

Stirling Cycle Engines

Stirling cycle engines, named after the Rev. Stirling who patented important improvements in their design, have been around since the 1700's in their most primitive forms. They experienced considerable popularity in the mid 1800's when steam engines either did not yet exist or were very unsafe and unreliable due to the materials available at the time. Later, with cheap fuel available, internal combustion engines largely took over this space.

Today energy is anything but cheap and the time has come again for Stirling engines. These can be very efficient and can use common materials (rather than exotics) in their construction if they are suitably designed.

Moreover, Stirling engines are but one entry in a class of engines known as external combustion engines. This means the engine does not generate its own heat internally by burning a fuel, such as gasoline, but rather uses externally generated heat as its power source. This external heat furthermore may come from waste heat generated as a by-product of other commercial processes such as glassmaking, air conditioning, power plants, and hundreds of others.

Examples of other external combustion engines would include a closed cycle steam engine for example. Here water is heated to steam, used to power the engine, condensed back to water, and recycled for use again.

An external combustion engine generally operates in a closed loop manner, like the Stirling and steam engines do. Generally a gas is heated, which causes it to expand. The expansion is used to push on a surface such as a piston, and thus do work. Then the gas is cooled, causing it to contract. It is then compressed easily back to its original volume, and is ready to again begin an expansion process. This approach is not limited to use with pistons. For instance, a turbine may be operated in this manner. There are also other possibilities. Many different gasses may also be used.

We have practical experience in designing and developing these machines. We may be able to help you work out a design for your own application. If that application is unique in some manner, then it may also be patentable. If you are interested in this field, please give us a call or send us an email.