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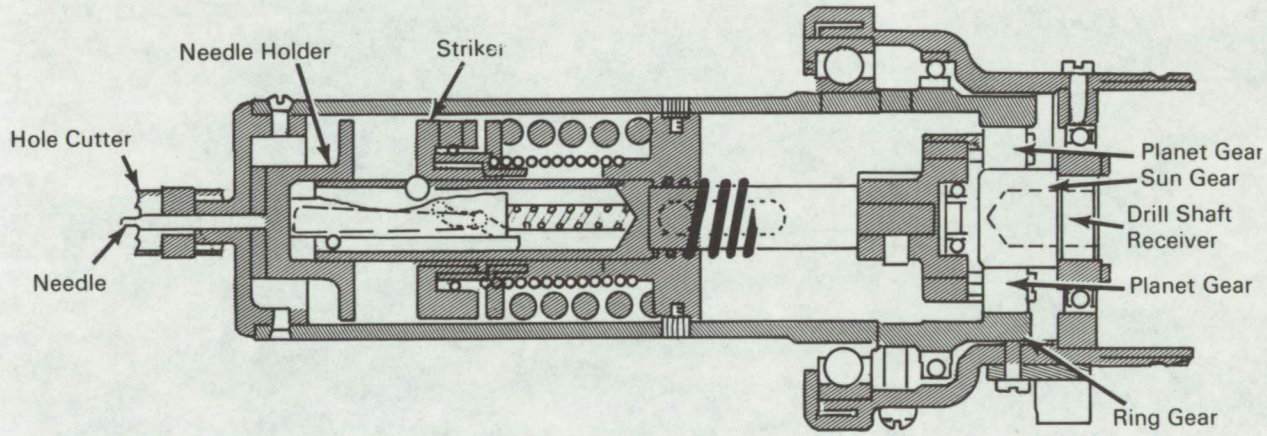
Brief 66-10604

NASA TECH BRIEF

Hole Saw Drill Attachment Has Zero Force Reaction



The problem:

Workers in space, being weightless, will propel themselves away from any workpiece that they are trying to drill, cut, or machine by application of force against a surface. In practice, physical restraint systems have been found less than ideal solutions to this problem because of their restrictive impositions on free movement by the worker.

The solution:

Zero reaction tools that require no force application by the worker. The subject tool accomplishes hole cutting by holding the workpiece and feeding the cutting blade into and through it by forces entirely absorbed within the tool.

How it's done:

The drill attachment is connected to the output shaft of a standard electric drill. A "needle" at the forward end of the attachment is forced into the workpiece by a spring loaded striker that is released by the operator. With the "needle" imbedded in the workpiece, the drill is turned on and spring tension within the attachment draws the hole saw blade and imbedded "needle" together, resulting in the hole saw cutting a circular path through the workpiece. When the hole is made, the drill and attachment are retracted and the resultant slug is removed from the "needle". Torque forces within the attachment operate in opposite directions by means of springs, detent balls, and a planetary gear arrangement in such a manner that they cancel out and the result is a zero reaction tool.

Note:

Inquiries concerning this invention may be made to:

Technology Utilization Officer
Manned Spacecraft Center
Houston, Texas 77058
Reference: B66-10604

(continued overleaf)

Patent status:

Title to this invention has been waived under the provisions of the National Aeronautics and Space Act [42 U.S.C. 2457 (f)], to the Black and Decker Mfg.; Co., Towson, Maryland.

Source: R. H. Riley, Jr.
of Black and Decker Mfg., Co.
and A. E. Holmes
of Martin-Marietta Corp.
under contract to
Manned Spacecraft Center
(MSC-543)