PATENT SPECIFICATION

278,427

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PROVISIONAL SPECIFICATION.

Improvements in Unidirectional Driving Devices.

I, GEORGE CONSTANTINESCO, British subject, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, do hereby declare the nature of this invention to be as follows:—

This invention relates to unidirectional driving devices for converting oscillatory angular motion into intermittent rotation in one direction.

The invention consists in interposing between a cylindrical oscillator and a cylindrical rotor which are coaxial, a number of rollers whose axes are parallel to the common axis of the oscillator and rotor, so that the rollers form pairs, the members of each pair being always in contact with one another, and one member being in contact with the oscillator and the other with the rotor. The sum of the diameters of the two rollers in a pair is slightly greater than the radial width of the gap between the oscillator and rotor in which the pair is lodged, so that the plane containing the lines of contact between the rollers and the cylindrical surfaces of the rotor and oscillator and the common normal plane of the rollers do not contain the common axis of rotation of the rotor and oscillator. The whole of the rollers in fact constitute an inner and an outer set in staggered relation.

By acting upon the rollers by suitable springs the arrangement described will permit relative angular motion between the oscillator and rotor only in one direction, while in the other the system will be locked provided that the angles between the plane passing through the lines of contact with the rotor and oscillator and the planes passing through such lines and the axis of rotation are not greater than the angle of friction between the materials used for rollers and their tracks.

In a practical arrangement of the invention several pairs of rollers are used in adjacent groups in such a way that suitable gaps are obtained between the pairs so that flat springs can be used to press the rollers in each pair in the right direction for maintaining the contact. The inner row of rollers is crowded together so that the rollers touch one another, the outer row taking its own position after the insertion of the springs. Distance pieces are used to fill the gaps in the outer row of rollers. These distance pieces may be in the form of suitably shaped loose blocks or simply loose small rollers.

In order to ensure that the cylindrical tracks on the oscillator and rotor shall be coaxial, a few large rollers may be fitted as carriers so that the pairs of gripping rollers are divided into several uniformly distributed groups. It is not essential that the rollers in each pair shall be of the same diameter. Provided that the sum of their diameters is within a few per cent. larger than the cylindrical gap between the rotor and oscillator, the apparatus will work as aforesaid. For instance, if the diameter of the outer row of rollers is made larger than the inner row by a suitable amount, the rollers of the outer row also touch one another. In this case the distance pieces between the rollers can be entirely omitted.

Dated the 5th day of July, 1926.

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[Price 1/-]

COMPLETE SPECIFICATION.

Improvements in Unidirectional Driving Devices.

I, GEORGE CONSTANTINESCO, British subject, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention consists in unidirectional driving devices in which the drive between an oscillating member and a concentric unidirectionally driven rotor member is effected by pairs of rollers which occupy a space left between the oscillator and the rotor. The sum of the diameters of the members of each pair of rollers is somewhat greater than the radial width of this space, so that the line between their centres is not radial to the oscillator and rotor. If suitable pressure be applied, as by springs, tending to force the members of each pair of rollers into contact with the oscillator and rotor and with each other, the oscillator will drive the rotor in one direction but not in the other provided that the frictional forces between the surfaces are properly adjusted. Distance pieces may be introduced at suitable intervals between the oscillator and the rotor and/or between the members of adjacent pairs of rollers, and the oscillator may be mounted on the rotor shaft by means of elastic rollers.

Referring to the drawings, Figure 1 is a diagram showing the action of a single pair of rollers, Figure 2 is a cross section of an embodiment of the invention in which distance pieces are applied between the rotor and oscillator and between members of the outer set of rollers, Figure 3 is a cross section of another embodiment in which the outer members of each set of rollers are in contact and the oscillator is resiliently mounted on the rotor shaft.

Referring to Figure 1, 1 indicates a rotor member and 2 an oscillating member having a common centre 3. The space between the two is occupied by rollers 4, 5, the sum of whose diameters is slightly greater than the radial width of the space, so that their line of centres is not radial. If now the aggregate diameter of the rollers be properly taken in relation to the friction between the surfaces and constant pressures be applied in the direction of the short arrows the oscillator will cause the rollers to jam together when it turns in the direction of the curved arrow, and the rotor will be driven in the same direction. The rollers will, however, be freed when the oscillator turns in the other direction.

Figure 2 is a cross-sectional view of one embodiment of the invention. 1 is a rotor keyed or otherwise secured by means (not shown) on a central shaft 6 upon which an oscillator 2 is mounted so as to be free to turn. The oscillator is given a to-and-fro rotary motion by any external means (not shown). A space is left between the rotor and the oscillator, which space is occupied by concentric sets of rollers 4, 5, arranged in pairs after the manner indicated in Figure 1. Between the inner member 4 of each pair and the outer member 5 of the next pair is inserted a spring 7 preferably in the form of a plate bent into U-shape. The springs are arranged so as to tend to jam the members of the several pairs together against each other and outwards or inwards as the case may be against the rotor and oscillator. 8 are distance rollers distributed at suitable intervals round the space between the oscillator and rotor and occupying its full width. The members of the outer set of rollers may also be provided with distance pieces shown for purposes of illustration as wedge-shaped at 9, and as balls or rollers at 10.

Figure 3 is a similar view to Figure 2 of another embodiment. In this case both sets of rollers occupy the whole space between the oscillator and rotor, distance pieces being dispensed with, and only a working clearance allowed. The oscillator is not mounted directly upon the rotor shaft 6, but upon elastic rollers 11 which are interposed between them. These rollers are preferably hollow in order to increase their elasticity, and their object is to compensate for any slight irregularities in the size of the gripping rollers 4, 5, or in the adjacent surfaces of the oscillator or rotor, which would result in setting up unsymmetrical lateral pressures.

Having now particularly described and ascertained the nature of my said inven-

tion and in what manner the same is to be performed, I declare that what I claim is:—

1. Unidirectional driving devices comprising an oscillating member and a concentric unidirectionally driven rotor member, an annular space being left between the two members, such space being occupied by pairs of contacting rollers of larger aggregate diameter than the width of the said space measured radially, and means for applying pressure to the members of each pair of rollers tending to force them against the oscillator and rotor respectively, thereby pressing the rollers together, substantially as described.

2. Unidirectional driving devices as claimed in Claim 1, in which the members of each pair of rollers form two concentric sets, springs being interposed between the inner members of each pair and the outer members of the adjacent pair, such springs pressing the inner members in the driving direction and the outer members in the opposite direction, substantially as described.

3. Unidirectional driving devices as claimed in Claim 2, in which distance rollers are situated at intervals in the space between the oscillator and rotor, the diameter of the rollers being equal to the width of the space between the oscillator and rotor measured radially, substantially as described.

4. Unidirectional driving devices as claimed in Claim 2 or 3, in which distance pieces are interposed between the adjacent members of the outer set of rollers, substantially as described.

5. Unidirectional driving devices as claimed in Claim 2, in which the adjacent members of the outer set of rollers are in contact, substantially as described.

6. Unidirectional driving devices as claimed in any of the preceding claims, comprising a shaft upon which the rotor is secured and upon which the oscillator is mounted, and elastic antifriction rollers interposed between the said shaft and the oscillator, substantially as described.

7. Unidirectional driving devices substantially as described with reference to the accompanying drawings.

Dated the 22nd day of September, 1926.

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Fig. 1.

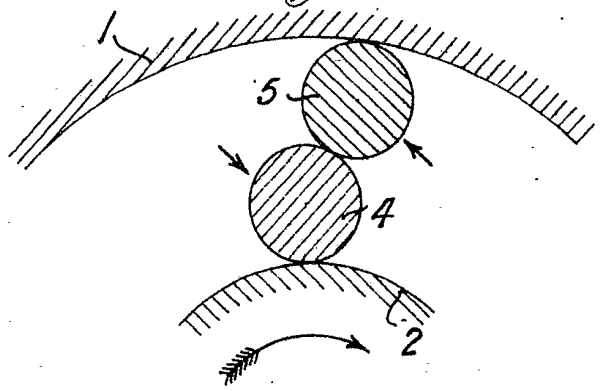


Fig. 2.

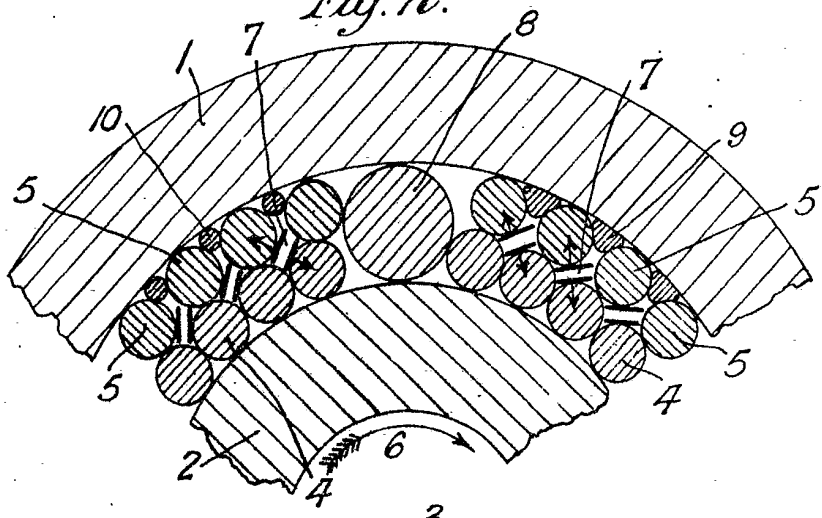
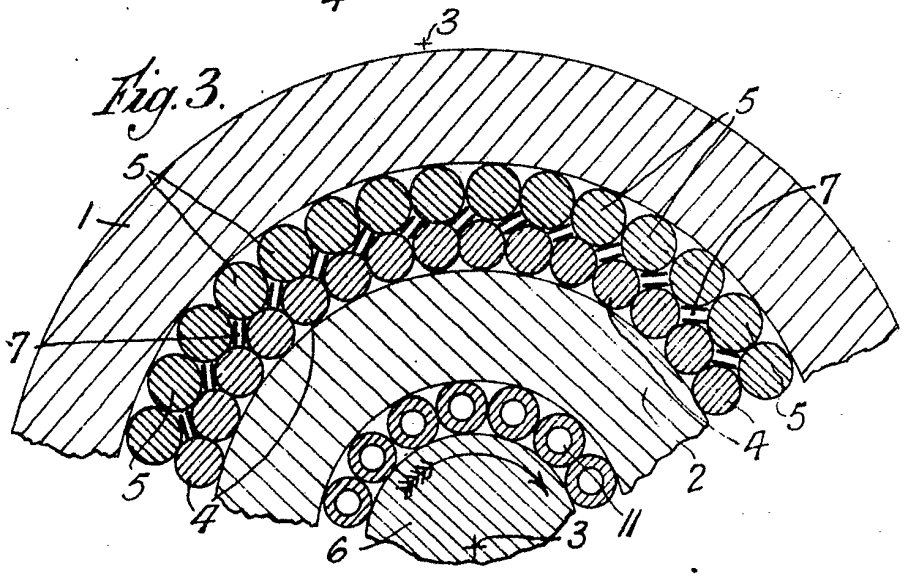


Fig. 3.



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