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NASA TECH BRIEF

Flexible or Rigid Extending Arm

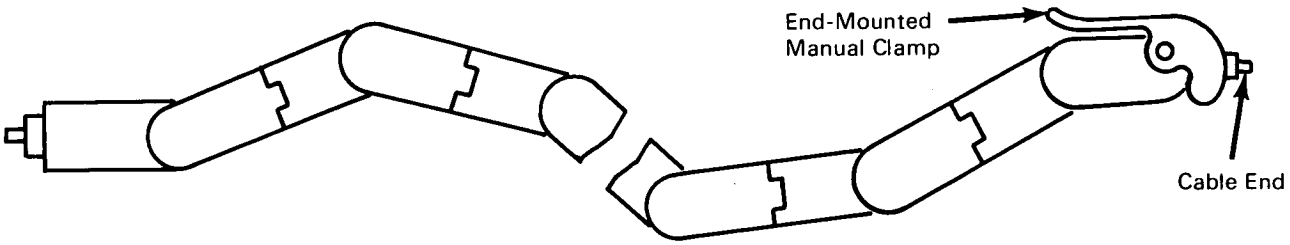

Figure 1. Diagram of Arm

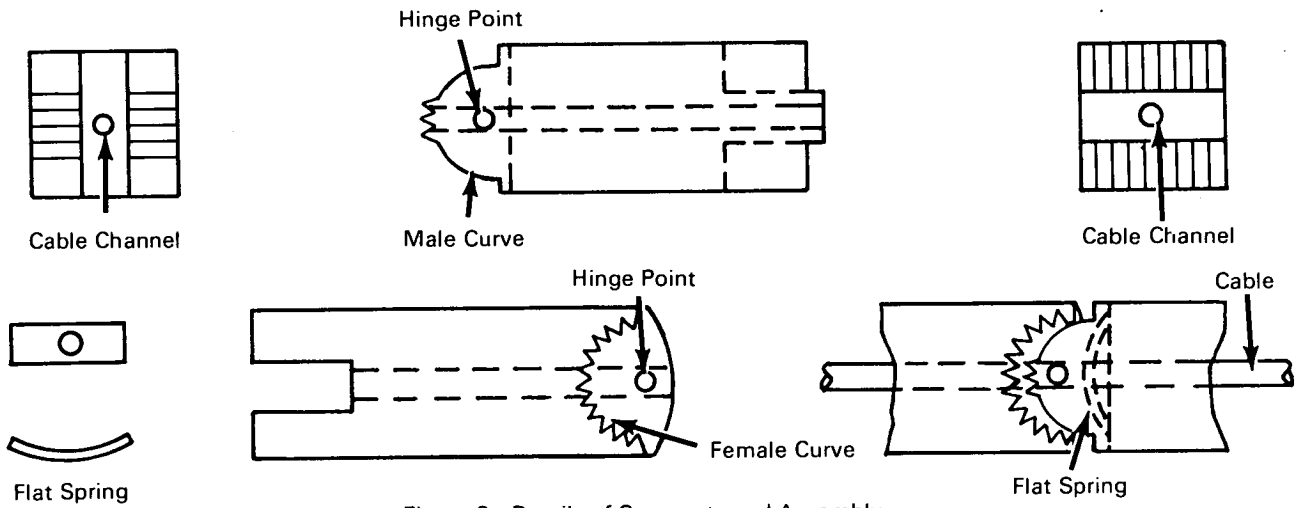

Figure 2. Details of Segments and Assembly

One motion of a manual clamp makes a universally flexible arm instantly rigid in any configuration (Fig. 1). The device is locked rigid by meshing of gear teeth, providing great resistance to loading (Fig. 2). The cable tension that locks the teeth is relatively low.

A series of hinged metallic segments, with matching male and female semicircularly curved ends, are connected through hinge points at the radial centers of the curves; the centers are free to translate axially to a small extent. The surface of the female curve is toothed; that of the male curve has two or three teeth only. A steel cable passes longitudinally through holes through the centers of the segments. This cable can be tautened by manual operation of a clamp located anywhere along the arm.

When the arm is in the flexible mode the teeth between two segments are held out of mesh by a flat spring. When applied to the cable, tension first com-

(continued overleaf)

presses the springs and then locks each pair of segments by engagement of the teeth.

This innovation has many potential applications: for holding components during assembly or welding, for example. Pedal operation could replace the manual clamp.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Manned Spacecraft Center, Code BM7
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Reference: TSP70-10465

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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