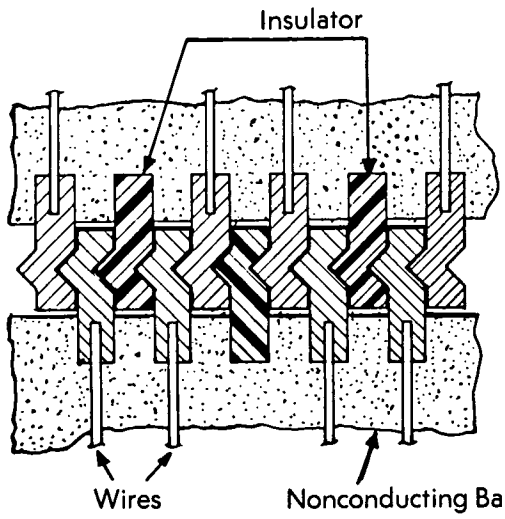
NASA TECH BRIEF

NASA Pasadena Office

Zipper-Type Electrical Connectors

The problem:

Multipin electrical connectors are quite bulky, and because they are made of small, precision parts, reliability of firm connection is not high. Moreover, since adequate pin-to-socket friction must be provided for proper electrical contact and all pins must release simultaneously, a great deal of force must be applied to separate a connector plug from its socket. Accordingly, it was considered desirable to seek a design for a simple, reliable connector which can be separated by application of small forces.



The solution:

An electrical connector of a zipper-like configuration, in which sequentially interlocking tines serve as electrical contacts or insulators.

How it's done:

An ordinary zipper with metal tines can be converted readily to an electrical connector by replacing every third metal tine in each row with a nonconducting tine. As indicated in the diagram, wires are attached to both rows of metal tines; when the zipper is closed, the metal tines are meshed together and electrical circuits are completed. The force required to make or break a connection is relatively low because tines are sequentially locked or released as in a zipper; moreover, selected circuits can be energized or interrupted in a desired sequence.

Many types of zippers can be used to form connectors; it is of interest to note that existing zipper-forming machines can be modified readily to produce connectors of nearly any length.

Patent status:

NASA has decided not to apply for a patent.

Source: Clarence E. Levoe of
Caltech/JPL
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Category 01