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WRITING IMPLEMENT

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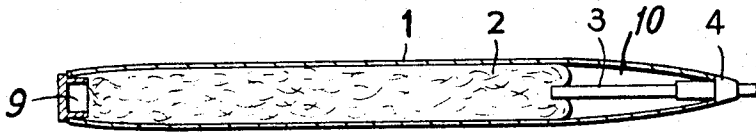


Fig. 1

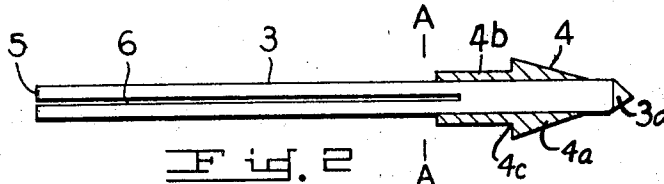


Fig. 2



Fig. 3

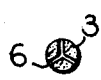


Fig. 4



Fig. 5

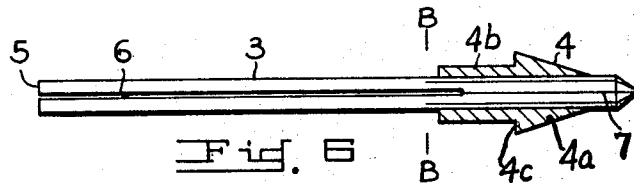


Fig. 6



Fig. 7

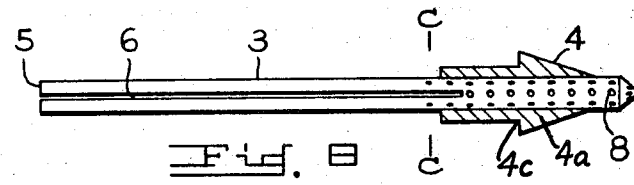


Fig. 8



Fig. 9

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WRITING IMPLEMENT

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4 Claims

ABSTRACT OF THE DISCLOSURE

A writing implement having a tubular casing and a plug with a bore inserted in an open end of the casing. A hard fiber core passes through the bore and has a writing point at one end, its other end being immersed in an absorbent pad within the casing. The core has a capillary slit extending from the pad toward the writing point. Complementary features are that the capillary slit extends to within the bore of the plug and that there are channels or pits at the interface between the plug and the core.

This invention relates to writing implements wherein ink or other writing fluid is fed to a point at a rate sufficient for all writing purposes.

It is the chief object of the invention to provide an implement of the character stated which is reliable in operation under all conditions of use, inexpensive to construct and assemble, and a general advance in the art.

Another object is to provide an implement wherein adequate supply of writing fluid is afforded at the point, by a specifically constructed core which at the same time prevents leakage of fluid, blots, and lines that are too thin or too wide in parts.

Other objects and advantages will become clear to those skilled in the art, after a study of the following detailed description in connection with the accompanying drawing.

In the drawing:

FIGURE 1 is a longitudinal section through an assembled writing instrument embodying the invention;

FIGURE 2 is a view to an enlarged scale over FIGURE 1, partly in section, of the core and sealing ring or plug forming a part of the assembly shown upon FIGURE 1;

FIGURE 3 is a cross section in a plane indicated by line A—A, FIGURE 2;

FIGURE 4 is a cross section corresponding generally to FIGURE 3, but showing a somewhat different pattern of capillary grooves;

FIGURE 5 likewise corresponds generally to FIGURE 3, but shows a still different pattern of grooves;

FIGURE 6 is a view corresponding to FIGURE 2 and partly in section, of a modification of the construction depicted upon FIGURE 2;

FIGURE 7 is a cross section taken in a plane identified by line B—B, FIGURE 6;

FIGURE 8 is a view corresponding to FIGURE 2, of still another modification; and

FIGURE 9 is a cross section taken in a plane identified by line C—C, FIGURE 8.

Referring in detail to the drawing 1, FIGURE 1, identifies the shell or casing of a writing implement embodying the invention. The forward end of the casing is closed by a plug or tip 4 including a frusto-conical part 4a and an integral cylindrical shank 4b, forming a circular shoulder 4c with the base of part 4a. Part 4a is sized and shaped to form a smooth continuation of the tapered surface at the contiguous end of the casing or shell.

The tip or plug 4 is centrally bored to accommodate the

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forward end of a core 3 which has a snug fit within the bore and is fixed therein. The forward end of the core projects forwardly of the adjacent end of the plug and is tapered as at 3a to form a scribing or writing point. The core is of relatively porous hard fiber so constructed that sufficient ink may permeate longitudinally therealong within the passage provided by the central bore in plug 4, to point 3a, without, however, permitting any leakage or excessive flow or fluid.

Casing 1 contains an ink-saturated body of felt 2 which, at its right end as viewed upon FIGURE 1, encompasses the leftward end of core 3 in contact therewith. As shown upon FIGURE 2, the core is provided with two diametral mutually-normal capillary slits extending from the end inside shell 1 to a location a little inside plug 4. Air cavities 9 and 10 within casing 1 compensate for pressure fluctuations.

In operation, ink is received from the saturated body of felt 2 and flows by capillary attraction in and along slit 6 to the solid portion of core 3 within plug 4. Due to the short axial distance from the end of the slit within plug 4 to point 3a, a supply of ink sufficient for writing is conveyed to the point, without, however, permitting any leakage from the implement. FIGURE 3 shows the core in cross section and from this it is noted that in the preferred construction the two slits are mutually normal and each extends diametrically completely across that portion of core 3 within shell 1, so that ink may flow unobstructedly from the saturated body of felt to the terminus of the slits within plug or tip 4, from whence it is conducted through the porous structure of the core, to the point thereof.

FIGURE 4 shows a modification wherein the slits in the core are three in number, intersecting at the center of the core and each extending radially thereof, in equiangularly-spaced relation.

FIGURE 5 shows a further modification wherein there is but a single slit extending diametrically across the core. In all forms, the slits terminate substantially at the same location in and with respect to the bore in tip 4.

At FIGURE 6 I have shown another modification wherein small channels or grooves 7 are formed longitudinally in that portion of the core extending from a little to the left of the end of sleeve portion 4b to the point 3a. These channels, as shown, thus slightly overlap the contiguous ends of slits 6 and assist in the conduction of ink in and along the plug or tip portion of the core, to point 3a. FIGURE 7, which is a cross section in a plane indicated by line B—B, FIGURE 6, shows that the channels may be six in number, equiangularly spaced from the axial plane of the single slit 6. In the particular embodiment of FIG. 6, it is shown that at least one channel 7 communicates with the slit.

In the modification of FIGURES 8 and 9, the channels 7 of FIGURES 6 and 7 are replaced by a plurality of small radial bores shown as regularly spaced in longitudinally-extending rows, which rows are equiangularly spaced about the core extending from the axial plane of slit 6. The longitudinal extent of these rows may be the same as that of the channels 7 of FIGURES 6 and 7. These pits may be 0.5 to 0.8 mm. in diameter and extend to a short distance only within the core.

I have thus provided a writing implement which fulfills all of the objects previously stated, and have provided a leak-proof writing instrument which is inexpensive to produce and reliable and long-lived in operation because of the large quantity of ink available as compared to an ordinary pen having a reservoir of limited capacity in comparison to that of the present invention. Only simple milling, drilling and assembly operations are required so that the invention is admirably adapted to production line and automation procedures.

Due to the fact that the writing fluid flows freely in and along the slits 6 from the end of the core within the casing, right up to and somewhat within plug 4, the fluid has but a relatively short distance to travel through the permeable core to point 3a. As a result the point is continuously supplied with an adequate supply of fluid, while at the same time, leakage or excessive flow otherwise causing blotting and fat lines, are avoided.

While I have shown the form of the invention presently preferred by me, together with several modifications thereof, various changes of size, shape, alterations and substitutions of equivalents will readily occur to those skilled in the art after a study of the disclosure. Hence the disclosure should be taken in an illustrative rather than a limiting sense. It is my desire and intention to reserve all modifications within the scope of the subjoined claims.

Having now fully disclosed the invention, what I claim and desire to secure by Letters Patent is:

1. In a writing implement, a hollow tubular casing having an opening in one end, a plug fitting and sealing said opening and extending a short distance only into said casing, there being a central longitudinal bore in and through said plug, a fluid-pervious core fitting and secured within said bore and projecting at its first end exteriorly of said casing to terminate in a writing point, and at its second end projecting into said casing a distance free and clear of said plug to terminate short of the mid-length of the casing, a body of ink-saturable fiber in said casing and encompassing said second end of said core, in contact therewith, there being at least one capillary slit in said core extending diametrically and longitudinally thereof, from said second end to a point within said plug, that portion of said core within said plug having a plurality of regularly angularly spaced channels extending longitudinally in the peripheral surface thereof, at least some of said channels extending from said capillary slit to said writing point.

2. In a writing implement, a hollow tubular casing having an opening in one end, a plug fitting and sealing said opening and extending a short distance only into said casing, there being a central longitudinal bore in and through said plug, a fluid-pervious core fitting and secured within said bore and projecting at its first end exteriorly

of said casing to terminate in a writing point, and at its second end projecting into said casing a distance free and clear of said plug to terminate short of the mid-length of the casing, a body of ink-saturable fiber in said casing and encompassing said second end of said core, in contact therewith, there being at least one capillary slit in said core extending diametrically and longitudinally thereof, from said second end to a point within said plug, that portion of said core within said plug, having a multiplicity of radially indented pits in regularly-spaced relation along and about its peripheral surface, the area covered by said pits extending to said writing point.

3. A rod-like core of ink-pervious material for a writing implement, said core being formed at one end with a writing point, and having a diametral capillary slit therein, opening through the other end and the peripheral surface thereof, and terminating at a plane about $\frac{3}{4}$ to $\frac{3}{4}$ the over-all length of said core from said other end, there being a plurality of longitudinal channels in the peripheral surface of said core, in equiangularly-spaced relation thereabout, said channels extending from said writing point to a point adjacent the terminal plane of said slit.

4. A rod-like core of ink-pervious material for a writing implement, said core being formed at one end with a writing point, and having a diametral capillary slit therein, opening through the other end and the peripheral surface thereof, and terminating at a plane about $\frac{3}{4}$ to $\frac{3}{4}$ the over-all length of said core from said other end, there being a multiplicity of regularly-spaced radially indented pits in said core and extending over the area thereof from said point to substantially the terminal plane of said slit.

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