United States Patent

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[54] **SOLDER-REMOVING DEVICE**
6 Claims, 2 Drawing Figs.

[52] **U.S. Cl.** **228/20,** 219/229; 228/52;
[51] **Int. Cl.** **B23k 1/00,** B23k 5/22
[50] **Field of Search** 228/20, 51, 52, 53; 219/228, 229

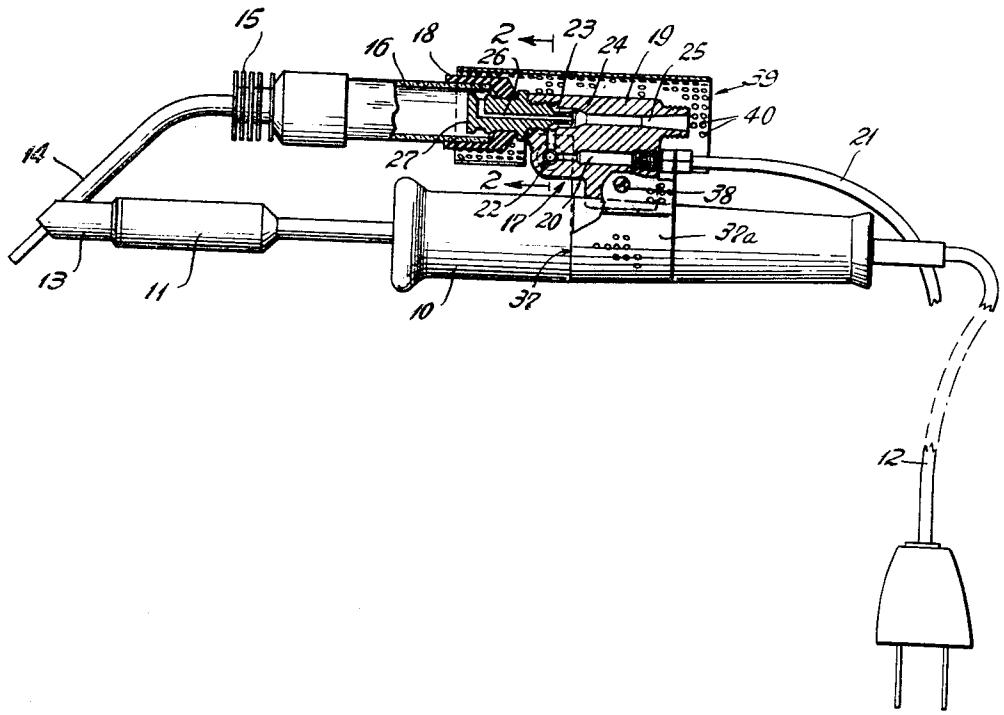
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ABSTRACT: A solder-removing device has a handle and a heated solder-removing tip thereon provided with a tube connected to a receptacle for the melted solder. A transducer means is mounted on the handle of the device adjacent the solder-receiving receptacle and connected thereto. The transducer means produces a suction in response to the flow therethrough of air under pressure, and has a manually operated valve thereon for controlling the flow of said air under pressure. A perforated protective shield covers the transducer means to prevent contact with the transducer means and to permit the transducer means to be cooled. The shield forms a part of the mounting for the transducer means and also a supplemental handle or gripping surface for the device.



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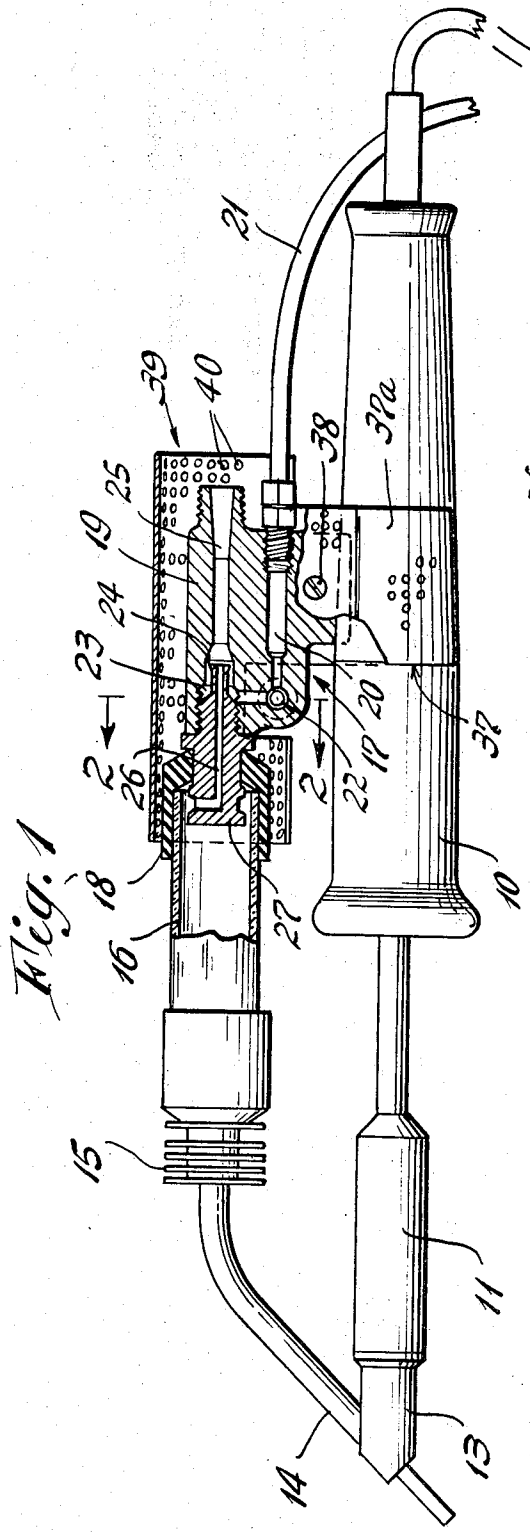


Fig. 1

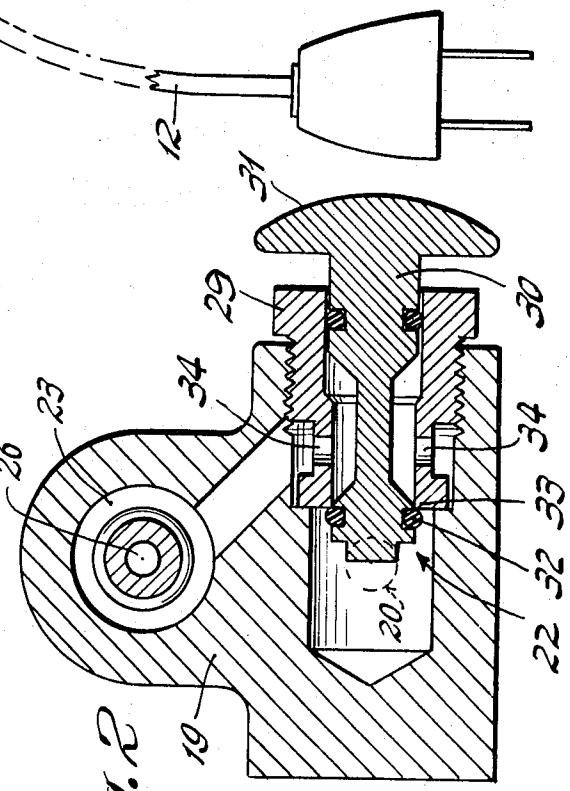


Fig. 2

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SOLDER-REMOVING DEVICE

The present invention is an improvement on our U.S. Pat. No. 3,163,145 relating to a solder-removing device. In the device of the patent, suction is provided by a transducer means remote from the solder-removing device and controlled by a solenoid valve actuated by a pedal operated switch, the melted-solder-receiving means on the device being connected by a long tube to the suction-producing means. This had a disadvantage, under some circumstances, of requiring additional electrical wiring to provide for the energization of the solenoid valve. Also the control pedal being remote presented a problem in the timing of the removal of the melted solder because of the time delay in the effectiveness of the vacuum, produced by the transducer means, due to the large volume of air in the long connecting tube which had to be removed before the suction became effective. Further, because of the length of the tube the substantial quantities of air which would flow into the tube through the desoldering tip, when the vacuum is removed, had a tendency to cool the tip and interfere with the desoldering function.

These difficulties have been avoided by the present invention by providing a suction-producing means, such as an air operated transducer means, on the handle of the device and directly connecting it to the melted-solder-receiving receptacle and having a manual valve on the transducer means to control the same, thus eliminating any need for additional wiring and eliminating the problems presented by the long connecting tube with its time lag and cooling effects on the solder-removing tip.

The transducer means is mounted on the handle by a clamp means and can be readily assembled thereon. Preferably, the clamp means also includes a shield portion extending around the transducer means to prevent contact with the transducer means which becomes warm in its operation. In order to dissipate this heat, the shield is made of perforated material and in addition to protecting the user from contact with the transducer, also provides additional gripping areas for manipulating the desoldering tool.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the accompanying drawings in which:

FIG. 1 shows a view of the desoldering device, partly in section, with the transducer mounted in position on the handle.

FIG. 2 is a section taken along line 2–2 of FIG. 1.

As shown in the drawings, the desoldering device comprises a handle **10** having a heating unit **11** at one end thereof which is adapted to be energized by an electric current fed to the iron through a plug-in electric cord **12**. The heating unit has a heating tip **13** into which is mounted a tubular solder-removing device **14** which is connected through a heat exchange unit **15** to a melted-solder-receiving receptacle **16**. This structure is substantially the same as shown in our U.S. Pat. No. 3,163,145 to which reference is made.

In accordance with the present invention a transducer means **17** is provided and is mounted on the handle adjacent the end of the solder-receiving receptacle **16** and is connected to the end thereof by a rubber sleeve **18** which is readily removed from the receptacle to permit the melted solder to be removed.

As shown in the drawings, the transducer means comprises a body **19** having an inlet passage **20** to receive air from line **21** connected to a source of air under pressure, not shown. The air flows through a valve **22** and into an air chamber **23** in the body. It then passes through a circular orifice **24** to the venturi portion **25** of the transducer means, producing a suction in the through passage **26** which opens laterally into the solder-receiving receptacle with the head **27** preventing flow of melted solder into the transducer means.

The valve **22** which is shown in detail in FIG. **2** comprises a

nut **29** supporting a sliding stem **30** having a actuating button **31** at one end and a valve ring **32** at the other end which is normally pressed against the valve seat **33** on the end of the nut by the pressure of the air in inlet **20**. When pressure is applied to the button **31**, the stem moves inwardly and moves the ring **32** from the seat **33** and feeds air under pressure through passages **34** in the nut to the air chamber to create a suction in passage **26**, receptacle **16** and tube **14** to quickly remove any solder which has been melted by the device.

Since the amount of air required to be displaced for the suction to be effective is merely that in the receptacle and the solder-removing tube, there is substantially no timelag from the actuation of the valve to the removal of the solder. Furthermore, when the valve is closed air that would replace the suction in the receptacle would flow through the tip but since only a small quantity of air is required to fill the receptacle, the danger of cooling of the solder-removing tip is reduced.

In accordance with the present invention, the transducer body rests on and has a bottom shaped to conform to the handle. It is held in position by a clamp comprising spring clips **37** on each side secured to the transducer of the body by screws **38** with the legs **37***a* of the clips gripping the handle.

Since some heat is generated in the transducer means, it is desired to provide a protective means to prevent the person from contacting it. This is accomplished by providing a shield **39** extending from the mounting clips **37** and surrounding the transducer unit. Preferably the shield is perforated at **40** so as to facilitate the cooling of the transducer means as it functions.

In addition to serving as a protective shield, the shield member **39** can also serve as an additional handle or gripping surface to facilitate the handling of the unit in removing melted solder.

Variations and modifications may be made within the scope of the invention and portions of the improvements may be used without others.

We claim:

1. A solder-removing device having a handle, a heater carried by the handle and having a heat transmitting portion, a solder-receiving tube carried by said portion to melt solder, said tube communicating with a solder-receiving receptacle, a suction-producing means connected to the receptacle to provide a suction to withdraw melted solder along the tube and into the receptacle, and means mounting the suction-producing means on the handle, said suction-producing means comprising a transducer means connected to a source of air under pressure to produce a suction in response to the flow of said air under pressure therethrough, and manually operated valve means on the suction-producing means for controlling the flow of said air under pressure and the suction produced thereby.

2. The invention as defined in claim **1** wherein the transducer means is closely adjacent the end of the receptacle whereby a minimum amount of air needs to be moved through the tube and receptacle in creating the suction.

3. The invention as defined in claim **1** wherein the means mounting the suction-producing means on the handle comprises a clamp having legs engaging the sides of the suction-producing means and the handle and means drawing said legs into clamping relation.

4. The invention as defined in claim **3** wherein the said clamp includes a shield extending over the transducer means.

5. The invention as defined in claim **4** wherein the shield has perforations to facilitate cooling of the transducer means.

6. The invention as defined in claim **4** wherein said shield provides a gripping surface for the device in addition to the handle.