Sept. 18, 1956 J. LYON 2,763,766

LOW VOLTAGE HEATING MEANS

Filed Jan. 6, 1953

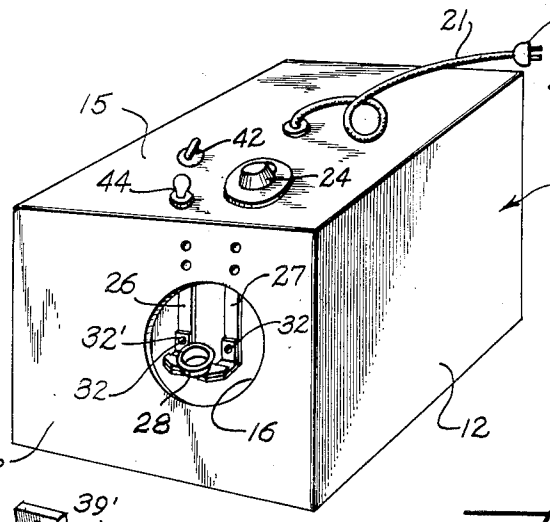


Fig. 1

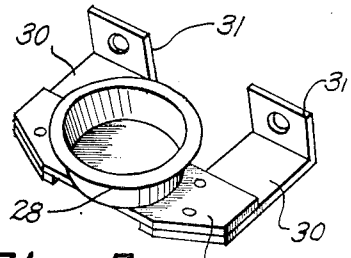


Fig. 3

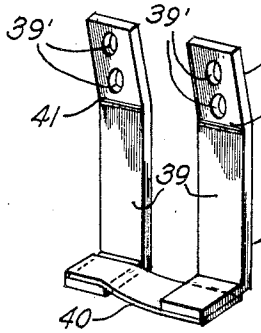


Fig. 5

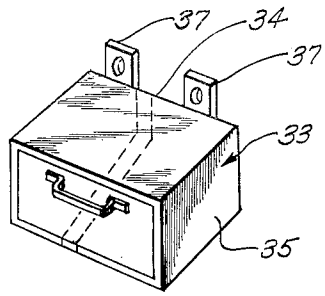


Fig. 4

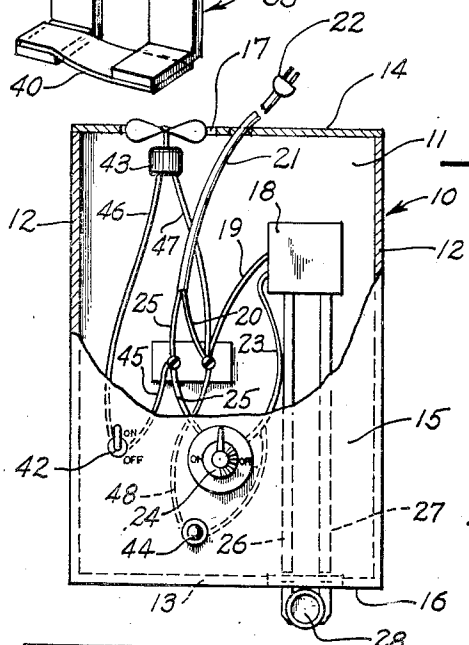


Fig. 2

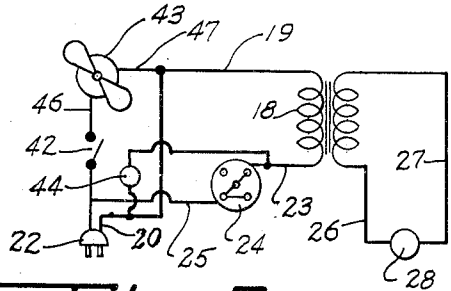


Fig. 6

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LOW VOLTAGE HEATING MEANS

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1 Claim. (Cl. 219—44)

This invention relates to a new and novel low voltage heating means which is suitable for use on assembly lines and repair shops and it consists in the constructions, arrangements and combinations herein described and claimed.

It is the cardinal object of the invention to provide a heating pot, oven or the like which is temperature controlled in which the heating pot, oven or the like, functions as the heating element, thus reducing the heating time required in rendered material in the pot to proper consistency and temperature, which is likewise true of the oven and other attachments which may be employed.

More specifically, it is an object of the invention to provide a compact unit for housing a transformer, heat control, exhaust fan, control switch and a lead in for connection to a suitable source of current, the transformer having respective terminals disposed adjacent an opening in the housing, whereby various instrumentalities may be interchangeably connected to the terminals of the transformer.

It is a still further and important object of the invention to provide a pot or the like which is temperature controlled, especially suitable for melting solder to a proper consistency and maintaining the solder at a proper temperature so pig-tails or like connectors may be bonded to terminals of electrical devices or to component parts of electronic assemblies by placing the connector and terminal in physical contact and dipping both into the molten solder.

Additional objects, advantages and features of invention will be apparent from the following description, considered in conjunction with the accompanying drawing, wherein,

Figure 1 is a perspective view of the unit.

Figure 2 is a top plan view of the unit partly in section.

Figure 3 is a perspective view of a solder melting pot.

Figure 4 is a perspective view of an oven which may be employed with the unit.

Figure 5 is a perspective view of a further form of heating unit, and

Figure 6 is a diagrammatic view of the electrical circuit of the unit.

Attention is invited to Figures 1 and 2 of the drawing wherein there is shown a housing unit **10** consisting of a bottom wall **11**, respective side walls **12**, front wall **13**, rear wall **14** and a top wall **15**, the walls being secured together in any approved manner to provide a sturdy construction.

The front wall **13** is formed with an opening **16** and the rear wall **14** is formed with an opening **17**, as best seen in Figure 2.

A 200 watt transformer **18** is suitably secured within the housing **10**, having a current conducting line **19** secured to one side of the transformer. The line **19** is electrically connected to a line **20** of a conductor **21**, the latter having a connector plug **22** which may be plugged into any conventional 110 volt circuit. A current conducting line **23** from the transformer is connected to one

side of a rheostat **24**, the opposite side of the rheostat being in electrical circuit with a line **25** of the conductor **21**. The rheostat controls the current passing through the transformer **18**.

Current conducting element **26** and **27** are in electrical connection with the transformer **18** and as shown in Figure 1 are suitably secured to the inside of the front wall **13** of the housing and are so positioned as to be exposed in advance of the opening **16**. The lower ends of the current conducting elements are formed with threaded extensions for mounting of suitable receptacles or the like, as will now be described, attention first being invited to Figure 3 of the drawing. In this figure, a miniature solder pot **28** is welded to a strip of resistance metal **29**, the ends projecting beyond respective sides thereof and upon the underside of said ends, a bracket arm **30** is spot welded, these arms being spaced apart to align with the current conducting elements **26** and **27**. In order to secure the arms **30** to the current conducting elements, a right angularly disposed ear **31** is formed thereon having an aperture for registry with a threaded stud **32** the assemblage being completed by means of nuts **32'**. The arms **30** are preferably iron strips, plated to resist corrosion and to increase conductivity.

In Figure 4 a miniature oven **33** is shown, the back **34**, sides **35** and top **35'** being formed of resistance metal, divided so as to provide an electrical circuit between brackets **37** and **38'**, while the front **36** is asbestos lined. The brackets **37** and **37'** corresponding to the arms **30** are apertured to receive fastening means for securing the oven upon the current conducting elements **26** and **27**.

In Figure 5, a further form of the heating device is shown, particularly useful for immersion in liquids, for rapid heating thereof or for maintaining the liquid at a desired temperature. The immersion heater indicated at **38** comprises a pair of parallel legs **39**, the lower ends of which are bent at right angles thereto and have welded thereon a strip of resistance metal **40**. The upper ends of the legs **39** are slightly offset from the vertical as indicated at **41** enabling proper mounting of the heater to the conductors **26** and **27** and present the strip **40** in spaced relation to the wall **13** of the unit so that it may be readily immersed in a liquid filled receptacle. The legs **39** are preferably constructed from iron strips which are plated to resist corrosion and are also provided with a number of vertically spaced apertures **39'** for adjustably securing the legs to the current conducting elements **26** and **27**.

A switch **42** is employed for controlling the flow of current to the fan from a suitable source of electrical current. The switch **42** has a line **45** connected to line **25** of the conductor **21** and a line **46** is connected to one terminal of the motor of the fan **43**; the other terminal of the motor of the fan having a line **47** which is in circuit with the line **20** of the conductor **21**. The light **44** is electrically connected to line **20** of the cable **21** and to line **23** of the rheostat, and while the light **44** is not essential to the operation of the heater, it serves as a signal means to indicate that the heater is connected. The fan **43** may likewise be eliminated where desired without effecting the operation of the heater, though in certain situations it is desirable to have a means for withdrawing annoying fumes and gases, by creating a circulation of air through the openings **16** and **17**.

With the heating unit installed in a 110 volt circuit, the solder pot or other heating device will in the matter of a few seconds be brought to a desired temperature by adjusting the rheostat and will be maintained at such temperature, so that, in the case of the solder pot, the solder is directly heated and will be of the proper consistency, in order that electrical connections such as pigtails may be readily tinned by a mere dipping operation.

In actual practice it has been found that a neater and more permanent connection can be obtained as compared to the present practice and also preheating of the pigtail or other connector is eliminated.

It should be noted that in all cases, the heating device per se is heated by passage of high amperage, low voltage current, thus eliminating the conventional heating coils or other elements, as now employed in soldering pots and irons, and therefore makes for greater efficiency, since there is an ideal and direct transfer of heat to the heating attachments. It will also be noted that in the present heating attachments, the need for electrical and thermal insulation is avoided.

Many uses have been found for the device, among which are the melting of metals other than solder; vaporizing chemicals, conditioning plastics, and heating liquids, while the oven has been found useful in certain laboratory work.

While preferred forms of the device has been shown and described, this is by way of illustration only, and I consider as my own, all such modifications in construction as fairly fall within the scope of the appended claim.

I claim:

A heater unit comprising a housing having an opening in one end thereof, an electrical circuit including a transformer of high amperage and low voltage current within said housing, said transformer having a pair of current conducting elements extended outwardly through said opening, a resistance metal member connected to said current conducting elements, a receptacle secured to said resistance metal member and positioned exteriorly of the housing and a rheostat in circuit with said transformer for controlling the temperature of said receptacle.

References Cited in the file of this patent

UNITED STATES PATENTS

475,189	Burton et al.	May 17, 1892
494,585	Mitchell	Apr. 4, 1893
1,370,631	Clark	Mar. 8, 1921
1,684,942	Carleton	Sept. 18, 1928
1,738,908	Kuhn et al.	Dec. 10, 1929
1,816,711	Berresford	July 28, 1931
1,949,450	Brown	Mar. 6, 1934
2,070,491	Park	Feb. 9, 1937
2,182,383	Lang et al.	Dec. 5, 1939

OTHER REFERENCES

Strong et al.: Procedures in Experimental Physics, Prentice-Hall, Inc., 1946; p. 176.