

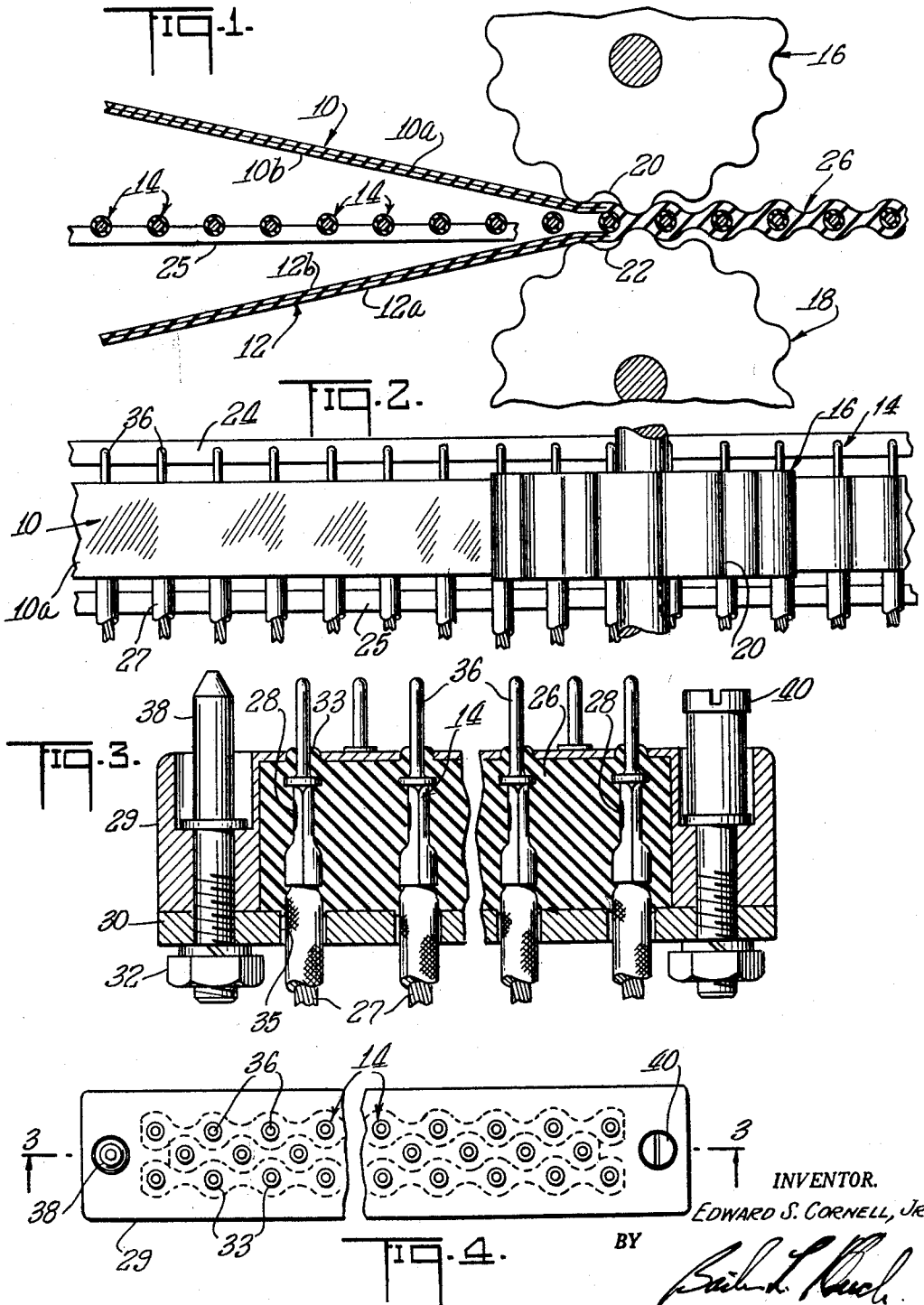
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FLEXIBLE MULTIPLE CONNECTOR

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3,097,036

FLEXIBLE MULTIPLE CONNECTOR

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vided and this application Oct. 28, 1960, Ser. No.
65,636

2 Claims. (Cl. 339-176)

My invention relates to a multiple connector wherein a plurality of electrical connections may be made and disconnected as a unit.

This application is a division of S.N. 633,137, filed January 8, 1957.

Connectors of this type are customarily provided with a solid phenolic or other rigid composition body, which is permanently molded about a plurality of mating connector halves. The connections, when made, are exposed to the atmosphere, permitting moisture to permeate the parts, with the possibility of a short circuit occurring. Such connections usually employ solder to secure the wire to the connectors, with the likelihood of some poor connections resulting thereby.

Attempts have been made to utilize a flexible insulating material for adaption to an irregularly shaped supporting structure, but such connectors are not adapted to establish and disconnect multiple connections as a unit.

It is a primary object of my invention to provide a multiple connector made of flexible material that is adapted to be manufactured on automatic equipment.

Further objects are to provide such a multiple connector that is capable of being assembled in tiers to any desired thickness; that possesses parts which may readily be assembled into the completed connector with simplicity and ease; that possesses electrical connecting halves that may be crimped to wire conductors before assembly into the insulation body; that may be made of endless strip material and cut to the desired length for use in a specified unit; and to accomplish the foregoing in a multiple connector that possesses a rigid housing that may be made of metal or other high structural strength materials.

I accomplish these and other objects and obtain my new results as will be apparent from the device described in the following specification, particularly pointed out in the claims, and illustrated in the accompanying drawing, in which:

FIG. 1 is a side elevation of the apparatus for manufacturing multiple connectors in accordance with my invention;

FIG. 2 is a plan view of the same;

FIG. 3 is a fragmentary sectional view of a multiple connector made in accordance with one form of my invention; and

FIG. 4 is a side elevation of a multiple connector showing a tier construction.

The multiple connector of my invention may be made from two endless strips of rubber 10 and 12 between which the desired connector halves 14 are inserted by positioning at properly spaced intervals. The connector halves are preferably of the pin and socket types which are mated together. The laminated rubber construction with contained connector halves is then passed between heating dies which may be the rollers 16 and 18, for compressing and unifying the two strips about the con-

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connector halves. The rollers are preferably provided with grooves 20 and 22 to accommodate the encased connector halves.

Various kinds of compressible strip material may be used, and thermoplastically reshaped by the heating dies, about the connector halves. As a specific example, I have found that each strip material itself may be made of a laminate construction, i.e., the outer portions 10a or 12a made of vulcanized rubber, and the inner portions 10b or 12b made of unvulcanized rubber. A rubber cement may be used to hold the two strips 10 and 12 together about the positioned connector half until the heated dies vulcanize the entire construction into a unitary assembly.

Jigs 24 and 25 may extend longitudinally outside the strip material to support the connector halves and attached wire in position until the heated dies vulcanize the rubber strips together.

The heated dies or rollers move at the rate required to vulcanize the strips over the connector halves. The speed is in part dependent on the temperature to which the dies or rollers are heated.

As is shown in FIG. 3, the final resilient insulation body 26 cut to the desired length, and preferably containing the connector halves and attached wire 27, crimped as at 28, is positioned into a frame or housing 29, which may be cup-shaped, and provided with the cover 30. The rubber body may be slightly greater in volume than the housing, causing an internal pressure to be developed when the closing bolts 32 are applied, forcing the insulating body to be resiliently compressed, thereby forming a substantially rigid assembly of housing, insulation body and connectors.

The housing and cover plate may be made of rigid insulation material or metal, since the body 26 adequately insulates the connections from each other. Where pin connector halves are employed, the housing face into which they are inserted should preferably be made of insulating material, to prevent an accidental short circuit when mating two complementary connector halves.

The openings 33 and 35 in the housing 28 and cover plate 30, respectively, are large enough to permit the pin 36 of each connector half 14, and wires 27, to project therethrough for abutment with the corresponding parts of complementary connector halves.

The connector bodies may extend from the housing to permit wires to be crimped thereto after assembly into the housing. It is also possible to provide the ends of the wires with means for snap fitting into the connector bodies, in a well-known manner.

A plurality of connector bodies may be mounted in tiers, as shown in FIG. 4. The connector bodies may be staggered to enable the parts to fit closely to each other.

I have thus described my invention, but I desire it understood that it is not confined to the particular forms or uses shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of my invention, and, therefore, I claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which, objects of my invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the

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many that can be employed to attain these objects and accomplish these results.

I claim:

1. A multiple contact electrical connector comprising a plurality of compressible bodies; each said body including a pair of insulating strips; a plurality of electrically isolated contact members positioned between said pairs of strips in side-by-side relationship; each said body having a sinuous surface having a convex configuration about each of the positioned contacts and having a concave configuration at points where said strips are joined together between said contacts; and a frame for securing said bodies in tiers with the abutting faces of said bodies having their concave and convex portions interfitted.

2. A combination comprising: a plurality of resilient bodies; each said body including a pair of insulating strips; a plurality of electrically isolated electric contact members disposed between said pairs of strips in side-by-side relationship; each pair of strips being joined between said contacts; each said body having a sinuous

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surface having a convex configuration about each of the positioned contacts and having a concave configuration at points where said strips are joined together between said contacts; and a means for securing said bodies in tiers with the abutting faces of said bodies having their concave and convex portions interfitted.

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