed-channel and at the other end with the atmosphere.

30 The nature of the invention will be clearly understood from the following description of some ways in which it may be carried into effect, given as examples only.

35 In all the forms to be described the feed-bar is formed on the side adjacent to the nib with an ink-feed channel extending from near the outer end to just within the pen barrel. At the opposite side the feed-bar is formed with a further feed-channel extending from the inner end to within a short distance of the mouth of the pen barrel. The two channels are placed in communication with each other by way of a transverse bore or duct connecting their adjacent ends. The channels are each formed with fine grooves along
45 their bottoms in the usual way and similar grooves may also be formed in the wall of the transverse bore or duct. For example, the latter may have a fine spiral groove cut in its wall or this wall may be grooved throughout its length, preferably over only half of its circumference, parallel with the axis of the bore.

50 One way of applying the invention con-

[Price 1/-]

sists in forming a venting duct in the feed-bar to extend from an exposed or projecting face thereof to open into the wall of the transverse bore or duct. For example, the venting duct may open into the transversely disposed surface of the feed-bar which is formed when the latter is cut away on the side remote from the nib in the usual manner. The venting duct may be axial of the feed-bar, parallel with the axis of the latter or disposed at right-angles to the transverse duct which itself is preferably arranged to slope slightly towards the nib side of the outer end of the feed-bar.

65 Alternatively, the venting duct may be formed by a groove in the lower surface of the feed-bar and constitute an extension of the feed-channel in the said surface, it not being formed with fine grooves.

70 In another way of applying the invention a venting duct is formed transversely of the projecting end of the feed-bar to extend from the lower face into the feed-channel on the upper face.

75 An alternative way is to form the venting duct in the inner surface of the pen barrel. The duct may be rectilinear and extend from the mouth of the pen barrel to overlap the end of the feed-channel in the lower face of the feed-bar within the barrel. If desired, however, the venting duct may be formed as a spiral groove in the pen barrel, opening at one end to the atmosphere and at the other end to the said lower feed-channel.

80 It is found that fountain pens incorporating a feed-bar constructed and arranged to co-operate with the barrel in the manner described are free from flooding. The explanation is thought to be that air in the ink-container can readily escape from the feed channels through the venting duct, when the pen is warmed by the hand, without increasing the quantity of ink supplied by the action of the capillary grooves.

85 Dated this 11th day of March, 1937.

90 For the Applicants,
95 RAWORTH, MOSS & COOK,
100 75, Victoria Street, London, S.W.1,
Chartered Patent Agents.

73 1

COMPLETE SPECIFICATION

Improvements in or relating to Fountain Pens

We, MENTMORE MANUFACTURING CO. LIMITED, a Company registered under the laws of Great Britain, of Tudor Grove, Well Street, Hackney, London, E.9, and
 5 WILLIAM FREDERICK JOHNSON, a Subject of the King of Great Britain, of 13, Merrick Square, London, S.E.1, do hereby declare the nature of this invention and in what manner the same is to be
 10 performed, to be particularly described and ascertained in and by the following statement:—

This invention concerns improvements in or relating to fountain pens and has for
 15 its general object to prevent or reduce certain irregularities in regard to ink-flow in such pens. A specific object of the invention is to obviate so-called
 20 "flooding," that is an undesirably full flow of ink from the ink-container to the nib of the pen when the same is in use. Such full flow is commonly experienced when the reserve of ink in the container is
 25 depleted.

The usual type of feed-section or feed-bar in a fountain pen is circular, at the
 30 end which is placed, together with the nib, in the nib-section or open end of the barrel and is cut away at the other end on the side remote from the nib, that is the
 35 underside. The nib is held firmly between the bar and the nib-section. Normally in such a feed-bar, an ink-feed channel extends along the surface beneath
 40 the nib from the inner end of the bar to within a short distance of its outer end, the said channel having fine grooves in its bottom which constitute capillaries
 45 through which the ink flows to the nib.

According to the present invention there is provided a fountain pen wherein the
 50 feed-section or feed-bar is formed with a feed-channel section communicating with the ink-container but not leading directly to the nib, a feed-channel section leading
 55 to the nib but not communicating with the ink-container and an intermediate feed-channel section which communicates between the two first named sections, and wherein a duct formed in the feed-section
 60 or feed-bar or in an adjacent portion of the nib-section or barrel communicates at one end with the atmosphere and at the other end with one of the said feed-channel sections. This arrangement has the effect of substantially overcoming the irregularity referred to above, namely "flooding," even in pens of the type in which the barrel itself forms the ink-container or a part thereof.

Various embodiments of the invention by way of example will now be described with reference to the accompanying drawing, in which:—

Fig. 1 is a longitudinal section of part
 65 of one form of pen, and

Figs. 2—6 are detail views of various modified forms of feed-bar.

In all of the illustrated embodiments of the invention, a feed-channel section 1
 70 with capillary grooves 2 in its bottom extends longitudinally of the feed-bar 3 below the undersurface of the nib 4 to a level just within the nib-section 4¹ and
 75 beyond the level at which the feed-bar is cut-away on its diametrically opposite side. In the latter side, a second rather wider feed-channel section 5 with capillary
 80 grooves 6 extends longitudinally from the inner end of the feed-bar, where it communicates with the ink-container formed by the barrel 7, to approximately the level at which the channel section 1
 85 terminates. These two channel sections are connected at or near their adjacent ends by an intermediate feed-channel section 8 penetrating the centre of the feed-bar and sloping downwardly (in the position of use of the pen) towards the nib 4.
 90 The feed-channel section 8 may be a relatively fine capillary duct of circular bore or may also have capillary grooves 8¹ throughout its length, preferably over half only of its circumference. Instead of
 95 grooves parallel to the duct, a fine helical groove may be provided.

In Figs. 1 and 6 a round axial bore 9
 100 wider than the feed-channel section 8 is formed centrally in the feed-bar 3 and extends from the outer end of the latter, where it may commence as a part-circular groove in the inner face of the cut-away
 105 portion of the said bar, to a level at or somewhat beyond its intersection with the channel section 8.

The bore 9, instead of being axial, may be parallel to the axis of the feed-bar or may be inclined or disposed at right-angles to the channel section 8, as at 9² in
 110 Fig. 2. In all these cases, the bore 9 forms a vent extending in the feed-bar from the wall of the channel section 8 to the cut-away end-face of the feed-bar.

Alternatively, as illustrated in Fig. 3, the vent may be formed by a groove 9³
 115 in the lower surface of the feed-bar 3 and may then constitute an extension of the feed-channel 5 but without the grooves 6. Similarly, as illustrated in Fig. 4, the vent may be formed by a groove 9⁴ in
 120

the inner face of the nib-section 4¹. As shown, the duct 9⁴ is straight and overlaps the channel 5, but it might be formed as a helical groove extending between the end of the nib-section and the said channel 5. According to a further alternative illustrated in Fig. 5, a duct 9⁵ is formed obliquely in the end of the feed-bar 3 between its cut-away end-face and the channel 1.

It is found that fountain pens incorporating a feed-bar constructed and arranged in the manner described are free from the defect of flooding. The explanation is thought to be that air in the ink-container can readily escape from the feed-channels through the vent, when the pen is warmed by the hand, without increasing the quantity of ink supplied by the action of the capillary grooves.

It will be noted that the feed-bar illustrated in Fig. 6 differs from the feed-bar of Fig. 1 in that the parts of the duct 8 on each side of the duct 9 are out of alignment, the part communicating with the feed-channel 5 being set slightly lower than the part communicating with the feed-channel 1. This arrangement is very effective in ensuring a regular moderate ink-flow and prevents any danger of ink flowing from the pen should the latter be left with the nib downwards and with the cap off.

Whilst the invention is illustrated in its application to a pen in which the barrel serves as the ink-container it can also be applied to pens with sac-containers, for instance lever-pens. Any desired form of nib-section may then be adopted. For instance, a reduced inner end-part of the nib-section over which the sac is secured may extend beyond the end 14 of the feed-bar 3. The length of the latter may be varied to suit the type of pen.

Various further modifications may be made without departing from the invention. For instance, the feed-channel 5 communicating with the ink-container may be replaced by a duct extending through the interior of the feed-bar 3, for example centrally.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A fountain pen wherein the feed-section or feed-bar is formed with a feed-channel section communicating with the ink-container but not leading directly to the nib, a feed-channel section leading to the nib but not communicating with the ink-container and an intermediate feed-channel section which communicates between the two first named sections, and wherein a duct formed in the feed-section or feed-bar or in an adjacent portion of the nib-section or barrel communicates at one end with the atmosphere and at the other end with one of the said feed-channel sections.

2. A fountain pen according to claim 1, wherein the duct communicating at one end with the atmosphere is formed in the feed-section or feed-bar and communicates at the other end with the intermediate feed-channel section.

3. A fountain pen according to claim 1, wherein the duct communicating at one end with the atmosphere is formed in the nib-section or barrel and communicates at the other end with the feed-channel section communicating with the ink-container.

4. A fountain pen according to any of claims 1 to 3, wherein the intermediate channel section slopes downwardly and towards the nib.

5. A fountain pen according to claim 2, wherein the duct is an axial bore formed centrally in the feed-bar and extends from the outer end thereof to intersect the intermediate channel section.

6. A fountain pen according to claim 2 or 5, wherein the parts of the intermediate feed-channel section on each side of the duct communicating with the atmosphere are set out of alignment with each other, the part which receives the ink coming from the container opening into the duct at a lower level than does the part which delivers the ink towards the nib.

7. The fountain pen substantially as described with reference to the accompanying drawing.

Dated this 25th day of October, 1937.

For the Applicants,
RAWORTH, MOSS & COOK,
75, Victoria Street, London, S.W.1,
Chartered Patent Agents.

[This Drawing is a reproduction of the Original on a reduced scale.]

