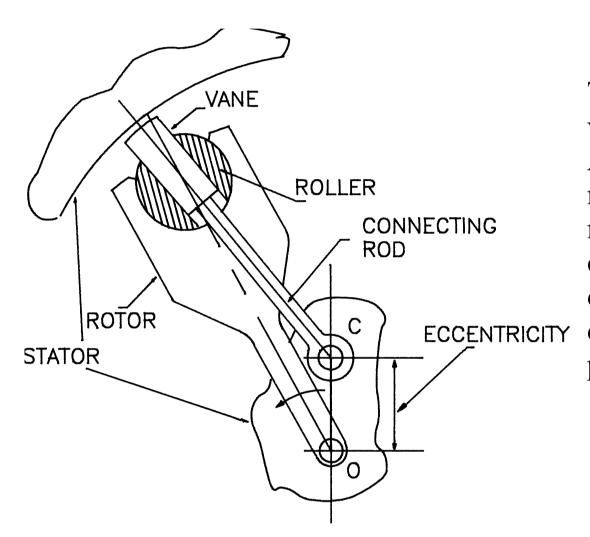
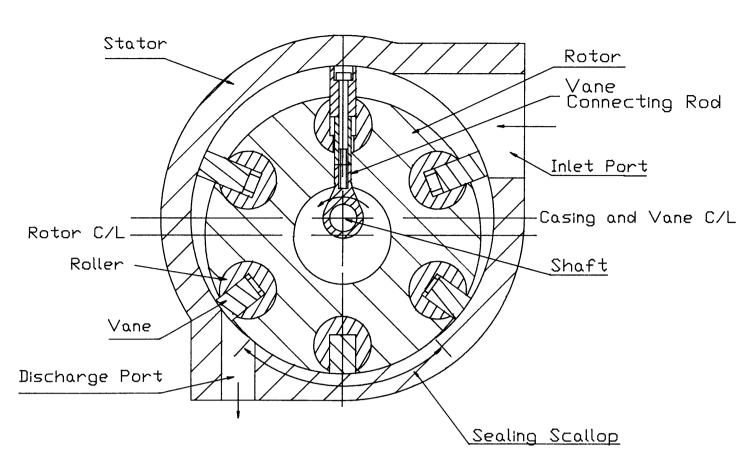
THE GROLL COMPRESSOR

Two test rigs were designed, built and operated to develop a novel compressor proposed by the late Robert Groll of Munich, Germany for Rotary Compression Systems (RCS) S.A.

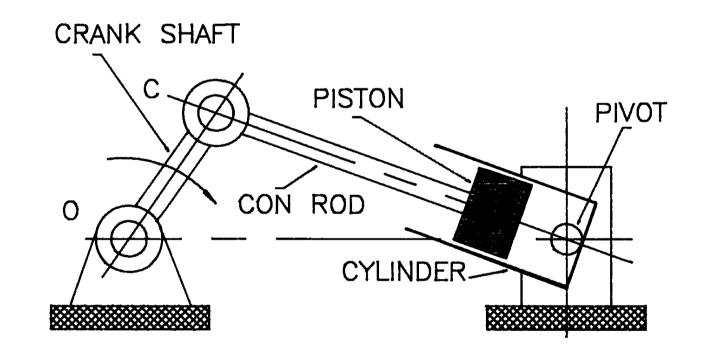
The aim was to improve on the sliding vane design by having separate centres of rotation for the rotor and vanes. By this means direct rubbing contact between the vanes and the casing is avoided. This eliminates wear and enables much higher rotational speeds to be attained. Also, thicker vanes may then be used to reduce tip leakage.



Details of the compressor are shown in the photographs. The vanes in the compressor on the test rig are made of cast iron and the rollers of bronze.



This machine is a constrained vane compressor in which the vanes rotate about a fixed centre without sliding in the rotor itself. At first sight, its motion is hard to understand but it becomes much clearer if a reverse rotation is imparted to the whole machine so that the rotor is considered as stationary and the casing as moving. Thus the Groll mechanism corresponds to an oscillating piston engine often favoured by model steam engine designers to avoid the need to construct a connecting rod which pivots at its small end, as shown in the figure below.







The programme proceeded for a little over two years and was technically highly successful. The machine on the test rig ran for 432 hours without mechanical faults and exhibited higher volumetric and adiabatic efficiencies than the conventional sliding vane machine.

