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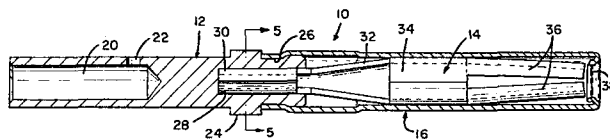
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Electrical contact assembly.

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An electrical contact assembly (10) comprises a wire barrel (12) onto which an electrical conductor (18) is connected along with a receptacle contact member (14) covered by a hood member (16). A C-shaped section (30) of the receptacle contact member (14) is frictionally secured in a bore (28) of the wire barrel (12) with the hood member (16) surrounding the receptacle contact member (14) and being crimped onto the wire barrel (12). The hood (16) has a beveled lead-in entrance (38) to facilitate insertion of a pin contact member (40) into electrical connection with the receptacle contact member (14) at a substantially low insertion force.


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ELECTRICAL CONTACT ASSEMBLY

This invention relates to electrical connectors and more particularly to an electrical contact assembly for use in electrical connectors.

5 A known type of electrical contacts are those that are formed as screw machine parts from bar stock. The bar stock from which these electrical contacts are machined has to be hard enough to enable them to be subject to screw machine operations which can present problems when electrical conductors are crimped thereto due to the wire barrels breaking. These entire contacts are evenly gold plated thereover because they cannot
10 be selectively gold plated. The insertion force when a pin is inserted thereinto is quite high.

Another type of known electrical contact assembly includes a screw machine wire barrel onto which is crimped a telescoped receptacle and hood. This type of contact can be selectively plated but a major drawback
15 is aligning the receptacle and hood and simultaneously crimping them onto the wire barrel as properly aligned and concentric members. The wire barrel is a screw machine part and, due to its configuration, cannot be readily cold formed. The wire barrel would also be subject to breakage when crimped onto an electrical conductor because of the hardness of the
20 metal if not subjected to annealing. The insertion force is not believed to be too low. Crimping of the receptacle onto the wire barrel does not provide a good mechanical and electrical connection and limits the diameter of the receptacle. The hood contains no beveled lead-in surface for the pin.

25 According to the present invention, an electrical contact assembly comprises a wire barrel onto which an electrical conductor is connected along with a receptacle contact member covered by a hood member. A

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C-shaped section of the receptacle is frictionally secured in a bore of the wire barrel with the hood member surrounding the receptacle and being crimped onto the wire barrel. The hood has a beveled lead-in entrance to facilitate insertion of a pin contact member into electrical connection with the receptacle contact member at a substantially low insertion force.

FIGURE 1 is a perspective and exploded view of an electrical contact assembly.

FIGURE 2 is a perspective view of an assembled electrical contact assembly with an electrical pin contact exploded therefrom.

FIGURE 3 is a cross-sectional view of the assembled electrical contact assembly.

FIGURE 4 is a cross-sectional view taken along line 4-4 of Figure 1.

FIGURE 5 is a cross-sectional view taken along line 5-5 of Figure 3.

FIGURE 6 is a perspective view showing an electrical connector in which the electrical contact assemblies are mounted.

FIGURE 7 is a cross-sectional view showing the electrical contact assembly secured in an opening of the electrical connector.

Figures 1 through 5 illustrate the electrical contact assembly 10 of the present invention with Figure 6 showing an electrical connector EC in which the electrical contact assemblies are secured for matable connection with a similar electrical connector (not shown). Electrical contact assembly 10 includes a wire barrel 12, a receptacle contact member 14, and a hood member 16.

Wire barrel 12 can be a screw machine part or it can be made in accordance with cold-forming techniques in accordance with conventional practices. If wire barrel 12 is made as a screw machine part, copper alloy material is used, whereas if it is formed in accordance with cold-forming techniques, soft copper is used. It is preferable that soft copper be used so that wire barrel 12 can be cold-formed and it can be readily crimped onto electrical conductor 18.

Wire barrel 12 is provided with a bore 20 in which electrical conductor 18 is disposed for electrical connection therewith. A sight hole 22 is located in wire barrel 12 to make certain that electrical conductor 18 has been properly positioned within bore 20 prior to it being connected thereto. An annular shoulder 24 is located adjacent the front end of wire

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barrel 12 next to annular recess 26. A bore 28 extends inwardly from the front end of wire barrel 12.

Receptacle contact member 14 is a stamped and formed member that is preferably stamped from beryllium copper and includes a C-shaped section 30 which frictionally engages bore 28 of wire barrel 12 to form an excellent mechanical and electrical connection therewith thereby securing contact member 14 therewithin. The resilient characteristics of C-shaped section 30 adds to the retention characteristics of C-shaped section 30 in bore 28. Tapered channel-shaped section 32 extends between C-shaped section 30 and cylindrical section 34 and has arcuate-shaped contact-engaging members 36 extending outwardly therefrom which taper towards each other toward the front ends thereof. Contact member 14 is selectively plated in the electrical contact area only on the inside surfaces of contact-engaging members 36 with a heavy gold plating, and the rest of the contact member is flash plated. The selective gold plating can be done on the material before stamping and forming of contact member 14 takes place.

Hood member 16 is a stainless steel cylindrical member which has its inner end crimped into annular recess 26, whereas its front end has a beveled surface 38 for facilitating insertion of pin contact member 40 into electrical contact with receptacle contact member 14. Hood member 16 protects contact member 14 and prevents spring contact-engaging members 36 from being overstressed.

The electrical contact assembly of the present invention has a low insertion force because receptacle contact member 14 is a stamped and formed part. This is a significant factor when a large number of receptacle contact members are to be electrically connected with pin contact members. Another important factor is the saving that takes place on selective gold plating because only heavy gold plating takes place on the internal surfaces of contact-engaging members 36 whereas the rest of contact member 14 and wire barrel 12 are flash plated.

Figure 7 illustrates electrical contact assembly 10 secured in a passageway 42 in dielectric mounting block 44 of electrical connector EC by means of lances 46 of clip member 48 engaging shoulder 24 to prevent withdrawal of contact assembly 10. Shoulder 24 is limited in its inner movement within passageway 42 by surface 50 interposed between the

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larger and smaller diameter sections of passageway 42. Another dielectric block 52 abuts against block 44 and has a passageway 54 extending therethrough and in which part of the wire barrel of the contact assembly is disposed and along which part of electrical conductor 18 extends; the
5 diameter of passageway 54 at the intersection between passageways 42 and 54 is smaller in diameter than passageway 42 to maintain clip member 44 in passageway 42. An epoxy material or the like can be placed in passageway 54 to seal the wire barrel and its termination to conductor 18.

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CLAIMS:

1. An electrical contact assembly (10) of the type including a wire barrel member (12) to which an electrical conductor (18) is to be connected and a telescoped receptacle contact member (14) and hood member (16) secured onto the wire barrel member (12) characterised in that

said receptacle contact member (14) has a receptacle contact section (34, 36) and a securing section (30) frictionally secured in a bore (28) in said wire barrel member (12); and

10 said hood member (16) has an inner end crimped onto said wire barrel member (12) and covering said receptacle contact section (34, 36).

2. An electrical contact assembly as set forth in claim 1 characterised in that said securing section (30) is C-shaped.

3. An electrical contact assembly as set forth in claim 1
15 characterised in that said receptacle section (34, 36) has arcuate-shaped contact-engaging members (36) tapering toward each other toward the front end of said hood member (16).

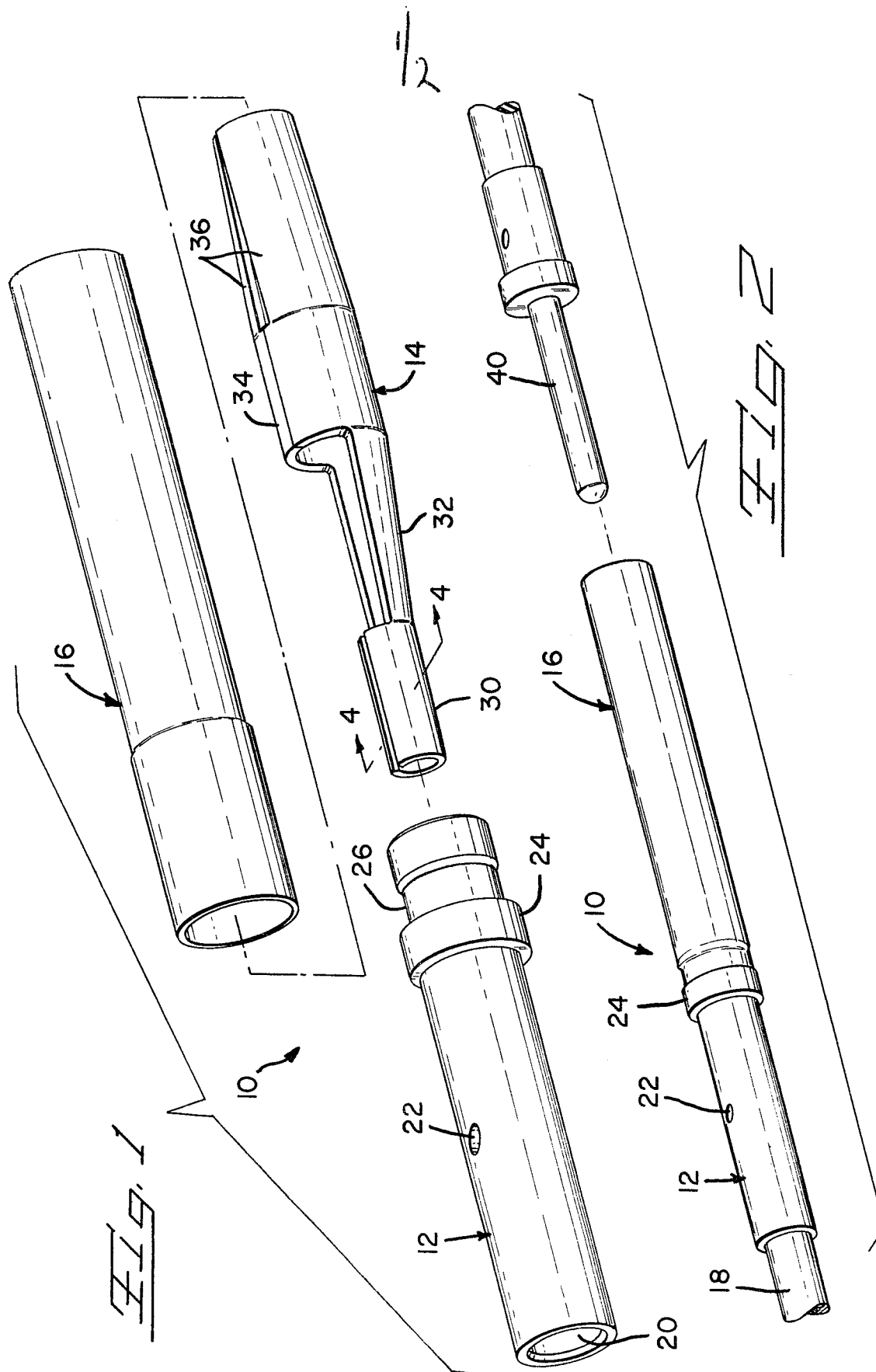
4. An electrical contact assembly as set forth in claim 3
20 characterised in that said receptacle section (34, 36) includes a tapered channel-shaped section (32) and a cylindrical section (34) containing said contact-engaging members (36).

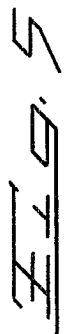
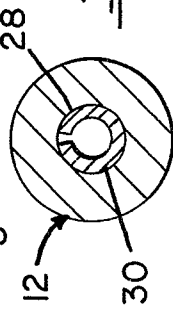
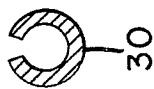
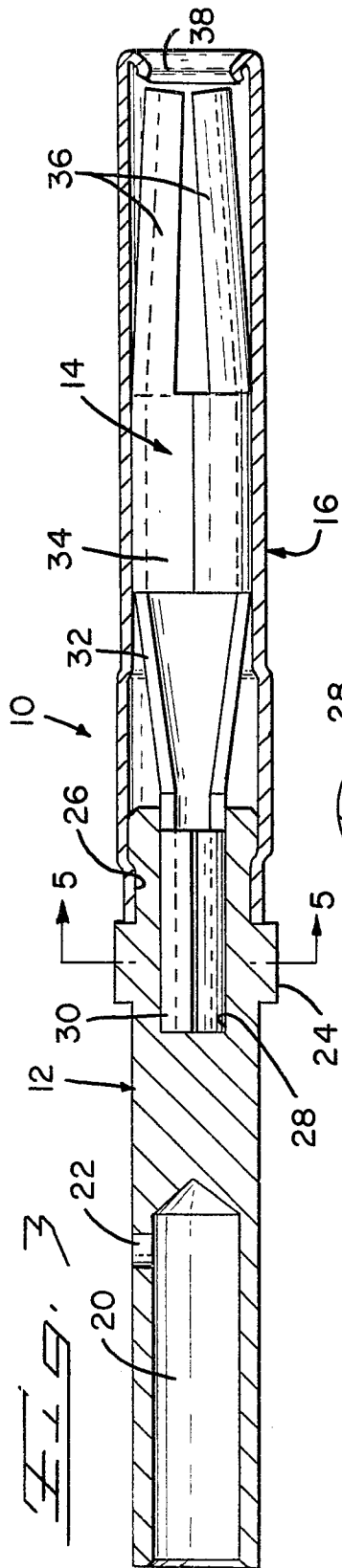
5. An electrical contact assembly as set forth in claim 1
25 characterised in that said hood member (16) has a beveled inner surface (38) at a front end thereof.

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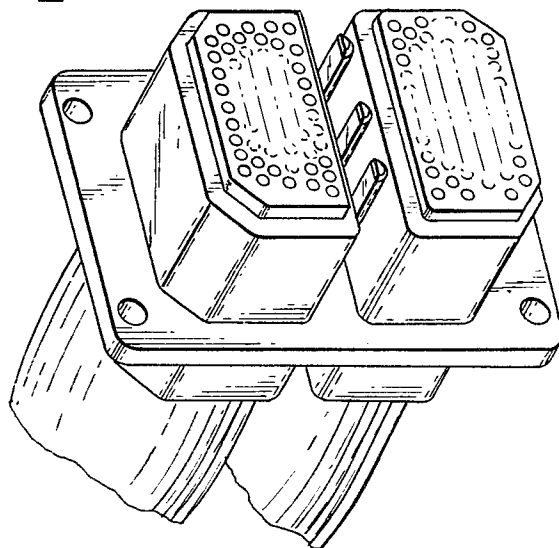
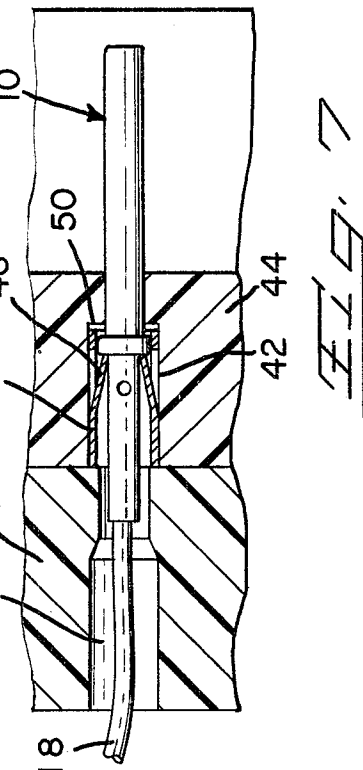


Fig. 6

EC