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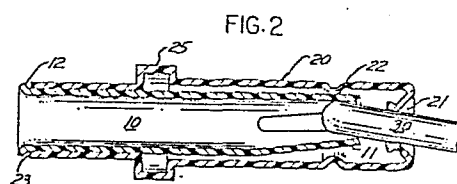
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54 Two piece electrical socket contact assembly.

57 An annular boss (22) in the forward portion of the outer sleeve (20) of a socket contact assembly prevents the over deflection of a spring finger (11) of the inner tubular member (10) thereby minimizing the damage that may be caused by a pin type contact entering the socket contact at an angle to the central axis of the socket contact.



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A TWO PIECE ELECTRICAL SOCKET CONTACT ASSEMBLY

This invention relates to electrical connectors and more particularly to a two piece stamped and formed electrical socket contact assembly for use within an electrical connector.

5 Electrical connectors generally include a plug and receptacle each having an insert of dielectric material provided with multiple openings within which respective pin and socket type electrical contacts are retained. Upon mating of the plug to the receptacle the pin type
10 contacts are inserted into the socket type contacts which have a plurality of radially deflectable spring fingers that engage the pin contact.

 All too frequently during the insertion of a pin type contact into a socket type contact the contacts are
15 not axially aligned and the pin enters the socket at an angle. In this instance the spring fingers are deflected beyond their normal range, decreasing their resiliency and their inward force on the pin contact after mating. Such an angular entry by a pin type contact may also
20 permanently deflect a spring finger from its original position. To minimize the problem of damage to the spring fingers in a stamped and formed electrical socket contact assembly a sleeve has been placed around the fingers to protect the spring fingers. Such an
25 arrangement is illustrated in U.S. Patent 4,120,556 entitled "Electrical Contact Assembly" issued October 17, 1978. In U.S. Patent 4,168,878 entitled "Pin and Socket Type Electrical Terminals" issued September 25, 1979 an annular crimp in the outer sleeve engages the spring
30 fingers to control the force of the fingers against a pin contact. However, with this type of arrangement, the annular boss provides a fulcrum for permanently bending the spring fingers of the socket contact.

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Disclosure of the Invention

This invention is a stamped and formed electrical socket type contact assembly that limits or confines the deflection of the spring fingers of the socket contact when mated to a pin type contact. The invention is characterized by a two piece stamped and formed electrical socket type contact assembly having in the outer sleeve thereof an annular boss that extends inwardly and spaced from the forward half portion of the spring fingers. The boss engages the fingers if they are deflected outwardly beyond a predetermined distance.

Accordingly, it is an advantage of this invention to provide a two piece stamped and formed electrical socket contact assembly that prevents the over deflection of a spring finger of the socket contact.

It is another advantage of this invention to reduce the number of pieces necessary to make a stamped and formed socket contact assembly.

Detailed Description of the Invention

FIGURE 1 illustrates a diagrammatic view of a two piece socket contact assembly incorporating the principles of this invention.

FIGURE 2 illustrates a pin type contact entering the socket contact shown in FIGURE 1.

FIGURE 3 illustrates a three piece contact assembly incorporating the principles of this invention mated with a pin type contact.

Referring now to the drawings, FIGURE 1 illustrates a socket contact assembly comprised of a stamped and formed tubular member 10 and a sleeve 20 coaxially mounted on the tubular member 10. The tubular member 10

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includes a rear wire receiving portion and a forward mating portion comprised of a plurality of resiliently deflectable spring fingers 11 adapted to mate with a pin type contact (not shown). The outside portion of the rear end of the tubular member 10 includes a forwardly facing shoulder 12. The outer sleeve 20, generally comprised of a corrosion resistant material such as stainless steel, includes: a rear portion; an enlarged middle portion 25 having a forwardly facing shoulder 26 and a rearwardly facing shoulder 27; and a forward portion that extends beyond the forward end of the spring fingers 11 of the tubular member 10. The forward end of the outer sleeve 20 terminates in an inwardly extending annular surface 21 that forms an opening slightly larger than the opening defined by the ends of the spring fingers 11 in the tubular member 10. It is the function of the annular surface 21 to guide a pin type contact (not shown) into the opening defined by the ends of the spring fingers 11. To limit the outward deflection of the spring fingers 11 of the tubular member 10 the forward portion of the outer sleeve 20 includes an inwardly extending annular boss 22. Preferably, the boss 22 is located coaxially with and spaced from the spring fingers 11 somewhere along the forward half of the spring fingers. The boss 22 may be arcuately shaped or have a flat portion adapted to engage a spring finger 11 when it is deflected outwardly to limit the fingers outward movement.

FIGURE 2 illustrates a pin type contact entering the socket type contact at an angle that without the boss 22 would deflect a spring finger 11 beyond its normal deflection. In this illustration the annular boss 22 prevents further outward deflection of each spring finger 11 thereby minimizing the effect that over deflection might otherwise have on the resiliency of each finger 11.

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FIGURE 3 illustrates a mated pin and socket type contact and the normal position of the annular boss 22 of the outer sleeve 20, which is spaced from the outside surface of fingers 11.

5 While a preferred embodiment of this invention has been disclosed it will be apparent to those skilled in the art that changes may be made to the invention as set forth in the appended claims without departing from the invention, and in some instances, certain features of the
10 invention may be used to advantage without corresponding use of other features. For example, the enlarged portion of the contact assembly may be part of the inner tubular member 10 or the outer sleeve 20 or there may be two
15 bosses 22 instead of one. Accordingly, it is intended that the illustrative and descriptive materials herein be used to illustrate the principles of the invention and not to limit the scope thereof.

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Claims:

1. A two-piece electrical socket contact assembly of the type comprised of a stamped and formed tubular member
5 (10) having a rear wire receiving portion and a forward mating portion, said forward mating portion of said tubular member including a plurality of resiliently deflectable spring fingers (11) adapted to receive a pin type contact through the opening defined by the ends of
10 said spring fingers (11), and a sleeve (20) coaxially mounted on said tubular member (10), said sleeve (20) having a rear portion and a forward portion extending beyond the ends of the spring fingers (11) of said tubular member (10), the improvement characterized by:
15 at least one inwardly extending annular boss (22) in the forward portion of the outer sleeve (20) coaxial with and spaced from said spring fingers (11), said boss (22) adapted to engage each spring finger (11) that is deflected outwardly a predetermined distance by a pin
20 shaped contact inserted into the opening defined by said spring fingers.
2. The electrical contact as recited in Claim 1 wherein said tubular member includes a forwardly facing annular
25 shoulder (12) on the outside rear end thereof that engages the rear end (23) of said sleeve (20).

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3. The electrical contact as recited in Claim 1 wherein one of said tubular member (10) and said sleeve (20) includes an enlarged portion (25) having forward (26) and rearward (27) facing shoulders on the outside surface thereof located between the rear and forward mating portions of said tubular member (10).

4. The electrical contact as recited in Claim 1 wherein the annular boss (22) is located adjacent the forward half portion of said spring fingers (11).

5. The electrical contact as recited in Claim 1 wherein the forward end of said sleeve terminates in an annular surface (21) that extends radially inwardly towards said spring fingers (11) to define an opening slightly larger than the opening defined by the ends of said spring fingers, said annular surface adapted to guide a pin type contact into the opening defined by said spring fingers.

6. The electrical contact as recited in Claim 2 wherein the forward end of said sleeve terminates in an annular surface (21) that extends radially inwardly towards said spring fingers (11) to define an opening slightly larger than the opening defined by the ends of said spring fingers, said annular surface adapted to guide a pin type contact into the opening defined by said spring fingers.

7. The electrical contact as recited in Claim 3 wherein the forward end of said sleeve terminates in an annular surface (21) that extends radially inwardly towards said spring fingers (11) to define an opening slightly larger than the opening defined by the ends of said spring fingers, said annular surface adapted to guide a pin type contact into the opening defined by said spring fingers.

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8. The electrical contact as recited in Claim 4 wherein the forward end of said sleeve terminates in an annular surface (21) that extends radially inwardly towards said spring fingers (11) to define an opening slightly larger than the opening defined by the ends of said spring fingers, said annular surface adapted to guide a pin type contact into the opening defined by said spring fingers.

9. An electrical contact assembly comprised of a pin type contact (30) having a forward mating portion (31) and a rear wire receiving portion; a stamped and formed tubular member (10) having a rear wire receiving portion and a forward mating portion, said forward mating portion of said tubular member including a plurality of resiliently deflectable spring fingers (11) in pressure contact with the mating portion (31) of said pin type contact (30); and a sleeve (20) coaxially mounted on said tubular member (10), said sleeve (20) having a rear portion and a forward portion, the improvement characterized by:

at least one inwardly extending annular boss (22) in the forward portion of the outer sleeve (20) coaxial with and spaced from said spring fingers (11), said boss (22) adapted to engage each spring finger (11) upon further outward deflection.

10. The electrical contact as recited in Claim 9 wherein the annular boss (22) is located adjacent the forward half of said spring fingers (11).

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FIG. 1

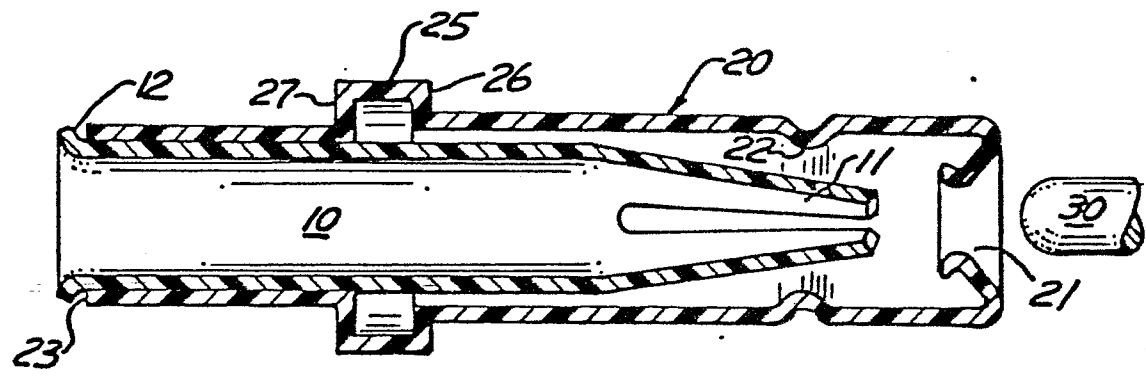


FIG. 2

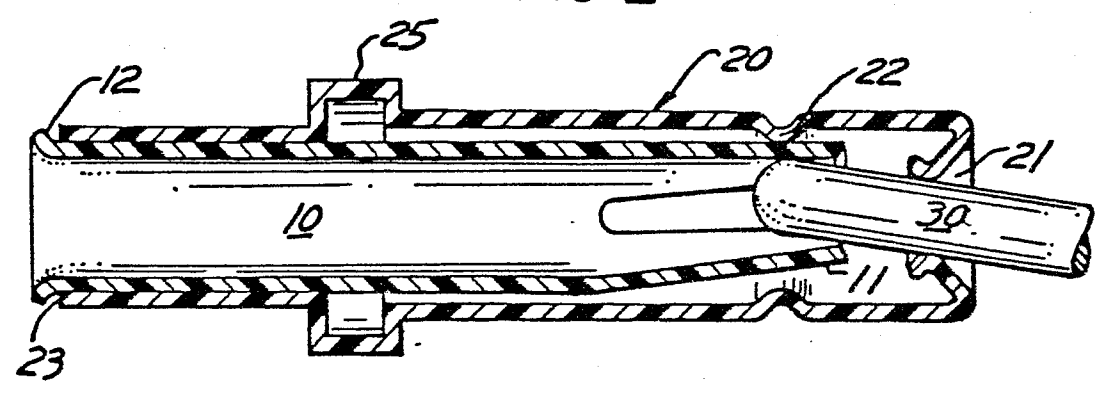
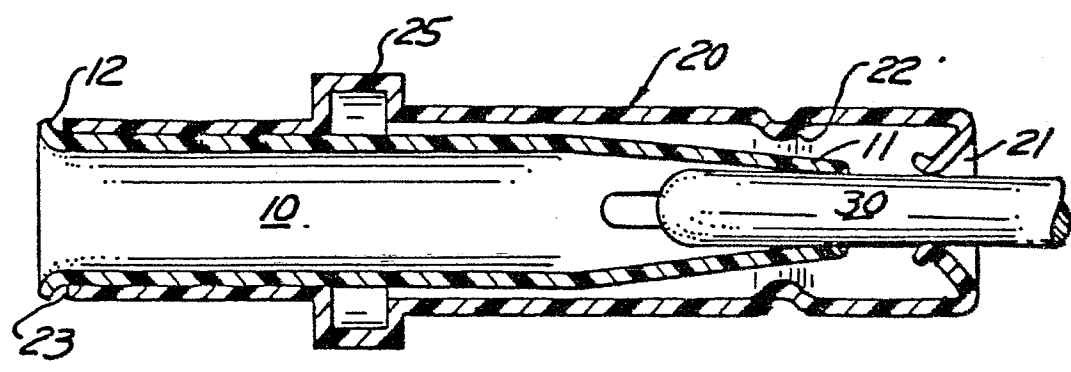


FIG. 3





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
A,D	US-A-4 168 878 (RISSER et al.) * Column 2, lines 35-46; figures 1-3 *	1,4-10	H 01 R 13/115
A	FR-A-2 507 021 (ITT COMPOSANTS ET INSTRUMENTS) * Page 3, line 36 - page 4, line 22; figures 2, 3, 9 *	1,3-10	
A	DE-A-2 407 063 (AMP) * Page 4, lines 11-36; figures 1-3, 5-7 *	1,4,9,10	
A	EP-A-0 060 770 (BENDIX) * Claims 1, 2; figures 5, 6 *		TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
A	DE-B-2 561 108 (BENDIX) * Claims 1-8; figures 3, 4, 5, 7, 10-14 *		H 01 R 13/10 H 01 R 13/15
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 14-06-1984	Examiner HAHN G
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	