Aug. 25, 1970 J. C. ASICK ET AL 3,525,972

INTEGRATED CIRCUIT CONNECTOR

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Fig. 1

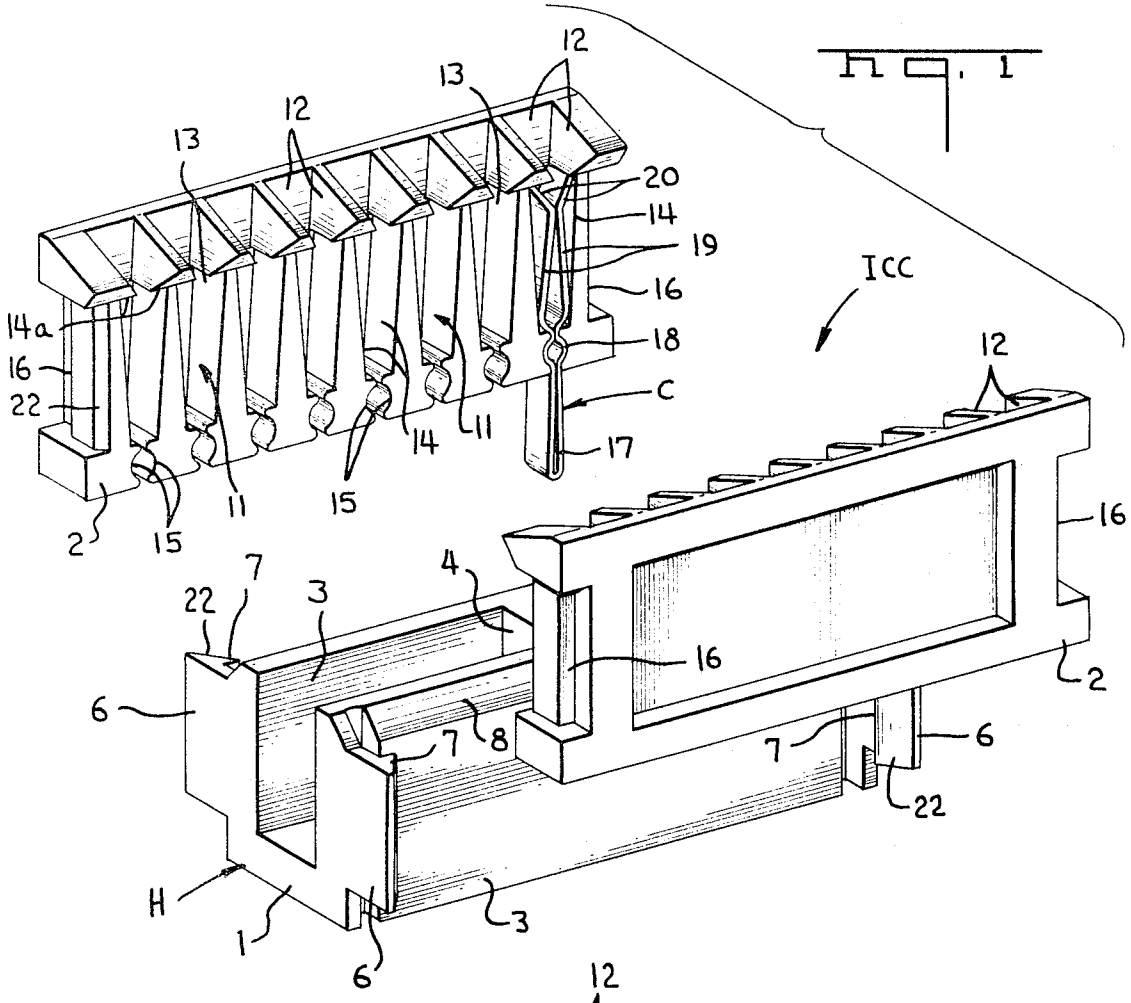
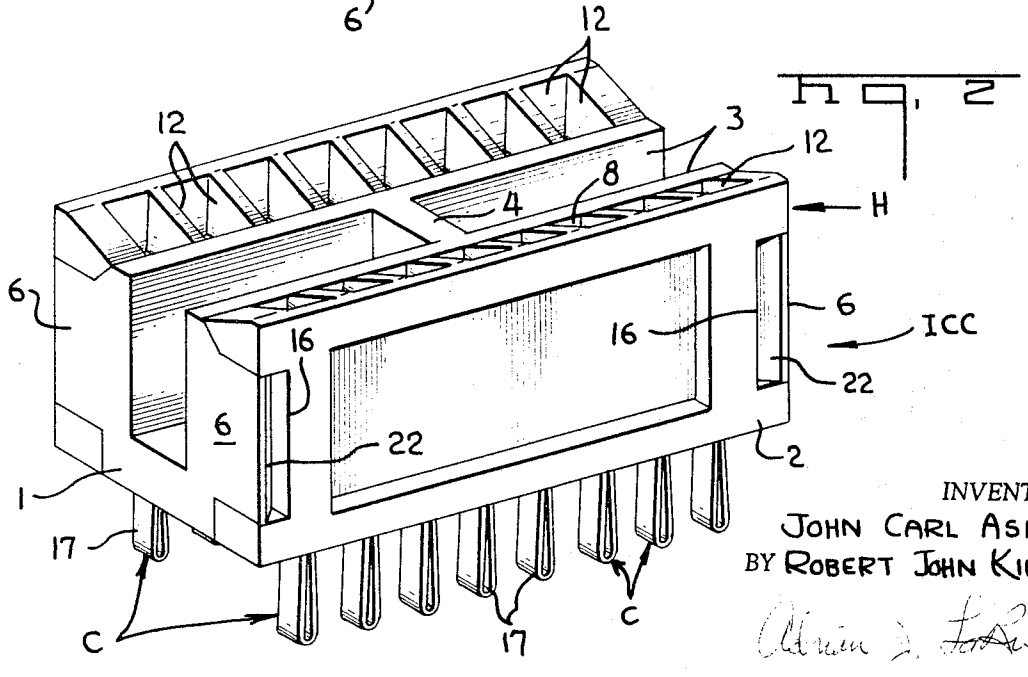


Fig. 2



INVENTOR.
JOHN CARL ASICK
BY ROBERT JOHN KINKAID

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Fig. 3

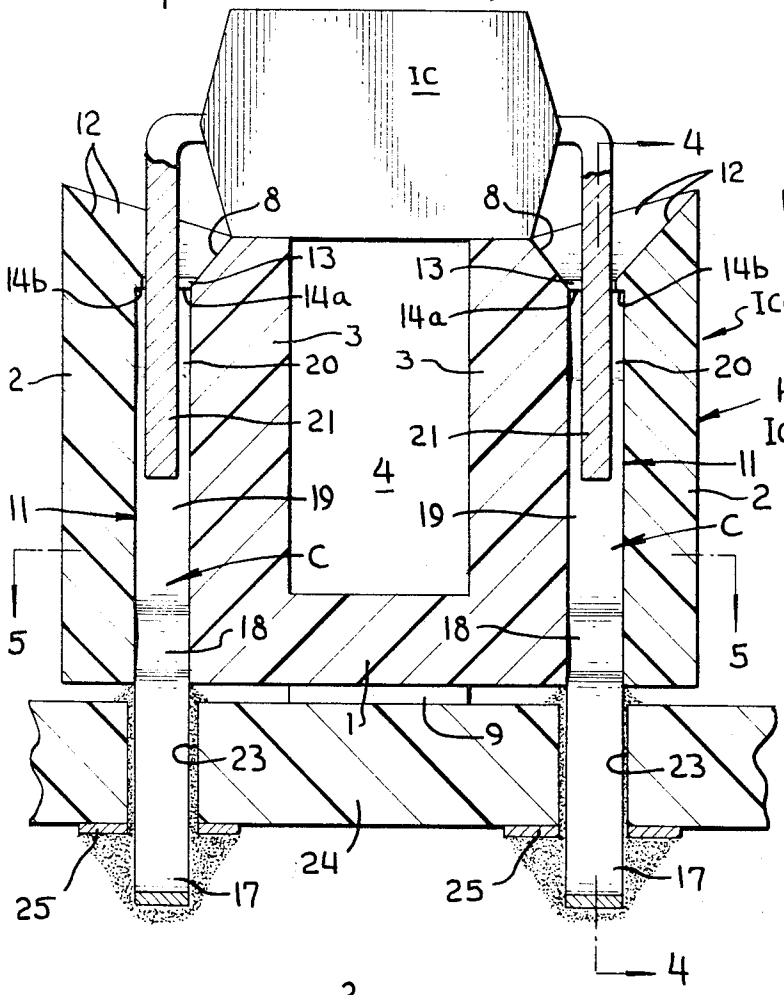
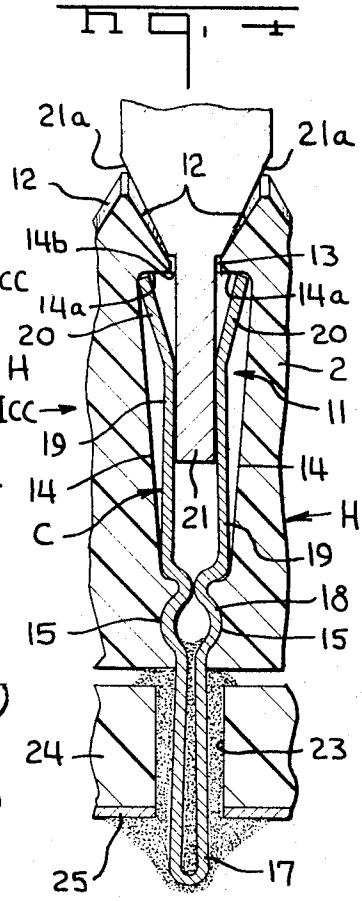


Fig. 4



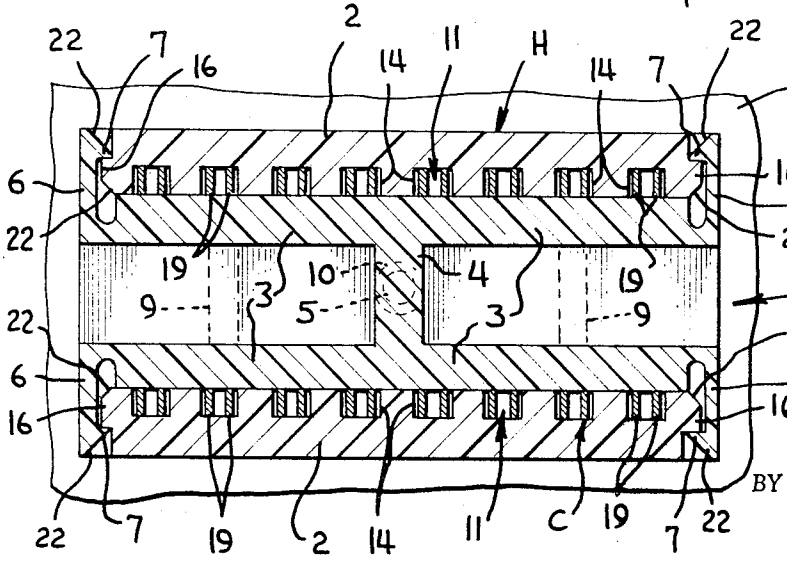


Fig. 5

INVENTOR.
JOHN CARL ASICK
BY ROBERT JOHN KINKAID

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INTEGRATED CIRCUIT CONNECTOR

John Carl Asick, Harrisburg, and Robert John Kinkaid, New Cumberland, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

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U.S. Cl. 339—64 12 Claims

ABSTRACT OF THE DISCLOSURE

An integrated circuit connector comprises a base onto sides of which are latchably secured contact-carrying members having contacts disposed in cavities spaced therealong, the entrances to the cavities having tapered surfaces facilitating guiding contact members of an integrated circuit into the cavities into electrical engagement with the contacts therein.

This invention relates to electrical connectors and more particularly to integrated circuit connectors.

Integrated circuits are being used in increasing numbers in equipment utilizing electronic circuitry and they generally take the form of a block in which the electronic circuitry is located and contact members extending outwardly from the sides of the block and then at right angles with respect to a bottom surface of the block. The contact members are generally of tab configuration but they can be pins.

An object of the invention is to provide an electrical connector wherein the contacts are readily positioned in cavities of the housing.

Another object is the provision of an electrical connector having contact-carrying members which are provided with cavities in which contacts are disposed and the contact-carrying members are latchably secured onto sides of a base.

A further object is to provide an electrical connector wherein the cavities of the contact-carrying members and the contacts are provided with securing means securing the contacts in the cavities as well as enhancing the spring characteristics of the contacts.

An additional object of the invention is the provision of guide means at the cavity entrances to guide the contact members of an electrical component into the cavities for electrical engagement with the contacts therein.

Still a further object is to provide means along the base of the housing to maintain the housing spaced from a printed circuit board to enable the housing to be ventilated.

A still additional object is the provision of means provided by the contacts to prevent wicking of solder into the contact-engaging area thereof.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there is shown and described an illustrative embodiment of the invention; it is to be understood, however, that this embodiment is not intended to be exhaustive nor limiting of the invention but is given for purposes of illustration in order

that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

In the drawings:

FIG. 1 is an exploded perspective view of an integrated circuit connector prior to being assembled;

FIG. 2 is a perspective view of FIG. 1 in an assembled condition;

FIG. 3 is a cross-sectional view of the integrated circuit connector in position on a printed circuit board and an integrated circuit connected thereto;

FIG. 4 is a view taken along lines 4—4 of FIG. 3; and

FIG. 5 is a view taken along lines 5—5 of FIG. 3.

Turning now to the drawings, an integrated circuit connector ICC comprises a dielectric housing H and electrical contacts C. Housing H is molded in accordance with conventional molding techniques from a suitable dielectric material and it includes a base **1** and contact-carrying members **2**. Base **1** has essentially a channel-shaped configuration with sides **3** interconnected at their midpoints with a central section **4** which maintains sides **3** in position. A hole **5** is disposed in the bottom of base **1** and within central section **4** so that a screw can be received therein to mount the connector in position on a mounting member, if desrired.

Stiffly-flexible latching members **6** are located at the ends of base **1** and they are provided with latching projections **7**. The upper ends of sides **3** include beveled surfaces **8** and the bottom surface of base **1** includes projections **9** which engage the surface of a printed circuit board, which is illustrated in FIG. 3, in order to maintain the bottom surface of the connectors spaced from the printed circuit board in order to permit proper ventilation of the connector. An annular projection **10** surrounds hole **5** and operates in the same manner as projections **9**.

Contact-carrying members **2** are provided with cavities **11** at spaced intervals therealong. Each of cavities **11** is provided with lead-in beveled surfaces **12**, an entrance **13**, tapered surfaces **14** and arcuate surfaces **15**. Latching areas **16** are provided in each end of contact-carrying members **2** and these latching areas are engaged by latching projections **7** of stiffly-flexible latching members **6** when contact-carrying members **2** are snapped into position on base **1** against sides **3**. Latching members **6** therefore securely maintain contact-carrying members **2** in position against sides **3**.

Contacts C are disposed in cavities **11** and they are formed by folding a strip of metal to provide a post **17**, a bulbous section **18** and bifurcated contact elements **19** having outwardly-directed free ends **20**.

In assembly, contacts C are disposed in cavities **11** with bulbous sections **18** disposed in arcuate surfaces **15** and contact elements **19** disposed along tapered surfaces **14** with free ends **20** disposed adjacent surfaces **14*a*** and **14*b*** adjacent entrances **13**. Arcuate surfaces **15** maintain the inner ends of contact elements **19** under spring tension so that the contact elements at the beginning of free ends **20** are disposed in touching or near-touching engagement in this area. Thus, bulbous sections **18** and

arcuate surfaces **15** define securing means to secure contacts C in position in cavities **11** as well as providing spring tension for contact elements **19**. Free ends **20** define guide means to guide contact members **21** of integrated circuit IC into electrical engagement with contact elements **19**, as illustrated in FIG. 4. Tapered surfaces **14** permit contact elements **19** freedom of movement of contact elements **19** within cavities **11** during engagement of contact members **21** therewith and the outer ends of free ends **20** slide along tapered surfaces **14** during the engaging and disengaging of contact members with contact elements **19**.

After contacts C have been positioned in cavities **11**, contact-carrying members **2** are then latched into position via latching projections **7** of latching members **6** latchably engaging areas **16** thereby securing contacts C in position in cavities **11** to preclude any sidewise movement. Latching projections **7** and latching areas **16** are provided with beveled surfaces **22** which act as camming means to cam latching members **6** in an outward direction so that latching projections **7** can be properly mated with latching areas **16**.

Now that the connector has been fully assembled, posts **17** are positioned in openings **23** of printed circuit board **24** and posts **17** are flow soldered to circuit paths **25** in accordance with conventional flow soldering techniques. A screw (not shown) can be screwed into hole **5** through printed circuit board **24** to main the connector in position on the printed circuit board during the flow-soldering operation.

After the connector has been secured onto the printed circuit board, integrated circuit IC is electrically connected with contacts C by inserting contact members **21** into respective cavities **11** with beveled surfaces **8** and **12** acting as guide means to guide contact members **21** within cavities **11**. Surfaces **14***b* are provided to preclude any hang-up between the sharp sheared ends of contact members **21** and housing H. As can be discerned from an observation of FIG. 3, beveled surfaces **12** are higher than beveled surfaces **8** so that contact members **21** are guided thereby within cavities **11**. Beveled surfaces **12** and **8** therefore properly guide contact members **21** into respective cavities **21** if there is any misalignment of contact members **21**. Opposing beveled surfaces **12** of each of cavities **11** also receive respective tapered surfaces **21***a* of each of contact members **21**, as illustrated in FIG. 4, to prevent any backward and forward motion of the integrated circuit. Integrated circuit IC, as illustrated in FIG. 3, rests on the top surfaces of sides **3** and the channels of base **1** on each side of central section **4** permit ventilation of integrated circuit IC and central section **4** can be provided with openings, if desired, to permit flowing of air entirely along base **1**. Bulbous sections **18** of electrical contact C defines an anti-wicking means to prevent wicking of the solder up onto the contact elements **19**.

Instead of posts **17** being flow-soldered to circuit paths of a printed circuit board, the connector can be mounted onto a mounting board via a screw into hole **5** with posts **17** extending through openings in the mounting panel and conductor means can be connected to posts **17** via soldering or in any other well known manner. While cavities **11** have been disclosed as being provided in contact-carrying members **2**, cavities **11** can, of course, be provided in sides **3** with members **2** being latched into position via latching members **6** and latching areas **16** to maintain the electrical contacts C in position in the cavities. Obversely, the ends of members **2** may be provided with latching members **6** and base **1** with latching areas **16**.

It will, therefore, be appreciated that the aforementioned and other desirable objects have been achieved; however, it should be emphasized that the particular embodiment of the invention, which is shown and described herein, is intended as merely illustrative and not as restrictive of the invention.

The invention is claimed in accordance with the following:

1. An electrical connector comprising a base having sides, maintaining members disposed along said sides, latching means provided between said base and said maintaining members latchably maintaining said maintaining members in position against said sides, said sides or said maintaining members having contact-carrying cavities disposed therein at spaced intervals therealong, said sides and said maintaining members providing entrances to said cavities, contact means having bifurcated contact elements disposed in said cavities with said bifurcated contact elements being directed toward said entrances, and securing means provided by said contact means and said cavities securing said contact means in position in said cavities and maintaining said bifurcated contact elements in a biased condition.

2. An electrical connector according to claim **1** whereing said sides and said maintaining members provide guide surface means outwardly from said entrances defining guide means for guiding contact members within said cavities for engagement with said contact means.

3. An electrical connector according to claim **1** wherein said base includes projection means extending outwardly from a bottom surface thereof for engagement with a mounting member when said connector is mounted thereon for providing ventilation for said connector.

4. An electrical connector according to claim **1** wherein said base defines generally a channel shape configuration.

5. An electrical connector according to claim **1** wherein said cavities are provided with tapered surfaces so that said bifurcated contact elements can move freely therealong.

6. An electrical connector for electrical engagement with contact members of an electrical component, said electrical connector comprising a base having sides, contact-carrying members having contact-receiving cavities at spaced locations therealong disposed along said sides, contact means in said cavities and having contact element means positioned in alignment with entrances to said cavities for electrical engagement with the contact members when they are inserted through said entrances, and latching means provided by said contact-carrying members and said base latchably maintaining said contact-carrying members in position along said sides and said contact means in position within said cavities.

7. An electrical connector according to claim **6** wherein said sides and said contact-carrying members are provided outwardly from said entrances to said cavities with guide surface means for guiding the contact members into engagement with said contact element means.

8. An electrical connector according to claim **6** wherein securing means are provided by said cavities and said contact means securing said contact means in position in said cavities and providing spring bias to said contact element means.

9. An electrical connector according to claim **6** wherein said contact means are provided with antiwicking means to prevent solder from reaching said contact element means.

10. An electrical connector according to claim **6** wherein said latching means include stiffly-flexible latching arms at ends of said base or said contact-carrying members and latching areas at ends of said base or said contact-carrying members.

11. An electrical connector according to claim **6** wherein said base is of generally channel shape with a central section connecting said sides together.

12. An electrical connector for connection with contact members of an integrated circuit, said connector comprising a channel-shaped base having sides, stiffly-flexible latching arms extending outwardly from ends of said base, retaining members extending along said sides and having latching areas engaged by said latching arms

thereby latchably maintaining said retaining members in position along said sides, contact-receiving cavities in said sides or said retaining members, said cavities having entrances thereto, contact means in said cavities with contact-engaging means disposed in alignment with said entrances and conductive-connective means extending outwardly from a surface of said connector, means provided by said contact means and said retaining members and sides securing said contact means in position in said cavities, and guide means extending outwardly from said entrances for guiding the contact members into electrical engagement with said contact-engaging means when the integrated circuit is connected to said connector.

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MARVIN A. CHAMPION, Primary Examiner

J. H. McGLYNN, Assistant Examiner

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339—17, 65, 192, 206, 275