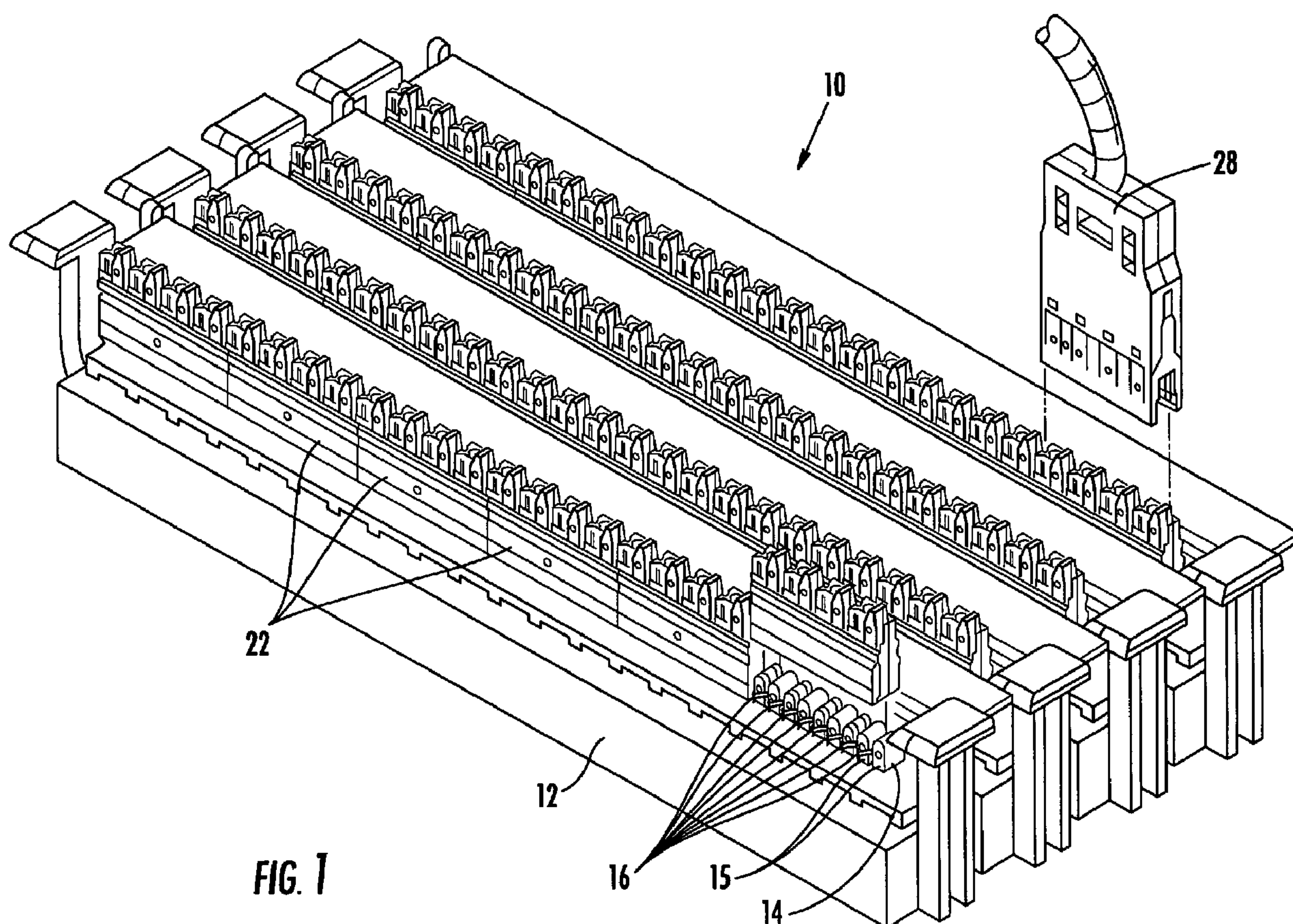




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(54) Titre : SYSTEMES D'INTERCONNEXION A ELEMENTS CONNECTEURS EQUILIBRES A AUTO-COMPENSATION
(54) Title: CROSS CONNECT SYSTEMS WITH SELF-COMPENSATING BALANCED CONNECTOR ELEMENTS



(57) Abrégé/Abstract:

A cross-connect wiring system includes a terminal block, a connecting block and a patch plug. The terminal block has a front side and a rear side. The connecting block is mounted on the front side of the terminal block. At least two pairs of tip and ring insulation



(57) **Abrégé(suite)/Abstract(continued):**

displacement contacts (IDCs) are at least partially mounted within the connecting block. Each of these IDCs has a first end that includes a first conductor receiving slot and a second end that includes a second conductor receiving slot. The first and second ends of each IDC are non-collinear. Both the first and second conductor receiving slots of each IDC are on the front side of the terminal block. The patch plug includes a housing and at least two pairs of tip and ring plug contacts. The tip and ring plug contacts of at least one of the two pairs of tip and ring plug contacts cross over each other within the plug housing.

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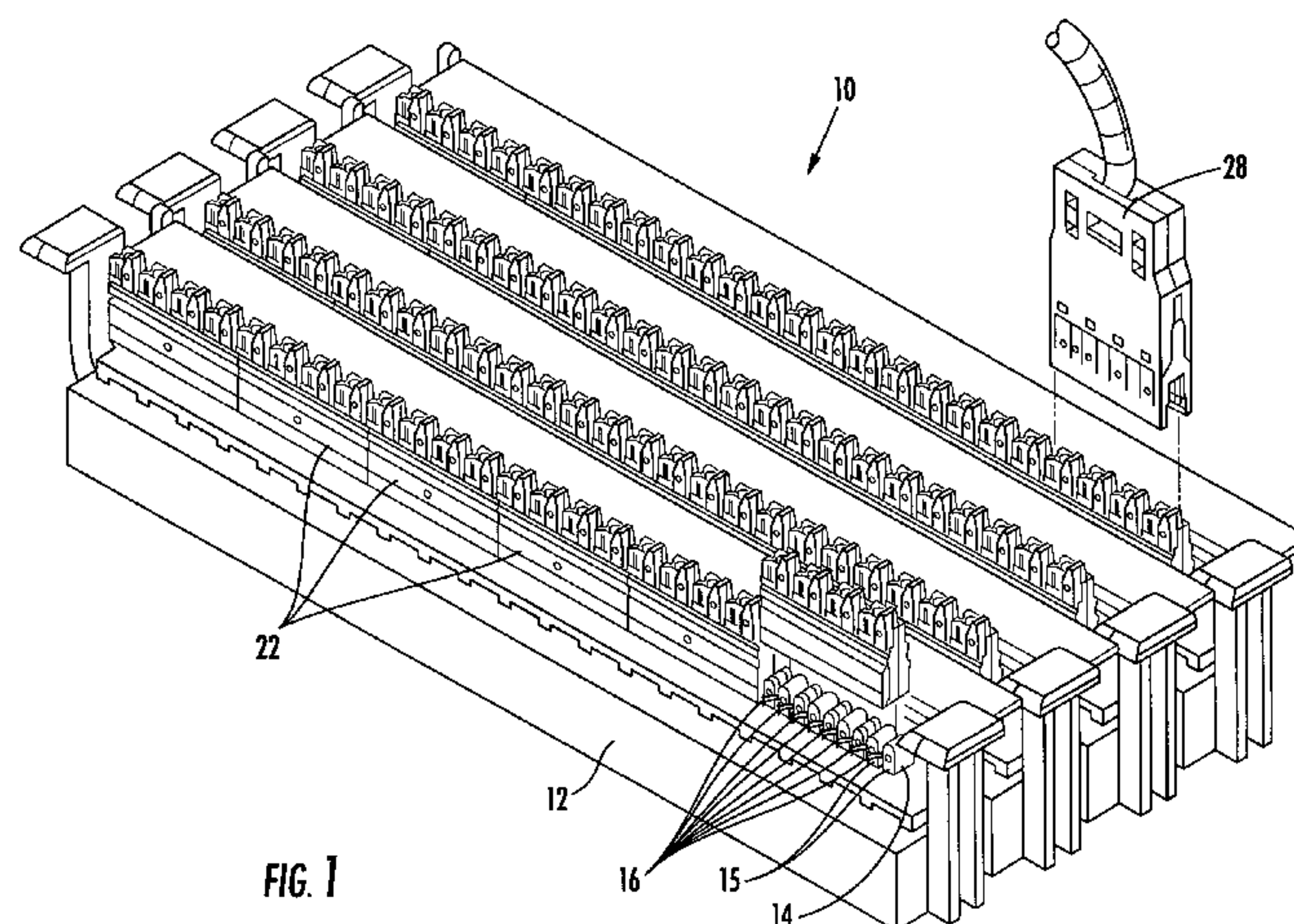
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CROSS CONNECT SYSTEMS WITH SELF-COMPENSATING BALANCED CONNECTOR ELEMENTS

Related Applications

[0001] This application claims priority as a continuation-in-part application from U.S. Patent Application Serial No. 11/154,836, filed June 16, 2005, which in turn claims priority from U.S. Provisional Patent Application Serial No. 60/687,112, filed June 3, 2005, the disclosures of each of which are hereby incorporated by reference herein in their entireties.

Field of the Invention

[0002] The present invention relates generally to communications connectors and, more specifically, to cross connect systems.

Background of the Invention

[0003] In an electrical communications system, it is sometimes advantageous to transmit information signals (e.g., video, audio, data) over a pair of conductors (hereinafter a "conductor pair" or a "differential pair" or simply a "pair") rather than a single conductor. The signals transmitted on each conductor of the differential pair have equal magnitudes, but opposite phases, and the information signal is embedded as the voltage difference between the signals carried on the two conductors. This transmission technique is generally referred to as "balanced" transmission. When signals are transmitted over a conductor such as a copper wire in a communications cable, electrical noise from external sources such as lightning, computer equipment, radio stations, etc. may be picked up by the conductor, degrading the quality of the signal carried by the conductor. With balanced transmission techniques, each conductor in a differential pair often picks up approximately the same amount of noise from these external sources. Because approximately an equal amount of noise is added to the signals carried by both conductors of the differential pair, the information signal is typically not disturbed, as the information signal is extracted by taking

[0049] The IDCs 24a-24h can be divided into TIP-RING IDC pairs as set forth in Table 1 below, where by convention, the TIP is the positively polarized terminal and the RING is the negatively polarized terminal. Each of the RINGS of the IDC pairs are in one row, and each of the TIPS of the IDC pairs are in the other row.

Table 1		
IDC	Pair #	Type
24a	1	TIP
24b	2	TIP
24c	3	TIP
24d	4	TIP
24e	1	RING
24f	2	RING
24g	3	RING
24h	4	RING

[0050] As is shown in FIG. 5, the length of each IDC 24a-24h may be a distance "k." In an exemplary embodiment of the present invention, "k" may be about 800 mils. In the exemplary embodiment shown in FIG. 5, the distance "j" between adjacent slots of the IDCs of an IDC pair may be about 96 mils. In the exemplary embodiment shown in FIG. 5, the distance "l" between the slots of adjacent IDCs in a row of IDCs may be about 260 mils. The first and second rows of IDCs may be separated by about 70 mils.

[0051] As is best seen in FIG. 5, the resulting arrangement of the IDCs 24a-24h is one in which the IDCs of each pair "cross-over" each other. Also, in this embodiment the distance between (a) the upper end of the IDC of one pair and the IDCs of an adjacent pair and (b) the lower end of the other IDC of the pair and the lower ends of the IDCs of the adjacent pair are generally the same. As a result, the TIP of each pair and the RING of each pair are in close proximity to the IDCs of adjacent pairs for generally the same signal length and at generally the same distance. For example, as seen in FIG. 6, the upper end 32 of the RING of pair 1 (IDC 24e) is closer to the upper ends 32 of the TIP and RING of pair 2 (IDCs 24b, 24f) than is the upper end 32 of the TIP of pair 1 (IDC 24a). However, as can be seen in FIG. 7, the lower end 30 of the TIP of pair 1 (IDC 24a) is closer to the lower ends 30 of the TIP and RING of pair 2 (IDCs 24b, 24f) than is the lower end of the RING of pair 1 (IDC 24e). This pattern holds for all of the pairs of IDCs in the connecting block 22, and continues

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[0063] In some embodiments of the present invention, the connecting block 22 may also include one or more parasitic conductive loops as disclosed and described in detail in co-pending U.S. Patent Application No. 11/369,457, filed on March 7, 2006, the contents of which are incorporated by reference herein as if set forth in its entirety.

[0064] The foregoing is illustrative of the present invention and is not to be construed as limiting thereof. Although exemplary embodiments of this invention have been described, those skilled in the art will readily appreciate that many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of this invention. Accordingly, all such modifications are intended to be included within the scope of this invention as defined in the claims. The invention is defined by the following claims, with equivalents of the claims to be included therein.

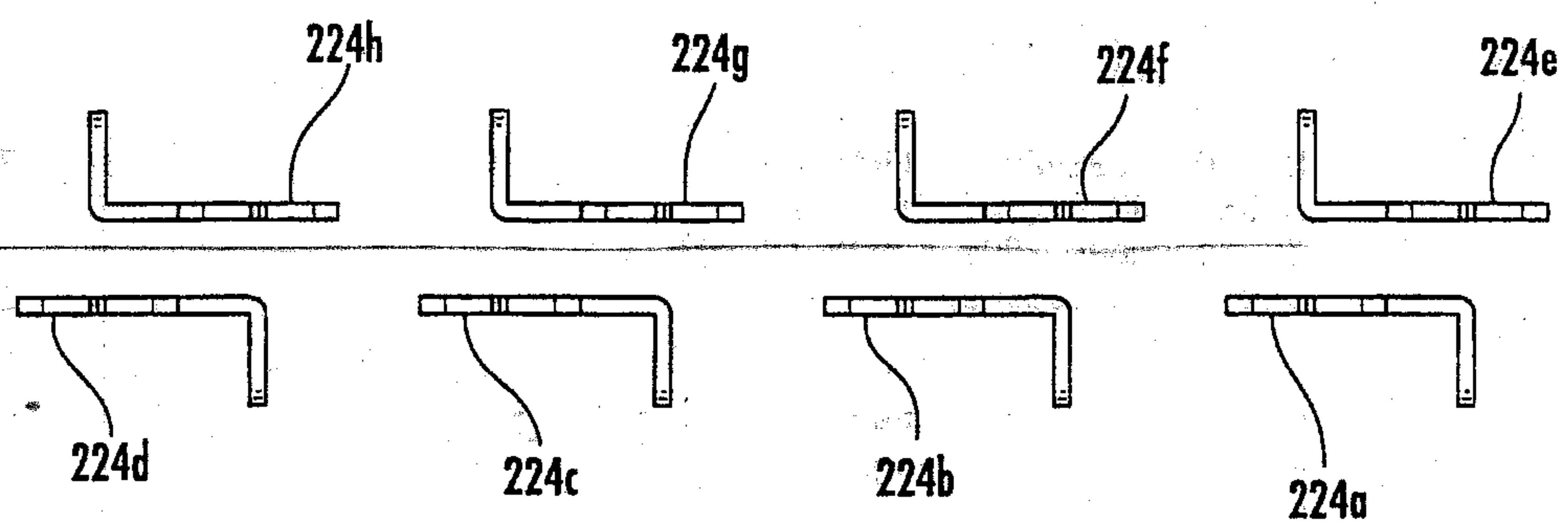


FIG. 11

