

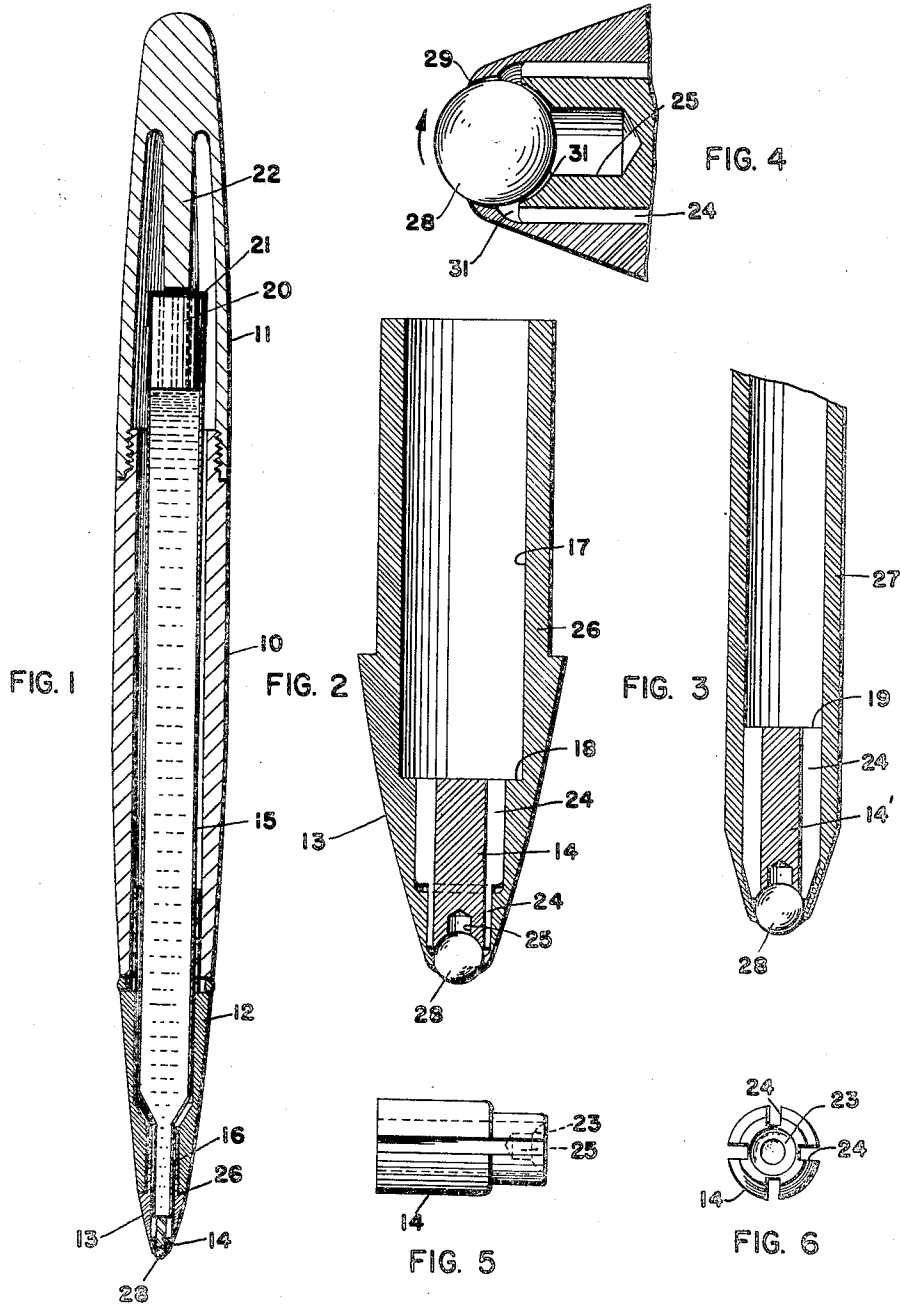
May 1, 1951

M. A. FERST ET AL
BALL POINT PEN

2,551,490

Filed Jan. 23, 1947

2 Sheets-Sheet 1



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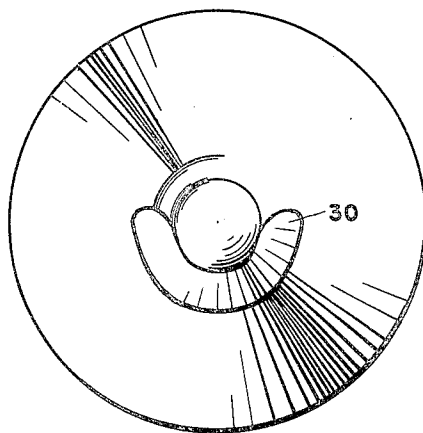
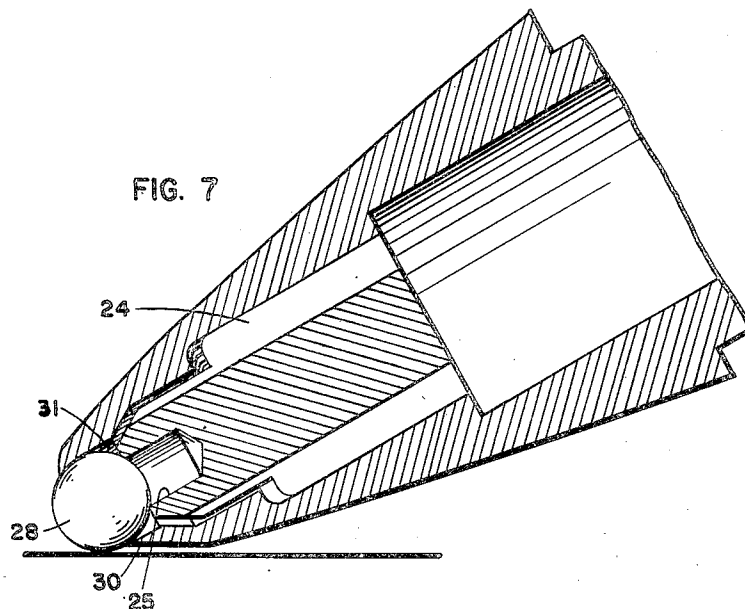


FIG. 8

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2,551,490

BALL POINT PEN

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Application January 23, 1947, Serial No. 723,800

1 Claim. (Cl. 120—42.4)

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The invention relates to ball pointed pens and has an object the provision of a pen of this character with improved ink feed.

It is an object of the invention to provide a pen of the character referred to having a removable and renewable cartridge to contain the usual viscous type of ink used in such pens.

It is a further object of the invention to provide a pen which may be used in writing at a lower angle to the paper than is usual with pens of this type.

Further objects will appear from the following description when read in connection with the accompanying drawings showing illustrative embodiments of the invention and wherein:

Figure 1 is a central vertical section;

Fig. 2 is a vertical detail section of the tip of the structure shown in Figure 1, drawn to an enlarged scale;

Fig. 3 is a view similar to Fig. 2 showing a different form of the tip;

Fig. 4 is a detail central section on a much enlarged scale of the ball point and ink feed provisions closely adjacent to the ball;

Fig. 5 is a side elevation of the insert carrying the ball seat;

Fig. 6 is an end view of the structure of Fig. 5 seen from the right thereof;

Fig. 7 is a detail vertical section corresponding to Fig. 2 but drawn to a larger scale and showing a structure for a low writing angle; and

Fig. 8 is an end view of the structure shown in Fig. 7, as seen from the left.

As shown, the device comprises a barrel 10 having a cap 11 screw threaded thereto and a portion 12 having a press fit with the barrel. The pen further comprises a tip 13 and an insert 14 formed for a press fit in the tip 13. The portion 12 has at its upper end an inside diameter sufficient to receive a portion of the body of a removable cartridge 15, which cartridge is formed with a reduced portion 16 to slip readily within the bore 17 of the tip 13. The reduced portion 16 of the cartridge is adapted to rest upon a shoulder 18 in the tip 13 in the form shown in Fig. 2 or upon the upper surface 19 of the insert 14 of Fig. 3.

The cartridge is shown as being provided with a follower 20 to contact the upper surface of the ink therein as the surface lowers through use

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and the cartridge will in storage be provided with a cap, not shown, fitting over the reduced portion 16, and with a sealing film 21 at its upper end.

To renew a cartridge in the pen, the cap 11 would be unscrewed and the old cartridge removed. A new cartridge will have its film 21 broken in some manner by pricking or scratching with a sharp instrument either before or after insertion into the barrel of the pen. When the cap 11 is screwed in place the projection 22 will come into contact with the film 21 and cause the follower 20 to be pressed slightly toward the ball of the pen to start the flow of ink toward the insert 14.

The insert 14 is shown as formed with a concave ball seat 23 and with radial feed channels 24 shown as four in number, although it will be understood that a less or greater number of channels may be provided as desired and in accordance with the character of the ink utilized. The insert 14 is also shown as formed with a surplus ink chamber 25, the opening of which chamber is surrounded by an unbroken concave surface between the opening of the chamber and the cutting through of the channels 24. The form of Fig. 3 omits the shoulders 26 which in the form of Figure 1 seats against the portion 12 of the pen and therefore, the neck 27 of the form of Fig. 3 can, if desired, be made slidable in the portion 12 and prevented from retrogression in use in any desired manner.

It is to be understood that the ball 28 which acts as a nib in the manner usual with this type of pen is retained in the tip by reaming or swaging of the material of the tip at the point 29 indicated in Fig. 4. It is also to be understood that the ball is retained between the inwardly flaring lip about the ball retaining opening 29 and the concave seat 25 and is provided with a small predetermined clearance to allow a film of ink to be carried upon the ball as it rolls to be deposited upon the paper to form the writing line.

In the form of Figs. 7 and 8, a portion of the material of the tip is removed as indicated at 30 to not contact the paper even though the pen is used as at low an angle as that indicated in Fig. 7.

In use the viscous ink moves downwardly in

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the feed channels 24 to form a body of ink in the annular space 31, Fig. 4, thus securing access to the surface of the ball. As the ball rolls a certain amount of the ink is deposited upon the surface to bear the writing, and surplus ink is wiped off from the ball at the point 31 in the chamber 25, assuming that the ball is revolving in the direction shown by the arrow on Fig. 4.

There will, therefore, be a body of surplus ink in the chamber 25 which will supplement the ink flowing to annular chamber 31 thus greatly improving the dependability of the pen for writing purposes.

It is obvious that the structure may be used without the cartridge 15, in which case the viscous ink or ink paste commonly used with this type of pen will be contained in the barrel 10 and passage 17 to feed to the radial slots 24 in the insert 14 or 14' and thus to the nib ball. In such use the follower 20 if utilized would slide in the barrel itself.

Minor changes may be made in the physical embodiments of the invention within the scope of the appended claim without departing from the spirit of the invention.

We claim:

A ball pointed pen comprising, in combination: a hollow barrel; a removable end portion opposite the writing tip of the pen; a renewable car-

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tridge seated in the barrel and provided with an ink follower; and an axial rod carried by said end projecting axially therein to initially press against said follower when the cartridge is full of ink.

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