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(54) Title: LAWN SPRINKLER

(57) Abstract: According to an exemplary embodiment of the invention, a lawn sprinkler 100 is disclosed. The lawn sprinkler 100 may include a centrifugal rotor 102 having at least one channel 108 to discharge water at a pre-set angle and pressure. The discharge of water at the pre-set angle and pressure may cause the rotation of the centrifugal rotor 102. The lawn sprinkler 100 may further include at least three plates 110 arranged at a predefined angle above the centrifugal rotor 102. Each of the plates 110 may have predefined extensions 114 on their external surfaces. The extensions 114 may deflect the water discharging from the channel 108 on the lawn area. The lawn sprinkler 100 may further include a resilient component 116 connecting each plate 110 to the centre of the lawn sprinkler 100. The resilient component 116 may bring the plates 108 to a default position.

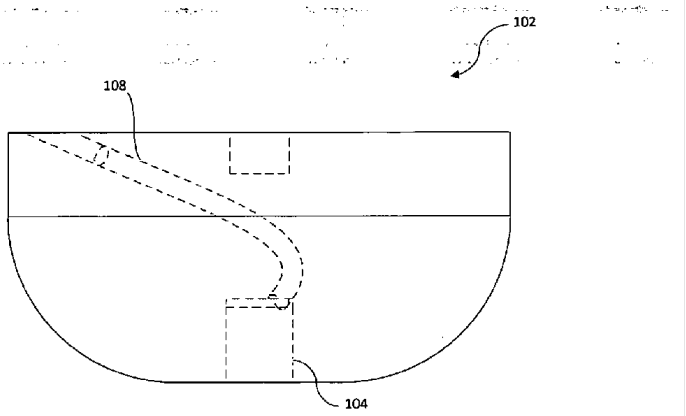

Figure 1

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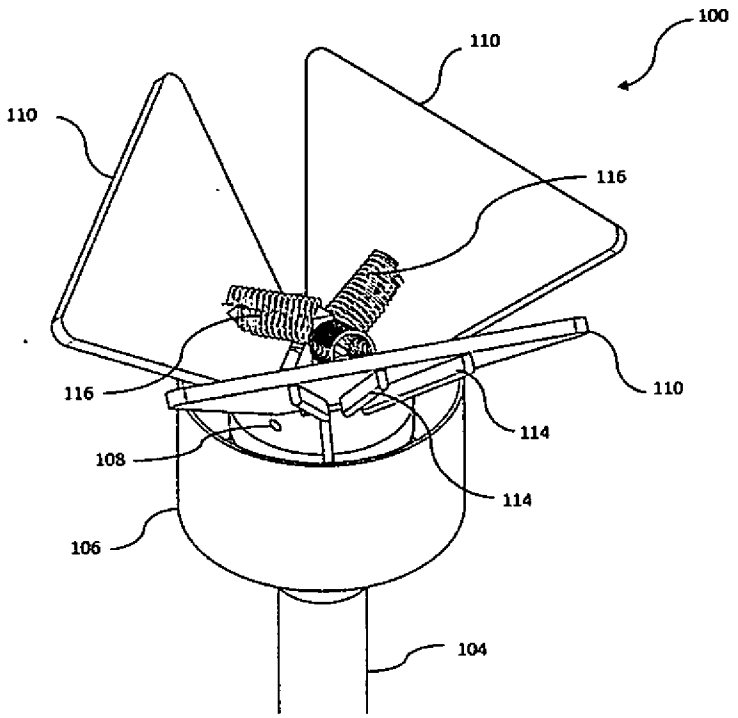
ABSTRACT

Lawn sprinkler

According to an exemplary embodiment of the invention, a lawn sprinkler 100 is disclosed. The lawn sprinkler 100 may include a centrifugal rotor 102 having at least one channel 108 to discharge water at a pre-set angle and pressure. The discharge of water at the pre-set angle and pressure may cause the rotation of the centrifugal rotor 102. The lawn sprinkler 100 may further include at least three plates 110 arranged at a predefined angle above the centrifugal rotor 102. Each of the plates 110 may have predefined extensions 114 on their external surfaces. The extensions 114 may deflect the water discharging from the channel 108 on the lawn area. The lawn sprinkler 100 may further include a resilient component 116 connecting each plate 110 to the centre of the lawn sprinkler 100. The resilient component 116 may bring the plates 108 to a default position.



We claim:

1. A lawn sprinkler 100 comprising:

a centrifugal rotor 102 having at least one channel 108 to discharge water at a pre-set angle and pressure, the centrifugal rotor 102 being connected to a water source 104;

at least three plates 110 arranged at a predefined angle above the centrifugal rotor 102 such that each plate 110 have predefined extensions 114 on the external face; and

a resilient component 116 connecting each plate 110 to the centre of the lawn sprinkler 100.

2. The lawn sprinkler 100 as claimed in claim 1, wherein the channel 108 has a helical shape.

3. The lawn sprinkler 100 as claimed in claim 1, wherein each plate 110 is hinged at the centre of the lawn sprinkler 100 and moves independent of the other plates 110.

4. The lawn sprinkler 100 as claimed in claim 1, wherein the plates 110 are substantially triangular.

5. The lawn sprinkler 100 as claimed in claim 1, wherein the lawn sprinkler 100 comprises of three plates for a triangular pattern, four plates for a square pattern and five plates for a pentagon pattern.

6. The lawn sprinkler 100 claimed in claim 1, wherein the one extension 114 is near each of the edges of the plate 110 and the one extension 114 is at the centre of the plate 110.

7. A lawn sprinkler 100 comprising:

a centrifugal rotor 102 having at least two channels 108 to discharge water at a pre-set angle and pressure, the centrifugal rotor 102 being connected to a water source 104;

four plates 110 arranged at a predefined angle above the centrifugal rotor 102 such that each plate 108 have predefined extensions 114 on the external face; and

a resilient component 116 connecting each plate 110 to the centre of the lawn sprinkler 100.

8. The lawn sprinkler 100 as claimed in claim 7, wherein both the channels 108 are helical shaped and are placed at an angle of 180 degree to each other, each channel 108 discharges water in a direction opposite to the other.

9. A method for distributing water from a lawn sprinkler 100 on a lawn comprising:

discharging a jet of water from a channel 108 on a centrifugal rotor 102 strikes on an extension 114 provided on an external face of a plate 110 at a pre-set angle and pressure;

deflecting the jet of water through the extensions 114 on the lawn; and

resonating the angle of deflection by oscillating the plate 110, each plate 110 being connected through a resilient component 116 to the centre of the lawn sprinkler 100.

10. The method for distributing water from the lawn sprinkler 100 on the lawn as claimed in claim 9, wherein the plate 110 is in a default position when the resilient component 116 is in a relaxed state.

Dated this 11th day of August 2017,

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FIELD OF INVENTION

The invention generally relates to an apparatus for watering lawns, fields, sports ground or the like, and more particularly to a lawn sprinkler.

BACKGROUND

A lawn sprinkler is an instrument for occasionally watering a piece of land. In the past, water was abundantly and inexpensively available. However, it has become quite scarce and expensive now. Typically, multiple varieties of sprinklers having varied costs and values are available for lawn sprinkling. It is to be observed that even though there are diverse shapes of lawns and irrigation sites available, the sprinklers which we use to irrigate these sites typically distribute water in a circular pattern. These types of sprinklers either do not cover the lawn area properly or distribute a part of the water outside the lawn which leads to water wastage. Among the multiple varieties of sprinklers that are available, several are purported to distribute water on areas other than circular. Some of which are unusually complicated for the purpose at hand and are thus expensive, while others are simple and cheap and imperfectly accomplish the desired result. One of such sprinklers available for distributing water in a square pattern comprises of a plurality of holes for ejecting water. The sprinklers ejecting water from so many holes often causes over spraying on the lawn thereby leading to water wastage.

Hence there is a need for an improved lawn sprinkler.

SUMMARY OF THE INVENTION

According to an exemplary embodiment of the invention, a lawn sprinkler is disclosed. The lawn sprinkler may include a centrifugal rotor. The centrifugal rotor may be free to rotate in a circular motion. The centrifugal rotor may have at least one channel to discharge water at a pre-set angle and pressure. The centrifugal rotor may be connected to a water source. The lawn sprinkler may further include at least three plates such that each plate may be arranged at a predefined angle above the centrifugal rotor. Each of the plates may have predefined extensions on their external face. The lawn sprinkler may further include a resilient component connecting each plate to the centre of the lawn sprinkler.

According to another exemplary embodiment of the invention, a lawn sprinkler is disclosed. The lawn sprinkler may include a centrifugal rotor. The centrifugal rotor may have at least two channels to discharge water at a pre-set angle and pressure. The centrifugal rotor may be connected to a water source. The lawn sprinkler may further include four plates arranged at a predefined angle above the centrifugal rotor. Each of the plate may have predefined extensions on their external face. The lawn sprinkler may further include a resilient component connecting each plate to the centre of the lawn sprinkler.

According to yet another embodiment, a method for distributing water from a lawn sprinkler 100 on a lawn is disclosed. The method includes discharging a jet of water from a channel on a centrifugal rotor. The jet of water discharging from the channel may strike on an extension provided on an external face of a plate. The method further includes deflecting the jet of water through the extensions on the lawn. The jet of water deflecting through the extensions may

exert a push on the plate and the extensions. A resilient component connecting the plate to the centre of the lawn sprinkler may bring the plate to a default position.

BRIEF DESCRIPTION OF DRAWINGS

Other objects, features, and advantages of the invention will be apparent from the following description when read with reference to the accompanying drawings. In the drawings, wherein like reference numerals denote corresponding parts throughout the several views:

Figure 1 illustrates a front view of a centrifugal rotor according to an exemplary embodiment of the invention.

Figure 2 illustrates an isometric view of the centrifugal rotor according to an exemplary embodiment of the invention.

Figure 3 illustrates an isometric view of a three-plate lawn sprinkler according to an exemplary embodiment of the invention.

Figure 4 illustrates a top view of the three-plate lawn sprinkler according to an exemplary embodiment of the invention.

Figure 5 illustrates a front view of a centrifugal rotor with two channels according to an exemplary embodiment of the invention.

Figure 6 illustrates an isometric view of the centrifugal rotor with two channels according to an exemplary embodiment of the invention.

Figure 7 illustrates an isometric view of a four-plate lawn sprinkler according to an exemplary embodiment of the invention.

Figure 8 illustrates a top view of the four-plate lawn sprinkler according to an exemplary embodiment of the invention.

DETAILED DESCRIPTION OF DRAWINGS

The following description with reference to the accompanying drawings is provided to assist in a comprehensive understanding of exemplary embodiments. It includes various specific details to assist in that understanding but these are to be regarded as merely exemplary. Accordingly, those of ordinary skill in the art will recognize that various changes and modifications of the embodiments described herein can be made without departing from the scope and spirit of the invention. In addition, descriptions of well-known functions and constructions are omitted for clarity and conciseness.

According to an exemplary embodiment of the invention, a lawn sprinkler 100 is disclosed. The lawn sprinkler 100 may be used to sprinkle water on areas such as, but not limited to lawns, agricultural lands, landscapes, golf courses etc. The lawn sprinkler 100 may include a centrifugal rotor 102. According to an embodiment, the centrifugal rotor 102 may be a substantially solid cylindrical body. According to another embodiment, the shape of the

centrifugal rotor 102 may vary depending on the design of the lawn sprinkler 100. The centrifugal rotor 102 may rotate in a circular motion in the effect of a centrifugal force. The centrifugal rotor 102 may be connected to a water source 104. According to an embodiment, the base of the centrifugal rotor 102 may be directly connected to the water source 104. According to another embodiment, the centrifugal rotor 102 may be connected to the water source 104 through a mounting cup 106. The mounting cup 106 may support the components of the lawn sprinkler 100. The mounting cup 106 may be a cup shaped structure having a provision to connect to the water source 104 on an external face of the mounting cup 106. The mounting cup 106 may have an opening on an internal face of the mounting cup 106. The opening on the internal face of the mounting cup 106 may have a provision for mounting the centrifugal rotor 102.

Figure 1 and Figure 2 illustrates a front view and an isometric view of the centrifugal rotor 102 respectively. According to an embodiment, the centrifugal rotor 102 may include at least one channel 108 to discharge water flowing into the centrifugal rotor 102 from the water source 104. The discharge of water from the channel 108 may produce a centrifugal force on the centrifugal rotor 102 and may cause the centrifugal rotor 102 to rotate about a vertical axis. According to an embodiment, the shape of the channel 108 may be helical. According to another embodiment, the shape of the channel 108 may vary depending on the design of the lawn sprinkler 100. The channel 108 may discharge water at a pre-set angle and pressure. The angle and pressure of water discharging from the channel 108 may be set based on the size of the area on which water needs to be sprinkled. By way of an example, the angle and pressure of water discharging from the channel 108 may be set low for covering smaller lawn area and the angle and pressure may be set high for covering larger lawn area.

Figure 3 and Figure 4 illustrates an isometric view and a top view of the lawn sprinkler 100 respectively according to an embodiment of the invention. The lawn sprinkler 100 may further include a plurality of plates 110 hinged to a fixed surface 112 above the centrifugal rotor 102. The fixed surface 112 may be horizontally positioned at the centre of the lawn sprinkler 100 above the centrifugal rotor 102. According to an embodiment, the lawn sprinkler 100 may include at least three plates 110, such that each plate 110 is arranged at a predefined angle with respect to the fixed surface 112. The plates 110 may rest at the predefined angle with respect to the fixed surface 112 as the default position. According to an embodiment, the shape of the plates 110 may be substantially triangular. According to another embodiment, the shape of the plates 110 may be substantially trapezoidal. According to yet another embodiment, the shape of the plates 110 may be isosceles trapezoidal.

Each of the plates 110 in a lawn sprinkler 100 may include a plurality of predefined extensions 114 on their external face. The external face of the plate 114 may be the face on which water discharging from the channel 108 strikes. According to an embodiment, each of the plates 110 may include at least three extensions 114 such that one extension 114 is on each edge of the plate 110 and one extension 114 is on the centre of the plate 110. The orientation of the extensions 114 may substantially be along the height of the plate. The lawn sprinkler 100 may further include a resilient component 116 connecting each of the plates 110 to the fixed surface 112 of the lawn sprinkler 100. The resilient component 116 may connect the fixed surface 112 to the internal face of the plate 110. According to an embodiment, the resilient component 116 may be a spring. According to another embodiment, the resilient component 116 may be integrated into the hinge. The hinge arrangement may enable each of the plates 110 to oscillate about the axis of the hinge. The arrangement of the plates 110 to the lawn sprinkler 100 may be such that each of the plate 110 may move independent of the other plates 110. The resilient

component 116 may bring each of the plates 110 to a default position. The plates 110 may be at the default position when the resilient member 116 is in a relaxed state.

According to an embodiment, the number of plates 110 and their arrangement may determine the water sprinkling pattern through the lawn sprinkler 100. By way of an example, the lawn sprinkler 100 may comprise of three plates for sprinkling water in a triangular pattern, four plates for a square pattern, five plates for a pentagon pattern etc.

According to another exemplary embodiment of the invention, a lawn sprinkler 100 for a square lawn is disclosed. Figure 5 and Figure 6 illustrates a front view and an isometric view of a centrifugal rotor 102 respectively. The centrifugal rotor 102 may include at least two channels 108 to discharge water flowing into the centrifugal rotor 102 from a water source 104. The discharge of water from the channels 108 may produce a centrifugal force on the centrifugal rotor 102 and may cause the centrifugal rotor 102 to rotate. The channels 108 may be in a helical shape and may be placed at an angle of 180 degree to each other such that each channel 108 discharges water in a direction opposite to the other.

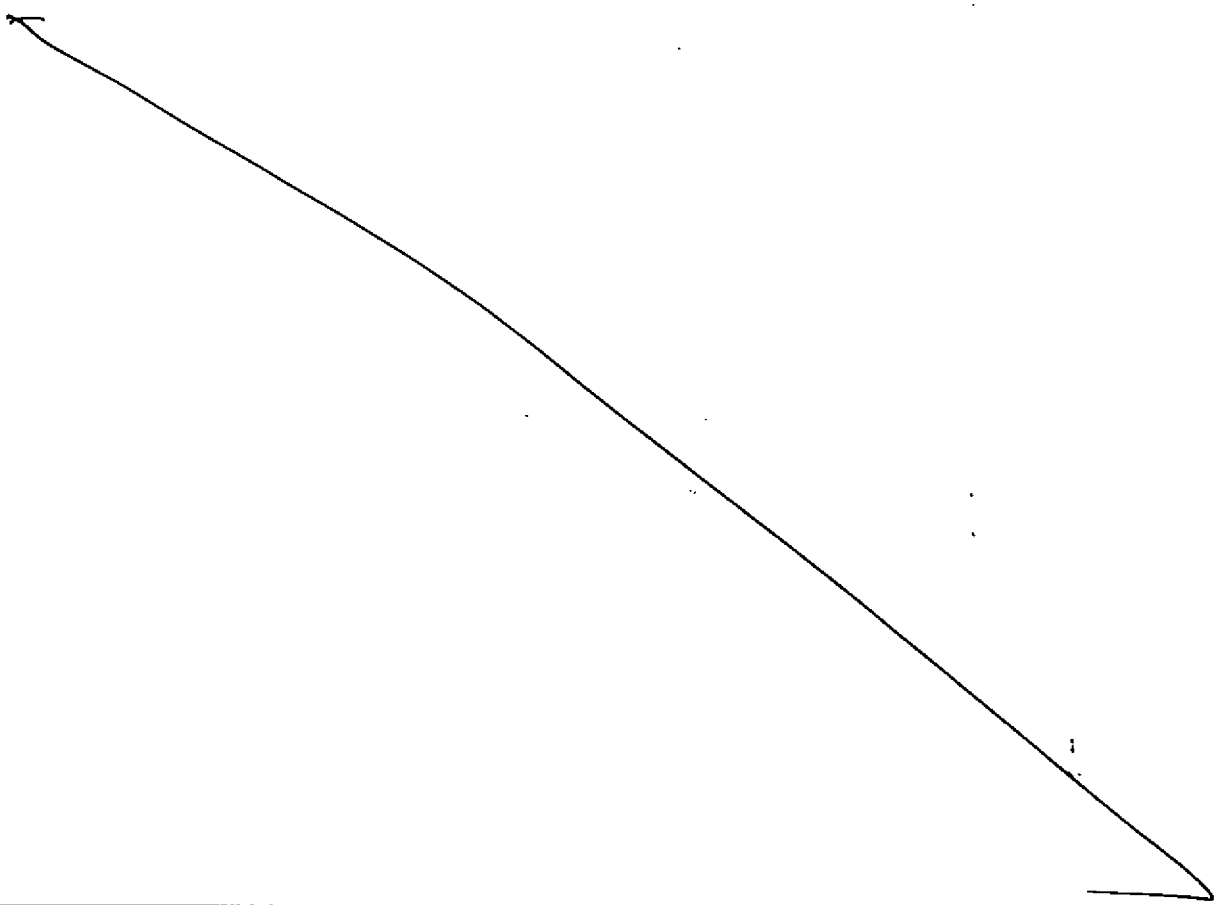
Figure 7 and Figure 8 illustrates an isometric view and a top view respectively of the lawn sprinkler 100 for a square lawn respectively according to an exemplary embodiment of the invention. The lawn sprinkler 100 for the square lawn may include four plates 110, such that each plate 110 is arranged at a predefined angle with respect to a fixed surface 112. Each of the plates 110 in a lawn sprinkler 100 may include a plurality of predefined extensions 114 on their external face. According to an embodiment, each of the plates 110 may include at least three extensions 114 such that one extension 114 is on each edge of the plate 110 and one extension 114 is on the centre of the plate 110. The lawn sprinkler 100 may further include a

resilient component 116 connecting each of the plates 110 to the fixed surface 112 of the lawn sprinkler 100. According to an embodiment, the resilient component 116 may be a spring. According to another embodiment, the resilient component 116 may be integrated into the hinge. The hinge arrangement may enable each of the plates 110 to oscillate along the axis of the hinge. The arrangement of the plates 110 to the lawn sprinkler 100 may be such that each of the plate 110 may move independent of the other plates 110. The resilient component 116 may bring each of the plates 110 to a default position.

According to another embodiment, a method for distributing water from a lawn sprinkler 100 on a lawn is disclosed. The water from a water source 104 may flow to a centrifugal rotor 102 and then to a channel 108. For a sprinkler with multiple channels 108, the water may flow equally through all the channels 108. The method may include discharging a jet of water at a pre-set angle and pressure from the channel 108. For a lawn sprinkler 100 with multiple channels 108, the water may flow at a same angle and pressure from all the channels 108. The jet of water discharging from the channels 108 may produce a centrifugal force causing the centrifugal rotor 102 to rotate. The jet of water discharging from the channels 108 may strike a predefined extension 114 provided on an external face of a plate 110. The method may further include deflecting the jet of water through the extensions 114 on the external face of the plate 110 to cover the area of the lawn. The jet of water striking the extensions 114 may further push the plate 110 from a default position. The plate 110 on being pushed may oscillate about a hinge of the plate 110. The oscillation of the plate 110 may allow the water to be sprinkled throughout the covered lawn area. According to an embodiment, the extent of movement of the plate 110 may depend on a resilient component 116. The resilient component 116 may further bring the plate 110 to the default position after jet of water stops striking the plate 110. According to an embodiment, for a three-plate lawn sprinkler 100, each plate covers one-third

area of a triangular lawn. According to another embodiment, for a four-plate lawn sprinkler 100, each plate covers one-fourth area of a square lawn. According to yet another embodiment, for a five-plate lawn sprinkler 100, each plate covers one-fifth area of a pentagon lawn.

It is understood that the above description is intended to be illustrative, and not restrictive. It is intended to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined in the appended claims. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled. In the appended claims, the terms "including" and "in which" are used as the plain-English equivalents of the respective terms "comprising" and "wherein," respectively.



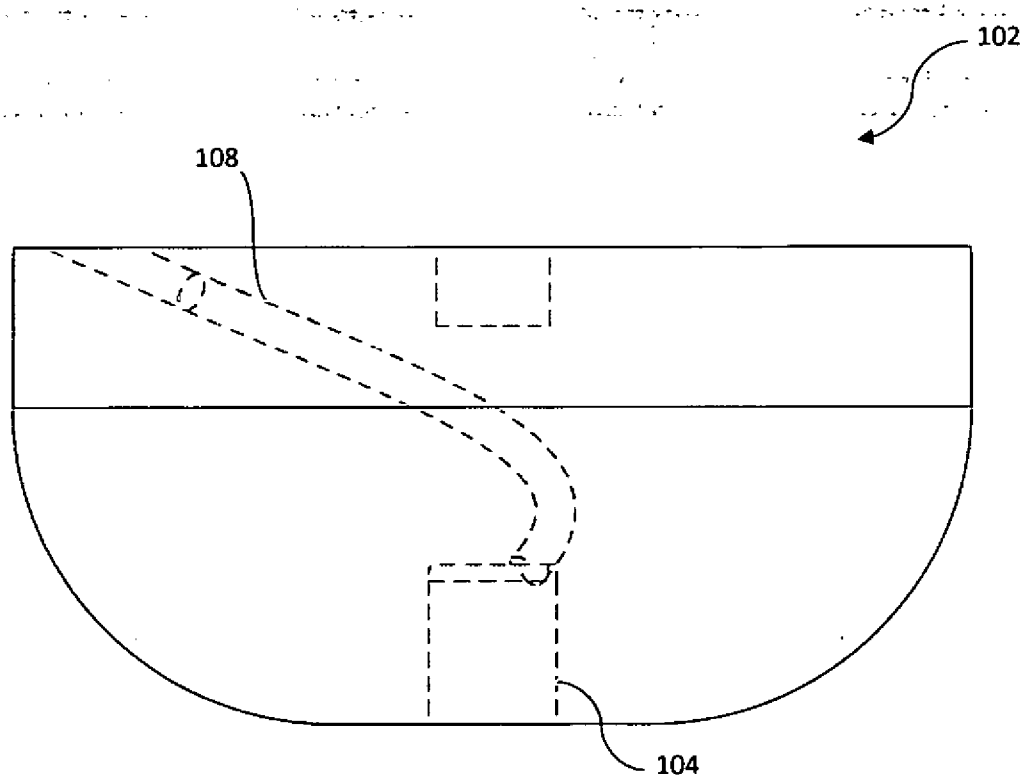


Figure 1

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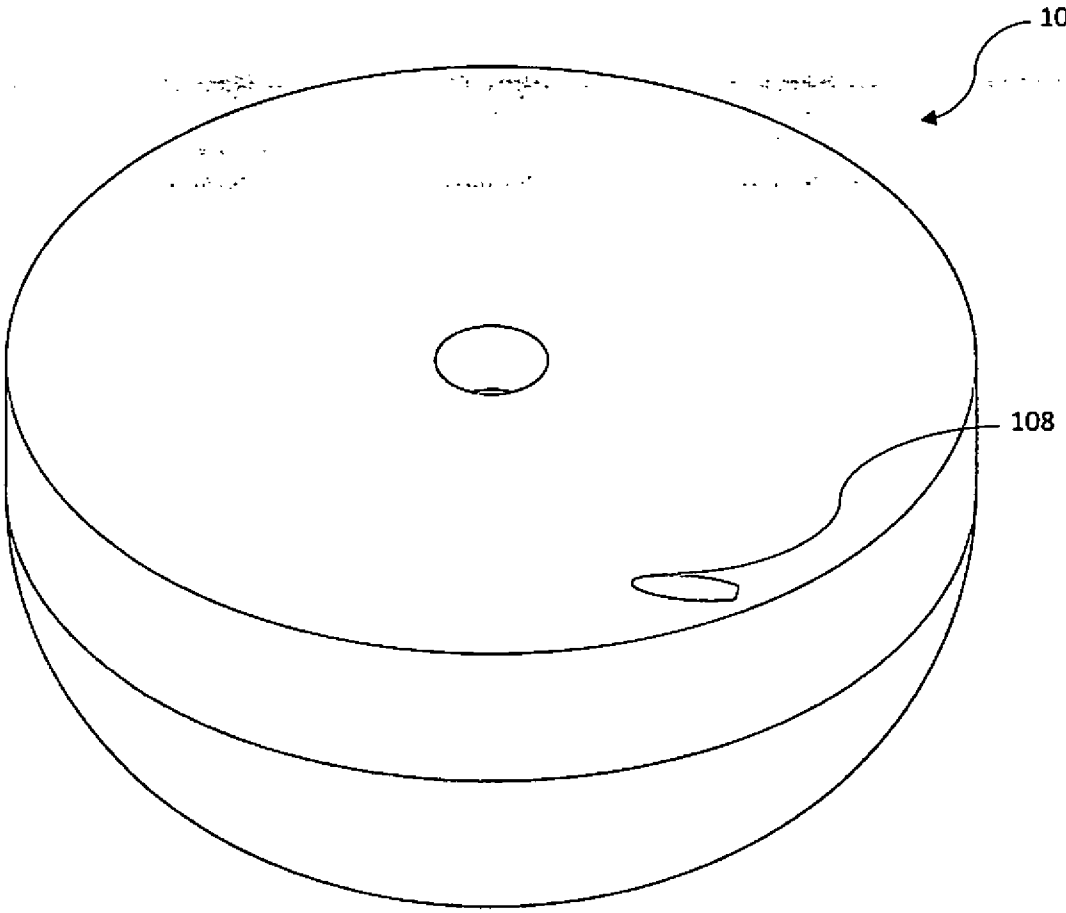

Figure 2

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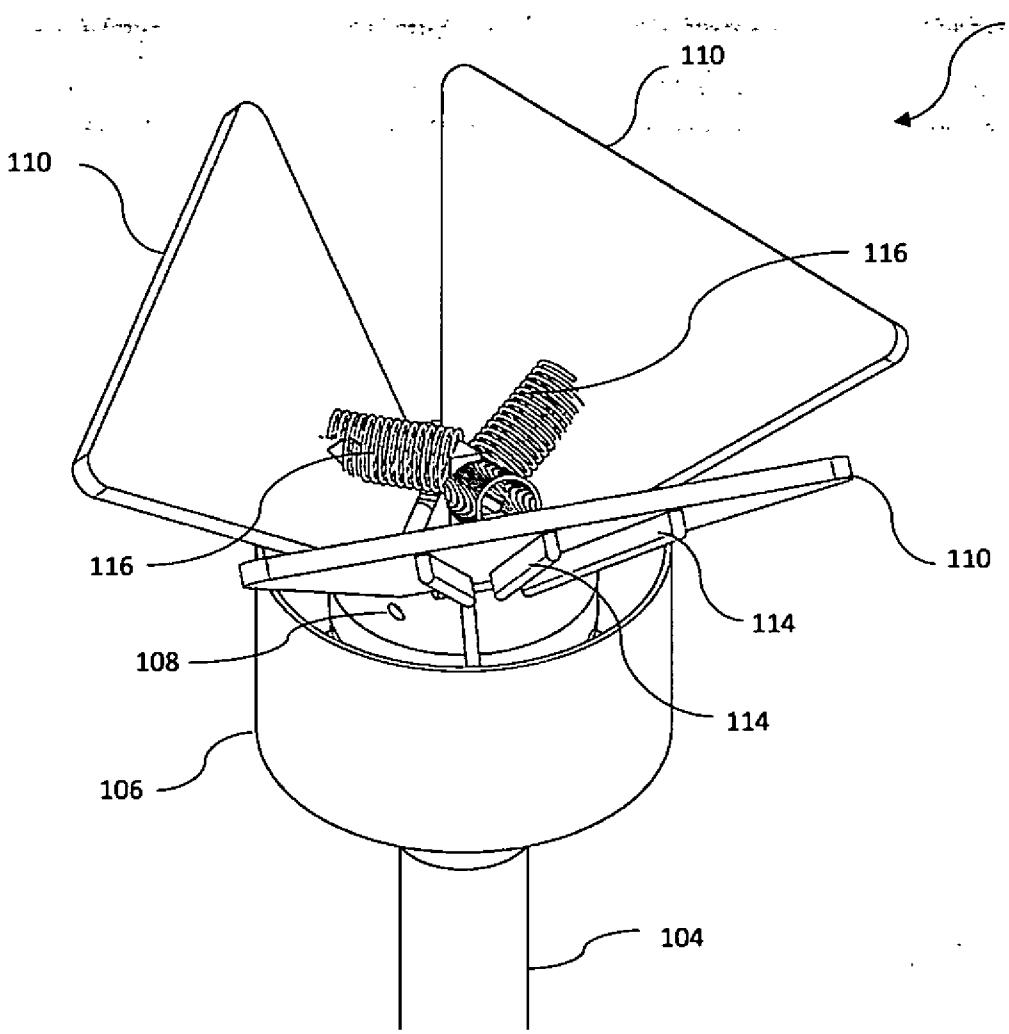

Figure 3

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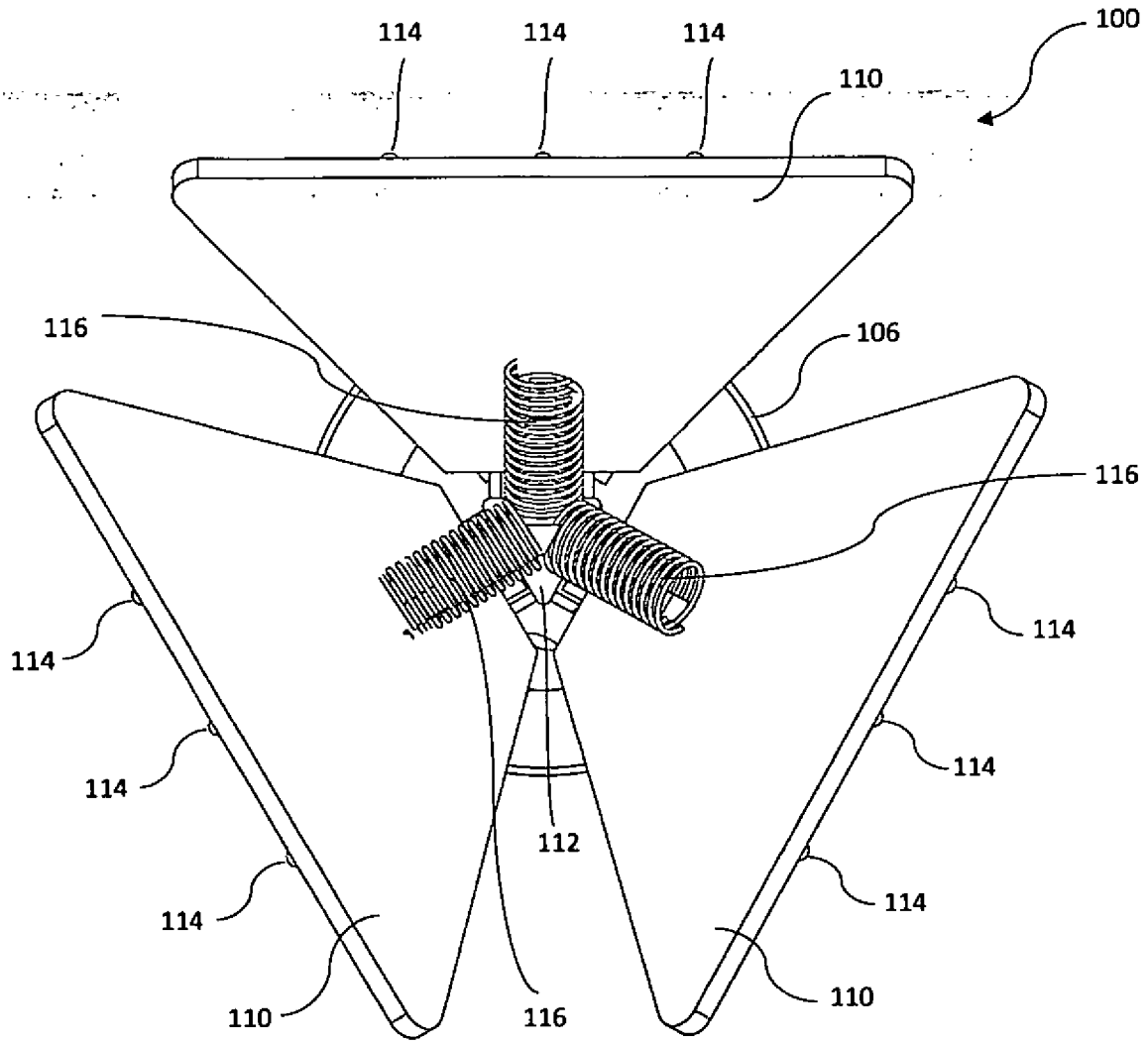

Figure 4

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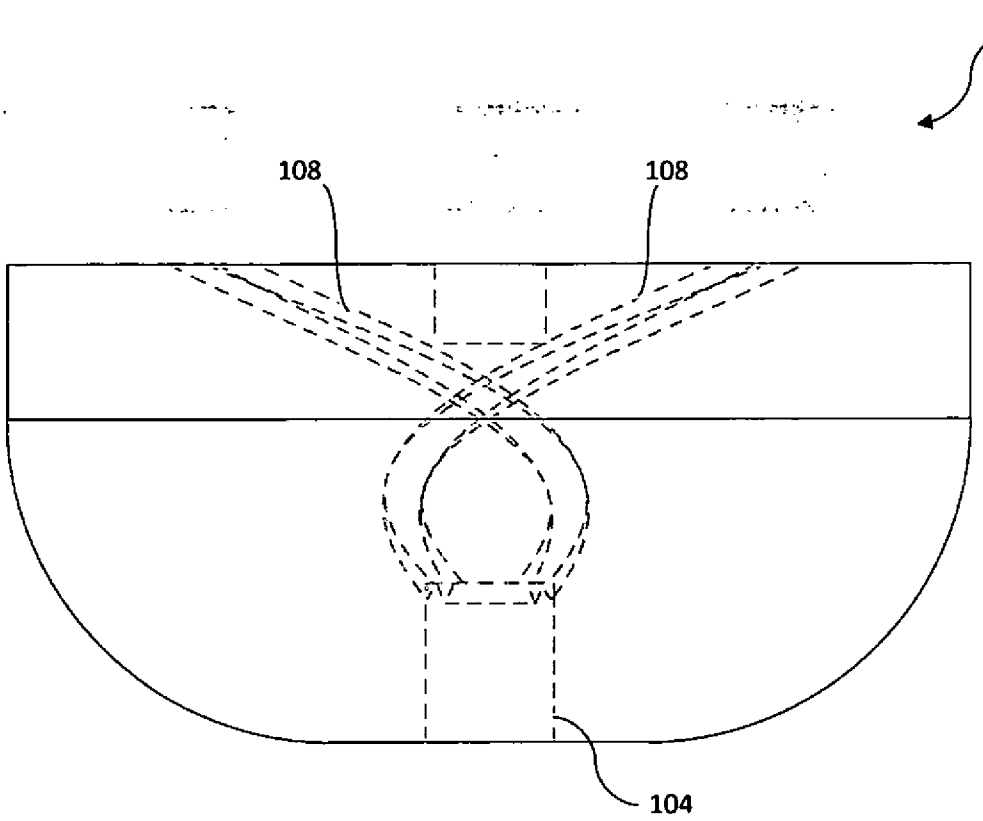

Figure 5

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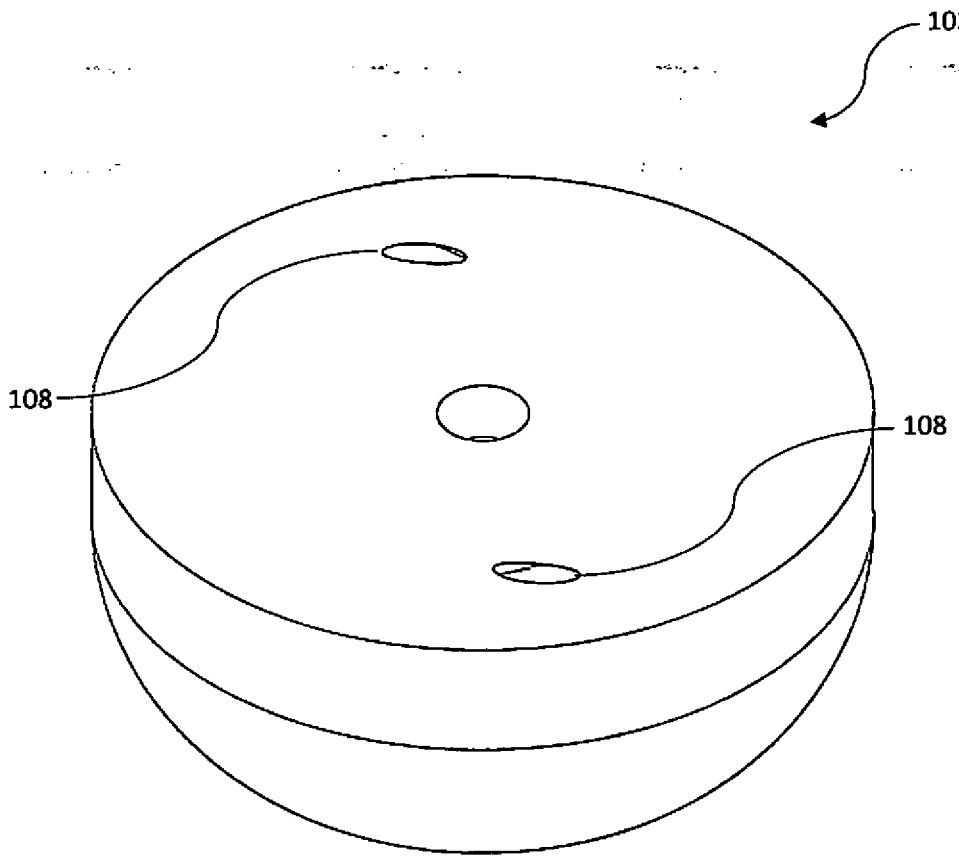

Figure 6

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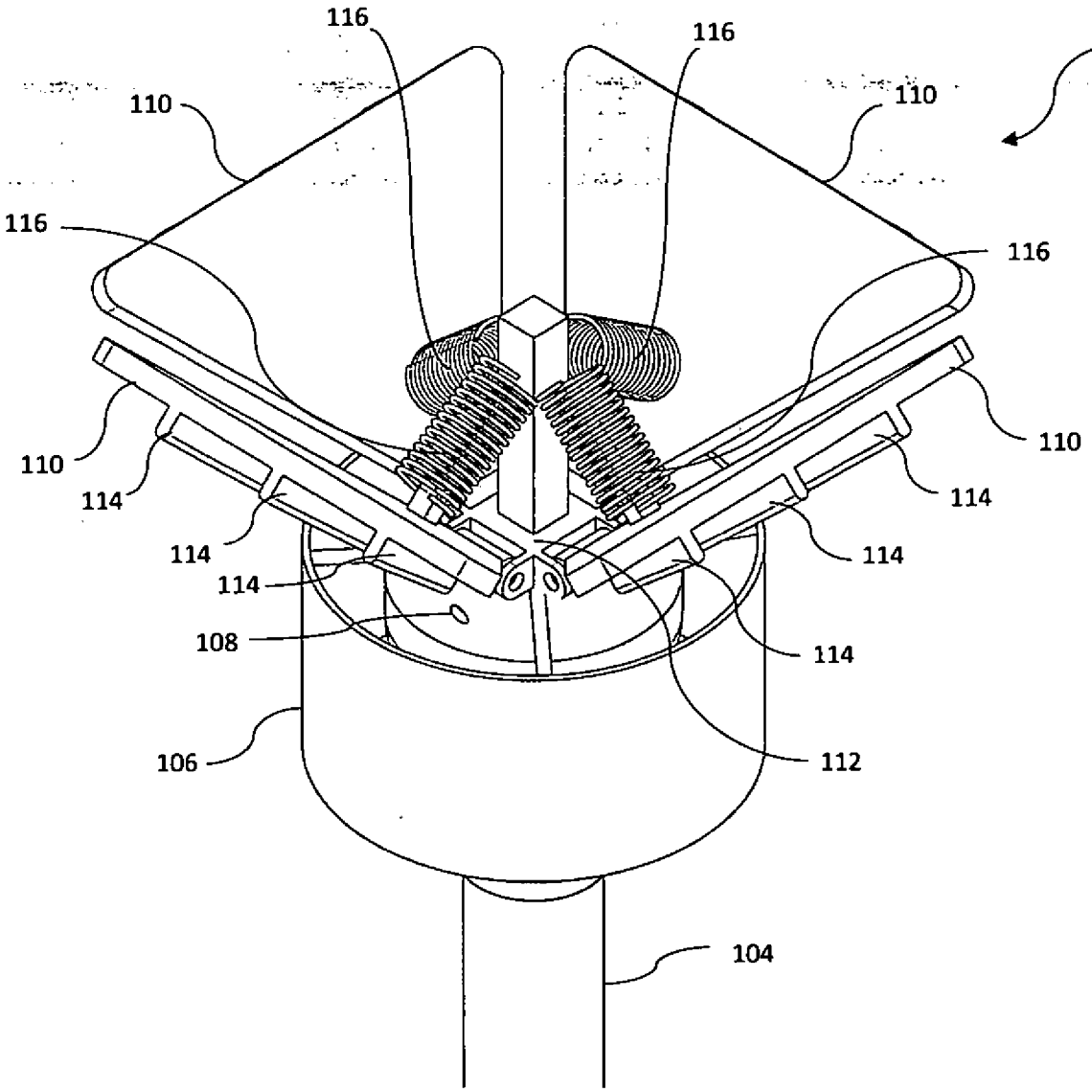

Figure 7

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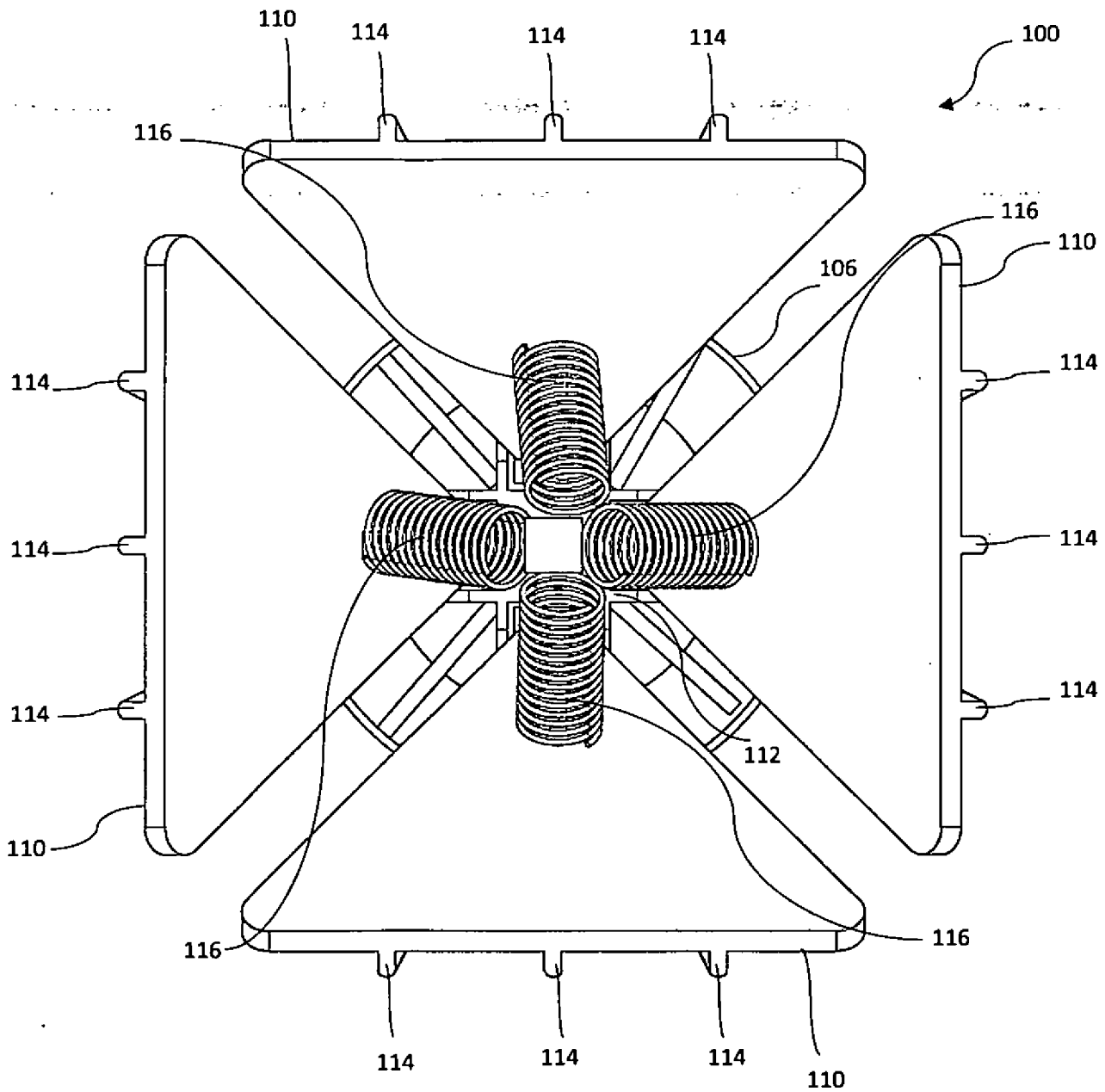

Figure 8

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