

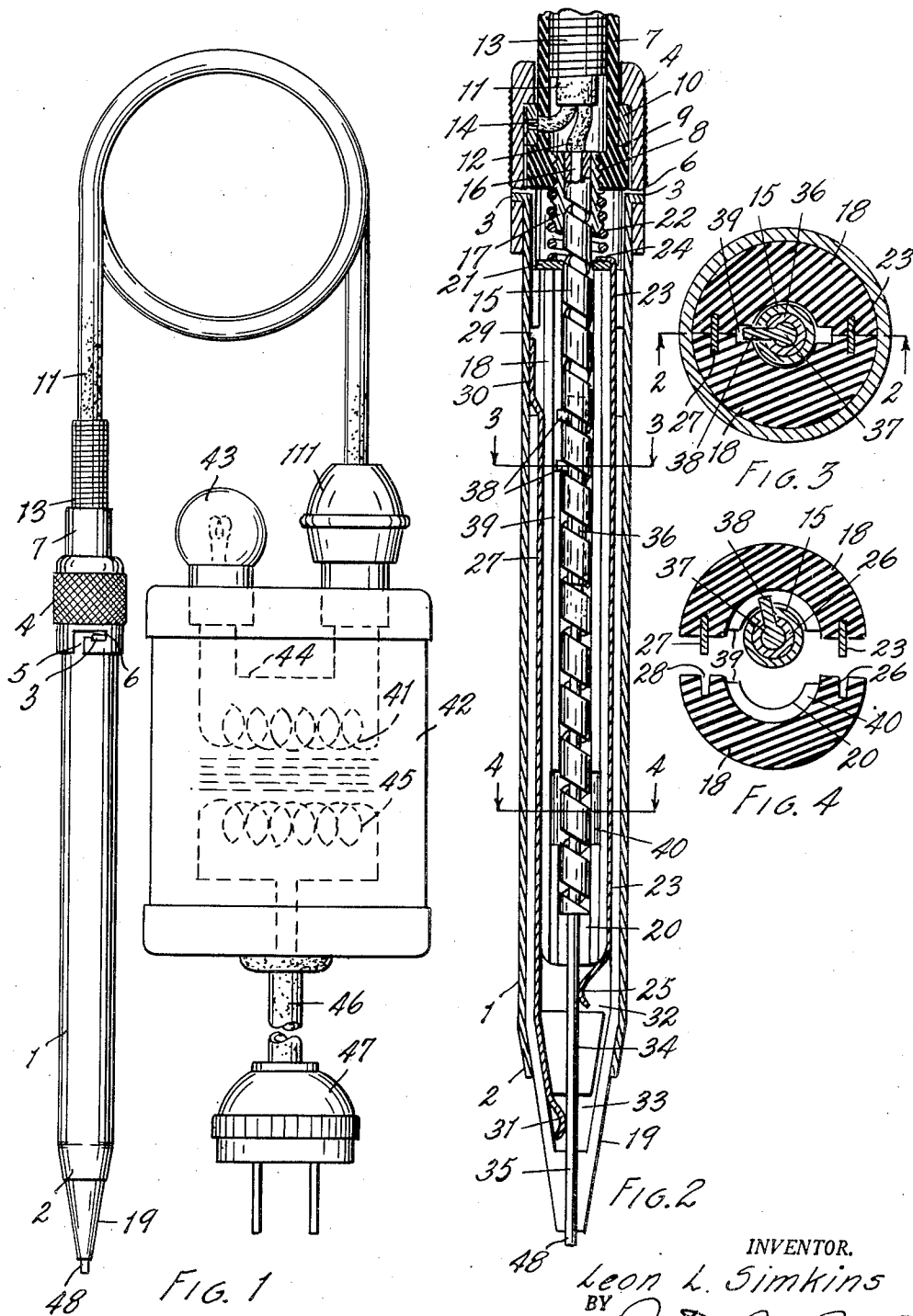
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L. L. SIMKINS

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HEATED PENCIL FOR WRITING ON WAXED PAPER

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INVENTOR.

Leon L. Simkins

BY

O. A. Earl

Attorney.

UNITED STATES PATENT OFFICE

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HEATED PENCIL FOR WRITING ON
WAXED PAPER

Leon L. Simkins, Kalamazoo, Mich.

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8 Claims. (Cl. 219—21)

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This invention relates to improvements in a heated pencil for writing on waxed paper.

The principal objects of this invention are:

First, to provide an electrically heated pencil for writing on waxed paper which will have a continuous supply of lead after the manner of ordinary automatic pencils.

Second, to provide an automatic pencil with means for heating the lead in which the lead itself forms the resistance element of the heating circuit.

Third, to provide an automatic pencil with a heated lead which pencil will not become uncomfortably or dangerously heated with prolonged use.

Fourth, to provide a heated pencil and power supply mechanism therefor which will visually indicate the operating condition of the pencil.

Other objects or advantages pertaining to the details and economies of my pencil will be apparent from a consideration of the following description and claims.

The drawings of which there is one sheet illustrate a preferred form of my pencil and power supply mechanism.

Fig. 1 is an elevational view of my pencil and its associated power supply mechanism.

Fig. 2 is a longitudinal cross sectional view through my pencil.

Fig. 3 is a transverse cross sectional view taken along the line 3—3 in Fig. 2.

Fig. 4 is a fragmentary partially exploded cross sectional view through the core of my pencil and taken along the line 4—4 in Fig. 2.

My pencil consists of a tubular metal barrel 1 having a frusto-conical point 2 at the lower end thereof and out turned locking lugs 3 at the upper end thereof. The upper end of the barrel 1 is arranged to be received within the hollow metallic cap 4, the cap being provided with axial slots 5 connecting with circumferential locking slots 6 for receiving the lugs 3. The barrel 1 is thus removable from the cap 4.

Positioned within the cap 4 is a tubular bushing 7 of fibre or other insulating material defining a threaded opening 8 at the lower end thereof. The lower end of the bushing 7 is provided with an outwardly extending shoulder 9 arranged to seat against and support a metallic conductor ring 10 and the upper end of the cap 4 is internally shouldered to engage the upper end of the ring and retain the ring against the shoulder 9. The lower end of the bushing 7 seats against and is retained in the cap by the upper end of the barrel 1.

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An electrical cable 11 having two conductors 12 enters the cap 4 through the bushing 7. Desirably the cable 11 is reinforced adjacent to the bushing by a coiled spring 13. One of the conductors 12 passes through an aperture in the wall of the bushing 7 and is electrically connected as at 14 to the conductor ring 10. The other conductor 12 is received in and electrically connected to the upper end of a spiral feed member 15 as at 16. The upper end of the spiral feed member 15 is nonrotatably secured in an externally threaded coupling member 17. The coupling member 17 is supported in the threaded aperture 8 in the bottom of the bushing 7.

Positioned within the tubular barrel 1 is a core consisting of a pair of symmetrically opposed core pieces 18 formed of electrically insulating material. When joined together the core pieces 18 form a tubular body with a conical point 19 which projects through the frusto-conical point 2 of the barrel 1. The core pieces 18 are oppositely hollowed out to define a central bore 20 arranged to freely receive the spiral feed member 15. A metallic washer 21 is positioned against the upper ends of the core pieces 18 and engaged by the coiled spring 22 to urge the core pieces downwardly in the barrel 1. The upper end of the spring 22 is centered around the coupling 17 and electrically connected thereto to transmit current from the coupling to the conductor strip 23 which has its upper end folded inwardly over the washer 21 as at 24.

The conductor strip 23 is formed of thin springable material and has an intumed contact finger 25 on the lower end thereof. The conducting strip 23 is received within the opposed longitudinal slots 26 formed in the meeting faces of the core members 18.

A second conducting strip 27 is positioned in longitudinal grooves 28 on the opposite side of the bore 20 from the strip 23 and the core pieces 18 are cut away as at 29 near the upper ends thereof to form a pocket through which the out turned upper end 30 of the conducting strip 27 may engage the inside of the metallic barrel 1. The lower end of the conducting strip 27 is provided with the inwardly turned spring contacting finger 31 spaced longitudinally below the contacting finger 25.

The meeting faces of the core members 18 are recessed as at 32 to form a space for the finger 25 and are further recessed as at 33 to form a chamber for the finger 31. The core members 18 are further recessed axially below the bore 20 to form a reduced bore 34 arranged to pass the

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lead or graphite writing point 35 of the pencil. Throughout this description and the claims the term lead as applied to the writing medium is intended to cover all forms of pencil "leads" as popularly understood.

The upper end of the lead 35 is frictionally received in a tubular carrier member 36 and the carrier member is provided near its upper end with a central block 27 having the advancing palls 38 extending outwardly therefrom through the side of the lead carrier. The advancing palls 38 are spaced to project through adjacent turns of the spiral feed member 15 and the walls of the bore 20 are longitudinally grooved as at 39 to receive the palls 38 in a nonrotatable but axially movable relationship.

Toward the lower end of the bore 20, the core members 18 are annularly relieved as at 40 to define a chamber into which the advancing palls 38 may be projected prior to the time at which the lower end of the lead carrier 36 engages the lower end of the main bore 20 in the core. Thus when the lead carrier is stopped in its downward movement with the bottom of the bore 20 the advancing palls 38 will be disengaged from the grooves 39 so that continued rotation of the core within the barrel 1 will not twist and damage the spiral feed member 15.

From the foregoing description it will be apparent that an electrical circuit is established from the connector ring 14 through the cap 4, barrel 1 to the upper end 30 of the conducting strip 27. The lower contact finger 31 electrically engages the lead 35 and the circuit is continued through a fixed length of the lead to the contact finger 25. The contact finger 25 and its conducting strip 23 are electrically connected through the washer 21, spring 22 and coupling member 17 to the other conductor of the cable 11.

The opposite or free end of the cable 4 is connected by means of the terminal plug 40 to the secondary coil 41 of a transformer mounted in a case 42. One of the conductors 12 is connected to the coil 41 through a signal lamp 43 and conductor 44. The metallic cover for the casing 42 may form the conductor 44. The primary coil 45 of the transformer is connected to a two conductor cable and plug 47 for attachment to a standard 110 volt lighting circuit.

The foregoing electrical circuit when energized from the transformer 22 causes electric current to pass through that portion of the lead between the fingers 25 and 31. The lead 35 being preferably formed of the familiar graphite construction of ordinary pencils forms a resistance in the circuit causing the lead to be heated adjacent to its lower end. The heat thus generated is transmitted by conduction to the writing point 48 of the lead so that when the pencil is applied to waxed paper the lead will melt its way through the wax and write on the surface of the paper. As the point 48 passes over the paper the melted wax will reform in the groove formed by the lead and solidify to cover and protect the material written on the paper.

The only heat generated by my pencil is localized within the lead itself and adjacent to the writing point so that most of the heat is available for melting the wax and so that little heat will accumulate in the barrel or other parts of the pencil. My pencil can thus be operated at economical and safe voltages from the transformer 42.

The signal lamp 43 is useful in that it will indicate a broken writing lead or other break in

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the electrical circuit by going out. The lamp will also indicate a short in the pencil or cable 11 by burning more brightly than when the current is passing through the lead in the proper manner.

The pencil is operative to advance the lead as the writing point is worn down or broken as in the familiar type of automatic pencil by holding the barrel 1 and turning the core point 19.

I have thus described one form of my pencil so that others may reproduce and use the same as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A heated pencil comprising, a tubular metal barrel having a lower end of reduced size, a cap removably secured to the upper end of said barrel and electrically connected therewith, an insulating bushing positioned in said cap and having a conductor ring around the outside thereof electrically engaged with said cap, a core including symmetrically opposed insulating core pieces positioned in said tube and projecting from the lower end thereof to a writing point, said core defining a central bore, a spiral feed member received in said bore, a coupling member threadedly received in the bottom of said bushing, said feed member being electrically connected to said coupling member, a lead carrying member having lugs engageable with said feed member and non-rotatably and slidably received between said core pieces, a pair of conducting strips mounted in opposed slots in the meeting faces of said core pieces, said conducting strips having inwardly turned spring fingers arranged to engage a writing lead carried by said lead carrier at points spaced axially along said lead, one of said conducting strips electrically contacting said barrel and the other of said conducting strips being electrically connected to said feed member, and a pair of conductors extending into said cap, one of said conductors being connected to said conductor ring the other of said conductors being connected to said feed member.

2. A heated pencil comprising, a tubular metal barrel, a cap removably secured to the upper end of said barrel and electrically connected therewith, an insulating bushing positioned in said cap and having a terminal thereon electrically engaged with said cap, a core including insulating core pieces positioned in said tube and projecting from the lower end thereof to a writing point, said core defining a central bore, a spiral feed member received in said bore, a coupling member received in the bottom of said bushing, a lead carrying member having lugs engageable with said feed member and non-rotatably and slidably received between said core pieces, a pair of conducting strips mounted in opposed slots in the meeting faces of said core pieces, said conducting strips having inwardly turned spring fingers arranged to engage a writing lead carried by said lead carrier at points spaced axially along said lead, one of said conducting strips electrically contacting said barrel and the other of said conducting strips being electrically connected to said coupling member, and a pair of conductors extending into said cap, one of said conductors being connected to said terminal, the other of said conductors being connected to said coupling member.

3. A heated pencil comprising, a tubular metal barrel, a cap removably secured to the upper end of said barrel and electrically connected therewith, an insulating bushing positioned in said cap and having a terminal electrically engaged with

the inside of said cap, a hollow core including symmetrically opposed insulating core pieces positioned in said tube and projecting from the lower end thereof in a writing point, writing lead advancing mechanism positioned in said core and adapted to project a writing lead through said point, a pair of conducting strips mounted in opposed slots in the meeting faces of said core pieces, said conducting strips having inwardly turned spring fingers arranged to engage said writing lead at points spaced axially along said lead and within said core, one of said conducting strips electrically contacting said barrel and the other of said conducting strips being electrically connected to said advancing mechanism, and a pair of conductors extending into said cap, one of said conductors being connected to said terminal, the other of said conductors being connected to said mechanism.

4. A heated pencil comprising, a tubular metal barrel, a cap removably secured to the upper end of said barrel and electrically connected therewith, an insulating bushing positioned in said cap and having a terminal electrically engaged with said cap, a hollow core including insulating core pieces positioned in said tube and projecting from the lower end thereof in a writing point, writing lead advancing mechanism positioned in said core and adapted to project a writing lead through said point, a pair of conducting strips mounted in said core pieces, said conducting strips having inwardly turned spring fingers arranged to engage said writing lead at points spaced axially along said lead, one of said conducting strips electrically contacting said barrel, and a pair of conductors extending into said cap, one of said conductors being connected to said terminal, the other of said conductors being connected to said other strip.

5. A heated pencil comprising, a tubular barrel, a cap removably secured to the upper end of said barrel, an insulating bushing positioned in said cap and having a terminal thereon, a hollow core including symmetrically opposed insulating core pieces positioned in said tube and projecting from the lower end thereof in a writing point, writing lead advancing mechanism positioned in said core and adapted to advance a writing lead through said point, a coupling member connected between said cap and said advancing mechanism, a pair of conducting strips mounted in opposed slots in the meeting faces of said core pieces, said conducting strips having inwardly turned spring fingers arranged to engage said writing lead at points spaced axially along said lead, one of said conducting strips being electrically connected to said terminal and the other of said conducting strips being electrically connected to said coupling member, and a pair of conductors extending into said cap, one of said conductors being connected to said terminal, the other of said conductors being connected to said coupling member.

minal, the other of said conductors being connected to said coupling member.

6. A heated pencil comprising, a tubular barrel, a cap removably secured to the upper end of said barrel, an insulating bushing positioned in said cap and having a terminal thereon, a hollow core positioned in said tube and projecting from the lower end thereof in a writing point, writing lead advancing mechanism positioned in said core and adapted to advance a writing lead through said point, a coupling member connected between said cap and said advancing mechanism, a pair of conducting strips carried by said core, said conducting strips having inwardly turned spring fingers arranged to engage said writing lead at points spaced axially along said lead, one of said conducting strips being electrically connected to said terminal and the other of said conducting strips being electrically connected to said coupling member, and a pair of conductors extending into said cap, one of said conductors being connected to said terminal, the other of said conductors being connected to said coupling member.

7. A pencil for writing on paper having a fusible coating comprising, a casing, mechanism in said casing for advancing a writing lead from said casing, a pair of electrical conducting elements positioned in said casing and having fingers on the lower ends thereof engageable with a writing lead carried by said mechanism at points spaced longitudinally along said lead, and a pair of conductors extending into said casing and electrically connected one to each of said conducting elements.

8. A heated pencil comprising, a tubular barrel, a cap removably secured to the upper end of said barrel, writing lead advancing mechanism positioned in said barrel and adapted to advance a writing lead through the opposite end thereof from said cap, a pair of conducting elements positioned in said barrel, said elements having spring fingers arranged to engage said writing lead at points spaced axially therealong, and a pair of conductors extending into said cap, said conductors being connected electrically one to each of said conducting elements.

LEON L. SIMKINS.

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