

FORM 1

COMMONWEALTH OF AUSTRALIA

PATENT:

609640

APPLICATION FOR A STANDARD PATENT

I\We,

THOMAS & BETTS CORPORATION

of

1001 FRONTIER ROAD
BRIDGEWATER, NEW JERSEY 08807
USA

hereby apply for the grant of a standard patent for an
invention entitled:

ELECTRICAL CONNECTOR FOR MODULE PACKAGING.

which is described in the accompanying complete specification

Details of basic application(s):

Number of basic application	Name of Convention country in which basic application was filed	Date of basic application
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63 244682

JP

30 SEP 88

My/our address for service is care of GRIFFITH HACK & CO.,
Patent Attorneys, 601 St. Kilda Road, Melbourne 3004,
Victoria, Australia.

DATED this 21st day of September 1989

THOMAS & BETTS CORPORATION

GRIFFITH HACK & CO.

TO: The Commissioner of Patents.

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED 11-1-91

M 012348 210989

AUSTRALIA

A/E 324F AUS **B**

PATENTS ACT 1952

APPLICATION
BY ASSIGNEE
OF INVENTORDECLARATION IN SUPPORT OF AN APPLICATION
FOR A PATENTNAME OF
APPLICANT

In support of an application made by:

Thomas & Betts Corporation

TITLE

for a patent for an invention entitled:

Electrical Connector for Module Packaging.FULL NAME AND
ADDRESS OF
SIGNATORYI, James D. Hayof Vice President-General Counsel1001 Frontier Road, Bridgewater, New Jersey 08807, U.S.A.

do solemnly and sincerely declare as follows:

1. I am authorised by the above mentioned applicant for the patent to make this declaration on its behalf.

FULL NAME AND
ADDRESS OF
INVENTOR(S)

2. The name and address of each actual inventor of the invention is as follows:

Toshimitsu Sonobe, 15-5 Todoroki 2-chome, Setagaya-
ku, Tokyo, Japan and Masahiro Yamamoto, Toua Live Town
Kibougaoka No. 204 Higashikibougaoka 148-1 Asaka-ku,
Yokohama City, Kanagawa Pref. Japan

SEE NOTES OVER

3. The facts upon which the applicant is entitled to make this application are as follows:

The said Thomas & Betts Corporation is the
assignee of the actual inventorsDELETE PARAGRAPHS
3 AND 4 FOR
NON-CONVENTION
APPLICATION

4. The basic application(s) as defined by Section 141 of the Act was (were) made as follows:

Country Japan on 30th September 1989in the name(s) Thomas & Betts Corporationand in onin the name(s)PLACE AND DATE OF
SIGNING

5. The basic application(s) referred to in the preceding paragraph was (were) the first application(s) made in a Convention country in respect of the invention the subject of this application.

Declared at Bridgewater, New Jersey, USAthis 17th day of October 1989Signed James D. Hay James D. HayPosition Vice President-General Counsel**GRIFFITH HACK & CO**

PATENT AND TRADE MARK ATTORNEYS

MELBOURNE · SYDNEY · PERTH

(12) PATENT ABRIDGMENT (11) Document No. AU-B-41628/89
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 609640

- (54) Title
ELECTRICAL CONNECTOR FOR MODULE PACKAGING
- International Patent Classification(s)
(51)⁴ **H01R 013/514 H01R 009/16 H01R 011/28 H05K 001/14**
- (21) Application No. : **41628/89** (22) Application Date : **21.09.89**
- (30) Priority Data
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63-244682 30.09.88 JP JAPAN
- (43) Publication Date : **05.04.90**
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- (71) Applicant(s)
THOMAS & BETTS CORPORATION
- (72) Inventor(s)
MASAHIRO YAMAMOTO; TOSHIMITSU SONOBE
- (74) Attorney or Agent
GRIFFITH HACK & CO, GPO Box 1285K, MELBOURNE VIC 3001
- (56) Prior Art Documents
AU 34029/89 H01R 13/62 13/64 13/514
AU 69446/81 H01R 23/04 13/645
AU 36614/78 H01R 23/10 13/36 13/46
- (57) Claim

1. An electrical connector comprising first contacts for electrical contact with a first member and an insulative housing supporting said first contacts,
 said housing including a first support surface for supporting said first member,
 said first contacts having portions exposed adjacent said first support surface of said housing so as to be brought into electrical contact with said first member,
 said first contacts further including terminal portions which are to be brought into electrical contact with second members, said terminal portions including portions substantially parallel to said first support surface,
 said housing including a second support surface for supporting a third member and supporting second contacts for electrically connecting said first member to said third member, said second contacts including contact portions which are to be brought into electrical contact with said first and third members, said contact portions being exposed adjacent

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(10) 609640

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said first and second support surfaces,

said housing comprising a pair of generally L-shaped housing members forming an internal opening, said housing including a plug portion having a plurality of holes for respectively receiving end portions of said second members for connection to said first contacts, said housing having a storage cavity for receiving said plug portion therein, said first contacts extending from the exterior of said housing into said storage cavity.

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PATENTS ACT 1952

Form 10

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE

Short Title:

Int. Cl:

Application Number:
Lodged:

Complete Specification-Lodged:
Accepted:
Lapsed:
Published:

Priority:

Related Art:

This document contains the
amendments made under
Section 49 and is correct for
printing.

TO BE COMPLETED BY APPLICANT

Name of Applicant:

THOMAS & BETTS CORPORATION

Address of Applicant: 1001 FRONTIER ROAD
BRIDGEWATER
NEW JERSEY 08807
USA

Actual Inventor:

Address for Service: GRIFFITH HACK & CO.,
601 St. Kilda Road,
Melbourne, Victoria 3004,
Australia.

Complete Specification for the invention entitled:
ELECTRICAL CONNECTOR FOR MODULE PACKAGING.

The following statement is a full description of this invention
including the best method of performing it known to me:-

ELECTRICAL CONNECTOR FOR MODULE PACKAGING

FIELD OF THE INVENTION

5 The present invention relates to a module connector for suitably connecting, e.g., electronic packages to each other or an electronic package to wires.

BACKGROUND OF THE INVENTION

10 Electronic packages (e.g., printed circuit boards) mounted with a large number of electronic components have been used in a variety of industrial fields. Depending on the application fields, electronic packages are connected to each other through a connector, or an electronic package is connected to wires through a connector to produce an electronic package module.

15 A conventional connector of this type is exemplified by a socket for surface-mounting integrating circuits. However, the application fields of such sockets are limited, and the sockets do not provide sufficient versatility.

SUMMARY OF THE INVENTION

20 The present invention has been developed in consideration of the above situation, and has an object to provide a connector for allowing production of a unit by surface-mounting various electronic packages and connecting electronic packages to wires.

25 The invention therefore provides an electrical connector comprising first contacts for electrical contact with a first member and an insulative housing supporting said first contacts,

30 said housing including a first support surface for supporting said first member,

said first contacts having portions exposed adjacent said first support surface of said housing so as to be brought into electrical contact with said first member,



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said first contacts further including terminal portions which are to be brought into electrical contact with second members, said terminal portions including portions substantially parallel to said first support surface,

5 said housing including a second support surface for supporting a third member and supporting second contacts for electrically connecting said first member to said third member, said second contacts including contact portions which are to be brought into electrical contact with said first and third members, said contact portions being exposed adjacent said first and second support surfaces,

10 said housing comprising a pair of generally L-shaped housing members forming an internal opening, said housing including a plug portion having a plurality of holes
15 for respectively receiving end portions of said second members for connection to said first contacts, said housing having a storage cavity for receiving said plug portion therein, said first contacts extending from the exterior of said housing into said storage cavity.



~~respectively brought into electrical contact with second members, the terminal portions being provided with portions substantially parallel to the first support surface.~~

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an exploded perspective view showing a portion of the connector of the present invention in use.

Figure 2 is a perspective view showing the overall structure in use.

Figure 3 is a perspective view showing a terminated wire to be connected by the connector of the present invention.

Figure 4 is an exploded perspective view showing an electronic package unit to be connected by the connector of the present invention.

Figure 5 is an exploded perspective view of a further electronic package unit.

Figure 6 is a perspective view showing a housing according to an embodiment of the present invention.

Figure 7 is a side elevation view of a contact in accordance with a preferred arrangement of the electrical connector.

Figure 8 is a sectional view showing an application of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, Figs. 1 and 2 show an electronic package module using a connector according to the present invention.

In Figs. 1 and 2, reference numeral 32A denotes a plug housing portion as one constituting a member of a housing of the connector of the present invention. Reference numeral 32B denotes a cap housing portion as the other constituting member. The plug housing 32A is stored in a storage cavity 34 formed in the cap housing 32E.



Holes 35 for receiving end portions (conductive receptacle contacts) 51 of connecting components 50 (wires) shown in Fig. 3 are formed in the plug housing 32A. The end portions 51 of the wires 50 stored in the holes 35 are respectively electrically connected to first contacts (to be described subsequently) mounted inside the housing.

Reference numerals 60 and 61 denote casings each constituted by, e.g., an aluminum case.

Fig. 4 shows a unit assembly supported on the upper portion of the housing 32 of Fig. 1 and electrically connected to contacts (to be described in detail) of the housing.

Referring to Fig. 4, reference numeral 62 denotes one of electronic components (e.g., a resistor, a capacitor, an IC, or a transistor). Reference numeral 10 denotes a printed circuit board on which the electronic components 62 are mounted; 60, the aluminum case.

A conductive pattern (denoted by reference numeral 11 in Fig. 8 to be described) is formed on a peripheral portion of the printed circuit board 10 and is brought into contact with the contacts mounted in the housing.

The aluminum case 60 shields the unit assembly from external electrostatic components and dissipates heat generated by the unit assembly.

Fig. 5 shows the unit assembly located in the lower portion of the housing and electrically connected to contacts of the housing.

Referring to Fig. 5, reference numeral 63 denotes one of electronic components; 20, a printed circuit board on which the electronic components are mounted; and 61, the aluminum case.

A conductive pattern (denoted by reference numeral 21 in Fig. 8) is formed on the peripheral portion of the

printed circuit board 10 and is brought into contact with contacts mounted in the housing.

Another electronic package 80 (e.g., a ceramic substrate on which a power IC is mounted) is arranged at the bottom portion of the case 61, as shown in Fig. 8. The electronic package 80 is connected to the printed circuit board 20 through a jumper lead 81.

Fig. 6 shows one embodiment of the housing 32 according to the present invention. The housing 36 is constituted by a pair of L-shaped housing members 32B to form an internal opening 36.

The housing 32 is made of a plastic material and holds first contacts 31 which are to be electrically brought into contact with the first member 10 (printed circuit board) to be connected.

The housing 32 comprises a first support surface 33A for supporting the first member.

The first contacts 31 are exposed adjacent the first support surface 33A of the housing so that portions 31A of the contacts 31 are electrically connected to the first member 10.

In the illustrated embodiment, the housing 32 supports the first contacts 31 so that the portions 31A are exposed outside the housing.

The first contacts 31 also comprise terminal portions 31B (Fig. 8) which are to be electrically connected to second members 50 (wires) to be connected. The terminal portions 31B have portions substantially parallel to the first support surface 33A so as to electrically connect the terminal portions 31B to the second members 50 (wires).

In the illustrated embodiment, the first contacts 31 comprise L-shaped members, respectively, and their legs are secured in the housing 32.

The housing 32 further comprises a second support surface 33B (Fig. 8) for supporting a third member 20 (a printed circuit board; Figs. 8 and 5) to be connected.

The housing further holds second contacts 40 (Figs. 8 and 7) for electrically connecting the first and third members 10 and 20.

The second contacts are exposed on the first and second support surfaces 33A and 33B such that portions 40A (Figs. 8 and 6) of the second contacts are electrically connected to the first and third members 10 and 20.

In the illustrated embodiment, the portions 31A and 40A of the first and second contacts 31 and 40 which are brought into contact with the first and third members 10 and 20 are constituted by spring portions, respectively.

Fig. 7 shows a detailed arrangement of each second contact.

Fig. 8 shows an electronic package module in which the printed circuit boards 10, 20 and 80 and the wires 50 are electrically connected by using the connector of the present invention. The respective components have been described above.

When the connector of the present invention is used, the housing becomes part of the unit to achieve compactness and a high packing density.

The housing of the connector is constituted by a combination of housing members having an identical shape. Therefore, the number of components is small, and assembly without minimized errors can be facilitated.

Since no solder is used in the connector of the present invention, the connector can be detachably connected to the member to be connected. As such, contact lead portions for soldering can be omitted to obtain a more compact structure.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An electrical connector comprising first contacts for electrical contact with a first member and an insulative housing supporting said first contacts,

said housing including a first support surface for supporting said first member,

said first contacts having portions exposed adjacent said first support surface of said housing so as to be brought into electrical contact with said first member,

said first contacts further including terminal portions which are to be brought into electrical contact with second members, said terminal portions including portions substantially parallel to said first support surface,

said housing including a second support surface for supporting a third member and supporting second contacts for electrically connecting said first member to said third member, said second contacts including contact portions which are to be brought into electrical contact with said first and third members, said contact portions being exposed adjacent said first and second support surfaces,

said housing comprising a pair of generally L-shaped housing members forming an internal opening, said housing including a plug portion having a plurality of holes for respectively receiving end portions of said second members for connection to said first contacts, said housing having a storage cavity for receiving said plug portion therein, said first contacts extending from the exterior of said housing into said storage cavity.

2. An electrical connector according to claim 1 wherein said housing supports said first contacts such that said portions of said first contacts which are to be brought into contact with said first and third members are exposed exteriorly of said housing.



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3. An electrical connector according to claim 2, wherein said contact portions which are to be brought into contact with said first and third members are formed of spring elements, respectively.

DATED THIS 8th DAY OF January 1991

THOMAS & BETTS CORPORATION
By Its Patent Attorneys

GRIFFITH HACK & CO.
Fellows Institute of Patent
Attorneys of Australia



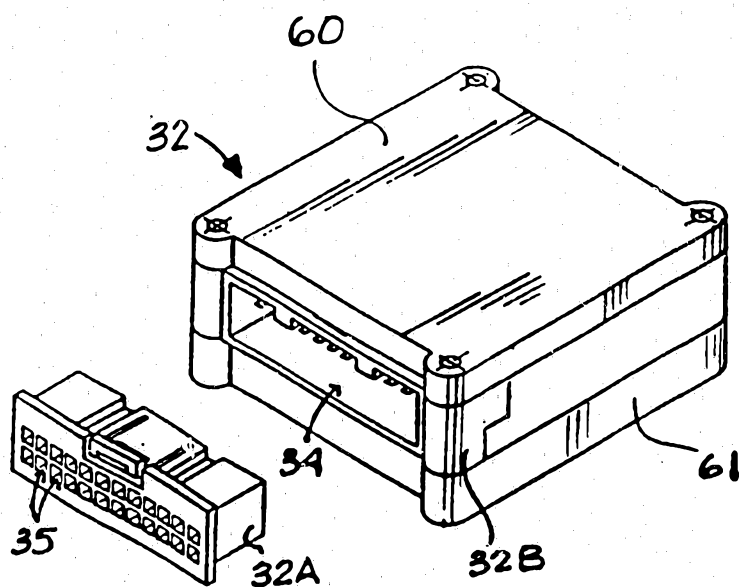


FIG. 1

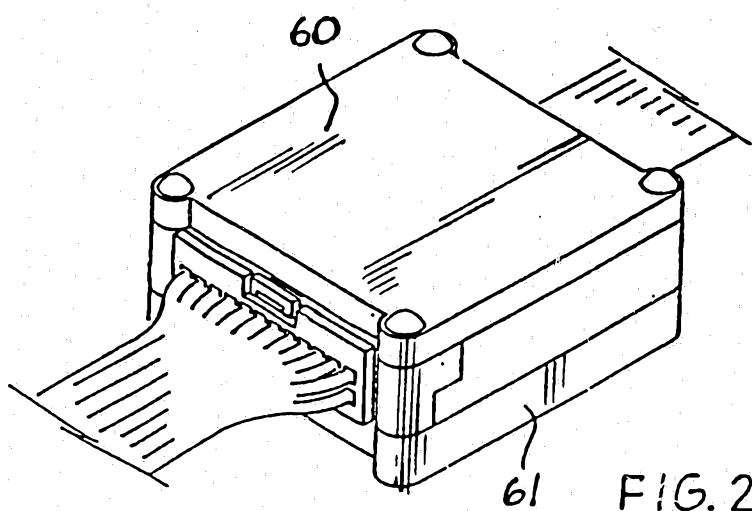


FIG. 2

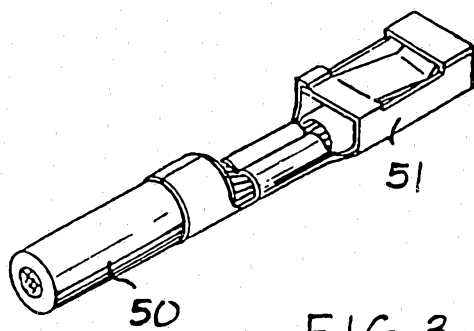


FIG. 3

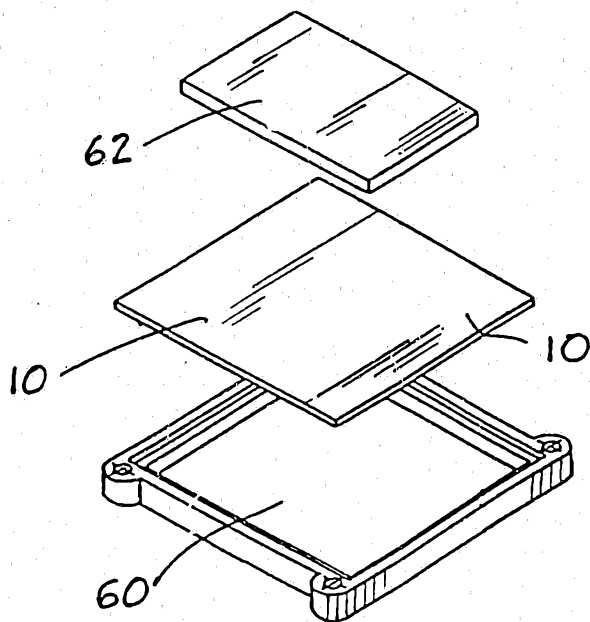


FIG. 4

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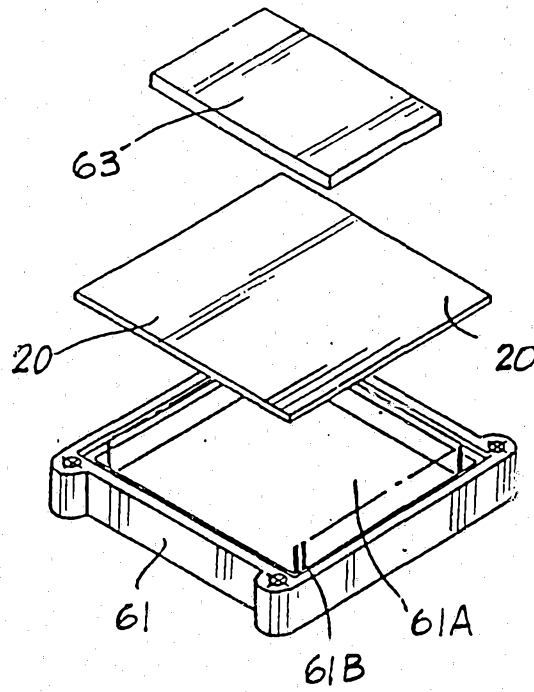


FIG.5

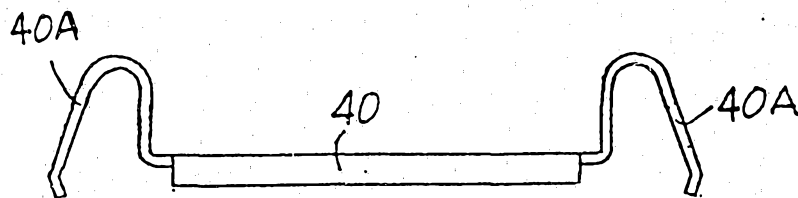


FIG.7

20 300 4000

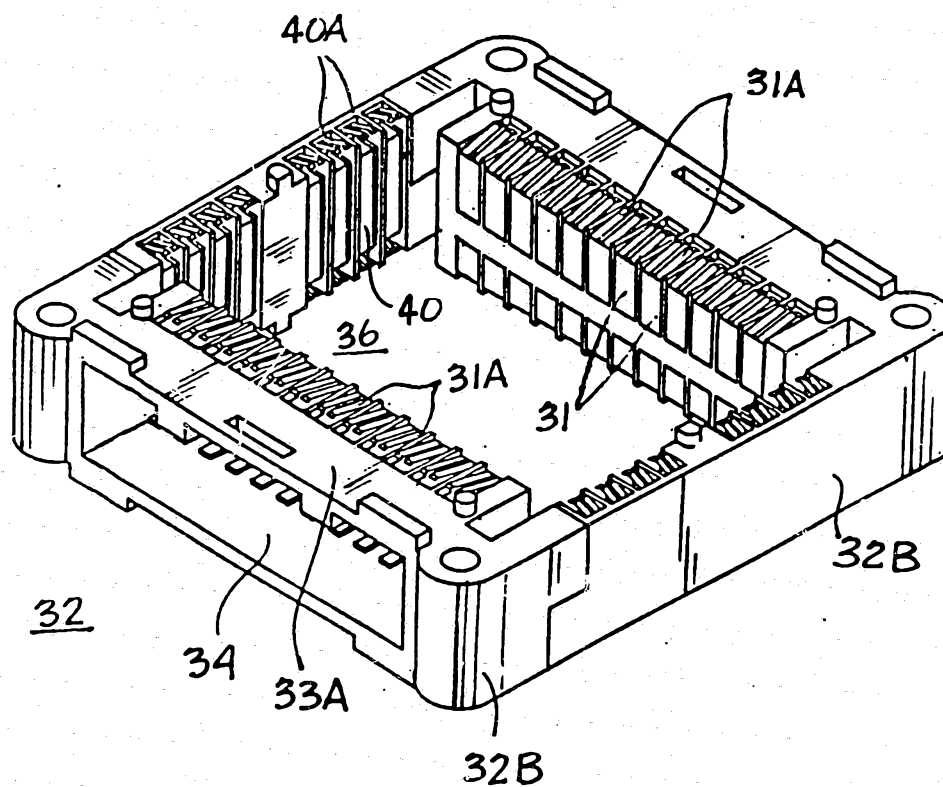


FIG. 6

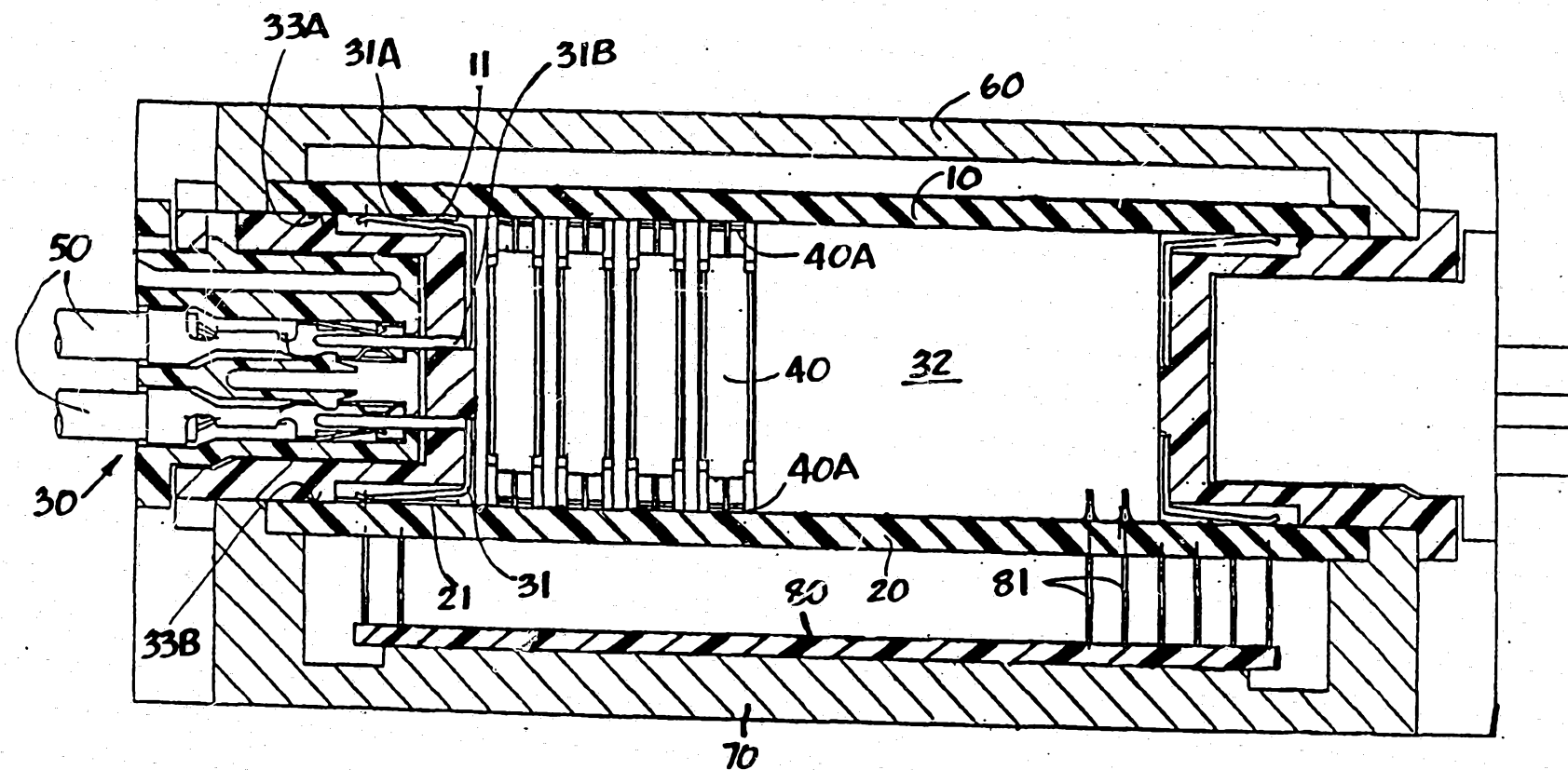


FIG. 8