material such as the FINEMET FT-3H nanocrystalline soft magnetic material available from Hitachi. The invention is not limited in this regard, however, as alternative materials, including laminated materials, may be used.

The connections of the primary magnetic path **404** to the two loops **400**, **401** create four segments apart from the magnetisable member **404E**, the four segments including two opposing segments **A, B** in the first loop on either side of magnet **402**, and the two opposing segments **C, D** in the second loop on either side of magnet **403**.

Four magnetic flux switches are provided, each being operative to control the flux through a respective one of the four segments. A controller **420** is operative to activate the switches associated with segments **A** and **D**, and then **B** and **C**, alternately, thereby reversing the flux through the member **404E**, and so, inducing electrical current in coil **430**.

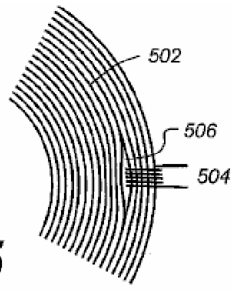


Fig - 5

Apertures may be formed through each of the four segments, with the switches being implemented by coils **410A** to **410D** which pass through the apertures and around an outer (or inner) portion of each segment. As shown in **Fig.5**, if the loops are fabricated with laminated material **502**, the laminations may be split at **506** to accommodate coil **504**. The percentage of the segment surrounded by the coil may vary in accordance with the material used, the waveforms presented to the coils, and other factors, with the goal being to magnetically saturate each segment through activation of the associated switch, thereby reversing the flux through path **404E**.

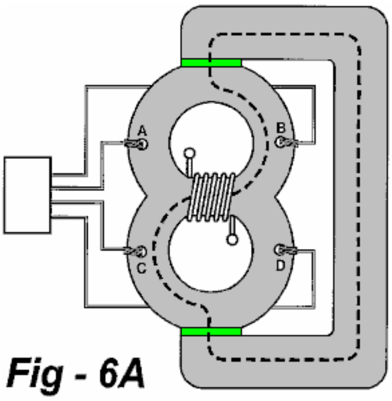


Fig - 6A

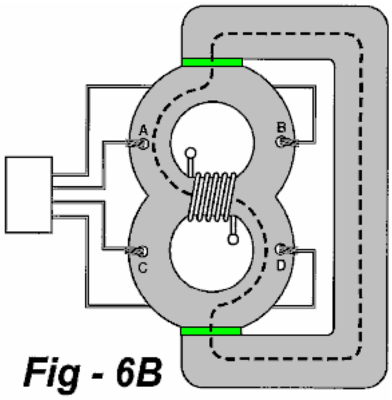


Fig - 6B

Fig.6A and **Fig.6B** show the operation of the apparatus of **Fig.4**. The primary path **404** carries the flux from permanent magnets **402** and **403** unidirectionally. Reluctance switches **410A** to **410D** are activated alternately to reverse the flux in segment **404E** which, in turn, induces electrical current in winding **430**. **Fig.6A** shows the flux flow in one direction, and **Fig.6B** shows it flowing in the opposite direction.

In **Fig.6A**, switches **410A** and **410D** are activated by controller **420** in electrical communication with the windings on the switches, such as through conductors **422** to switch **410B**. The flux provided by switches **410A** and **410D**, thereby saturating these paths, causing the flux through segment **404C** to be in the direction shown. In **Fig.6B**, switches **410B** and **410C** are activated, saturating segments **404B** and **404D**, thereby reversing the flux through path **404E**.

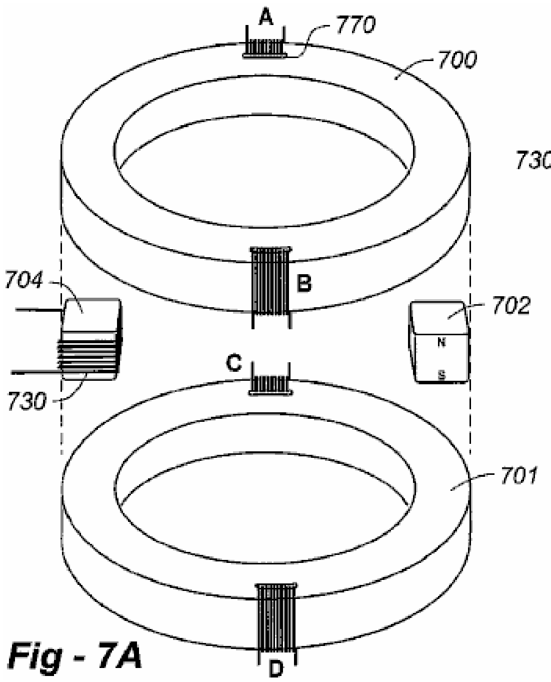


Fig - 7A

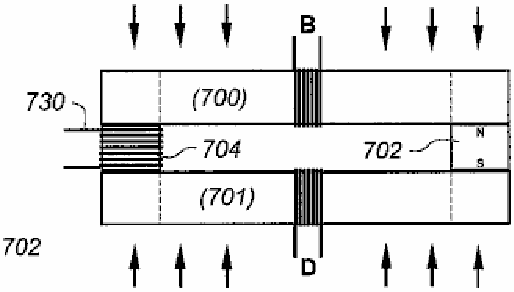


Fig - 7B

Fig.7A depicts a preferred construction of the apparatus depicted in **Fig.4**, **Fig.6A** and **Fig.6B**. Loops **400** and **401** are implemented as complete toroids **700**, **701**. This is important, since preferred high-performance magnetic materials are currently available in regular shapes of this kind. Note that, in this case, curved slots such as **770** are formed through the sides of each toroid to implement flux switches **A** to **D**. The magnetisable member in this embodiment is implemented with a block of material **704**, preferably the same high-performance magnetic material used to construct loops **400**, **401**. Permanent magnet **702**, shown at **702**, preferably has the same length as block **704**, enabling the various constituent parts to be held together with compression, shown in **Fig.7B**.

The following sections summarise some of the important characteristics of the preferred embodiments:
In terms of materials, the apparatus benefits from the use of nanocrystalline material with a “Square” BH intrinsic curve, a high Br (remanence) which is about 80% of its Bs (saturation), a low Hc (coercivity), and a fast magnetic response time to saturation. An example is FineMet FT-3H from Hitachi of Japan, which has a Br of 1.0 Tesla, a Bs (saturation) of 1.21 Tesla, a time to saturation (Bs) of 2 usec, and an Hc of −0.6 amp-turns/meter.

Modern permanent magnets are used with a square BH intrinsic curve, a Br in the range of 1.0 Tesla or more, and high Hc in the range of −800,000 amp-turns/meter or more. An example is the NdFeB magnet from the German company VAC, which has a Br of 1.427 Tesla and an Hc of −1,079,000 amp-turns/meter.

An important consideration is the matching of the magnet to the nanocrystalline material, both in Tesla rating and in cross-sectional area. The magnet's Br should be below the Bs of the nanocrystalline material. If the magnet is too “strong” for the nanocrystalline material, this may cause the nanocrystalline material to saturate at the area of contact with the magnet.

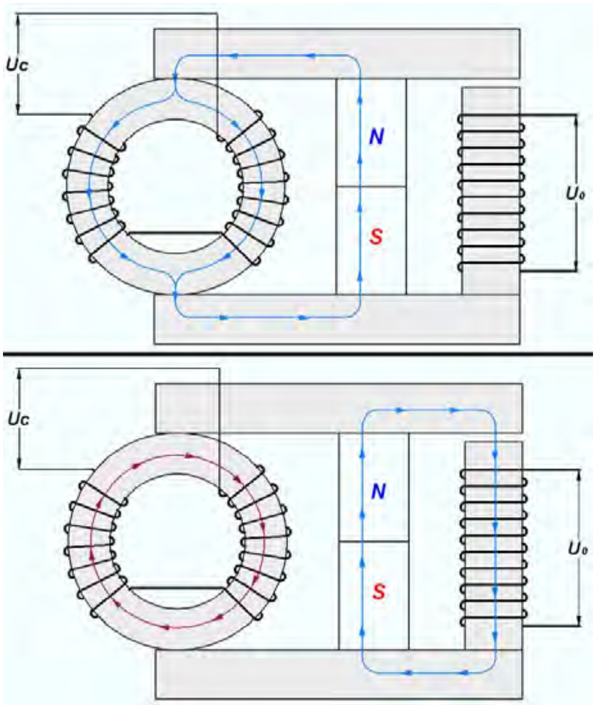
The current driving the reluctance switches in the prescribed 2 × 2 sequence should have a sharp rise in the leading edge (Tr) of each pulse with a pulse width (Pw) and Amperage value that are sustained until released at the end of the pulse width (Tf). The table below shows the effects of input current pulse rise times (Tr) on the output. There exists a narrow band of Tr, before which there is small power output, at which there are excellent power output and COPs in the range of 200 to 400 or greater, and after which there is no major increase in power output. The COP of this device without the coupling circuit is defined as “Output power/Drive Power” for the switches.

Tr	Output Power	Waveform Description
1.0E–4 secs	50 Watts	Spikes
7.5E–5	50 Watts+	Spikes with intermittent 30 Kilowatt square waves
5.0E–5	15 Kilowatts	Square waves after 3 cycles
1.0E–5	15 Kilowatts	Square waves after 1 cycle

Valeri Ivanov's Motionless Generator.

There are other devices which have what appears to be a very important air-gap in a magnetic frame. One of these was displayed on a Bulgarian website and is on the web page which is located at http://www.inkomp-delta.com/page3.html, put up by Valeri Ivanov in 2007. Valeri lives in Elin Pelin, Bulgaria and his motionless generator has COP=2.4 performance. Videos:
http://www.youtube.com/watch?v=7IP-buFHKKU and
http://www.youtube.com/watch?v=npFVaeSbk1Q are for his design, and it appears that he is about to go commercial: http://www.inkomp-delta.com/index.html in May 2014.

It is shown that an effective device can be constructed from a permanent magnet, a toroid and a laminated iron yoke. The arrangement is displayed like this:



When the input coil is pulsed with an input voltage, it causes a flux reversal in the frame around which the output coil is wound, generating an electrical output.

There is another forum related to this and the better known MEG of Tom Bearden's which can be found at http://tech.groups.yahoo.com/group/MEG_builders/message/1355 where that particular message states that Valeri's device can be made to work at frequencies as low as 50 Hz and can use standard laminated iron frame components and produces Coefficient Of Performance figures up to 5.4 (that is, the output power is more than five times the input power). A demo video is at http://inkomp-delta.com/page10.html but not in English. It may well be that in order to work well, the MEG needs a very narrow input coil with an air-gap on each side of it and the same may well apply to Lawrence Tseung's magnetic frame shown earlier in this chapter.

The Motionless Generators of Kelichiro Asaoka

Kelichiro Asaoka received US patent 5,926,083 some two years before the well-known MEG patent of Tom Bearden and his associates. Personally, I find it hard to understand how the MEG patent (in the Appendix) could have been awarded when the Asaoka patent was already in place. However, here is most of the content of the Asaoka patent:

US Patent 5,926,083 20 July 1999 Inventor: Kelichiro Asaoka

Static magnet dynamo for generating electromotive force based on changing flux density of an open magnetic path

ABSTRACT

A static magnet dynamo including at least one permanent magnet having different poles; a first core comprising a soft magnetic material and which couples the different poles of the permanent magnet to form a closed magnetic path; a second core comprising a soft magnetic material which couples to the closed magnetic path via a paramagnetic material to form an open magnetic path; a magnetised coil wound around a portion of the first core where the closed magnetic path is formed; and an induction coil wound around a portion of the second core. A direction of a flux of the closed magnetic path is changed by applying an alternating voltage to the magnetised coil, generating an electromotive force in the induction coil by electromagnetic induction due changes in a flux of the open magnetic path induced by the change in direction of the flux of the closed magnetic path.

FIELD OF THE INVENTION

This invention relates to a dynamo which generates electromotive force by electromagnetic induction by changing the flux passing through an induction coil. More particularly, this invention relates to a static magnet dynamo that changes magnets that pass through an induction coil without turning the armature or electromagnet.

DISCUSSION OF BACKGROUND

Dynamos currently in practical use are so designed as to generate electromotive force by electromagnetic induction by changing the flux passing through an induction coil. Dynamos that generate power this way come in a wide variety, ranging from large models used in hydroelectric, thermal or atomic power plants to small models such as small dynamos with a diesel engine.

In all dynamo models mentioned above, the armature and electromagnet are turned, to change the flux passing through the induction coil, thus generating electromotive force in the induction coil by electromagnetic induction. For examples, the armature and electromagnet are turned by the torque of a water turbine in hydroelectric power generation, by the torque of the steam turbine in thermal and atomic power generation, and by the torque of the diesel engine in small dynamos.

Disadvantages:

Dynamos that generate electromotive force by electromagnetic induction as mentioned above are so designed that, regardless of the size of the dynamo, the armature and electromagnet are turned in order to change the flux passing the induction coil. These dynamos are disadvantageous in that the said turning of the armature and electromagnet generates vibrations and noise.

OBJECTS OF THE INVENTION

The purpose of this invention is to provide a static magnet dynamo devoid of any torque-giving means or other moving part to eliminate vibrations and noise, in order to resolve the various problems mentioned above.

To resolve the above problems, this invention is composed as described below.

The static magnet dynamo involved in this invention consists of at least one permanent magnet, a first core consisting of a soft magnetic material forming a closed magnetic path by coupling the different poles of the said permanent magnet, a second core consisting of a soft magnetic material forming an open magnetic path by being coupled to the closed magnetic path via a paramagnetic material, a magnetised coil wound around a part consisting of only the closed magnetic path of the first core, and an induction coil wound around the second core. The point of this invention is to generate electromotive force in the induction coil by electromagnetic induction by changing the direction of the flux of the closed magnetic path by applying an alternating voltage to the magnetised coil and by changing the flux of the open magnetic path induced by changes in the direction of the flux in the closed magnetic path.

Effects:
In the above configuration, the static magnet dynamo involved in this invention consists of a first core consisting of a permanent magnet and a closed magnetic path, a second core consisting of an open magnetic path via a paramagnetic material, a magnetised coil wound around the part consisting only of the closed magnetic path of the first core, and an induction coil wound around the second magnetic path. The dynamo is so designed as to generate electromotive force in the induction coil by electromagnetic force by changing the direction of the flux of the first core by applying an alternating voltage to the magnetised coil, and by changing the flux of the second core induced by changes in the direction of the flux of the first core.

This makes it possible to change the flux passing through the induction coil without a torque-giving means or other moving part and to generate electromotive force in the induction coil by electromagnetic induction, thus enabling power generation without causing vibrations or noise. This dynamo can also be downsized and made available at low prices.

Other characteristics and benefits of this invention will be made clear by the description given below with diagrams attached.

BRIEF DESCRIPTION OF THE DRAWINGS
A more complete appreciation of the invention and many of the attendant advantages thereof will be readily obtained as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

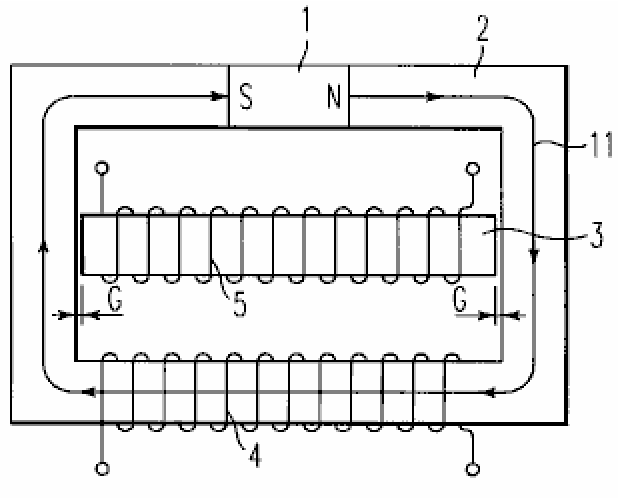


FIG. 1

Fig.1 represents a basic configuration of a static magnet dynamo with an open magnetic path involved in this invention.

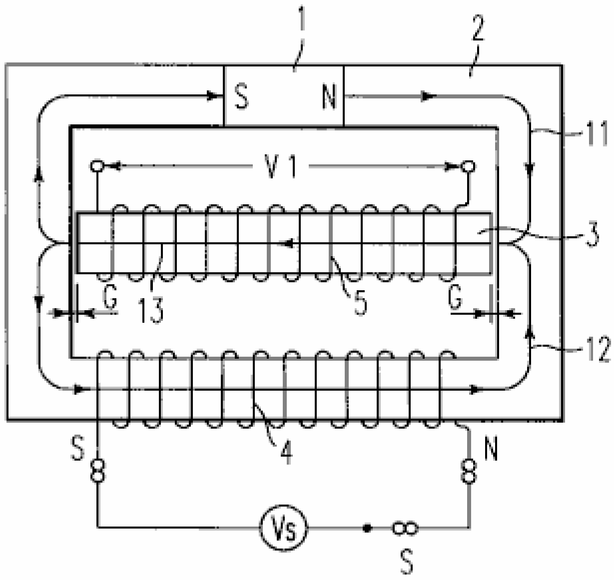


FIG. 2

Fig.2 represents how a flux in the direction opposed to that of a permanent magnet typically occurs in the magnetised coil.

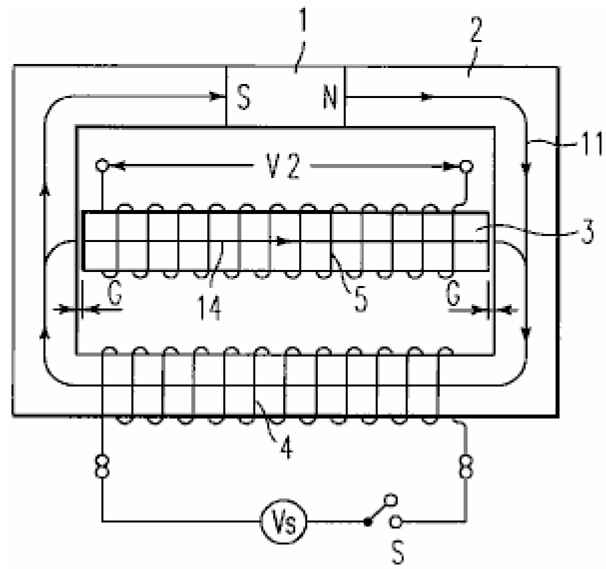


FIG. 3

Fig.3 represents how a flux in the direction opposed to that of a permanent magnet typically disappears from the magnetised coil.

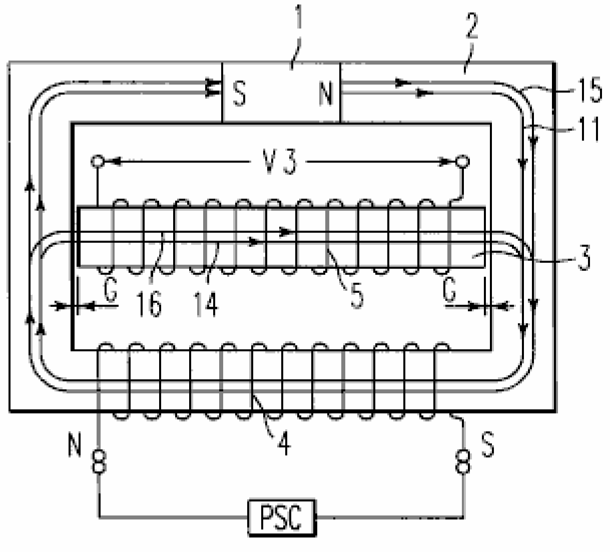


FIG. 4

Fig.4 represents how a flux in the same direction as that of the permanent magnet typically occurs in the magnetised coil.

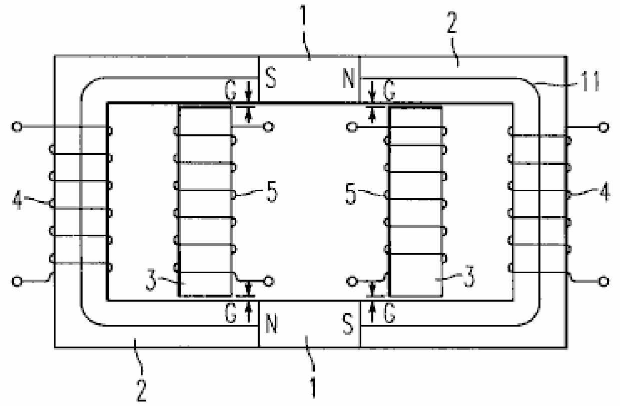


FIG. 5A

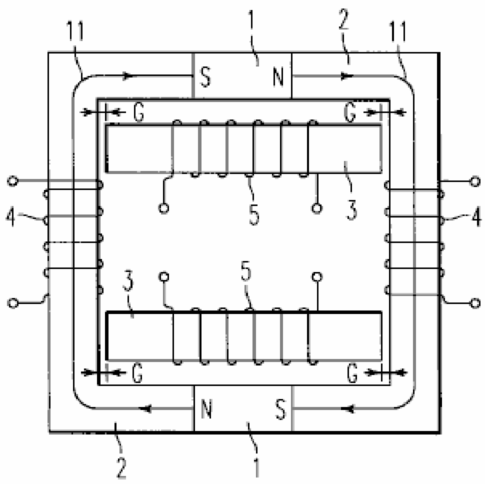


FIG. 5B

Fig.5 is a first embodiment of the static magnet dynamo involved in this invention.

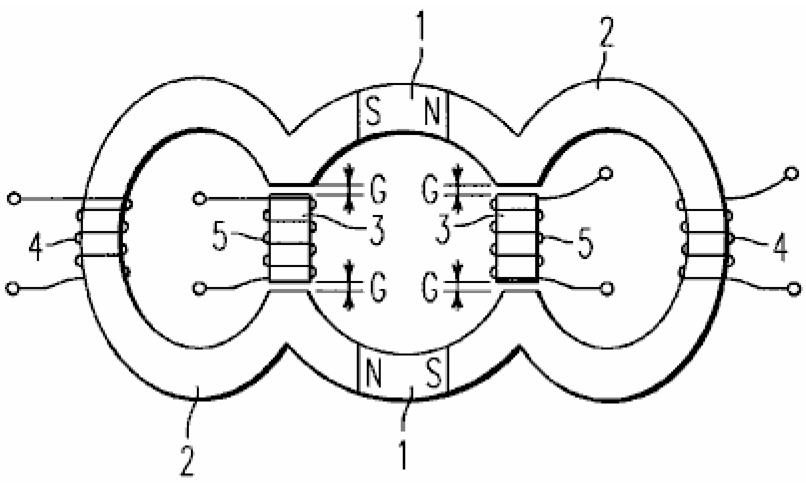


FIG. 6

Fig.6 is a second embodiment of the static magnet dynamo involved in this invention.

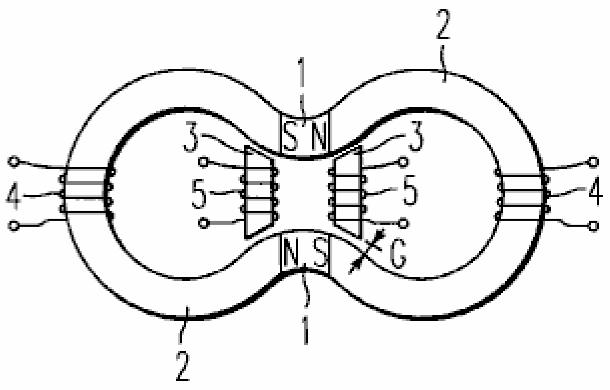


FIG. 7

Fig.7 is a third embodiment of the static magnet dynamo involved in this invention.

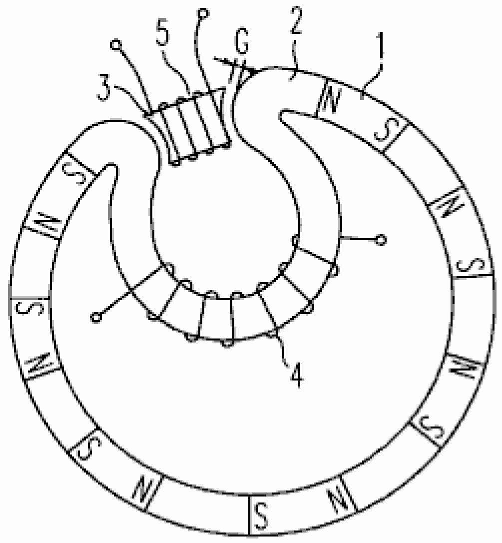


FIG. 8

Fig.8 is a fourth embodiment of the static magnet dynamo involved in this invention.

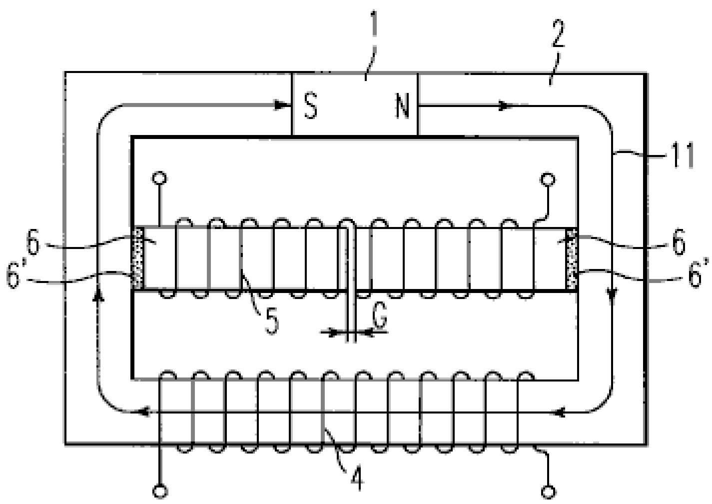


FIG. 9