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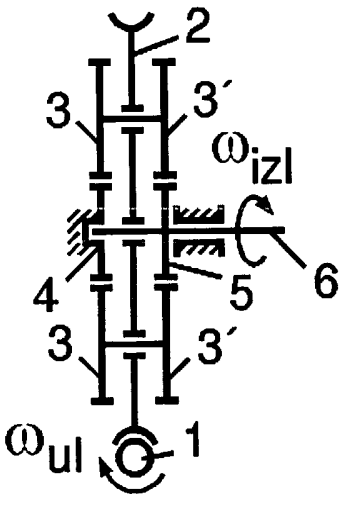
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(54) Title: WORM-PLANETARY GEAR TRAIN WITH HIGH TRANSMISSION RATIO



(57) Abstract: The invention represents a combination of a worm gearing and a planetary gear train that are not connected in series, which is standard with combined gear trains, but the output member of the worm gearing is the input member of the planetary gear train at the same time so that a compact construction is achieved.The rotation of a worm (1) with the angular velocity in is transmitted to a worm wheel (2), which is in mesh with the worm (1). The worm wheel (2) rotates on an output shaft (6) and acts as a carrier of planet gears (3, 3') in the planetary gear train. One central gear (4) is fixed and the other, a central gear (5), is fastened to the output shaft (6). The central gear (5) transmits the rotation with the angular velocity out to the output shaft (6). A high transmission ratio is realized with a convenient selection of the gear parameters of the planetary gear train.

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WORM-PLANETARY GEAR TRAIN WITH HIGH TRANSMISSION RATIO

Field of application

The invention refers to the field of mechanical engineering, more precisely to the field of gear trains for rotary motion transmission, with two central gears in mesh by means of planet gears, and with the designation according to the international patent classification: **F 16 H 1/36**.

Technical problem

The invention solves the problem of the realization of a gear train with high transmission ratio and also compact construction, favourable dynamic characteristics and simple manufacture.

State of engineering

Different types of gear trains with high transmission ratios in use are mostly composed of serial connected worm gearings, planetary gears or their combinations. Their main disadvantages are non-compact construction and large dimensions. The realization of special gear trains (cyclo drive or harmonic drive, for example) requires exceptionally high technological facilities.

Essence of invention

The invention is a combination of a worm gearing and a planetary gear train, which are not serial connected, as is usual with combined gear trains, but the output member of the worm gearing is the input member of the planetary gear train at the same time. By such integration of the members, the kinematic chain becomes shorter and a compact construction is attained. The rotation speeds of gears in the planetary gear train are considerably reduced so that dynamic characteristics are improved. It is necessary to use only standard processes for the realization of this worm-planetary gear train.

Short description of figures

Schematic presentations of the invention are given in outline:

Figure 1: Worm-planetary gear train with external gearing and two-side output shaft

Figure 2: Worm-planetary gear train with internal gearing

Figure 3: Worm-planetary gear train with one-side output shaft

Detailed description

Figures 1, 2 and 3 show schematic presentations of the variants of the suggested worm-planetary gear train with high transmission ratio. This gear train consists of a worm gearing (members 1, 2) and a planetary gear train (members 2, 3, 3', 4, 5).

The rotation of a worm (1) with the angular velocity ω_{in} is transmitted to a worm wheel (2), which is in mesh with the worm (1). The worm wheel (2) rotates on an output shaft (6) and acts as a carrier of planet gears (3,3') in the planetary gear train. One central gear (4) is fixed and the other, a central gear (5), is fastened to the output shaft (6). The central gear (5) transmits the rotation with the angular velocity ω_{out} to the output shaft (6). A high transmission ratio is realized with a convenient selection of the gear parameters of the planetary gear train.

Industrial and other applications

The invention represents a gear train with high transmission ratio that can be used individually or in combination with an electric motor as a built-in drive unit for general application.

PATENT REQUEST

The worm-planetary gear train with high transmission ratio consists of a worm (1), a worm wheel (2) and a planetary gear train that is composed of planetary gears (3,3'), which are fastened to each other, a stationary central gear (4) and an output central gear (5) **marked by that** the worm wheel (2) is a carrier of the planet gears (3,3') at the same time and rotates on a two-side supported output shaft (6), which passes through the stationary central gear (4) and is fastened to the output central gear (5).

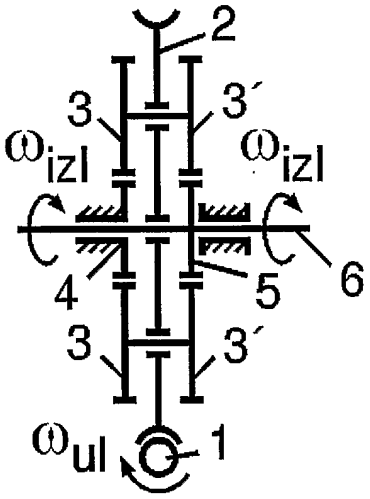


Figure 1

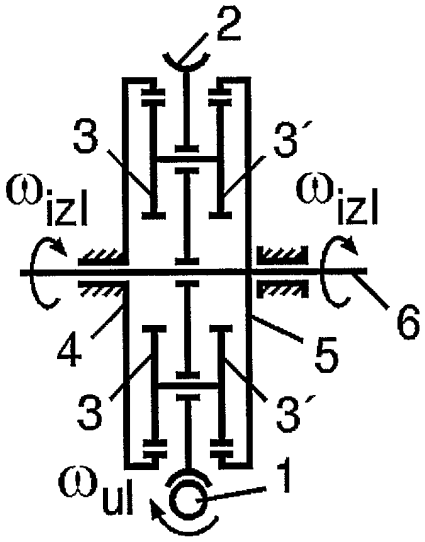


Figure 2

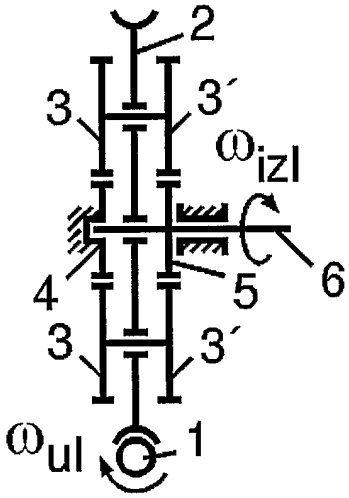


Figure 3