

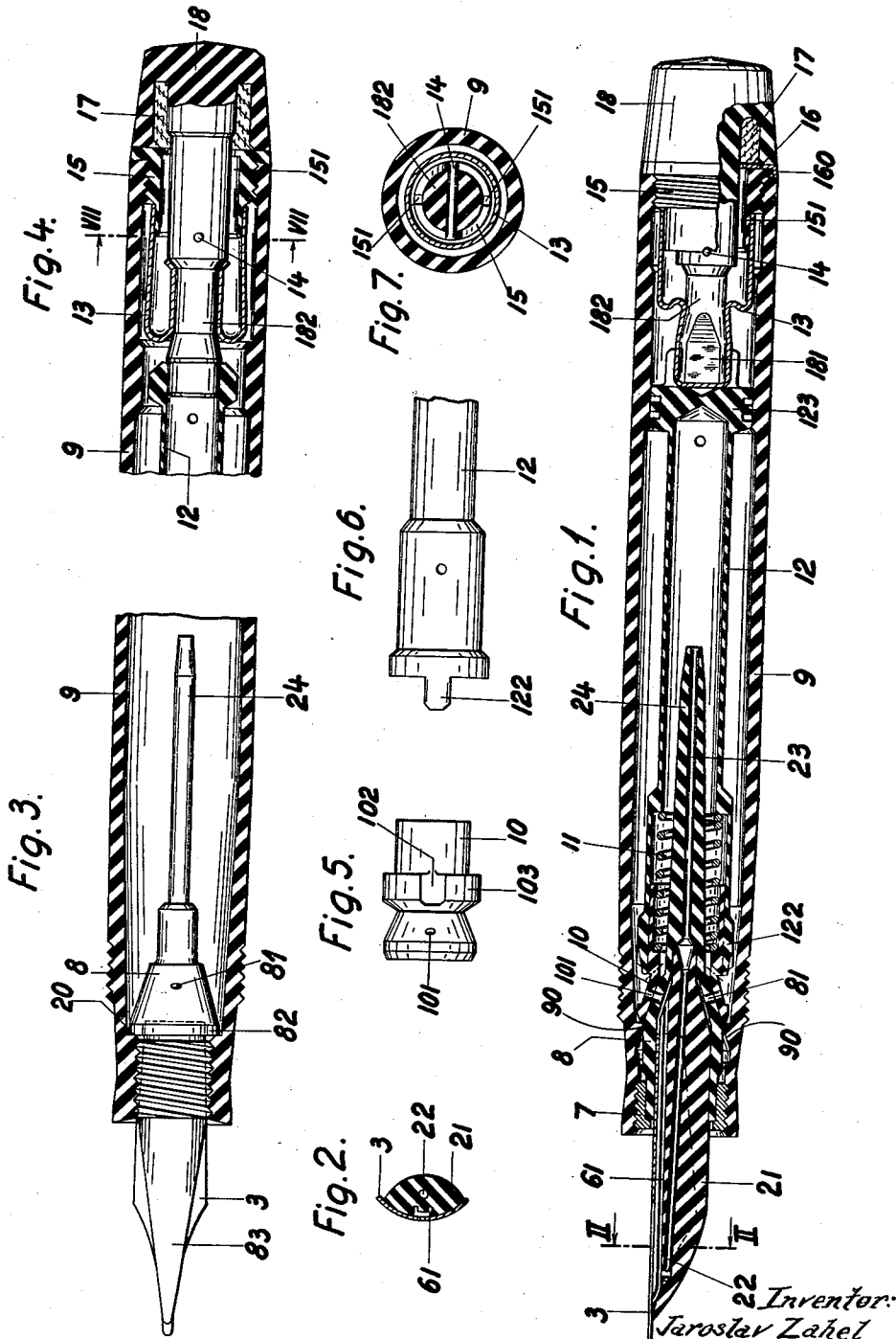
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J. ZAHEL

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FOUNTAIN PEN

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Inventor:
Jaroslav Zahel
Attorney:
James W. Grant

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FOUNTAIN PEN

Jaroslav Zahel, Prerov, Czechoslovakia

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This invention refers to new devices and mechanisms in fountain pens the object of which is to eliminate deterioration of the sealing surfaces of the ink flow closing and obstructive working of the suction mechanism due to the fact that the sealing surfaces might come out of their coaxial position.

An object of this invention is a new closing device for controlling the ink admittance to the pen tip which device may be associated to a suction filling mechanism of new and improved structure.

In a preferred embodiment of my invention cooperating sealing bodies are provided between the ink container within the penholder and the ink admission duct to the pen tip, the contacting sealing surfaces of said sealing bodies being passed by passages, the opposition and co-operation of which—and thus the ink admittance to the pen tip—is controlled by a movable part connected to the suction filling mechanism.

It is a further object of this invention to connect and combine the new closing and ink control device to operating elements of the filling mechanism.

Other objects and advantages will be hereinafter set forth in this specification and in the claims and will be shown by way of illustration in the accompanying drawing, in which

Fig. 1 is a longitudinal section of an embodiment of a fountain pen according to this invention.

Fig. 2 is a cross section taken on line II—II of Fig. 1.

Fig. 3 is a modification of a penholder according to this invention shown in longitudinal section of its front part.

Fig. 4 is a longitudinal section of the rear part of another modification.

Figs. 5 and 6 are a longitudinal view of the movable sealing body and the front part of the connection rod showing means for connecting them.

Fig. 7 is a sectional view on the line VII—VII of Fig. 4.

Referring to Fig. 1, a supporting body 21 of the writing pen 3 is fastened to the penholder. The pen support 21 is provided with a duct 22 which discharges at its one end into a duct 61 and at its other end into the conduit 23 of a passage tube 24.

The duct 61 at the upper surface of the support 21 is provided for supplying ink from the ink container to the tip 3 of the pen as it is known per se. The passage tube 24 in its pre-

ferred embodiment is conically enlarged at its front end and forms a fixed sealing body 8 of the closing device and is provided with passages 81. The movable sealing body 10 is formed with a corresponding cone and is provided with passages 101. The conical contacting sealing surfaces of both sealing bodies 8 and 10 are urged together by means of a spring 11.

In the position shown in Fig. 1, the sealing bodies 8 and 10 of the closing device have been rotated into the "open" position in which the passages 101 are opposite to and in co-operation with the passages 81. Thus, in this open position of the closing device, ink is admitted beneath the tip of the pen from the ink container of the penholder 9 and will flow at the bottom of the channel 61, whilst air which enters the slit of pen tip 3 may reach the interior of the penholder 9 in passing the upper part of the duct section 61.

When rotating the movable sealing body 10 relatively to the fixed sealing body 8 out of its "open" position, admittance of ink from the penholder 9 to the pen tip 3 will be stopped. Rotation of both sealing bodies 8 and 10, one relatively to the other is operated by the manipulation button 13 which is connected with the movable sealing body 10 by means of the connection rod 12 of tube like form. The connection rod 12 may be connected to the movable sealing body non-rotatably according to Figs. 1, 5 and 6, but slidably by providing grooves 102 within a flange 103 into which grooves projections 122 of the tube like connecting rod 12 may enter, or vice-versa.

The tube like connecting rod 12, by means of spring 11, is permanently urged against the suction part 13, which governs decrease and increase of the container volume alternately on reciprocation of the manipulation button 13.

The spring 11 is, advantageously, made of rust-proof material so that it may be mounted in the very ink container of the penholder 9. At its opposite end, the tube like connection rod 12 is hinged or fast to the button 13 and the suction part but may be rotated thereagainst when applying force.

The suction part may consist of a gas-tight bag 13, f. i. of rubber, or of a piston 123 or of both, 13 and 123 jointly, as is shown in Fig. 1.

According to the modification shown in Fig. 4, the tube like connecting rod 12 is fast to the button 13 but may be rotated when applying force, the pin 132 of the button 13 being driven with its end into the cylindrical bore of the con-

nection rod 12, and being adapted to be rotated therein when applying force.

This connection is applied if one of the sealing bodies f. i. cone 8, is fast to the penholder 9, be it by screwing it in (Fig. 3) be it by driving it in, and the position of passages 101 may then be set by rotating the connection rod 12 against the button 18 to such a position that the passages 101 are just in opposition to passages 81 in the "open" condition.

If the sealing cone 8 is of even surface, thus without thread, and if, when being mounted, it is brought into its correct position by means of the threaded socket 7 (Fig. 1), which may be provided with inside or with outside thread, or by driving it into a corresponding opening of the penholder 9, the tube like connection rod 12 will be hinged to button 18 according to Fig. 1, the pin 182 being provided at its end with a head 181 of non-round f. i. of square or oblong cross section, over which head a rubber or otherwise compressible gas-tight bag 13 has been drawn and which together enter a corresponding opening or slot at the rear end face of the connecting rod 12. The advantage of this connection is that the wall of the rubber bag remains continuous and entirely closed and that the bag need not be cemented to the pin 182 of the button 18, but may embrace the non-round head 181 without any interruption of its wall, so that the connection tube 12 will be rotated by intermediary of the wall of said rubber bag 13.

The stationary sealing or closing body 2 may be driven or screwed into the holder 9 from the front side, as shown in Fig. 1, or from the interior as shown in Fig. 3, and may be sealed there-against either by the flange 82 bearing against a seat 20 of the holder 9 (Fig. 3) or by means of its conical sealing surface which is extended towards the front of the holder and bears against the conic surface, 90, provided at the interior wall of the holder 9 (Fig. 1).

The pen is filled by reciprocating the button 18 which, by means of spring 11, is urged out of the holder. Reciprocation of the suction piston 123 or/and axially compressing or tilting over the rubber bag 13 produces sub-pressure within the holder and thus suction of the ink through the ducts 22 and 23.

For the duration of this axial movement, the sealing body 10 has been rotated into such a position as to close supply passages 101, 81 leading to the pen tip.

The rubber bag may be of soft, gas-tight, and axially compressible material, or may consist in a thin walled bag of hard rubber or of non-corrodible metals which may be compressed axially like a harmonica bellows.

Axial movement of the suction stroke of button 18 is guided by a pin and slot connection, the pin 14 (Figs. 1, 4 and 7) being mounted at the throat 182 of the button 18, and the notches 151 being provided at the sleeve 15, which is screwed into the pen holder, or vice-versa.

The axial movement of button 18 is limited to the outside by perforated disc 16 (Fig. 1) which is fastened to sleeve 15 and covers the guide notches 151. This axial movement might otherwise be limited by the means that the notches 151 do not extend to the rear end of the sleeve but end before its rearward face (Fig. 4). The perforated disc may be provided with an ornamental strip on its flange 160 forming the end of the holder body.

For filling the fountain pen, button 18, to-

gether with connection rod 12, and sealing body 10, will be rotated about 90° out of their position represented in Fig. 1 (see also Fig. 7) so that the pin 14 will leave the edge of sleeve and will enter the notches 151; button 18 together with suction elements 13 and 123 respectively being thus enabled to be reciprocated.

Spring 11 will then operate an outward stroke. After the fountain pen has been filled, button 18 will be urged into its inward position and rotated again about 90° so that the pin 14 bears against the inward edge face of sleeve 15 and button 18 is retained in its inoperative position. Detents may be provided at the inner frontal surface of sleeve 15 for positioning pin 14.

A packing 17 (Fig. 4) may be provided at the inside surface of button 18 to bear against the frontal surface of sleeve 15, or against perforated disc 16, for sealing the passage in case ink should pass between button 18 and sleeve 15 on deterioration of rubber bag 13.

The covering tongue 83 (Fig. 3) covering the pen tip 3 and which is formed as an extension of the fast or stationary sealing body 8 or of the thread socket 7 (Fig. 1) will increase constancy of ink flow to the pen tip especially if, when writing, hard pressure is exercised on the pen tip.

I claim:

1. In a fountain pen in combination, a penholder, a pen, a support for said pen, an ink duct and a suction duct provided in said support, an ink container, a suction mechanism for filling said ink container, a manipulation button for said suction mechanism, a fixed front end sealing body of said ink container, an extension of said suction mechanism, a front end sealing surface of said extension bearing against a rear end sealing surface of said fixed front end sealing body, both said sealing surfaces being passed by co-operating ink passages communicating to said ink duct on the one hand and to said ink container on the other hand, one of said sealing surfaces adapted to be slidably rotated upon the other for placing said passages in or out of opposition and co-operation and for thus controlling ink admittance to the pen.

2. In a fountain pen in combination, a penholder, a pen, a support for said pen, an ink duct and a suction duct provided in said support, an ink container, a suction mechanism for filling said ink container, a manipulation button for said suction mechanism, a fixed front end sealing body of said ink container, an extension of said suction mechanism and movable thereto, a front end sealing surface of said extension bearing against a rear end sealing surface of said fixed front end sealing body, a spring being interposed between said suction mechanism and said extension, both said sealing surfaces being passed by co-operating ink passages communicating to said ink duct on the one hand and to said ink container on the other hand, one of said sealing surfaces adapted to be slidably rotated upon the other for placing said passages in or out of opposition and for thus controlling ink admittance to the pen.

3. In a fountain pen in combination, a penholder, a pen, a support for said pen, an ink duct and a suction duct provided in said support, an ink container, a suction mechanism for filling said container, a manipulation button for said suction mechanism, two front end co-operating sealing bodies of said ink container, a forward extending and rotatably mounted connection rod

of said suction mechanism adapted to support slidably but not rotatably thereon one of said sealing bodies, a spring being interposed between said rod mounted sealing body and said connection rod, the contacting surfaces of both co-operating sealing bodies being passed by cooperating ink passages communicating to said ink duct and to said ink container, one of said contacting surfaces being adapted to be slidably rotated against the other together with said movable sealing body by means of said suction mechanism connection rod.

4. In a fountain pen in combination a penholder, a pen, a support for said pen, an ink duct and a suction duct provided in said support, an ink container, a suction manipulating button adapted to be reciprocated, a pin fastened to said button and protruding into the interior of said holder, a gas-tight compressible bag fastened at its edge to said holder and adapted to be slipped over said pin, two front end co-operating sealing bodies of said ink container, one being fast to the container, a connection rod rotatably mounted within said holder and adapted to support slidably but not rotatably and on its front end the second of both said sealing bodies, said connection rod being further adapted to clutch both said pin and said bag with its rear end, a spring being interposed between said movable sealing body and said connection rod, means for latching said button, said pin, and said connection rod in their normal position, said spring adapted to urge together the contacting surfaces of said sealing bodies and, on said latching means being released, to urge said connection rod, together with said pin, said button, and said bag to operate a suction stroke.

5. In a fountain pen in combination a pen holder, a pen, a support for said pen, an ink duct and a suction duct provided in said support, an ink container, a suction manipulating button adapted to be reciprocated, a pin fastened to said button and protruding into the interior of said holder, a gas-tight compressible bag fastened at its edge to said holder and adapted to be slipped over said pin, two front end co-operating sealing bodies of said ink container, one being fast to the container, a connection rod rotatably mounted within said holder and adapted to support slidably but not rotatably on its front end the second of both said sealing bodies, said connection being further adapted to clutch both said pin and said bag with

its rear end, a spring being interposed between said movable sealing body and said connection rod, means for latching said button, said pin, and said connection rod in their normal position, said spring adapted to urge together the contacting surfaces of said sealing bodies, and, on said latching means being released, to urge said connection rod, together with said pin, said button, and said bag to operate a suction stroke, said contacting surfaces of said sealing bodies being passed by co-operating ink passages communicating to said ink duct and to said container, said movable sealing body adapted to be rotated by said manipulation button relatively to said sealing body which is fast to the container, for placing said passages in or out of opposition and co-operation and for thus controlling ink admittance to the pen.

6. A fountain pen sealing device comprising an interior sealing body provided with an annular sealing surface of greater diameter than that of the bore of the penholder, means for supporting said annular sealing surface against the interior wall of the fountain pen holder, said sealing body further having a tongue forming a pen support and covering the pen tip slit.

7. A fountain pen as set forth in claim 1, said fixed front end sealing body being mounted to the holder by means of a sleeve inserted into the holder from the front side.

8. A fountain pen as set forth in claim 1, both sealing surfaces being of conical shape, and the sealing surface of said fixed sealing body being extended toward the front of the holder to bear against an associated interior sealing surface of said holder.

9. A fountain pen including a filling device which comprises an ink container, a governing means for alternately decreasing and increasing the volume of said container, a manipulation button at the rear end of said fountain pen, an actuation rod mounted to said button and forming a throat thereof, said rod being adapted to reciprocate said governing means, a guide sleeve for said rod, a pin and groove guide associated to said rod and said sleeve, said groove being open at its rear end, an annular perforated disc for embracing said rod and for covering the rear ends of both said sleeve and pen holder, the outside edge of said perforated disc forming an ornamental strip around said penholder.

JAROSLAV ZAHEL.