PATENT SPECIFICATION

DRAWINGS ATTACHED

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903,560

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COMPLETE SPECIFICATION

Improvements in or relating to Fountain Pens

We, MENTMORE MANUFACTURING CO. LIMITED, a Company registered under the laws of Great Britain, of Platignum House, Six Hills Way, Stevenage, Hertfordshire (formerly of Platignum House, Tudor Grove, Well Street, Hackney, London, E.9), 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 fountain pens of the kind (hereinafter referred to as "the kind specified") in which capillary action alone is utilised for filling the ink reservoir, for retaining ink therein and for feeding ink from the reservoir to a writing surface when the pen is in use.

It has already been proposed in such pens to provide a filling for the reservoir composed of a material incapable itself of absorbing ink and having relatively fixed, rigid walls defining a capillary ink storage space. Similarly, it has also been proposed to employ a filling composed of a porous mass of solid material which material is itself non-absorbent. Such fillings are not inexpensive to produce and assemble into the pens.

Other pens of the kind specified have been proposed in which the reservoir is filled with an ink-absorbent material, such as cellulose or cotton.

In the pens having a non-absorbent filling it has been suggested that this should be a spirally rolled sheet extending the full length of the reservoir (including that portion within the nib section of the pen) and in the other type of pens the proposals include filling the reservoir (including that portion within the nib section) with a stack of discs cut from a woven cotton fabric.

The present invention is concerned with pens of the kind specified in which the filling for the reservoir is composed of contacting layers of fabric and has for its object to provide an improved construction which shall avoid difficulties encountered when the filling for the portion of the reservoir within the barrel of the pen and the filling for the portion of the reservoir within the nib section of the pen are each entirely composed of a stack of fabric discs. Such difficulties include a tendency for the discs adjacent to the union of the nib section and the barrel to become displaced and crumpled up when these parts are assembled and disassembled and an uncertainty of contact between the stack of discs in the nib section and the stack of discs in the barrel unless elaborate precautions are taken during assembly.

According to this invention, in a fountain pen of the kind specified having the reservoir filled with contacting layers of fabric, the fabric filling the portion of the reservoir contained in the barrel of the pen being provided in the form of a large number of discs stacked one upon the other, the filling of the portion of the reservoir contained in the nib section is provided in the form of a spirally rolled length of fabric, the two fillings being in contact with each other when the nib section is assembled to the barrel.

The fabric employed is of a relatively open mesh and may have been produced by weaving, knitting or other suitable processes, the fibres being of a very fine count or low denier and employed as mono-filaments (which is preferred) or as spun yarns. It is preferred that the fibres be incapable themselves of absorbing ink, a very suitable fibre being one composed of nylon. The fabric produced therefrom may be a knitted mono-filament tricot.

A wick of braided or woven fibres is generally provided, in the known manner, in close contact with the nib of the pen and also with at least the filling in the nib section. It is preferred that the fibres of the wick be incapable themselves of absorbing ink.

An example of a pen according to the invention is shown in longitudinal section in the

[*Price 4s. 6d.*]

single figure of the accompanying drawing.

The pen comprises a barrel 1 closed at one end, as by a metal plug 2, and a nib section 3 screwed into the other end of the barrel and carrying a writing nib at its free end. The nib section, which may be a moulding from a thermoplastic material, is formed with a crescent-shaped slot in which the nib 4 is engaged with its writing tip protruding. Also located in the slot, over the upper face of the nib, is a narrow wick 5 covering the greater part of the width of the nib and extending from the free extremity of the nib section to the other end thereof. The free end of the section is solid except for the slot and an axial passage 6 of small cross-section, the slot and passage opening at their inner ends into the cavity of the hollow inner end of the section which is filled with a tightly rolled length 7 of a nylon tricot fabric. The roll of fabric projects somewhat beyond the screw-threaded end of the nib section to have the inner end of the wick 5 folded across its end face and tucked in between the roll of fabric and the inner surface of the nib section 3.

The barrel 1 has a reservoir space 8 extending from its screw-threaded mouth towards its closed end and an air chamber 9 of smaller diameter extends axially from the base of the reservoir space to the closed end of the barrel. A lateral bore 10, in which is fitted a small tube 11 projecting into the air chamber, establishes communication between the latter and the outside air near the inner end of the air chamber.

In the reservoir space 8 is fitted a stack of discs 12 cut from a nylon tricot fabric, the end of the stack remote from the nib section being supported by the annular shoulder 13 connecting the wall of the reservoir space to the wall of the air chamber. The other end of the stack is adapted to contact the end of the roll of fabric 7 in the nib section with light pressure when the latter is screwed home in the barrel. The endmost disc of the stack may be held in position by a retaining ring (not shown) which is a press-fit in the mouth of the barrel and into the central aperture of which the projecting end of the fabric roll 7 is adapted to pass.

Such a pen can readily be filled with ink by merely dipping the nib end of the nib section into a body of ink to a sufficient extent to cause the ink to rise up the passage 6 into contact with the lower end of the fabric roll 7. When the pen has been written out it can be refilled in the same manner and when the fibres of the fabric are of nylon, as described, the quantity of ink taken up at each refilling operation does not vary substantially throughout the life of the pen. Fabrics formed from fibres which are themselves absorbent of ink may be employed to produce the respective fillings of roll and stack form but there is a tendency, especially if these fillings are allowed to dry out at any time, for the fillings progressively to lose their absorbency during the life of the pen with the result that the quantity of ink taken up at each refilling operation tends to become progressively smaller.

It will be understood that the mesh size of the fabrics employed is selected so that the pen may be filled by capillary action and yet can be emptied during writing. For example, a nylon mono-filament tricot having wales spaced apart by about one-fortieth of an inch and formed from filaments of a thickness of one-thousandth of an inch has proved satisfactory. The stack of discs 12 is tightly packed together and the roll 7 is tightly wound so that substantially the same degree of capillarity exists in the interstices between layers as in those in the layers themselves.

In the specification of our co-pending application No. 22219/57 (Serial No. 903,559) we have claimed a fountain pen of the kind in which capillary action alone is utilised for filling the ink reservoir, for retaining ink therein and for feeding ink from the reservoir to a writing surface when the pen is in use, the reservoir having a portion contained within the barrel of the pen and a portion contained within the nib section of the pen, in which the portion of the reservoir within the barrel is filled with contacting layers of a fabric formed from fibres which have their surfaces freely exposed and are incapable themselves of absorbing ink.

WHAT WE CLAIM IS:—

1. A fountain pen of the kind specified having the reservoir filled with contacting layers of fabric, the fabric filling the portion of the reservoir contained in the barrel of the pen being provided in the form of a large number of discs stacked one upon the other, wherein the filling of the portion of the reservoir contained in the nib section is provided in the form of a spirally rolled length of fabric, the two fillings being in contact with each other when the nib section is assembled to the barrel.

2. A fountain pen as claimed in claim 1, wherein the rolled length of fabric is arranged to protrude from the nib section so that it may make contact with the stack of discs in the barrel of the pen.

3. A fountain pen as claimed in claim 1 or 2, wherein a wick of braided or woven fibres is provided in close contact with the nib of the pen and also with at least the filling in the nib section.

4. A fountain pen as claimed in claim 3, wherein the fibres of the wick are incapable themselves of absorbing ink.

5. A fountain pen as claimed in any one of the preceding claims, wherein the fibres from which the fabric is formed are capable themselves of absorbing ink.

6. A fountain pen as claimed in claim 1,

substantially as herein described with reference to the accompanying drawing.

For the Applicants,
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Reference has been directed in pursuance of Section 9, subsection (1) of the Patents Act, 1949, to Patent No. 732,463.

PROVISIONAL SPECIFICATION

Improvements in or relating to Fountain Pens

We, MENTMORE MANUFACTURING CO. LIMITED, a Company registered under the laws of Great Britain, of Platignum House, Tudor Grove, Well Street, Hackney, London, E.9, do hereby declare this invention to be described in the following statement:—

This invention relates to fountain pens of the kind (hereinafter referred to as "the kind specified") in which capillary action alone is utilised for filling the ink reservoir, for retaining ink therein and for feeding ink from the reservoir to a writing surface when the pen is in use.

It has already been proposed in such pens to provide a filling for the reservoir composed of a material incapable itself of absorbing ink and having relatively fixed, rigid walls defining a capillary ink storage space. Similarly, it has also been proposed to employ a filling composed of a porous mass of solid material which material is itself non-absorbent. Such fillings are not inexpensive to produce and assemble into the pens.

Other pens of the kind specified have been proposed in which the reservoir is filled with an ink-absorbent material, such as cellulose or cotton. Fillings of this character are found progressively to lose their absorbency during the life of the pen.

In the pens having a non-absorbent filling it has been suggested that this should be a spirally rolled sheet extending the full length of the reservoir and in the other type of pens the proposals include filling the reservoir with a stack of discs cut from a woven cotton fabric.

The object of the present invention is to provide a relatively inexpensive yet highly efficient pen of the kind specified which shall remain capable of taking up a full charge of ink throughout an extended life.

According to this invention a fountain pen of the kind specified has the reservoir filled with fabric formed from fibres which are incapable themselves of absorbing ink.

It is preferred also to fill the space within the nib section of the pen with such a fabric, the two fillings being in contact with each other, and there is generally provided a wick of braided or woven fibres which is in close contact with the nib of the pen and also with at least the filling in the nib section. The fibres of the wick may be capable of absorbing ink.

A preferred arrangement is one in which the fabric filling the reservoir is provided in the form of a large number of discs stacked one upon the other and the filling of the nib section is provided in the form of a spirally rolled length of fabric.

The fabric employed is of a relatively open mesh and may have been produced by weaving, knitting or other suitable processes, the fibres being of a very fine count or low denier and employed either as mono-filaments (which is preferred) or as spun yarns. A very suitable fibre is one composed of nylon and the fabric produced therefrom is preferably a knitted mono-filament tricot.

In one example of a pen according to the invention there is a pen barrel closed at one end and a nib section screwed into the other end of the barrel and carrying a writing nib at its free end. The nib section may be a moulding from a thermoplastic material, which may be transparent, formed with a crescent-shaped slot in which the pen nib is engaged with its writing tip protruding. Also located in the slot, over the upper face of the nib, is a narrow wick covering the greater part of the width of the nib and extending from the free extremity of the nib section to the other end thereof. The free end of the section is solid except for the slot and an axial passage of small cross-section, the slot and passage opening at their inner ends into the cavity of the hollow rear end of the section which is filled with a tightly rolled length of a nylon tricot fabric. The wall of the cavity is formed with longitudinal shallow flutes or corrugations and the roll of fabric projects somewhat beyond the screw-threaded end of the nib section to have the inner end of the wick folded across its end face and tucked in between the roll of fabric and the inner surface of the nib section.

The barrel of the pen has a reservoir space extending from its screw-threaded mouth towards its closed end (say, to terminate within about one-third of its length from this end) and a bore of small diameter extends axially from the base of the reservoir space to near the closed end of the barrel, a lateral bore establishing communication between the axial bore and the outside air near the closed extremity of the axial bore.

In the reservoir space is fitted a stack of circular discs cut from a nylon tricot fabric, the end of the stack being adapted to contact

the end of the roll of fabric in the nib section with light pressure when the latter is screwed home in the barrel.

Such a pen can readily be filled with ink by merely dipping the nib end of the nib section into a body of ink. When the pen has been written out it can be refilled in the same manner and the quantity of ink taken up at each refilling operation does not vary substantially throughout the life of the pen.

It will be understood that the mesh size of the nylon fabrics employed is selected so that the pen may be filled by capillary action and yet can be emptied during writing due to the more powerful capillary action exerted by the fibres of the writing paper at the point of contact of the nib.

For the Applicants,
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903560 COMPLETE SPECIFICATION

1 SHEET *This drawing is a reproduction of the Original on a reduced scale*