Feb. 26, 1924. 1,484,683

L. M. TEBBEL

SELF FILLING FOUNTAIN PEN

Original Filed Oct. 1, 1921

Fig 1

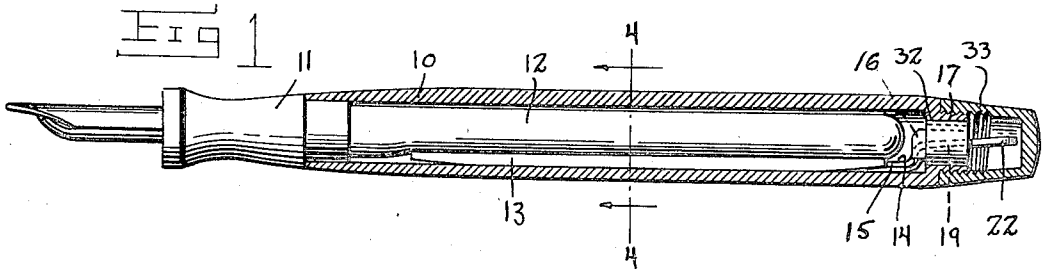



Fig 2

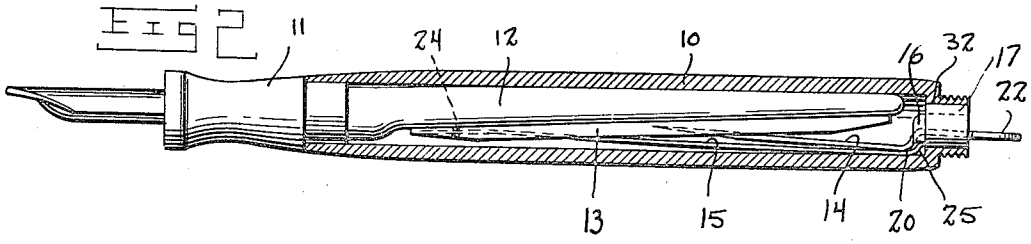



Fig 3

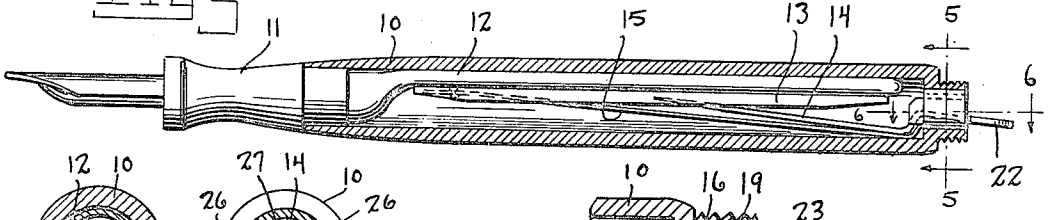



Fig 4

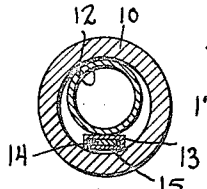



Fig 5

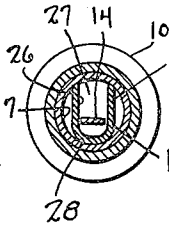



Fig 6

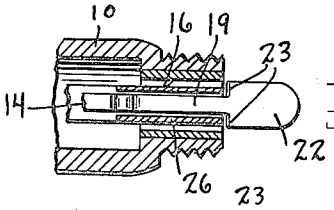



Fig 7

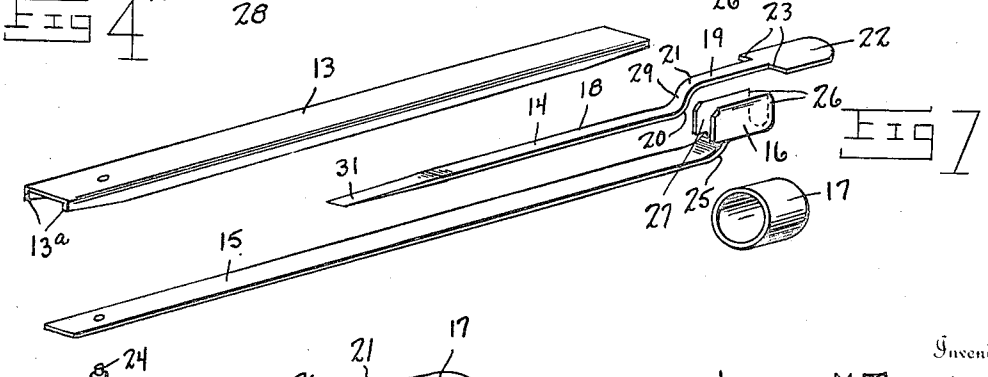
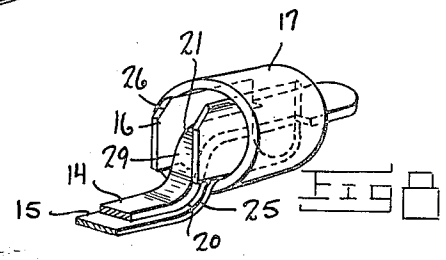



Fig 8

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# UNITED STATES PATENT OFFICE.

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## SELF-FILLING FOUNTAIN PEN.

Application filed October 1, 1921, Serial No. 504,630. Renewed April 6, 1923.

*To all whom it may concern:*

Be it known that I, LEWIS M. TEBBEL, a citizen of the United States, and resident of Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Self-Filling Fountain Pens, of which the following is a specification.

My invention relates to self-filling fountain pens of the type embodying a barrel, a pen section detachably associated with the barrel and carrying a collapsible ink sack, a presser bar disposed between the inside of the barrel and the sack and an operating lever for forcing the presser bar in a direction to collapse the sack.

One of the principal objects of my invention is to provide a novel device for effecting movement of the presser bar to collapse the ink sack, whereby simplicity of construction, cheapness of manufacture and ease of assembly is combined with effective operation and whereby the collapsing mechanism is so constructed and assembled that it may be inserted within and removed from the barrel as a unit.

Other objects are to provide a device of the character described which shall permit the use of an ink sack of relatively great ink capacity, and which shall cause the complete collapse of the ink sack when the pen is being prepared for re-filling, hence enabling the sack to be filled to capacity after release of the collapsing means.

A further object is to so construct the collapsing device that, in expelling the air from the ink sack preparatory to filling the same with ink, the closed end of the ink sack will be collapsed in advance of the collapse of the pen section end of the sack.

A further object is to so construct the collapsing mechanism that, while all parts are held together as a unit, there is such freedom of movement between the various parts as will insure ease of operation and absence of any binding effect.

Still further objects will be more fully described in connection with the accompanying drawings and more particularly pointed out by the appended claims.

In the drawings, wherein like characters of reference designate corresponding parts in the different views:

Figure 1 is a view partly in longitudinal section and partly in side elevation of a pen, embodying my improvements and showing a normal position of the operating parts.

Figure 2 is a view similar to Figure 1 showing the position of the operating parts when the ink sack is partially collapsed.

Figure 3 is a view similar to Figure 1 showing the position of the operating parts when the ink sack is collapsed.

Figure 4 is a transverse section on line 4—4 of Figure 1.

Figure 5 is a transverse section on line 5—5 of Figure 3.

Figure 6 is a vertical section on line 6—6 of Figure 3.

Figure 7 is a perspective of the parts of the collapsing mechanism in relative disassembled relation.

Figure 8 is a perspective of certain parts of the collapsing mechanism in assembled relation.

Referring now to the drawings in detail, 10 designates the usual tubular pen barrel with the usual pen section 11 which holds the feed bar and pen, and which also carries a collapsible ink sack 12 extending into and substantially filling the interior of the barrel 10. These parts are of ordinary or any suitable construction and, as is customary in fountain pens of this type, means is provided for the purpose of compressing the sack 12 preparatory to filling or re-filling the same.

My improved compressing or collapsing means consists of a presser bar 13, an operating lever 14, a spring 15 carrying the guide member 16, and anchoring ring 17. With the exception of the anchoring ring 17, all the parts are preferably constructed of flat material so that they may be readily and cheaply stamped approximately into the shapes disclosed in the drawings. In order to lend strength to the structure the presser bar 13 may be flanged as at $13^a$ or may be constructed of channeled material and such presser bar 13 is of slightly greater width than the operating lever 14 and spring 15 in order that the same may be relatively nest-

ed, thus consuming a minimum of space within the barrel 10.

The main body portion of operating lever 14 is indicated at 18 and one end portion 19 of lever 14 is offset with respect to the main body portion 18 by twice bending the same as at 20 and 21. End portion 19 terminates in a finger engaging button or similar formation 22 for use in manipulating the lever 14. Button 22 is of increased width with respect to end portion 19 to increase the finger engaging surface and also to provide shoulders 23.

One end of the leaf spring 15 is suitably secured as by rivet 24 to the presser bar 13 near one end thereof, such end being adjacent the pen section end of barrel 10 when the collapsing unit is in position within the barrel.

The opposite end of spring 15 is bent upwardly as at 25 and terminates in the guide member 16, which consists of the turned up ears 26 to provide a guideway 27.

In assembling the collapsing unit, operating lever 14 is disposed so that the main body portion 18 is interposed between the presser bar 13 and spring 15 and the end portion 19 disposed between ears 26. Ring 17 is then slipped over the guide member 16 so as to encircle same and close the open top of guideway 27 so as to prevent lever 14 from becoming detached from the assembly. The bottom of guide member 16 is preferably rounded as at 28 so as to snugly fit the bore of ring 17, and member 16 is soldered or otherwise suitably secured to ring 17.

Lever 14 is fulcrumed at the bend 20 on the upper surface of spring 15 although there is no fixed connection between the two. The lateral movement of end portion 19 is limited by the ears 26 while the longitudinal movement of lever 14 is limited in one direction by the contact of shoulders 26 against the ends of ears 26 and in the other direction by the bend 25 in spring 15 which lies in the path of portion 29 which lies between bends 20 and 21 in lever 14.

There is a limited amount of longitudinal movement allowed on the part of portion 19 with respect to guide 16 in order to allow lever 14 to properly function without causing shoulders 26 to bind on the end of guide 16 or portion 29 to bind on bend 25.

The end of lever 14 is preferably tapered as at 31 and is adapted to engage the bottom of presser bar 13 substantially midway of its length.

It will be noted that lever 14 is unanchored, thus making a material saving in the expense and labor of assembling the unit and also giving it a freedom of movement which eliminates all cramping or binding of the various elements making up the unit, when lever 14 is being operated.

When the ink sack collapsing means is properly associated with the pen, the presser bar 13, which is substantially coextensive in length with the sack 12, is disposed between sack 12 and the bore of the barrel 10 as in Figure 1 and is retained in this position either by the frictional engagement between ring 17 and the inner surface of barrel 10, or by suitably cementing ring 17 within the open end 32 of barrel 10.

With presser bar 13 in this position, the finger engaging button 22 extends through open end 32 of barrel 10 so as to be readily accessible for manipulating lever 14 upon removal of cap 33 which is provided for normally closing the rear open end of barrel 10.

Spring 15 maintains presser bar 13 and lever 14 normally in the position of Figure 1, but upon removal of cap 33 and an application of pressure to the offset end portion of the lever, the same is caused to fulcrum at the bend 20 against the upper surface of spring 15 and thereby end 31 is moved towards the opposite side of the barrel 10 imparting corresponding movement to presser bar 13 and causing the latter to squeeze the sack 12 against the inner surface of barrel 10 and thereby collapse said sack.

Due to the attachment of one end of presser bar 13 to one end of spring 15 (said end of presser bar being that adjacent the pen section end of barrel 10 and said end of spring being the free end, thereof) the spring 15 has a normal tendency to initially retard the raising of that end of bar 13 to which spring 15 is attached. Hence there is a delayed action on the part of the forward end of the presser bar resulting in the effect shown in Figure 2 whereby the closed end of sack 12 is compressed prior to the pen section end of the sack. Thereby it is insured that the air is completely dispelled from the closed end of the sack and there is no possibility that the sack become "ballooned" due to a closing of the pen section end prior to the complete collapse of the sack.

Eventually the pressure of point 31 of operating lever 14 overcomes the resistance of spring 15 and causes the complete collapse of the sack as shown in Figure 3.

The fact that point 31 is allowed a free engagement against the under surface of bar 13 and is in no way connected with spring 15 except for being fulcrumed on the anchored end of said spring, insures a non-binding action and enables a rapid and complete collapse of the sack. Point 31 is tapered so as to present a better engagement surface to bar 13 during the actuation of lever 14.

Upon release of the pressure against engagement button 22, spring 15 causes bar 13 and lever 14 to return to normal position.

It will be noted that due to the particular

construction and arrangements of parts, the fulcrum point of the operating lever occurs adjacent the open end 32 of barrel 10 and yet sufficient leverage is gained to render easy operation of the collapsing means. Furthermore, it will be noted that a minimum of space is required for the operating mechanism due to its peculiar construction and thereby the use of an ink sack of relatively great ink capacity is permitted.

From the foregoing it will be observed that upon removal of pen section 11, the ink sack collapsing mechanism may be inserted or removed as an entirety or as a unit into or from the barrel through the front or pen section end thereof and the mechanism will properly function irrespective of its transverse angular relation with respect to the barrel, that is, care need not be exercised in inserting the mechanism except to assure its proper longitudinal adjustment with respect to the ink sack.

While I have shown and described one specific embodiment of my invention, I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:

1. A fountain pen comprising a barrel having a pen section in one end and an opening in its opposite end, a collapsible ink sack, a presser bar interposed between the barrel and the sack, resilient means rigidly secured at one end to said barrel and attached to said presser bar to longitudinally position said presser bar within said barrel, a guide member secured to said barrel, an unanchored operating lever non-fixedly fulcrumed within said barrel and adjacent the open end thereof to force said presser bar in a direction to collapse said sack, said lever comprising a main body portion interposed between said presser bar and the barrel and an end portion bent in offset relation with respect to said main body portion, said end portion extending through said guide member and the open end of said barrel, and co-acting means on said guide member and said end portion whereby the lateral and longitudinal movement of said operating lever is limited.

2. A fountain pen comprising a barrel having a pen section in one end and an opening in its opposite end, a collapsible ink sack, a presser bar interposed between the barrel and the sack, a guide member secured to said barrel, resilient means rigidly secured at one end to said guide member and attached to said presser bar to longitudinally position said presser bar within said barrel, an unanchored operating lever non-fixedly fulcrumed within said barrel and adjacent the open end thereof to force said presser bar in a direction to collapse said sack, said lever comprising a main body portion interposed between said presser bar and the barrel and an end portion bent in offset relation with respect to said main body portion, said end portion extending through said guide member and the open end of said barrel, and co-acting means on said guide member and said lever whereby the lateral and longitudinal movement of said operating lever is limited, said resilient means being adapted to automatically return the presser bar and operating lever to normal position after collapse of the ink sack.

3. In a self-filling fountain pen, the combination with a barrel, a pen section, a collapsible ink sack and a presser bar interposed between the ink sack and barrel, of means secured to said barrel and said presser bar and adapted to position said presser bar within said barrel, a guide member secured to said barrel, an unanchored operating lever fulcrumed within said barrel to force said presser bar in a direction to collapse said sack, said lever passing through said guide member, and co-acting means on said guide member and said lever whereby the lateral and longitudinal movement of said operating lever is limited.

4. In a self-filling fountain pen, the combination with a barrel, a pen section, a collapsible ink sack and a presser bar interposed between the ink sack and barrel, of a guide member secured to said barrel, resilient means rigidly secured at one end to said guide member and at the other end of said presser bar, and an unanchored operating lever fulcrumed within said barrel to force said presser bar in a direction to collapse said sack, said lever passing through said guide member, co-acting means on said guide member and said lever whereby the lateral and longitudinal movement of said operating lever is limited, said resilient means being adapted to automatically return the presser bar and operating lever to normal position after collapse of the ink sack.

5. In a self-filling fountain pen, a barrel, a pen section, a collapsible ink sack, a presser bar interposed between the sack and the barrel, a lever non-fixedly fulcrumed within said barrel for forcing the presser bar in a direction to collapse said bag, a leaf spring secured at one end to said barrel and connected at its other end with the presser bar adjacent the pen section end of the barrel, the freedom of movement of said spring being otherwise unrestrained.

6. In a self-filling fountain pen, a barrel, a pen section, a collapsible ink sack, a presser bar interposed between the sack and the barrel, a lever for forcing the presser bar in a direction to collapse said sack, a ring secured within said barrel, a guide member within said ring adapted to limit the longitudinal movement of said lever in

one direction, a spring connected at one end to said presser bar and anchored at the other end within said barrel, and a bent up portion on said spring adapted to co-act with said lever to limit the longitudinal movement of said lever in the opposite direction.

7. A self-filling fountain pen comprising a barrel having a pen section in one end and an opening in its opposite end, a collapsible ink sack, a presser bar interposed between the barrel and the sack, an anchoring member secured in the opening at one end of said barrel, a leaf spring secured at one end to said presser bar and at the other end to said anchoring member, a guide member carried by said anchoring member, an operating lever non-fixedly fulcrumed within said barrel, one end thereof engaging said presser bar, and the other end extending through said guide member and terminating in a finger engaging button.

8. A sack collapsing unit for self-filling fountain pens, comprising an anchoring member, a guide member carried by said anchoring member, a leaf spring secured to said anchoring member, a bent up portion on said spring, a presser bar secured to the free end of said spring, an operating lever fulcrumed on said spring adjacent the guide member and co-acting with said bent up portion to limit the longitudinal movement of said operating lever in one direction, said lever having a main body portion interposed between said leaf spring and said presser bar, and an end portion bent in offset relation to said main body portion, said end portion extending through said guide member, and co-acting means on said guide member and said lever to limit the longitudinal movement of said lever in the other direction.

9. A sack collapsing unit for self-filling fountain pens comprising an anchoring member, a presser bar, a leaf spring secured at one end to said presser bar, the other end of said spring being bent upwardly and terminating in a guide member, an operating lever comprising a main body portion, an end portion bent upwardly in offset relation to said body portion, said main body portion being interposed between said presser bar and said leaf spring, shoulders on said end portion adapted to co-act with said guide member to limit the longitudinal movement of said operating lever in one direction, and the bent up portion of said operating lever co-acting with the bent up portion of said spring to limit the longitudinal movement of said operating lever in the opposite direction.

10. A sack collapsing unit for self-filling fountain pens comprising a presser bar, a leaf spring secured at one end to said presser bar, a guide member secured to the other end of said spring, an operating lever non-fixedly fulcrumed on said spring adjacent the guide member, the work arm of said lever being interposed between said spring and said presser bar and the power arm extending through said guide, means adapted to limit the longitudinal movement of said lever with respect to said guide member, and a ring secured to and encircling said guide member.

11. A sack collapsing unit for self-filling fountain pens comprising a presser bar, a leaf spring secured at one end to said presser bar, a guide member integral with said spring and comprising a bent up portion and ears extending upwardly from said bent up portion, an operating lever fulcrumed on said spring adjacent the guide member and extending from its fulcrum point between said spring and said presser bar and extending in the other direction between said ears.

12. A sack-collapsing unit for self-filling fountain pens comprising an anchoring member, a guide member anchored thereto, a leaf spring secured to said guide member, a presser bar secured at one end to said leaf spring, and an operating lever non-fixedly fulcrumed on said spring, and engaging the bottom of said presser bar.

13. A sack collapsing unit for self-filling fountain pens comprising an anchoring member, a guide member anchored thereto, a leaf spring secured to said guide member, a presser bar secured at one end to said leaf spring, an operating lever fulcrumed on said spring, and a tapered end on said lever engaging the bottom of said presser bar.

14. In a self filling fountain pen, the combination with a barrel, a collapsible ink sack and a presser bar interposed between the ink sack and barrel, a resilient member secured at one end to said presser bar, a guide member secured to said resilient member and including upwardly extending ears, an operating lever fulcrumed within said barrel and extending from its fulcrum point between said resilient member and said presser bar and extending in the other direction between said ears.

15. A sack collapsing unit for self filling fountain pens comprising a presser bar, a resilient member secured at one end to said presser bar, ears extending upwardly from said resilient member, an operating lever fulcrumed on said spring and extending in one direction from its fulcrum point between said resilient member and said presser bar and extending in the opposite direction between said ears.

16. A sack collapsing unit for self filling fountain pens comprising a presser bar, a leaf spring secured at one end to said presser bar, side flanges on said presser bar, a guide member secured to the other end of said spring, an operating lever non-fixedly fulcrumed on said spring, the work arm of said

lever being interposed between said spring and said presser bar and between said side flanges, and the power arm extending through said guide member and means adapted to limit the longitudinal movement of said lever with respect to said guide member.

17. In a self-filling fountain pen, a barrel, a pen section, an ink sack, a bar interposed between the sack and the barrel, and a non-fixedly fulcrumed lever extending longitudinally within the barrel from one end thereof for forcing the pressure bar to collapse the sack.

18. In a fountain pen provided with an ink sack, a bar extending longitudinally of the ink sack, a spring bar, at one side of the first-named bar, and a non-fixedly fulcrumed lever extending between said bars longitudinally of the barrel from one end thereof for moving said first-named bar against the sack.

19. In a fountain pen provided with an ink sack, a bar extending longitudinally of the ink sack, a spring bar at one side of said first-named bar, having an offset at one end fixed to the rear end of the fountain pen, and a lever between said bars fulcruming against said offset of said spring bar for bodily moving said first-named bar against the sack.

20. In a fountain pen provided with an ink sack, a bar extending longitudinally of the ink sack, a spring bar at one side of said first-named bar, having an offset at one end fixed to the rear end of the fountain pen, and a floating lever between said bars fulcruming against said offset of said spring bar for bodily moving said first-named bar against the sack.

In testimony whereof I hereunto affix my signature.

LEWIS M. TEBBEL.