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[56] **References Cited**
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[54] **POLARIZED MICROMOTOR**
6 Claims, 2 Drawing Figs.

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 310/27
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ABSTRACT: A polarized micromotor, including at least one flat coil, cooperating with at least one magnetic circuit consisting of one pair of permanent magnets and two pairs of polar pieces, characterized in that the magnets have their magnetizing axes perpendicular to the axis of the coil and are arranged in the close vicinity of said coil, the fields of the magnets being parallel to each other and of opposite senses, the polar pieces being fixed to the faces constituting the poles of the magnets and covering the latter without extending beyond them.

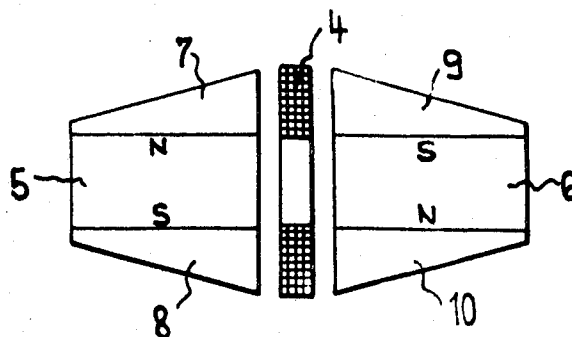


FIG. 1

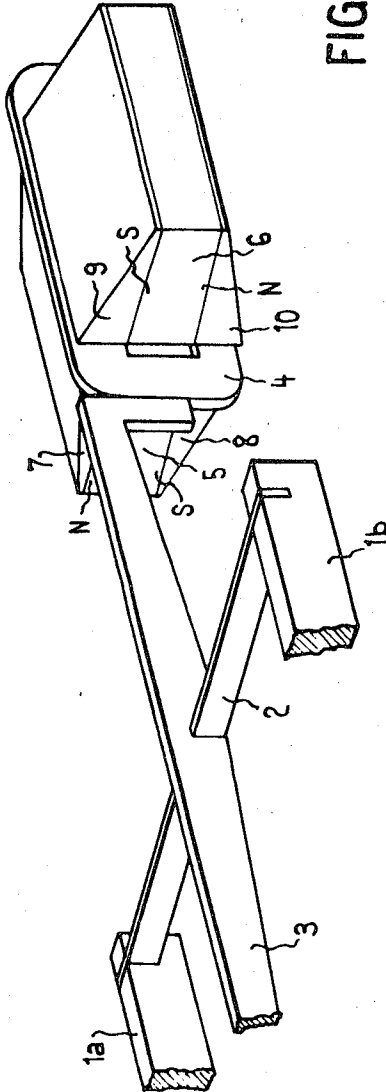
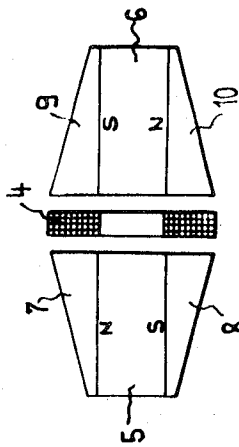


FIG. 2



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POLARIZED MICROMOTOR

The present invention relates to a polarized micromotor.

The conventional magnetic circuits include polar pieces which are rather long with respect to the length of the permanent magnets. When short magnets, but having a very strong coercitive field, such as platinum-cobalt magnets, are used, the losses due to the proximity of the polar pieces between one another, fixed to each pole of the magnets, become very important and the field in the airgap is accordingly reduced.

The invention aims at overcoming these drawbacks. The micromotor according to the invention includes at least one flat coil, stationary or movable, cooperating with at least one magnetic circuit, movable or stationary respectively, consisting of one pair of permanent magnets and two pairs of polar pieces, and is broadly characterized in that the magnets have their magnetizing axes perpendicular to the axis of the coil and are arranged in the close vicinity of said coil, the fields of the magnets being parallel to each other and of opposite senses, the polar pieces serving for canalizing the field through the coil being fixed on the faces constituting the poles of the magnets and covering the latter without extending beyond them.

The accompanying drawing illustrates, by way of example, an embodiment of the invention.

FIG. 1 is a perspective view of said embodiment.

FIG. 2 is a cross-sectional view of the electromagnetic device.

FIG. 1 illustrates a portion of a frame the legs 1a and 1b of which present a certain elasticity. The elastic portion of the micromotor consists of a plane torsion blade 2. The torsion blade 2 is embedded at its both ends in the legs 1a and 1b of the frame, and carries in the middle thereof the mass portion, which is formed by a rigid bar 3, distributed on both sides of the torsion blade 2. At the ends of the bar 3 are respectively fixed a flat coil 4 and a counterweight (not shown) in such a manner that a static equilibrium is obtained about the axis of the torsion blade 2.

The coil 4 is electromagnetically connected with a stationary magnetic circuit consisting of one pair of permanent magnets 5, 6 and two pairs of polar pieces 7, 8 and 9, 10. This electromagnetic device is controlled by a very stable oscillator, for instance a quartz oscillator.

The magnets 5 and 6 have their magnetizing axes perpendicular to the axis of the coil 4 and are arranged in the close vicinity of said coil, the fields of the magnets 5 and 6 being parallel to each other and of opposite senses. More precisely, the magnet 5, having the shape of a parallelepiped, is magnetized vertically, its N pole being at the top and its S pole being at the bottom. As concerns the magnet 6, it has the same shape as the magnet 5 and is also magnetized vertically, but its

N pole is at the bottom and its S pole is at the top.

The polar pieces 7, 8 and 9, 10 serving for canalizing the field through the coil 4 are fixed on the faces constituting the poles of the magnets 5 and 6 and cover the latter without extending beyond them. Thus, the polar pieces 7 and 8 are respectively fixed on the faces constituting the N and S poles of the magnet 5, whereas the polar pieces 9 and 10 are respectively fixed on the faces constituting the S and N poles of the magnet 6. Each of the polar pieces 7 to 10 has the shape of a prism whose base is quasi triangular, its thickness tapering from the coil 4, so as to avoid as much as possible the dispersion of the lines of force.

In the example described, the coil 4, carried by the oscillating bar 3, is movable, whereas the magnetic circuit is stationary. It would, however, be possible to have an inverse arrangement, in which the coil would be stationary and the magnetic circuit would be movable.

What is claimed is:

1. A polarized micromotor, including at least one flat stationary coil, cooperating with at least one movable magnetic circuit, consisting of one pair of permanent magnets and two pairs of polar pieces, characterized in that the magnets have their magnetizing axes perpendicular to the axis of the coil and are arranged in the close vicinity of said coil, the fields of the magnets being parallel to each other and of opposite senses, the polar pieces serving for canalizing the field through the coil being fixed on the faces constituting the poles of the magnets and covering such faces without extending beyond said magnets in a direction parallel to said faces.

2. A micromotor according to claim 1, wherein the magnets have the shape of parallelepipeds.

3. A micromotor according to claim 1, wherein each of the polar pieces has approximately the shape of a triangular prism, its thickness tapering from the coil.

4. A polarized micromotor, including at least one flat movable coil, cooperating with at least one magnetic stationary circuit, consisting of one pair of permanent magnets and two pairs of polar pieces, characterized in that the magnets have their magnetizing axes perpendicular to the axis of the coil and are arranged in the close vicinity of said coil, the fields of the magnets being parallel to each other and of opposite senses, the polar pieces serving for canalizing the field through the coil being fixed on the faces constituting the poles of the magnets and covering such faces without extending beyond said magnets in a direction parallel to said faces.

5. A micromotor according to claim 4, wherein the magnets have the shape of parallelepipeds.

6. A micromotor according to claim 4, wherein each of the polar pieces has approximately the shape of a triangular prism, its thickness tapering from the coil.

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