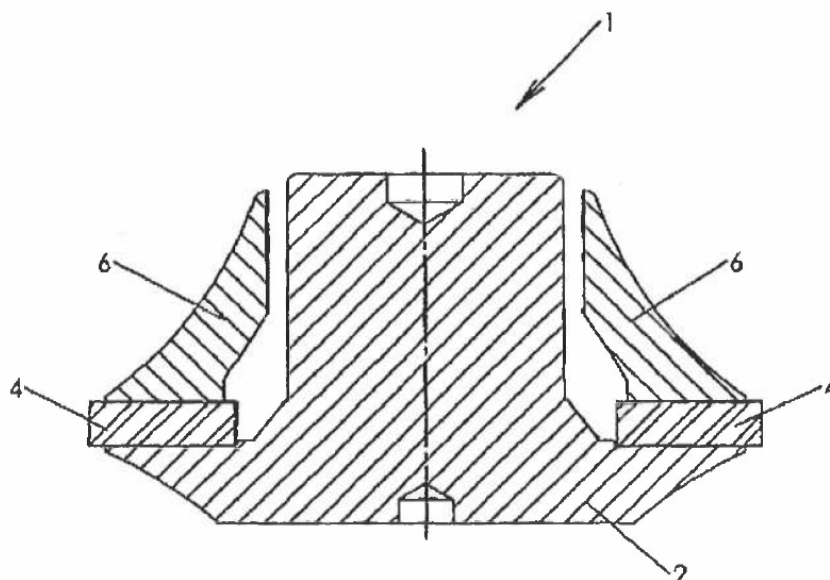


## Under-hung Magnet Assembly

Our patented under-hung magnet system technology known as “SD-3” (Symmetrical Drive) is part of Scan-Speak’s Illuminator line and a sketch of the system’s principle is shown below.

Fig 1:



This concept is part of a quest to design an ultra linear motor system. It is possible to make linear systems with traditional over-hung magnet systems, but the under-hung principle can be realized with an overall lower moving mass for the loudspeaker together with a lower inductance when combined with copper caps. Both support better transient capability and high frequencies are unimpeded by a rising voice coil inductance.

Benefits achieved with the Illuminator motor system are:

1. Linear excursion.
2. Low inductance and low inductance modulation (primarily  $L_e(x)$ ).
3. When the motor is linear, the midrange clarity is especially improved. The capability of the speaker to play multiple tones simultaneously without distortion, especially intermodulation distortion, is improved significantly.

The solution in the Illuminator design is to provide a gradual change in the thickness of the top plate combined with the step on the inside of the top plate in such a way that it comprises the desired uniform flux density throughout the air gap and a symmetric drop on both sides of the air gap.

Regarding the linearity, for example the 15WU and 18WU magnet system has a linear excursion range where the force factor drops only about 10% at +/- 9 mm.

*Europe EP: WO 2009/086838 A1. Covering USA in 2011.*