Sept. 9, 1947. J. C. WAHL 2,427,033

MECHANICAL INK PENCIL

Filed Oct. 11, 1944 3 Sheets-Sheet 1

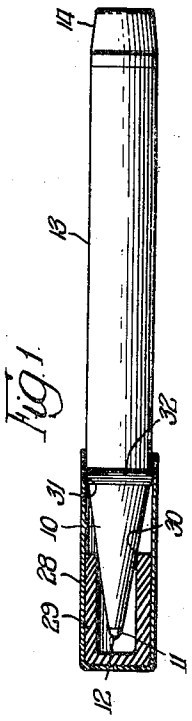


Fig. 1.

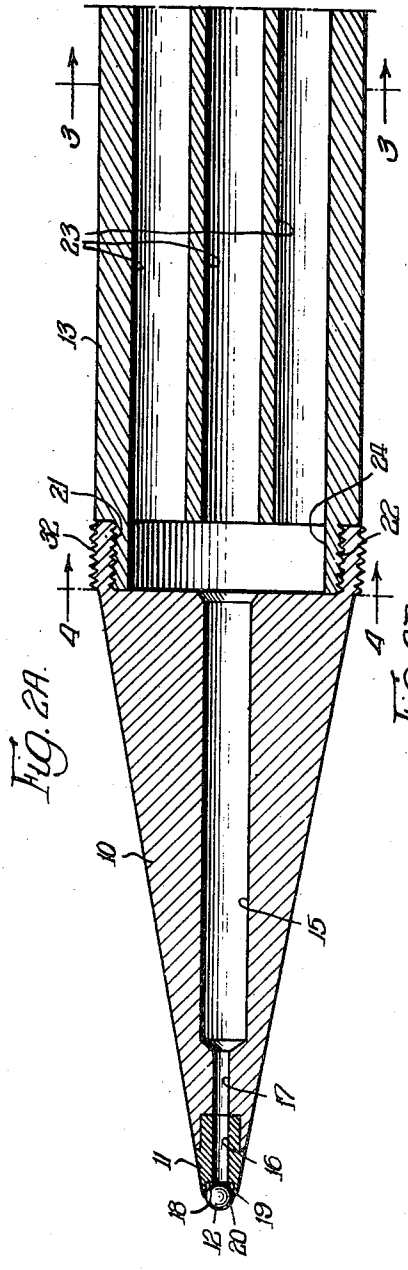


Fig. 2A.

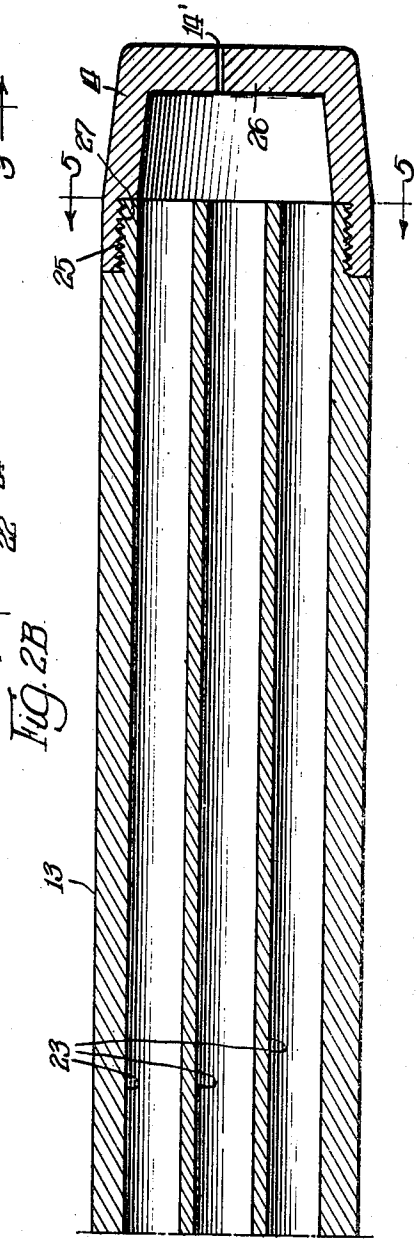


Fig. 2B.

INVENTOR.
John C. Wahl.
BY
Cromwell, Brick, Warden & Butler
Attys.

Sept. 9, 1947. J. C. WAHL 2,427,033

MECHANICAL INK PENCIL

Filed Oct. 11, 1944 3 Sheets-Sheet 2

Fig. 5

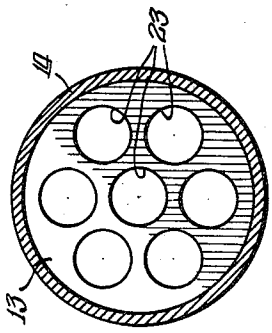


Fig. 4

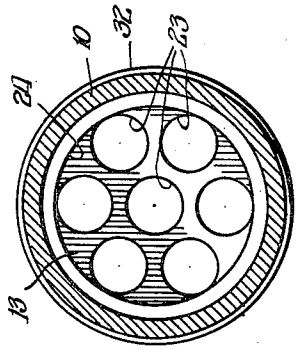


Fig. 3

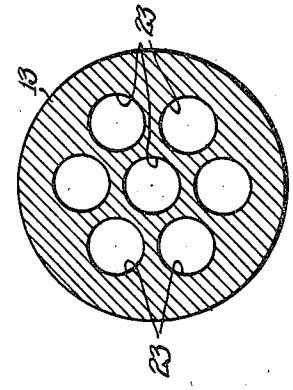


Fig. 7

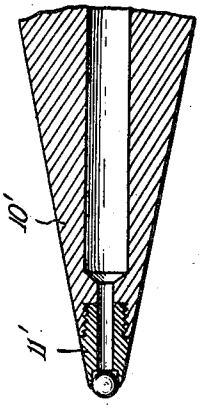
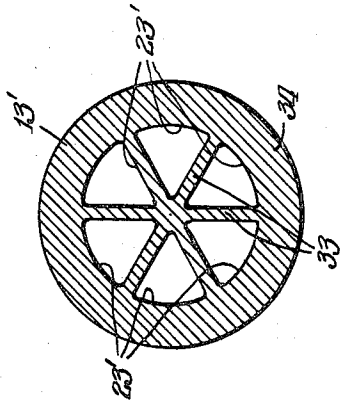


Fig. 6



INVENTOR.
John C. Wahl,
BY
Cromwell, Frisch, Warden & Butler
attys.

Sept. 9, 1947. J. C. WAHL 2,427,033

MECHANICAL INK PENCIL

Filod Oct. 11, 1944 3 Sheets-Sheet 3

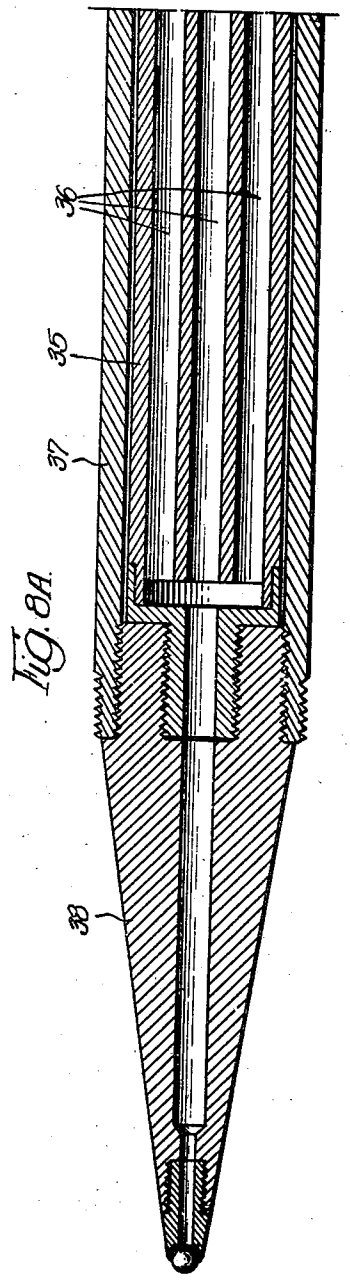


Fig. 8A.

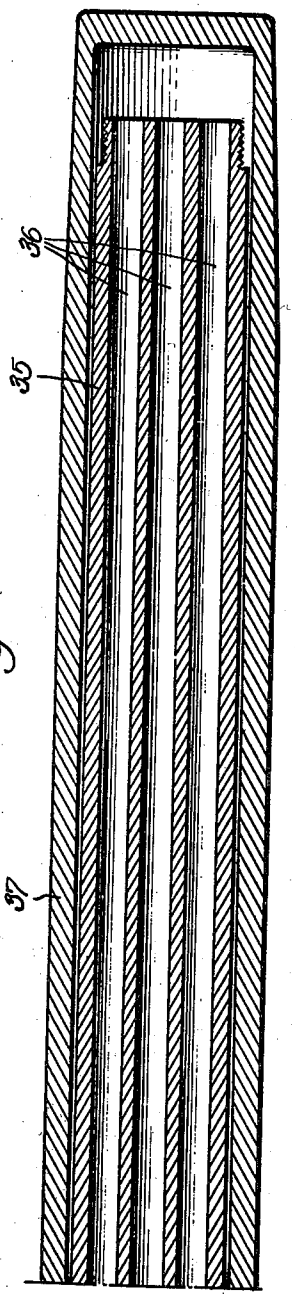


Fig. 8B.

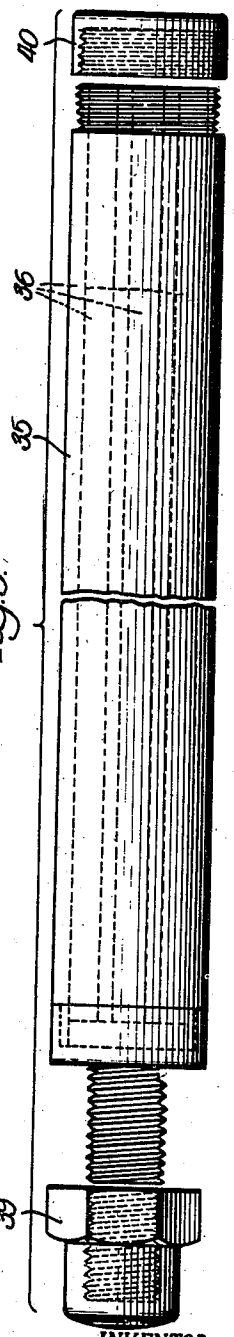


Fig. 9.

INVENTOR.
John C. Wahl,

BY

Cromwell, Greist, Warden + Butler
Attys

Patented Sept. 9, 1947

2,427,033

UNITED STATES PATENT OFFICE

2,427,033

MECHANICAL INK PENCIL

John C. Wahl, Chicago, Ill., assignor to Eversharp, Inc., Chicago, Ill., a corporation of Delaware

Application October 11, 1944, Serial No. 558,144

4 Claims. (Cl. 120—42)

1

The present invention relates to mechanical ink pencils of the type in which the ink used is of paste-like semi-fluid consistency and is transferred to the sheet of paper or other material by a small ball which is rotatably mounted in the tip.

The principal purpose of the invention is to provide a writing implement of the type described having an ink reservoir of new and improved construction.

In my copending application, Serial No. 553,515, filed September 11, 1944, I have disclosed and claimed a writing implement of the same general character in which the reservoir for the ink consists of a long tortuously arranged capillary passage, which passage is connected at one end with the tip containing the ball and is left open at the other end.

In the present disclosure the improved reservoir consists instead of a plurality of separate open-ended capillary passages, which passages are each adapted to direct the ink held within the same forwardly to a common outlet leading to the ball.

One of the objects of the invention is to provide an ink reservoir containing a plurality of separate open-ended capillary passages for the retention of the ink.

Another object of the invention is to provide an ink reservoir of the capillary passage type in which the member containing the passages forms the barrel proper of the writing implement.

Still other more specific objects and advantages of the invention will be apparent to those skilled in the art upon a full understanding of the construction, arrangement and manner of use of the parts forming the writing implement.

A few embodiments of the invention are presented herein for the purpose of exemplification, but it will of course be appreciated that the invention is susceptible of incorporation in still other structurally modified forms coming equally within the scope of the appended claims.

In the accompanying drawings:

Fig. 1 is a side view of a writing implement constructed in accordance with the invention, with the cap shown in longitudinal section;

Fig. 2A is a longitudinal section through the front portion of the writing implement;

Fig. 2B is the same section through the remainder of the writing implement;

Fig. 3 is a transverse section, taken on the line 3—3 of Fig. 2A;

Fig. 4 is a transverse section, taken on the line 4—4 of Fig. 2A;

2

Fig. 5 is a transverse section taken on the line 5—5 of Fig. 2B;

Fig. 6 is a transverse section through a modified form of the reservoir;

Fig. 7 is a longitudinal section through a modified form of the tip;

Figs. 8A and 8B are views which correspond generally to Figs. 2A and 2B but show a modified barrel construction in which the capillary passages are formed in a separate cartridge member; and

Fig. 9 is a side view of the cartridge, including the end caps which are adapted to be applied to the cartridge prior to its installation in the barrel.

Referring first to the construction shown in Figs. 1 to 5, inclusive, it will be observed that the same includes primarily a head 10, a tip 11 which contains an ink transferring ball 12, an ink reservoir 13 which forms the barrel proper of the writing implement, and a cap 14 which forms an enclosure for the rear end of the reservoir 13.

The head 10 is of forwardly tapering shape and contains a longitudinally extending bore 15 through which the ink passes in advancing from the reservoir 13 to the tip 11. The tip 11 is mounted in the front end of the head 10 and contains a longitudinally extending bore 16 in register with a reduced continuation 17 of the bore 15. The bore 16, which is of quite small diameter, opens forwardly into the center of a small socket 18 in which the ball is mounted. The socket 18 opens forwardly, and the ball 12 is held in the same in a partially projecting position by a fine inturned annular edge 19. The ball 12 is rotatably mounted in the socket 18, between the annular edge 19 and an annular shoulder 20 present between the bottom of the socket and the front end of the bore 16.

The ink used in the writing implement is preferably of a paste-like semi-fluid consistency and is designed particularly for feeding by capillary action. The ink is fed to the rear surface of the ball 12 from the bore 16. Movement of the writing implement with the ball 12 in contact with the surface to be written upon causes the ball to rotate within the socket 18, transferring the ink from the ball onto such surface in a thin quick drying film, much after the fashion of offset printing.

The head 10 is provided at its rear end with a rearwardly opening circular recess which is screw-threaded at 21 for the reception of the front end of the reservoir 13. The front end of the reservoir is reduced in diameter and is exteriorly screw-threaded at 22 for engagement

within the head. The reservoir is a single rod-like member of generally cylindrical shape which constitutes the barrel proper of the writing implement and is arranged with its outer surface substantially flush with the outer surface of the rear end of the head 10.

The reservoir 13 contains a plurality of separate longitudinally extending bores 23 which are arranged in more or less uniformly spaced parallel relation to each other. These bores constitute capillary passages in which the supply of ink is retained. All of the passages open at their front ends into a relatively large circular recess 24, which recess is formed in the front end of the reservoir and opens forwardly into the bore 15 present in the head 10. All of the passages extend rearwardly through the rear end of the reservoir and are left open.

The rear end of the reservoir 13 is reduced and exteriorly threaded at 25 for the reception of the cap 14. The cap 14 is hollow and is cupped forwardly with its bottom 26 in rearwardly spaced relation to the rear end of the reservoir. The rim of the cap 14 is interiorly screw-threaded at 27 for engagement with the rear end of the reservoir. If desired, the cap 14 can be provided at some point with a minute atmospheric vent 14', but the addition of such a vent is not necessary in view of the character of the connection between the rear end of the reservoir and the cap.

The writing implement is provided with a cap 28 for enclosing and protecting the writing point. The cap 28 may be of any suitable construction. It is shown as provided with an insert 29 which wedgingly seals at 30 against the head 10. The rim of the cap is provided with a screw-threaded portion 31 which engages with screw threads 32 formed on the outer surface of the rear end of the head.

The reservoir 13 can be readily filled by removing the cap 14 and forcing the ink forwardly through all of the passages 23 in the reservoir until such passages, together with the recess 24 and the bores 15, 16 and 17, have been completely filled. The reservoir, if desired, can be removed from the head 10 when empty and replaced by another full reservoir. The capacity of the passages 23 in the reservoir is preferably such as to permit the writing implement to be used for a long period of time, say six months or a year, before having to refill or replace the reservoir.

In Fig. 6 a modified reservoir 13' is shown in which the capillary passages 23', instead of being of circular shape, are formed in the shape of complementary sectors, with thin partitions 33 separating the passages, and with a relatively thick outer wall 34 surrounding the same.

In Fig. 7 a modified tip assembly is shown in which the tip 11' is screwed into the front end of the head 10', instead of being permanently molded or press-fitted into the same as in the first described embodiment. This screw-threaded arrangement enables the tip 11' to be readily removed for the purpose of replacement, cleaning or repair.

In the modification shown in Figs. 8A, 8B and

9 the writing implement is provided with a separate readily applicable cartridge 35 in which the open-ended capillary tubes 36 are formed. The cartridge 35 fits into a surrounding barrel 37 which is threaded onto the head 38. The ends of the cartridge 35 are adapted to be slid off prior to insertion in the barrel by screw threaded end caps 39 and 40.

I claim:

1. In a writing implement for use with paste type ink, a tip having a longitudinally extending bore, a ball rotatably mounted in the tip at the front end of the bore, and a reservoir for the ink characterized by a plurality of separate capillary passages, each of which is open at one end to the atmosphere and is connected at its other end with said bore, said passages being distributed throughout the cross-sectional area of the reservoir in spaced generally parallel relation to each other.

2. In a writing implement for use with paste type ink, a tip having a longitudinally extending bore, a ball rotatably mounted in the tip at the front end of the bore, and a reservoir for the ink characterized by a plurality of separate capillary passages, each of which is open at one end to the atmosphere and is connected at its other end with a common outlet opening into said bore, said passages being distributed throughout the cross-sectional area of the reservoir in spaced generally parallel relation to each other.

3. In a writing implement for use with paste type ink, a tip having a longitudinally extending bore, a ball rotatably mounted in the tip at the front end of the bore, and a reservoir for the ink characterized by a plurality of separate capillary passages, each of which is open at one end to the atmosphere and is connected at its other end with a common outlet opening into said bore, said reservoir being elongated, and said passages being arranged lengthwise of the reservoir in spaced generally parallel relation to each other.

4. In a writing implement for use with paste type ink, a tip having a longitudinally extending bore, a ball rotatably mounted in the tip at the front end of the bore, and a reservoir for the ink characterized by a plurality of separate capillary passages, each of which is open at one end to the atmosphere and is connected at its other end with a common outlet opening into said bore, said reservoir being an elongated longitudinally bored member, and said reservoir forming the barrel proper of the writing implement.

JOHN C. WAHL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,327,729	Paschal	Jan. 13, 1920
1,179,086	Foster	Apr. 11, 1916
1,493,680	Koepsell	May 13, 1924
1,527,971	Forsell	Mar. 3, 1925