Jan. 20, 1970 J. H. GEIS, JR 3,491,328

CONNECTION DEVICE FOR CONNECTING STACKED TAB MEMBERS

Original Filed Jan. 6, 1966 2 Sheets-Sheet 1

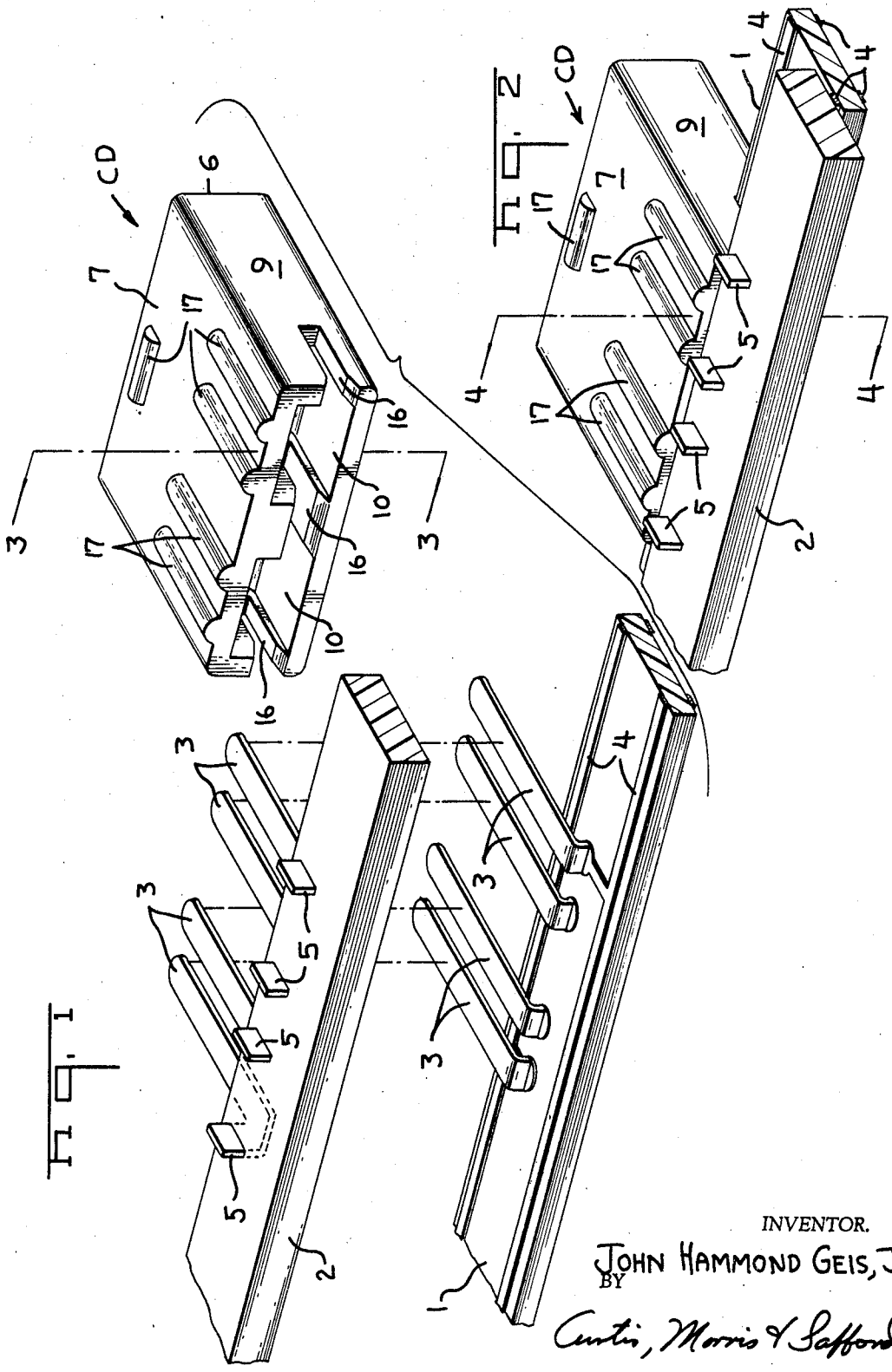


FIG. 1

FIG. 2

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Fig. 3

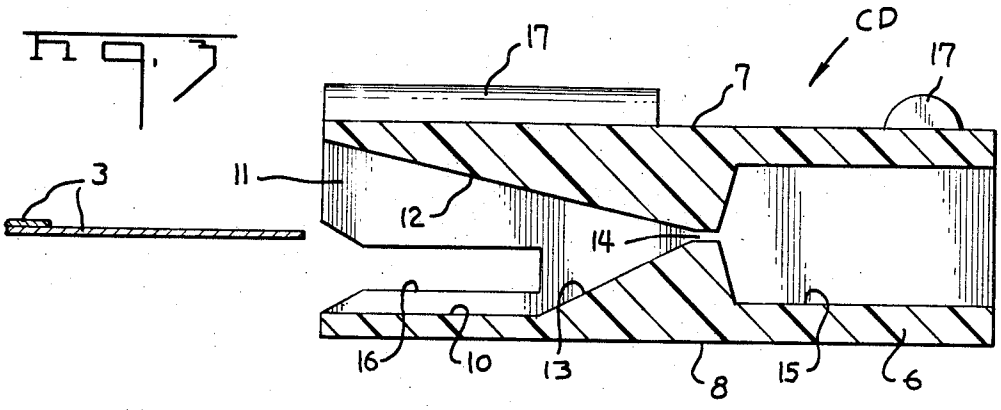


Fig. 4

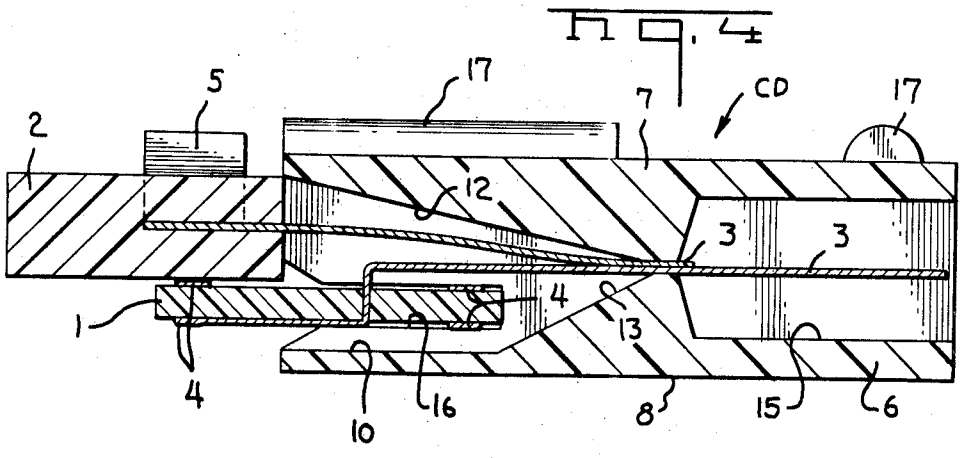
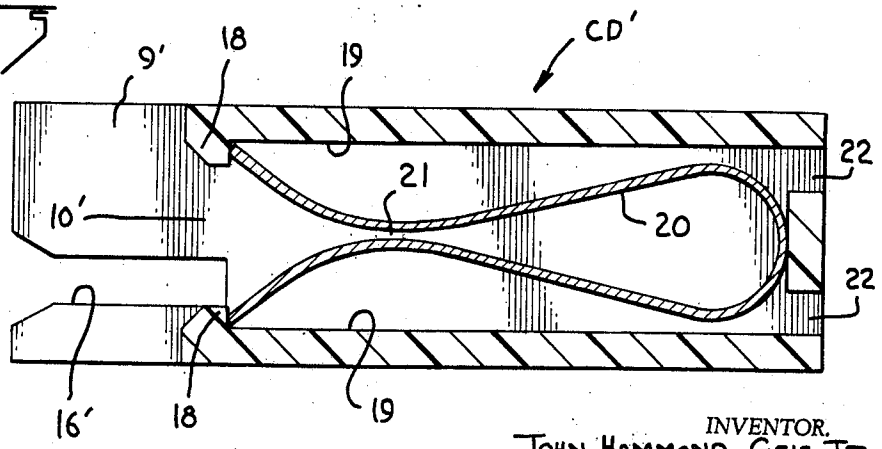


Fig. 5



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3,491,328

CONNECTION DEVICE FOR CONNECTING STACKED TAB MEMBERS

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Continuation of application Ser. No. 519,112, Jan. 6, 1966. This application Aug. 21, 1968, Ser. No. 781,644
Int. Cl. H01r 13/20, 13/50, 13/70
U.S. Cl. 339—66 6 Claims

ABSTRACT OF THE DISCLOSURE

A connection device for connecting stacked tab members on tab-carrying means comprises a dielectric block having an opening therein provided with an entrance and surfaces extending toward each other and inwardly to a constricting area thereby defining guiding means to guide the stacked tab members into the constricting area, the constricting area having substantially parallel surfaces and defining an engaging area for engaging the stacked tab members and maintaining them in electrical engagement with each other, and means provided by the block for stabilizing the block on the tab-carrying means when the block is used to connect the stacked tab members together.

This application is a continuation of application Ser. No. 519,112, filed Jan. 6, 1966 and now abandoned.

This invention relates to a connection device and more particularly to a connection device for connecting stacked tab members.

In the electrical field and more particularly in the computer field, tab members are disposed on a tab-carrying member at spaced locations therealong. These tab members are connected to respective conductors on the tab-carrying member and are generally stacked in pairs with tab members on a further tab-carrying member. The stacked pairs of tab members are to be electrically engaged and this can be accomplished by several conventional techniques. The stacked pairs of tab members may be soldered, welded, crimped or held together by wrapping wire or the like around the tab members. These techniques are suitable if the tab members are to be maintained in permanent electrical engagement, but, if they are not to be permanently engaged, it is desirable that the tab members be readily disengageable when desired.

An object of the invention is to provide a connection device to maintain stacked tab members in electrical engagement.

Another object of the invention is the provision of a connection member that readily connects and disconnects stacked tab members.

A further object of the invention is to provide a dielectric connection device having guiding means to guide stacked tab members into a tab-engaging means to maintain the stacked tab members in electrical engagement.

An additional object of the invention is the provision of a connection device which is simple in design, durable in construction and economical to manufacture.

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 are shown and described illustrative embodiments of the invention; it is to be understood, however, that these embodiments are not intended to be exhaustive nor limiting of the invention but are 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

in various forms, each as may be best suited to the conapplying it in practical use so that they may modify it ditions of a particular use.

The foregoing objects are achieved by means of a connection device for connecting stacked tab members on tab-carrying means comprising a dielectric block having an opening therein, the opening having an entrance and surfaces extending toward each other, the surfaces extending inwardly to a constricting area and defining guiding means to guide the stacked tab members into the constricting area, the constricting area having substantially parallel surfaces spaced apart a distance less than the thickness of the stacked tab members thereby defining an engaging means to squeezingly engage the stacked tab members to maintain the stacked tab members in electrical engagement.

In the drawings:

FIGURE 1 is a perspective exploded view of a connection device and tab members on tab-carrying members;

FIGURE 2 is a view of the connection device in engagement with stacked tab members;

FIGURE 3 is a view taken along lines 3—3 of FIGURE 1;

FIGURE 4 is a view taken along lines 4—4 of FIGURE 2; and

FIGURE 5 is a cross-sectional view of an alternative embodiment of the connection device.

Turning now to the drawings and more particularly to FIGURES 1 through 4, there is illustrated insulative tab-carrying members **1** and **2** having tab members **3** extending outwardly therefrom in parallel spaced pairs. Tab carrying member **1** has spaced conductive members **4** secured on the upper and lower surfaces thereof and the tab members on tab-carrying member **1** are connected to respective conductive members **4**. Thus, the pair of tab members **3** to the right in FIGURE 1 are connected to respective back conductive members **4** and the left-handed pair of tab members **3** are connected to respective front conductive members **4**; however, any interconnection between the tab members and conductive members can be selected. Tab members **3** on tab-carrying member **2** are not connected to any conductive members but contain extensions **5** to interconnect the tab members with each other or for connection with exterior conductive means (not shown) as desired.

Tab-carrying members **1** and **2** are normally mounted on a frame with tab-carrying member **2** disposed on tab-carrying member **1** in overlapping relationship and the front side of tab-carrying member **2** is disposed proximate the bent sections of tab members **3** at their juncture with tab-carrying member **1**. Thus, the spaced pairs of tab members **3** of the tab-carrying members are disposed in stacked relationship as illustrated in FIGURES 3 and 4 with the ends of tab members **3** of tab-carrying member **2** terminating about midway of tab members **3** of tab-carrying member **1**. While pairs of stacked tab members have been disclosed, more than two tab members may be stacked together.

Connection device CD is used to guide the stacked tab members into a constricting area which engages the stacked tab members and maintains them in electrical engagement. Connection device CD comprises a dielectric block **6** preferably molded from a suitable dielectric material in accordance with conventional molding techniques. Block **6** includes a top surface **7**, a bottom surface **8**, and sides **9**. Openings **10** are disposed in block **6** which are parallel with respect to each other and are separated from each other by means of a center section **11**. Each opening **10** includes an entrance and surfaces **12** and **13** extending toward each other and inwardly to a constricting area **14**. A cavity **15** extends from constricting area **14** to the end

of block **6** with constricting area **14** in communication therewith. Surfaces **12** and **13** act as a guiding means to guide the stacked tab members into constricting area **14**. The constricting area has substantially parallel surfaces spaced apart a distance less than the thickness of the stacked tab members thereby defining engaging means to apply pressure to the stacked tab member to squeezingly engage the stacked tab members to maintain the stacked tab members in electrical engagement. Cavity **15** accommodates the portions of the stacked tab members that extend beyond constricting area **14**. Thus, the constricting area is an essential feature of the present invention since the distance between the parallel surfaces thereof is important in order to provide the proper engagement with the stacked tab members to maintain them in electrical engagement via the pressure thereon derived from the characteristics of the material. The surfaces of constricting area **14** may be slightly tapered from the front to the rear to provide increasing pressure on the stacked tab members.

Sides **9** and center section **11** have rectangular recesses **16** disposed therein to accommodate tab-carrying member **1** as illustrated in FIGURE 4, as well as to stabilize the connection device thereon. The entrances to recesses **16** are preferably tapered in order to facilitate the insertion of the connection device onto the stacked tab members and the tab-carrying member. Stabilizing recesses **16** may be tapered to frictionally engage the tab-carrying member. The stabilizing recesses may have other configurations in order to latch the connection device onto the tab-carrying member if desired. Latching means may extend out from block **6** to engage the tab-carrying member in order to latch the block thereon.

Arcuate projections **17** extend outwardly from top surface **7** in order to readily indicate the orientation of the block so as to readily insert the block in position on the tab members and tab-carrying member. The projection which extends normal to center section **11** and is disposed rearwardly of the pairs of projections serves to provide a gripping member to remove the block from the stacked tab members and tab-carrying member.

FIGURE 5 illustrates an alternative embodiment of connection device CD' which is similar in construction to connection device CD. In this embodiment, dielectric block **6'** has an opening **10'** for each of the stacked tab members. The entrance of opening **10'** has inwardly directed lips **18**. Inner surfaces **19** of opening **10'** are parallel. A U-shaped spring contact member **20** is disposed in opening **10'** with the bight of the contact member disposed adjacent the inner surface of opening **10'** and the ends of the free legs of the contact member are disposed against respective lips **18**. As can be discerned, the legs of the contact member **20** from lips **18** extend toward each other to be constricting area **21** where the legs are substantially parallel with respect to each other, then the legs extend away from each other to the bight of the contact member. The inwardly extending sections of the legs of the contact member from lips **18** to constricting area **21** define guiding means to guide the stacked tab members into the constricting area, and the constricting area defines a contact engaging means to engage the stacked tab members to squeezingly maintain the stacked tab members in electrical engagement. The legs of the contact member from constricting area **21** to the bight thereof accommodate the ends of the stacked tab members. Thus, the configuration of contact member **20** is similar in configuration to surfaces **12** and **13**, constricting area **14** and cavity **15** of connection device CD. With the free ends of contact member **20** disposed against the junctions of lips **18** and surfaces **19**, the legs of the contact member are springingly disposed toward each other to form constricting area **21** and provides an effective operation thereby to maintain the stacked tab members in electrical engagement when disposed therein. The bight of the contact member has a radius to permit the contact member to be inserted within opening **10'** through the entrance thereof delimited by lips **18**. Apertures **22** are disposed in the end wall to permit a tool (not shown) to be inserted within opening **10'** in order to move the free ends of the leg members of the contact member out of engagement with lips **18** in order to remove the contact member from its respective opening. Recesses **16'** are disposed in sides **9'** to form stabilizing recesses in the same manner as recesses **16**.

Adjacent stacked tab members are insertable into each opening **10** of connection device CD whereas individual stacked tab members are insertable in respective openings **10'** of connection device CD'. While only four pairs of stacked tab members have been illustrated on the tab carrying members, it is obvious that the tab-carrying members are provided with other pairs of stacked tab members therealong. From the foregoing, there has been disclosed a unique and novel connection device to maintain stacked tab members in electrical engagement without having to permanently connect the stacked tab members together.

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

I claim:

1. A connection device for electrically connecting stacked tab members disposed on tab-carrying means comprising a dielectric block of stiffly flexible material and having an opening disposed therein, said opening defining first and second sections, said first section extending from an entrance of said opening and including tapered surfaces terminating at said second section, said second section having substantially parallel surfaces and defining a constricting area, said tapered surfaces defining guiding means to guide said stacked tab members into said constricting area, said constricting area defining engaging means to engage said stacked tab members and maintain said stacked tab members in electrical engagement, and means, on said block for stabilizing said block on said tab-carrying means when said block is used to connect the stacked tab members together, said stabilizing means being spaced from said constricting area and outwardly from a plane containing said constricting area.

2. A connection device according to claim **1** wherein said block includes means to indicate the proper positioning of said block on said tab-carrying means.

3. A connection device for connecting stacked tab members on tab-carrying means comprising a dielectric block having an opening therein, a U-shaped metallic spring contact means in said opening, means provided by said contact means and said block securing said contact means in said opening with a bight of said contact means facing an entrance to said opening, said contact means having legs extending toward each other from said entrance to a constricting area and then said legs extend away from each other, said legs from said entrance to said constricting area defining guiding means for guiding said stacked tab members to said constricting area, said constricting area having substantially parallel surfaces and defining an engaging area for engaging said stacked tab members and maintaining them in electrical engagement with each other, and means provided by said block for stabilizing said block on said tab-carrying means when said block is used to connect said tab members together, said stabilizing means being spaced from said constricting area and outwardly from a plane containing said constricting area.

4. A connection device electrically connecting stacked tab members disposed on tab-carrying means comprising a dielectric block of stiffly-flexible material when having an opening disposed therein, said opening defining first and second sections, said first section extending from an entrance of said opening and including tapered surfaces terminating at said second section, said second section

having substantially parallel surfaces and defining a constricting area, the distance between said parallel surfaces being less than the thickness of said stacked tab members, said tapered surfaces defining guiding means guiding said stacked tab members into said constricting area, said constricting area defining engaging means engaging said stacked tab members and maintaining said stacked tab members in electrical engagement, and means on said block stabilizing said block on said tab-carrying means.

5. A connection device connecting stacked tab members on tab-carrying means comprising a dielectric block having an opening therein, a U-shaped metallic spring contact means in said opening, means provided by said contact means and said block securing said contact means in said opening with the bight of said contact means facing an entrance to said opening, said contact means having legs extending toward each other from said entrance to a constricting area then said legs extend away from each other, said legs from said entrance to said constricting area defining guiding means guiding said stacked tab members to said constricting area, said constricting area having substantially parallel surfaces defining an engaging area engaging said stacked tab members and maintaining them in electrical engagement with each other, and means provided by said block stabilizing said block on said tab-carrying means.

6. A connection device for connection with conductive means provided on conductive-carrying means comprising a dielectric block having an opening therein and extending therethrough, a U-shaped metallic spring contact means in said opening, means provided by said contact means and said block securing said contact means

in said opening with a bight of said contact means facing an entrance to said opening, said contact means having leg means extending away from each other from said bight and then extending toward each other from an area spaced from said bight with said area defining contact-engaging means for electrical engagement with said conductive means, said leg means between said entrance and said contact-engaging means defining guide means for guiding said conductive means into engagement therewith, and receiving means for said conductive-carrying means in said block adjacent said opening, said receiving means being spaced from said contact-engaging means and having an axis of reception laterally offset with respect to the engagement axis of said conductive means and said contact-engaging means for stabilizing the engagement between said block and said conductive-carrying means and for maintaining said contact-engaging means in electrical engagement with said conductive means.

References Cited

UNITED STATES PATENTS

1,203,582	11/1916	Chase.	
2,793,354	5/1957	Heimbach	339—198
2,858,372	10/1958	Kaufman	339—19
3,048,811	8/1962	Locke.	
3,267,410	8/1966	Baer et al.	

MARVIN A. CHAMPION, Primary Examiner

U.S. CI. X.R.

200—51; 339—176

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,491,328 January 20, 1970

John Hammond Geis, Jr.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 65, after "said" insert -- stacked --.

Signed and sealed this 17th day of November 1970.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents