B72-10669

NASA TECH BRIEF

Marshall Space Flight Center

Sprag Solenoid Brake

The sprag solenoid brake (see Figures) produces approximately ten times the braking torque of similarly sized solenoid brakes and is not limited to low or medium shaft rotation speeds. The locking mechanism consists of a double set of sprags arranged alternately so that every other sprag wedges between the inner shaft and the outer housing to prevent rotation in one direction, while the remaining sprags wedge in a similar manner to prevent rotation in the opposite direction. The control member is keyed to rotate with the socket member. The sprags are mounted in the socket member so that a spring, which goes through the sprags, will pull them into contact with the outer housing, thus preventing rotation by the previously described wedging action. The sprags are disengaged when the wedge shaped control member is forced between each set of sprags pushing them apart and away from the outer housing.

The control member is spring loaded to push the sprags apart and hold them away from the outer housing when no power is applied to the solenoid (see Figure 1). This allows the socket member and shaft to rotate freely. When power is applied to the solenoid, the control member is pulled in parallel to the shaft which allows the sprags to make contact with the outer housing (see Figure 2). In this manner, the sprags act as brakes to halt rotation of the socket member and shaft.

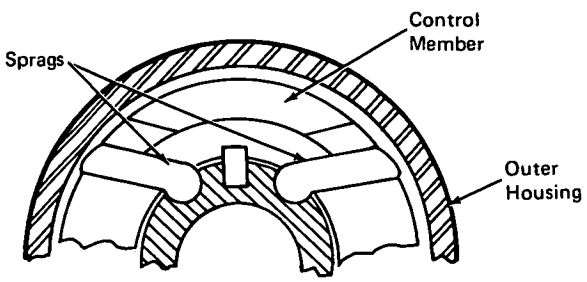

Figure 1. Brake in Freewheeling Configuration

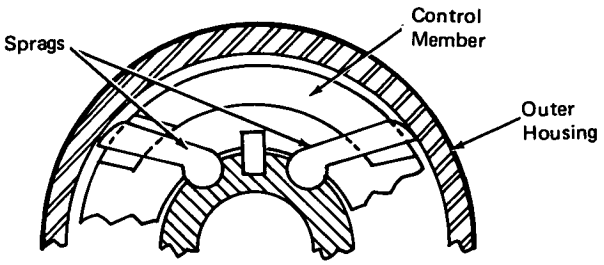

Figure 2. Brake in Locked Configuration

Thus, braking occurs when power is applied to the solenoid and free rotation otherwise. The reverse case, free wheeling with the power on and braking with the power off, can be accomplished by changing the control member to push the sprags apart when power is applied.

Notes:

1. Information concerning this innovation may be of interest to manufacturer of mechanical power equipment.
2. Requests for further information may be directed to:
   Technology Utilization Officer
   Marshall Space Flight Center
   Code A&PS-TU
   Marshall Space Flight Center, Alabama 35812
   Reference: B72-10669

Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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