

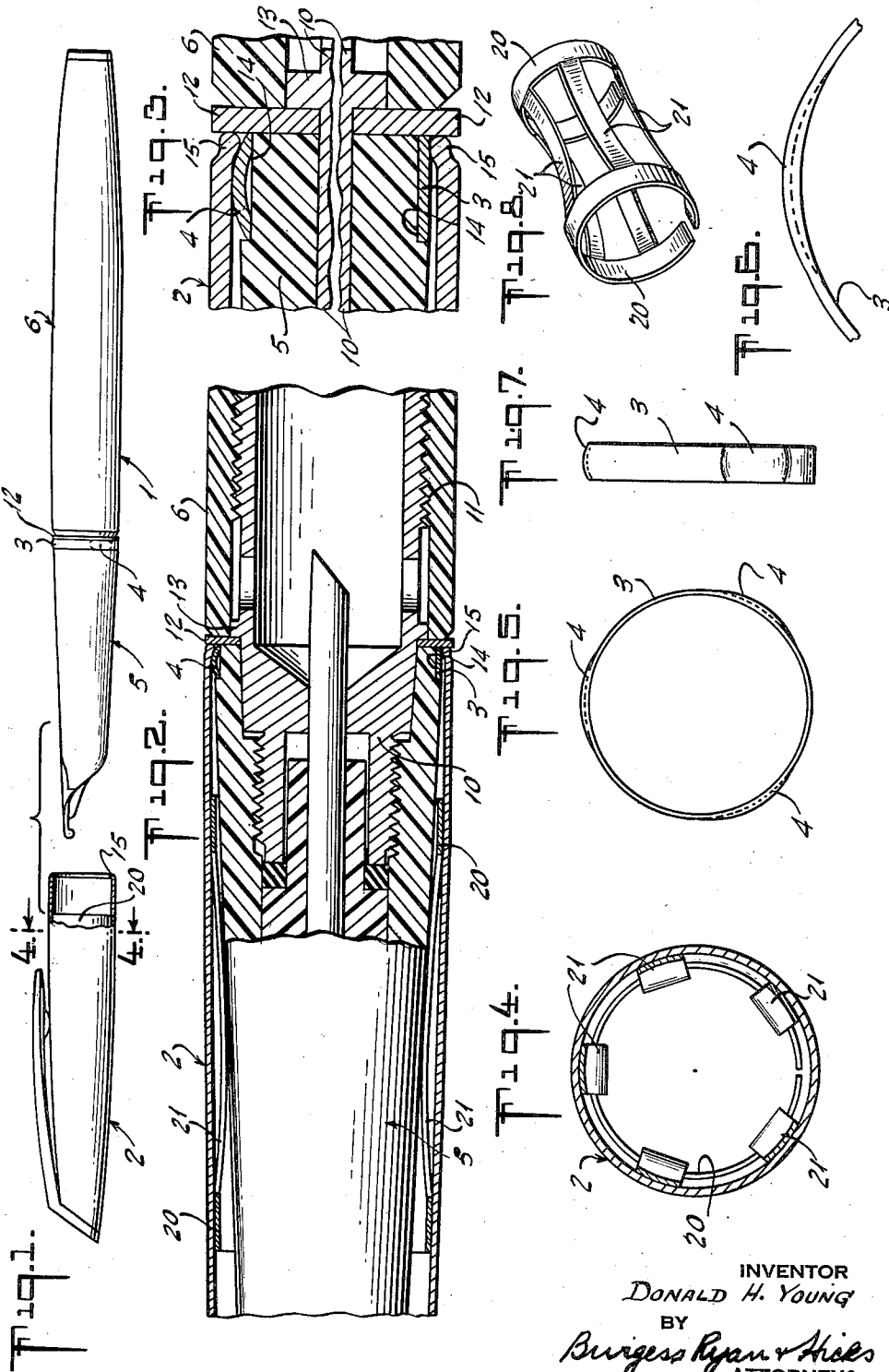
Feb. 26, 1957

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2,782,762

SNAP-ACTION CAP FOR FOUNTAIN PEN OR THE LIKE

Filed Sept. 7, 1955



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2,782,762

SNAP-ACTION CAP FOR FOUNTAIN PEN OR THE LIKE

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Application September 7, 1955, Serial No. 532,970

10 Claims. (Cl. 120—42.01)

The invention relates to fountain pens, pencils and similar objects having a body portion which for convenience will be referred to as a barrel and a cap adapted to be slipped over one end for protective purposes and removed when the device is to be used.

The principal object of the invention is to eliminate that type of cap and barrel engagement which depends upon the cap being more or less wedged on a tapered portion of the barrel and provide, instead, a snap interlock which is positive in action and fool-proof and which avoids any marring of the barrel as the result of the repeated application and removal of the cap.

In general, the invention involves the provision of a cap stop at a suitable position lengthwise of the barrel, a cap having a circular end opening defined by an inwardly projecting bead and a plurality of humps spaced around the barrel adjacent but ahead of the cap stop, leaving a bead-receiving space between the humps and the stop, the humps being dimensioned to spring the cap bead to out-of-round shape in its passage over the said humps into the bead space.

Throughout this specification and in the claims the expressions "ahead of," "forwardly of" and the like mean in the direction of that end of the device to which the cap is to be applied for protective purposes (the point end, in other words, in the case of a writing instrument).

For purposes of illustration the invention is shown in the drawings and is described herein as applied to a fountain pen but it will be apparent that its utility is by no means limited thereto.

In the accompanying drawings:

Fig. 1 is a side elevation of a cap and fountain pen embodying the invention;

Fig. 2 is an enlarged, broken-out, longitudinal section of a portion of the pen, with the cap applied to it;

Fig. 3 is a still further enlarged, broken-out, longitudinal section of the interlocking portions of the pen and cap;

Fig. 4 is an enlarged transverse section on the line 4—4 of Fig. 1;

Fig. 5 is an end view of a ring element;

Fig. 6 is a broken-out, enlarged end view of a portion of the ring element;

Fig. 7 is a side view of the ring element; and

Fig. 8 is a perspective view of a preferred form of spring guide element.

The barrel of the pen, which may be assumed to be made of hard rubber or plastic, is generally designated 1 and the cap, which is preferably of metal, is marked 2.

In this preferred form of the invention, the cap locking humps are not formed directly on the barrel but on a ring or band 3 applied to it, the ring also being preferably of metal. As shown, the ring is generally flat and the humps 4 are outwardly formed so as to be rounded as viewed in section transversely of the band (Fig. 3). Three equally spaced humps are preferred.

The pen illustrated is of the type having a separable

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forward barrel portion 5 (or section, as it is sometimes called) which carries the nib and feed. The rear or main portion 6 of the barrel, in this instance, is designed to receive an ink cartridge (not shown) the forward end of which is seated in a coupling or ferrule 10 secured in barrel portion 5 and exteriorly threaded at 11 to receive the rear or main part 6 of the barrel. The details of the cartridge mounting, feed, etc. form no part of the present invention.

In accordance with the invention, the barrel is formed or provided with a cap stop to limit the cap movement onto the barrel and, in the type of pen illustrated, this stop is conveniently located at the juncture of the two barrel portions. The illustrated stop consists of a washer 12 which is clamped against the rear end of barrel section 5 by flange 13 of coupling 10 (Fig. 3). As will be seen, the washer not only forms a shoulder or abutment for engagement by the cap but also serves to lock the ring 3 against rearward movement when barrel 6 is removed. The ring is seated on a slightly reduced diameter and portion 14 (Fig. 3) of barrel section 5 so that, except for the humps, its outer surface is substantially flush with the adjacent surface of barrel section 5.

The open end of cap 2 is spun or otherwise formed to provide an inwardly projecting bead 15, which serves to reinforce it and also provides material which can be accurately sized to provide the desired circular end opening. The opening defined by the cap bead, and the humps, are so dimensioned that, when the cap is applied, the bead engages the humps and then, as sufficient pressure is applied, the humps serve to spring the bead slightly out-of-round as it moves over them. Of course, the bead is not permanently deformed by this action but returns to its circular form after it has passed over the peaks of the humps. As indicated, the bead is rounded so as to be more readily movable over the ring humps. It will also be noted that the curvature of the humps serves to space their peaks from the washer; in other words, there is a bead space between the humps and the washer into which the bead snaps when the cap is fully applied (Fig. 3).

It will be seen that when so applied the cap is locked in place against inadvertent endwise movement. However, it does not engage the barrel over any extended length and hence, unless prevented, would tend to rock laterally about its beaded end and feel insecure. Accordingly means are provided for holding the cap against such rocking and also for guiding or centering it as it is applied to the barrel. Suitable yielding means disposed within the cap itself serve these purposes.

In the illustrative embodiment, such means consists of a sheet metal unit stamped out of flat stock and then formed up to more or less cylindrical shape to provide end ring portions 20 and spaced elements 21 which are inwardly bowed. The inwardly bowed elements 21 engage the forward barrel portion, serving both to center the cap as it is being applied and to hold it against rocking when the cap is snapped home. As will be recognized, the elements 21 serve as springs, yielding as necessary to receive the barrel section 5. The unit is preferably coated with rubber or plastic so that the longitudinally disposed spring elements can slide on the barrel without marring it. The unit is formed up of a diameter slightly larger than the internal diameter of the cap, so that when slightly compressed and inserted in the cap and released, the ring portions 20 will expand and engage the cap wall and hold the unit in place.

In the light of the foregoing description of the preferred form of the invention and with the understanding that such form is illustrative only, the following is claimed:

1. In a writing instrument or the like having a barrel incorporating a cap stop, the combination therewith of

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a cap having a circular end opening defined by an inwardly projecting bead, a plurality of humps spaced around the barrel adjacent but ahead of the cap stop to form a bead space between the humps and stop, the said humps being dimensioned to spring the cap head to out-of-round in its passage over the said humps into the said bead space.

2. In a writing instrument or the like having a barrel incorporating a cap stop, the combination therewith of a cap having a circular end opening defined by an inwardly projecting bead, three humps equally spaced around the barrel adjacent but ahead of the cap stop to form a space between the humps and stop adapted to receive the said bead, the said humps being dimensioned to spring the cap bead to out-of-round in its passage over the said humps into the said bead space.

3. In a writing instrument or the like having a barrel incorporating a cap stop, the combination therewith of a cap having a circular end opening defined by an inwardly projecting bead, a ring encircling the barrel adjacent and forwardly of the said stop, a plurality of humps spaced around the ring, the said humps being dimensioned to spring the cap bead to out-of-round in its passage over the said humps into engagement with the said cap stop.

4. In a writing instrument or the like having a barrel incorporating a cap stop, the combination therewith of a cap having a circular end opening defined by an inwardly projecting bead, a flat band encircling the barrel on the forward side of the cap stop, a plurality of humps spaced around the band and forming a bead space between the humps and stop, the said humps being dimensioned to spring the cap bead to out-of-round in its passage over the said humps into the said bead space.

5. In a writing instrument or the like having a barrel incorporating a shoulder forming a cap stop, the combination therewith of a cap having a circular end opening defined by an inwardly projecting bead, a ring encircling the barrel adjacent the shoulder on the forward side thereof, the outer surface of the ring being substantially flush with the surface of the barrel ahead of the ring, a plurality of humps spaced around the ring and forming a bead space between the humps and shoulder, the said humps being dimensioned to spring the cap bead to out-of-round in its passage over the said humps into the said bead space.

6. In a writing instrument or the like having a barrel incorporating a shoulder forming a cap stop, the combination therewith of a cap having a circular end opening defined by an inwardly projecting bead, a plurality of humps spaced around the barrel adjacent but ahead of the cap stop and forming a bead space between the humps and stop, the said humps being dimensioned to spring the cap bead to out-of-round in its passage over the said humps into the said bead space and centering means disposed within the cap for engagement with a portion of the barrel.

7. In a writing instrument or the like having a barrel incorporating a cap stop, the combination therewith of a

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cap having a circular end opening defined by an inwardly projecting bead, three humps equally spaced around the barrel adjacent but ahead of the cap stop to form a space between the humps and stop adapted to receive the said bead, the said humps being dimensioned to spring the cap bead to out-of-round in its passage over the said humps into the said bead space and yielding centering means disposed within the cap for engagement with a portion of the barrel.

8. In a writing instrument or the like having a barrel incorporating a cap stop, the combination therewith of a cap having a circular end opening defined by an inwardly projecting bead, a plurality of humps spaced around the barrel adjacent but ahead of the cap stop to form a bead space between the humps and stop, the said humps being dimensioned to spring the cap bead to out-of-round in its passage over the said humps into the said bead space and a series of inwardly bowed, longitudinally disposed spring elements mounted within the cap adapted to engage a portion of the barrel.

9. In a writing instrument or the like of the kind having a main barrel portion and a forward, removable barrel section, the improvement which comprises: a ring mounted on a reduced end portion of the forward barrel section and having a plurality of spaced humps projecting beyond the adjacent surface of the forward barrel section; a washer rearwardly of the ring adapted to secure it against removal; means for locking the washer to the forward barrel section, the said washer being adapted to form a cap stop spaced from the humps; and a cap having an end opening defined by an inwardly projecting bead adapted to snap over the humps into the space between the humps and the washer.

10. In a writing instrument, front and rear barrel sections, a coupling member longitudinally separably connected to said front barrel section, a cap stop member clamped in fixed position between said coupling and said front barrel section, means providing a detachable connection between said coupling and said rear barrel section, circumferentially spaced peripheral projections on said forward barrel section adjacent but ahead of said cap stop so as to leave a small longitudinal space therebetween, and a snap action cap movable longitudinally over said front barrel section having at its open end an in-turned annular edge portion defining a circular opening and adapted to resiliently deform out of round during passage over said projections and then snap into said space before abutting said cap stop.

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