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(71) Applicant
Uni-Cardan Aktiengesellschaft (FR Germany),
Alte Lohmarer Str 59, 5200 Sieburg, Federal Republic of Germany

(72) Inventor
Bernard Bihr

(74) Agent and/or Address for Service
G M Dodd, B C Robertson, B Thorpe,
Guest Keen and Nettlefolds plc, Group Patents and Licensing Department, P O Box 55, Ipsley House, Ipsley Church Lane, Redditch, Worcestershire B98 0TL

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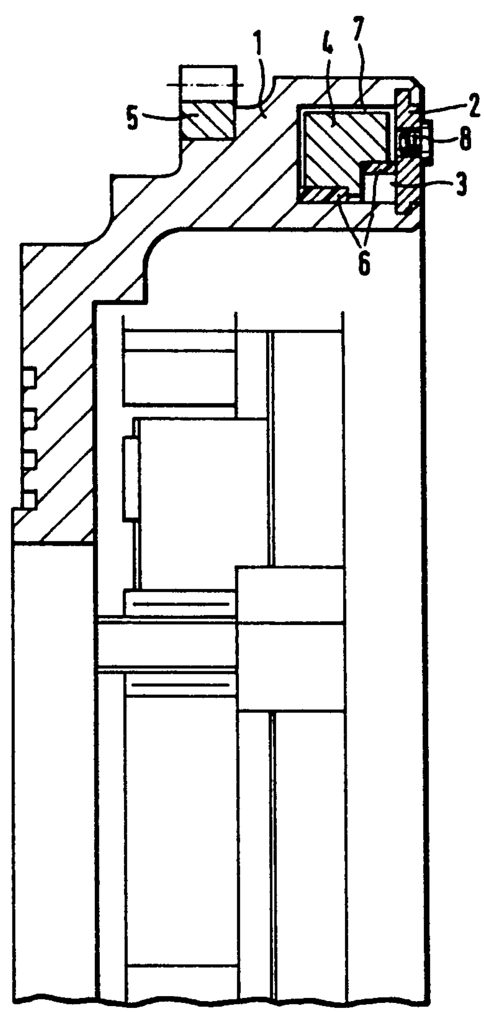
(54) Torsional vibration damper

(57) A torsional vibration damper comprises a flywheel for an internal combustion engine, with a cavity 3 defined in a radially outermost part 1 of the flywheel, containing a flyring 4. A viscous medium is contained in the gap 7 between the flyring and the walls of the cavity 3, to provide damping by shearing in the viscous medium when relative rotation between the flywheel and flyring occurs. The damper is thus provided in the flywheel itself rather than in a separate damper unit.



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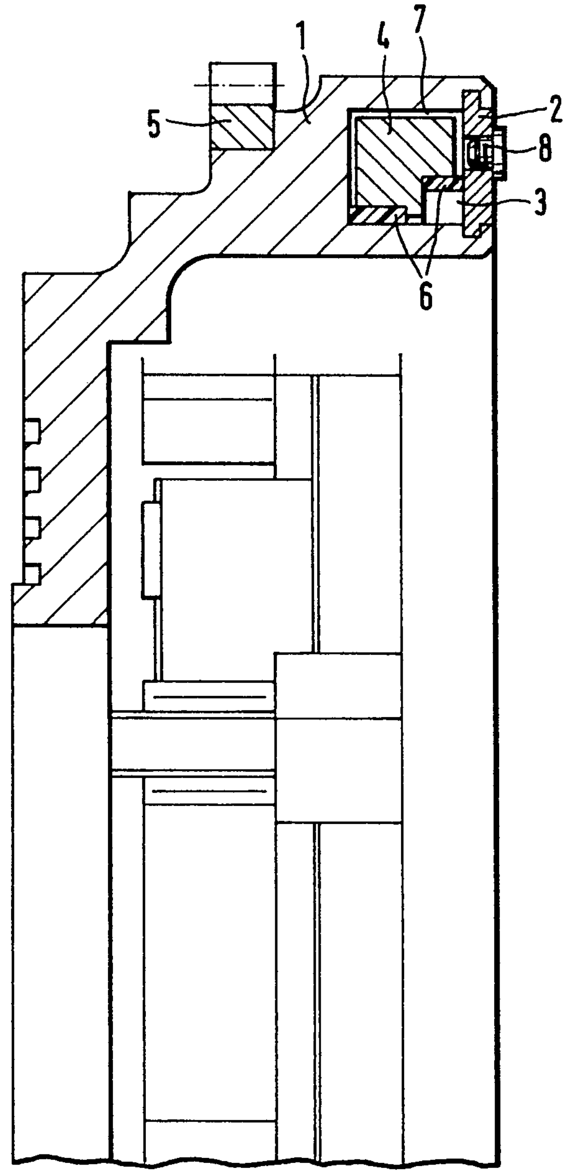

SPECIFICATION

Torsional vibration damper

This invention relates to a torsional vibration damper, for use in damping torsional vibration in the crankshaft of an internal combustion engine. The invention is particularly, although not exclusively, applicable to motor vehicle engines.

A known form of torsional vibration damper comprises a housing, e.g. a hub, adapted to be fitted to the rotary element in which vibration is to be damped, the housing defining an annular cavity within which is contained an annular inertia member (hereinafter termed the flyring) able to move angularly relatively to the housing, the remaining space in the cavity being filled with a viscous medium. The viscous medium damps relative angular movement between the housing and element therein, thereby damping torsional vibration in the rotary part to which the housing is attached.

An example of such a damper for an internal combustion engine is disclosed in DE–OS 2644808. A disadvantage of this damper is that it comprises a separate housing unit which requires to be connected to the engine. As a result, the weight of the engine is increased as is the space occupied thereby. This is undesirable for motor vehicle application, where an increase in weight leads to an increase in fuel consumption, and hence light weight and compactness are desirable.

It is an object of the present invention to provide a torsional vibration damper which is incorporated in existing engine components, and hence does not have the above disadvantages attendant on separate dampers, nor require any changes in engine design.

According to the invention, we provide a torsional vibration damper in the form of a flywheel for an internal combustion engine, having a cavity containing an inertia member, guided for angular movement relative to the flywheel about the rotational axis thereof, and a viscous medium.

An advantage of disposing the torsional vibration damper in the flywheel, apart from that of not requiring a separate damper unit, is that the damping takes effect at the point where the power of the engine is delivered.

Preferably the inertia member comprises a flyring disposed in an annular cavity in a radially outermost region of the flywheel.

The invention will now be described by way of example with reference to the accompanying drawing, which is a diagrammatic section through part of a flywheel according to the invention.

The illustrated flywheel is adapted to be connected to the crankshaft of an internal combustion engine in known manner, e.g. by bolts, and to have a clutch assembly (shown diagrammatically in outline in the drawing) connected to it also in known manner. The flywheel is of somewhat cup-shaped configuration, and in its radially outermost part 1 is provided with an annular recess 3. The recess is closed by an annular cover 2 fitted to the flywheel and held in place, e.g. by deformation of the flywheel. The cover 2 has a screwed filler plug 8, which provides for introduction of a suitable viscous medium into the cavity 3.

Within the cavity 3 there is disposed an inertia member in the form of a flyring 4, freely rotatable relative to the flywheel. Guiding rings 6, e.g. of plastics material, guide the flyring 4 in such a way that it cannot contact the walls of the cavity 3. The viscous medium fills the gap 7 between the flyring and the walls of the cavity. It will be appreciated that relative rotational movement between the flywheel and flyring 4 causes shear in the viscous medium filling the cavity 3, thereby exerting a torsional damping effect.

The flywheel carries a starter ring gear 5 in known manner.

Because the flyring 4 is disposed in a radially outermost region of the flywheel, its damping effect on torsional vibration is maximized, without the complications of providing a separate damper as above described.

CLAIMS

1. A torsional vibration damper in the form of a flywheel for an internal combustion engine, having a cavity containing an inertia member, guided for angular movement relative to the flywheel about the rotational axis thereof, and a viscous medium.

2. A flywheel according to Claim 1 wherein said inertia member comprises a flyring disposed in an annular cavity in a radially outermost region of the flywheel.

3. A flywheel for an internal combustion engine, substantially as hereinbefore described with reference to the accompanying drawing.

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