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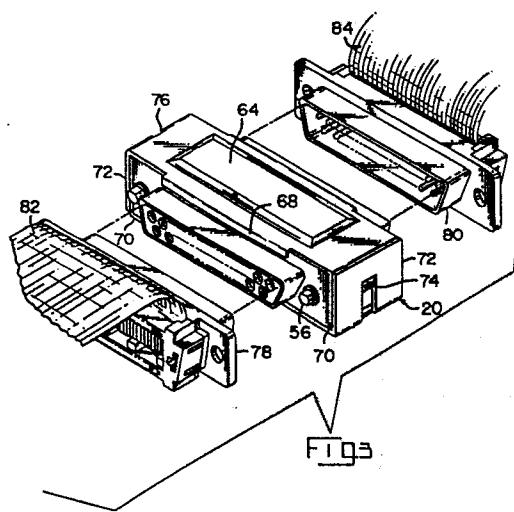
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(54) **Gender change connector.**

(57) An assembly (10) for effecting interconnection of like gender connectors (78, 80) on the ends of existing cables (82, 84) or between a cable and an equipment panel is formed by a pair of connectors (12, 14) of the same gender terminating opposite ends of a short length of multi conductor cable (16). The connectors (12, 14) are fixed in a back-to-back condition with the cable (16) and the gap between the connector enclosed in cover members (70, 72). The thus formed assembly can be used to mate cables and equipment having connectors of like gender which must be mated.



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GENDER CHANGE CONNECTOR

The present invention relates to a connector which permits mating of like gender connectors, such as two male connectors terminating cable assemblies, or two female connectors one of which terminates a cable assembly and the other is panel mounted.

There are many instances when cabling of main and peripheral equipment creates a situation where connectors of like gender are already provided and must be mated. This could be accomplished by reworking the mating end of one cable to install a connector of the opposite gender. However, this is not always convenient to do since the interconnection of the main equipment with the peripheral equipment is generally accomplished somewhere in the field where there is not always access to equipment for changing connectors on the end of a cable. Not only are there problems associated with having extra connectors of the proper type and gender, as well as terminating tools, but loss of cable length caused by changing connectors could be a significant problem.

It is known in the telephone industry to have connectors which allow multiple terminations of a single cable at a single location. Examples of this may be found in U.S. Patent Nos. 3,963,300 which shows a multiple tap and 4,032,211 which shows what is known as a half tap which allows two connectors to be mated to a single cable. However, both of these termination systems have the same type of connector at the free end of the cable. Further, examples may be found in U.S. Patent Nos. 3,876,276 and 4,236,977 which are half tap configurations.

The present invention is a gender change connector formed by a pair of like connectors terminating opposite ends of a short length of flat cable, assembled in a back-to-back configuration, and enclosed by a housing. The connectors of the subject gender change connector are either plug or receptacle connectors and preferably employ an insulation piercing technique for terminating the cable. The cable can be either multi-conductor flat flexible cable or multi-conductor ribbon cable.

The present invention will be described by way of non-limiting example with reference to the accompanying drawings in which:

FIGURE 1 is an exploded perspective view of a gender change connector according to the present invention;

FIGURE 2 is a perspective view of the assembled connector according to the present invention;

FIGURE 3 is a perspective view of the subject invention as it would be used to interconnect a pair of cables having like connectors at the ends thereof; and

FIGURE 4 is an exploded perspective view of the hermaphroditic covers to be used with the present invention.

The subject gender change connector has been shown utilizing a pair of receptacle connectors to intermate a pair of pin connectors. However, it is to be understood that the invention also encompasses the use of a pair of pin connectors in the same configuration to intermate a pair of receptacle connectors.

The subject gender change connector assembly 10 includes a pair of receptacle connectors 12, 14 terminating opposite ends of a short length of multi-conductor flat or ribbon cable 16 and secured in a back-to-back condition by hardware 18 and enclosed by hermaphroditic outer covers 20.

The connectors 12, 14 are like connectors each having a housing 22, 24 of rigid insulative material with a plurality of terminal passages 26 extending between a mating face 28 and a rear surface 30. A like plurality of terminals 32 are mounted in the respective passages 26 with each terminal 32 having a mating portion (not shown) directed toward or extending from the mating face 28 and an insulation

displacing, conductor engaging portion 34 extending from the rear surface 30. Each housing 22, 24 is further provided with cover latching means 36, 38. Each connector 12, 14 further has a cable cover 40, 42 each with latching means 44, 46, a cable receiving slot 48, and a plurality of terminal receiving passages 50.

The hardware 18 includes spacing cylinders 52, 54 which are tapped at both ends to receive bolts 56, 58, 60, 62, respectively.

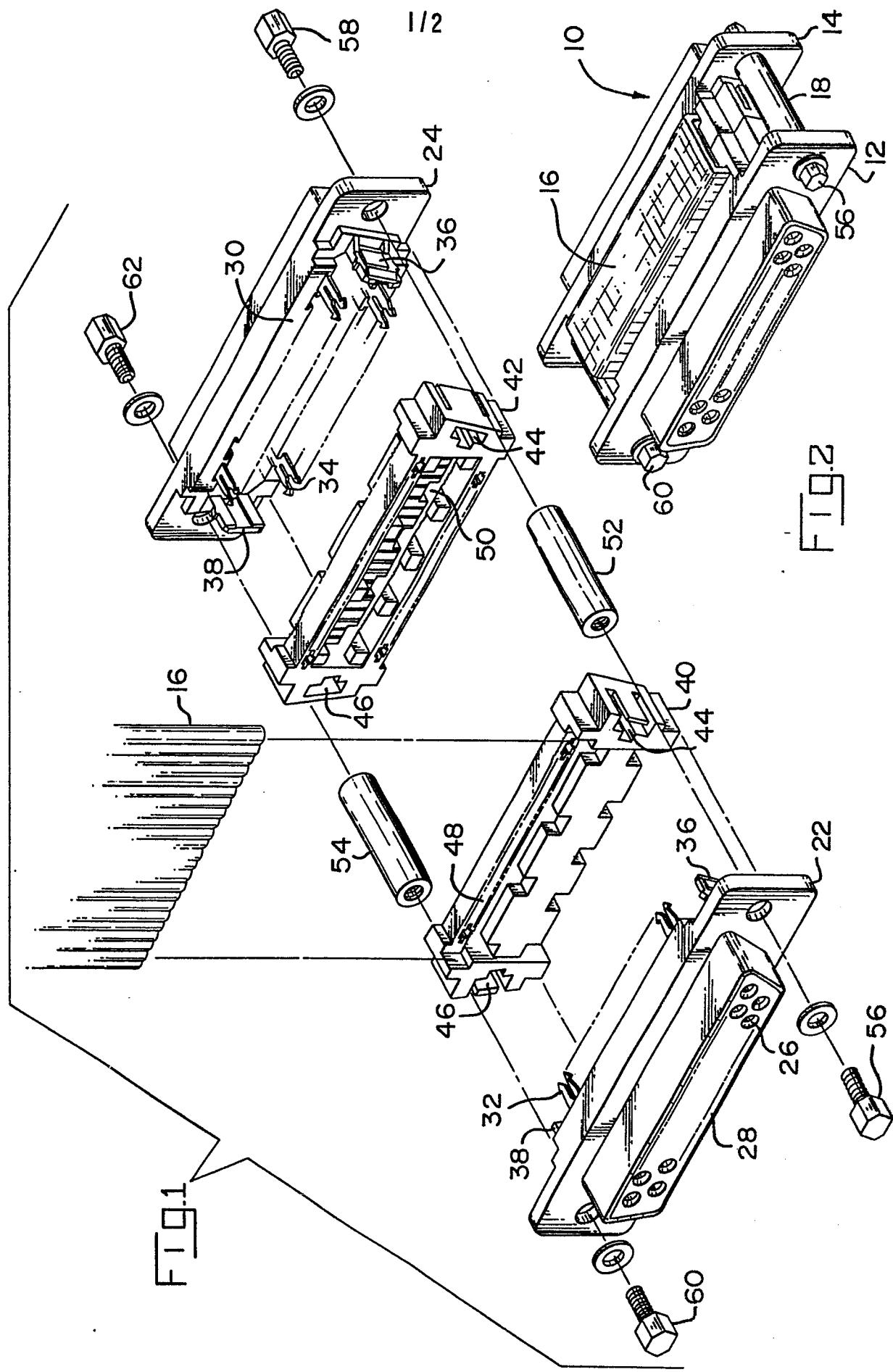
The outer covers 20 are hermaphroditic and each includes a profiled side cover portion 64 having depending longitudinal flanges 66, 68 and depending opposite end flanges 70, 72. Each end flange 70 includes an outwardly directed latching lug 74 while each end flange 72 includes a latching slot or recess 76 located to receive a respective lug 74 therein.

The subject gender change connector is formed by terminating, in known fashion, a short length of cable 16 at opposite ends thereof with the respective connectors 12, 14. The connectors 12, 14 are then brought into a back-to-back position and secured by the hardware 18 through the conventional mounting flanges of the connectors. The thus formed assembly of cable 16 and connectors 12, 14 is then enclosed by the covers 20 with flanges 66, 68 gripping the respective elongated sides of the connectors 12, 14 and the cover portions 64 and end flanges 70, 72 covering the cable 16 and gap between connectors 12, 14. The assembly 10 is inserted into a system, such as shown in Figure 3, with the connectors 78, 80 being either mounted on the ends of cables 82, 84, respectively, (as shown) which are to be joined or on the end of a cable and a panel of an equipment housing (not shown). To effect mating, the correct gender change assembly 10 according to the present invention is simply inserted between the two like existing connectors and the mating effected.

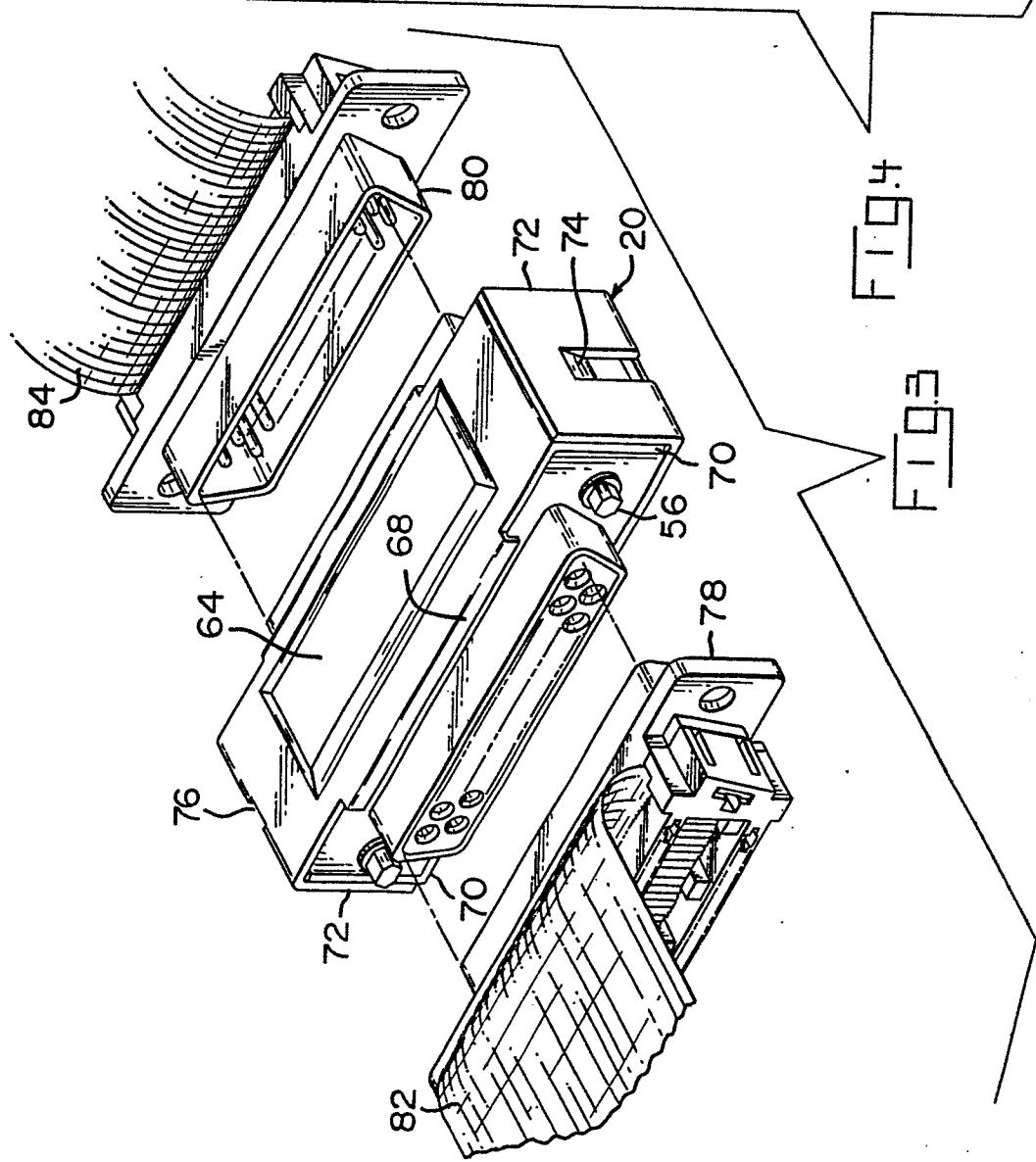
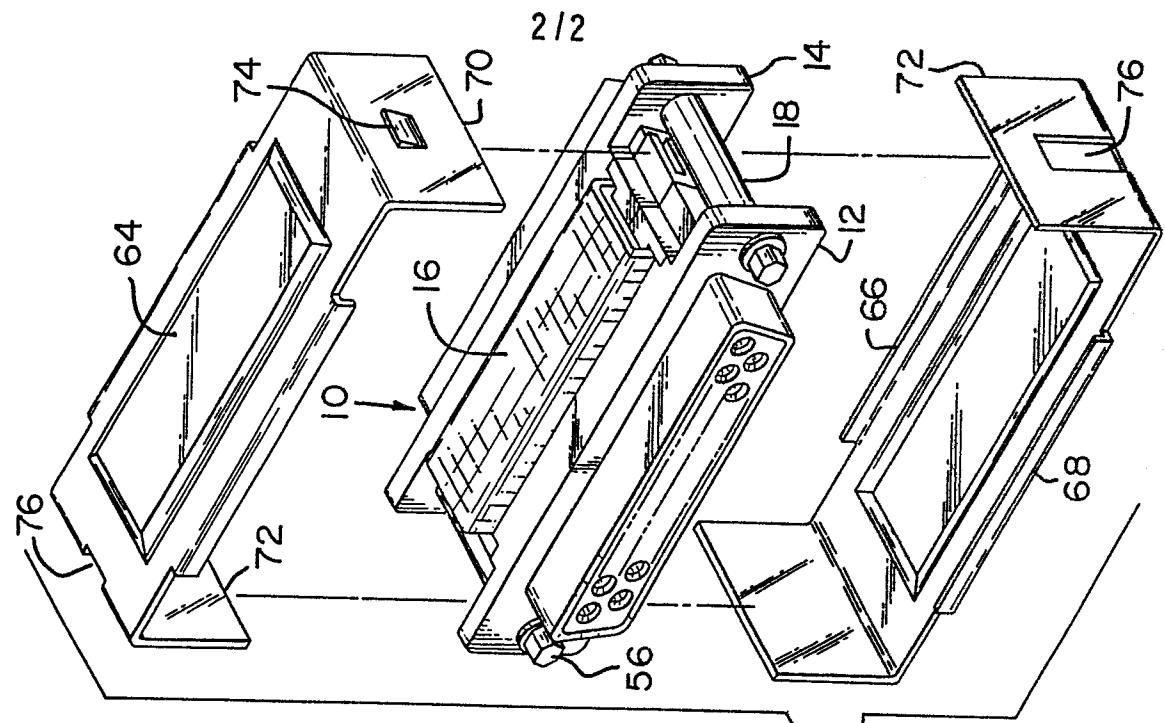
CLAIMS:

1. A gender change electrical connector assembly 10 for effecting intermating of cables and/or cables and equipment already provided with connectors (78, 80) of like gender making normal interconnection impossible, said assembly (10) having a pair of electrical connectors (12, 14) of like gender each with a housing (22, 24) of insulative material with a plurality of terminal passages (26) extending between a mating face (28) and a rear surface (30), a like plurality of terminals (32) each mounted in a respective passage (26) with a mating portion directed toward said mating face and a conductor engaging portion (34) extending from the rear surface (30), and a short length of multi conductor cable (16) having a connector (12, 14) terminating each end thereof characterized by means (18) to secure said connectors (12, 14) in a back-to-back condition and outer cover means (20) enclosing the rear portions of said connectors in the assembled condition.
2. A gender change electrical connector assembly according to claim 1 further characterized by cover means (40, 42) for each said connector housing (22, 24).
3. A gender change electrical connector assembly according to claim 1 further characterized by both said connectors (12, 14) being receptacles.
4. A gender change electrical connector assembly according to claim 1 further characterized by both said connectors (12, 14) being plugs.
5. A gender change electrical connector assembly according to claim 1 further characterized by said conductor engaging portions (34) of each said terminal (32) having an insulation displacing conductor engaging profile.
6. A gender change electrical connector assembly according to claim 1 further characterized by said cover means (20) comprising a pair of hermaphroditic cover members (70, 72).

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EUROPEAN SEARCH REPORT

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Application number

EP 83 30 4825

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	US-A-3 482 201 (SCHNECK) * Column 2, line 44 - column 4, line 20; figures 1-7 *	1-3	H 01 R 31/00 H 01 R 31/06
A	US-A-4 243 289 (KOZEL) * Column 4, line 6 - column 5, line 26; figures 1-6 *	1,4	
A	US-A-3 315 219 (BRINSER et al.) * Column 1, line 56 - column 3, line 23; figures 1-5 *		

			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			H 01 R 31/00 H 01 R 31/06
<p>The present search report has been drawn up for all claims</p>			
Place of search BERLIN	Date of completion of the search 28-11-1983	Examiner HAHN G	
CATEGORY OF CITED DOCUMENTS		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	
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			