

[54] POINT PROTECTORS FOR WRITING IMPLEMENTS
[75] Inventor: Edward A. Smagala-Romanoff, Beverly, Mass.
[73] Assignees: Charles F. Coles; Christopher M. Weld; Sally C. Leighton; Henry Hornblower; Michael J. Perrin; John Gikas; James Tenn; Campbell Steward, Topsfield, Mass.

895,511	8/1908	Sturgis	401/91
2,435,185	1/1948	Reynolds	401/117
2,559,555	7/1951	Zepelovitch	401/117 X
2,649,074	8/1953	Burchett	401/117
2,136,979	11/1938	Mureau et al.	401/117

FOREIGN PATENTS OR APPLICATIONS

436,038	7/1948	Italy	401/117
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Primary Examiner—Lawrence Charles
Attorney—Maurice R. Boiteau

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Related U.S. Application Data

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[51] Int. Cl. B43k 7/12
[58] Field of Search 401/117, 59, 60, 401/107, 108, 91

References Cited

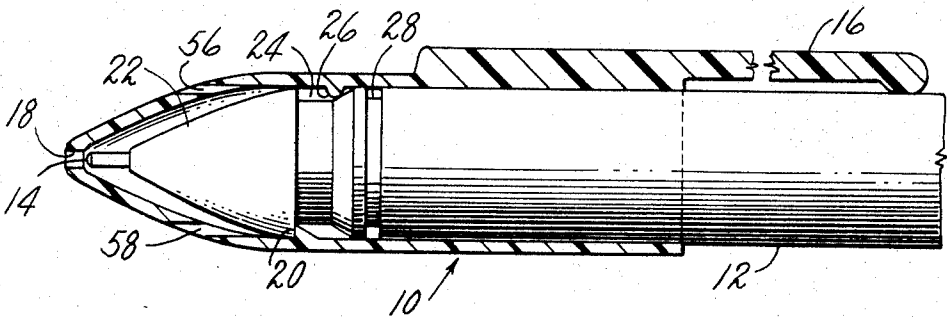
UNITED STATES PATENTS

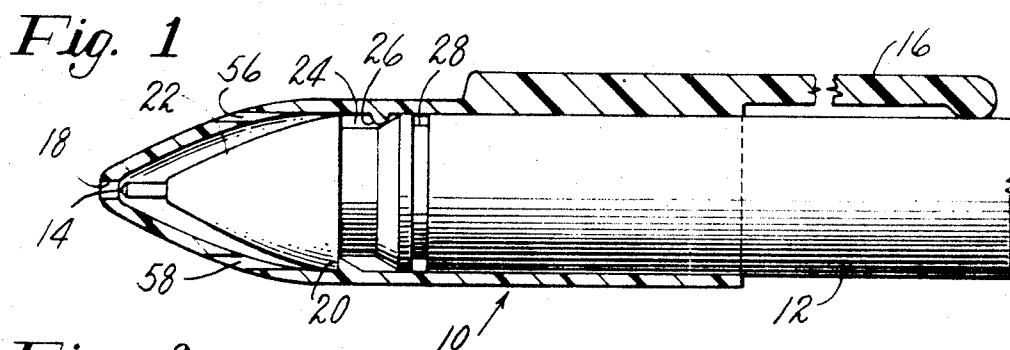
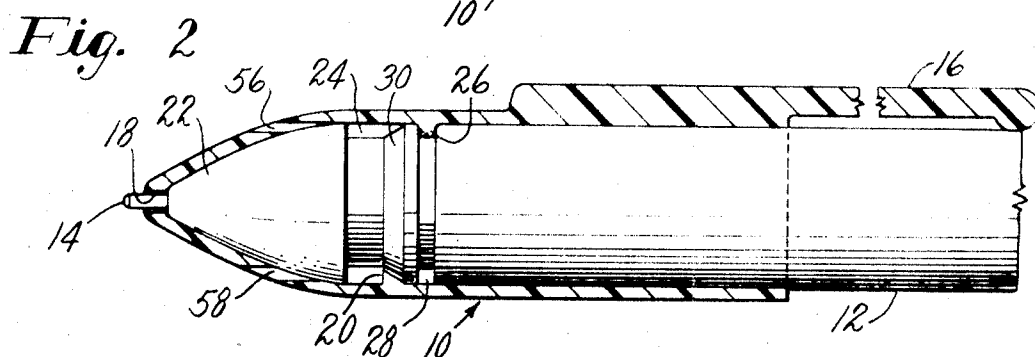
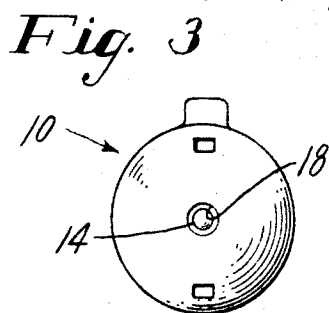
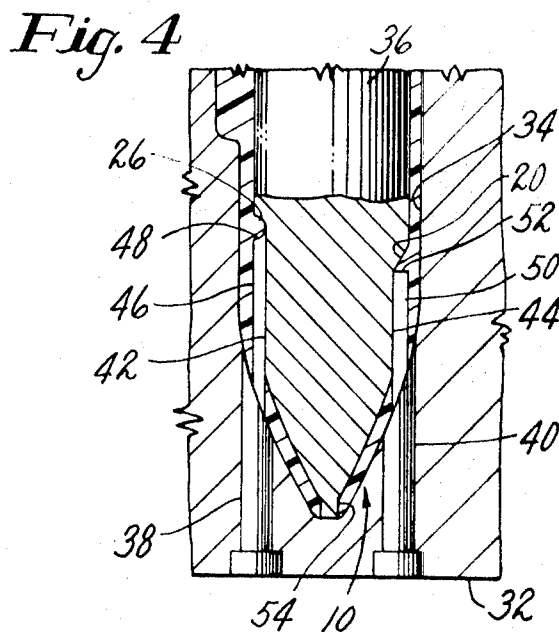
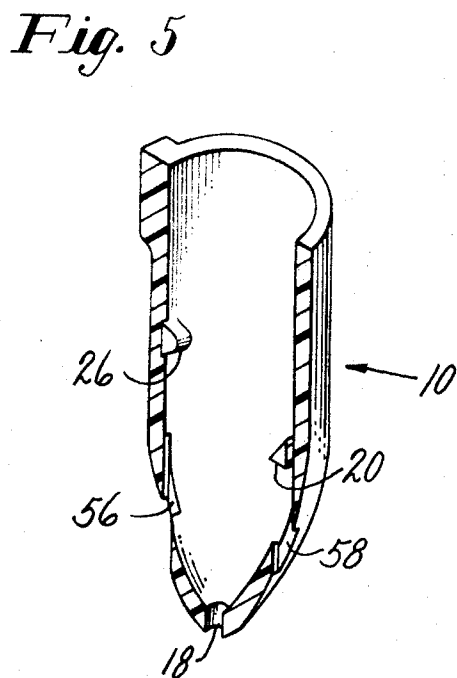
866,148 9/1907 Levingston..... 401/91

[57] ABSTRACT

There is disclosed in the present application a point protector for a writing implement such as a ball point pen, which is moldable with internal retaining and indexing projections. The molding operation and the mold for the production of the protector are simplified by providing openings in alignment with the projections through which stationary core rods are introduced into the mold cavity.

1 Claim, 5 Drawing Figures





Inventor
 Edward A. Smagala-Romanoff
 By his Attorney
 Maurice R. Boiteau

POINT PROTECTORS FOR WRITING IMPLEMENTS

This application is a continuation in part of my earlier application for U.S. Letters Patent Ser. No. 66,764 filed Aug. 25, 1970.

The present invention relates generally to improvements in caps or point protectors for writing implements such as ball point pens, but more particularly to such protectors intended to be retained captive on the pen body or barrel and either retracted to expose the writing point or advanced to a point shielding position. Another aspect of the invention relates to improvements in mold for producing such point protectors and to the method of molding.

There is discarded in my co-pending application a protective cap or point protector for writing implements generally similar in design and function to the present one. The prior cap, however, requires for its production molds which include a plurality of moving parts in each cavity. Such molds are relatively expensive to construct and also generally result in lower production rates with consequently further increased cost. In inexpensive ball point pens of the type to which the cap is most reasonably applicable, minor increases in costs, because of the very large quantities produced and the extremely low selling price of each unit, may render a captive point protector economically unfeasible.

It is accordingly a general object of the present invention to provide a point protector or cap for writing implements, which may be produced economically in large quantities.

Another object is to provide a method and apparatus for producing such caps economically.

Still another object is to facilitate the installation of captive point protectors upon pen bodies.

The foregoing objects are achieved in a unitary, centrally perforated molded cap which, when retracted, exposes the point of a writing implement and which is held captive on the barrel of the writing implement by a pawl and a detent formed on the interior of the cap. Preferably, the detent and pawl are formed at diametrically opposite points on the interior of the cap and according to a feature of the invention each is in alignment with an opening in the otherwise essentially closed end of the cap. As a result of the opening, it is possible to produce the cap in a simple mold in which molding rods held stationary in the female half of the mold form undercut surfaces on the interior of the cap. The method and mold are not only less expensive to manufacture but permit more rapid opening of the mold cavity after molding and thereby result in increased production.

The foregoing objects, features and numerous advantages of the present invention will be best understood from a detailed description of an illustrative embodiment taken in connection with the accompanying drawings in which:

FIG. 1 is a view in side elevation of a pen bearing a cap or point protector according to the present invention, the cap being shown in longitudinal section for clarity and advanced to a point shielding position;

FIG. 2 is a view similar to FIG. 1 but showing the cap retracted to expose the writing point of the pen;

FIG. 3 is an end view of the cap shown in FIGS. 1 and 2;

FIG. 4 is a fragmentary detail drawing of a portion of a mold for producing the cap depicted as part of the previous ; and

FIG. 5 is a fragmentary detail view in longitudinal section showing the interior construction of the cap.

Referring now to the drawings, there is shown a point protector or cap indicated generally at 10 mounted upon a pen having a barrel 12 terminating in a writing ball 14. The cap 10 depicted in the drawings is one which includes a clip 16 which may optionally be molded integral with the cap and used for securing the cap to a pocket, for example.

The cap 10 is centrally perforated at 18 to expose the writing ball 14 when the cap is retracted to the position depicted in FIG. 2. On the interior of the cap, there is an integrally molded pawl 20 which slides easily over the tapered nose 22 of the barrel 12 and is thereafter retained in an annular groove 24 formed for this purpose with a square shoulder at the end of the groove nearest the ball 14. There is also formed on the interior of the cap 10 a generally semicylindrical detent projection 26 located at a greater distance from the perforated end of the cap than the pawl 20 and preferably diametrically opposite from it. The barrel 12 is also provided with a second but narrower annular groove 28 into which the projection 26 drops when the cap 10 is retracted to expose the ball 14. When the cap 10 is advanced to shield the ball 14, the projection 26 drops into the groove 24 which is closed at its rearward end by a conical surface 30 over which the projection 26 rides under the influence of nominal force to the groove 28. The surface 30 also complements the back surface of the pawl 20. The annular grooves 24 and 26 eliminate the need for orientation of the pen body for the installation of the cap 10.

A single cavity mold for producing the cap already described is fragmentarily depicted in FIG. 4 and includes a lower mold member 32 in which there is formed a cavity 34 corresponding in shape to the exterior of the cap 10. The interior shape of the cap 10 is produced by a central generally cylindrical core 36 co-operating with core rods 38 and 40 which are fixedly mounted in the lower member 32. The rods 38 and 40 are cylindrically piloted and headed for a press fit in the block 32 and fit slots 42 and 44 respectively in the core 36. The rod 38 is formed with an outer surface 46 generally matching the cylindrical surface of the core 36 and an upper surface 48 adapted to mold the lower half of the detent projection 26. The surface 48 is accordingly approximately 90° of a small circle. Similarly an outer surface 50 on the rod 40 matches the cylindrical surface of the central core 36 and an upper surface 52 is flat to form the underside of the pawl 20. The central core 36 is formed to provide a generally uniform thickness to the cap and is also formed with a pilot 54 for coring the central perforation 18.

The rods 38 and 40 form openings 56 and 58 respectively in alignment with the projection 26 and the pawl 20 but these openings have no effect on the functional characteristics of the point protector. However, an important advantage is that a cap produced in the mold is withdrawn from the cavity by being carried upon the central core 36 from which it may readily be stripped mechanically. Since there is minimum relative motion between parts of the mold, opening and closing of the mold consumes a minimum of time.

It will of course be understood that the single cavity mold is merely illustrative and that molds having large numbers of cavities conventionally gated, vented and designed in details other than those already described may be of usual construction.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A readily moldable point protector adapted for captive mounting upon the working end of a writing implement comprising a unitary elongated shell of molded plastic material open at one end defined by a wall free of open-ended slots and substantially closed at the other end, a central perforation in the closed end, a pawl of limited circumferential extent formed on the

interior of one shell intermediate the ends, an internal detent projection angularly separated from the pawl about the axis of the shell and farther than the pawl from the closed end, a first mold member access opening in addition to the central perforation through the closed end in alignment with the pawl, the first opening being of a size at least equal to the maximum cross-sectional area of the pawl and a second mold member access opening in alignment with the detent projection and of a size at least equal to the maximum cross-sectional area of the projection, whereby undercut surfaces of the pawl and projection may be readily stripped from the mold.

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