United States Patent [19]

Sloan

[11] **4,218,152**

[45] **Aug. 19, 1980**

[54] **ELECTRIC RESIST WAX PEN**

[76] Inventor: **Leila C. Sloan,** 212 Weiders La., Emmaus, Pa. 18049

[21] Appl. No.: **974,219**

[22] Filed: **Dec. 28, 1978**

[51] **Int. Cl.**[3] **A46B 11/08**

[52] **U.S. Cl.** **401/2;** 401/265

[58] **Field of Search** 401/1, 2, 265, 259

[56] **References Cited**

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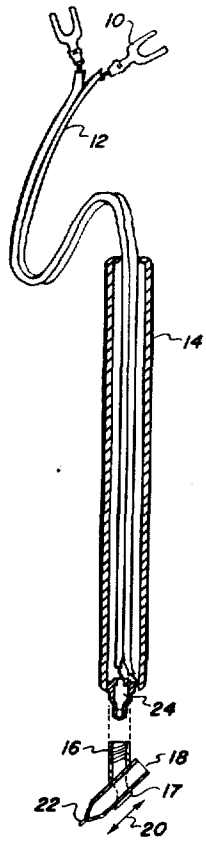
Primary Examiner—John D. Yasko

Attorney, Agent, or Firm—Ruth Moyerman

[57] **ABSTRACT**

An electric hand-held resist pen with an improved font and holder is disclosed. The font holder includes arcuate prongs for slidably engaging the font. By sliding the font up and down in the font holder, the heat eminating from the resistance heat to the font to its contained materials is varied and, thus, the flow rate of the material from the pen is controlled.

4 Claims, 3 Drawing Figures



United States Patent [19]

Cowell

[11] **Patent Number: 4,839,501**

[45] **Date of Patent: Jun. 13, 1989**

[54] **CARTRIDGE SOLDERING IRON**

[75] Inventor: **Mark J. Cowell**, San Carlos, Calif.

[73] Assignee: **Metcal, Inc.**, Menlo Park, Calif.

[21] Appl. No.: **904,298**

[22] Filed: **Sep. 8, 1986**

[51] **Int. Cl.**[4] **B23K 3/06**

[52] **U.S. Cl.** **219/237**; 219/236; 219/240; 219/229; 219/230

[58] **Field of Search** 219/227, 223, 229, 230, 219/231, 236, 237, 238, 239, 240, 241; 228/51-55

[56] **References Cited**

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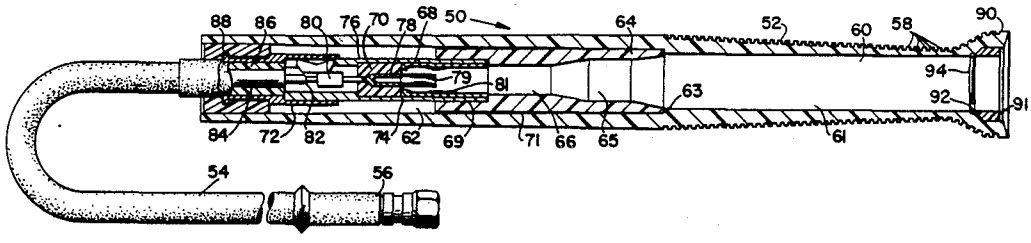
Primary Examiner—M. H. Paschall

Attorney, Agent, or Firm—Shlesinger & Myers

[57] **ABSTRACT**

Provided is a cartridge soldering iron having a hollow cylindrical handle, incorporating an internal coaxial socket assembly, a connection to a power supply, and a cartridge housing support, and a soldering tip bearing cartridge incorporating a tip, a heater assembly, a tubular housing and a coaxial socket assembly adapted to mate with the handle socket assembly in a wiping electrically conductive manner.

15 Claims, 2 Drawing Sheets



US007745760B2

(12) **United States Patent**
Shigekawa

(10) **Patent No.: US 7,745,760 B2**
(45) **Date of Patent: Jun. 29, 2010**

(54) **METHOD OF MANUFACTURING SOLDERING IRON**

(75) Inventor: **Tomohiro Shigekawa**, Fukuyama (JP)

(73) Assignee: **Taiyo Electric Ind. Co., Ltd.**, Fukuyama-shi, Hiroshima-ken (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 238 days.

(21) Appl. No.: **11/848,334**

(22) Filed: **Aug. 31, 2007**

(65) **Prior Publication Data**

US 2008/0010808 A1 Jan. 17, 2008

Related U.S. Application Data

(62) Division of application No. 11/284,708, filed on Nov. 22, 2005, now Pat. No. 7,291,809.

(30) **Foreign Application Priority Data**

Nov. 25, 2004 (JP) P2004-340157

(51) **Int. Cl.**
H05B 1/00 (2006.01)

(52) **U.S. Cl.** **219/229**; 219/230; 219/231

(58) **Field of Classification Search** 219/229, 219/230, 231, 237, 241, 544; 29/552; 228/51, 228/54
See application file for complete search history.

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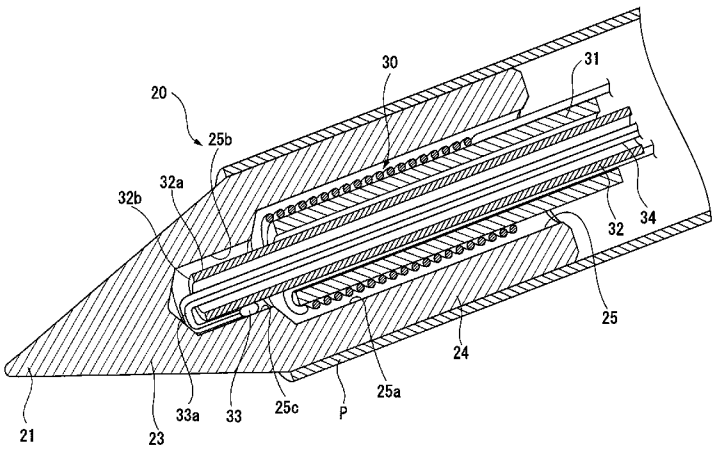
Primary Examiner—Tu B Hoang
Assistant Examiner—Vinod D Patel
(74) *Attorney, Agent, or Firm*—Matthew B. Dernier, Esq.; Gibson & Dernier LLP

(57) **ABSTRACT**

A soldering iron provided with a soldering tip that melts solder at a distal end, having inside said soldering tip a substantially cylindrical insertion fit recess portion extending from a proximal end of the soldering tip to the distal end, opening at the proximal end, and a heater formed into a coil shape and whose surface is covered with an insulating oxide film being fittingly inserted into the insertion fit recess portion.

3 Claims, 3 Drawing Sheets



United States Patent [19]

Polckemann

[11] **Patent Number: 4,648,545**

[45] **Date of Patent: Mar. 10, 1987**

[54] **SOLDERING IRON**

[76] Inventor: **Birger H. Polckemann,** 17, Midgårdsvej, DK-3000 Helsingor, Denmark

[21] Appl. No.: **753,962**

[22] Filed: **Jul. 11, 1985**

[30] **Foreign Application Priority Data**

Jul. 24, 1984 [DK] Denmark 3626/84

[51] **Int. Cl.**[4] **B23K 3/02;** B23K 3/06

[52] **U.S. Cl.** **228/53;** 228/20; 228/52; 219/230

[58] **Field of Search** 228/52, 53, 55, 20; 219/229, 230

[56] **References Cited**

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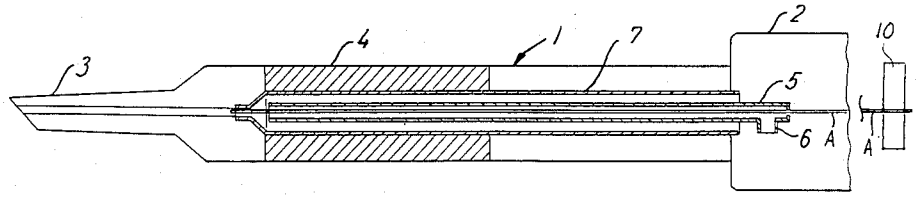
Primary Examiner—Nicholas P. Godici
Assistant Examiner—Christopher L. McKee
Attorney, Agent, or Firm—Browdy and Neimark

[57] **ABSTRACT**

A soldering iron is provided of a type in which the solder is fed through the interior of the soldering iron to the tip, which is heated by a heating element in the soldering iron. In order to prevent the solder from melting before it reaches the tip, as a result of the heat transmitted from the heating element to the solder, the soldering iron is provided, e.g. on a feed tube for the solder, with an inlet for a coolant, e.g. water or air, which is made to flow through the interior of the soldering iron around the solder, thereby cooling the surroundings of the solder.

10 Claims, 2 Drawing Figures



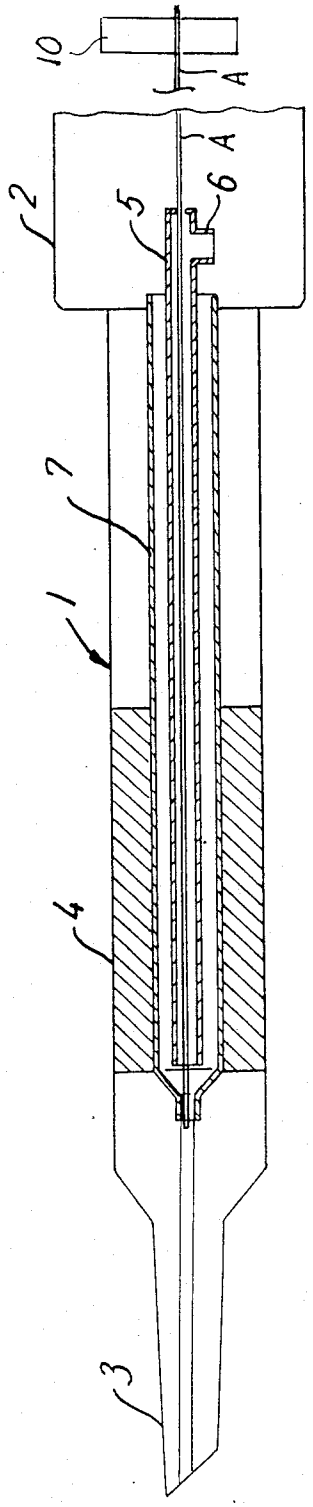


FIG. 1

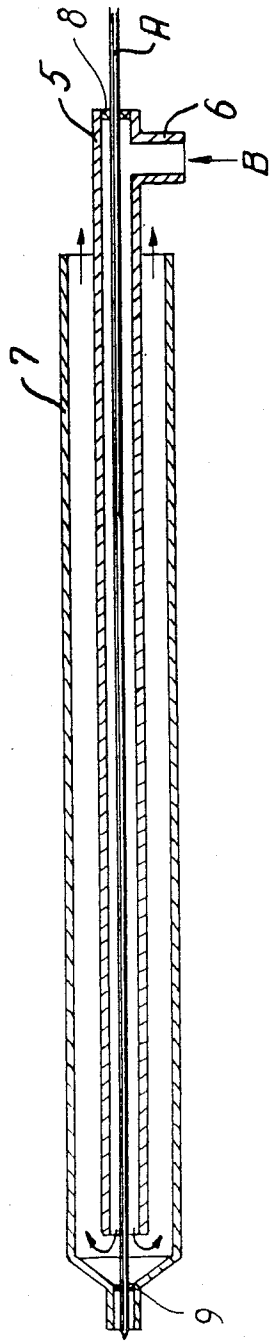


FIG. 2

SOLDERING IRON

BACKGROUND OF THE INVENTION

The invention relates to a soldering iron of the type in which the solder is fed through the interior of the iron to the soldering tip, which is heated by a heating element in the soldering iron.

A problem with soldering irons of this type is that the heat from the heating element, which serves to heat the tip, spreads through the material of the soldering iron, thereby causing the solder to soften to an unwanted extent or even melt, before it reaches the tip of the iron, because the solder has a considerably lower melting-point than the material of which the iron itself is made. This affects the quality of the soldering process, and makes precise soldering difficult.

Attempts at eliminating this problem by means of insulating of the solder from the heating element have not been sufficiently efficient, because a sufficient insulation is not possible in the relatively small place which is available in a soldering iron. If, on the other hand, the soldering iron were to be bigger, in order to make sufficiently efficient thermal insulation of the solder from the heating element possible, the soldering iron would become less handy to operate.

SUMMARY OF THE INVENTION

The present invention has the purpose of preventing a premature melting of the solder in soldering irons without increasing the size of the soldering iron as a result of the use of space-demanding insulation means.

This is, according to the invention, achieved by means of a soldering iron of the aforementioned type, in which means are provided for supplying a coolant, cooling air for instance, said coolant flowing through the interior of the soldering iron around the solder, at least in the area which comprises the heating element.

Such a flow of coolant through the interior of the soldering iron, a flow which preferably surrounds the solder entirely, will have the effect that the areas surrounding the solder will be cooled down, and that the heat is, before it reaches the solder, led away to such an extent that the residual-heat does not influence the consistency of the solder, and by thus leading away the heat, instead of simply trying to keep it out by way of more or less voluminous insulation members, a premature melting of the solder is efficiently avoided without necessitating an increase of the overall dimensions of the soldering iron.

BRIEF DESCRIPTION OF THE DRAWING

In the following, the invention is explained in more details by way of an embodiment which is shown schematically on the drawing, on which

FIG. **1** is a cross sectional view of the portion of a soldering iron which is comprised by the invention, whereas

FIG. **2** is an enlarged view of a portion of the cross-sectional view of FIG. **1**. in which the paths of the coolant and the solder are shown.

DETAILED DESCRIPTION

In FIG. **1** the soldering iron **1** is equipped with a handle **2**, and at its opposite end it is terminated by a soldering tip **3**. The tip is heated by way of a heating element **4**, which is heat-conductively connected with the soldering tip **3**.

The solder, in the shape of a solder wire A, is supplied from a not shown source to the right of FIG. **1**, and it is fed such as by hand or a feeding means **10** within the interior of the soldering iron **1** through a tube **5** extending therein to the tip **3**, where it is melted down in the conventional fashion. Thus, see FIG. **2** which shows the solder at A, and in which parts which correspond to those shown in FIG. **1** carry the same references.

On its path through the soldering iron **1**, the solder passes through the area of the heating element **4**, and in this area, after a relatively short time of operation, the temperature will be so high that the solder wire softens and thereafter melts if steps are not taken to prevent this.

Such steps, according to this invention, consist in conducting away of at least an essential part of the internally directed heat, before it is transmitted to the solder, and such a conducting away of the heat can, in a soldering iron according to the invention, as exemplified in FIGS. **1** and **2**, be realized by a pipe stub **6** serving as a coolant inlet on the feed tube **5** which inlet is connected with a coolant supply (not shown), for instance cooling water or cooling air, e.g. supplied or blown from B as shown in FIG. **2**. When coolant is thus introduced under pressure, i.e. forced, through the inlet **6**, the coolant will flow to the left in FIG. **1**. i.e. along the solder in direct contact with it, as shown by arrows in FIG. **2**, and an efficient cooling of the feed tube **5** is achieved. At the orifice of the tube **5** to the left in FIG. **1**, the coolant could, possibly, be ejected to the surroundings through the outer walls of the soldering iron, by way of openings not shown, but the tube **5** can, in an appropriate manner, be enclosed by an additional tube **7**, which, to the left in FIGS. **1** and **2**, communicates with the exit from the tube **5**.

As shown in FIG. **2** the solder wire is at **8** and **9** led into the tube **5** and out of the tube **7** in a tightening manner, e.g. through a restricted opening. The tightening may for instance be obtained by means of diaphragms having a central hole the diameter of which is a little smaller than the diameter of the solder wire.

The tubes **5** and **7**, which may be manufactured from stainless steel, are preferably reflecting, e.g. high-polished or chromium-plated on their outer side in order to reflect as much as possible of the incident infrared heat radiation. On their inner side said tubes may be rough, e.g. sandblasted, in order to increase the cooling surface.

As shown by the arrows in FIG. **2**, the coolant after having left the tube **5**, will flow back towards the coolant inlet on the outside of the tube **5**, hereby achieving partly an additional cooling around the solder and its feed tube, partly an opportunity to eject the coolant close to the place of introduction thereof so that one double tube will be sufficient to introduce and eject the coolant. This further reduces the space demands of the soldering iron and makes it more handy.

I claim:

1. A soldering iron of the type in which the solder is fed through the interior of the iron to the soldering tip, which is heated by a heating element in the soldering iron, wherein means are provided for actively supplying a distinct coolant under pressure, said coolant flowing through the interior of the soldering iron around the solder, at least in the area which comprises the heating element.

2. A soldering iron of the type in which the solder is fed through the interior of the iron to the soldering tip, comprising:

a body terminating in a tip, said body having a passageway therethrough for the feeding therethrough of solder in wire form, and heating means in said body for heating said tip;

said body defining an internal cavity in the vicinity of said heating element through which cavity said wire solder moves; and

said cavity having a coolant inlet and a coolant outlet, and means for forcing coolant under pressure through said coolant inlet, about the solder being fed, and out said coolant outlet.

3. A soldering iron according to claim 2, wherein said cavity comprises an elongated cylindrical pipe.

4. A soldering iron according to claim 3, wherein said coolant inlet is at the upstream end of said pipe relative to the movement of the wire solder therethrough, and said coolant outlet is at the downstream end of said pipe, whereby coolant flow is concurrent with movement of wire solder through said soldering iron.

5. A soldering iron according to claim 2, wherein said cavity comprises a pair of concentric cylindrical pipes with an annular space therebetween.

6. A soldering iron according to claim 5, wherein said coolant inlet is at the upstream end, relative to the direction of movement of wire solder, of the innermost of said concentric pipes, and said coolant outlet is at the upstream end of the outermost of said concentric pipes, the innermost of said concentric pipes opening to the outermost of said concentric pipes at their respective downstream ends.

7. A soldering iron according to claim 3, wherein said elongated cylindrical pipe has a reflective outer surface.

8. A soldering iron according to claim 3, wherein said elongated pipe has a roughened interior surface.

9. Soldering iron of the type in which the solder is fed through the interior of the iron to the soldering tip, which is heated by a heating element in the soldering iron, wherein means are provided for supplying a coolant, said coolant flowing through the interior of the soldering iron around the solder, at least in the area which comprises the heating element, having a feed tube for the solder, wherein the feed tube as seen in the direction of feed of the solder has in front of the heating element an inlet for the coolant and beyond the heating element an outlet for the coolant.

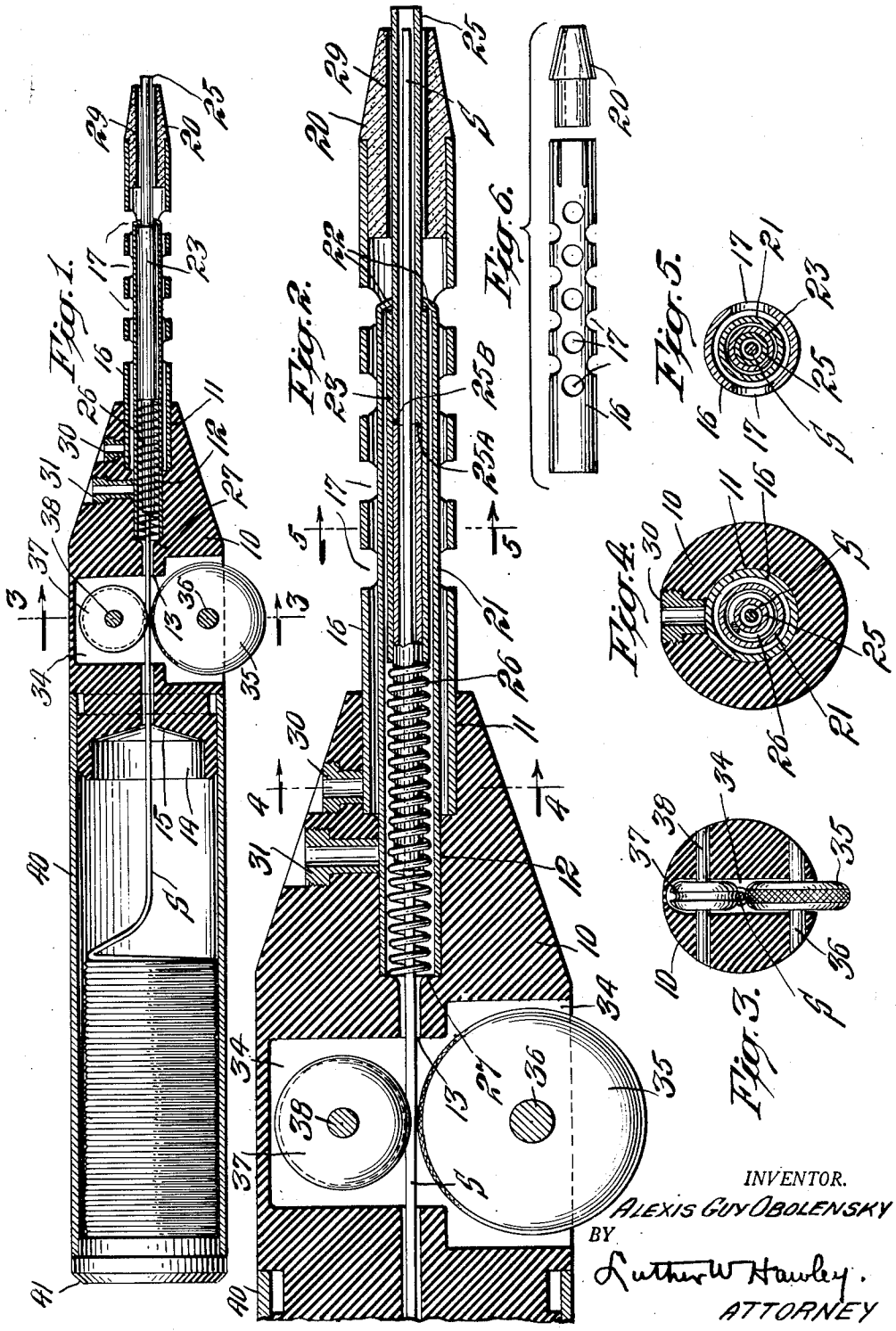
10. Soldering iron as claimed in claim 9, wherein the feed tube extends within a second tube or channel, into which the coolant outlet of the feed tube opens, and which itself is provided with a coolant outlet in front of the heating element.

* * * * *

Sept. 21, 1954 A. G. OBOLENSKY 2,689,901

SOLDERING TOOL

Filed Jan. 5, 1952



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ALEXIS GUY OBOLENSKY
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Luther W. Hawley.
ATTORNEY

Patented Sept. 21, 1954

2,689,901

UNITED STATES PATENT OFFICE

2,689,901

SOLDERING TOOL

Alexis Guy Obolensky, New York, N. Y., assignor to The Solder-Weld Corporation, New York, N. Y., a corporation of New York

Application January 5, 1952, Serial No. 265,180

1 Claim. (Cl. 219—27)

1

This invention relates to a soldering iron or tool.

More particularly stated, the invention relates to an electric soldering tool capable of being operated by one hand.

The invention has for its salient object to provide a tool of the character described that comprises few parts, can be economically manufactured and assembled, and will operate efficiently.

Another object of the invention is to provide a tool of the character described that can be operated to solder a connection or joint from any angle.

Another object of the invention is to provide a tool of the character described that will have long life and is economical to operate.

Further objects of the invention will appear from the following specification taken in connection with the drawings which form a part of this application, and in which:

Fig. 1 is a longitudinal sectional elevation of a tool constructed in accordance with the invention;

Fig. 2 is a sectional elevation, on an enlarged scale, of the front end portion of the tool;

Fig. 3 is a transverse sectional elevation on line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a transverse sectional elevation on line 4—4 of Fig. 2, looking in the direction of arrows;

Fig. 5 is a tranverse sectional elevation on line 5—5 of Fig. 2, looking in the direction of the arrows; and

Fig. 6 is an elevational exploded view of the tube and carbon electrode.

The invention, briefly described, consists of a soldering tool adapted for operation on low voltage and having a pair of electrodes and means for feeding a rod or pencil of solder to a position adjacent said electrodes. One electrode is slidable in the base relative to the other electrode and is resiliently forced outwardly to a limited extent. In the specific embodiment illustrated, the electrodes are tubular and concentric and the solder is fed through the slidable tubular electrode. Further details of the invention will appear from the following description.

In the particular embodiment of the invention illustrated, the tool has a base block 10 of insulating material, the block having a central opening therethrough, this bore comprising stepped bores or openings 11, 12 and 13. The

2

rear end of the block has a recess 14 having a conical inner surface 15.

A metallic tube 16 is mounted in the bore 11 and has ventilating holes 17. A carbon electrode 20 is mounted in the outer end of the tube 16.

A second metallic tube or sleeve 21 is mounted in the bore 12 and has an inturned flange 22 at its front end. A sleeve 23 is slidably mounted in sleeve 21 and has fixedly mounted therein a tubular electrode 25 comprising abutting sections 25A and 25B, the tubular electrode extending beyond the sleeve 23 in both directions.

A spring 26 encircles the inner end of the tubular electrode 25 and engages the inner end of sleeve 23 and abuts against a shoulder 27 at the inner end of bore 12. The forward movement of the sleeve 23 and tubular electrode 25 is limited by the engagement of flange 22 by the outer end of sleeve 23. Normally, the outer end of the electrode 25 projects beyond the outer end of electrode 20, as shown in Figs. 1 and 2.

It will be noted that the electrode 25 is spaced from the bore of the carbon electrode 20 and, if desired, the bore of the carbon electrode may be lined, as shown at 29, with insulating material or, alternatively, the outer surface of the portion of electrode 25 within the electrode 20 may have an insulating coating.

The tube 16 is secured in the base block 10 by a metallic bushing 30, and the sleeve 21 is held in the bore 12 of block 10 by a metallic bushing 31.

The electrical leads for the two electrodes are secured in the bushings 30 and 31.

The block 10 is recessed, as shown at 34, to receive a solder feed wheel 35 mounted on pin 36 and an idler wheel 37 mounted on a pin 38.

The solder, in the form of a wire or rod S, is stored in a coil disposed in a cylinder 40 which is mounted on the rear or inner end of the block 10 and forms the handle for the soldering tool. A plug 41 closes the rear end of the cylinder 40.

The solder wire is led through the bores 11, 12 and 13 of block 10, between wheels 35 and 37, and through the inner tubular electrode 25.

In use, the outer end of electrode 25 first engages the work and is pushed in until the electrode 20 engages the work. The work or joint engaged by the electrodes is thus heated and then the wheel 35 is rotated in a clockwise direction, viewing Figs. 1 and 2, to feed the solder wire to the work or joint to be made.

It will be evident from the foregoing specification that the joint can be soldered easily

and quickly from any angle and by the use of one hand of the operator.

Although one specific embodiment of the invention has been particularly shown and described it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claim.

What I claim is:

A soldering tool comprising a base of insulating material, a metal tube mounted in and projecting from said base, an electrode mounted on the outer end of said tube, means for making an electrical contact with said tube, a second tube mounted in said base and spaced from the first tube, a tubular electrode slidably mounted in the second tube and normally projecting beyond the outer end of the electrode mounted in the first tube, said tubular electrode having sliding contact with said second tube, means for making an electrical contact with the second tube, resilient means for forcing said tubular electrode outwardly, and means for feeding a solder pencil through the tubular electrode.

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United States Patent

[11] **3,570,742**

[72] Inventor **Walter E. Graham**
1140 Karen Raod, Montgomery, Ala. 36109

[21] Appl. No. **796,022**
[22] Filed **Feb. 3, 1969**
[45] Patented **Mar. 16, 1971**

[54] **CARTRIDGE-LOADING HEATED SOLDERING ELEMENT CONSTRUCTION**
10 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **228/53**, 228/55, 228/52
[51] **Int. Cl.** **B23k 3/04**
[50] **Field of Search** 228/52, 53, 55; 219/229; 222/146; 206/46

[56] **References Cited**
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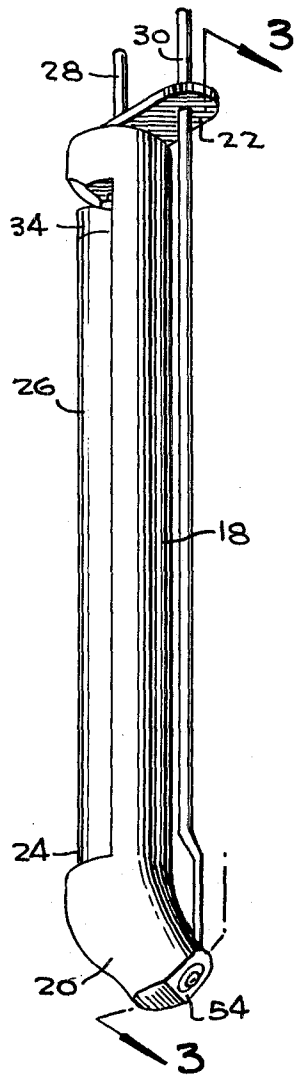
Primary Examiner—John F. Campbell
Assistant Examiner—D. M. Heist
Attorney—Mason, Fenwick & Lawrence

ABSTRACT: An electrically heated soldering element with a removable cartridge of solder received within a cavity in the element with a spherical valve mounted in the tip of the element and communicating with a solder-dispensing tubular extension on the cartridge so that inward movement of the valve sphere will open the valve to allow dispensing of melted solder from the cartridge.



PATENTED MAR 16 1971

3,570,742

Fig-1

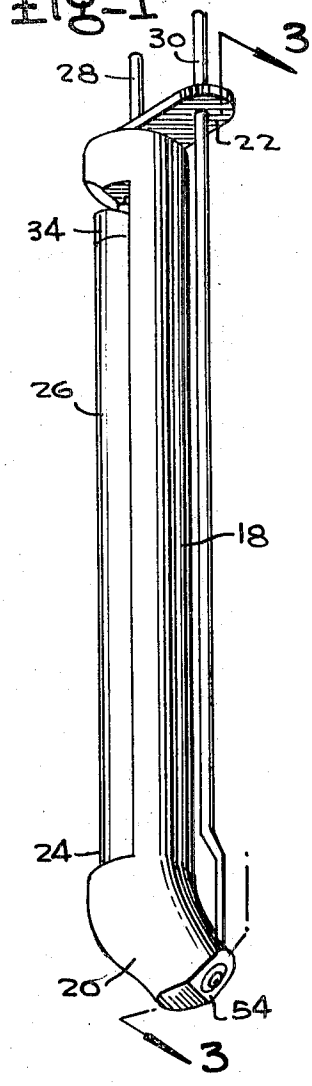


Fig-2

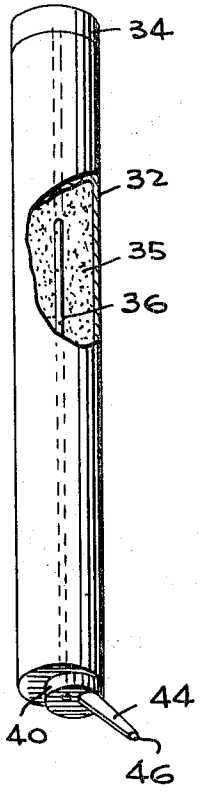


Fig-4

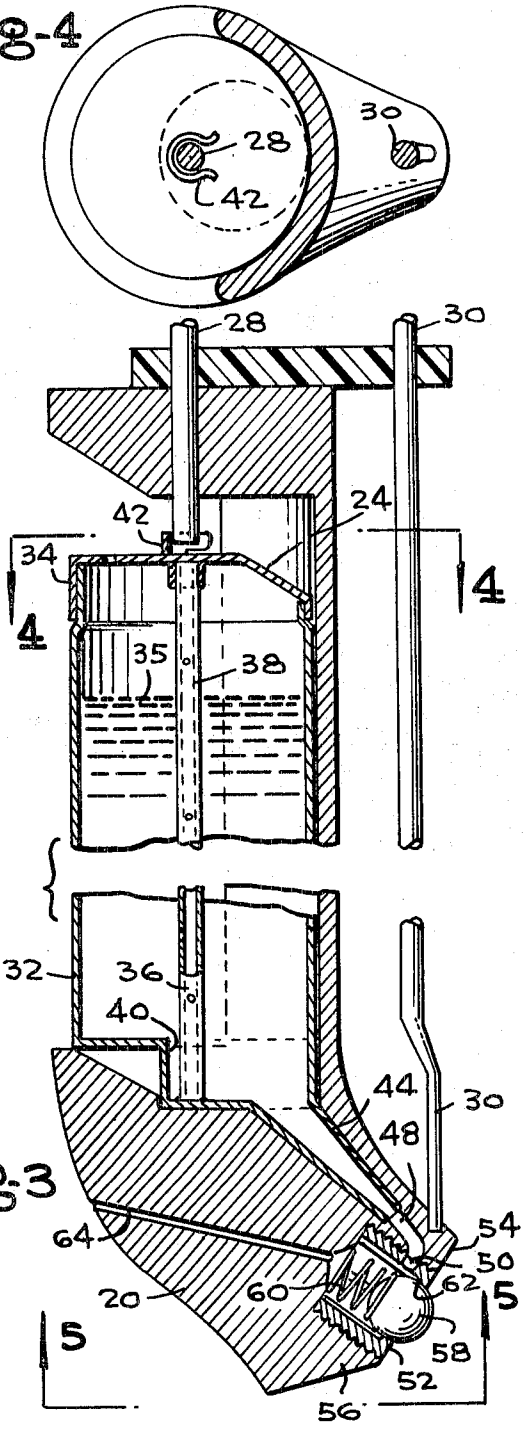
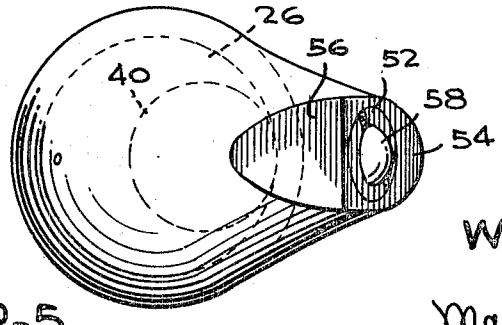


Fig-3

Fig-5



INVENTOR

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CARTRIDGE-LOADING HEATED SOLDERING ELEMENT CONSTRUCTION

BACKGROUND OF THE INVENTION

This invention relates to the field of solder equipment and to soldering guns in particular and is specifically directed to an electric soldering gun having means for dispensing melted solder automatically.

The use of a soldering gun normally requires that the gun be held in one hand and the solder manually applied to the tip of the gun or the work being soldered with the other hand. While this method of operation is generally satisfactory when the parts being soldered are held in fixed relationship with respect to each other, it often occurs that the parts are loose with respect to each other and some means must be found for fixedly positioning the parts during the soldering application. Consequently, in situations of this type many technicians will hold the solder between their teeth in order to employ one hand for holding the parts in such a fixed position with respect to the other. Needless to say, this process is an awkward one and often results in unsatisfactory work.

Awareness of the aforediscussed problems has resulted in numerous attempts to provide an adequate solution to the problem by the provision of means for dispensing solder from or adjacent the soldering gun or iron tip. For example, U.S. Pat. application Ser. No. 325,158, now U.S. Pat. No. 3,297,452, to Coffee illustrates an early attempt to solve the problems and discloses a soldering iron having a hollow tip within which melted solder is contained for outward flow through a small aperture or opening in the end of the tip. Devices of this sort have not proven to be satisfactory since there is no control over the flow of solder so that an excessive amount of solder can and does flow from the opening.

Other prior known devices recognized the problems of the simple devices of the type shown in the Coffee patent and attempted to provide a solution through the provision of manually operable valve means for varying the flow of melted solder from the interior of the tip. Examples of devices of this sort are found in U.S. Pat. No. 1,233,614 to Self, U.S. Pat. No. 1,574,361 to Brown and U.S. Pat. No. 2,135,764 to Oleson. Although the devices of the last-mentioned patents employ manually operable valve means for controlling the amount of melted solder dispensed from the iron tip, such devices of the aforementioned type have not proven to be satisfactory in that they require extensive manual manipulation of the valve actuator for opening and closing the valve means associated with the soldering gun tip and consequently do not provide any substantial advantage over the simple nondispensing-type soldering iron or gun.

Another problem with the prior known soldering-iron construction of the type employing an internal cavity for heating the solder is that it is difficult to remove all the solder from the internal cavity within the iron tip. While this defect would not be of great importance to many operations, the purity and composition of the solder is of extreme importance in many environments such as electronic circuits and the like.

SUMMARY OF THE INVENTION

Therefore, it is the primary object of this invention to provide a new and improved soldering gun construction.

A still further object of this invention is the provision of a new and improved soldering gun construction having means for automatically dispensing solder if such is needed.

Yet another object of this invention is the provision of a new and improved soldering gun construction in which the solder is supplied from removable containers or cartridges which can be easily changed for changing the nature of the solder being dispensed.

Obtainment of the objects of this invention is enabled through the provision of a soldering gun tip provided with a recess into which a solder-containing cartridge is easily inserted. The cartridge has a dispensing tube extending from one end and communicating with a valve chamber from adjacent and within the end of the soldering iron tip. The valve chamber includes a small check valve incorporating a spherical valve member biased outwardly so as to protrude from the soldering iron's tip. When the spherical check valve extends outwardly in its protruded position, the valve is closed so that no melted solder from the cartridge can flow from the tip. However, movement of the spherical member against a workpiece moves the spherical member inwardly to allow solder to flow from the tip. Consequently, when the tip is removed from the work, the flow of solder is automatically terminated with no wastage of solder. Other aspects of the invention include the provision of a working face adjacent the solder-dispensing face for enabling the heating of workpieces without dispensing of solder upon such occasions as when such is desired or necessary.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the preferred embodiment of this invention;

FIG. 2 is a perspective view of the solder-containing cartridge forming a portion of the preferred embodiment;

FIG. 3 is a sectional view taken along lines 3–3 of FIG. 1;

FIG. 4 is a sectional view taken along lines 4–4 of FIG. 3; and

FIG. 5 is an end view of the soldering gun tip as viewed in the direction of lines 5–5 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of this invention is directed to an electric soldering gun having a work heating element generally designated 18 which is provided with an offset tip 20 on its outermost end and is connected to a baseplate 22 on its innermost end. An elongated generally cylindrical chamber 24 is formed within the element 18 for receiving a generally cylindrical solder-containing cartridge 26 which is removably inserted therein.

First and second electrodes 28 and 30 respectively extend through the baseplate 22 for providing electrical current for heating the element 18 in a conventional manner. Second electrode 30 is connected adjacent the end of the tip 20 while the first electrode 28 merely extends only a short distance into the chamber 24 as best illustrated in FIG. 3 of the drawings. Electrodes 28 and 30 are connected to the conventional voltage source of a soldering gun handle (not shown) of any conventional type so as to cause heating of the element when current flows through the element and cartridge from the electrodes.

Cartridge 26 comprises a generally cylindrical shell 32 having a removable cap 34 on its rear end for enabling the filling of the cartridge with solder material 35. A hollow heat-conducting tube 36 extends along the axis of cartridge 26 and conducts heat from the heating element 18 to the interior of the cartridge for melting the solder 35. Additionally, it should be noted that hollow tube 36 of the preferred embodiment contains a plurality of apertures 38 which permit flux material on the interior of the tube to escape upon the melting of the cartridge interior contents. However, it should be understood that the use of flux within the interior of the tube 36 is not mandatory and can be eliminated if the use of such material is not desireable.

The forward end of cartridge 26 is provided with a cylindrical retainer lug 40 mounted eccentrically with respect to the cartridge's longitudinal axis and which serves the purpose of retaining element tip 20 in a manner to be discussed in greater detail hereinafter. Retention of the rearmost end of the cartridge 26 within the heating element 18 is enabled through a horseshoe shaped clamp 42 which clampingly engages the innermost end of the first electrode 28 as best illustrated in FIG. 3.

A tubular solder discharge extension 44 extends outwardly and downwardly from the forward end of the eccentric cylindrical retaining lug 40 and is of hollow construction for

enabling the discharge of liquid solder from within the interior of cartridge **26**. The tubular extension **44** has an open aperture **46** on its extreme end for enabling the discharge of the melted solder.

The tubular extension **44** is matingly received in a discharge conduit **48** formed in the tip **20** as illustrated in FIG. **3**. The lower end of the conduit **48** communicates with an aperture **50** extending through the wall of a threaded cylindrical valve body cup member **52** which is threadably retained in a cylindrical cavity extending inwardly from a first planar face **54** on the tip **20**. Face **54** serves as a solder-dispensing surface and a second or work face **56** is formed adjacent one edge of face **54** and is used for heating a joint or other work area when it is not desired to dispense melted solder upon same.

A valve member comprising a movable valve member in the form of a spherical ball **58** is mounted within the valve body cup **52** to be biased outwardly by a coil compression spring **60** against a valve seat **62**. Dispensing of solder is prevented when the spherical ball **58** is biased against the seat **62** as shown in FIG. **3**. However, spherical ball **58** is movable inwardly by engagement with a work area so as to enable the consequent dispensing of melted solder from the interior of the valve body cup **52** in a n obvious manner. Moreover, a vent line **64** is formed in the tip **20** for enabling a free and easy dispensing of the melted solder from the valve.

One very significant aspect of the instant invention involves the fact that the valve member comprising the valve body cup **62** and spherical ball **58** etc. is easily removable for replacement by other valve members of varying capacity. For example, in some soldering operations, it is necessary that only a small amount of liquid solder be dispensed. Applications of this type would require a valve construction having a small dispensing aperture. On the other hand, in other applications in which a greater quantity of solder would be desired, a valve of greater capacity would be required. The removability of the valve means also enables a thorough cleaning or replacement of such when changing solder compositions.

Cartridge **26** is inserted in the heating element **18** by initially positioning the tubular extensions **44** and the eccentric retaining lug **40** within the mating portions of element **18** within which they are to be received. The rearmost end of the cartridge is then moved downwardly and inwardly so as to engage the horseshoe clamp **42** over the end of the electrode **28** to provide a relatively fixed mounting of the cartridge in the heating element. The cartridge can be removed by pivoting the rear end outwardly from the heating element and removing same in reverse order from the manner in which it is inserted in the heating element.

Variations in the exact construction of the subject invention will occur to those skilled in the art and it should be understood that the subject invention is limited solely by the appended claims.

I claim:

1. A soldering means having a heating element with a heated tip portion comprising, a solder cartridge-receiving chamber in said heating element for receiving a cartridge container of solder, a cartridge container of solder in said chamber, a solder-dispensing tubular extension extending from said cartridge, a solder discharge conduit in said tip portion communicating with said solder-dispensing tubular extension for gravitationally dispensing solder from said tip when solder within said cartridge is melted with said discharge conduit including valve means comprising a spring-urged valve closure member movable to an open position for allowing discharge of melted solder and movable to a closed position for preventing discharge of melted solder wherein said spring-urged valve closure member is mounted in a removable valve body cup threadedly received within said tip and is biased outwardly from said tip and has a projecting portion projecting outwardly of said tip so that engagement of said projecting portion with an object to be soldered will move said closure member inwardly for opening said valve to allow melted solder to flow therefrom onto the object to be soldered.

2. The invention of claim **1** wherein said spring-urged closure member is a spherical ball mounted within said valve body cup.

3. The invention of claim **2** additionally including a vent extending through said tip and communicating with the interior of said valve body cup.

4. The invention of claim **3** wherein said tip portion includes a solder-dispensing face from which melted solder is dispensed from said valve body cup and a planar working face adjacent said dispensing face and oriented at an acute angle with respect to said dispensing face.

5. The invention of claim **4** wherein said spherical ball includes a portion which extends outwardly from the surface of said solder-dispensing face.

6. The invention of claim **5** wherein said solder-dispensing face is oriented at an angle with respect to the longitudinal axis of said heating element at an acute angle less than the angle at which said working face is oriented with respect to said heating element.

7. The invention of claim **1** wherein said tip portion includes a solder-dispensing face on which melted solder is dispensed and a planar working face adjacent said dispensing face and oriented at an acute angle with respect to said dispensing face.

8. The invention of claim **7** wherein said spring-urged closure member is a spherical ball mounted within said valve body cup.

9. The invention of claim **8** additionally including a vent extending through said tip and communicating with the interior of said valve body cup.

10. The invention of claim **9** wherein said spherical ball includes a portion which extends outwardly from the surface of said solder-dispensing face when said solder-dispensing face is not in engagement with a surface to be soldered.

United States Patent [19]

Dhillon

[11] **3,876,857**

[45] **Apr. 8, 1975**

[54] **SOLDERING PEN FOR MICROCIRCUIT PRODUCTION**

[75] Inventor: **Tejinder Singh Dhillon,** Toronto, Ontario, Canada

[73] Assignee: **The Raymond Lee Organization, Inc.,** New York, N.Y.

[22] Filed: **June 29, 1973**

[21] Appl. No.: **375,030**

[52] **U.S. Cl.** ..... **219/230;** 219/236; 219/421; 222/146 HE; 228/53; 401/2

[51] **Int. Cl.** **H05b 1/00;** B23k 3/06

[58] **Field of Search** ..... 219/221, 227–240, 219/421; 401/1, 2, 260; 228/51–55; 222/146 R, 146 HE

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Primary Examiner—A. Bartis
Attorney, Agent, or Firm—Daniel Jay Tick

[57] **ABSTRACT**

A soldering pen for microcircuit production comprises an outer tube of substantially hollow cylindrical configuration having a predetermined diameter and length. An inner tube of substantially hollow cylindrical configuration is coaxially positioned in the outer tube in spaced relation therewith and has a diameter smaller than that of the outer tube and a length shorter than that of the outer tube. Both tubes are open at one end. A substantially conical cover is provided over both tubes at the one end thereof. The cover has an aperture formed therethrough at the apex thereof. A heating element is provided in the inner tube and a substantially conical bit in the tube has a pen point extending coaxially through the aperture through the cover. Soldering metal is provided in the space between the inner and outer tubes. A spring is provided between the inner and outer tubes urging the inner tube in a direction urging the pen point out of the cover. Thus, when the pen point is pressed against a surface, the inner tube is forced back into the outer tube against the action of the spring and enlarges the uncovered area of the aperture through the cover thereby permitting molten solder to pass through the aperture onto the pen point.

3 Claims, 3 Drawing Figures

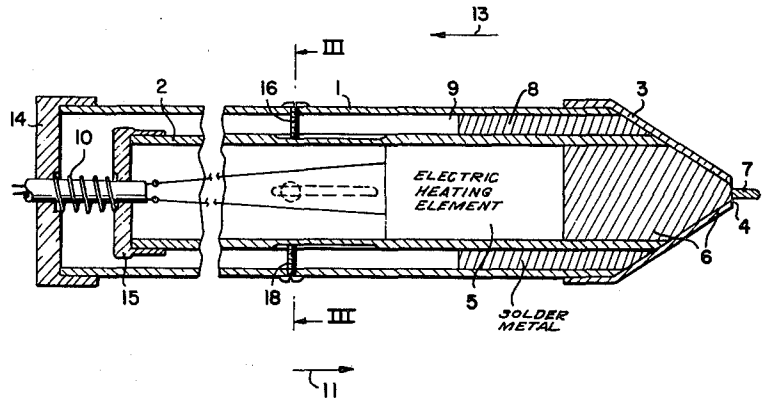

FIG. 1

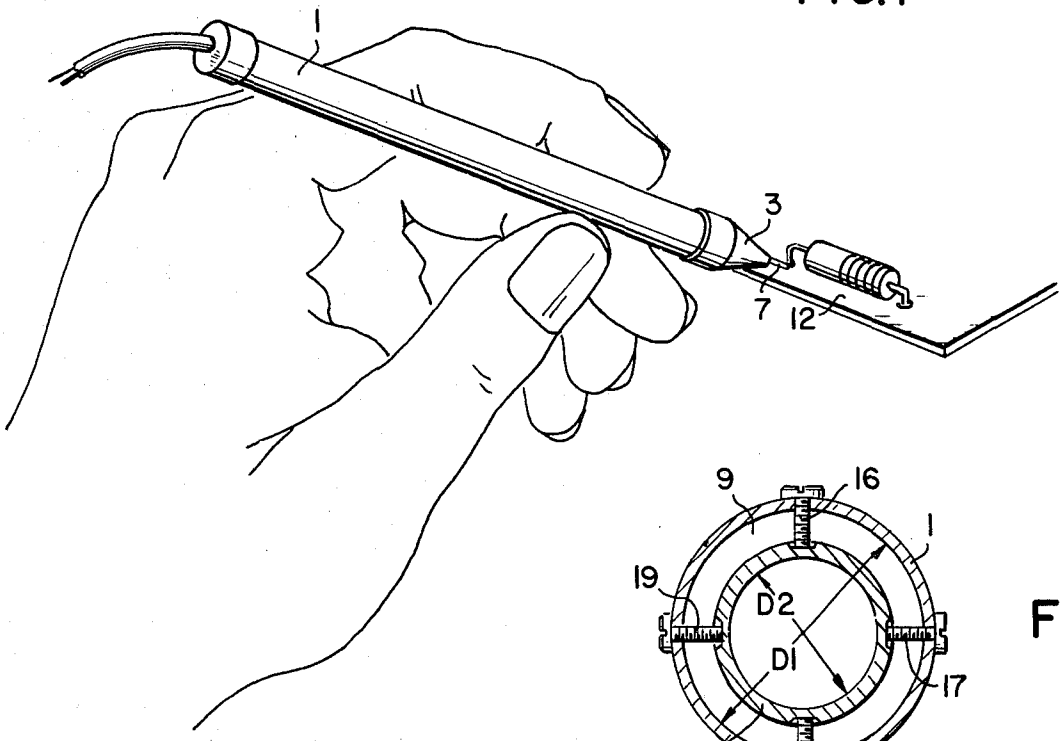

FIG. 3

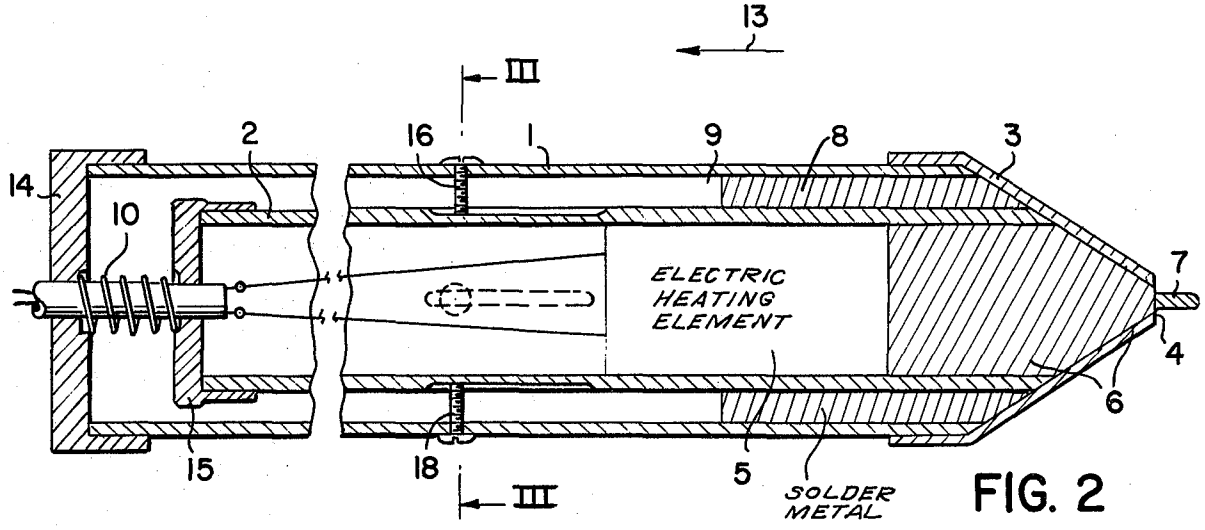

FIG. 2

SOLDERING PEN FOR MICROCIRCUIT PRODUCTION

DESCRIPTION OF THE INVENTION

The present invention relates to a soldering pen. More particularly, the invention relates to a soldering pen for microcircuit production.

Objects of the invention are to provide a soldering pen of simple structure which is efficient, effective, reliable and economical in use, is simple, easy, convenient and facile to use, is of light weight, carries a large supply of solder sufficient for long use, may be utilized with one hand, is especially applicable for microcircuit production and may be used for tin soldering.

In order that the invention may be readily carried into effect, it will now be described with reference to the accompanying drawing, wherein

FIG. 1 is a schematic diagram of an embodiment of the soldering pen of the invention in use;

FIG. 2 is a longitudinal sectional view of the soldering pen of the invention;

FIG. 3 is a cross-sectional view, taken along the lines III—III, of FIG. 2.

In the FIGS., the same components are identified by the same reference numerals.

The soldering pen of the invention comprises an outer tube 1 (FIGS. 1, 2 and 3) of substantially hollow cylindrical configuration having a predetermined diameter D1 (FIG. 3) and length.

An inner tube 2 (FIGS. 2 and 3) of substantially hollow cylindrical configuration is coaxially positioned in the outer tube 1 in spaced relation therewith and has a diameter D2 (FIG. 3) smaller than that of the outer tube and a length shorter than that of the outer tube. Both tubes 1 and 2 are open at one end, at the right of FIG. 2.

A substantially conical cover 3 (FIGS. 1 and 2) is provided over both tubes 1 and 2 at the one end thereof. The cover 3 has an aperture 4 formed therethrough at the apex thereof (FIG. 2).

A heating element 5 (FIG. 2) is provided in the inner tube 2. A substantially conical bit 6 (FIG. 2) is also provided in the inner tube and has a pen point 7 (FIGS. 1 and 2) extending coaxially through the aperture 4 through the cover 3.

Soldering metal 8 is provided in the space 9 (FIGS. 2 and 3) between the inner and outer tubes 2 and 1.

A spring 10 (FIG. 2) is positioned between the inner and outer tubes 2 and 1 and urges the inner tube in a direction, indicated by an arrow 11, urging the pen point 7 out of the cover 3. Thus, when the pen point 7 is pressed against a surface 12 (FIG. 1), the inner tube 2 is forced back into the outer tube 1, in the direction of an arrow 13, against the action of the spring 10, and enlarges the uncovered area of the aperture 4 through the cover 4, thereby permitting molten solder from the space 9 to pass through the aperture onto the pen point.

The other end of each of the inner and outer tubes 2 and 1, at the left of FIG. 2, is open. A cap 14 covers the other end of the outer tube 1 (FIG. 2). A cap 15 covers the other end of the inner tube 2 (FIG. 2). The spring 10 is coaxially positioned between the caps 15 and 14 of the inner and outer tubes 2 and 1, respectively.

The conical cover 3 is removably affixed to the one end of the outer tube 1.

Each of a plurality of screws 16, 17, 18 and 19 (FIG. 3) is threadedly affixed to the outer tube 1 and passes through the outer tube in a radial direction. Each of the screws 16, 17, 18 and 19 abuts the inner tube 2 thereby maintaining the inner tube in spaced coaxial position within the outer tube 1, as shown in FIGS. 2 and 3.

While the invention has been described by means of a specific example and in a specific embodiment, I do not wish to be limited thereto, for obvious modifications will occur to those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. A soldering pen for microcircuit production, said soldering pen comprising

an outer tube of substantially hollow cylindrical configuration having a predetermined diameter and length;

an inner tube of substantially hollow cylindrical configuration coaxially positioned in the outer tube in radially spaced relation therewith and having a diameter smaller than that of the outer tube and a length shorter than that of the outer tube, both tubes being open at both ends, said inner tube being supported within said outer tube for axial movement relative thereto;

a substantially conical cover over both tubes at one end thereof, said cover being secured to said outer tube and having an aperture formed therethrough at the apex thereof;

an electric heating element in the inner tube and a substantially conical bit at the one end of the inner tube and having a pen point extending coaxially through the aperture through the cover;

power supply means extending from the other end of the inner tube and outwardly through the other end of the outer tube for energizing the heating element;

soldering metal in the space between the inner and outer tubes;

a cap on the inner tube covering the other end thereof;

a cap on the outer tube covering the other end thereof; and

spring means coaxially positioned between and engaging the caps of the inner and outer tubes urging the inner tube in a direction urging the conical bit into engagement with the conical cover to close the aperture with the pen point extending out of the cover whereby when the pen point is pressed against a surface the inner tube is forced back into the outer tube against the action of the spring and enlarges the uncovered area of the aperture through the cover thereby permitting molten solder to pass through the aperture onto the pen point.

2. A soldering pen as claimed in claim 1, wherein the conical cover is removably affixed to the one end of the outer tube.

3. A soldering pen as claimed in claim 2, further comprising a plurality of screws each threadedly affixed to the outer tube and passing through the outer tube in a radial direction and slidably abutting the inner tube thereby maintaining the inner tube in spaced coaxial position within the outer tube.

* * * * *

United States Patent [19]

Babarin

[11] **Patent Number: 4,936,501**

[45] **Date of Patent: Jun. 26, 1990**

[54] **SOLDERING DEVICE**

[76] Inventor: **Sergei Babarin**, 21-57 Hollland Ave. #L, Bronx, N.Y. 10462

[21] Appl. No.: **337,646**

[22] Filed: **Apr. 13, 1989**

[51] **Int. Cl.**[5] **B23K 3/06**

[52] **U.S. Cl.** **228/53**; 219/230

[58] **Field of Search** 228/51, 53, 52; 219/230

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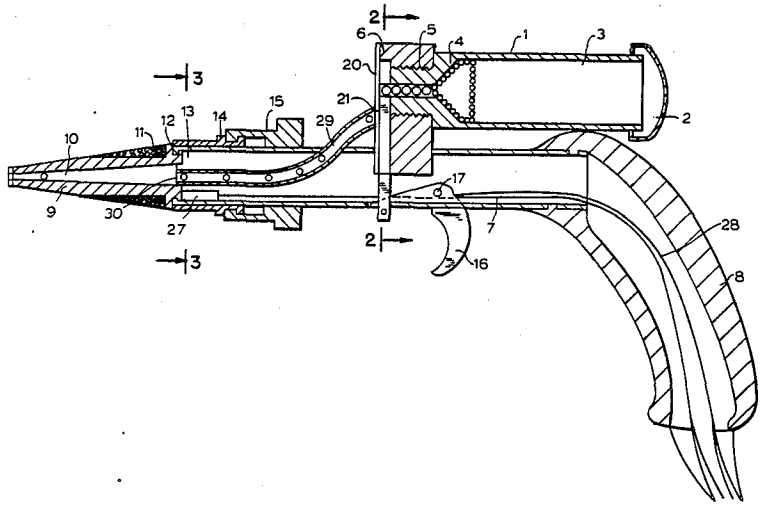
Primary Examiner—Kenneth J. Ramsey

Attorney, Agent, or Firm—Ilya Zborovsky

[57] **ABSTRACT**

A soldering device has a container for accommodating solder bodies, a soldering head, a tubular guide for guiding the solder bodies to the soldering head, and a slider formed to take the solder bodies from the container and transfer them into the tubular guide.

8 Claims, 1 Drawing Sheet



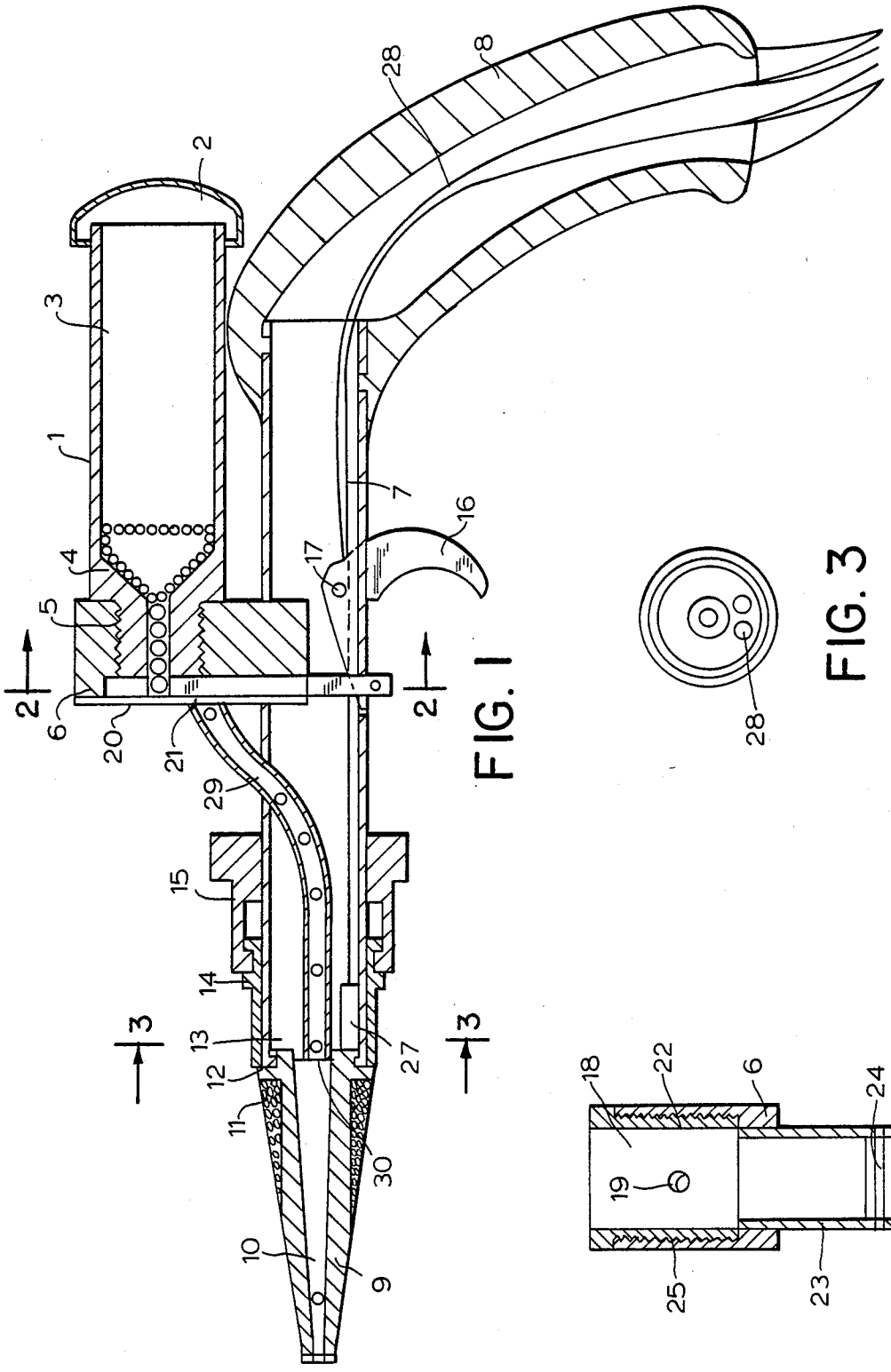


FIG. 1

FIG. 3

FIG. 2

SOLDERING DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to a soldering device.

Soldering devices are widely known and used in various modifications. Their constructions are relatively complicated especially when used with discrete soldering bodies to be supplied to the solder zone. It is believed to the desirable to improve further the existing soldering devices of this type.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a soldering device which is a further improvement of the devices of this type.

In keeping with these objects and with others which will become apparent hereinafter, one feature of the present invention resides, briefly stated, in a soldering device which has a container for accommodating a plurality of solder bodies, a tubular guide communicating with a soldering head, and a slider movable between an outlet of the container to the inlet of the tubular guide to transfer the solder bodies from the former to the latter.

The novel features of the present invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its manner of operation: will be best understood from the following description of a preferred embodiment which is accompanied by the following drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a soldering device in accordance with the present invention; and

FIGS. 2 and 3 are views showing sections taken along the lines II—II and III—III in FIG. 1.

DESCRIPTION OF A PREFERRED EMBODIMENT

A soldering device in accordance with the present invention has a container 1 with an open end closeable by a removable cover 2. The interior of the container has a cylindrical part 3, a conical part 4 and a short passage 5 communicating with one another. The front part of the container 1 is screwed into a holder 6 which is mounted on a tubular support 7 for example by welding. A plastic handle 8 is connected with the rear end of the support 7.

The device further has a soldering head 9 with a supply passage 10 narrowing toward its front end. The rear end of the soldering head has an engaging formation 11 which engages with an engaging formation 12 on the front end of the tubular support 7. The front end of the tubular support 7 has a removable segment 13. A bush 14 slides over the front end and over the segment 13. The rear end of the bush 14 engages with a knob 15 rotatably relative to the latter. The knob is turnable on the tubular support 7 and displaceable along the latter via threads provided on the inner surface of the knob and the outer surface of the tubular support.

A cock 16 is pivotally mounted on the tubular support 7 by a pivot pin 17. A slider 18 has a receiving opening 19 and moves in a guide of the holder 6. Its opposite side is covered by a plate 20 having an opening 21. The slider has a solid part 22 and a hollow part formed by two strips 23 connected by a pin 24. The front end of the cock 16 engages the pin 24. Two springs 25 are connected by first ends to a shoulder of the slider 18 and by second ends to the holder 6 to normally pull the slider upwardly in the drawings. Electrical conductors 26 extend through the interior of the tubular support 7 and end in a plug 27 provided with two prongs 28. The prongs 28 are insertable in not shown plug holes in the soldering head 9 to form plug-socket means.

The soldering device operates in the following manner. The conductors 26 are connected with the electrical source and the soldering head is heated. The device is turned by 90° vertically so that the. front end of the soldering head faces downwardly. A solder body moves into the passage 5 of the container and from there into the opening 19 of the slider 18. A user pulls the cock 16 and turns its end counterclockwise so that the front end pulls the slider away of the passage 5 and to the guide 29 which extends from the opening 21 of the plate 20 to the inlet 30 of the soldering head. When the opening 19 of the slider coincides with the inlet of the guide 29, the solder body slides through the guide into the passage 10 and is melted there under the action of heat of the heated soldering head. Then the melted solder flows out of the head onto a required spot. When the user releases the cock, the springs 25 return the slider to its initial position. The process is then repeated as many times as desired.

For removing the soldering head, the knob 15 is turned and therefore displaced axially rearwardly over the tubular support away from the soldering head. The knob displaces the bush 14 axially rearwardly away of the region of the segment 13, the segment is removed radially, and then the rear end of the soldering head is removed radially through a recess in the tubular support, which recess is formed after the removal of the segment. The installation of the soldering head is performed in a reversed order.

The present invention are not limited to the details shown since various modifications and structural changes are possible without departing in any way from the spirit of the invention.

What is desired to be protected by Letters Patent is set forth in the appended claims.

1. A soldering device, comprising

a container arranged to accommodate a plurality of solder bodies and having an outlet;

a soldering head having a passage provided with a passage inlet and a passage outlet;

a tubular guide having a first end located in the region of said container outlet and a second end communicating with said passage inlet of said soldering head;

a slider movable between a first position in which it takes one of the solder bodies from said container outlet and a second position in which it places the taken solder body to the region of said passage inlet to introduce the same into said passage;

a cock arranged to move said slider from said first position to said second position;

return spring means arranged to return said slider from said second position to said first position upon release of said cock by a user, wherein said slider having an opening with a size substantially corresponding to a size of one solder body and formed to receive one solder body when said slider is in said first position and hold the one solder body during the movement of said slider to said second position.

2. A soldering device, comprising

a container arranged to accommodate a plurality of solder bodies and having an outlet;

a soldering head having a passage provided with a passage inlet and a passage outlet;

a tubular guide having a first end located in the region of said container outlet and a second end communicating with said passage inlet of said soldering head;

a slider movable between a first position in which it takes one of the solder bodies from said container outlet and a second position in which it places the taken solder body to the region of said passage inlet to introduce the same into said passage;

a cock arranged to move said slider from said first position to said second position;

return spring means arranged to return said slider from said second position to said first position upon release of said cock by a user, wherein said slider having a solid portion provided with said opening and another part composed of two narrow parallel strips having free ends, said slider further having a transverse pin connecting said free ends of said strips with one another, said cock having an engaging end which engages said transverse pin of said slider to move the latter from said first position to said second position.

3. A soldering device, comprising

a container arranged to accommodate a plurality of solder bodies and having an outlet;

a soldering head having a passage provided with a passage inlet and a passage outlet;

a tubular guide having a first end located in the region of said container outlet and a second end communicating with said passage inlet of said soldering head;

a slider movable between a first position in which it takes one of the solder bodies from said container outlet and a second position in which it places the taken solder body to the region of said passage inlet to introduce the same into said passage;

a cock arranged to move said slider from said first position to said second position;

return spring means arranged to return said slider from said second position to said first position upon release of said cock by a user;

a handle;

a tubular support having an axis and one end releasably connected with said soldering head and another end connected with said handle;

means for releasably connecting said one end of said tubular support with said soldering head, said connecting means including a removable segment provided in a wall of said tubular support in the region of said one end; and

a bush axially movable on said one end of said tubular support between one position in which it is located over said segment and holds said segment in engagement with a remaining part of said tubular support so as to hold said soldering head in said one end of the latter, and another position in which said bush is displaced away of said segment so that said segment can be removed radially by a user and said soldering head can then be removed radially from said one end of said support through an opening in the wall of said tubular support formed after the removal of said segment.

4. A soldering device as defined in claim 3, and further comprising a displacing knob connected with said bush and having an inner thread, said tubular support having an outer thread on which said inner thread of said knob engages so that when said knob is turned by a user it displaces along said tubular support and displaces said bush between said one and other positions.

5. A soldering device as defined in claim 1, and further comprising a tubular support having one end releasably connected with said soldering head, and another end; a handle connected with the other end of said tubular support, said cock being pivotably supported on said tubular support; and electrical conductors extending through said tubular support.

6. A soldering device as defined in claim 5, wherein said electrical conductors have ends releasably connectable with said soldering head; and further comprising means for releasably connecting said ends of said electrical conductors with said soldering head and formed as plug-socket means.

7. A soldering device as defined in claim 1, wherein said container has a cylindrical part and a conical part extending from said cylindrical part toward said container outlet, said container also having a short passage extending betwen said conical part and said outlet of said container for guiding the solder bodies from the interior of said container to said container outlet.

8. A soldering device as defined in claim 7, wherein said container has a first end provided with said short passage and an opposite end which is open; and further comprising a removable cover arranged to close said open end of said container during use and to open said open end for supplying solder bodies into the interior of said container.

* * * * *

March 19, 1946. F. D. McCULLY 2,396,799

ELECTRIC SOLDERING IRON

Filed Feb. 28, 1944

Fig. 1.

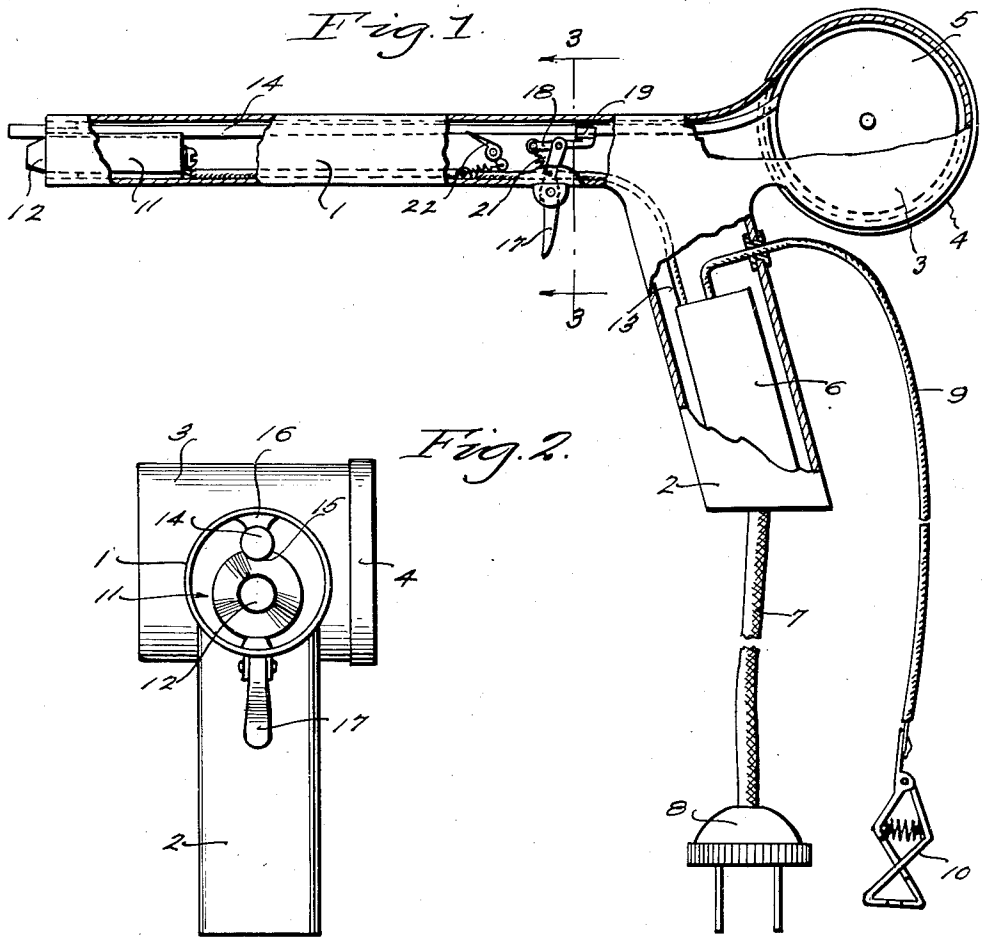


Fig. 2.

Fig. 3.

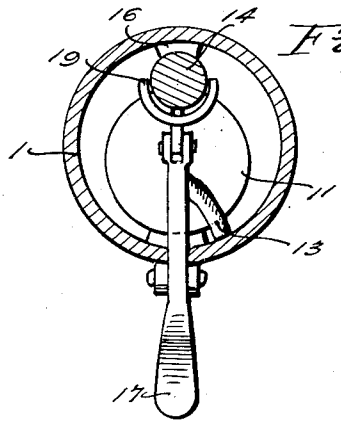
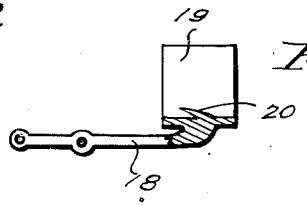


Fig. 4.



Inventor

Frank D. McCully

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Sept. 22, 1959 J. DE RUGERIS 2,905,799

SOLDERING IRON

Filed July 25, 1958 2 Sheets-Sheet 1

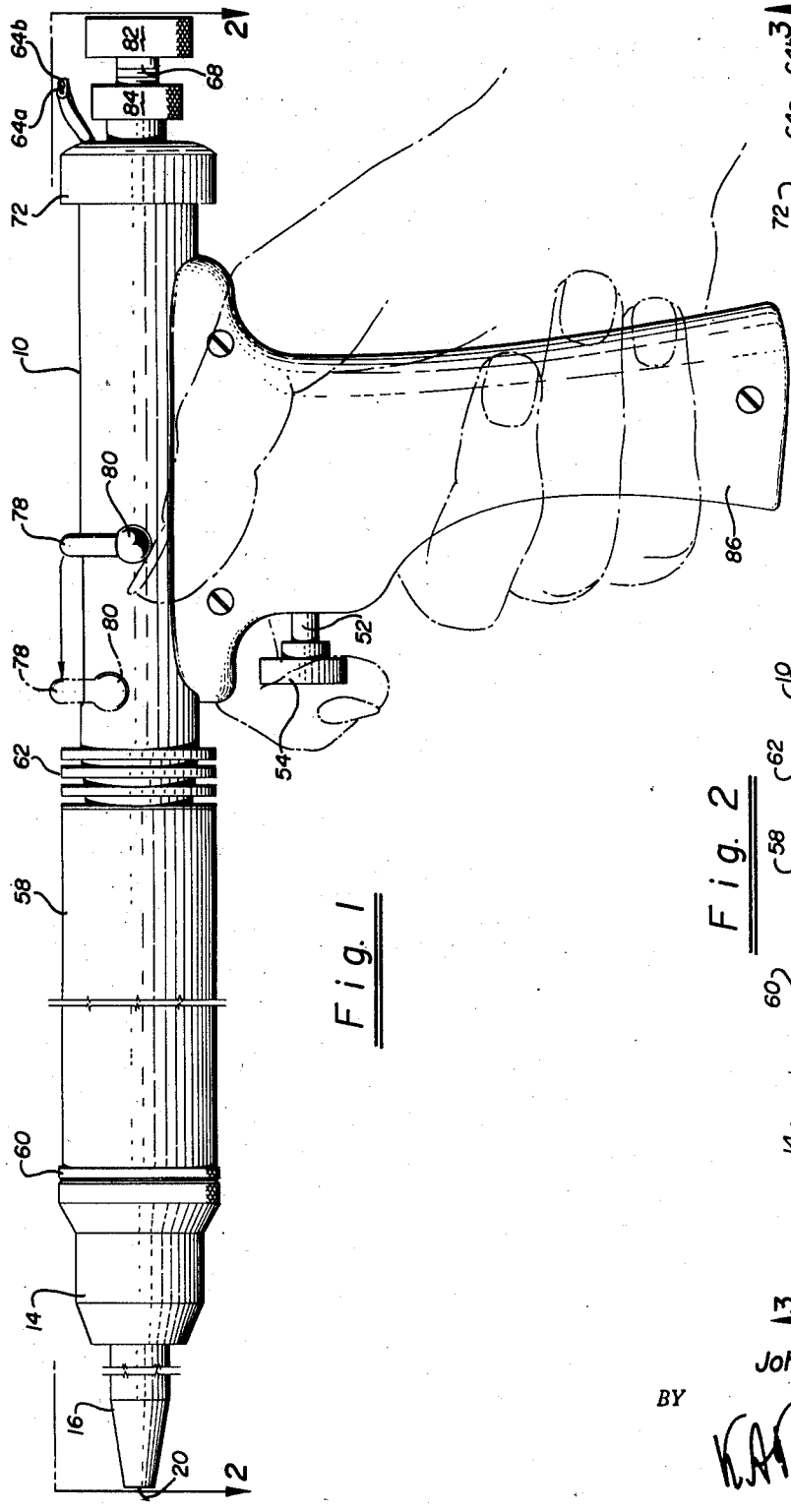


Fig. 1

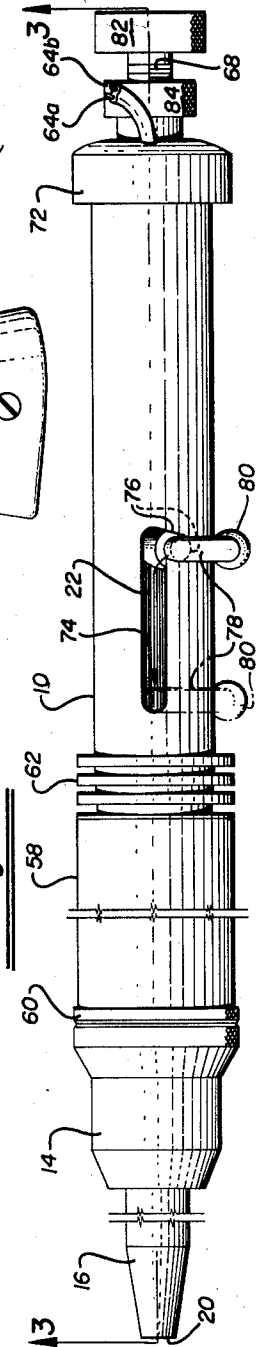


Fig. 2

INVENTOR.
John DeRugeris

BY

May 13, 1969 W. S. FORTUNE 3,443,734

SOLDER-DESOLDER COMBINATION IMPLEMENT

Filed Oct. 24, 1967 Sheet 1 of 2

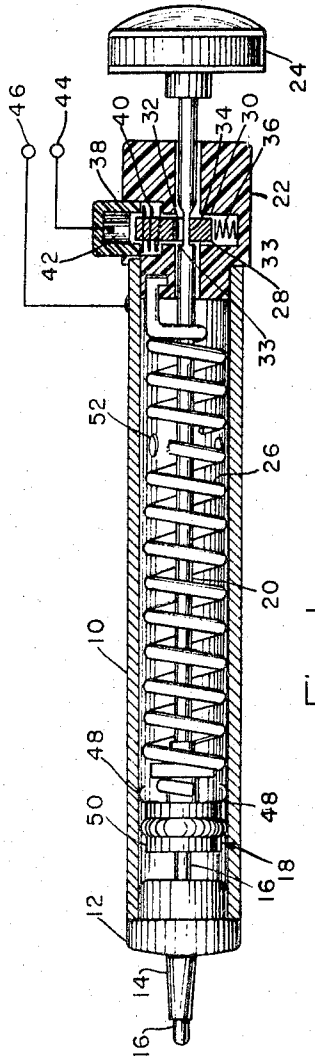


Fig. 1

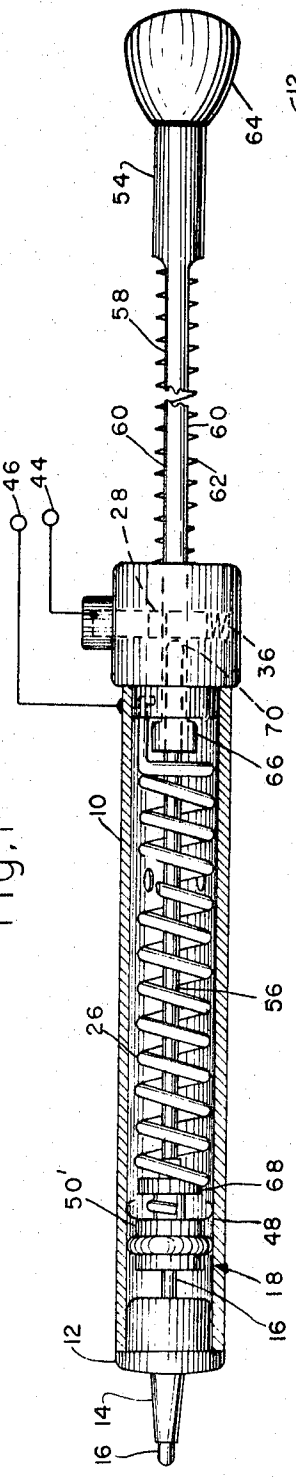


Fig. 2

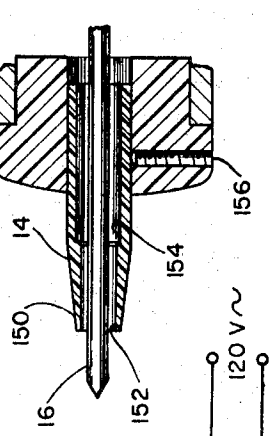


Fig. 7

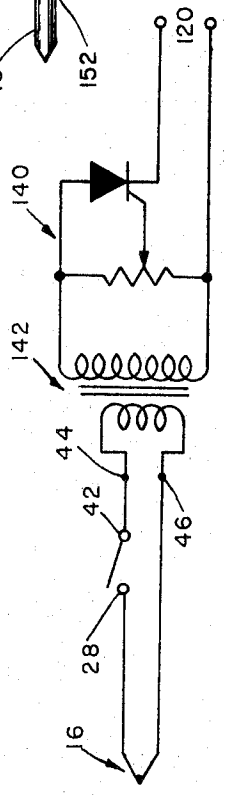


Fig. 6

William S. Fortune
INVENTOR.

BY Daniel T. Anderson
ATTORNEY

United States Patent

[11] 3,592,378

[72] Inventor **Frank A. Petraglia**
New York, N.Y.

[21] Appl. No. **769,071**
[22] Filed **Oct. 21, 1968**
[45] Patented **July 13, 1971**

[73] Assignee **Metro-Tel Corp.**
Westbury, N.Y.

[54] **SOLDERING IRON**
8 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** **228/51,**
158/24, 219/229, 228/53, 228/54
[51] **Int. Cl.** **B23k 3/02**
[50] **Field of Search** 228/51, 53,
54, 55, 20, 21; 219/229; 126/263; 42/67, 70

[56] **References Cited**
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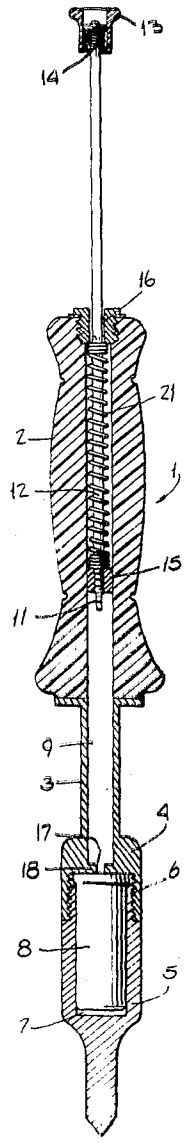
Primary Examiner—John F. Campbell
Assistant Examiner—Robert J. Craig
Attorney—Norman N. Holland

ABSTRACT: A portable soldering iron having a hollow chamber next to the soldering tip which holds a cartridge that contains heat-producing chemicals. A spring-pressed firing pin is placed in a bore in the handle of the iron and is adapted to pass through a small aperture to strike the cartridge causing the chemicals to ignite to produce heat which is conducted to the soldering tip.



United States Patent

[11] 3,612,357

[72] Inventor **Henry Ruskin**
Cranford, N.J.

[21] Appl. No. **864,109**
[22] Filed **Oct. 6, 1969**
[45] Patented **Oct. 12, 1971**
[73] Assignee **Swingline Inc.**
Long Island, N.Y.
Continuation-in-part of application Ser. No. 721,722, Apr. 16, 1968.

[54] MOLTEN MATERIAL DISPENSERS WITH CONTROLLED FORCIBLE MANUAL FEEDER FOR RATCHET-TOOTHED HEAT-LIQUEFIABLE ROD, HAVING HEATER AND THERMOSTAT

19 Claims, 27 Drawing Figs.

[52] **U.S. Cl.** **222/146,** 219/230, 219/421, 228/52, 228/53, 337/392
[51] **Int. Cl.** **B67d 5/62**
[50] **Field of Search** ..... 222/146, 146 HE, 146 H, 391; 221/270; 118/76, 202; 219/230, 421; 228/52, 53; 337/392

[56] **References Cited**

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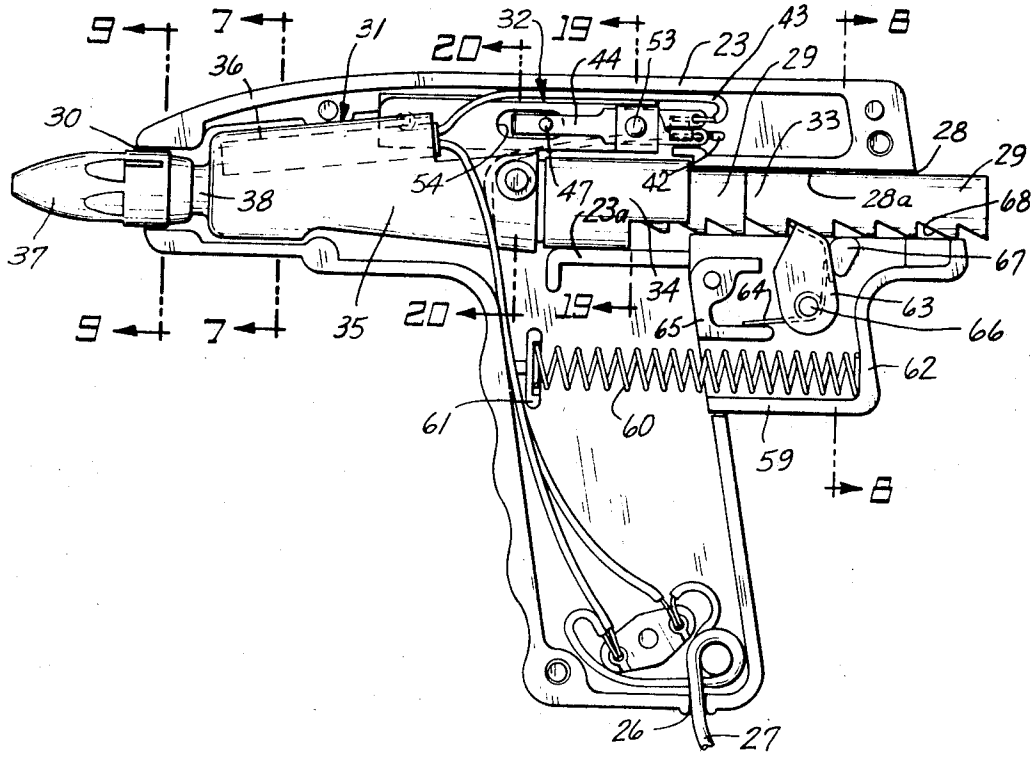
Primary Examiner—Stanley H. Tollberg
Attorney—Paul S. Martin

ABSTRACT: The disclosed gun especially for glue sticks has a melting chamber with an electric heater conspicuously closer to the melted-material discharge nozzle than to the solid material inlet end and a thermostat conspicuously closer to the solid material inlet end than to the nozzle end of the heating chamber for accommodating the supply of electric heat to the rate of discharge of the molten material. The gun has a hand grip carrying the heating chamber, and a pawl-carrying reciprocable manual driver is disposed at the side of the hand grip remote from the nozzle. The driver is controllably but powerfully operable by the squeeze of a hand that embraces the hand grip and the driver. The liquefiable material has ratchet teeth engaged by the manually driven pawl. The ratchet-toothed rod enters the melting chamber in solid state and acts as a piston for the molten material in the melting chamber.



United States Patent

Schlitt

[15] **3,707,258**

[45] **Dec. 26, 1972**

[54] **SOLDERING GUN FOR ONE-HANDED MANIPULATION**

[72] Inventor: **Klaus Schlitt,** 2, Voltenseestrasse, 6 Bergen-Enkheim near Frankfurt/Main, Germany

[22] Filed: **May 13, 1969**

[21] Appl. No.: **824,209**

[30] **Foreign Application Priority Data**

Mar. 26, 1969 Germany..... P 19 15 259.1

[52] **U.S. Cl.** **228/52,** 219/229, 228/41

[51] **Int. Cl.** **B23k 3/06**

[58] **Field of Search** 228/51, 52, 53, 41; 219/229

[56] **References Cited**

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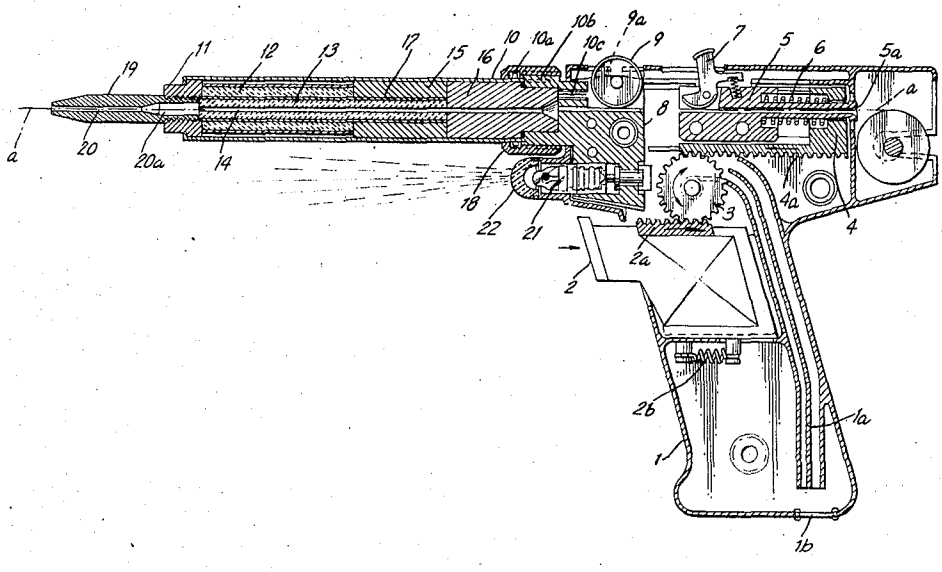
Primary Examiner—John F. Campbell
Assistant Examiner—R. J. Craig
Attorney—Markva & Smith

[57] **ABSTRACT**

A soldering gun, and more particularly a soldering gun for one-handed manipulation is provided containing a supply bobbin for soldering wire and means for feeding the latter. Said soldering gun consists of two functional assemblies resiliently coupled as required by the state and properties of the soldering wire by means of a compression spring being placed between said cooperating assemblies. The soldering wire advances through the axial bore of a fine steel barrel which contains insulating lining members as well as a heating cartridge, the advance of the wire being controlled by a locking wheel located in a stationary part of the soldering gun. Thus a thrust is generated that does not exceed the buckling strength of the heated wire.

17 Claims, 1 Drawing Figure



United States Patent [19]

Gleizes

[11] **4,216,894**

[45] **Aug. 12, 1980**

[54] **PORTABLE SOLDERING APPARATUS**

[76] Inventor: **Raymond M. X. Gleizes,** 10, rue Pasteur, 77300 Fontainebleau, France

[21] Appl. No.: **925,760**

[22] Filed: **Jul. 18, 1978**

[30] **Foreign Application Priority Data**

Jul. 9, 1977 [FR] France 77 22049

[51] **Int. Cl.**[2] **B23K 3/02;** B23K 3/06

[52] **U.S. Cl.** **228/52;** 228/41; 221/266; 222/363

[58] **Field of Search** 228/52, 53, 41; 219/421, 230; 221/266; 222/363

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481669	3/1938	United Kingdom	219/230

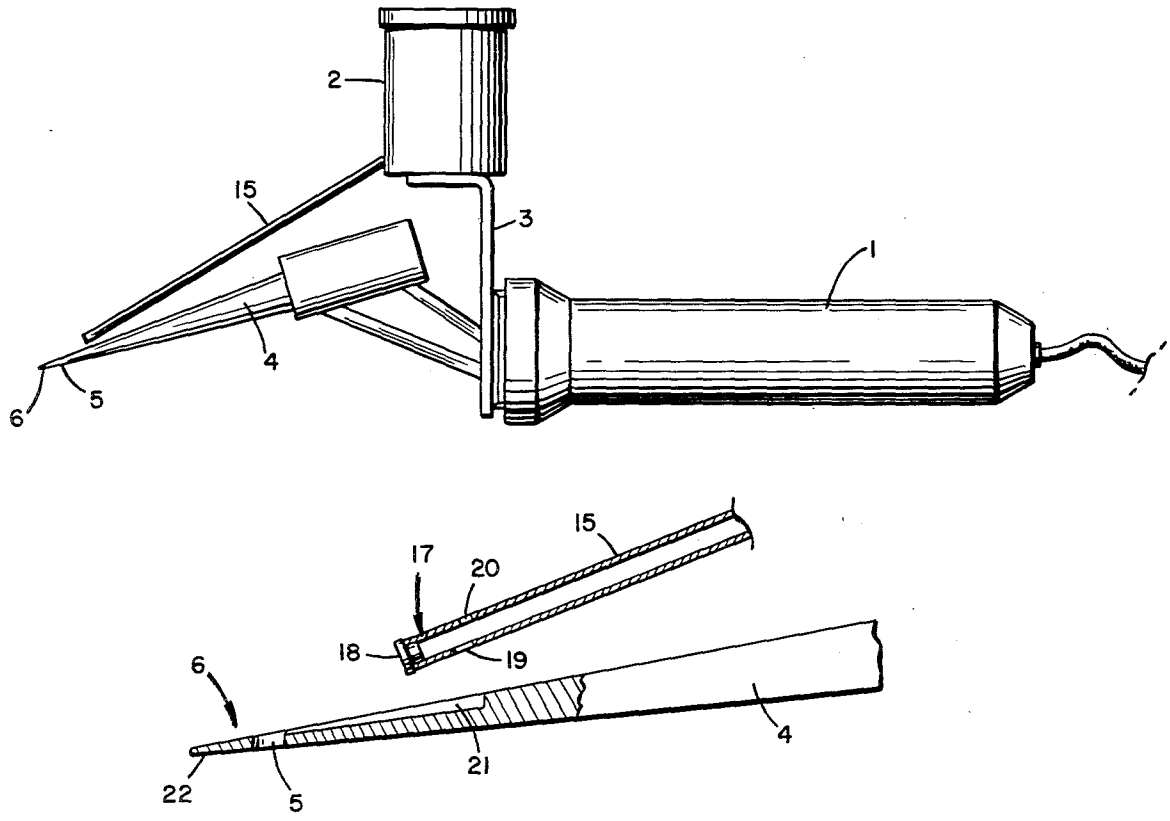
Primary Examiner—Daniel C. Crane

Attorney, Agent, or Firm—Fleit & Jacobson

[57] **ABSTRACT**

An improved soldering device has a magazine to hold preformed solder shapes for dispensing them through a tubular duct onto a channel formed in a soldering bit. The channel leads to an opening formed in the bit to permit passage therethrough of the preformed solder shapes. An actuator is affixed to the magazine to dispense the preformed solder shapes one at a time. The preformed solder shapes do not become molten until passing through the opening in the bit.

8 Claims, 6 Drawing Figures



US005163600A

United States Patent [19]

Barbarich et al.

[11] **Patent Number: 5,163,600**

[45] **Date of Patent: Nov. 17, 1992**

[54] **FINGERTIP SOLDERING TOOL**

[76] Inventors: **Steve Barbarich**, 3862 Mission Ave., Carmichael, Calif. 95608; **Cary W. Chleborad**, 4024 Triplett Ct., Carmichael, Calif. 95608-6628; **James Fiechtner; Floyd Fiechtner**, both of 5930 Dollar La., Carmichael, Calif. 95608-0127

[21] Appl. No.: **821,679**

[22] Filed: **Jan. 17, 1992**

[51] **Int. Cl.**[5] **B23K 3/03**

[52] **U.S. Cl.** **228/51**; 219/229; 219/237; 228/57; D8/30

[58] **Field of Search** 219/221, 229, 230, 233, 219/236, 237, 238, 239, 240, 241; 228/51, 57; D8/30

[56] **References Cited**

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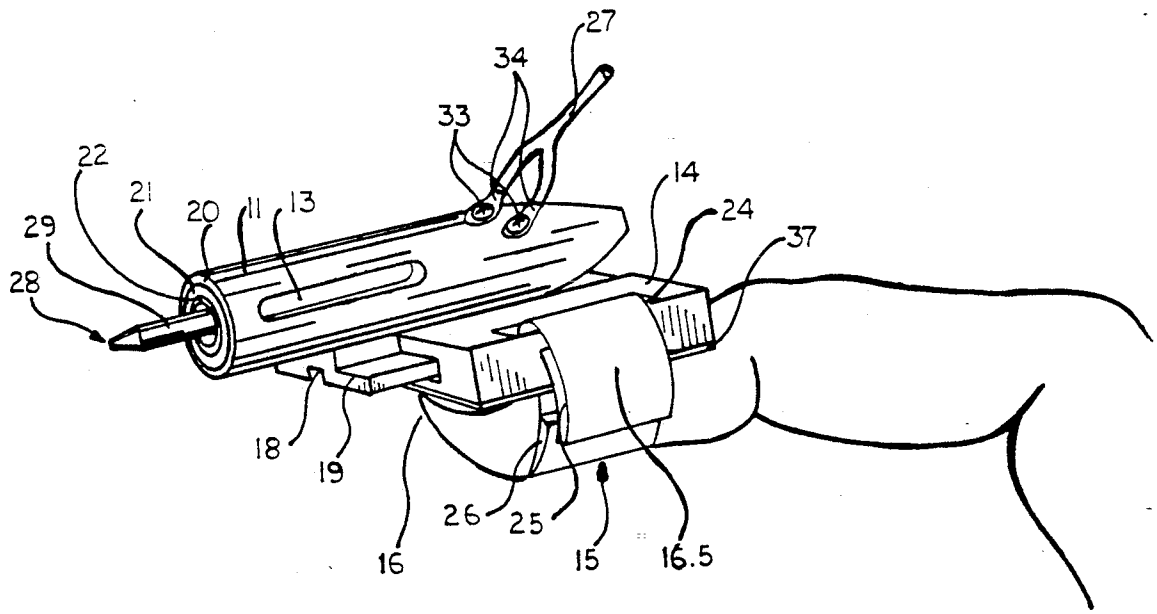
Primary Examiner—Kenneth J. Ramsey

[57] **ABSTRACT**

A fingertip soldering tool has been designed which is made up of a small fingertip soldering body that is secured above the human finger (preferably the index finger) via a finger strap. Within the fingertip soldering body is a soldering tip for electrical and electronic soldering. The present fingertip soldering tool has essential advantages: a) The same hand which the soldering tool is attached to is freed up for other use; and (b) the small soldering tip provides electrical efficiency, allows wide access into small areas and gives rise to structural lightness which enhances its maneuverability further. A protective shield around the soldering tip provides safety from the surrounding environment and human flesh.

11 Claims, 2 Drawing Sheets



US007608805B2

(12) **United States Patent**
Miyazaki et al.

(10) **Patent No.: US 7,608,805 B2**
(45) **Date of Patent: Oct. 27, 2009**

(54) **CONTROL SYSTEM FOR BATTERY POWERED HEATING DEVICE**

(75) Inventors: **Mitsuhiko Miyazaki**, Higashiosaka (JP); **Toshinobu Ishihara**, Hyogo Prefecture (JP); **Hitoshi Takeuchi**, Nara Prefecture (JP)

(73) Assignee: **Hakko Corporation**, Osaka (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/036,417**

(22) Filed: **Jan. 14, 2005**

(65) **Prior Publication Data**

US 2006/0157466 A1 Jul. 20, 2006

(51) **Int. Cl.**
H05B 1/02 (2006.01)

(52) **U.S. Cl.** **219/497**; 219/227; 219/229; 219/233; 219/236; 219/501

(58) **Field of Classification Search** 219/221–242, 219/482–519; 228/51, 55
See application file for complete search history.

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Primary Examiner—Stephen J Ralis
(74) *Attorney, Agent, or Firm*—Squire, Sanders & Dempsey, L.L.P.

(57) **ABSTRACT**

A control system and method of controlling a battery powered heating device such as a soldering or desoldering tool that includes a control circuit to control the delivery of power to a cartridge heating tip and to cycle the power to the cartridge heating tip during times of no use so as to minimize the amount of power expended to maintain the device in a ready or usable state.

19 Claims, 9 Drawing Sheets