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FOUNTAIN PEN INK

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This invention relates to a fountain pen ink and more particularly to a viscous, substantially instantaneously drying ink for use in a ball pointed fountain pen.

In accordance with the present invention I have provided an ink of such characteristics that a single charge thereof in the order of about five to seven grams is capable of maintaining its original, substantially homogeneous composition and of operating satisfactorily in a ball pointed fountain pen for a period of at least two years. In such pens, the rotation of the ball point by the movement thereof over a writing surface serves to draw the ink from the reservoir within the barrel of the pen to the writing surface, and as the ink passes over the ball point it lubricates the ball, thereby enabling it to rotate freely on its seat.

The ink of the present invention is very viscous and has an extremely long body, thereby enabling it to remain in the pen reservoir without seeping past the ball point, yet enabling it to be transferred readily to a writing surface upon rotation of the ball point thereover. This ink contains an organic coloring matter and a vehicle which comprises a mineral oil and a long chain unsaturated fatty acid. These materials are combined in certain critical proportions, set forth hereafter, to give an ink having the aforesaid properties.

Notwithstanding the viscous character of the ink and the presence therein of a non-drying oil, the ink writes dry on paper. By that it is meant that as the ink on the ball point of the pen strikes the paper it becomes set therein to such an extent and so quickly that the writing will not smudge when a finger is drawn over it almost instantaneously after it is made.

Any substantially wax-free mineral oil may be used in the ink made in accordance with the present invention, but it is preferred to use as the mineral oil a wax-free, light colored, distilled oil obtained from a low pour naphthenic crude, such as a coastal crude, having a viscosity of 100–120 seconds Saybolt at 100° F. and a specific gravity of 0.912 at 25° C. This is the mineral oil used in the illustrative formulae set forth hereafter. If desired, a highly refined mineral oil may be used, such as the deodorized and decolorized mineral oil sold under the trade name "Rose oil" by Standard Oil Company of Indiana. As for the long chain unsaturated fatty acid, this may be either oleic acid or a mixture of the normally liquid unsaturated acids (oleic, linoleic and linolenic), which are essentially normally

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liquid alkenoic acids. The former (oleic) is preferred.

The following is the preferred formula for a dark blue ink which writes dry in a ball pointed fountain pen. In this formula and elsewhere throughout the specification, the term "parts" indicates parts by weight.

	Parts
Methyl Violet	0.72
Victoria Blue	1.68
Oleic acid	2.42
Mineral oil	0.84

In preparing this ink the methyl violet, victoria blue and oleic acid are heated to about 65° C. and held for 15 minutes while continuously stirring the batch. The hot mixture is removed from the source of heat and as the mixture cools, the mineral oil is stirred into it. The mixture is then run twice over a three roller, water cooled ink mill and the ends are thrown away, thereby forming a stable, viscous homogeneous ink with an extremely long body which is free from large and rough particles.

The proportions of the constituents of the above formula may be varied only slightly without destroying the utility of the ink for use in a ball pointed fountain pen. Thus in the case of the above formula, keeping the organic coloring materials and mineral oil constant, variations in the oleic acid of no more than about 10% on either side of the figure given can be tolerated. If the oleic acid content of the ink is more than 10% less than that given, the ink is too heavy and incapable of operating in a ball pointed pen. If it is more than 20% greater than that given, then the ink is too light and leaks out of the pen. In general, the proportion of oleic acid to mineral oil should be in the order of about three to one and sufficient organic coloring matter should be added to the vehicle to impart to the ink the desired viscosity and long body. With organic coloring material in the order of approximately the amounts set forth in the illustrative formula, the mineral oil content of the ink may vary from about 0.8 to about 0.95 part and the oleic acid from about 2.20 to 2.90 parts.

The following is a preferred formula for a viscous, quick drying black ink embodying the present invention.

	Parts
Nigrosine	2.40
Oleic acid	2.90
Mineral oil	0.92

The ink is prepared from this formula in the manner described above.

It is to be understood that the present invention is not to be limited to the specific preferred formulations set forth above or to the method of making the inks, since variations in the formulations may be made as set forth above and the method of making the inks may be varied, as desired, so long as these methods result in the production of inks having the aforesaid properties. It is further to be understood that other organic dyestuffs may be used to produce other colors and that where such dyestuffs are used the proportions of the constituents of the inks must be varied to compensate for the oil absorption qualities of the organic dyestuffs used. In all events, however, the constituents of the vehicle should be maintained within the approximate limits of about three parts of the oleic acid to about one part of mineral oil and the organic coloring material should be added in an amount necessary to produce a very viscous ink with an extremely long body.

I claim:

1. A very viscous ink having an extremely long body, capable of use in a ball pointed fountain pen and of writing dry therefrom, and consisting essentially of about 0.72 part of methyl violet, about 1.68 parts of Victoria Blue, about 2.42 parts of oleic acid and about 0.84 part of a wax-free mineral oil having a viscosity in the order of about 100 to 120 seconds Saybolt at 100° F.

2. A very viscous ink having an extremely long body, capable of use in a ball pointed fountain pen and of writing dry therefrom, and consisting essentially of about 2.40 parts of nigrosine, about 2.90 parts of oleic acid and about 0.92 part of a wax-free mineral oil having a viscosity in the order of about 100 to 120 seconds Saybolt at 100° F.

3. A very viscous ink having an extremely long body, capable of use in a ball pointed fountain pen and of writing dry therefrom, and consisting essentially of oleic acid and a wax-free mineral oil having a viscosity in the order of about 100 to 120 seconds Saybolt at 100° F. as a vehicle, and organic dyestuff in solution in the oleic acid and in uniform dispersion throughout the vehicle, the proportion of oleic acid to the mineral oil being in the order of about three to one and the proportion of oleic acid to organic dyestuff being in the order of about one to one.

4. A very viscous ink having an extremely long body, capable of use in a ball pointed fountain pen and of writing dry therefrom, and consisting essentially of normally liquid higher alkenoic acid and a wax-free mineral oil having a viscosity in the order of about 100 to 120 seconds Saybolt at 100° F. as a vehicle, and organic dyestuff in solution in the acid and in uniform dispersion throughout the vehicle, the proportion of acid to the mineral oil being in the order of about three to one and the proportion of acid to organic dyestuff being in the order of about one to one.

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