Dec. 6, 1932. F. B. COONEY ET AL 1,889,963

VIAL

Filed Oct. 29, 1930 2 Sheets-Sheet 1

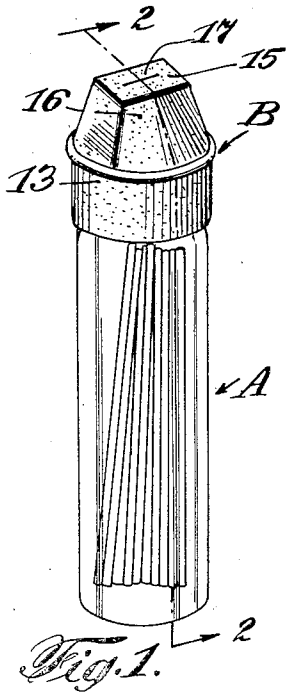


Fig. 1.

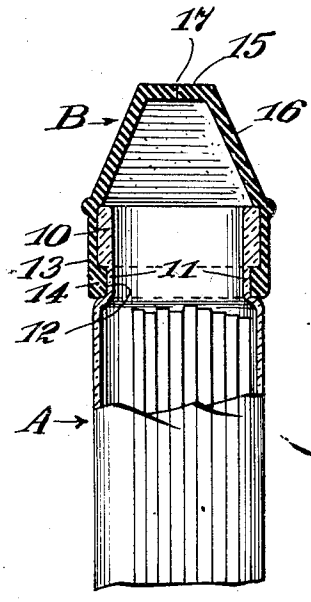


Fig. 2.

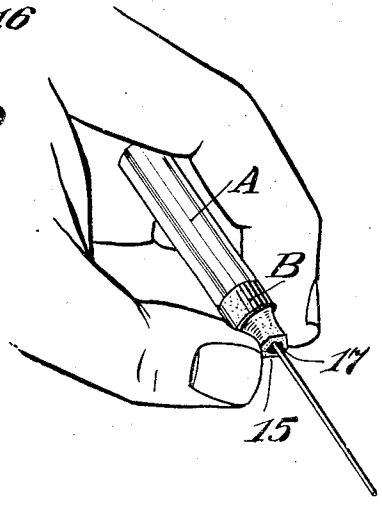


Fig. 3.

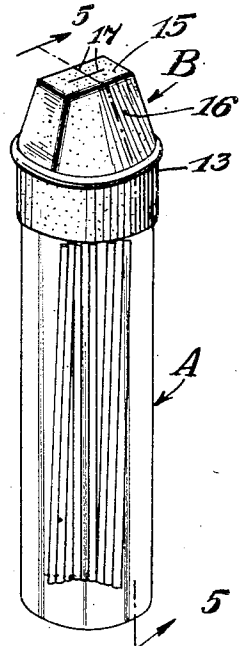


Fig. 4.

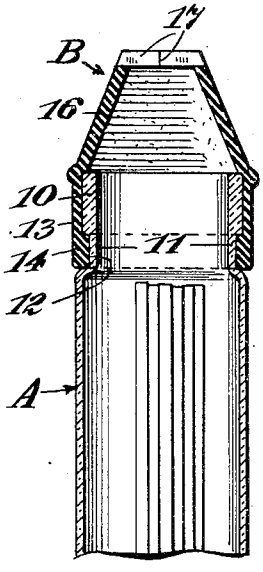


Fig. 5.

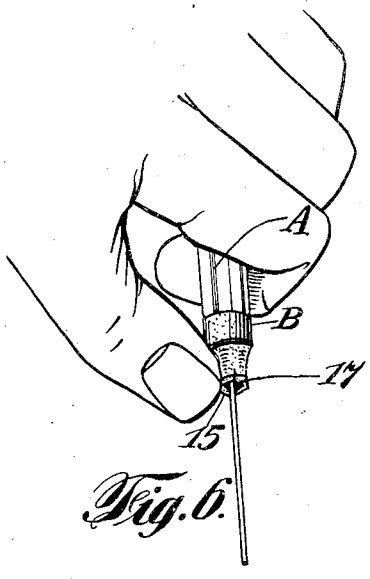


Fig. 6.

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Dec. 6, 1932. F. B. COONEY ET AL 1,889,963

VIAL

Filed Oct. 29, 1930 2 Sheets-Sheet 2

Fig. 7.

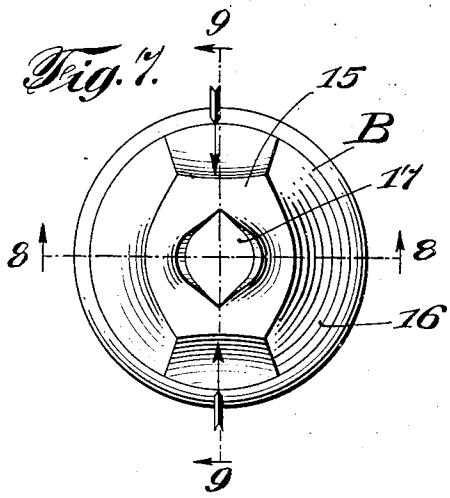


Fig. 8.

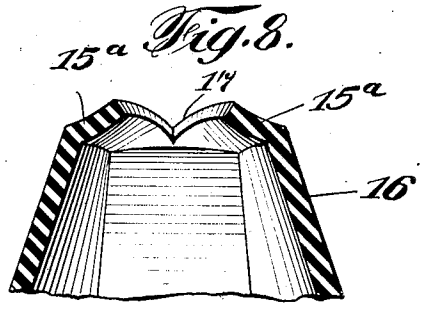


Fig. 9.

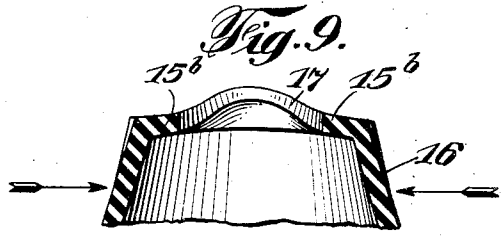


Fig. 10.

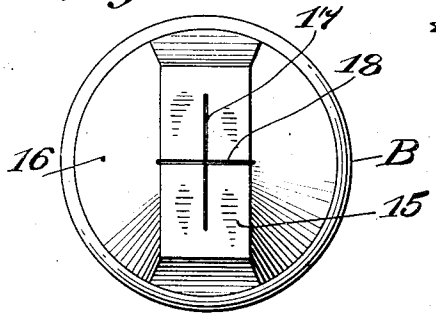


Fig. 12.

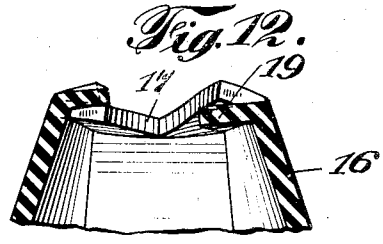


Fig. 11

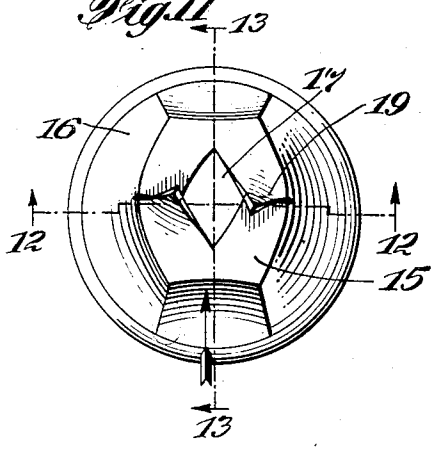
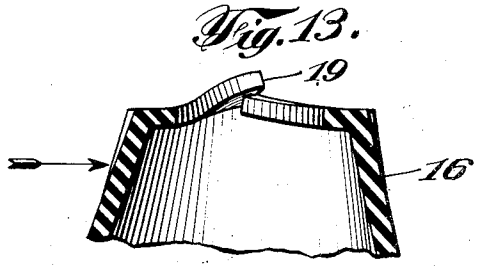


Fig. 13.



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Patented Dec. 6, 1932 1,889,963

UNITED STATES PATENT OFFICE

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VIAL

Application filed October 29, 1930. Serial No. 491,930.

This invention has to do broadly with the art of closure means for vials, bottles, and other similar containers, and is more particularly concerned with a novel type of cap designed primarily for vials or bottles containing materials such as pencil leads, pellets, or other substances in this form.

At the present time users of mechanical pencils experience some little annoyance in connection with the refilling of the pencils with lead, due to the fact that the lead is usually contained in small tubes or vials the caps of which are completely detachable from the vials and not easily manipulated during the taking off and putting on operations. Moreover, the removal of the cap leaves the opening entirely unrestricted with the result that the whole contents of the vial is very often accidentally discharged at times when it is desired to take out only a portion of the contents, say one pencil lead. Another nuisance associated with present-day containers is that the caps very often become lost or come off the vials while they are carried in the pocket of a user which leaves the discharge opening free to permit the contents to fall out and become damaged.

With this condition in mind, this invention has in view, as its primal object, the provision of a cap for vials or tubes containing elongated rigid articles such as lead refills for mechanical pencils, or material in pellet form, which caps normally constitute a closure for the vials and which may be manipulated without detaching the caps from the vials to provide for the removal of a portion of the contents of the vial, say, one lead or one pellet. In this connection it is notable that the cap is permanently attached to the vial which feature is of great importance because it obviates the liability of accidental displacement of the cap.

In carrying out this thought in a practical embodiment, we propose to avail of a cap made from some suitable yielding material, such as rubber or one of its compositions. The cap is provided with suitable means for attachment with a vial and has a flat head defined by a comparatively thin web of the material of the cap. This head is formed with a slit that normally remains closed due to the resiliency of the material and its natural tendency to retain its normal shape. However, upon proper application of pressure laterally of the cap the head is distorted to open the slit, thereby permitting discharge of the contents of the vial as desired.

Developing the invention in a more detailed manner, it is our idea to provide the head of the cap with cross slits so that the head will be distorted to provide an opening upon pressure being applied at any and only one side of the cap. Relieving the pressure naturally causes the cap to assume its normal position in which it constitutes a closure for the open end of the vial.

A vial having closure means in the form of a cap made in accordance with the above-noted thoughts may be used with advantageous results heretofore maintained. The discharge of the contents is accurately controlled so that small quantities thereof may be withdrawn with ease and certainty.

With these and other objects and advantages in view, as will in part become apparent and in part be hereinafter stated, the invention comprises certain model constructions, combinations, and arrangements of parts as will be subsequently specified and claimed.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawings, wherein:—

Figure 1 is a view in perspective of a vial and cap made in accordance with the precepts of this invention;

Fig. 2 is a vertical section through the vial shown in Fig. 1 and is taken about on the plane represented by 2—2 of Fig. 1;

Fig. 3 is a view in perspective which brings out somewhat diagrammatically the condition of the head of the cap when it is distorted by a person in discharging a portion of the contents of the vial;

Fig. 4 is a view similar to Fig. 1 but of a slightly modified form in which the head of the cap is provided with cross slits;

Fig. 5 is a vertical section of the head taken about on the plane represented by the line 5—5 of Fig. 4;

Fig. 6 is a showing similar to that of Fig. 3 developing the opening of the cross slits in the head of the cap when pressure is applied to only one side thereof;

Fig. 7 is an enlarged plan view of the form shown in Fig. 1 as distorted under application of pressure;

Fig. 8 is a detailed section taken about on the plane represented by the line 8—8 of Fig. 7 and on the same scale;

Fig. 9 is a detailed sectional showing taken about on the plane represented by the line 9—9 of Fig. 7;

Fig. 10 is an enlarged plan view of the form shown in Figs. 4, 5, and 6;

Fig. 11 is a plan view similar to Fig. 10 but taken when the head is distorted under the influence of lateral pressure;

Fig. 12 is a detailed vertical section taken about on the plane represented by the line 12—12 of Fig. 11; and

Fig. 13 is another sectional showing taken about on the plane represented by the line 13—13 of Fig. 11.

Referring now to the drawings and more particularly to Figs. 1, 2, and 3, a receptacle or vial, such as is commonly employed as a container for leads for mechanical pencils, is referred to by the reference character A, while the cap which closes the open end of the vial A is designated generally as B. The vial A may be of the usual cylindrical shape and the open end thereof is defined by a thickened portion slightly reduced in diameter as compared with the main body portion of the vial and which is connected to the latter by a curved portion 11 which defines an annular groove 12. The vial A may be made from any preferred material. In the illustrated embodiment it is depicted as being made from glass, as the property of transparency readily enables the user to determine the state of the contents of the vial.

The cap B may be made from any suitable material having the necessary property of resiliency—rubber, or one of its compositions has been found to be satisfactory. This cap B comprises a cylindrical skirt portion 13, the lower lip of which is thickened as shown at 14 to provide a flange that enters the groove 12 whereby the cap B is positively attached to the vial A. In fitting the cap B on the end of the vial A, the skirt 13 is expanded sufficiently to permit of the passage of the thickened extremity 10 past the flange 14 so that the latter may slip into the groove 12 to effect the connection between the cap and vial.

The cap B has a flat head 15 which consists of a relatively thin web of the rubber material and this head is connected with the skirt 13 by the inclined wall shown at 16. It is notable that the head 15 is of a general rectangular formation with sides of unequal length providing an oblong shape. Extending lengthwise of the head 15 and formed therein in any suitable manner is a slit 17 which normally has its side in abutting engagement as brought out in Figs. 1 and 2. When the slit is in this condition the cap constitutes a closure for the open end of the vial A and the contents thereof is retained in the vial. However, when a person is desirous of removing one of the lead refills from the vial A, the latter is tilted to a reversely inclined position, as shown in Fig. 3 and pressure applied to the narrower ends of the head 15 whereby the latter is distorted to open the slit 17, as is clearly brought out in Fig. 3. After the head is opened in the manner indicated, the vial may be slightly shaken whereby one of the lead refills will be caused, under the influence of gravity action, to pass out through the open slit 17. After the desired part of the contents has been withdrawn from the vial, the pressure is relieved to close the slit 17 whereby the open end of the vial is sealed.

The form which the cap B assumes when distorted under the application of pressure laterally of the head is shown in Figs. 7, 8, and 9. It is notable that the head 15 is bulged outwardly to distend the sides of the slit to provide the inclined or converging walls shown at 15*a* and 15*b* that terminate in the opening through which the material in the vial is discharged. The discharge opening provided by the slit 17 is comparatively small and the inclined walls serve to guide a pencil lead so that it will be discharged therethrough and at the same time they serve to retain the remainder of the leads in the vial.

Referring now more particularly to the modification shown in Figs. 4, 5, and 6, it is noted that the vial A and head B are of substantially the same construction as has been hereinbefore described. However, in addition to the slit 17, the head 15 of the cap B is provided with a transverse slit which extends entirely across the head 15 and which is designated 18. The slit cooperates with the slit 17 which terminates short of the extremities of the head to provide an opening through which the contents of the vial may be discharged when pressure is applied to only one side of the head as shown in Fig. 3. In this connection, it is notable that it makes no difference just where the pressure is applied, because application at any point will result in the distortion of the head 15 in the manner desired.

Figs. 10, 11, 12, and 13 develop the condition of the head when it is distorted by the influence of pressure at a single point and laterally of the head 15. When pressure is applied at the point designated by the arrow in Fig. 11 the sides of the slit 18 overlay one another as clearly shown at 19. This arrangement provides the inclined wall or so-called "bull nosed" formation in the head 15

that insures the guiding of a pencil lead to the opening defined by the slits 17 and 18.

It is evident from the foregoing that the novel closure means provided by this invention affords advantageous results of no little importance. Not only is the liability of accidental displacement or loss of the cap eliminated, but a control of the discharging action on the part of the contents is provided. Spilling and breaking of leads while one is being withdrawn is therefore entirely obviated.

While preferred specific embodiments of the invention have hereinbefore been set forth, it is to be understood that we are not to be limited to the exact constructions illustrated and described, because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claim.

We claim:—

In a pressure operated discharging means for pencil leads, wherein a lead is to be discharged upon each application of pressure, a supply vial for the leads, a discharging device for receiving leads from the vial comprising an elongated cap having a flat head end, said cap and head end being formed of resiliently elastic material, said head end being longer in one direction than in the other and provided with crossed slits, extending one along the longer dimension and the other across the shorter dimension, and dividing the head end into pairs of elongated members adapted, on application of pressure to the cap, to bulge and overlap outwardly whereby to provide an outlet opening for a lead, a guiding surface inside the cap for directing a lead to said opening, and an extension on the cap adjacent said guiding surface for engagement with the vial.

In testimony that we claim the foregoing as our invention, we have signed our names hereto.

FRANK B. COONEY.
JUDSON P. SPORE.