

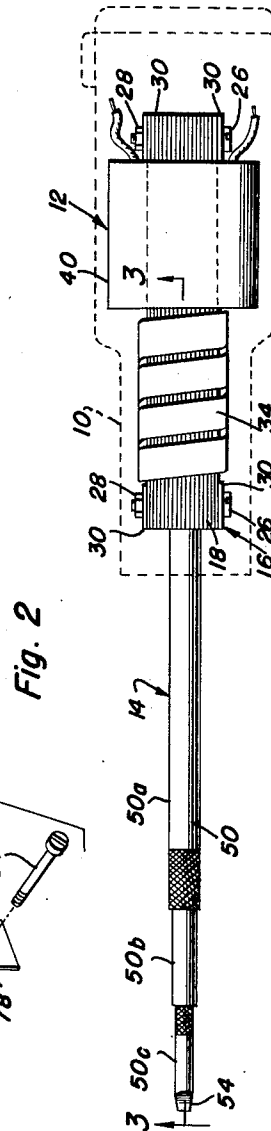
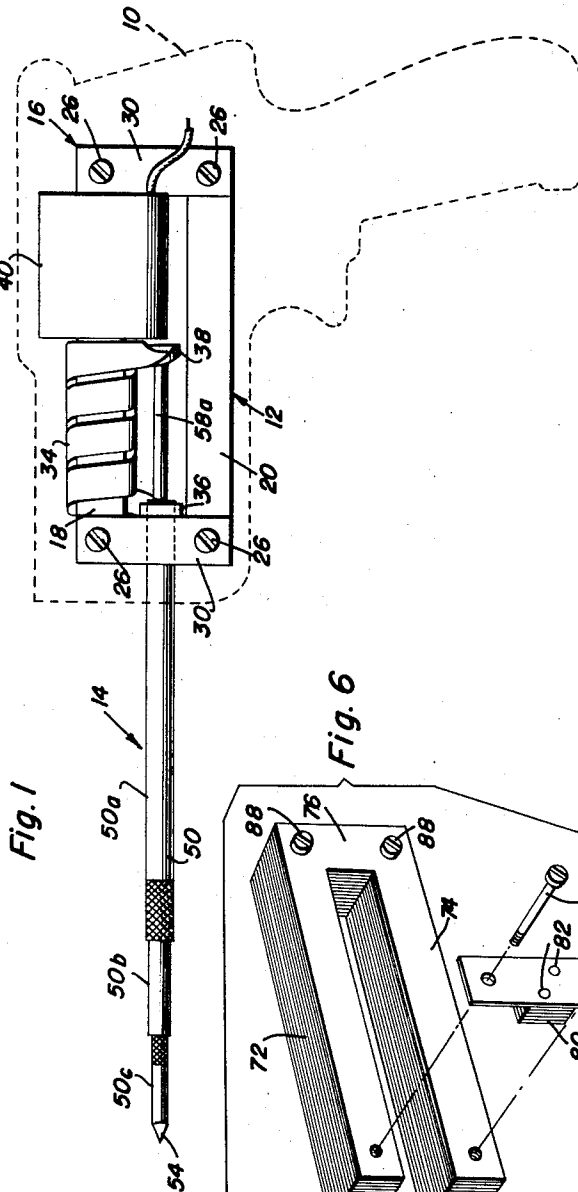
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J. L. CALIRI
SOLDERING GUN CONSTRUCTION

2,674,680

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2 Sheets-Sheet 1



Joseph L. Caliri
INVENTOR.

BY *Phance A. O'Brien*
and *Harvey B. Jackson*
Attorneys

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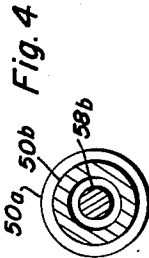
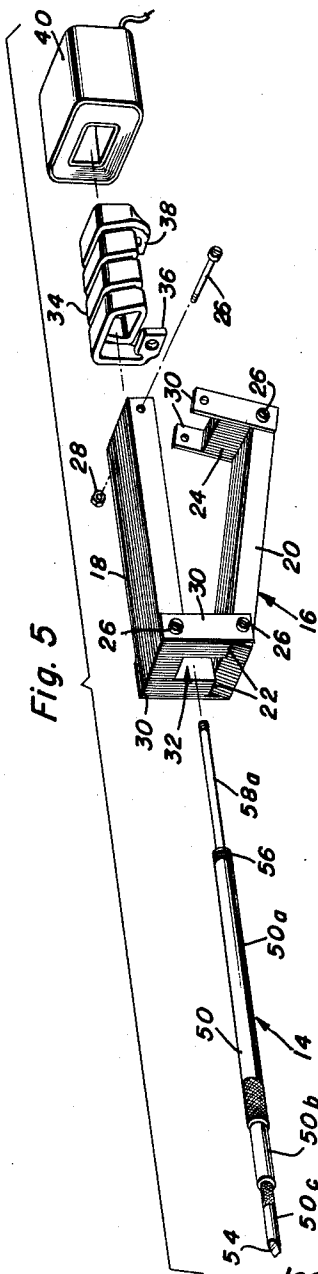
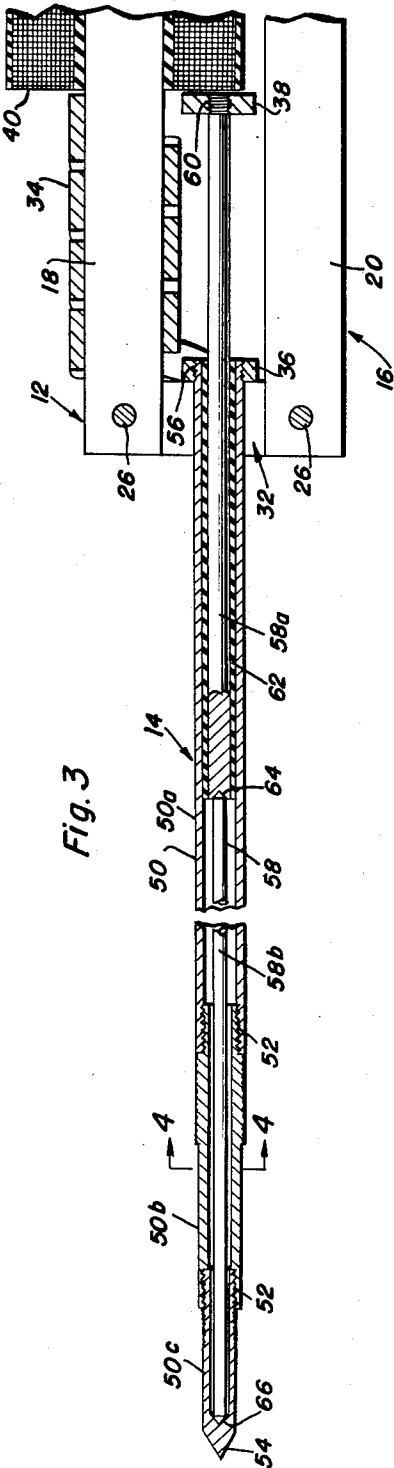
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SOLDERING GUN CONSTRUCTION

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2 Sheets-Sheet 2



Joseph L. Caliri
INVENTOR.

BY *Alfonso A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

UNITED STATES PATENT OFFICE

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SOLDERING GUN CONSTRUCTION

Joseph L. Caliri, Lawrence, Mass., assignor to
Caliri Manufacturing Company, Inc., Lawrence,
Mass., a corporation of Massachusetts

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1 Claim. (Cl. 219—26)

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This invention relates to new and useful improvements and structural refinements in soldering guns, particularly soldering guns of the coaxial type electrode variety employing a step down transformer for energizing the electrode, and the principal object of the instant invention is to provide an improved transformer structure having primary and secondary windings which may be easily and independently removed from the transformer core, so that the entire transformer or gun need not be discarded when, after a period of use, the primary transformer winding becomes inoperative.

Another feature of the invention resides in the specific coaxial electrode structure and in its structural relationship to the transformer core and the secondary winding.

Some of the advantages of the invention lie in its simplicity of construction, in its dependable operation, and in its adaptability to economical manufacture.

With the above more important objects and features in view, and such other objects and features as may become apparent as this specification proceeds, the invention consists essentially of the arrangement and construction of parts as illustrated in the accompanying drawings, in which:

Figure 1 is a side elevational view of the transformer and electrode structure, the outline of the gun housing being illustrated by dotted lines;

Figure 2 is a top plan view of the subject shown in Figure 1;

Figure 3 is a longitudinal sectional view of the electrode and portion of the transformer;

Figure 4 is a transverse sectional detail, taken substantially in the plane of the line 4—4 in Figure 3;

Figure 5 is a group perspective view of the components shown in Figure 3; and

Figure 6 is a group perspective view illustrating a modified transformer core construction.

Like characters of reference are employed to designate like parts in the specification and throughout the several views.

Referring now to the accompanying drawings in detail, and more particularly to Figures 1-5 inclusive, the reference character 10 indicates the outline of a soldering gun housing, containing a step-down transformer assembly 12 to which is operatively connected a coaxial electrode unit 14, the latter projecting outwardly from the housing, as indicated.

The transformer assembly 12 comprises an elongated, substantially rectangular core 16, which includes a pair of spaced side members 18, 20

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and end members 22, 24 (see Figure 5). Of course, the transformer core is of the usual laminated construction, and a set of bolts 26, equipped with nuts 28 are employed for connecting the laminated side and end members of the core together.

It is to be noted that pairs of straps 30 are disposed at the outside of the end members 22, 24 to facilitate connecting the several members together, and if desired, the end members 24 may be formed integrally with the side members 20, while the end members 22 are formed integrally with the side members 18. However, a recess 32 is provided in the end member 22, which recess is in communication with the space between the side members 18, 20.

A secondary transformer winding coil 34, assuming the form of a helical strap, is slidably positioned on the side member 18 of the transformer core, adjacent the recess 32, the end portions of this coil being provided with a pair of screw threaded terminal lugs 36, 38 which are disposed in the space between the side members 18, 20 and are in substantial longitudinal alignment in the recess or opening 32.

A primary winding coil 40 is slidably positioned on the side member 18 of the core between the secondary coil 34 and the other end of the core, that is, between the coil 34 and the end member 30, it being noted that in this manner the transformer core constitutes the sole means of connection between the primary and secondary winding coils. Moreover, it will be observed that by simply removing one of the bolts 26 as is shown in Figure 5, the transformer core may be "opened" by hingedly spreading the side members 18, 20 apart, so that at least one end of the side member 18 is exposed to permit the primary and secondary coils 40, 34 to be individually and successively removed from the core for purposes of inspection or replacement.

Referring now to the structure of the coaxial electrode unit 14, this embodies a hollow, elongated outer electrode member 50 which preferably consists of a plurality of longitudinally aligned sections 50A, 50B and 50C, these sections being separably connected together by engaging screw threads 52 and the section 50C having a closed end affording a work engaging tip 54. The electrode unit 14 extends into the recess or opening 32 in the core 16, and the outer electrode section 50A is provided with a screw threaded end portion 56 which is secured in the terminal lug 36 of the secondary winding coil 34.

The inner member of the electrode is shown at

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58 and includes a pair of longitudinally aligned sections 58A and 58B, the section 58A having a screw threaded end 60 which is secured in the other terminal lug 38 of the secondary winding coil 34.

A suitable insulating sleeve 62 is positioned between the inner electrode section 58A and the outer electrode section 50A (see Figure 3), and the inner section 58A is provided with a countersink 64 which functions as a seat for the adjacent end of the inner electrode section 58B. The other end of the section 58B engages a countersink 66 provided in the work engaging tip 54, and it will be observed from the foregoing that when the outer electrode sections 50A, 50B and 50C are connected together by tightening the screw threads 52, axial pressure will be transmitted to the inner electrode sections 58A and 58B so that the latter are in proper electrical contact with each other and with the work engaging tip 54.

If desired, the outer electrode section 50B may be omitted and the inner electrode section 58B replaced by a shorter one, whereby, upon connecting the outer section 50C directly to the section 50A, the overall length of the electrode unit may be shortened accordingly. Moreover, by simply removing the outer section 50C from the section 50B, the work engaging tip may be quickly and conveniently replaced, when necessary.

With reference now to the modified transformer core structure illustrated in the accompanying Figure 6, the transformer core 70 herein consists primarily of U-shaped laminations which afford a pair of spaced side members 72, 74 connected together at one end by an end member 76.

A pair of straps 78 are provided at the opposite sides of the side members 72, 74 at the open end of the laminations, and these straps have secured to the opposing inner surfaces thereof a set of "end member" laminations 80. The laminations 80 are secured to the straps 73 by any suitable means, such as for example, rivets 82, and when the straps 78 are connected to the side members 72, 74 by the screws and nuts 84, 86, respectively, the thickness of the laminations 80 relative to the thickness of the side members 72, 74 is such that the sets of laminations 80 are spaced apart so as to afford therebetween an opening or recess, corresponding to the aforementioned recess 32, through which the electrode unit may extend into the transformer core. Additional screws 88 are employed for connecting together the laminations at the closed end of the core, and it will be apparent from the foregoing that by simply removing the screws 84, the straps 78 together with the laminations 80 may be readily removed, so as to facilitate installation or removal of the primary and secondary coils on either of the side members 72, 74.

It is believed that the advantages and use of the invention will be clearly understood from the foregoing disclosure and accordingly, further description thereof at this point is deemed unnecessary.

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While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

Having described the invention, what is claimed as new is:

In a soldering gun, the combination of a coiled strap affording a path for the secondary circuit of a step-down transformer and having a pair of spaced parallel end portions provided with coaxial apertures, a tubular outer electrode member having one end portion thereof secured in the aperture of one end portion of said strap, a tubular head removably connected to and constituting a longitudinal continuation of the other end of said outer electrode member and terminating in a closed work-engaging end, a rod-shaped inner electrode member secured at one end thereof in the aperture of the other end portion of said strap and extending axially in said outer member in spaced relation therefrom to a terminal point intermediate the ends of the outer member, a tubular insulating sleeve having its inner and outer surfaces in engagement with the respective inner and outer members and extending from the end of the outer member secured in said strap to said terminal point of the inner member, and a rod-shaped extension having one end thereof in abutment with said terminal point of the inner member, all but the other end of said extension being disposed axially in but spaced radially from the outer member and said head, said other end of the extension being in abutment with the work engaging end of the head, said work-engaging end of said head being provided at the inside thereof with a conical seat, said terminal point of said inner member also being provided with a conical seat, and said extension having conical ends in engagement with the respective seats whereby to provide sole means for sustaining the extension in radially spaced relation from said outer member and from said head.

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