April 10, 1962 H. K. OHNSTAD 3,029,330

BALL-POINT PEN REJUVENATOR

Filed March 6, 1961

FIG. 1.

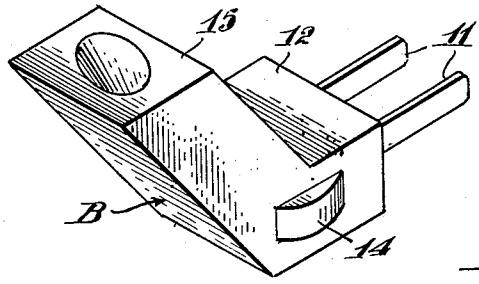


FIG. 2.

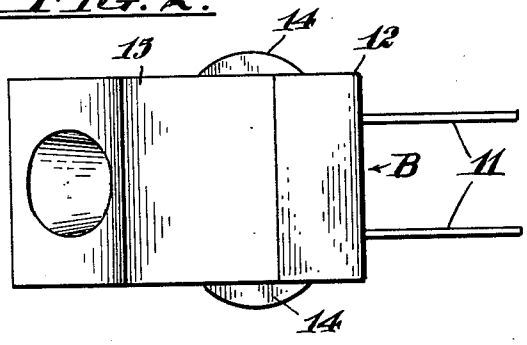


FIG. 5.

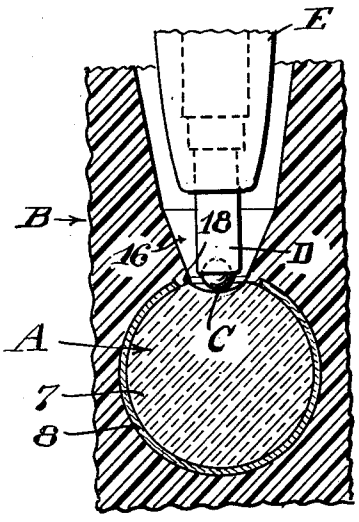


FIG. 3.

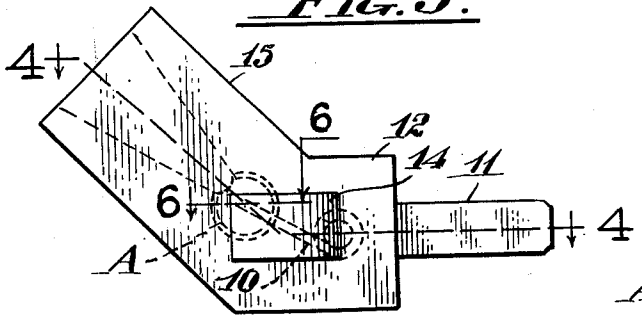


FIG. 4.

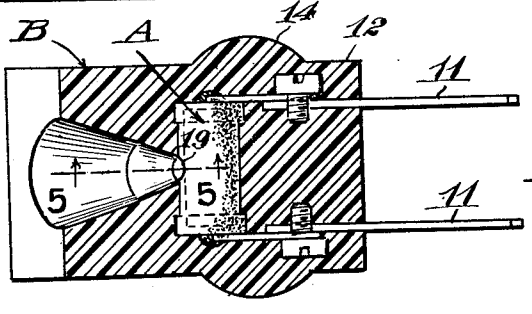
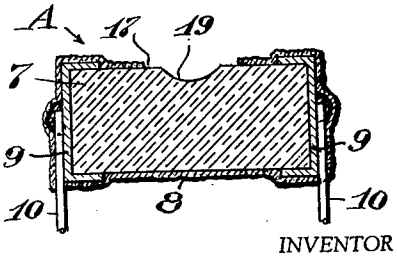


FIG. 6.



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United States Patent Office 3,029,330 Patented Apr. 10, 1962

3,029,330

BALL-POINT PEN REJUVENATOR

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Filed Mar. 6, 1961, Ser. No. 93,500
3 Claims. (Cl. 219—19)

This invention relates to a device for rejuvenating ball-point pens of the type embodying an elongated ink containing magazine equipped at one end with a nipple having a scribing ball revolubly seated in its outer extremity. Such pens frequently become inoperative by reason of the pen point being clogged by thickening or solidifying of ink within the discharge end of the pen such as to inhibit rotation of the scribing ball or to prevent the flow of ink from the magazine.

When such clogging of the pen occurs it is ordinarily discarded or refilled with another magazine under the supposition that the ink content of the magazine has been exhausted when actually such is not the case. It has been found that where the magazine contains a quantity of ink the flow of which is prevented by clogging of the pen point, such flow can be established by subjecting the pen point to the action of heat.

The primary object of the invention is to provide an electrical heating device which is adapted to receive and support a ball-point pen and which is operable to apply heat to the ball point in a manner such as to effect expansion of the ball and at the same time act to liquify or render fluid the ink contained within the discharge nipple of the ink magazine which has become conditioned such as to prevent discharge of the ink from the pen, and thereby rejuvenate the pen and permit further use thereof.

Another object is to provide a pen-point heating device embodying a miniature electrical heating element mounted in a dielectric body and fitted with a pair of terminal prongs adapted to be "plugged" in a conventional electrical socket, and wherein such heating element is so constructed and arranged as to provide a hot spot on which the ball-point of a pen may be seated.

With the foregoing objects in view together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts hereinafter described and claimed and as illustrated by way of the accompanying drawings in which:

FIG. 1 is a perspective view of the device;

FIG. 2 is a plan view thereof;

FIG. 3 is a side view;

FIG. 4 is a view in horizontal section taken on the line 4—4 of FIG 3;

FIG. 5 is an enlarged detail in section as seen on the line 5—5 of FIG. 4; and

FIG. 6 is a view in longitudinal section of the heating element as seen on the line 6—6 of FIG. 3 with the housing removed.

Referring to the drawings more specifically A indicates generally an electrical heating element and B designates a housing in which the element A is imbedded. The element A comprises a cyindrical heat conducting dielectric core 7 formed of porcelain or the like.

An electrically conductive and resistance sheath 8 encompasses the core 7 and has electrical contact with electrically conductive caps 9—9 fixed on the ends of the core 7, from which caps lead wire conductors 10—10 connecting with a pair of parallel prongs 11—11 adapted to be removably inserted in the conventional electric sockets into contact with terminals of an electric circuit in a well known manner, whereby electric current from a source of supply will be directed from said terminals

through the sheath 8 such as to heat the latter and the core 7 encompassed thereby.

The sheath 8 may comprise any suitable material having the requisite electrically conductive and resistance properties, but is here shown as being a hardened plastic or semi-fluid surface coating consisting of finely comminuted electrically conductive metallic particles intimately bonded together by a fluid cementitious material into a body into which the assembled core 7 may be dipped to effect coating thereof and which coating is baked or otherwise dried on the core in a usual manner.

The sheathed core 8 together with the caps 9—9, conductors 10—10 and the inner ends of the prongs 11—11 are imbedded within a body of hardened molded dielectric material such as rubber or kindred substances, constituting the housing B which latter embodies a block-like base 12 having an inner end from which the parallel prongs 11—11 project. Formed on the opposite side margins of the base 12 are rounded protrusions 14—14 which serve as finger holds to facilitate manipulation of the housing B in effecting engagement of the prongs 11—11 with a terminal socket and their disengagement therefrom.

In carrying out the invention the cylindrical heating element A is positioned horizontally in the base 12 to present a side portion thereof toward the upper face of the base and an upstanding pen receiving tube 15 is erected on said upper face in fixed relation thereto. The tube has an open upper end and has the interior of its lower end in open communication with a convergent passage 16 of circular cross-section leading downwardly in the base 12 and opening to the upper portion of the heating element A.

A feature of the invention resides in the provision of a circular opening 17 in the portion of the sheath 8 opposite the open lower end of the passage 16 which opening is concentric with the passage 16 and has a diameter exceeding that of the adjacent end of the passage. A dielectric ring 18 integral with the base 12 rims the margin of the opening 17 to insulate said margin from the interior of the passage 16 as shown in FIG. 5.

An unobstructed imperforate laterally extended circular area 19 of the cylindrical surface of the heating core 7 will be exposed through the ring 18 which area constitutes a hot-spot when the core is heated. This area 19 may be curved in continuation of the curvature of the periphery of the core 7 but in-as-much as such area constitutes a seat for the scribing ball C in the end of the discharge nipple D of a ball-point pen E the area 19 is preferably concave with the surface thereof extending on a radius slightly greater than that of the periphery of the pen point ball to be seated thereon so that the ball will be automatically centered on the heating area with a substantial portion of the lower part of the ball lying in close proximity to the surface of the area 19 so as to effect rapid heating of the ball.

The tube 15 has an internal diameter slightly larger than that of the lower end portion of the pen E so as to freely receive the latter and yet afford a support therefor, and the passage 16 has a diameter at its reduced end slightly larger than that of the nipple D to permit ready positioning of the ball C on the heating area 19 of the core 7.

In the operation of the invention the prongs 11—11 are inserted in an electric socket having terminals connected in an electric circuit, whereby electric current will be caused to flow through the prongs 11—11, wires 10—10 and the resistance sheath 8 to thereby heat the latter and also effect heating of the core 7 by heat transmitted from the sheath 8.

The pen E to be rejuvenated is then inserted in the tube 15 and disposed with the ball-point C thereof seated on the area 19 of the core 7 whereby the ball-point will be subjected to the action of heat such as to effect slight expansion thereof and the transmission of heat therethrough to the wall of the nipple D so as to slightly expand the nipple and at the same time melt and liquify such solidified or gummy ink as may be present in the nipple thereby rendering the pen operative.

Ordinarily the above heating operation is effected in less than a minute. However in some instances a longer time may be required and sometimes on removing the pen and testing its operation if it is found unoperable it may be necessary to repeat the operation.

By the use of the invention the presence or absence of ink in the magazine of ball-point pens may be readily and quickly determined.

While a specific form of the invention has been set forth herein, the construction is subject to modification, the invention embracing such modifications as come within the meaning and scope of the appended claims.

I claim:

1. In a device for rejuvenating ball-point pens embodying an ink magazine having a discharge nipple fitted with a scribing ball, a cylindrical dielectric core,

an electrically conductive and resistance heating sheath encompassing said core having a circular opening

therein opposite and leading to the cylindrical surface of said core,

there being an unobstructed laterally extended circular area of the cylindrical surface of said core exposed through said opening to support a ball thereon with the spherical surface thereof in contact therewith,

a housing imbedding said core,

a sheath having a ball-point pen receiving and supporting passage therein leading from its exterior,

said passage having a circular end opening opposite said circular area concentric with the margin of said circular opening in spaced relation thereto,

and means carried by said housing for directing electric current through said sheath.

2. The structure called for in claim 1 in which said exposed area of said core has a concave ball receiving recess centrally thereof.

3. The structure called for in claim 2 together with a dielectric ring apart from said core insulating the margin of said opening from the interior of said passage.

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