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3,225,745

PLUNGER LATCH FOR A BALL-POINT PEN

Original Filed Aug. 11, 1961

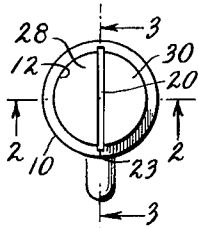


FIG. 1

FIG. 3

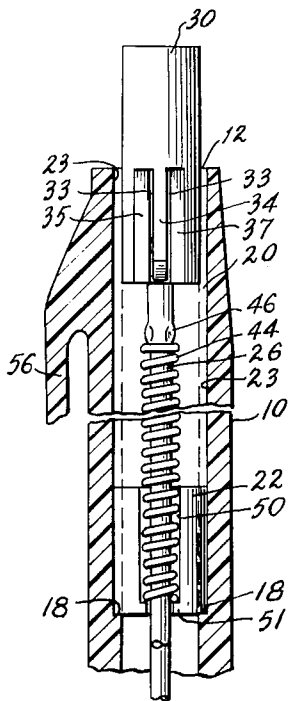


FIG. 7

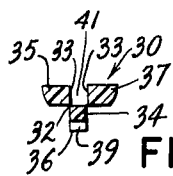
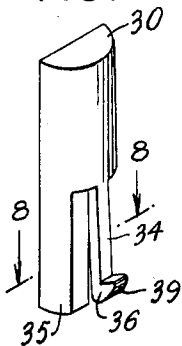


FIG. 8

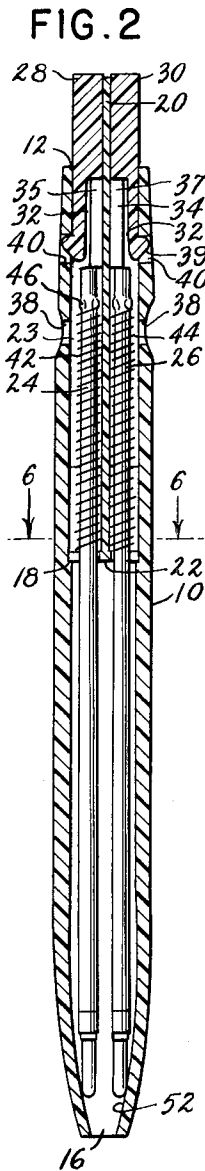


FIG. 2

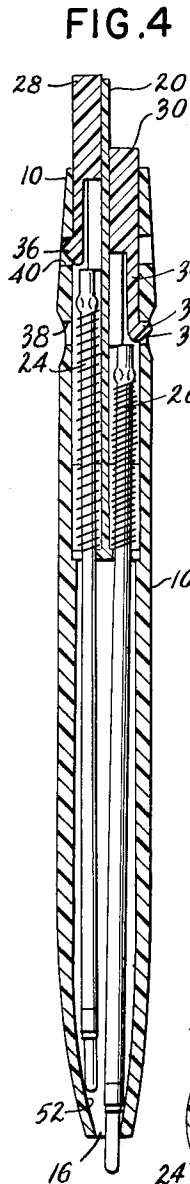


FIG. 4

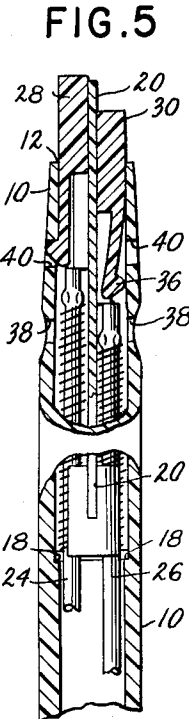


FIG. 5

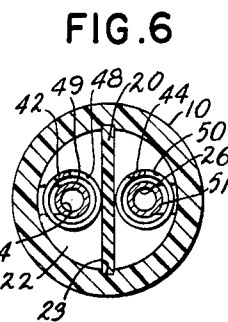


FIG. 6

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3,225,745

PLUNGER LATCH FOR A BALL-POINT PEN

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Original application Aug. 11, 1961, Ser. No. 130,851, now Patent No. 3,143,101, dated Aug. 4, 1964. Divided and this application Dec. 16, 1963, Ser. No. 330,758
1 Claim. (Cl. 120—42.03)

This application is a division of my application Serial Number 130,851 filed August 11, 1961, now Patent Number 3,143,101.

My invention relates to a ball-point pen wherein a cartridge may be propelled and retracted and more particularly to a plunger latch for projecting the cartridge of such a pen.

The objects of the invention are to provide a plunger latch for engaging the catch of the pen that is of minimum length, to reduce the overall length of the pen; to provide a latch capable of swinging in an arc having a length no less than the thickness of the plunger, to obtain maximum flexibility and strength; that may be made hollow to reduce the weight of the plunger; and which nevertheless is capable of perfect alignment in the barrel for insuring the integrity of the latch engagement.

I accomplish these and other objects and obtain my new results as will be apparent from the device described in the following specification, particularly pointed out in the claim, and illustrated in the accompanying drawing in which:

FIGURE 1 is a top view of a pen incorporating the novel plunger latch,

FIGURE 2 is a longitudinally sectional view taken in the plane 2—2 of FIGURE 1,

FIGURE 3 is a similar fragmentary view taken in the plane 3—3 of FIGURE 1,

FIGURE 4 is a view similar to FIGURE 2 but with a cartridge propelled into writing position,

FIGURE 5 is a similar view with the cartridge partially propelled,

FIGURE 6 is a transverse sectional view taken in the plane 6—6 of FIGURE 3,

FIGURE 7 is a perspective view of the plunger and associated latch,

FIGURE 8 is a transverse sectional view taken in the plane 8—8 of FIGURE 7.

Referring more in detail to the drawing, reference numeral 10 designates a one-piece barrel having an opening 12 into which a multi-cartridge unit assembly is inserted. The barrel is provided with a ball point opening 16, and a seat 18 for positioning the assembly.

The cartridge assembly unit comprises a longitudinally extending separator 20, terminating in a transversely extending spacer 22. The separator divides the upper barrel compartment 23 into the number of units corresponding to the number of cartridges employed. In the embodiment illustrated, a two cartridge unit is utilized by way of example, containing cartridges 24 and 26. The separator constitutes a thin diametric wall extending from the spacer to the outside of the opening 12 where it separates the plungers 28 and 30, used for adjusting the cartridges. The separator may fit into longitudinal slots 23 extending in the wall of the barrel. This would prevent accidental rotation and help orient the plungers.

The plungers are partially slotted as at 32 and 33 to form shape retaining legs 35 and 37, and an intermediate springy leg 34 having a latch 36 extending from the end thereof.

The barrel of the embodiment is formed with two catch openings 38 and 40 representing the propel and retract positions of the cartridges. The latch 36 springily engages the wall of the openings to snaplock the cartridge into the

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opening, when in each of the two positions. Springs 42 and 44 encircle the cartridges for biasing the cartridge into each of the positions. Ears 46 extend laterally from the cartridge to engage the spring which rests on the spacer 22. This forces the cartridges against their respective plungers. Pressure is thus exerted between the latch 36 and the spacer upon which spring rests. Openings 48 and 50 are provided in the spacer 22 through which the cartridges extend. The openings are spaced sufficiently apart to enable the springs to be independently operable, without interference. The springs rest on the flanges 49—51 formed at the bottom of openings 48 and 50.

The propel-retract mechanism 14 comprising the separator with spacer, cartridges, springs, and plungers, may be inserted as a unit into the barrel, until the spacer reaches the seat 18. The plungers are individually depressed until the respective latches are located in the catch openings 40 constituting the retract position. In this position the springs are under sufficient pressure to hold the entire assembly secured in position in the barrel.

Upon selecting the cartridge to be propelled, the corresponding plunger is depressed, causing the respective latch to be cammed out of catch opening 40 until it reaches catch opening 38 where the latch will engage the wall thereof, against the action of the spring.

When it is desired to retract the cartridge, the latch is depressed in opening 38 until the latch is free of the wall of the barrel. The cartridge encircling spring will drive the plunger away from opening 38 until the latch reaches opening 40. At this point the latch will project itself through the opening engaging the wall thereof.

The latch 36 is provided with a camming surface 39 to allow the catch to be inwardly sprung to free it from its respective opening when either the plunger is depressed, or the latch is depressed by the finger.

The inner barrel taper 52 adjacent the ball point opening 16 will cam the cartridge slightly off its longitudinal position to enter the opening. The cartridge may be made flexible, or the openings 48 and 50 in the spacer 18 may be slightly elongated to permit the ball point to tilt slightly when entering the central opening.

The plunger may be made of springy plastic with the latch outwardly biased in position, to provide the necessary snap action when the latch reaches the catch opening. The hollowed portion 41 is formed in the plunger to permit the latch to be accommodated without interference between legs 35 and 37, when the latch is depressed from its position in the catch, and to reduce its weight.

The barrel opening 38 corresponding to the propelled position of the cartridge, may be externally grooved, as shown to permit the nail of the finger to be guided against the latch, to facilitate depressing and unlatching the plunger. This convenience is not necessary in upper catch opening 40 from which position the latch is normally disengaged by direct axial pressure on the plunger. The selected propel-retract mechanism requires minimum space in the barrel. Other mechanisms may also be employed where the overall diameter of the pen barrel is not controlling.

The multi-cartridge pen is exceptionally easy to assemble and operate. Any cartridge may be replaced by simply depressing the corresponding latch from upper catch opening 40, which frees the plunger, cartridge, and associated spring.

The clip 56 may be molded to the one-piece barrel when forming the same.

The plunger latch so described achieves the desired objects of the invention, with respect to the reduction in weight, maximum flexibility and movement of the latch; and ability to maintain itself in the barrel in perfect alignment without tilting to insure the security of its position in either the project or retract position, while reducing the

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plunger length to permit a reduction in the overall length of the pen.

I have thus described my invention, but I desire it understood that it is not confined to the particular form or use shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of my invention, and therefore I claim the right to employ all equivalent instrumentalities coming within the scope of the appended claim, and by means of which objects of my invention are obtained and new results accomplished, since the particular embodiment herein shown and described is only one of the many that can be employed to obtain these objects and accomplish these results.

I claim:

A cartridge positioning member for a ballpoint pen, said pen having a barrel provided with a catch, said cartridge positioning member comprising a body having oppositely positioned extending rigid portions defining a hollow passageway extending transversely across the entire rigid portions, forming openings at both ends, and an extending resilient member formed into a latch for engaging

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said catch, said latch having a dimension in the direction of movement equal to the transverse distance of the passageway across said rigid portions, and movable into the hollow passageway providing maximum clearance for the latch, said rigid portions terminating in a cartridge-engaging means for positioning a cartridge thereby.

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