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HOT-STICKABLE DISK

Abstract

A barrier for use in an electrical system includes a body and a channel. The body has an outer perimeter and an inner perimeter that forms an aperture which can receive a support. The aperture is formed in a center of the body. A channel extends through the body between the outer perimeter and the inner perimeter. A center of mass (COM) of the body is located along the channel a first distance away from the center of the body.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION [0001] This application claims the benefit of U.S. Provisional Patent Application No. 63/552,424, filed Feb. 12, 2024, the entire contents of which are incorporated herein by reference in its entirety.

FIELD

[0002] The present disclosure relates to a barrier for limiting access to energized elements. More particularly, the present disclosure relates to eccentric barrier that resists decoupling in extreme environmental conditions.

BACKGROUND

[0003] Electrical components (e.g., power lines and other energized elements) are built across different environments to bring power to consumers and businesses. To convey electrical energy to consumers across wide and diverse areas, energized components need to be built within many environments, some of may be undeveloped or otherwise include an abundance of wildlife. Wildlife may be interested in these structures and not realize the dangers posed by the energized elements.

[0004] To keep the wildlife safe, linesman or other technicians may install guards at or near the energized elements. These guards may assist in providing a barrier between the animals' habitat and the energized elements, thereby reducing the animals that are inadvertently harmed. The guards also help to maintain the integrity of the system by limiting shorts or other electrical failures caused when animals interact with the energized elements.

[0005] The guard (e.g., a barrier disc) can be a simple (**1** step installation) hot stick application. Installation may also occur with a tool (e.g., a shotgun tool) by pushing or pulling the component on the equipment. The guard can also be installed via rubber glove work method (e.g., manually).

[0006] Some environments where guards are installed may produce high winds, which can cause the guard to rotate. Rotating bodies experience a centrifugal force, which is a force directed radially outwardly from a body's center of mass.

[0007] The guards typically include a pathway to insert the guard around its supporting element. As the guard rotates, the centrifugal force may at times be directed in an opposite direction from the pathway. In mild conditions, the guard may be capable of resisting the centrifugal force (e.g., via a frictional force). However, in high winds, the centrifugal force may exceed any other forces and may cause the guard to decouple from its support, which enables wildlife to access potentially dangerous areas.

[0008] Additional components to secure the pathway could be hot stick or shotgun installed. Although technicians can attempt to secure the pathway closed (e.g., with a zip tie) this may be an imperfect and impractical method to keep the guard secured. Securing the pathway adds additional steps, components, and effort, which may increase labor and/or material costs. Additionally, the body of the guard may be flexed to fit around a support and overtightening the guard after it is received around the support may cause it to fracture. Alternatively, while simply closing an opening to the pathway may initially limit the guard from becoming disconnected, the guard may still decouple because of the centrifugal force and ride along the technician's fastener, which can also fail.

[0009] A need for a way to ensure that a guard will remain coupled to its support during various environmental conditions is needed to limit failure of the guards and ensure that wildlife remains protected.

SUMMARY

[0010] Various examples of the present disclosure can overcome various of the aforementioned and other disadvantages associated with known guards and offer new advantages as well.

[0011] According to one aspect of various examples of the present disclosure there is provided an eccentric body having a center of mass spaced apart from a centroid.

[0012] According to one aspect of various examples of the present disclosure there is provided an

eccentric body having a central opening and a channel. A center of mass of the body is located along the channel.

[0013] According to one aspect of various examples of the present disclosure there is provided an eccentric body having an asymmetric body with a first half that has a channel and a second half that lacks a channel. A center of mass of the body is located within the first half of the body and spaced apart from a geometric center.

[0014] According to another aspect of various examples of the present disclosure, there is provided a barrier for use in an electrical system. The barrier includes a body and a channel. The body has an outer perimeter and an inner perimeter that forms an aperture which can receive a support. The aperture is formed in a center of the body. A channel extends through the body between the outer perimeter and the inner perimeter. A center of mass (COM) of the body is located along the channel a first distance away from the center of the body.

[0015] According to another aspect of various examples of the present disclosure, there is provided a barrier for use in an electrical system. The barrier includes a body and a channel. The body has an outer perimeter and an inner perimeter that forms an aperture which can receive a support. The aperture is formed in a center of the body. A channel extends through the body between the outer perimeter and the inner perimeter. A center of mass (COM) of the body is located proximate to the channel a first distance away from the center of the body.

[0016] According to another aspect of various examples of the present disclosure, there is provided a barrier for use in an electrical system. The barrier includes a body and a channel. The body includes an outer perimeter and an inner perimeter. The inner perimeter forms an aperture that can receive a support. A first axis passes through a center of the body and delineates a first region of the body and a second region of the body. A channel extends through the body between the outer perimeter and the inner perimeter. The channel is disposed in the first region. The first region includes a first mass and the second region includes a second mass less than the first mass such that the center of mass (COM) is located in the first region.

[0017] According to another aspect of various examples of the present disclosure, there is provided a barrier for use in an electrical system. The barrier includes a body, an aperture, a channel, and a support section. The body is formed from a plurality of spaced apart first ribs. The aperture is formed at a geometric center of the body. The channel extends from the aperture to an outer perimeter of the body. The support section is disposed proximate to the channel and includes an opening that can receive a tool for connecting the body to the support. The support section includes a plurality of spaced apart second ribs. The second ribs are oriented in a denser pattern than the first ribs. The center of mass (COM) of the body is spaced apart from the geometric center in the direction of the support section.

[0018] According to another aspect of various examples of the present disclosure, there is provided a barrier for use in an electrical system. The barrier includes a body formed from a plurality of spaced apart first ribs, an aperture formed at a center of the body, and a channel extending from the aperture to an outer perimeter of the body. The body includes a first inner wall and a second inner wall that together at least partially form a boundary of the channel. The body is movable between a first position wherein the first inner wall and the second inner wall are spaced apart by a first distance and a second position where the first inner wall and the second inner wall are spaced apart by a second distance greater than the first distance. A center of mass (COM) of the body is located along the channel and is spaced apart from the center of the body.

[0019] According to another aspect of various examples of the present disclosure, there is provided a method of reducing wildlife disturbances. The method includes attaching a guard to a support to block access from wildlife. The guard includes a channel that can receive the support, and a center of mass of the guard is spaced apart from the centroid. The guard can rotate around the support with the application of an external force and a centrifugal force acts to maintain the guard coupled to the support.

[0020] According to another aspect of various examples of the present disclosure, there is provided a method of mounting a guard to an electrical support to limit access from wildlife, the method including positioning a tool through an opening in a body of the guard; maneuvering a channel of the body at least partially around an electrical support; wherein the center of mass of the body is disposed within the channel and spaced apart from the centroid.
[0021] According to another aspect of various examples of the present disclosure, there is provided a method of mounting a guard to an electrical support to limit access from wildlife, the method including positioning a tool through an opening in a body of the guard; maneuvering a channel of the body at least partially around an electrical support; wherein the center of mass of the body is disposed proximate to the channel and spaced apart from the centroid.
[0022] The disclosure herein should become evident to a person of ordinary skill in the art given the following enabling description and drawings. The drawings are for illustration purposes only and are not drawn to scale unless otherwise indicated. The drawings are not intended to limit the scope of the disclosure. The following enabling disclosure is directed to one of ordinary skill in the art and presupposes that those aspects within the ability of the ordinarily skilled artisan are understood and appreciated.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0023] Various aspects and advantageous features of the present disclosure will become more apparent to those of ordinary skill when described in the detailed description of preferred examples and reference to the accompany drawing wherein:
[0024] FIG. **1** is a perspective view of a disk guard.
[0025] FIG. **2** is a top view of the disk guard of FIG. **1**.
[0026] FIG. **3** is a schematic view of the disk guard of FIG. **1** illustrating a centroid and center of mass.
[0027] FIG. **4** is a schematic view of an external force acting on the disk guard of FIG. **1**.
[0028] FIG. **5** is a schematic view of the disk guard of FIG. **1** of a centrifugal force acting in response to the external force
DETAILED DESCRIPTION
[0029] FIGS. **1** and **2** illustrate one example of a guard or barrier **100** according to the present disclosure. The guard **100** includes a body **105** that is illustrated as having a substantially circular shape (e.g., a substantially circular outer perimeter **110**). However, other examples of the guard **100** may include a body with a different shape (e.g., elliptical, triangular, rectangular, etc.).
[0030] In some forms, the body **105** may not be fully solid and may include a webbed region **115**, which may be made up of circumferentially extending webs **116**. For example, the webs **116** in the webbed region **115** may be disposed radially inside of the outer perimeter **110** and may include a similar shape (e.g., circular) as the outer perimeter **110**.
[0031] In certain forms, the circumferential webs **116** may be substantially equally spaced from one another in the radial direction, although in other examples the webs **116** may have unequal spacing. A void may exist between adjacent webs **116** in the radial direction, which may permit airflow to pass through the body **105**.
[0032] In some forms, the webbed region **115** may further include radial webs **117** that extend along a radial direction of the body **105**. For example, the radial webs **117** may extend from the outer perimeter **110** toward the center, although the radial webs **117** may extend along any length of the circumferential direction.
[0033] In certain forms, at least some of the radial webs **117** may be unequally spaced around the circumference of the body **105**. For example, the spacing of the radial webs **117** on the first half

118 of the body **105** may have a different spacing than the radial webs **118** on a second half of the body **119**. The illustrated example includes radial webs **117** that are equally spaced relative to the other radial webs **117** on the same half **118**, **119** of the body **105**, although other examples may include unequal spacing throughout the entire body **105**.

[0034] With continued reference to FIGS. **1** and **2**, the webbed region **115** may radiate outwardly from a center of the body **105**. The center may include an aperture **120**, which as described in more detail below, may receive an electrical component or support. These terms may be used throughout to designate any element that the guard is coupled to (e.g., a bushing, a conductor, an insulator, a non-energized structure supporting energized components, etc.). A center point of the aperture **120** may represent a geometric center or centroid of the body **105**.

[0035] In some forms, one or more channels **125** (e.g., two shown) may extend outwardly in the radial direction from the aperture **120**. The illustrated channels **125** are each formed on the second half **119** of the body **105**, although any configuration (e.g., one or more on the first half **118**) may be constructed.

[0036] In certain forms, each channel **125** may be formed as an elongated section that extends in the radial direction outwardly from the aperture **120**. The end of each channel **125** may include a rounded region (e.g., substantially circular in shape) that may be wider than the remainder of the respective channel **125**.

[0037] In one form, a radial web **117** may extend between a channel **125** and the outer perimeter **110**. Although in other examples, the radial web **117** and the channel **125** may be spaced apart from one another in the circumferential direction.

[0038] The body **105** may also include an insertion pathway **130**. Like the channels **125**, the insertion pathway **130** may extend outwardly in the radial direction from the aperture **120**. The illustrated insertion pathway **130** may be formed on the first half **118** of the body **105**.

[0039] In some forms, the channels **125** and the insertion pathway **130** may be similar. For example, they may each provide an opening within the body **105** (e.g., through which air or objects may pass) that extends in the radial direction from the aperture **120**. In some forms, the channels **125** and the insertion pathway **130** may be equally spaced (e.g., about 120° apart), although in other example, there may be different (e.g., unequal spacing).

[0040] In certain forms, the insertion pathway **130** may differ from the channels **125** because the insertion pathway **130** may extend to the outer perimeter **110** and provide a pathway to reach the aperture in the radial direction of the body **105**. The other perimeter **110** may therefore not form a closed perimeter.

[0041] The body **105** may be constructed from an at least partially flexible material. The guard **100** illustrated in FIGS. **1** and **2** may show the body **105** in a neutral position. For example, walls forming the insertion pathway **130** may extend toward one another and eventually contact one another proximate to the outer perimeter **110**. However, as described in more detail later, the body **105** may flex so that the distance between the walls increases and the insertion pathway **130** widens.

[0042] The body **105** may include one or more holes **135** (e.g., three shown) proximate to the outer perimeter **110**. As described in more detail below, a tool (e.g., a hot-stick-not shown) may be inserted into one of the holes **135** to manually position the guard **100** around a support.

[0043] As described above, the first half **118** may differ from the second half **119** of the body **105** because there is a greater concentration of ribs **116**, **117** in the first half **118** than in the second half **119**. Similarly, the holes **135** may differ based on their positioning on the body **105**.

[0044] For example, the illustrated body **105** includes two holes **135** on the first half **118** and one hole **135** on the second half **119**, although any number or configuration may be used. The holes **135** may be surrounded by a support section, which may have a different shape depending on the location on the body **105**.

[0045] For example, the hole **135** on the second half **119** may include a support section **140** having

a first weight and each hole **135** on the first half **118** may include a support section **145** with a second weight. In some forms, the support section **140** may include a first number of webs, and the support section **145** may include a second number of webs that is greater than the first number. The increased number of webs may make each support section **145** heavier than the support section **140**. The first support section **140** is illustrated as being substantially opposite each of the support sections **145**, and may be disposed at least about 90° apart so that the support section **140** is disposed on an opposite half of the body **105** from the support sections **145**.

[0046] In certain forms, the webs of the support section **145** may be more densely positioned than the webs **116**, **117** of the webbed region **115** on the first half **118**. Although in other examples, support section **145** and the webbed region **115** on the first half **118** could have substantially the same density of webs.

[0047] In other examples, the support section **145** may not include any webs and may be a solid region around the respective hole **135**. In this instance, the support section **140** may include the webs (e.g., as shown in FIG. **2**) or may also be a solid region disposed around the hole **135**. In either case, each support section **145** may be constructed so that it is more massive than the support section **140**.

[0048] In still other examples, the first weight and second weight may be equal. The first half **118** of the body **105** may include a greater mass than the second half **119** because there are more support sections **145** than support sections **140** and/or because there are more webs **116**, **117** on the first half **118**.

[0049] In still further examples, substantially all the first half **118** may be solid and at least some second half **119** may be open to allow for airflow through the body **105**. This example may also make the first half **118** more massive than the second half **119**.

[0050] In still further examples, the first half **118** may be constructed from a first material and the second half **119** may be constructed from a second material (e.g., two materials are introduced into a mold). The first material may be denser than the second material, which may make the first half **118** more massive than the second half **119**.

[0051] As shown in FIG. **3**, the guard **100** may be positioned so that a support **50** is received within the aperture **120**. Coupling the guard **100** to the support **50** may involve using a tool (e.g., a hot-stick-not shown) to position the guard **100** without touching the support **50**. The tool may be removable coupled to the guard **100** via at least one of the holes **135**. The tool can move (e.g., push or pull) the guard to the support **50** and adjust the insertion pathway **130** (e.g., move the body **105** from a neutral position to a second position) to accommodate the support **50**. In the second position, the walls of the insertion pathway **130** may be moved against a bias toward the neutral position (see e.g., FIG. **2**) to form a wider area. In some forms, the walls of the aperture **120** may provide a clamping force against the support as the insertion pathway **130** attempts to return to the neutral position. Although not shown, the channels **125** may also widen as the insertion pathway moves away from the neutral position to accommodate the support **50**.

[0052] In some forms, the body **105** may include at least one compressive region **127** (e.g., two shown in FIGS. **1** and **2**). The compressive regions **127** may be disposed substantially opposite of the insertion pathway **130**. The compressive regions **127** may permit the body **105** to compress around that location to permit the insertion pathway **130** to widen.

[0053] As shown in FIGS. **1** and **2**, the support section **140** may be disposed between the compressive regions **127**. Each compressive region **127** may include a wider middle section and a narrower outer section (e.g., proximate to the other perimeter **110**). The outer perimeter **110** of the body **105** may also be discontinuous on either side of each compressive region **127**. When a force is applied to the body **105** to expand the width of the insertion pathway **130** (e.g., expand from a neutral position), the discontinuous sections of the outer perimeter **110** on either side of a respective compressive region **127** may move proximate to one another is the middle section of the compressive region **127** flattens out and decreases in width.

[0054] Returning to FIG. **3**, the guard **100** may have a geometric center or centroid **60** in a center of the body **105** (e.g., in a center of the aperture **120**). A center of mass **70** of the guard **100** may be spaced apart from the geometric center **60**. In the illustrated example, the center of mass **70** may be located in the first half **118** of the body **105**. Specifically, the center of mass **70** may be located along the insertion pathway **130** (e.g., along the center of the insertion pathway **130**, although other locations of the center of mass **70** may be used). For example, other forms may include a center of mass located a certain distance (e.g., 0.25 inches, 0.5 inches, 1 inch, etc.) on either side of the insertion pathway while remaining in the first half **118** of the body **105**.

[0055] In some examples, the center of mass **70** may be between about 0.01 inches and about 10 inches away from the geometric center **60** in the radial direction. In some examples, the center of mass **70** may be between about 0.05 inches and about 8 inches away from the geometric center **60** in the radial direction. In some examples, the center of mass **70** may be between about 0.1 inch and about 5 inches away from the geometric center **60** in the radial direction. In some examples, the center of mass **70** may be between about 0.25 inches and about 4 inches away from the geometric center **60** in the radial direction. In some examples, the center of mass **70** may be between about 0.5 inches and about 2 inches away from the geometric center **60** in the radial direction. In some examples, the center of mass **70** may be about 1 inch away from the geometric center **60** in the radial direction.

[0056] In some examples, the center of mass **70** may be located in the first half **118** any distance away from the geometric center **60** that is at least about 1 inch (e.g., 1 inch, 1.5 inches, 2 inches, etc.).

[0057] In other forms, the distance between the center of mass **70** and the geometric center **60** may be measured along a pathway axis **150**. For example, the center of mass **70** may be positioned at any location with a negative coordinate (e.g., as viewed in FIG. **3**) along the pathway axis **150** (i.e., in the first half **118** of the body **105**). The center of mass **70** may therefore have a non-zero coordinate along the transverse axis **155**. The radial distance between the center of mass **70** and the geometric center may therefore be greater than the distance between the center of mass **70** and the geometric center **60** may be measured along a pathway axis **150**. For example, the center of mass **70** may be about 1 inch away from the geometric center **60** as measured along the pathway axis **150**, and may be further than 1 inch away from the geometric center **60** as measured along the radial direction. In this situation, the first half **118** may be asymmetric about the pathway axis **150** so that the center of mass **70** includes a non-zero coordinate along the transverse axis **155** (e.g., the body **105** includes only one support section **145**).

[0058] In use, an external force **80** may act on the guard **100**. For example, the guard may be installed in places that experience high winds (e.g., up to and/or exceeding about 80-90 mph) that exert a force on the guard **100**. As illustrated in FIG. **4**, the external force **80** (e.g., wind force) may act proximate to the outer perimeter **110**, which creates a torque sufficient to cause rotation **90**. In windy environments, the guard **100** may rotate about the support **50**.

[0059] When an object moves in a circular path, a centrifugal force acts on the body in a direction away from the center of rotation. Because the body **105** has an opening (e.g., the insertion path **130**), body **105** should be designed so that the centrifugal force does not cause the guard **100** to disconnect from the support **50** in windy conditions.

[0060] To achieve this, the body **105** is manufactured with a greater mass on the first half **118** than on the second half **119**. As described above, this may be achieved through a greater density of webs **116**, **117**, by more massive support sections **145**, and/or by a greater number of support sections **145** in the first half **118** as compared to the second half **119**. More specifically, the section of the body **105** proximate to the insertion path **130** is more massive than the opposite section.

[0061] As shown in FIG. **5**, the centrifugal force **85** acts outwardly from the center of mass **70** along the insertion path **130**. For example, the first half **118** of the body **105** may be substantially symmetrical about the insertion pathway **130** so that the center of mass is oriented substantially in

the center of the insertion pathway **130**.
[0062] Positioning the center of mass away from the centroid and within the insertion pathway **130** always orients the centrifugal force in a radial direction along the insertion pathway **130** toward the outer perimeter **110**.
[0063] This force draws the wall of the aperture **120** into the support. In other words, the centrifugal force **85** forces the body **105** into contact with the support **50** and prevents the support from traveling down the insertion path **130**. Because the centrifugal force **85** is always directed outwardly, the body **105** will remain in this position as it continues to rotate about the support **50**.
[0064] In some forms, the center of mass **70** may be at least about 1 inch away from the geometric center **60** to provide sufficient stability on the support **50**. For example, a centrifugal force acting at about 1 inch from the geometric center **60** may be sufficient to retain the body **105** on the support **50**. A centrifugal force that acts further than 1 inch away from the center (e.g., because the center of mass **70** is more than 1 inch away) may still provide a greater force while also needed more material, while a centrifugal force acting less than 1 inch may not provide sufficient force to retain the body **105**. Although these numbers may represent the optimized values for this specific guard **100**, changing the dimensions of the guard **100** (e.g., a guard **100** with a larger or smaller diameter) can change when the optimized center of mass **70** is located.
[0065] Orienting the center of mass along the insertion pathway **130** also helps to ensure that the centrifugal force is not directed into a wall, which could create frictional forces and limit the ability of the guard to rotate.
[0066] Additionally, no additional fasteners are needed to secure the body **105** to the support **50**. The centrifugal force, and any clamping forces supplied by the walls of the aperture **120** resulting from the bias of the body **105** toward the neutral position, are sufficient to retain the body **105** coupled to the support **50**.
[0067] One of ordinary skill will appreciate that the exact dimensions and materials are not critical to the disclosure and all suitable variations should be deemed to be within the scope of the disclosure if deemed suitable for carrying out the objects of the disclosure.
[0068] One of ordinary skill in the art will also readily appreciate that it is well within the ability of the ordinarily skilled artisan to modify one or more of the constituent parts for carrying out the various examples of the disclosure. Once armed with the present specification, routine experimentation is all that is needed to determine adjustments and modifications that will carry out the present disclosure.
[0069] The above examples are for illustrative purposes and are not intended to limit the scope of the disclosure or the adaptation of the features described herein. Those skilled in the art will also appreciate that various adaptations and modifications of the above-described preferred examples can be configured without departing from the scope and spirit of the disclosure. Therefore, it is to be understood that, within the scope of the appended claims, the disclosure may be practiced other than as specifically described.

Claims

1. A barrier for use in an electrical system, the barrier comprising: a body having an outer perimeter and an inner perimeter forming an aperture configured to receive a support, the aperture formed in a center of the body; and a channel extending through the body between the outer perimeter and the inner perimeter; wherein a center of mass (COM) of the body is located along the channel a first distance away from the center of the body.
2. The barrier of claim 1, wherein the body includes radial ribs that extend at least partially between the outer perimeter and the inner perimeter, wherein the body includes a greater density of radial ribs proximate to the channel.
3. The barrier of claim 2, wherein the body further includes circumferential ribs spaced around the

body, and wherein the circumferential ribs are equally spaced from one another in a radial direction.

4. The barrier of claim 1, wherein the body includes an opening spaced apart from the aperture and proximate to the outer perimeter, the opening is configured to receive a tool for maneuvering the body onto the support.

5. The barrier of claim 4, wherein the body further includes a support section at least partially surrounding the opening, wherein the support section is located proximate to the channel and includes a mass greater than surrounding sections of the body.

6. The barrier of claim 1, wherein the body includes a first inner wall and a second inner wall that together at least partially form a boundary of the channel, wherein the body is movable between a first position wherein the first inner wall and the second inner wall are spaced apart by a first distance and a second position where the first inner wall and the second inner wall are spaced apart by a second distance greater than the first distance.

7. A barrier for use in an electrical system, the barrier comprising: a body including, an outer perimeter, an inner perimeter forming an aperture configured to receive a support, and a first axis passing through a center of the body and delineating a first region of the body and a second region of the body; and a channel extending through the body between the outer perimeter and the inner perimeter, wherein the channel is disposed in the first region; wherein the first region includes a first mass and the second region includes a second mass less than the first mass such that the center of mass (COM) is located in the first region.

8. The barrier of claim 7, wherein the body further includes, an opening spaced apart from the aperture and proximate to the outer perimeter, the opening configured to receive a tool for maneuvering the body onto the support; and a support section at least partially surrounding the opening, wherein the support section is located in the first region and includes a third mass greater than surrounding sections of the body.

9. The barrier of claim 8, wherein the opening is a first opening and the support section is a first support section, the body further includes, a second opening spaced apart from the aperture and proximate to the outer perimeter, the second opening configured to receive the tool for maneuvering the body onto the support; and a second support section at least partially surrounding the second opening, wherein the second support section is located in the second region and includes a fourth mass that is less than the third mass.

10. The barrier of claim 8, wherein the opening is a first opening and the support section is a first support section, the body further includes, a second opening spaced apart from the aperture and proximate to the outer perimeter, the second opening configured to receive the tool for maneuvering the body onto the support; and a second support section at least partially surrounding the second opening, wherein the second support section is located in the first region and includes a fourth mass that is greater than surrounding sections of the body; wherein the first support section and the second support section are disposed symmetrically about the channel.

11. The barrier of claims 7, wherein the body includes a plurality of spaced apart radial ribs that each extend at least partially between the inner perimeter and the outer perimeter, and wherein the density of radial ribs in the first region is greater than the density of radial ribs in the second region.

12. The barrier of claim 7, wherein the body includes a second axis that extends along a center of the channel and is oriented perpendicularly to the first axis, and wherein the COM is located along the second axis.

13. The barrier of claim 7, wherein the body includes a first inner wall and a second inner wall that together at least partially form a boundary of the channel, wherein the body is movable between a first position wherein the first inner wall and the second inner wall are spaced apart by a first distance and a second position where the first inner wall and the second inner wall are spaced apart by a second distance greater than the first distance.

14. The barrier of claim 7, wherein the body is formed from a plurality of spaced apart ribs that are

configured to permit airflow through the body.

15. A barrier for use in an electrical system, the barrier comprising: a body formed from a plurality of spaced apart first ribs; an aperture formed at a geometric center of the body; a channel extending from the aperture to an outer perimeter of the body; and a support section disposed proximate to the channel and including an opening configured to receive a tool for connecting the body to the support, the support section including a plurality of spaced apart second ribs; wherein the second ribs are oriented in a denser pattern than the first ribs; and wherein a center of mass (COM) of the body is spaced apart from the geometric center in the direction of the support section.

16. The barrier of claim 15, wherein the support section is a first support section and the opening is a first opening, the support section further comprising: a second support section disposed proximate to the channel and including a second opening configured to receive the tool for connecting the body to the support, the second support section including a plurality of spaced apart third ribs; and wherein the COM is disposed between the first support section and the second support section.

17. The barrier of claim 15, wherein the support section is a first support section and the opening is a first opening, the support section further comprising: a second support section disposed greater than 90° apart from the first support section and including a second opening configured to receive the tool for connecting the body to the support, the second support section including a plurality of spaced apart third ribs; and wherein the COM is disposed closer to the first support section than the second support section.

18. The barrier of claim 15, wherein the body includes a first inner wall and a second inner wall that together at least partially form a boundary of the channel, wherein the body is movable between a first position wherein the first inner wall and the second inner wall are spaced apart by a first distance and a second position where the first inner wall and the second inner wall are spaced apart by a second distance greater than the first distance.

19. The barrier of claim 15, wherein the COM is located along a first axis that pass through the geometric center and a center of the channel.

20. The barrier of claim 19, wherein a second axis perpendicular to the first axis passes through the geometric center and delineates a first region of the body and a second region of the body, wherein there is a greater number of first ribs in the first region than in the second region.

21.-**24**. (canceled)