

Inline Twin-Piston Engine

General

The invention relates to a four-stroke internal combustion engine, designed as a twin-piston engine according to the inline principle. Here two pistons sliding one inside the other move in a working cylinder. In the functional diagram of the conventional four-stroke engine the residual pressure is not exploited during the working cycle but is rather lost via the exhaust system even if it is of a very elaborate design. This problem is not only present with engines having an older design.

Prior Art

In a four-stroke internal combustion engine the cycle operates according to the known four strokes. Due to the constant surface area of the working piston and the requisite opening of the exhaust valve prior to the lower dead centre of the piston stroke in the working cycle, exhaust gas that is still compressed leaves the cylinder space without being used for generating a torque. Designs are known where counter pistons achieve the largest possible constancy of the compression in that own crank drives are connected via a transmission or by using pistons that slide one inside the other.

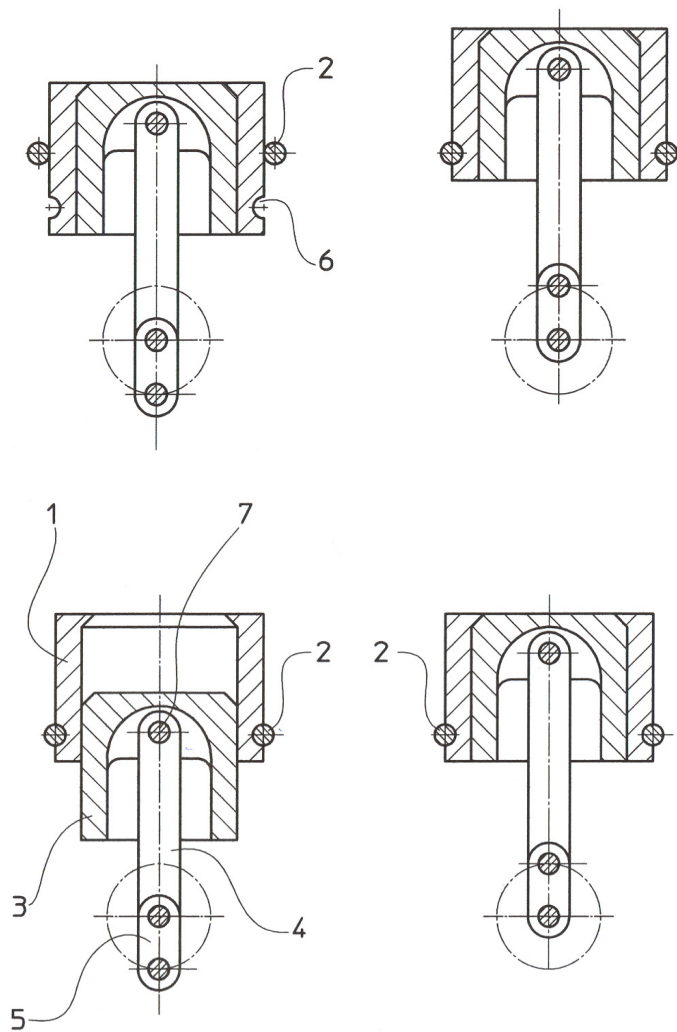
The invention

It consists of a twin-piston engine that uses the residual volume in the working cycle to increase the torque and that does not require any additional mechanical parts in the force-transmission region. The entire working piston consists of two pistons 1 and 3 lying one inside the other. During the intake stroke the inner, small piston 3 draws in the fuel-air mixture, while the upper, big piston 1 remains at the upper dead centre. The compression is also carried out by the small piston 3. During the working stroke the upper piston 1 is unlocked by the inner locking ring 2 so that the pair of pistons 1, 3 with the entire, i. e. enlarged piston surface area can be used for converting the pressure energy into kinetic energy. During the exhaust stroke the outer piston 1 is again lifted into its original starting position by the inner piston so that the locking ring 2 ends up in the locking groove 6.

Market potential

Simulations have shown that the friction can be expected to remain constant despite an increase in the number of moving parts in the engine, that non-uniform running properties of the engine are attenuated by the invention and also the emission of CO₂ is reduced slightly. Therefore in the age of electromobility there may be a market opportunity for the inline twin-piston engine.

Function diagram



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