December 1969

Brief 69-10696

NASA TECH BRIEF

Precisely Repeatable Rotary Mechanism

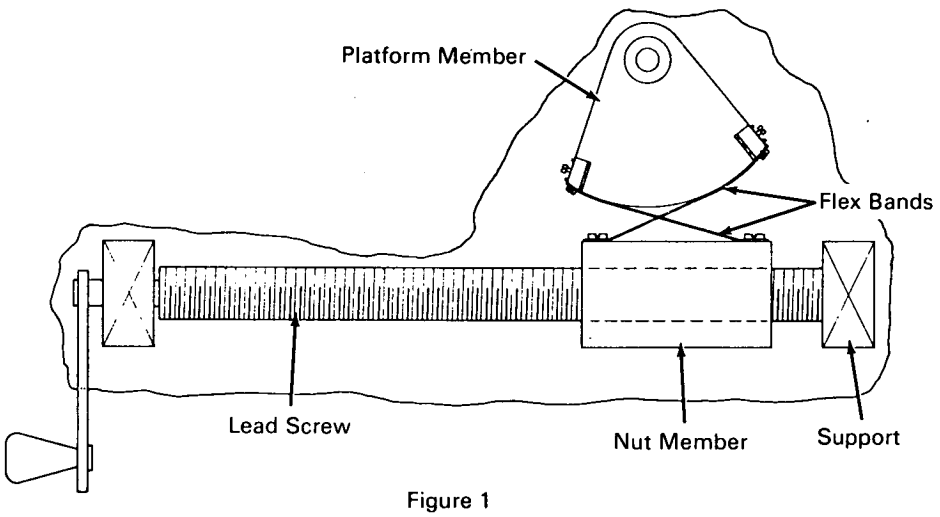

Figure 1

The problem:

Precise instrumentation such as a star tracker requires accurate and repeatable positioning within two seconds of arc.

The solution:

A rotatable, precision-finished lead screw and a fitted mating nut member are used to produce a linear translatory motion. This motion is transformed to a rotary movement of a pivotally platform member; the transformation is achieved by coupling the nut member and the platform member through a pair of opposed, taut, flex bands.

How it's done:

The rotary mechanism shown in Figures 1 and 2 comprises a precision ground lead screw which is journaled at its ends in the two supports. The precision ground and lapped nut member, mounted on the screw, has the capability of translatory movement along the axis of the screw when the latter is turned. The platform member which serves as the support for that portion of the instrument whose position is to be shifted angularly, is mounted for rotation in a horizontal plane about the vertical axis. The platform member and the nut member are coupled together by two flex bands which are made from a resilient material such as phosphor bronze. With the bands drawn taut, it is apparent that as the lead screw is rotated to translate the nut member, the platform member will be drawn about its pivot without any lost motion or play. Since the nut member is accurately fitted to the lead screw, and since precision ground lead screws have a minimum of lead error, the uniform linear translation produced by rotation of the lead screw will result in a uniform angular rotation of the platform member.

(continued overleaf)

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
NASA Pasadena Office
Pasadena, California 91103
Reference: B69-10696

Patent status:

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Source: Kenneth G. Johnson of
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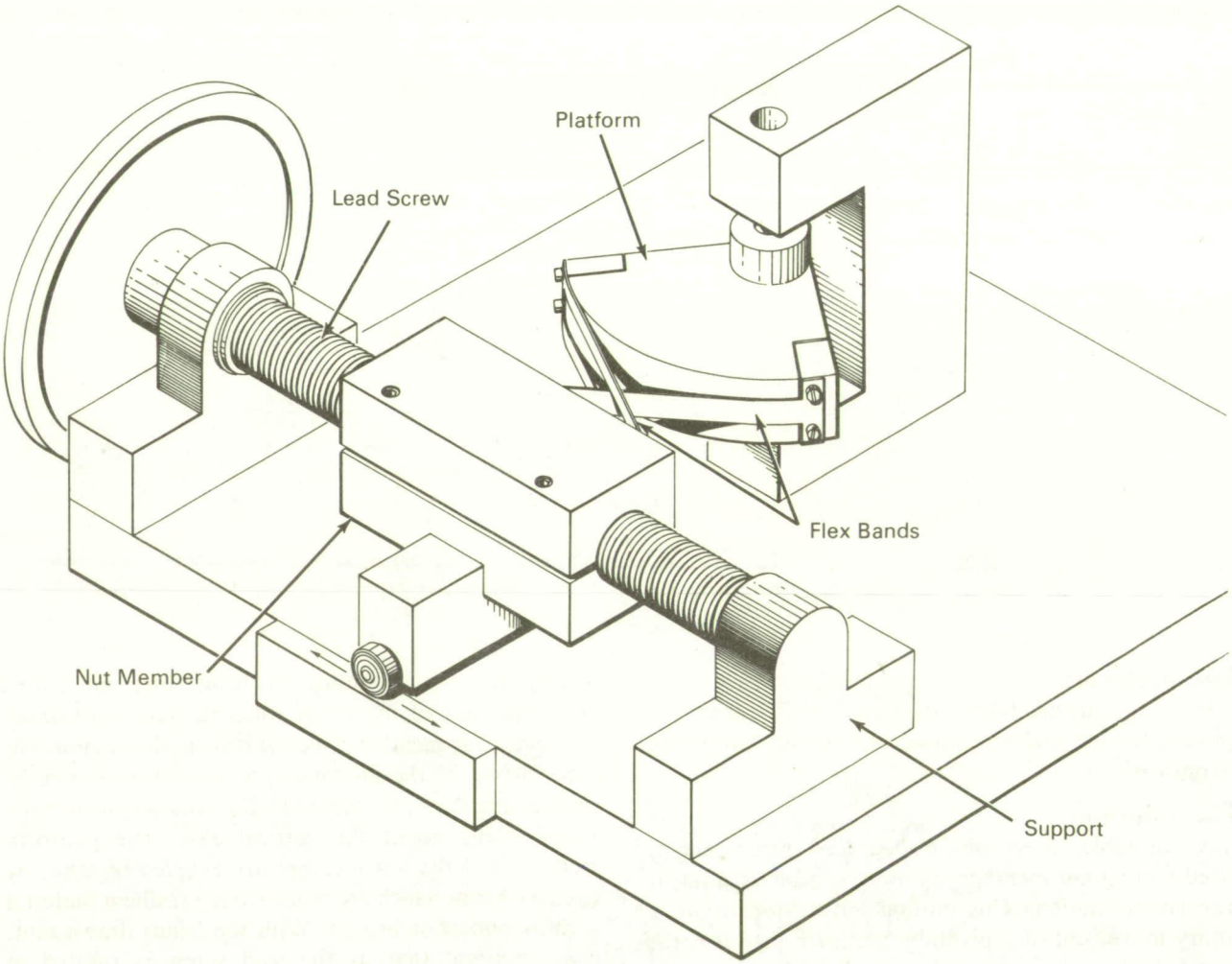

Figure 2