

Description

The present invention relates to a solder cup terminal having improved retention means.

A known electrical connector, described in AMP Incorporated Catalog No. 79-546, comprises an insulative housing having a mating face, an opposed rear face, and a plurality of passages therethrough from said mating face to said rear face. The passages have respective electrical terminals mounted therein which are received from the rear face. Each terminal is stamped and formed from standard metal strip stock and has a mating portion formed in a first direction from the plane of the stock and an opposed solder cup portion.

The known connector is molded in two pieces with resilient fingers disposed radially about each passage to retain the terminal by snapping in behind a collar between the mating portion and the solder cup portion, the entire terminal being formed in the first direction from the plane of the stock. Wire is soldered in the solder cup of each terminal before it is inserted into a respective passage, since the terminals have no solder barriers and must be visually inspected to be sure the solder does not wick into the mating portion, which cannot only impede mating but coat plating. Soldering before insertion is also necessary since there is no means of maintaining radial orientation of the terminals in the passages, and further because the integrity of the resilient fingers would be adversely affected by the heat of soldering. A special tool is required to insert the terminals to prevent damage to the solder joints which could occur if wires were pushed directly.

There is disclosed in US-A-4 274 701, an electrical connector of the type comprising an insulative housing having a mating face, an opposed rear face, and a plurality of passages therethrough from said mating face to said rear face, the passages having respective electrical terminals mounted therein which are received from the rear face, each terminal being stamped and formed from standard metal strip stock and having a mating portion formed in a first direction from the plane of the stock and an opposed solder cup formed in a second, opposite direction from the plane of the stock, a transition portion crossing the axis of the terminal to axially align the mating portion and the solder cup and first retention means to retain the terminals from the rear face.

This known connector has means for retaining each terminal in its passage, in the form of a U-shaped spring on the terminal defining a channel having a pair of spaced walls having pointed ends which provide an interference fit in the passage. The housing is made in one piece and the mating portion of each terminal extends up to position

proximate to the mating face of the housing, the solder cup extending up to a position proximate to the rear face of the housing.

According to the present invention a connector as defined in the fourth paragraph of the present specification is characterized in that said retention means comprise a pair of opposed flanges extending laterally from the transition portion whereby upon insertion of the terminal into its passage, the flanges bend to bite into the sidewalls of the passage to retain the terminal therein.

The transition portion provides an effective solder barrier and the flanges thereon orient the terminal so that insertion before soldering is possible. The housing is molded in one piece without resilient fingers in the passages and a special tool is not necessary to insert the terminals.

US-A-4,379,611 discloses a connector having terminals which are stamped from non-standard stock and have a pin rather than a solder cup opposite the mating portion. The specification at column 3, lines 21-24, suggests that a solder cup can be substituted for the pin, and such a terminal is known. This known terminal has a transition portion crossing the axis between the mating portion and solder cup, which are stamped in opposite directions. However, the housing is different from that described above, the terminals being inserted in passages from the mating face and not suited to pin and socket connectors. Further, the use of flanges on the transition portion to prevent pulling the terminals out from the rear face is not suggested.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a terminal formed in accordance with the present invention; Figure 2 is a side elevation of a terminal according to the present invention mounted in a housing and prior to application of a wire and solder to the terminal; and

Figure 3 is a side elevation, partially in section of the subject terminal after termination and soldering to an associate wire.

The subject terminal 10 is formed from standard stock metal strip and has a mating portion 12, a transition portion 14, first retention means 16, second retention means 18, and a solder cup 20.

The mating portion 12 has been shown as a pin extending forwardly from a body 22 but a socket could be used. The body 22 is formed coaxially of the terminal 10, and together with the mating portion 12 is formed from the stock material in a first direction from the plane of the material. The transition portion 14 traverses the axis of the terminal and has flanges 24, 26 of first retention means 16 extending from opposite sides substan-

tially normal to the axis of the terminal. The transition portion 14 has been shown as a single section but it also could be formed with one or more loops. The transition portion 14 also is a demarcation point between the sections of the terminal formed in opposite directions from the plane of the stock material. The second retention means 18 and solder cup 20 are formed in the opposite direction from the plane of the stock material. A method for accomplishing this type of terminal forming is set out in U.S. Patent No. 3,575,034. The second retention means 18 is generally U-channel-shaped having a base 36 and a pair of side walls 28, 30 having respective pointed ends 32, 34.

The solder cup 20 is a closed barrel configuration formed by a continuation of base 36, side walls 38, 38 to top walls 40, 42 and may have a profiled entry 44 to facilitate both the insertion of a wire 46 and application of solder 48 to the terminal 10.

The subject terminal has been shown mounted in a passage 50 of a representative connector housing 52, the passage 50 extending between a rear face 54 and a mating face 56 with a mating portion 12 of the terminal 10 projecting beyond the mating face 56 while the solder cup 20 extends from the rear face 54. The housing 52 is molded of insulative material.

Figure 3 shows a wire 46 joined to the subject terminal. The bared conductors 58 are inserted into the solder cup 20 and the penetration can be stopped both by the insulation 60 on the wire 40 as well as abutting against the transition portion 14. The solder 48 is then applied to secure the wire in the terminal. It will be noted that when solder is applied to the subject terminal the transition portion 14 will prevent the wicking of the solder up through and over the mating portion 12.

It will also be noted from Figures 2 and 3 that the body 22 serves to position the terminal within the housing 52 while the flanges 24, 26 bitingly engage in the material of the housing 52 on the sides of the passage 50 while points 32, 34 on the walls 28, 30 of the second retention means 18 bite into the top of the passage to prevent withdrawal of the terminal. The first retention means 16 provides about 80% of the retention force while the second retention means 18 provides the rest. Pushing or pulling causes the flanges 24, 26 to bend and bite into the sidewalls. The retention means 16, 18 also serve to stabilize the terminal 10 within the housing 52.

It is within the scope of the present invention to provide plating on the mating portion and/or a solder coating in the solder cup to facilitate termination by solder reflow.

Claims

1. An electrical connector of the type comprising an insulative housing (52) having a mating face (56), an opposed rear face (54), and a plurality of passages (50) therethrough from said mating face (56) to said rear face (54), the passages (50) having respective electrical terminals (10) mounted therein which are received from the rear face (54), each terminal (10) being stamped and formed from standard metal strip stock and having a mating portion (12) formed in a first direction from the plane of the stock and an opposed solder cup (20) formed in a second, opposite direction from the plane of the stock, a transition portion (14) crossing the axis of the terminal (10) to axially align the mating portion (12) and the solder cup (20) and first retention means (16) to retain the terminals (10) against withdrawal from the rear face (54), characterized in that: said retention means (16) comprise a pair of opposed flanges (24,26) extending laterally from the transition portion (14) whereby upon insertion of the terminal into its passage (50), the flanges (24,26) bend to bite into the sidewalls of the passage (50) to retain the terminal therein.
2. An electrical connector as in claim 1, characterized by second retention means (18) comprising a U-channel shaped portion formed in said second direction, said U-channel shaped portion having a pair of spaced walls (28,30) having pointed ends (32,34) which provide an interference fit in the respective passage (50).
3. An electrical connector as in claim 1, characterized by a one piece housing (52), said mating portion (12) of said terminal (10) comprising a pin (12) extending from said mating face (56), the solder cup (20) extending from the rear face (54).

Revendications

1. Connecteur électrique du type comprenant un corps isolant (52) comportant une face d'emboîtement (56), une face postérieure opposée (54) et plusieurs passages (50) qui le traversent de part en part et qui vont de la face d'emboîtement (56) à la face postérieure (54), les passages (50) contenant des éléments de connexion électrique respectifs (10) qui y sont montés et y sont reçus à partir de la face postérieure (54), chaque élément de connexion

tially normal to the axis of the terminal. The transition portion 14 has been shown as a single section but it also could be formed with one or more loops. The transition portion 14 also is a demarcation point between the sections of the terminal formed in opposite directions from the plane of the stock material. The second retention means 18 and solder cup 20 are formed in the opposite direction from the plane of the stock material. A method for accomplishing this type of terminal forming is set out in U.S. Patent No. 3,575,034. The second retention means 18 is generally U-channel-shaped having a base 36 and a pair of side walls 28, 30 having respective pointed ends 32, 34.

The solder cup 20 is a closed barrel configuration formed by a continuation of base 36, side walls 39, 38 to top walls 40, 42 and may have a profiled entry 44 to facilitate both the insertion of a wire 46 and application of solder 48 to the terminal 10.

The subject terminal has been shown mounted in a passage 50 of a representative connector housing 52, the passage 50 extending between a rear face 54 and a mating face 56 with a mating portion 12 of the terminal 10 projecting beyond the mating face 56 while the solder cup 20 extends from the rear face 54. The housing 52 is molded of insulative material.

Figure 3 shows a wire 46 joined to the subject terminal. The bared conductors 58 are inserted into the solder cup 20 and the penetration can be stopped both by the insulation 60 on the wire 40 as well as abutting against the transition portion 14. The solder 48 is then applied to secure the wire in the terminal. It will be noted that when solder is applied to the subject terminal the transition portion 14 will prevent the wicking of the solder up through and over the mating portion 12.

It will also be noted from Figures 2 and 3 that the body 22 serves to position the terminal within the housing 52 while the flanges 24, 26 bitingly engage in the material of the housing 52 on the sides of the passage 50 while points 32, 34 on the walls 28, 30 of the second retention means 18 bite into the top of the passage to prevent withdrawal of the terminal. The first retention means 16 provides about 80% of the retention force while the second retention means 18 provides the rest. Pushing or pulling causes the flanges 24, 26 to bend and bite into the sidewalls. The retention means 16, 18 also serve to stabilize the terminal 10 within the housing 52.

It is within the scope of the present invention to provide plating on the mating portion and/or a solder coating in the solder cup to facilitate termination by solder reflow.

Claims

1. An electrical connector of the type comprising an insulative housing (52) having a mating face (56), an opposed rear face (54), and a plurality of passages (50) therethrough from said mating face (56) to said rear face (54), the passages (50) having respective electrical terminals (10) mounted therein which are received from the rear face (54), each terminal (10) being stamped and formed from standard metal strip stock and having a mating portion (12) formed in a first direction from the plane of the stock and an opposed solder cup (20) formed in a second, opposite direction from the plane of the stock, a transition portion (14) crossing the axis of the terminal (10) to axially align the mating portion (12) and the solder cup (20) and first retention means (16) to retain the terminals (10) against withdrawal from the rear face (54), characterized in that:

said retention means (16) comprise a pair of opposed flanges (24,26) extending laterally from the transition portion (14) whereby upon insertion of the terminal into its passage (50), the flanges (24,26) bend to bite into the sidewalls of the passage (50) to retain the terminal therein.

2. An electrical connector as in claim 1, characterized by second retention means (18) comprising a U-channel shaped portion formed in said second direction, said U-channel shaped portion having a pair of spaced walls (28,30) having pointed ends (32,34) which provide an interference fit in the respective passage (50).

3. An electrical connector as in claim 1, characterized by a one piece housing (52), said mating portion (12) of said terminal (10) comprising a pin (12) extending from said mating face (56), the solder cup (20) extending from the rear face (54).

Revendications

1. Connecteur électrique du type comprenant un corps isolant (52) comportant une face d'emboîtement (56), une face postérieure opposée (54) et plusieurs passages (50) qui le traversent de part en part et qui vont de la face d'emboîtement (56) à la face postérieure (54), les passages (50) contenant des éléments de connexion électrique respectifs (10) qui y sont montés et y sont reçus à partir de la face postérieure (54), chaque élément de connexion



(10) étant estampé et façonné dans du feuil-
lard standard et comportant une partie d'em-
boîtement (12) façonnée dans un premier sens
à partir du plan du feuilard et un auget à
soudure opposé (20) façonné dans un second
sens opposé à partir du plan du feuilard, une
partie de transition (14) croisant l'axe de l'élé-
ment de connexion (10) pour aligner axiale-
ment la partie d'emboîtement (12) et l'auget à
soudure (20) et un premier moyen de retenue
(16) pour retenir l'élément de connexion (10)
de manière à empêcher toute extraction à par-
tir de la face postérieure (54), caractérisé en
ce que :

le moyen de retenue (16) comprend deux ailes
opposées (24, 26) qui s'étendent latéralement
depuis la partie de transition (14), de sorte
que, lors de l'introduction de l'élément de
connexion dans son passage (50), les ailes
(24, 26) fléchissent et mordent dans les parois
latérales du passage (50) pour y retenir l'élé-
ment de connexion.

2. Connecteur électrique suivant la revendication
1, caractérisé par un second moyen de rete-
nue (18) comprenant une partie profilée en U
façonnée dans le second sens, la partie pro-
filée en U comportant deux parois espacées
(28, 30) présentant les extrémités pointues (32,
34) qui déterminent un ajustement serré dans
le passage (50) respectif.
3. Connecteur électrique suivant la revendication
1, caractérisé par un corps d'une pièce (52), la
partie d'emboîtement (12) de l'élément de
connexion (10) comprenant une broche (12)
qui dépasse de la face d'emboîtement (56),
tandis que l'auget à soudure (20) dépasse de
la face postérieure (54).

entgegengesetzten Richtung aus der Ebene
des Materials herausgeformt ist, wobei ein
Übergangsabschnitt (14) die Achse des An-
schlusses (10) kreuzt und den Anschlußteil (12)
und den Lötkehl (20) axial ausrichtet, und
wobei erste Haltemittel (16) die Anschlüsse
(10) gegen ein Zurückziehen von der rückwärti-
gen Fläche (54) festhalten, dadurch gekenn-
zeichnet, daß die Haltemittel (16) ein Paar von
einander gegenüberliegenden Flanschen (24,
26) aufweisen, die sich seitlich von dem Über-
gangsabschnitt (14) erstrecken, wodurch nach
dem Einsetzen des Anschlusses in seinen
Durchgang (50) die Flansche (24, 26) so gebo-
gen sind, daß sie in die Seitenwände des
Durchgangs (50) eingreifen, um den Anschluß
darin zu halten.

2. Elektrischer Verbinder nach Anspruch 1, ge-
kennzeichnet durch zweite Haltemittel (18),
die einen U-kanalförmig gestalteten Abschnitt
aufweisen, der in der zweiten Richtung ausge-
bildet ist, wobei der U-kanalförmig gestaltete
Abschnitt ein Paar von mit Abstand angeordne-
ten Wänden (28, 30) aufweist, die spitze En-
den (32, 34) haben, die einen Festsitz in dem
jeweiligen Durchgang (50) bilden.
3. Elektrischer Verbinder nach Anspruch 1, ge-
kennzeichnet durch ein einstückiges Gehäu-
se (52), wobei der Anschlußteil des Anschlus-
ses (10) einen Stift (12) aufweist, der sich von
der Stirnfläche (56) erstreckt, wobei der Löt-
kehl (20) sich von der rückwärtigen Fläche
(54) erstreckt.

Ansprüche

1. Elektrischer Verbinder mit einem isolierenden
Gehäuse (52), das eine Stirnfläche (56), eine
dieser gegenüberliegende rückwärtige Fläche
(54) und eine Vielzahl von von der Stirnfläche
(56) zu der rückwärtigen Fläche (54) durchge-
henden Durchgängen (50) aufweist, wobei in
den Durchgängen (50) jeweils elektrische An-
schlüsse (10) angeordnet sind, die von der
rückwärtigen Fläche (54) her aufgenommen
sind, wobei jeder Anschluß (10) aus Standard-
Metallstreifenmaterial ausgestanzt und geformt
ist und einen Anschlußteil (12), der in einer
ersten Richtung aus der Ebene des Materials
gebildet ist, und einen entgegengesetzt ange-
ordneten Lötkehl (20) hat, der in einer zweiten

