

United States Patent

[11] 3,592,552

[72] Inventor **Curtis L. Malm**
Norwalk, Calif.
[21] Appl. No. **825,190**
[22] Filed **May 16, 1969**
[45] Patented **July 13, 1971**
[73] Assignee **The Gillette Company**
Santa Monica, Calif.

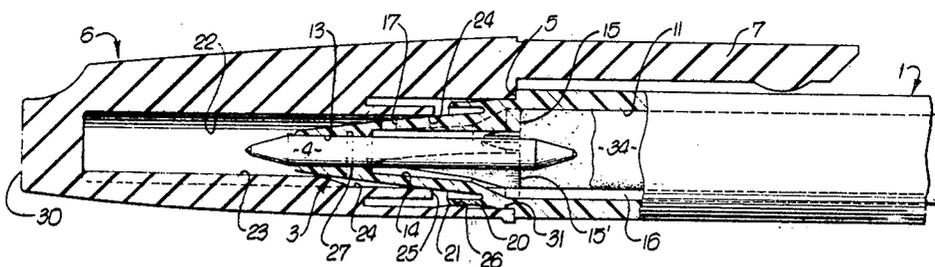
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Primary Examiner—Lawrence Charles
Attorney—Miketta, Glenny, Poms & Smith

[54] **WRITING INSTRUMENT**
5 Claims, 5 Drawing Figs.

[52] U.S. Cl..... 401/202,
401/199
[51] Int. Cl..... B43k 8/00
[50] Field of Search..... 401/98,
124, 202, 213, 243—247, 262, 269

ABSTRACT: A writing instrument having a forward writing point portion and a removable cap therefor, the cap and writing portions each including internal thin-walled collarlike cylindrical portions whose free ends cooperate with sections of the opposite removable port to provide a tight seal.



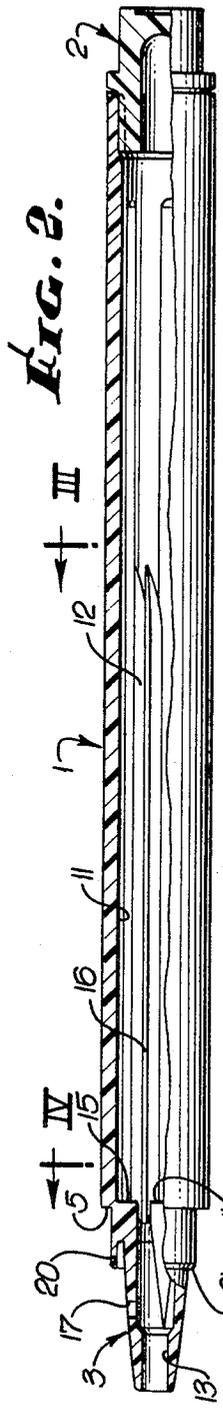


FIG. 1.

FIG. 2.

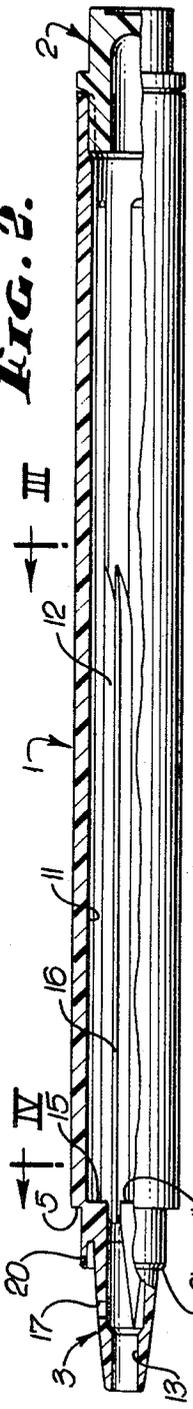


FIG. 3.

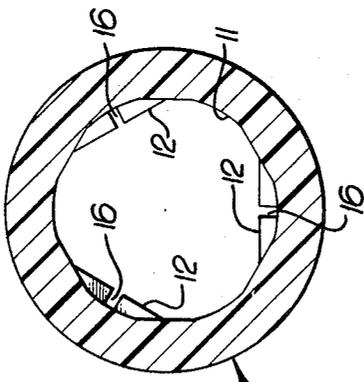


FIG. 4.

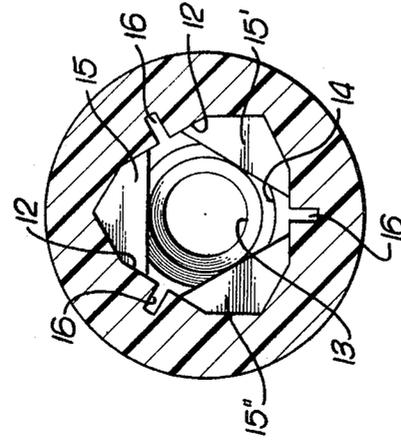
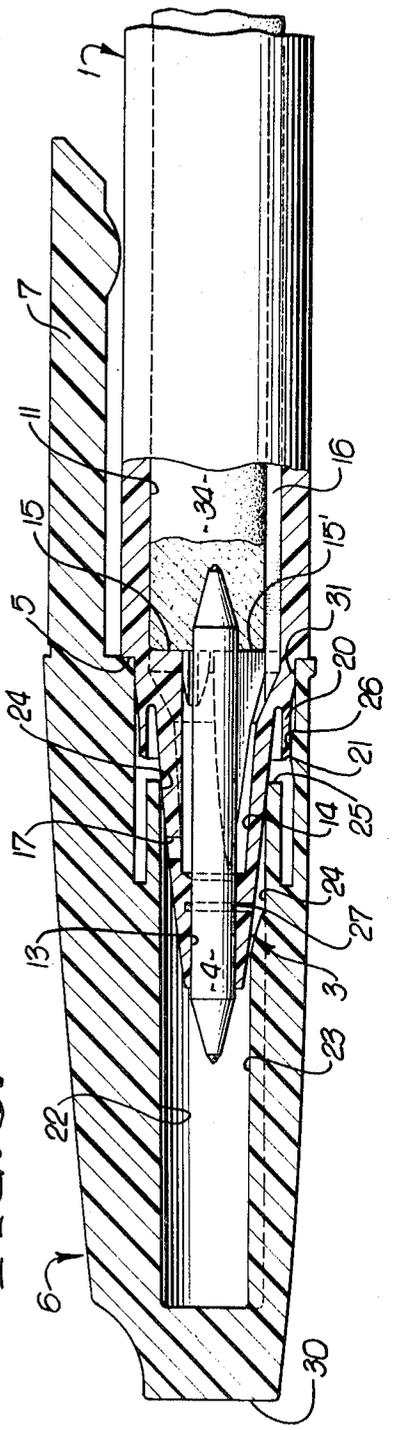


FIG. 5.



INVENTOR.
CURTIS L. MALM
By

Miketta, Glenn, Pons & Smith

ATTORNEYS.

WRITING INSTRUMENT

The present invention relates to an improved construction of a writing instrument which permits the manufacture of inexpensive, but very efficient, writing instruments. More specifically, the invention is directed to a writing instrument which includes a hollow barrel provided with a forwardly facing stop shoulder just to the rear of a forwardly extending, generally conical, writing point portion; although certain aspects of the construction are new per se, the invention also contemplates a novel and efficient removable cap for use with this writing instrument, portions of the barrel cooperating with certain portions of the cap so as to insure efficient and long utilization of the writing point and the ink employed in the writing instrument.

The term "writing point" as used herein may include the well known ballpoint tip and the so-called porous writing tip as well as other types of points, nibs or styli. However, particular attention will be directed to the utilization of the invention with a so-called porous point, the term "porous point" including any type of writing point in which ink is fed from a reservoir carried by the barrel to the actual writing end by channels exerting some capillary effect upon the ink so as to feed the ink from the reservoir to the writing point. Such points can be made from various fibrous materials, including both natural and artificial fibers (such as filaments, thread, tow or the like) composed of polyethylene, polyamides, polyesters, and other plastic materials either in extruded or drawn and hardened form. These various fibrous materials are formed into writing tips of desired rigidity and porosity by bonding the preferably generally aligned fibers or filaments with a suitable curable resinous adhesive. Other "porous points" may be made of sintered plastics, metals or ceramic materials in finely granular or powdered form.

An object of the present invention therefore is to disclose and provide an improved construction of writing instruments as herein broadly defined.

Another object is to disclose and provide an inexpensive writing instrument whose body or barrel is adapted to cooperate with a cap member, and proper centralization of the point within the cap and sealing of the writing point within the cap is attained.

Other objects and advantages will become apparent to those skilled in the art from the following description. For purposes of illustration, reference will be had to the appended drawings in which:

FIG. 1 generally indicates one form of writing instrument which may be made in accordance with this invention;

FIG. 2 is an enlarged view, partly in section, of a writing barrel made in accordance with the invention;

FIGS. 3 and 4 are transverse sections taken along planes III-III and IV-IV in FIG. 2;

FIG. 5 is an enlarged longitudinal section, partly in elevation, of a cap constructed in accordance with this invention in cooperating relation to an ink-filled pen barrel.

As generally indicated in FIG. 1, the writing instrument of the present invention includes a barrel 1 having a body of sufficiently large internal diameter to accommodate a suitable quantity of ink or a sufficiently large capillary type of absorbent cylinder adapted to hold and supply to the writing point an adequate amount of ink. The barrel 1 is preferably provided with an open rear end for the insertion of ink, reservoir filler, etc., such end being normally closed by a plug 2. The forwardly extending writing point portion 3 holds a suitable writing point 4 in position, and the entire writing point portion may be distinguished from the barrel per se as being that portion which is forward of shoulder 5. Such a writing instrument may be provided with a removable cap 6 of suitable artistic configuration, adapted to fit over the writing point portion of the instrument so as to protect the point from accidental breakage, the cap being provided with clip 7 whereby the capped instrument may be readily carried on the edge of a pocket.

The writing instrument barrel illustrated in FIGS. 2, 3 and 4 is particularly adapted for use with a rigid, porous point made of polyamide filamentary material, preferably aligned in general and bonded at discontinuously associated points while such fibers are under tension in the manner disclosed in copending U.S. Pat. application Ser. No. 560,405 (Goodenow, et al.). In the form illustrated in these FIGS. the barrel 1 is provided with a main chamber 11 which receives a preformed mass of porous absorbent material, saturated with ink, such material cooperating with the body of the barrel to provide a reservoir for ink.

The internal configuration of the chamber 11 may vary. In some instances, it may be desirable to have the walls of the chamber 11 include flattened areas such as 12, each provided with a groove 16 which extends longitudinally of the barrel for an appreciable portion of its length and is used as a means of supplying air from a vent opening located at one end of the barrel to the opposite end of the barrel. Venting or means of supplying air to the reservoir are highly desirable, and may comprise a small port 17. The forward end of the reservoir chamber 11 of the barrel is associated with and preferably integral with the writing point portion 3 located forwardly of the forwardly facing shoulder 5 formed in the outer surface of the writing instrument. The external configuration of the writing point portion 3 is preferably generally frustoconical and in the drawings is shown provided with an axially extending bore 13 adapted to snugly receive a writing point. This axial bore is rearwardly enlarged in order to place the area around the point in communication with the reservoir chamber 11. An enlarged somewhat conical internal chamber within the writing point is indicated at 14. As indicated by sections illustrated in FIGS. 3 and 4, the transition from the chamber 14 to the main reservoir chamber 11 is not smooth; the walls of chamber 14 may include three angularly related surfaces at 60° to each other, these surfaces in turn terminating in a transverse plane wherein each of the inclined longitudinally directed surfaces terminates in a rearwardly facing abutment surface area such as the abutment surface areas 15, 15' and 15''. This arrangement automatically provides three spaced transverse abutments against which the porous or absorbent ink-containing cartridge or reservoir filler 34 may abut and against which it can be stopped when it is introduced into the barrel 1 through the rear open end of such barrel.

As best indicated in FIG. 4, the three abutment surfaces 15, 15' and 15'', are equiangularly related and one or more of the longitudinally extending grooves 16 may be used for conducting air from around the writing point to the rear portion of the ink carrying filler in chamber 11. The grooves need not extend completely to the rear end of the chamber since in the form illustrated, the cross-sectional area of the chamber is gradually increased from front to rear so as to facilitate core withdrawal during injection molding of the entire barrel and writing point assembly. The rear portion of the barrel may not be completely filled with filler and will be receptive to air therearound.

Forwardly of the stop shoulder 5, the writing point is provided with a forwardly extending latch collar 20. The forward end portion of this cylindrical thin-walled collar is provided with an outwardly directed bead or bulge and tapered forwardly and inwardly as indicated at 21; the rear end of the collar is integral with the body of the writing point portion. It is to be noted that this latch collar has a concaved outer surface rearwardly of an outwardly extending bead or ridge formed by its forward edge 21: such concavity reduces the median thickness of the collar wall and insures flexibility thereof; in actual practice, the thickness of latch collar 20 at its zone of minimum thickness may be on the order of 0.016 inch to 0.02 inch. Moreover, the forward edge 21 of the latch collar is to the rear of the terminal forward portion of the writing point portion 3. The form of cap shown in the drawings is particularly adapted for use with pens employing so-called porous tips. It is very important to make certain that this type of pen does not expose its writing tip to the dehydrating action of ambient air unnecessarily when it is not in actual use. The con-

struction herein disclosed makes certain that the writing point is properly centered within its cap and that such point is sealed from atmosphere.

As shown in the drawings, the cap 6 is provided with a closed end 30 (into which point receiving bore 22 extends) and an open end 31 of larger internal diameter than the bore 22. The end portion 31 is a cylindrical wall portion which may be thin except for that part of the wall which is formed into the rib and clip 7. The end portion 31 is normally adapted to seat upon the forwardly facing stop shoulder 5 of the barrel.

The internal surface of the bore 22 is preferably provided with three equally angularly spaced inwardly extending ribs adapted to guide the writing point 4 and the forward terminal end portion of the conical writing point portion 3 of the barrel into the cap. One of such ribs is indicated at 23. Between the bore 22 and the larger end portion 31, the cap is provided with a thin-walled cylindrical sealing collar 24, such sealing collar having a free end 25 (directed toward the open end of the cap) while the rest of the collar is an integral part of the cap. The internal surface of the open end portion 31 of the cap is also provided with a plurality of angularly spaced dimples, such as 26. These dimples 26 are spaced from the end of the cap a shorter distance than the distance between the largest end portion of the latching collar 20, thereby insuring the location of the dimples 26 in position to contact the concave outer surface of the latching collar when the cap is in place with its end 21 seated on the stop shoulder 5.

When the cap is seated on shoulder 5 of the barrel, it is held there by the snap action of dimples 26 with respect to the outwardly directed bead of latch collar 20. Simultaneously, the free end 25 of sealing collar 24 contacts the gently tapering outer surface of point portion 3 and forms a seal which completely isolates the porous point 4 from the action of atmosphere.

FIG. 5 also illustrates one method of holding a porous point in position in bore 13 of the writing point portion of barrel 1, namely by means of a wire retainer 27 driven through the wall and point therein. The end plug 2 may be press fitted into the rear end of barrel 1, or may be similarly staked by means of a wire or may be adhesively secured to the barrel. In many instances, it is desirable to make the end 2 of the plug of a reduced diameter (adapted to fit into open end 21 of the cap) so as to permit the cap to be carried by the rear end of the barrel when the writing instrument is being used.

It will be evident from the above description and drawings that applicant has disclosed a simple and inexpensive construction, employing a minimum number of parts, which are preferably made of polypropylene or other plastic. The resilience of the plastic is utilized in the construction to provide the snap-on latch, shirt edge grasping, resilience to the clip bar 7 and a perfect air seal between point 3 and the thin sealing collar 24 which is protectively located within the opened portion 31. Assembly is rapid and foolproof. Various types of writing points can be employed. All changes coming within the scope of the claims are embraced thereby.

I claim:

1. In a writing instrument including a hollow barrel provided with a forwardly facing stop shoulder and a forwardly extending generally conical writing portion on said barrel and a

removable cap, the provision of:

a forwardly extending latch collar provided with a forwardly and inwardly tapered forward edge carried by the writing point portion with said forward edge spaced rearwardly from the front of the writing point portion and radially outwardly from said writing point portion, said collar having a concaved outer surface rearwardly of its forward edge; and a removable cap for said writing point portion, said cap having a cylindrical wall portion with an open end, the end of said wall at such open end being adapted to seat on a forwardly facing stop shoulder on the barrel; the internal surface of said cylindrical wall portion of the cap including a plurality of inwardly extending angularly related dimples adapted to contact the concave surface of the collar when the end of the cap wall is seated on the stop shoulder.

2. A writing instrument as stated in claim 1 wherein the cap is provided with an integral clip bar extending beyond said open end of the cap into proximity with the barrel.

3. A writing instrument as stated in claim 1 wherein the cap has a closed end opposite said open end and a point-receiving bore extending into said closed end, said bore being of smaller diameter than said open end, and a thin-walled cylindrical sealing collar positioned within and unitary with the cap between said bore and open end, said sealing collar having a free end facing the open end and being free to adjustably position itself in sealing relation to the writing point portion of a writing instrument inserted into said cap.

4. A writing instrument as stated in claim 1, said cap being provided with a closed end opposite said open end and a point-receiving bore extending into said closed end, said bore being of smaller diameter than said open end.

5. In a writing instrument including a removable unitary cap and clip and a barrel, the provision of:

said cap having a closed end and an open end, a bore extending into the closed end, said bore being of smaller diameter than the inner diameter of the open end;

a thin-walled cylindrical sealing collar extension of said bore positioned within and unitary with the cap between said bore and open end, said sealing collar having a free end facing the open end and being free to accept and sealingly contact the outer surface of a writing point portion of a writing instrument inserted into said cap;

a clip bar integral with said cap, said bar having a surface parallel to the bore axis of the cap but spaced therefrom and extending beyond said open end, said cap and clip bar being composed of an organic plastic whose resiliency is reflected and utilized in the clip bar; and

said barrel having a forwardly facing stop shoulder and a forwardly extending generally conical writing portion, said writing portion integrally carrying a forwardly extending inwardly tapered latch collar having a forward edge spaced rearwardly from the front of the writing portion and radially outwardly from said writing portion, said cap including inwardly extending means adapted to contact said latch collar outer surface so as to retain said cap on said barrel when the end of the cap abuts said barrel stop shoulder.

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