(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 476 883 B1**

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification : **25.10.95 Bulletin 95/43**

(51) Int. Cl.[6] : **H01R 13/658,** H01R 23/70

(21) Application number : **91308042.0**

(22) Date of filing : **30.08.91**

(54) **Electrical connector assembly.**

(30) Priority : **21.09.90 US 586360**

(43) Date of publication of application : **25.03.92 Bulletin 92/13**

(45) Publication of the grant of the patent : **25.10.95 Bulletin 95/43**

(84) Designated Contracting States : **DE FR GB IT NL**

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Description

This invention relates to an electrical connector assembly for electrically interconnecting corresponding circuits between two circuit boards.

Board to board connectors are used to interconnect circuitry on a plurality of daughter boards to a mother board or backplane. These boards may be mounted in a vertical or horizontal relationship depending upon the configuration of the mating connector members.

The demand for connectors that solve problems such as common mode noise and crosstalk has increased with the density and speed of electronic circuitry. It is desirable, therefore, to provide high density electrical connectors with means to provide a low inductance and low resistance ground connection from the connector to the circuit board to which it is attached.

U.S. Patent 4,867,690 discloses an electrical connector system comprising a pin header having a plurality of rows of terminal members extending parallel to the sidewalls. The outermost rows of terminals adjacent the sidewalls are adapted to provide ground reference paths while the remaining rows of terminals are adapted to be mated to a receptacle member.

U.S. Patent 4,655,518 discloses an electrical connector according to the preamble of claim 1 and a two-piece connector assembly according to the preamble of claim 4, providing grounding contacts along the dielectric sidewalls of the respective connectors. The terminal members of the pin header are positioned in recesses along the inside surfaces of the sidewall with the contact portion being a convex shape single resilient beam facing inwardly toward the pin terminals positioned between the sidewalls. In the receptacle member, ground contacts are placed along the outside surfaces of the sidewall so that they will slidably engage resilient beams in the pin header when the connectors are mated.

It is also desirable in certain applications to provide means for shorting together any two adjacent electrical contacts when a mating connector and board is removed from a system thereby providing a switching effect to maintain electrical continuity of the system. The "built in" switches eliminate the need for additional parts to provide the same capability.

For high density, high speed electronic systems it is generally desirable to provide means for shielding modules within the system for protection from EMI/RFI. It is desirable, therefore, that connector assemblies used within the system include means for facilitating interconnection of module shields to ground planes within the mother board or backplane. For purposes of this application, the terms "shielded pin header", "shielded receptacle" or "shielded connector assembly" are to be understood to mean members having a ground plate or other structure that provides the above described capability.

Furthermore, it is desirable that the mating members of grounded or shielded connector assembly also be matable with respective existing complementary non-grounded or shielded members to provide a cost effective manner of upgrading existing electronic systems such as computers and instrumentation.

The present invention is directed to an electrical connector system that eliminates the problems and disadvantages of the prior art and consists in an electrical connector according to claim 1 and in an electrical connector assembly according to claim 4.

The invention enables an improvement in the electrical performance of the connector by providing additional low inductance and low resistance paths for ground current to flow through the electrical connector assembly to a circuit board. Moreover, it can provide a shielded connector system that is also compatible with existing unshielded connectors.

According to a feature of the invention, means may be provided for shunting or switching adjacent contact terminals to provide electrical continuity upon removal of a board from a system, thereby eliminating the need to use additional components to provide the same function.

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:

FIGURE 1 is an enlarged fragmentary perspective view of the electrical connector assembly of the present invention with the receptacle and pin header members exploded from one another.

FIGURE 2 is a cross sectional view of the connector assembly of the invention with the members exploded from each other.

FIGURE 3 is a cross sectional view of the mated connector assembly with the members mated.

FIGURE 4 is an enlarged fragmentary portion of an alternative embodiment of the receptacle member with a shunt terminal exploded therefrom.

FIGURE 5 is enlarged portion of the receptacle member of Figure 4 illustrating the means for securing a shunt terminal to the housing sidewall.

FIGURE 6 is a fragmentary portion of the pin header member of the present invention with one of the ground plate shields exploded therefrom.

FIGURE 7 is an enlarged fragmentary portion of Figure 6 illustrating the means for securing the ground plate to the pin header.

FIGURE 8 is fragmentary perspective view of an alternative embodiment of the pin header for use with the receptacle member of Figure 4.

FIGURE 9 is a cross sectional view of the receptacle member of Figure 4 mated with the pin header of Figure 8.

FIGURE 10 is fragmentary perspective view of a pin header illustrating an alternative embodiment of the invention.

FIGURE 11 is a cross sectional view of the receptacle of the present invention mated to an unshielded pin header member.

FIGURE 12 is an exploded perspective view of a further alternative embodiment of the receptacle member.

FIGURES 13 and 14 are enlarged views of portions of the receptacle member of Figure 12.

FIGURE 15 is a cross sectional view of the assembled receptacle member of Figure 12.

Referring now to Figures 1, 2 and 3, the connector assembly 10 of the present invention comprises a receptacle member 12 and a pin header 60. For purposes of illustrating the invention, the board to board connector assembly 10 is shown in a configuration suitable for mounting daughter cards perpendicular to the mother board or backplane. It is to be understood that the pin header member can be modified for positioning the daughter cards in parallel with the mother board. Receptacle member 12 includes a housing member 14 having a mating face 16 and a mounting face 18. Housing 14 has a transverse body section 20 extending along the mounting face 18 as best seen in Figure 4, an inner body portion 22 and opposed outer side walls 34 extending from mounting face 18 to mating face 16 and defining elongate cavities 36 between the inner body portion 22 and respective outer side walls 34. Inner body portion 22 includes opposed side walls 24, end walls 28 having mounting flanges 30 extending outwardly therefrom, and a plurality of terminal-receiving passageways 32 extending from the mounting face 18 to the mating face 16. A plurality of first contact terminal members 40 are disposed in respective passageways 32, as shown in Figures 2 and 3. For purposes of illustration, first terminal members 40 have been eliminated in Figures 1 and 4. First terminal members 40 include a first contact section 42 for mating with complementary terminal members 78 of pin header 60 and a second contact section 44 extending below the mounting face 18 for engagement with corresponding apertures 104 of the circuit board 102.

As seen in Figures 1-3 elongate cavities 36 are defined along thin sides by the inner surface of outer side walls 34 and the corresponding outer surfaces of body side walls 24 and the respective portions of transverse wall 20 extending therebetween forms cavity base 21. Cavity base 21 includes a plurality of apertures 38 extending therethrough. Receptacle 12 further includes a plurality of second contact terminal members 46 disposed in terminal-receiving apertures 38 of transverse wall 20 and having first contact sections 48 extending into elongate cavities 36 and a second contact section 52 extending outwardly from mounting face 18 for engagement with apertures 106 of mother board or backplane 102. As best seen in Figures 2 and 3, first terminal section 48 of respective second contact terminals 46 include cantilevered beam portions having an inwardly directed arcuate section 49 and a contact surface 50 intermediate arcuate section 49 and second contact section 52. Corresponding contact surfaces 50 of second terminal members 46 are adapted to mate with corresponding ground bus means 84,90 of the complementary mating connector 60 as shown in Figure 3.

Figures 4 and 5 illustrate an alternative receptacle member embodiment 120, which includes at least one shunt terminal member 54 to provide an internal "switching effect." Since the basic structure of receptacle member 120 is essentially the same as that of receptacle member 12, the same reference numerals have been used for the identical parts. Receptacle member 120 includes a housing member 140 having a transverse body section 20 extending along the mounting face 18 as best seen in Figure 4, an inner body portion 122 and opposed outer side walls 34 extending upward from the mounting face 18 and defining elongate cavities 36 between the inner body portion 122 and respective outer side walls 34. Inner body portion 122 includes opposed side walls 124, end walls 28 having mounting flanges 30 extending outwardly therefrom. In this embodiment, the outside surfaces of side walls 124 of inner body portion 122 further include projections 126 extending into respective cavities 36 at selected locations therealong. Projections 126 include slots 127 for receiving a shunt terminal member 54 therebetween. Shunt terminal member 54 includes an outwardly extending portion 56 and ends 58, the ends 58 being received in projection slots 127 and extending between two adjacent second terminal members 46. As shown in Figure 5, shunt terminal member 54 electrically interconnects two adjacent second terminal members 46 within a respective cavity 36, when the receptacle member 120 is not mated to a complementary connector.

Referring again to Figures 1-3, the pin header 60 of the present invention includes a housing 62 having a mating face 64 and mounting face 68. Cavity 66, configured to receive inner housing 22 of mating receptacle 12 therein, extends inwardly from mating face 64. For purposes of illustration, pin header 60 is shown in a right angle configuration for mounting to a daughter card 108. Pin header 60 includes side wall 70 opposed to mounting face 68, back wall 71 opposed to mating face 64, and opposed end walls 72 having outwardly extending flanges 74 thereon. Housing 62 further includes a plurality of terminal-receiving passageways 76 extending through the housing 62 and between the mating and mounting faces 64,68. A plurality of third terminal members 78 having first and second contact sections 80,82 are disposed within respective terminal-receiving passageways 76. As shown more clearly in Figure 6, the terminal-receiving passageways 76 include slots 77 along the back wall 71 for assembling respective third terminal members 78 into the housing 62. First contact section

80 of each third terminal member 78 is shown as a pin member adapted for mating with a complementary first terminal member 40 and second contact section is adapted for mounting to corresponding apertures 110 of daughter card 108. Pin header 60 further includes first and second ground or shield plate means 84,90 disposed on outer surfaces of the connector with first ground plate means 84 extending along back wall 71 and side wall 70. The first ground plate 84 includes first and second connecting portions 86,88 respectively, the first ground connecting portion 86 being adapted for electrical connection with the second terminal members 46 in one of the cavities 36 of receptacle 12, as best seen in Figure 3. The second ground plate 90 extends along the forwardly projecting portion of mounting face 68 of pin header 60 and is adapted to be received within the other of the elongate cavities 36 of the corresponding receptacle member 12 and to be electrically engaged to the plurality of second contact members 46 therein. As best seen in Figures 6 and 7 the ground plate members 84 and 90 include outwardly extending tabs 85,91 for being received into corresponding slots 75 in the outwardly extending flanges 74 to secure the ground plates 84,90 continuously along the corresponding sides of the housing member 62.

As shown in Figures 2 and 3 when pin header 60 is mated to the receptacle member 12 the outwardly extending contacts 86,92 on the ground plates 84,90 of pin header 60 will engage the corresponding ground contact terminals 46 of the receptacle member 12 prior to engagement of the respective first contact sections 42,80 of first and third terminal members 40,78. As the mating members are moved into mating engagement, the arcuate first contact sections 86,92 of the ground plates 84,90 enter respective cavities 36, outwardly deflect the cantilevered arms of second terminal members 46 and electrically engage the corresponding contact surfaces 50 of the second terminal members 46 within the respective cavities 36. Concomitantly herewith, the third terminal members 78 become fully mated with the corresponding first terminal members 40. The continuous shield on the outer surfaces of the pin header 60 facilitates interconnection to ground planes in the mother board or backplane and to shielding means in those applications where EMI/RFI protection is desired.

Figures 8 and 9 illustrate alternative pin header embodiment 160 for mating with receptacle member 120 of Figure 4 having at least one shunt terminal member 54 disposed along a side wall 124. In this embodiment wall 170 of pin header housing member 162 includes at least one projection 171 extending outwardly therefrom at a location selected to correspond to the location of the shunt terminal member 54 of receptacle member 120 of Figure 4. First plate member 184 includes at least one slot 187 extending thereinto from the edge of the first contact portion 186 at a location selected to correspond to the location of shunt terminal member 54 of receptacle member 120.

As shown in Figure 9 when pin header 160 is mated to the receptacle member 120, the outwardly extending contacts 86,92 on the ground plates 84,90 of pin header 60 will engage the corresponding ground contact terminals 46 of the receptacle member 120 prior to engagement of the respective first contact sections 42,80 of first and third terminal members 40,78. As the mating members are moved into mating engagement, the outwardly extending projection 171 of housing member 162 disengages shunt terminal member 54 from engagement with the associated second terminal members 46 by deflecting the corresponding cantilevered arms outwardly and into the corresponding cavities 36. Slot 187 of plate 186 is of sufficient size to prevent engagement of plate member 186 with the formerly shunted second terminal members, thereby establishing switching capability for the connector assembly. The remaining terminal members electrically engaged their respective counterparts as previously described.

Figure 10 shows a further alternative pin header embodiment 260 wherein first plate member 284 includes a plurality of segments 285, each including at least one aperture 287 therein for cooperating with projection means 271 on a wall 270 of pin header housing member 262. Wall 270 further includes a plurality of spacer members 273, which aid in keeping shield segments 285 from rotating. In the preferred embodiment plate segments 285 are heat staked to the housing wall. Only the second corresponding receptacle terminal members 46 (as shown in Figure 1) associated with each individual segment 285 are commoned. By using a plurality of plate segments the individual segments can be used for interconnection of either signal, ground or power circuits, thereby increasing the capability of the connector assembly.

As is shown in Figure 11, the receptacle 12 of the present invention is intermatable with an unshielded pin header 360 as well as the grounded or shielded pin header 60 of the present invention. When receptacle member 12 is mated with the unshielded pin header 160 presently available, the arcuate portion 49 of each of the second terminal members 46 engage the outer surface of dielectric housing 162. The electrical contact region 50 of receptacle member 12 is, therefore, protected from accumulating films or debris from the dielectric housing walls of the unshielded pin header 160. Thus, the same receptacle member 12 can be mated interchangeably with a shielded or grounded pin header or unshielded pin header 60,160. Any buildup of dielectric material on the second contact terminal 46 occurs at the arcuate portion 49 rather than the contact section 50.

Figures 12-15 illustrate another alternative receptacle embodiment 412 wherein the housing means is comprised of first and second housing mem-

bers 414a and 414b, which together define elongate cavities 436 extending between corresponding sides 424 and 434 of first and second housing members 414a,414b respectively, as best seen in Figure 15. Housing members 414a and 414b are securable together along their respective longitudinal sides by respective interlocking "teeth" 426,435 and at the ends by interlocking teeth and groves, 431a,431b. First housing member 414a corresponds to the inner housing portion of the previously described embodiments and includes mating face 416, mounting face 418, side walls 424 and end walls 428. A plurality of spaced outwardly projecting teeth 426 extend along the outer surface of wall 424 proximate mounting face 418. A plurality of first terminal members 440 having first and second connecting portions 442,444, respectively are disposed in respective terminal-receiving passageways 432. Second housing member 414b is essentially a shell member having longitudinally extending side walls 434, end walls 433, and a plurality of terminal-receiving passageways 438 for receiving second terminal members 446 therein. Second terminal members 446 include first contact section 448 having an arcuate portion 449 adjacent free end 447 and second contact section 452 extending through lower second housing wall 421.

The assembled receptacle 412 having a shunt terminal member 454 is shown in Figure 15. Figures 13 and 14 show enlarged views of the respective interlocked walls 424,434 at a shunt location. Selected teeth 426 along wall 424 are provided with slots 427 for receiving ends of shunt terminal members 454 in a manner similar to that previously described. Housing wall 424 as shown in Figure 14, includes two such teeth 426 having a shunt terminal 454 disposed therebetween. Tooth 426a intermediate the modified teeth 426 has been shortened to accommodate the outwardly projecting contact surface 456 of shunt terminal 454. As seen more clearly in Figure 13, the inner surfaces of wall 434 includes teeth 435 that are adapted to interlock with first housing member teeth 426 to secure the first and second housings together. This figure also shows the shortening of two of the teeth 435a at a shunt terminal location to accommodate the shape of the shunt terminal.

The housing members of the present invention are molded from a suitable dielectric material such as a glass-filled polyester or the like. The first and second terminal members are from a material having high spring characteristics such as stamped and formed phosphor bronze or the like. Since the third terminal members are not spring members they may be formed of brass or other suitable materials. Ground shields or plate members 84,90 are preferably made from a high conductivity brass. Preferably the shunt terminal members are made from beryllium copper. In assembling receptacle members shown in Figures 1-11, first terminal members are inserted into the terminal-receiving passageways from the mounting face and secured therein by means known in the art. Second terminal members are inserted into terminal-receiving passageways from the mating face and are secured therein as known in the art. If desired, shunt contact are inserted at the appropriate locations along the housing sidewalls. The receptacle of Figures 12-15 is assembled by loading the first and second terminals into their respective terminal-receiving passageways and any shunt contacts into their respective locations. The two housing members are assembled by engaging the teeth along the sidewalls and sliding the members together. The assembled receptacle member can then be mounted to a board 102 by inserting respective second contact sections of the first and second terminal members into corresponding board apertures and are held thereon by appropriate means.

Pin header 60 is assembled by inserting third terminal members 78 into slots 77 along wall 70 of housing 62. The first and second ground plates 84,90 are assembled to housing 62 by inserting respective 85,91 into associated slots 75 to flanges 74.

In forming the plate members 84,90, it is preferable to include a plurality of second contact sections 84,90 respectively thereby providing multiple parallel paths to ground, thus lowering the inductance and resistance to ground.

In the preferred embodiment the number of outwardly extending second ground contact sections 88,94 of the plates 84,90 correspond to the number of columns of third terminal members 68 in the pin header 60 and the corresponding second terminal members 46 of the receptacle member 12 correspond to the columns of first terminal members 40 within the receptacle housing 14. The present invention provides a number of advantages for board to board connector systems. As is shown in the drawings a connector system is compatible with existing ungrounded/shielded connectors thereby permitting the user to gradually upgrade the system. Since the configuration of the basic pin header and basic receptacle member remains the same, both the enhanced and the standard pin header and receptacle member can be used interchangeably.

Claims

1. An electrical connector (12) comprising housing means (14) having a mating face (16) and a mounting face (18), and a body portion (22) extending therebetween, the body portion (22) having a plurality of terminal-receiving passageways (32) extending therethrough and a plurality of first terminal members (40) disposed in respective passageways (32) for mating with complementary terminal members of a complementary sat-

ing connector:
characterized in that

the housing means (14) includes a transverse body section (20) extending along the mounting face (18) and having two opposed outer sidewalls (34) spaced from the body portion (22) and extending from the mounting face (18) to the mating face (16) and defining elongate cavities (36) between the body portion (22) and the respective outer side walls (34), and

at least one second contact terminal member (46) is disposed in the transverse body section (20) and has a terminal section extending into at least one of said elongate cavities (36), the at least one second terminal member (46) being mateable with ground bus means of the complementary mating connector.

2. The connector of claim 1 wherein at least one of the elongate cavities (36) includes a plurality of second contact terminal members (46).

3. The connector of claim 2 including at least one shunt terminal member (54) arranged to common at least two of the second contact terminal members (46).

4. An electrical connector assembly (10) comprising a receptacle member (12) and a complementary mating pin header (60), the receptacle member (12) including housing means (14) having a mating face (16) and a mounting face (18) and a body portion (22) extending therebetween, the body portion (22) including a plurality of terminal-receiving passageways (32) extending therethrough and a plurality of first terminal members (40) disposed in respective passageways (32), for mating with complementary terminal members of the mating pin header (60); and the pin header (60) including a housing member (62) having a mating face (64), a mounting face (68), opposed sides, a plurality of terminal-receiving passageways (76) extending through the housing member, and a plurality of other electrical contact terminal members (78) disposed in respective terminal-receiving passageways (76) for mating with the first terminal members (40); the connector assembly (10) being characterized in that

the receptacle housing means (14) includes a transverse body section (20) extending along the mounting face (18), and having two opposed outer sidewalls (34) spaced from the body portion and extending from the mounting face (18) to the mating face (16) and defining elongate cavities (36) between the body portion (22) and the respective outer side walls (34) at least one second contact terminal member (46) is disposed in the transverse body section (20), and has a section (48) extending into at least one of the elongate cavities (36), the at least one second terminal member (46) being mateable with ground bus means of a complementary mating connector (60); and

at least one ground member (90) is disposed along at least one of the sides of the pin header housing member (60), the at least one ground member (84) being receivable in one of the elongate cavities (36) of the receptacle member (12) when the receptacle member (12) and the pin header (60) are mated, and the at least one ground member (90) being disposed at a selected location opposing the at least one second contact terminal member (46) of receptacle member (12) to electrically engage therewith upon mating.

5. The connector assembly (10) of claim 4 wherein at least one of the respective elongate cavities (36) includes a plurality of second contact terminal members (46).

6. The connector assembly (10) of claim 4 or 5 wherein at least one ground member (84) defines a bus means and extends continuously along at least one side of said pin header.

7. The connector assembly of claim 4, 5 or 6 wherein the pin header includes at least one second ground plate member (84) disposed along another side of the pin header housing member (62), the second plate member (84) being receivable in the other of said elongate cavities of said receptacle member and be electrically connectable to at least one second terminal member therein.

8. The connector assembly of claim 7 wherein the other cavity (36) includes a plurality of second terminal members (46) and the at least one second ground plate member includes a plurality of segments (284), whereby selected groups of associated second terminal members (46) of the receptacle (12) are commoned.

9. The connector assembly of claim 5 including at least one shunt terminal member (54) arranged to electrically common at least two of the second terminal members (46) of said receptacle member (12).

10. The connector assembly of claim 4 or 5 wherein the body portion (22) of the receptacle member (12) further includes means for securing a shunt terminal member (54) thereto, the shunt terminal member (54) being arranged to electrically common at least two adjacent second terminal mem-

bers (46) when the receptacle member (12) is not mated to the pin header (60).

Patentansprüche

1. Elektrischer Verbinder (12) mit einem Gehäuse (14), das eine Fügefläche (16) und eine Montagefläche (18) hat, und mit einem sich dazwischen erstreckenden Hauptteil (22), wobei der Hauptteil (22) eine Vielzahl von Anschlußaufnahmedurchgängen (32) hat, die sich durch diesen hindurch erstrecken, und wobei eine Vielzahl von ersten Anschlußgliedern (40) in entsprechenden Durchgängen (32) zum Zusammenfügen mit komplementären Anschlußgliedern eines komplementären, damit zusammenzufügenden Verbinders angeordnet ist,
dadurch **gekennzeichnet**,
daß das Gehäuse (14) einen sich quer erstreckenden Hauptteilabschnitt (20) hat. der sich längs der Montagefläche (18) erstreckt und zwei einander gegenüberliegende äußere Seitenwände (34) hat, die von dem Hauptteil (22) beabstandet sind und sich von der Montagefläche (18) zu der Fügefläche (16) erstrecken und längliche Hohlräume (36) zwischen dem Hauptteil (22) und den entsprechenden äußeren Seitenwänden (34) bilden, und
daß wenigstens ein zweites Kontaktanschlußglied (46) in dem quer verlaufenden Hauptteilabschnitt (20) angeordnet ist und einen Anschlußabschnitt hat, der sich in wenigstens einen der länglichen Hohlräume (36) erstreckt, wobei das wenigstens eine zweite Anschlußglied (46) mit einer Erdungssammelschiene des komplementären, anfügbaren Verbinders zusammenfügbar ist.

2. Verbinder nach Anspruch 1, bei dem wenigstens einer der länglichen Hohlräume (36) eine Vielzahl von zweiten Kontaktanschlußgliedern (46) aufweist.

3. Verbinder nach Anspruch 2, der wenigstens ein Nebenschluß-Anschlußglied (54) (Shunt) aufweist, das so angeordnet ist, daß es wenigstens zwei der zweiten Kontaktanschlußglieder (46) miteinander verbindet.

4. Elektrische Verbinderanordnung (10) mit einem Aufnahmeglied (12) und einem komplementären, anfügbaren Stiftsockel (60), wobei das Aufnahmeglied (12) ein Gehäuse (14) aufweist, das eine Fügefläche (16) und eine Montagefläche (18) und einen sich dazwischen erstreckenden Hauptteil (22) hat, wobei der Hauptteil (22) eine Vielzahl von Anschlußaufnahmedurchgängen (32) hat, die sich durch dieses hindurch erstrecken, sowie eine Vielzahl von ersten Anschlußgliedern (40), die in entsprechenden Durchgängen (32) zum Zusammenfügen mit komplementären Anschlußgliedern des anfügbaren Stiftsockels (60) angeordnet sind, und wobei der Stiftsockel (60) ein Gehäuseglied (62) aufweist, das eine Fügefläche (64), eine Montagefläche (68), gegenüberliegende Seiten, eine sich durch das Gehäuseglied hindurch erstreckende Vielzahl von Anschlußaufnahmedurchgängen (76) und eine Vielzahl von anderen elektrischen Kontaktanschlußgliedern (78) aufweist, die in entsprechenden Anschlußaufnahmedurchgängen (76) zum Zusammenfügen mit den ersten Anschlußgliedern (40) angeordnet sind. wobei die Verbinderanordnung (10) dadurch **gekennzeichnet** ist,
daß das Aufnahmegehäuse (14) einen sich quer erstreckenden Hauptteilabschnitt (20) hat, der sich längs der Montagefläche (18) erstreckt und zwei einander gegenüberliegende äußere Seitenwände (34) hat, die von dem Hauptteil (22) beabstandet sind und sich von der Montagefläche (18) zu der Fügefläche (16) erstrecken und längliche Hohlräume (36) zwischen dem Hauptteil (22) und den entsprechenden äußeren Seitenwänden (34) bilden, wobei wenigstens ein zweites Kontaktanschlußglied (46) in dem quer verlaufenden Hauptteilabschnitt (20) angeordnet ist und einen Abschnitt (48) hat, der sich in wenigstens einen der länglichen Hohlräume (36) erstreckt, wobei das wenigstens eine zweite Anschlußglied (46) mit einer Erdungssammelschiene des komplementären, anfügbaren Verbinders (60) zusammenfügbar ist, und
daß wenigstens ein Erdungsglied (90) längs wenigstens einer der Seiten des Gehäuseglieds des Stiftsockels (60) angeordnet ist, wobei das wenigstens eine Erdungsglied (84) in einem der länglichen Hohlräume (36) des Aufnahmeglieds (12) aufnehmbar ist. wenn das Aufnahmeglied (12) und der Stiftsockel (60) zusammengefügt sind, und wobei das wenigstens eine Erdungsglied (90) an einer ausgewählten Stelle angeordnet ist, die dem wenigstens einen zweiten Kontaktanschlußglied (46) des Aufnahmeglieds (12) gegenüberliegt, um nach dem Zusammenfügen damit einen elektrischen Kontakt herzustellen.

5. Verbinderanordnung (10) nach Anspruch 4, bei der wenigstens einer der entsprechenden länglichen Hohlräume (46) eine Vielzahl von zweiten Kontaktanschlußgliedern (46) aufweist.

6. Verbinderanordnung (10) nach Anspruch 4 oder 5, bei der wenigstens ein Erdungsglied (84) eine Sammelschiene bildet und sich kontinuierlich längs wenigstens einer Seite des Stiftsockels er-

streckt.

7. Verbinderanordnung nach Anspruch 4, 5 oder 6, bei der der Stiftsockel wenigstens ein zweites Erdungsplattenglied (84) aufweist, das längs einer anderen Seite des Gehäuseglieds (62) des Stiftsockels angeordnet ist, wobei das zweite Plattenglied (84) in dem anderen der länglichen Hohlräume des Aufnahmeglieds aufnehmbar ist und elektrisch mit wenigstens einem darin angeordneten zweiten Anschlußglied verbindbar ist.

8. Verbinderanordnung nach Anspruch 7, bei der der andere Hohlraum (36) eine Vielzahl von zweiten Anschlußgliedern (46) aufweist und das wenigstens eine zweite Erdungsplattenglied eine Vielzahl von Segmenten (284) aufweist, wodurch ausgewählte Gruppen von zusammengehörigen zweiten Anschlußgliedern (46) der Aufnahme (12) miteinander verbunden sind.

9. Verbinderanordnung nach Anspruch 5, mit wenigstens einem Nebenschluß-Anschlußglied (54) (Shunt), das so angeordnet ist, daß es wenigstens zwei der zweiten Anschlußglieder (46) des Aufnahmeglieds (12) elektrisch miteinander verbindet.

10. Verbinderanordnung nach Anspruch 4 oder 5, bei der der Hauptteil (22) des Aufnahmeglieds (12) ferner Einrichtungen zum Befestigen eines Nebenschluß-Anschlußglieds (54) (Shunt) daran aufweist, wobei das Nebenschluß-Anschlußglied (54) so angeordnet ist, daß es wenigstens zwei benachbarte zweite Anschlußglieder (46) elektrisch miteinander verbindet, wenn das Aufnahmeglied (12) nicht mit dem Stiftsockel (60) zusammengefügt ist.

Revendications

1. Connecteur électrique (12) comportant un moyen à boîtier (14) ayant une face d'accouplement (16) et une face de montage (18), et une partie du corps (22) s'étendant entre elles, la partie de corps (22) étant traversée de plusieurs passages (32) de réception de bornes et plusieurs premiers éléments à bornes (40) étant disposés dans des passages respectifs (32) pour un accouplement avec des éléments à bornes complémentaires d'un connecteur complémentaire caractérisé en ce que

   le moyen à boîtier (14) comprend une section de corps transversale (20) s'étendant le long de la face de montage (18) et ayant deux parois latérales extérieures opposées (34) espacées de la partie de corps (22) et s'étendant depuis la face de montage (18) vers la face d'accouplement (16) définissant des cavités allongées (36) entre la partie de corps (22) et les parois latérales extérieures respectives (34), et

   au moins un deuxième élément à borne de contact (46) est disposé dans la section de corps transversale (20) et comporte une section de borne pénétrant dans au moins l'une desdites cavités allongées (36), le ou chaque deuxième élément à borne (46) pouvant être accouplé avec un moyen à bus de masse du connecteur complémentaire.

2. Connecteur selon la revendication 1, dans lequel au moins l'une des cavités allongées (36) comprend plusieurs deuxièmes éléments à bornes de contact (46).

3. Connecteur selon la revendication 2, comprenant au moins un élément à borne de shuntage (54) disposé de façon à mettre en commun au moins deux des deuxièmes éléments à bornes de contact (46).

4. Assemblage de connecteur électrique (10) comportant un élément à prise femelle (12) et une embase à broches complémentaire (60), l'élément à prise femelle (12) comprenant un moyen à boîtier (14) ayant une face d'accouplement (16) et une face de montage (18), et une partie de corps (22) s'étendant entre elles, la partie de corps (22) étant traversée par plusieurs passages (32) de réception de bornes et plusieurs premiers éléments à bornes (40) étant disposés dans des passages respectifs (32) pour un accouplement avec des éléments à bornes complémentaires de l'embase à broches complémentaire (60) ; et l'embase à broches (60) comprenant un élément de boîtier (62) ayant une face d'accouplement (64), une face de montage (68), des côtés opposés, plusieurs passages (76) de réception de bornes s'étendant à travers l'élément de boîtier, et plusieurs autres éléments à bornes de contact électrique (78) disposés dans des passages respectifs (76) de réception de bornes pour un accouplement avec les premiers éléments à bornes (40) ; l'assemblage de connecteur (10) étant caractérisé en ce que

   le moyen à boîtier de prise femelle (14) comprend une section de corps transversale (20) s'étendant le long de la face de montage (18), et ayant deux parois latérales extérieures opposées (34) espacées de la partie de corps, s'étendant de la face de montage (18) à la face d'accouplement (16) et définissant des cavités allongées (36) entre la partie de corps (22) et les parois latérales extérieures respectives (34), au moins un deuxième élément à borne de contact (46) est

disposé dans la section de corps transversale (20) et comporte une section (48) pénétrant dans au moins l'une des cavités allongées (36), le ou chaque deuxième élément à borne (46) pouvant être accouplé avec un moyen à bus de masse d'un connecteur complémentaire (60) ; et

au moins un élément de masse (90) est disposé le long d'au moins l'un des côtés de l'élément de boîtier (60) de l'embase à broches, le ou chaque élément de masse (84) pouvant être reçu dans l'une des cavités allongées (36) de l'élément à prise femelle (12) lorsque l'élément à prise femelle (12) et l'embase à broches (60) sont accouplés, et le ou chaque élément de masse (90) étant disposé en un emplacement choisi opposé au ou à chaque deuxième élément à borne de contact (46) de l'élément à prise femelle (12) pour établir un contact électrique avec lui lors de l'accouplement.

5. Assemblage de connecteur (10) selon la revendication 4, dans lequel au moins l'une des cavités allongées respectives (36) comprend plusieurs deuxièmes éléments à bornes de contact (46).

6. Assemblage de connecteur (10) selon la revendication 4 ou 5, dans lequel au moins un élément de masse (84) définit un moyen à bus et s'étend de façon continue le long d'au moins un côté de ladite embase à broches.

7. Assemblage de connecteur selon la revendication 4, 5 ou 6, dans lequel l'embase à broches comprend au moins un second élément à plaque (84) de masse disposé le long d'un autre côté de l'élément de boîtier (62) de l'embase à broches, le second élément à plaque (84) pouvant être reçu dans l'autre desdites cavités allongées dudit élément à prise femelle et pouvant être connecté électriquement à au moins un deuxième élément à borne qu'elle renferme.

8. Assemblage de connecteur selon la revendication 7, dans lequel l'autre cavité (36) comprend plusieurs des deuxièmes éléments à bornes (46) et le ou chaque deuxième élément à plaque de masse comprend plusieurs segments (284), de manière que des groupes choisis de deuxièmes éléments à bornes associés (46) de la prise femelle (12) soient mis en commun.

9. Assemblage de connecteur selon la revendication 5, comprenant au moins un élément à borne de shuntage (54) disposé pour mettre en commun électriquement au moins deux des deuxièmes éléments à bornes (46) dudit élément à prise femelle (12).

10. Assemblage de connecteur selon la revendication 4 ou 5, dans lequel la partie de corps (22) de l'élément à prise femelle (12) comprend en outre des moyens pour y fixer un élément à borne de shuntage (54), l'élément à bornes de shuntage (54) étant disposé de façon à mettre en commun électriquement au moins deux deuxièmes éléments à bornes adjacents (46) lorsque l'élément à prise femelle (12) n'est pas accouplé avec l'embase à broches (60).

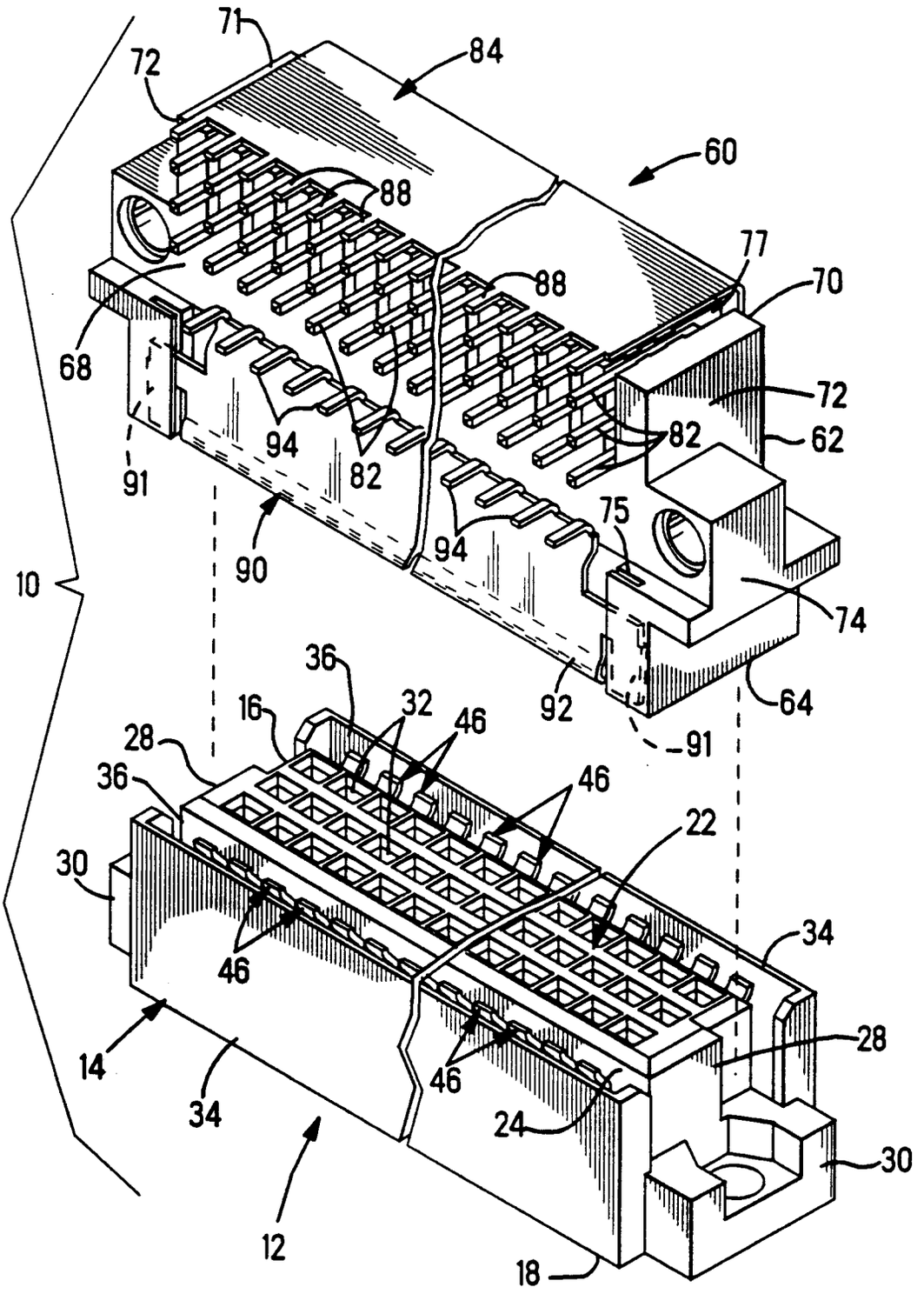
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Fig. 1

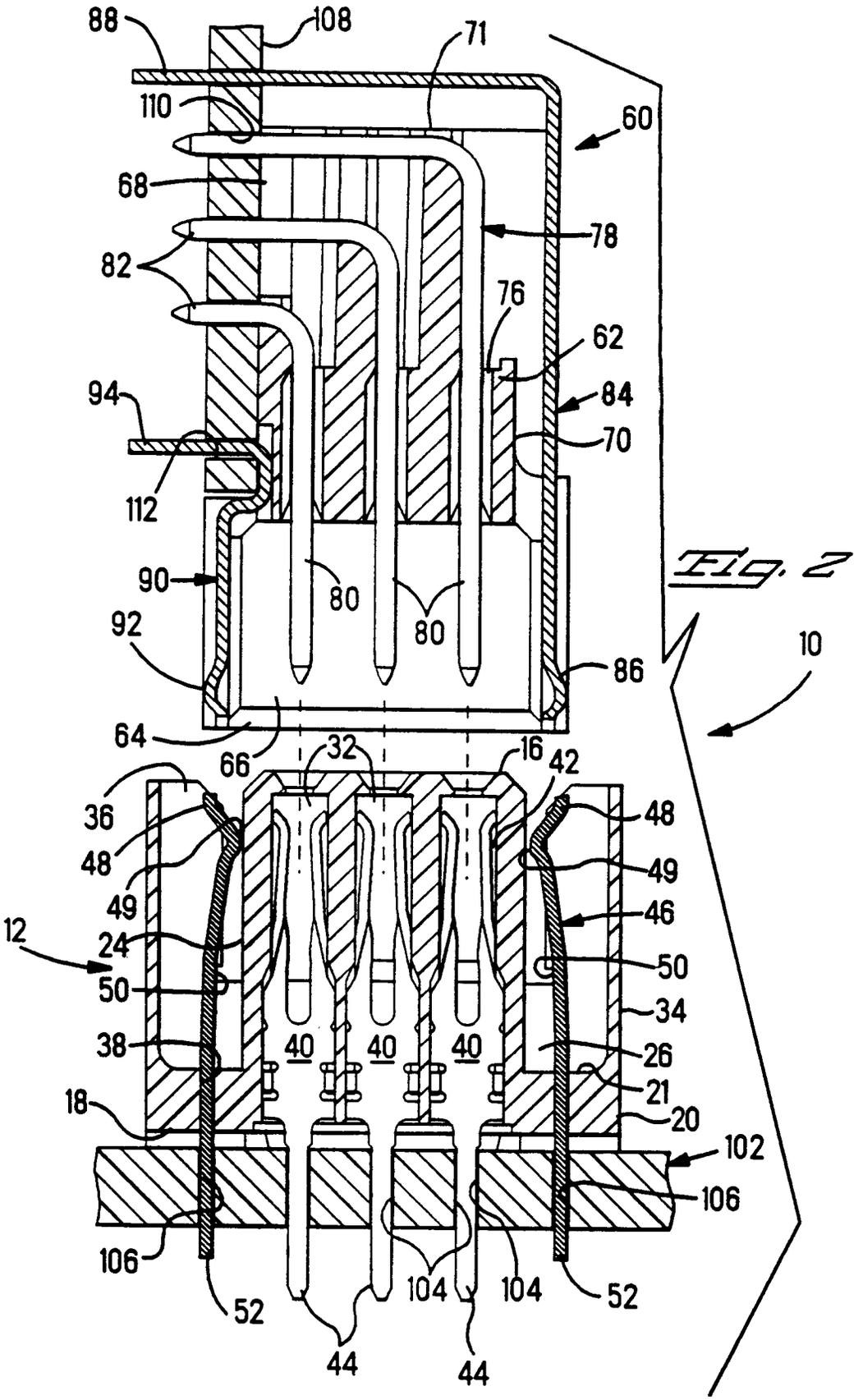
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Fig. 2

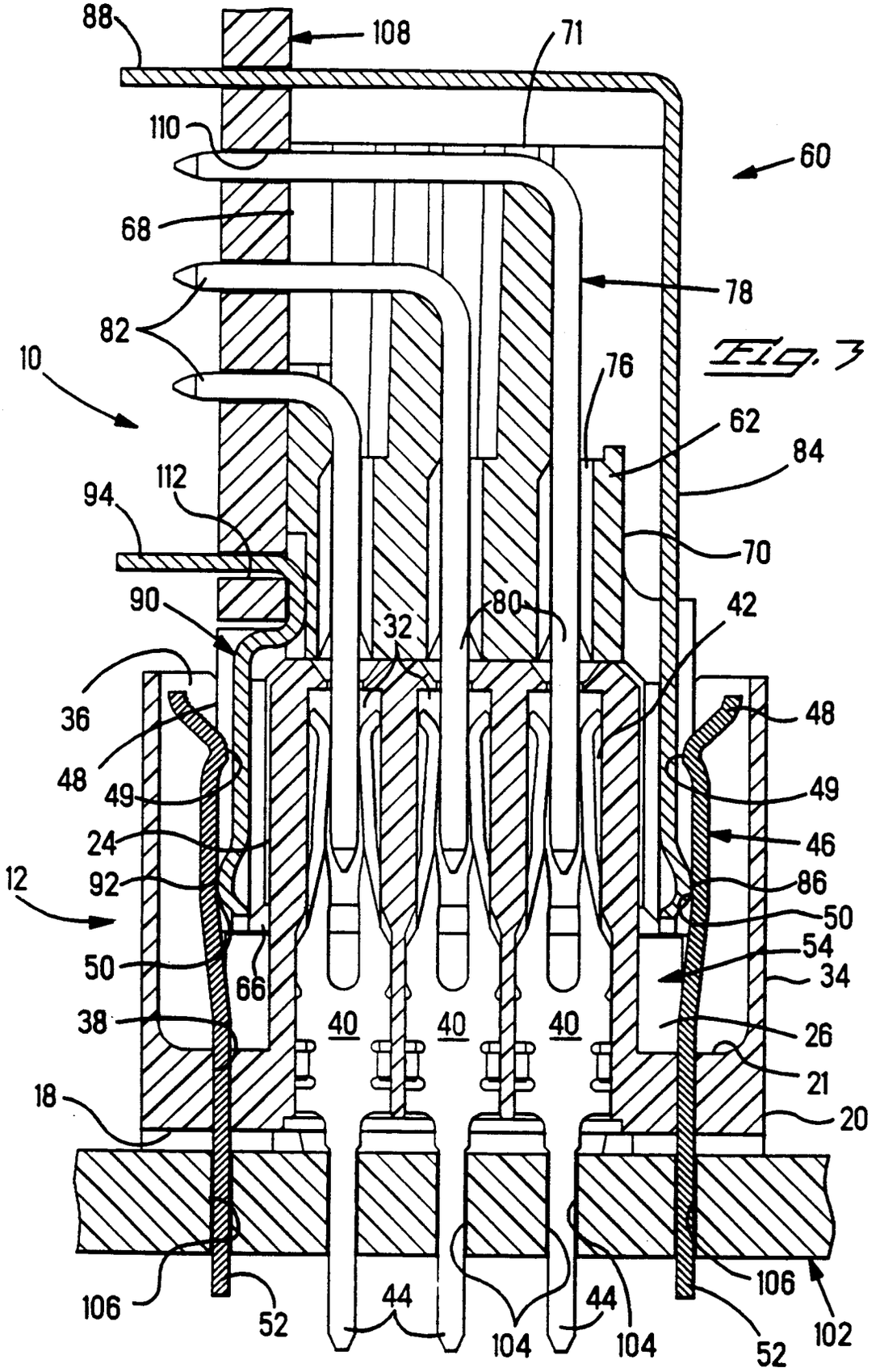
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Fig. 3

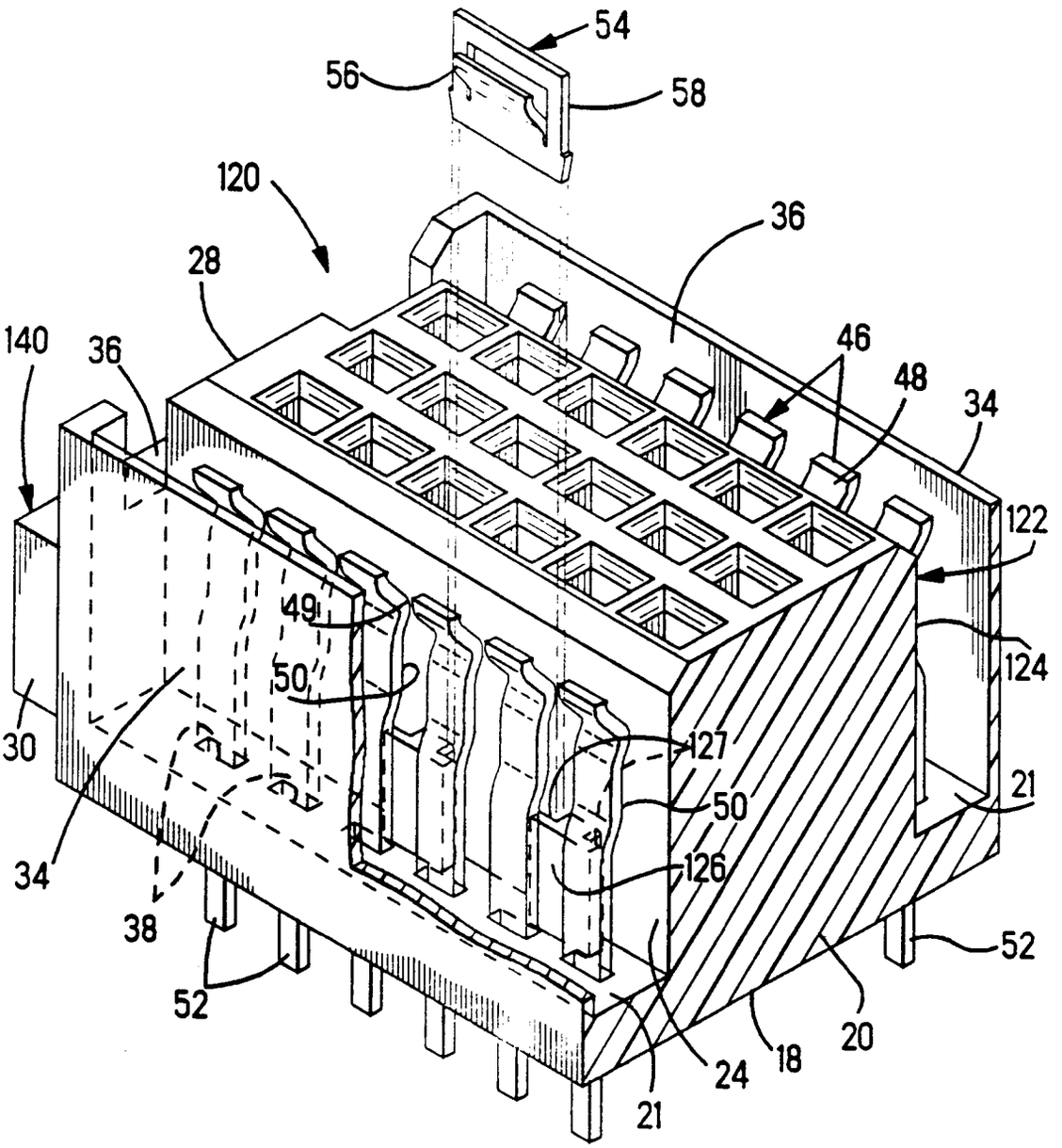
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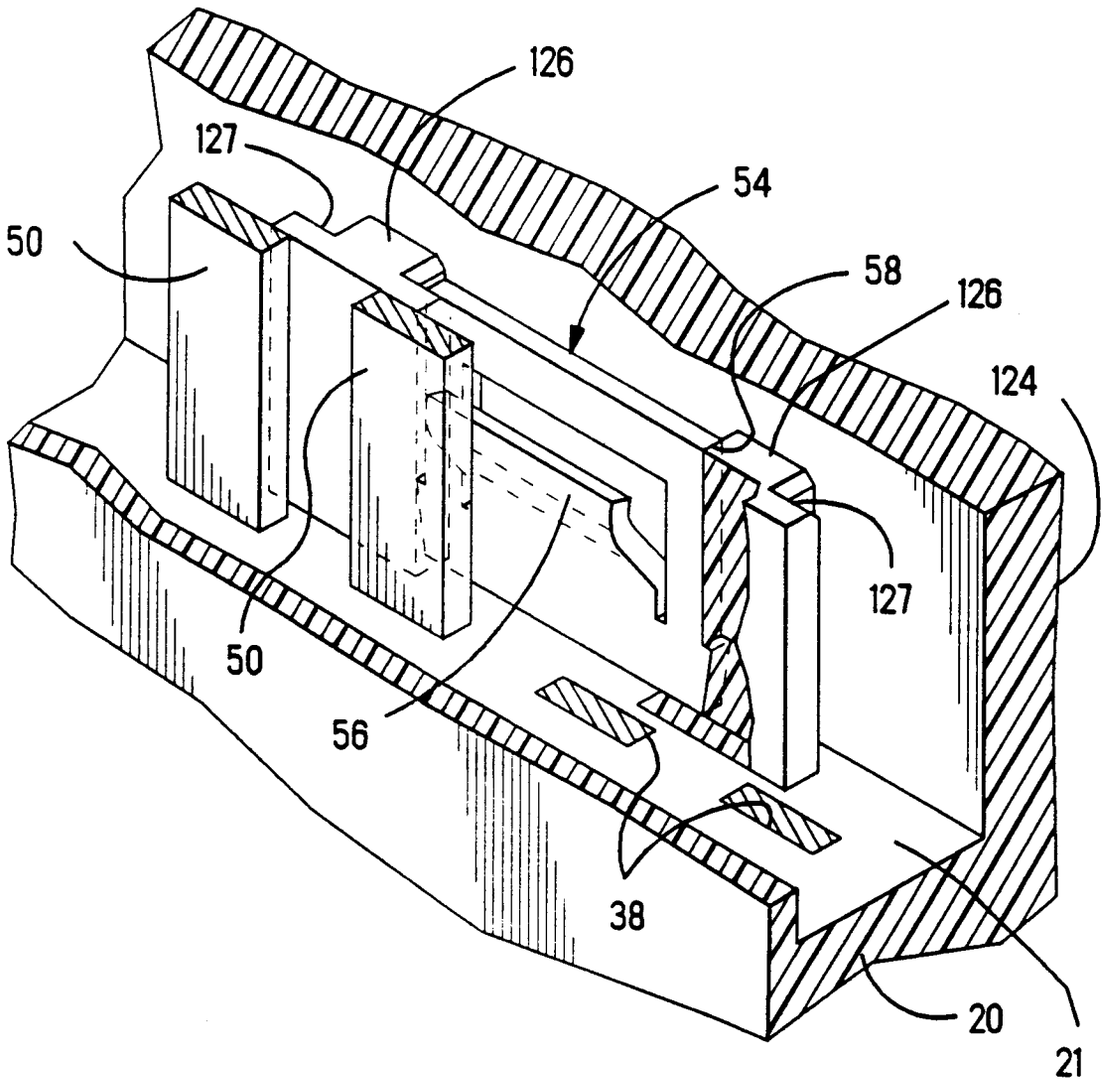
Fig. 4



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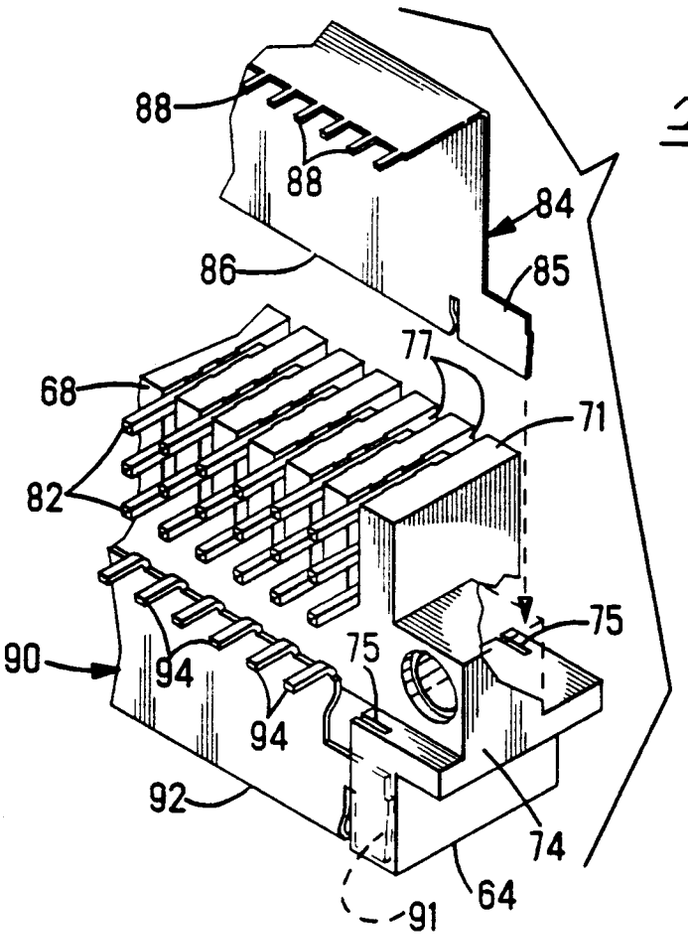

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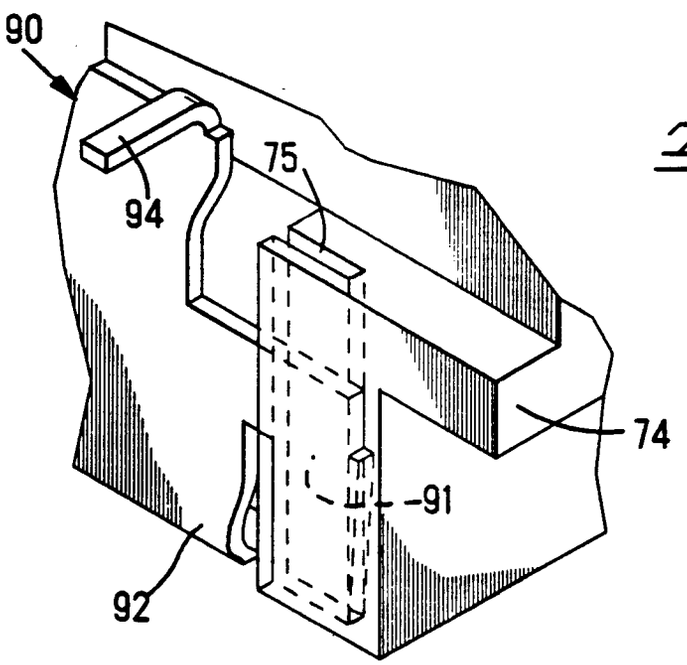

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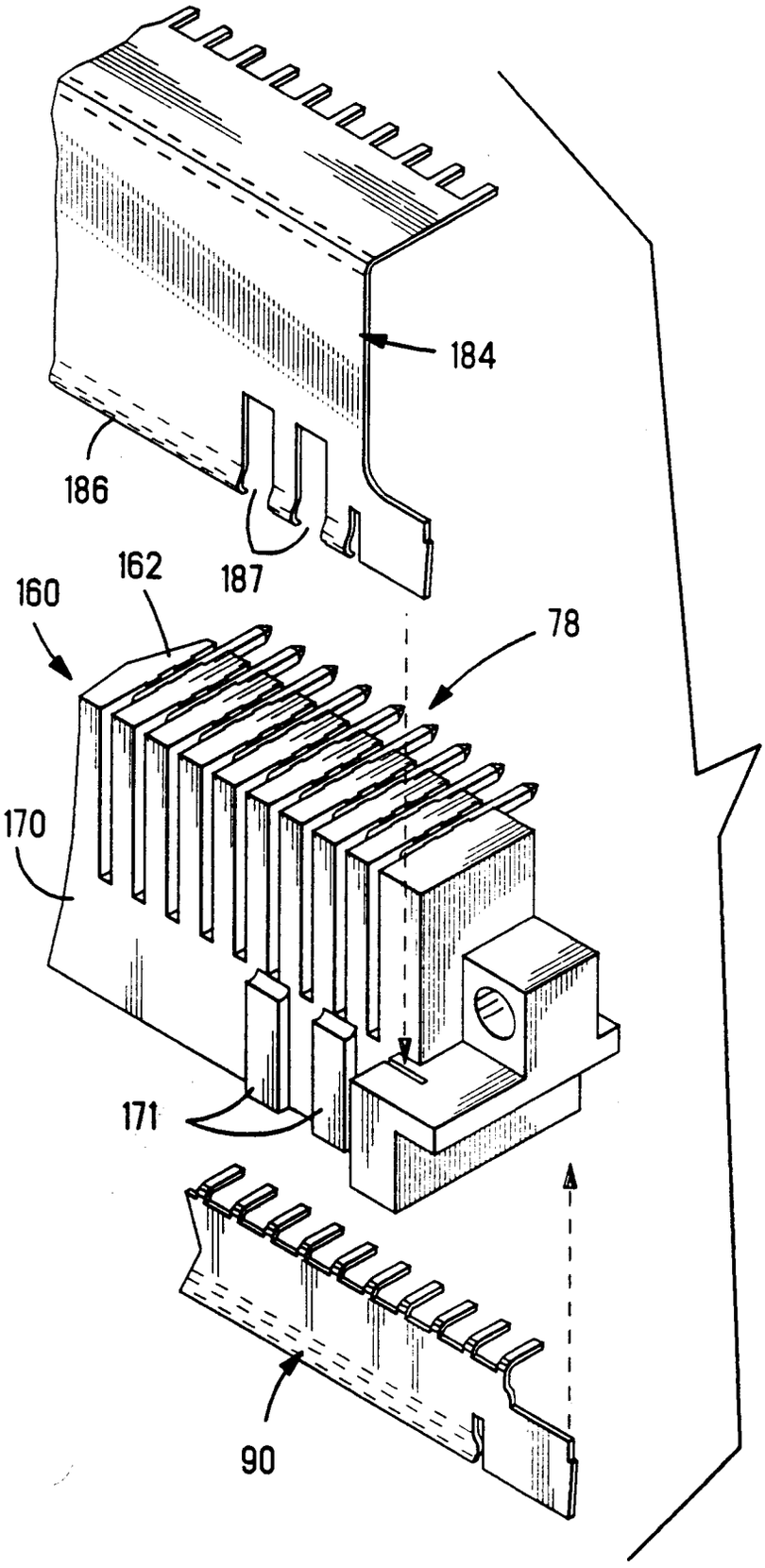

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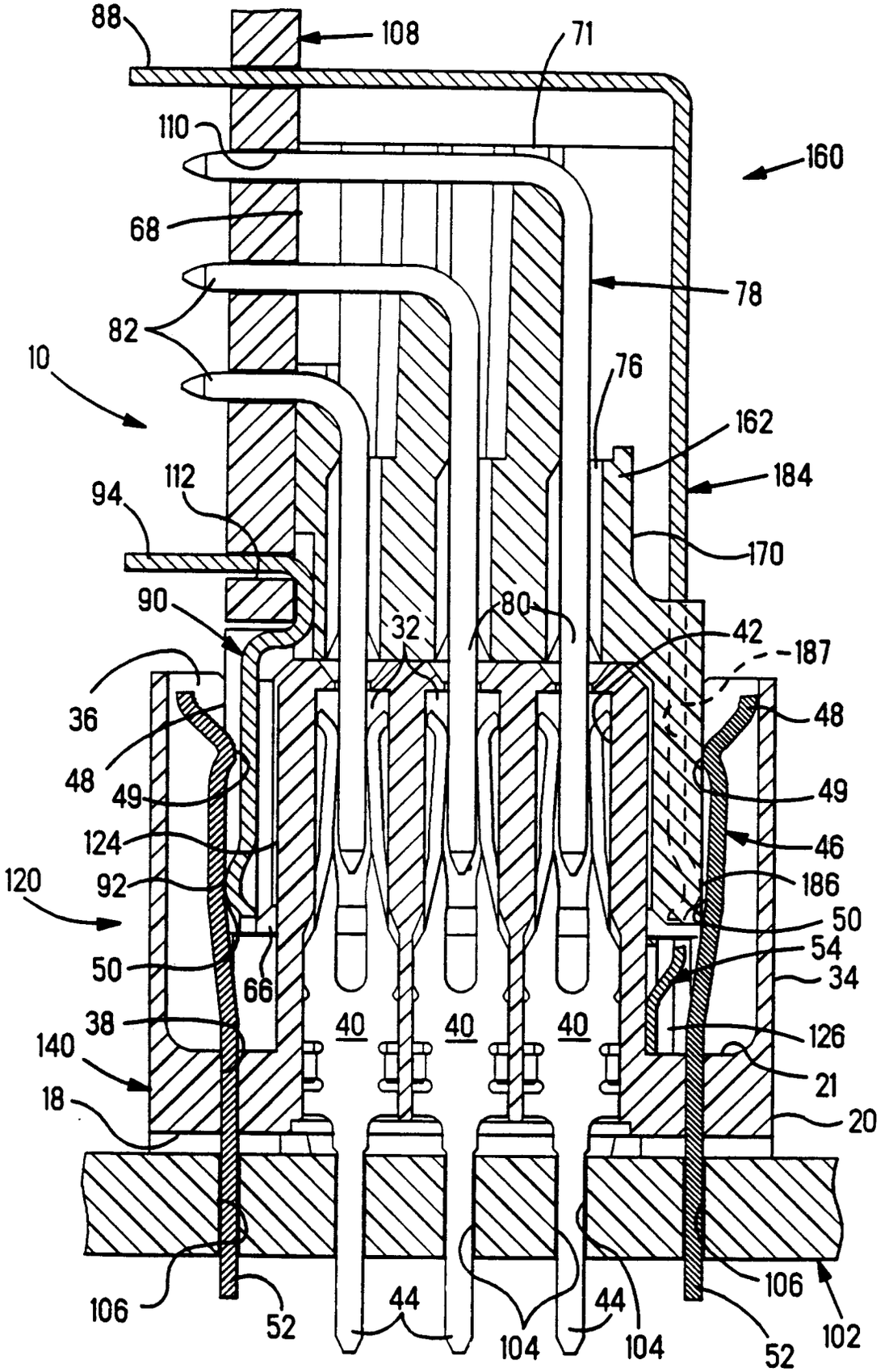
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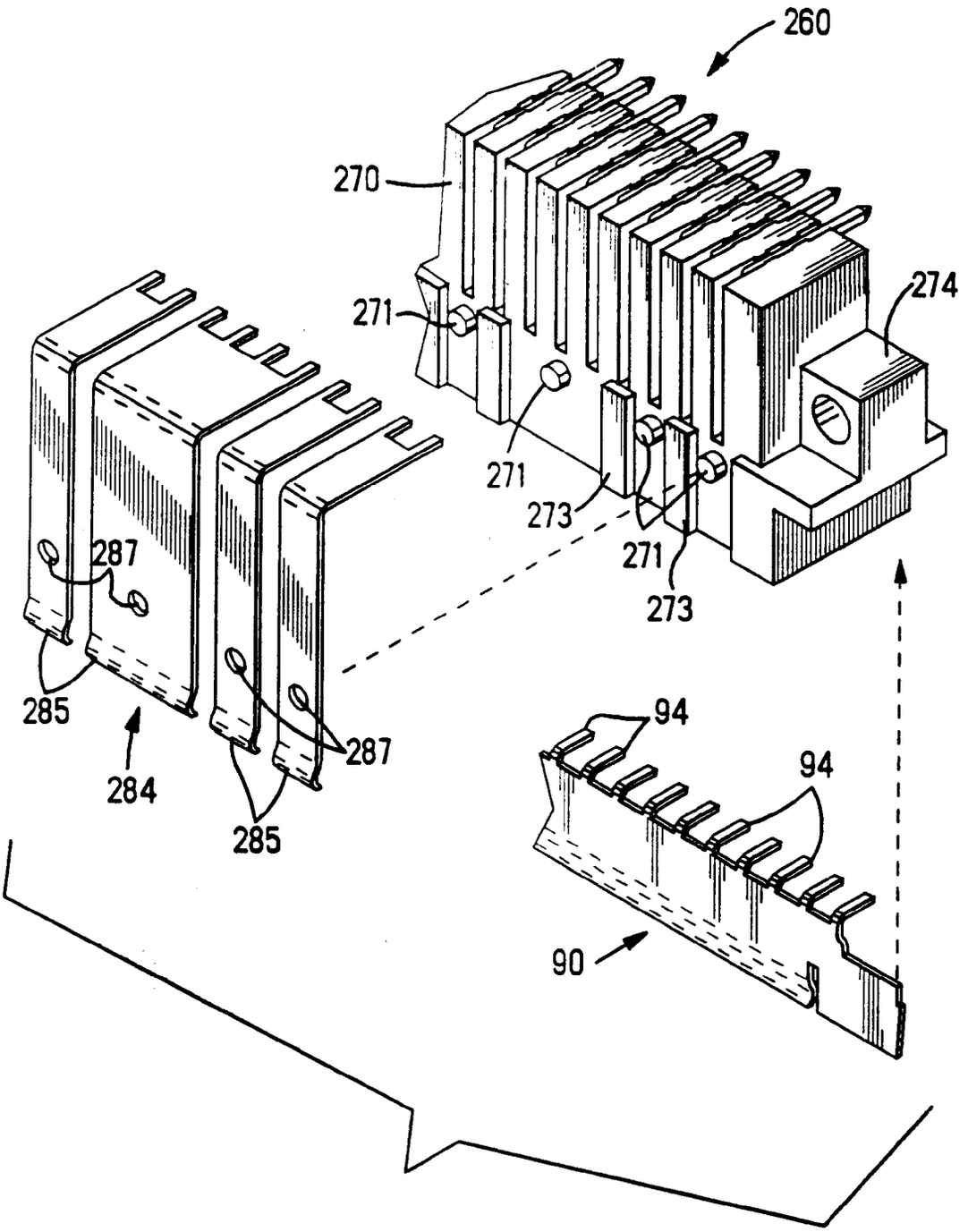
Fig. 9



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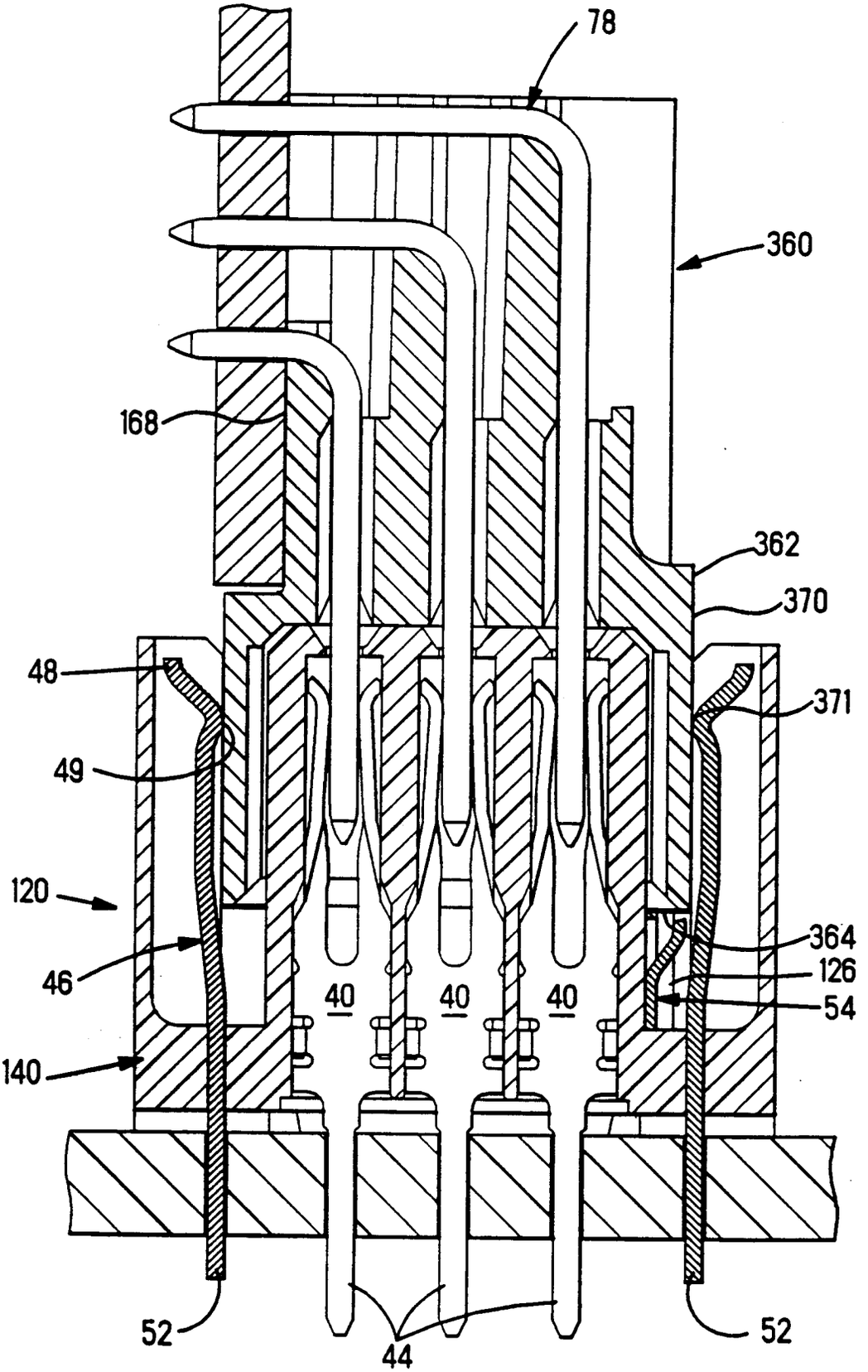

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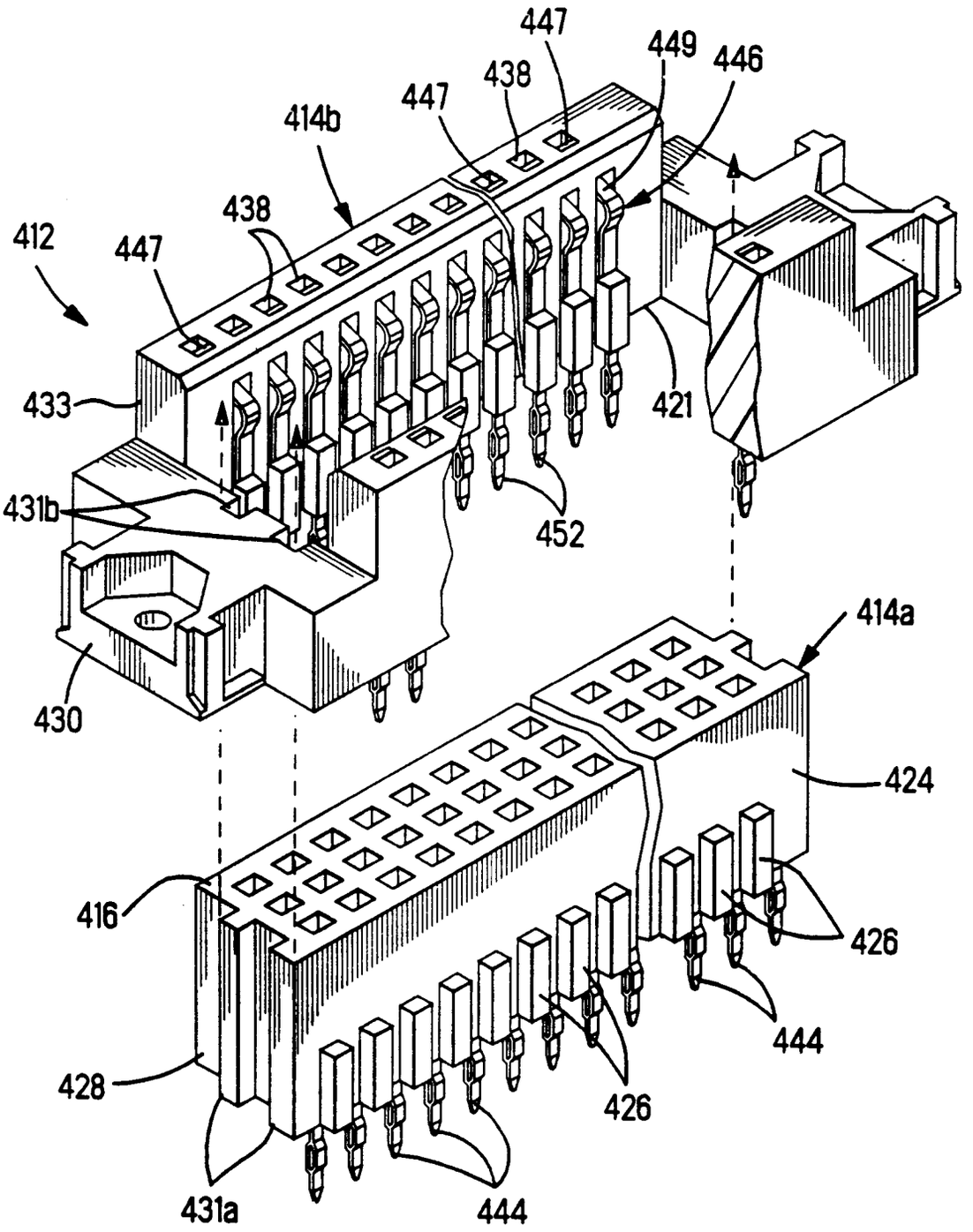
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Fig. 12

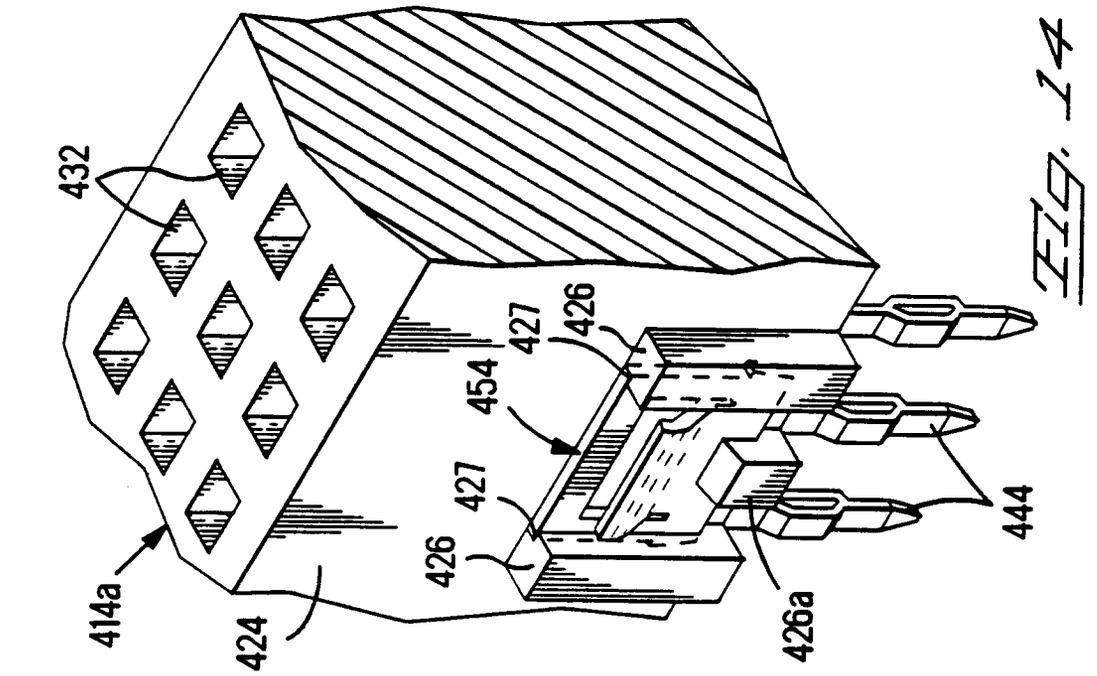
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Fig. 14

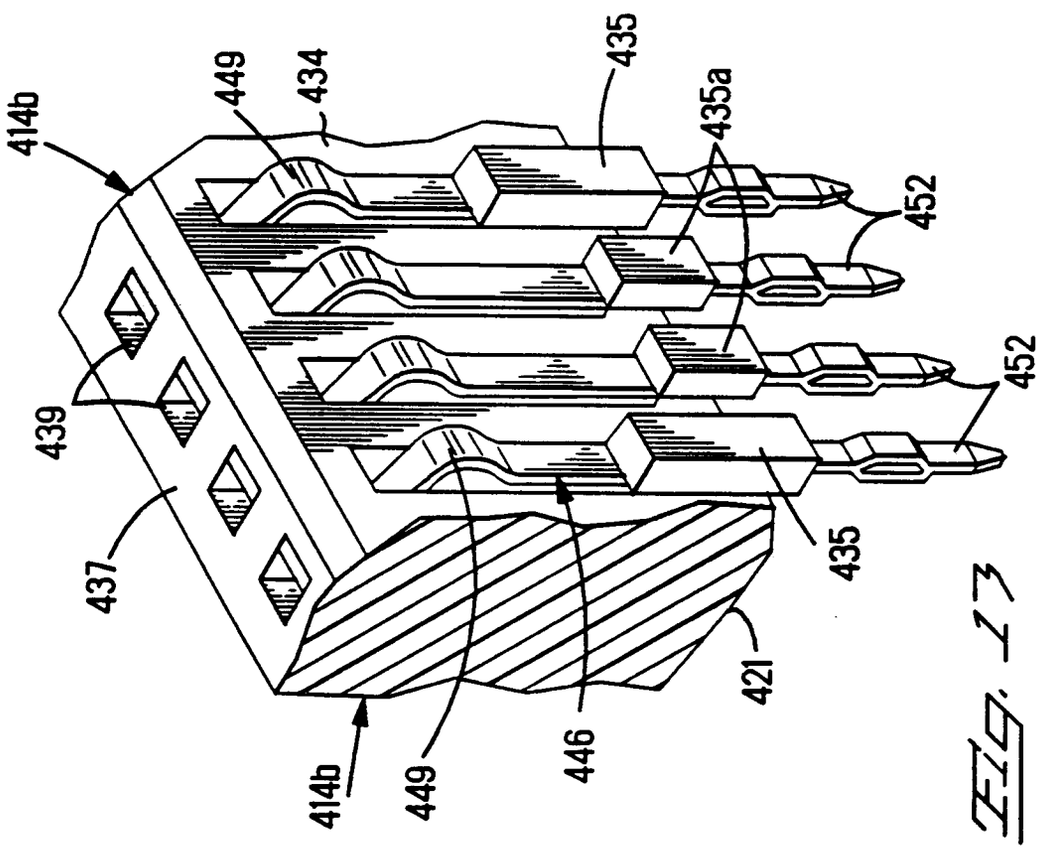
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Fig. 13

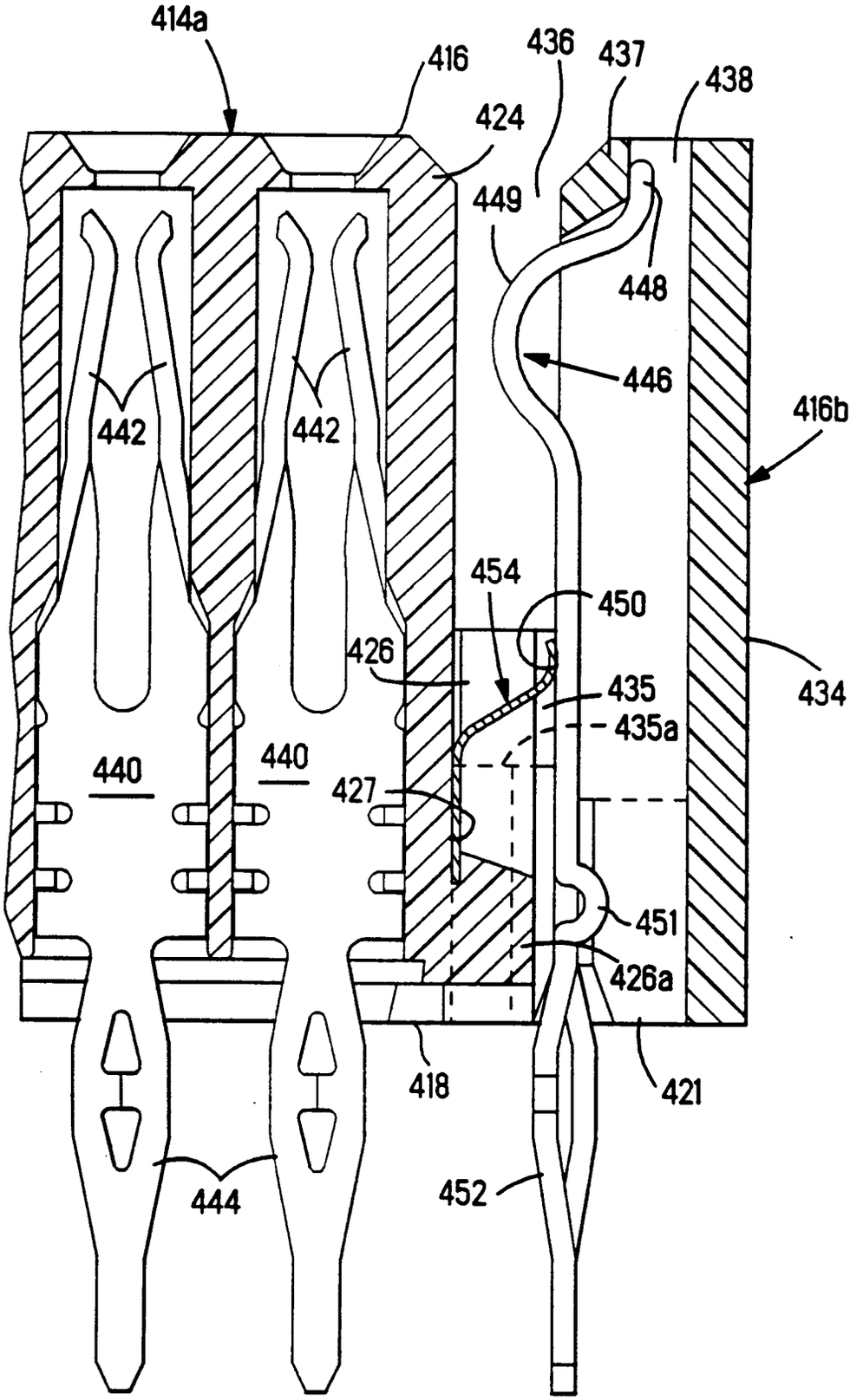
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Fig. 15