

PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

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Improvements in Pencil Holders.

I, WALLACE CRANSTON FAIRWEATHER, M.A., of British nationality, of 62, Saint Vincent Street, Glasgow, and 65—66, Chancery Lane, London, W.C., do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 Certain known types of pencil-holders or so-called propelling pencils are so constructed that on the application of pressure to the head or button, coupling and feeding means are operated to act upon
15 a centrally guiding push rod which affords an abutment to the pencil-lead or propels it forward, and, on the return movement of the head or button, remains in its adjusted position together with the pencil-lead. In the pencil-holders heretofore known there is provided a toothed
20 push rod, which is moved forward, on pressing a spring-pressed head, by the aid of a spring-pressed pawl engaging the push rod, and which is locked when the pawl is released. The means for feeding and locking the lead are liable to be broken and are unreliable in operation.

25 These drawbacks are obviated by the present invention in which the push rod, which is to support or to hold the lead against upward thrust, is locked by a coupling consisting of a hollow cone and an annular frame, carrying a series of
30 balls surrounding the push rod inside the hollow cone. By giving a relative movement to the hollow cone and the ball-carrier frame the clamping action may be discontinued so that the push rod
35 together with the lead is free to fall forward.

In the accompanying drawings three constructions of pencil-holder embodying the invention are shown.

40 Fig. 1 is a longitudinal section of a
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pencil-holder, having a coupling which, when opened, releases the push rod.

Figs. 2 and 3 show pencil-holders in which by the aid of the coupling the feed of the pencil can be effected.

In the construction shown in Fig. 1 the main tubular body or casing 1 of the holder is firmly connected with a tube 2, projecting from the body at its open end. Inside the tube, at a point between the ends, there is a hollow cone 3, within which is slidable a ball carrier having in the construction shown the shape of a cone 4. In this cone 4, which has a stem 41 guided at the lower end in the bottom 21 of the tube 2, is a circular series of spherical recesses 6 filled by a corresponding number of balls 61, which project slightly beyond the outer surface of the cone 4 and are adapted to engage the female conical surface of the hollow cone 3, while at the same time they also engage the push-rod 5, which projects centrally through a bore 42 of the ball carrier. Thus, in the position shown in Fig. 1 the balls clamp the push rod between them. The upper end of the ball carrier or inner cone has a tubular extension 7 which also surrounds the push rod 5 and which at its outer end engages a guide piece 8. This guide piece is connected by a pin 17, projecting through slots 9 in the tube 2, with a tubular slide 10 which movably surrounds the end of the tube 2. A helical spring 11 surrounding the tubular extension 7 bears against the guide piece 8, and a second helical spring 12 surrounding the stem 41 bears with one end against the bottom 21 of the tube 2 and with the other end against the ball carrier 4.

It will be well understood that the pencil-lead 13 projecting beyond the lower or distal end of the body 1 is held against inward movement by abutting against the lower end of the push rod 5, which latter, being held fast by the balls

61, prevents the lead from moving upwardly when writing.

If it is desired to allow the pencil lead to project to a greater extent, the holder 5 is held vertically with its point downward and the slide 10 is shifted by the thumb and finger towards the distal end of the holder. With this movement also the ball carrier 4 is moved downward due to the guide piece 8 being connected with the tubular slide and bearing against the tube 7. Thus, the balls 61 are loosened and the push rod 5 is released so that it can protrude the lead to any desired extent by its own weight. As soon as the tubular slide 10 is released, it will be again moved upward by the spring 11, while the cone 4 is returned by the spring 12. The balls 61 will now again grip the push rod 5 and hold it in its adjusted position.

If it is desired to push the lead into the holder, it will be sufficient to hold the pencil-holder with the point of the lead down on the paper or table and to catch hold of the tubular slide 10 and shift it downward.

As a consequence, the push rod 5 will be again released and the lead will be moved inwardly to any desired extent, as the push rod 5 will offer no resistance.

The construction shown in Fig. 2 differs from that described above in respect that the tube 2 is not connected with the main tubular body 1, but is movable relatively to the latter. The relative movement of the two tubes is limited by a slot 22 in the tube 2 and a pin 21 on the inside wall of the main body 1, projecting into the slot 22. A spring 23 in the lower part of the body 1 tends to push the tube 2 upward, thus tending to loosen the coupling. On application of pressure to the button 24 screwed into the upper or proximal end of the tube 2, the tube 2 together with the complete coupling 3, 61, 4 will be moved downward as far as the slot 22 and pin 21 will allow. The push rod 5, being gripped by the balls 61, will propel the lead 13 to a corresponding extent. When the button 24 is released, the spring 23 will move the tube 2 back to its former position, the frictional resistance offered to the lead 13 and rod 5 by its tubular guide being sufficient to retain the lead in its adjusted position while the coupling 3, 61, 4 is loosened, until this return motion is completed, whereupon the spring 12 again acts to press the ball carrier upward and to force the balls between the rod 5 and the hollow cone 3.

The construction shown in Fig. 3 differs from that shown in Fig. 2

mainly in respect that the tubular slide is omitted and that the button connected to the tube 2 is constructed as a cap 14 telescoping over the upper end of the holder 1. The relative movement of the tube 2 or the cap 14 and the main body 1 is limited by a pin 15 attached to the main body 1 and projecting into a slot in the tube 2. The tubular extension 7 of the ball carrier 4 projects through a central opening in the cap 14 for a purpose hereinafter described.

When pressure is applied to the cap 14, the operation is similar to that described with reference to Fig. 2, that is to say, both parts of the coupling will be moved axially of the casing and the tube 2 will transmit the downward motion by the aid of the balls 61 to the push rod 5, and thus also to the lead 13. When the pressure on the cap 14 is released, the tube 2 will be restored to its former position by the spring 18, the push rod 5 remaining in its adjusted position and held by friction as before. Each time a further pressure is applied to the cap 14, the push rod 5 together with the pencil-lead will be moved further downward.

If it is desired to allow the lead to disappear within the holder, so as to protect its point, the end of the tube 7 projecting into the cap 14 will be pushed inwardly so that the push rod 5 will be no longer gripped by the balls 61 and thus the lead will easily slide upward. The same operation will take place when a new lead is to be inserted.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A pencil-holder comprising a tubular casing fitted with a button or head and with a push rod abutting at one end against the pencil lead and adapted to feed the lead, characterised by a coupling consisting of a hollow cone arranged within the casing and a series of balls intermediate the hollow cone and the push rod, a carrier for the balls holding them normally in contact with the hollow cone, and externally operable means to move the carrier whereby to release the balls when the push rod is to be fed forward.

2. A pencil-holder as set forth in Claim 1, further characterised in that the ball carrier is operated by a spring bearing against the bottom of a tube carrying the hollow cone and tending to hold the coupling closed, a second spring intermediate the ball carrier and the button tending to release the coupling.

3. A pencil-holder as set forth in Claim 1

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1, further characterised in that the hollow cone is carried by a tube slidably guided within the tubular casing and having a pin and slot connection with the casing limiting the relative movement of said two parts.

4. A pencil-holder as set forth in Claims 1, 2 or 3, further characterised by a tubular slide intermediate the end of the casing and the button, and a guide attached to the tubular slide by a pin projecting through the tube by longitudinal slots; the guide being adapted to engage the ball carrier, so as to permit the balls to be released when the slide is moved downward.

5. A pencil-holder as set forth in Claim 2 or Claim 3, further characterised by the arrangement of a spring intermediate the bottom of the tube and the bottom of the casing.

6. A pencil-holder as set forth in

Claims 1 and 3, further characterised in that the button or head is formed as a cap to telescope relatively to the tubular casing, the spring-pressed ball carrier having a tubular extension projecting through the cap, and a spring being interposed between the lower end of the tube and the bottom of the casing, both parts of the coupling being thus adapted to be moved axially of the casing on depression of the cap and the ball carrier being adapted to be moved into released position by the extension projecting through the cap.

7. The improved constructions of pencil-holder herein described and illustrated in the accompanying drawings.

Dated this 7th day of September, 1922.
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 Agents for the Applicant.

Fig. 1.

Fig. 2.

Fig. 3.

[This Drawing is a reproduction of the Original on a reduced scale.]

