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Tab Receptacle with Resilient Retention Tongue

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The present invention relates to a tab receptacle for electrical connections such as those used in automotive and electrical equipment applications. An electrical tab connector is usually a flat strip-like element which push-fits into a female electrical tab receptacle. The tab and the tab receptacle are usually respectively crimped at rear connection portions to electrical conductors.

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Conventional tab receptacles rely on a friction fit of the tab between spaced contact surfaces of the tab receptacle. Usually tab receptacles have a base with upstanding side walls and at least one of these side walls is turned over so that the tab is gripped between the base and the edge portions of the turned-in side walls. Conventionally, the tab is held in position by friction and may be withdrawn by pulling.

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More recently, tab receptacles have been designed which include a tongue-like element having a lance or other form of latching shoulder adapted to engage in a small hole in the centre of the tab. An extension of the tongue is arranged to extend out of the portion of the receptacle which engages the tab to permit displacement of the tongue to disengage the lance thereby permitting withdrawal of the tab.

The present invention is directed to new and useful developments in relation to tab receptacles.

According to the present invention, there is provided an electrical tab receptacle integrally formed and comprising

5 a rearward portion adapted to be crimped to an electrical conductor,

a forward receptacle portion extending in a forward direction from the rearward portion to a free forward end for receiving an inserted tab with electrical and mechanical interengagement,

10 the forward portion having a base and upstanding side walls with at least one of said side walls having a portion turned-over to provide an elongate contact strip whereby a tab is adapted to be engaged between said contact strip and a corresponding contact portion
15 of the base,

a spring tongue extending from the base in the region of the forward end of the forward portion, the tongue extending rearwardly from its connection with the base and, at a location remote from its connection
20 with the base, having an upstanding dimple for resilient, retaining engagement in a hole in a tab inserted into the receptacle above the tongue, the tongue being such that the tab is removable by a pulling force applied to the tab, the tongue being
25 adapted to bend resiliently in a region thereof between the dimple and the connection of the tongue to the base upon insertion and removal of the tab, and said corresponding contact portion of the base being arranged to extend along and adjacent to at least one
30 marginal region of the tongue.

In a preferred and important embodiment of the invention, both of the side walls are constructed such that upon insertion of the tab minimal displacement and/or flexing of the side walls occurs whereby easy
35 insertion of the tab is provided for, the engagement of the tab between the or each turned over portion and the base providing electrical interconnection with the tab but little mechanical retention.

In at least a preferred embodiment, the spring tongue flexes on insertion of a tab but side wall

flexing may be avoided, in contrast to prior designs which are disadvantageous in this regard.

Preferably, both of the side walls have turned-over portions with the edge regions thereof formed into elongate contact strips each having a curved profile transverse to the direction of elongation.

The form of the turned over portions of the side walls may vary; one useful form is one in which the edge portions are curled over through greater than 270° and in another form the contact portions are provided by rib-like formations near the edges of the turned side walls. For this latter embodiment, most preferably, the edge regions extend generally in a plane parallel to the general plane of the base and have respective pressed ribs protruding on the side of the turned-in wall portions confronting the base, said ribs being located near the edges of the turned-in wall portions.

With advantage, the base has the or each corresponding contact portion provided by an upwardly pressed substantially planar surface, whereby a tab may be readily inserted yet will establish good electrical contact. This arrangement can be especially beneficial in permitting reliable manufacture without excessively demanding tolerances in respect of tooling and more importantly, the design is one in which reliable manufacture can be achieved despite inevitable variations in feedstock. The feedstock is a strip of suitable conductive metal and there will be small variations in thickness, metallurgical characteristics and temper, all of which must be accommodated in producing a commercially acceptable product.

Secure mechanical interengagement is an important characteristic and an additional desirable feature is one in which the construction of the tongue is such that its flexing is confined to a region near the connection of the tongue to the base; advantageously

this is achieved by providing a transverse pressing in the tongue of generally V-shape near its point of connection with the base, thereby providing a zone of preferential flexing in a resilient manner.

5 The form of the dimple may be altered as desired but preferably a shallow part-spherical dome is provided in the central region of the tongue.

 For illustrative purposes only, a preferred embodiment will now be described with reference to the
10 accompanying drawings of which:-

 Figure 1 is a perspective view of an embodiment of the invention;

 Figure 2 is a plan view of Figure 1;

 Figure 3 is a sectional front elevation taken
15 along the line B-B of Figure 2;

 Figure 4 is a sectional end elevation taken along the lines of A-A of Figure 2;

 Figure 5 is an end elevation from the rear end; and

 Figure 6 is an end elevation from the front end.

20 The tab receptacle shown is formed from a length of feed-stock stamped into shaped blanks which are planar and interconnected by a frangible neck; each blank is then formed in a series of pressing operations into the final product which is illustrated. The tab
25 receptacle illustrated comprises a forward portion 11, which functions as a female receptacle, and a rearward portion 12 for a crimp connection with an electrical conductor. The rearward portion 12 includes a channel
30 13 to be crimped around the conductor wire and a channel 14 to be crimped around the insulator surrounding the conductor.

 The forward portion has a spring tongue 15 pressed out of a base portion 16 and a pair of upstanding side walls 17 are turned over to provide edge regions 18
35 having respective downwardly pressed ribs 19 confronting the base. The ribs 19 provide good electrical interengagement with an inserted tab which is pressed into engagement on its lower surface with

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planar base strips 20. The strips 20 are pressed upwardly in the base region and extend alongside the spring tongue.

5 Since the edges 21 of the turned-in side walls can be the edges of the feedstock material, this design minimises the width of the feedstock required and therefore the economy of the tab receptacle.

10 The spring tongue 15 has a transverse corrugation 22 in a neck region which connects the tongue at its forward end of the connector to the base 16. The mid-region of the tongue incorporates a part-spherical dimple 23 and the sides and end of the tongue are free from any engagement with portions at the base.

15 A flat tab having a central hole is simply pushed into the space between the ribs 19 and surfaces 20, inherent resilience of the body of the receptacle permitting this engagement with good pressure applied for electrical contact purposes; the dimple 23 is depressed by the tab initially and then springs back to
20 engage a hole in the tab on completion of insertion. The configuration of the dimple and the inherent resilience of the tongue is such that the tab is simply pulled out.

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CLAIMS

1. An electrical tab receptacle integrally formed and comprising

5 a rearward portion adapted to be crimped to an electrical conductor,

a forward receptacle portion extending in a forward direction from the rearward portion to a free forward end for receiving an inserted tab with

10 electrical and mechanical interengagement,

the forward portion having a base and upstanding side walls with at least one of said side walls having a portion turned-over to provide an elongate contact strip whereby a tab is adapted to be engaged between
15 said contact strip and a corresponding contact portion of the base,

a spring tongue extending from the base in the region of the forward end of the forward portion, the tongue extending rearwardly from its connection with
20 the base and, at a location remote from its connection with the base, having an upstanding dimple for resilient, retaining engagement in a hole in a tab inserted into the receptacle above the tongue, the tongue being such that the tab is removable by a
25 pulling force applied to the tab, the tongue being adapted to bend resiliently in a region thereof between the dimple and the connection of the tongue to the base upon insertion and removal of the tab, and said corresponding contact portion of the base being
30 arranged to extend along and adjacent to at least one marginal region of the tongue.

2. A tab receptacle according to Claim 1 and wherein both of the side walls have turned-over portions each
35 of which has a rib-like elongate contact strip with a curved profile transverse to the direction of elongation.



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3. A tab receptacle according to Claim 1, and wherein the or each turned-over portion extends generally in a plane parallel to the general plane of the base and has a pressed rib protruding on the side of the turned-in portion confronting the base, said rib extending in the direction in which a tab is to be inserted into the receptacle.

4. A tab receptacle according to any one of the preceding claims, and wherein the base has the or each contact portion provided by displaced portion which is displaced upwardly from the general plane of the base and provides a substantially planar contact surface, whereby a tab may be readily inserted yet will established good electrical contact.

5. A tab receptacle according to any one of the preceding claims, and wherein the tongue has a transverse pressing at right angles to the general plane of the tongue and of generally V-shape in cross-section, the pressing being located near the connection of the tongue with the base, whereby flexing of the tongue preferentially taken place in the region of the pressing.

6. A tab receptacle as claimed in any one of the preceding claims wherein the upstanding dimple is part spherical.

7. A tab receptacle substantially as herein described with reference to the accompanying drawings.

