ISSN: 2476-2334

Review Article

International Journal of Nanotechnology & Nanomedicine

Linear Acceleration over water surface by using magnetic strips

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Submitted: 24 Oct 2017; **Accepted**: 31 Oct 2017; **Published**: 09 Nov 2017

Abstract

Permanent Magnets are known from thousands of years and this human eagerness to utilize magnetic force for useful work. Magnets have north and south poles, similar pole always repel and opposite poles attract to each other. Magnetic Strips are made of thousands of tiny magnets in similar arrangement in the form of long strip. In this article magnetic force behavior of magnetic strips over water surface in two different cases has been discussed.

A linear acceleration is generated along the magnetic strip which is responsible for the motion of movable disk in both directions only by changing the inclination angle, and in second case the continuous force on the internal disk which makes the disk rotating over the water surface.

Introduction

Magnetism is basically a non-contact force. It is the core of attraction and repulsion without having to touch the object they are attraction or repulsion. Accordingly, herein below I represent the model elucidating the study based on above theory. There is no gravitational force interference if water used as floating medium.

Magnetic Force Vs Electrostatic Force:

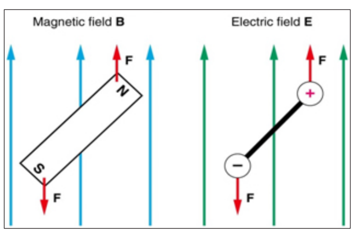

Figure 1: Magnetic force direction

Magnetic force direction is calculated by assuming North Pole behaviors in magnetic field similar as positive charge behavior in electrostatic field as shown in Figure 1.

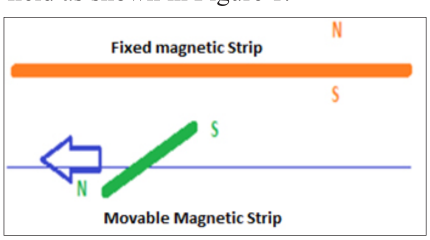

Figure 2: Magnetic force direction on movable strip

When a movable magnetic strip placed at an angle in the field of fixed magnetic strip, it will feel a force in the arrow direction as shown in figure 2.

Magnetic Strips

Different types of magnetic strips are available in the market.

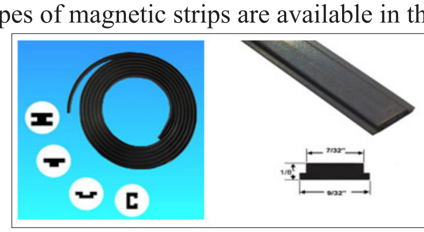

Figure 3: Types of magnetic Strips

In this experiment T-shape of magnetic strip are used

Figure 4: Types of magnetic Strips used in the experiment

Examples of physical properties of magnetic strips are given below table.

Physical Properties of extruded magnetic strip

Code	Tensile Strength (Mpa)	Elongation	Hardness (SHA)	Temperature	Density (g/cm3)
DXZJ-1	5~10	30~100	85~98	-10~80	3.6~3.7
DXZJ-2	5~10	40~100	85~98	-10~80	3.6~3.7

Polarity of Magnetic Strips:

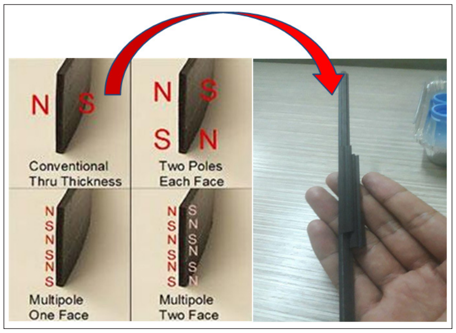

Figure 5: Magnetic Strips Polarities

In this study as shown above conventional through thickness type of magnetic strip is used. Magnetic strips have magnetic poles on each surface.

Method

Liner acceleration over water surface has been shown with two experiments.

Figure 6: Magnetic strips arrangements in first experiment

In first experiment a long magnetic strips used, which have thousands of poles on each edge. When a small magnetic strip is placed over water surface inside the disk, disk moves along the long magnetic strip as the water surface is efficient to detect a minute magnetic force in slow motion as shown Fig.6.

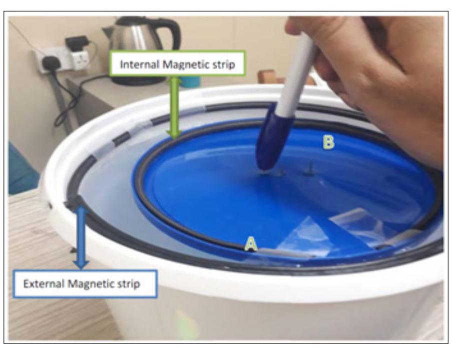

Figure 7: Magnetic strips arrangements in second experiment

In second experiment external magnetic strip is fixed with the outer circular bucket containing water and the internal magnetic strip is tied to the inner circular disk placed over the water surface as shown in Figure7. The continuous rotation of internal disk is by maintaining the fixed distance between two disks either point 'A' or 'B'. If fixed distance is set at point 'A' the internal disk rotate clockwise and if the fixed distance is set at point 'B' the internal disk rotate anticlockwise.

Result

Experiment 1

The direction of force on small disk changes with change of orientation of small magnet inside disk over water surface. Small disk moves left to right in figure 8.1, Figure 8.2, Figure 8.3. If only angle of small magnetic strip changed to 180 Degree and others all parameter are constant, small magnetic strips inside disk will move left to right direction as shown in Figure 8.4, Figure 8.5, and Figure 8.6.

Figure 8.1 : small magnetic strip start moving left to right

Figure 8.2 : small magnetic strip moving left to right

Figure 8.3 : small magnetic strip moving towards right end

Figure 8.4 : small magnetic strip start from right to left

Figure 8.5 : small magnetic strip moves from right to left

Figure 8.6: small magnetic strip moves from right toward left end

Experiment 2

Linear acceleration on the periphery of inner magnetic strip ring due to repulsion forces. If we maintain the fixed distance either at Point ‘A’ it start rotate in anticlockwise direction as shown in Figure 9.1, Figure 9.2, Figure 9.3, Figure 9.4. If the fixed distance maintained by external (by hand) during rotation of inner ring it will continuous rotate in clockwise direction.

Anti-Clockwise rotation:

Figure 9.1 :Rotation due fixed distance maintain at Point ‘A’

Figure 9.2 : Rotation due fixed distance maintain at Point ‘A’

Figure 9.3 : Rotation due fixed distance maintain at Point ‘A’

Figure 9.4 : Rotation due fixed distance maintain at Point ‘A’

Figure 9.5 : Rotation due fixed distance maintain at Point ‘B’

Figure 9.6 : Rotation due fixed distance maintain at Point ‘B’

Figure 9.7: Rotation due fixed distance maintain at Point ‘B’

Figure 9.8 : Rotation due fixed distance maintain at Point 'B'

Conclusion

A linear acceleration is generated along the magnetic strip in first case which is responsible for the motion of the small disk in both directions only by changing the inclination angle, and in second case the continuous force on the internal disk which makes the disk rotating over the water surface. Rotating motion is possible without hand (external) support by fixing the distance mechanically.

Computer simulation of Magnetic field and mathematical formulation of Magnetic force are under development.

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