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Griffin et al.

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(54) **ELECTRICALLY HEATED CIGARETTE SMOKING SYSTEM**

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(51) **Int. Cl.**
F24F 1/22 (2006.01)

(52) **U.S. Cl.** **131/329**

(58) **Field of Classification Search** 131/329; D13/107–110; 320/110–115
See application file for complete search history.

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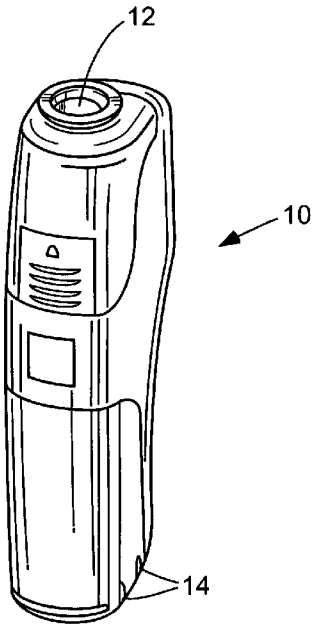
(57) **ABSTRACT**

A stand for an electrically heated cigarette smoking device can removably support an electrically heated cigarette smoking device, which includes a rechargeable power supply. The stand is configured to fit in a receptacle, such as a receptacle in a vehicle. Charging electronics controls charging of the rechargeable power supply when the electrically heated cigarette smoking device is supported by the stand, and the electrically heated cigarette smoking device or stand is electrically connected to the external power supply.

3 Claims, 10 Drawing Sheets



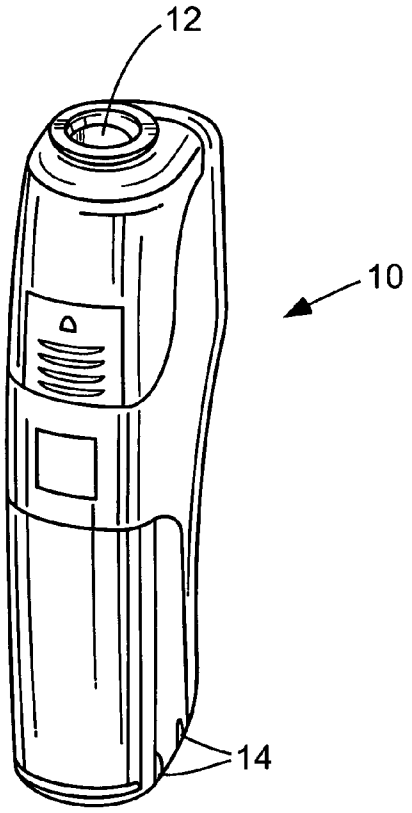


FIG. 1

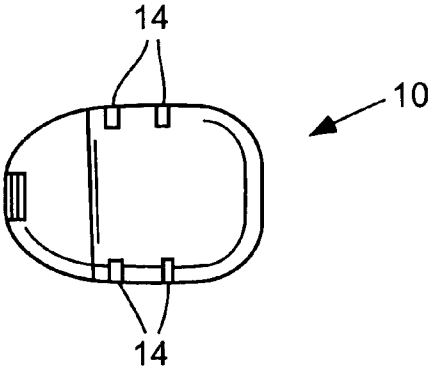


FIG. 2

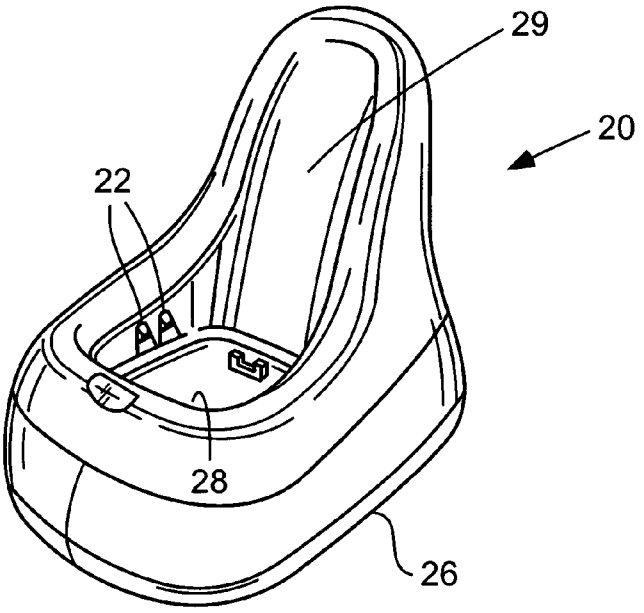


FIG. 3

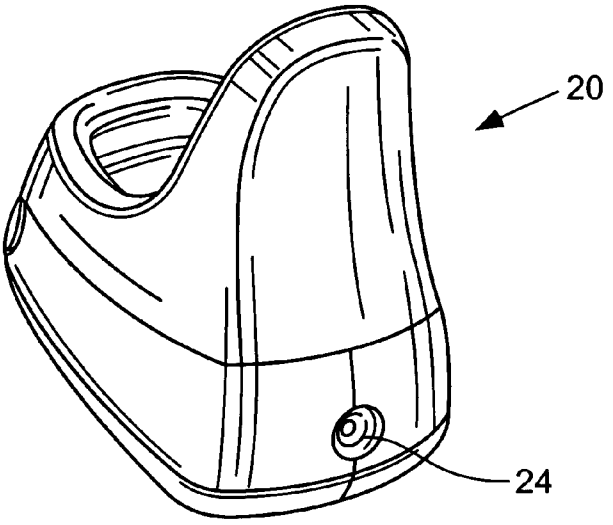


FIG. 4

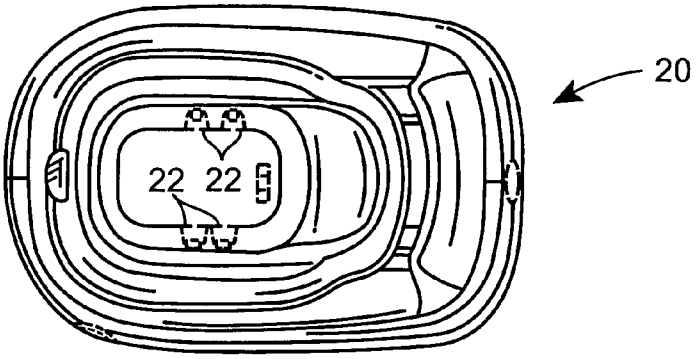


FIG. 5

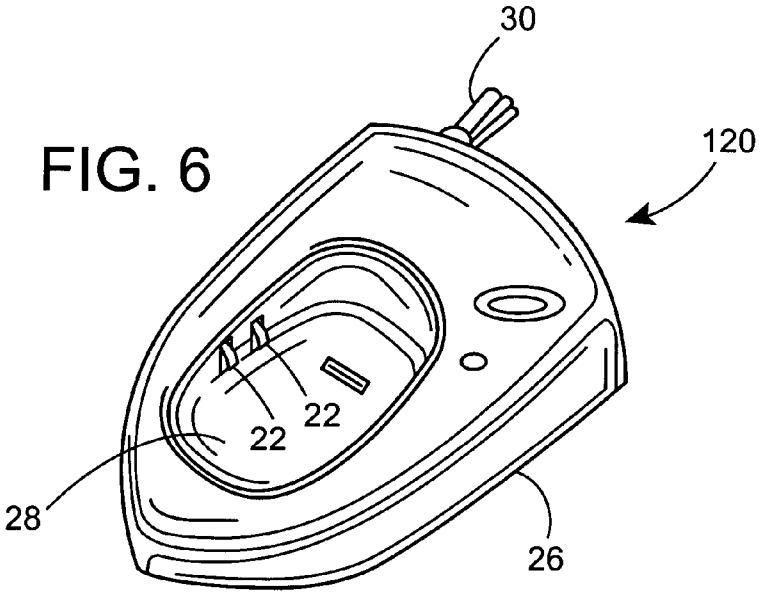


FIG. 6

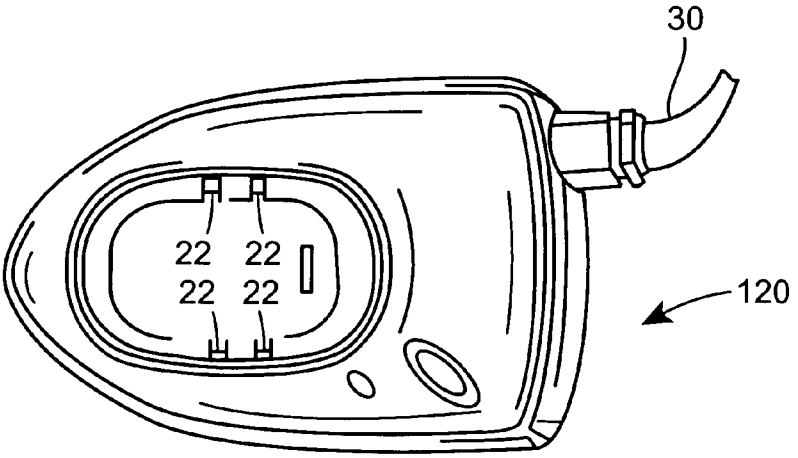


FIG. 7

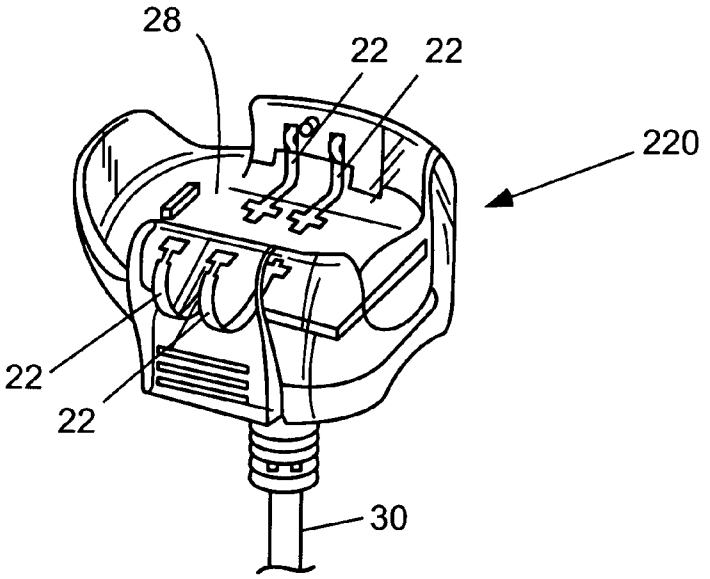


FIG. 8

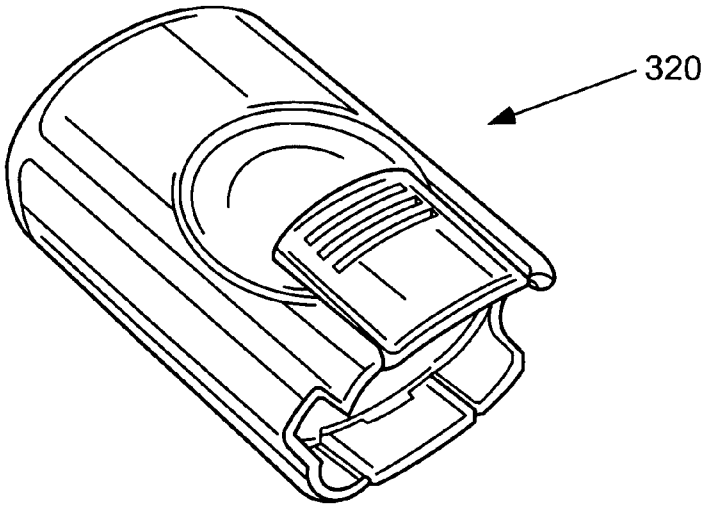


FIG. 9

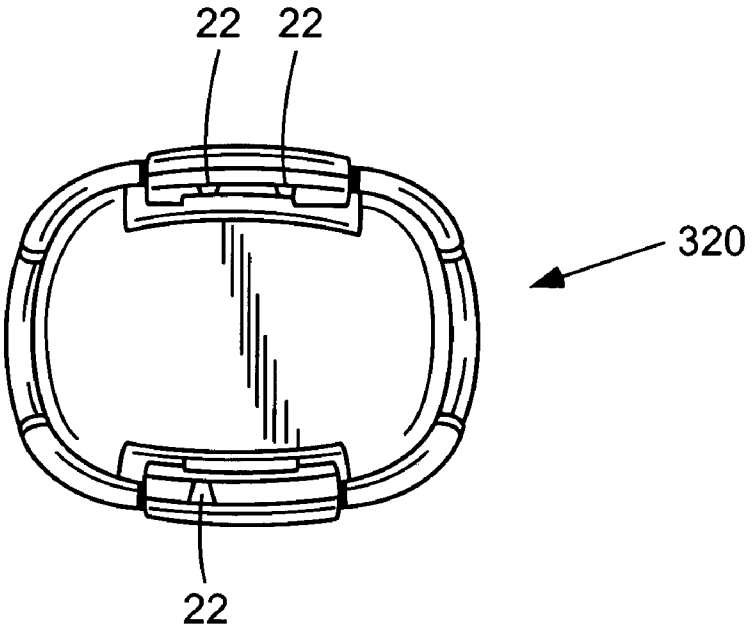


FIG. 10

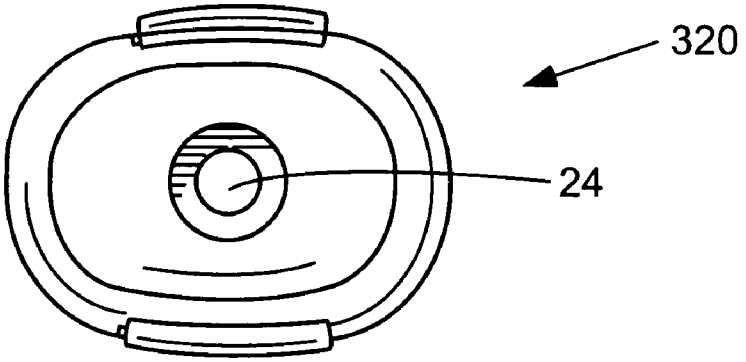


FIG. 11

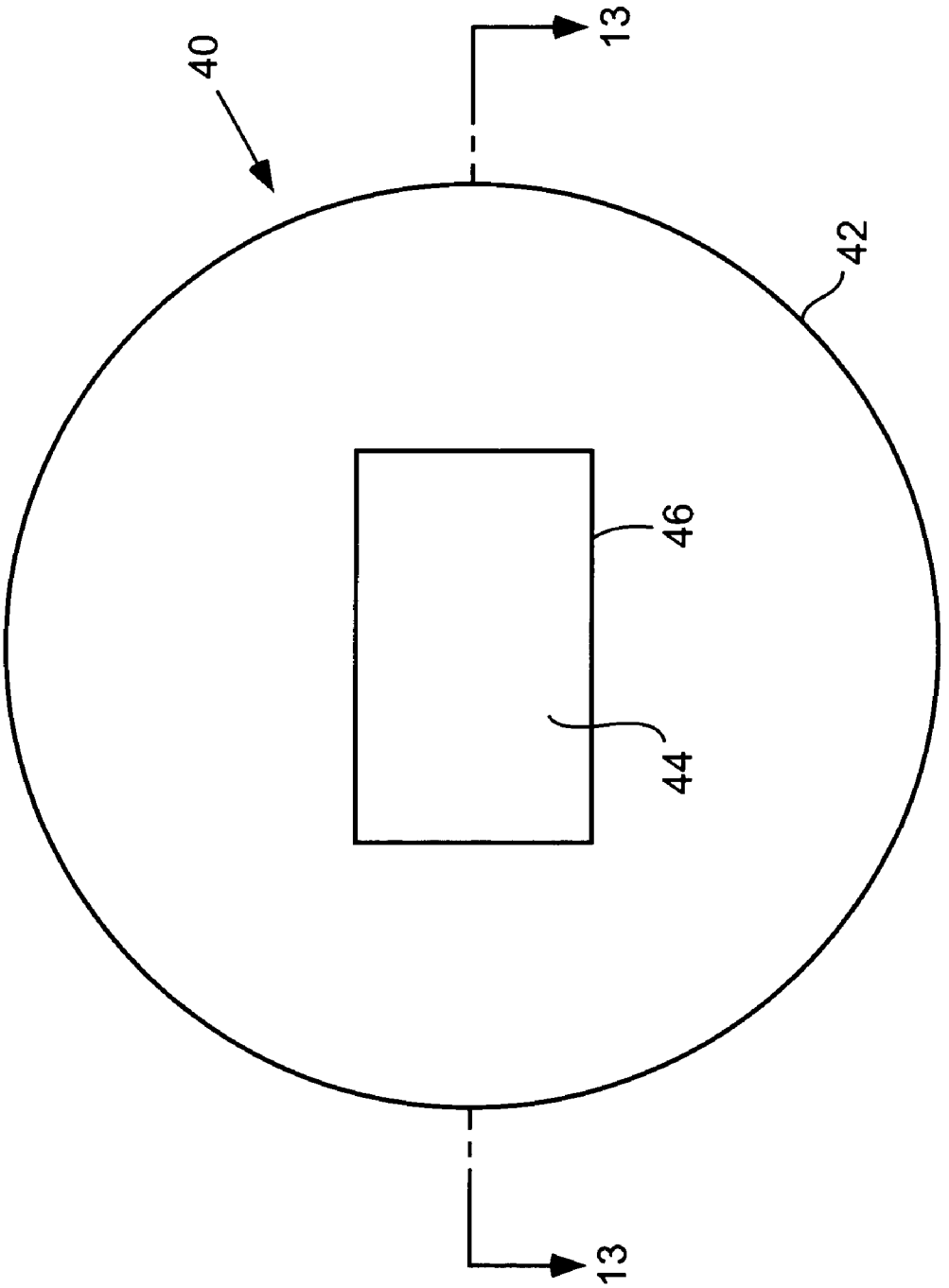
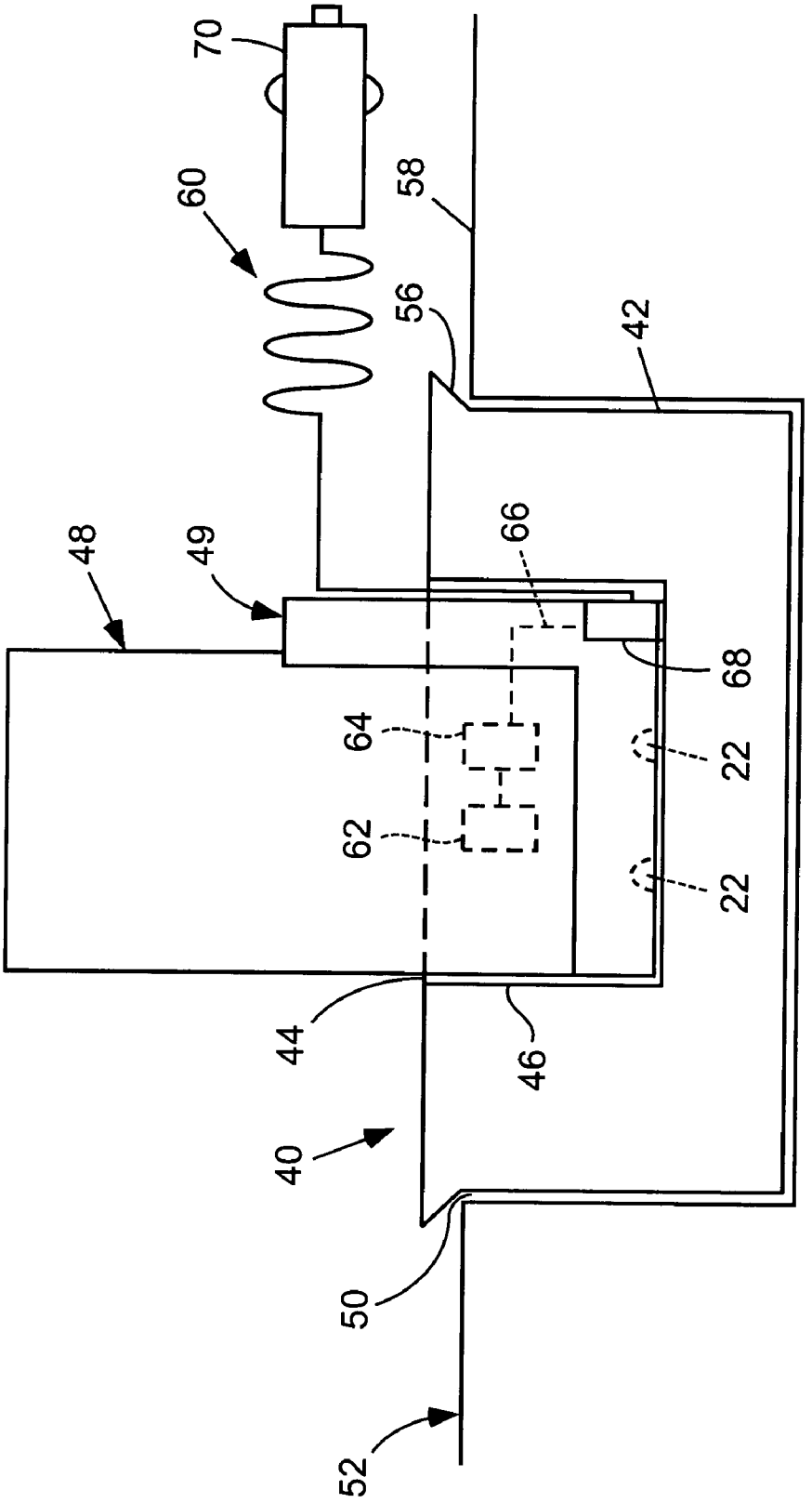


FIG. 12

FIG. 13



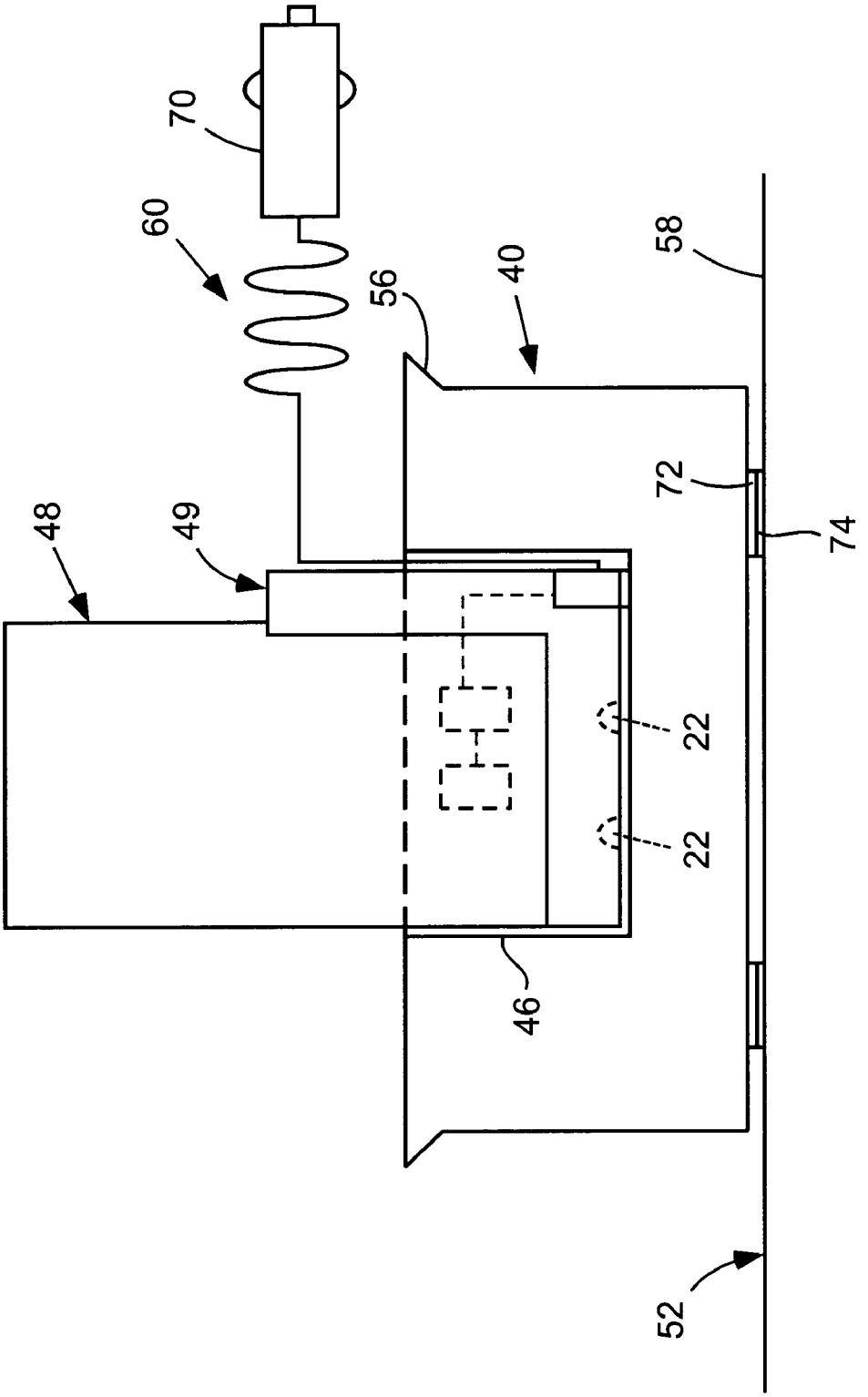


FIG. 14

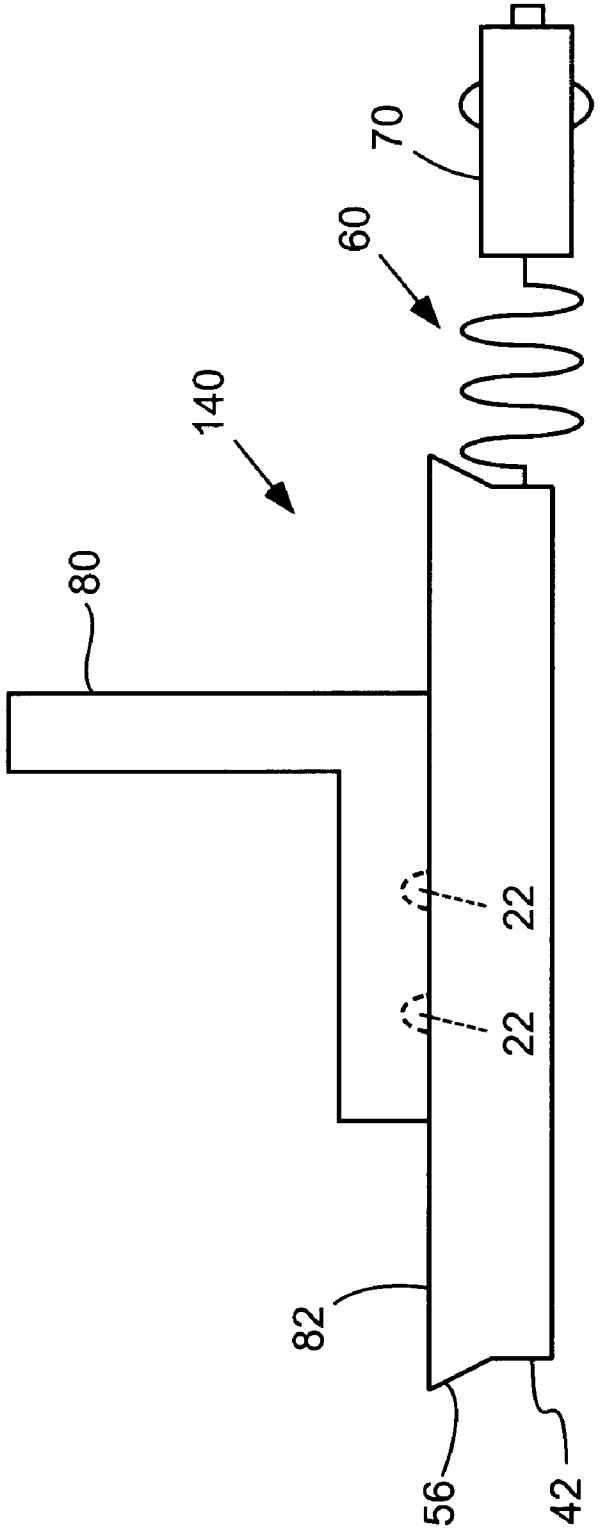


FIG. 15

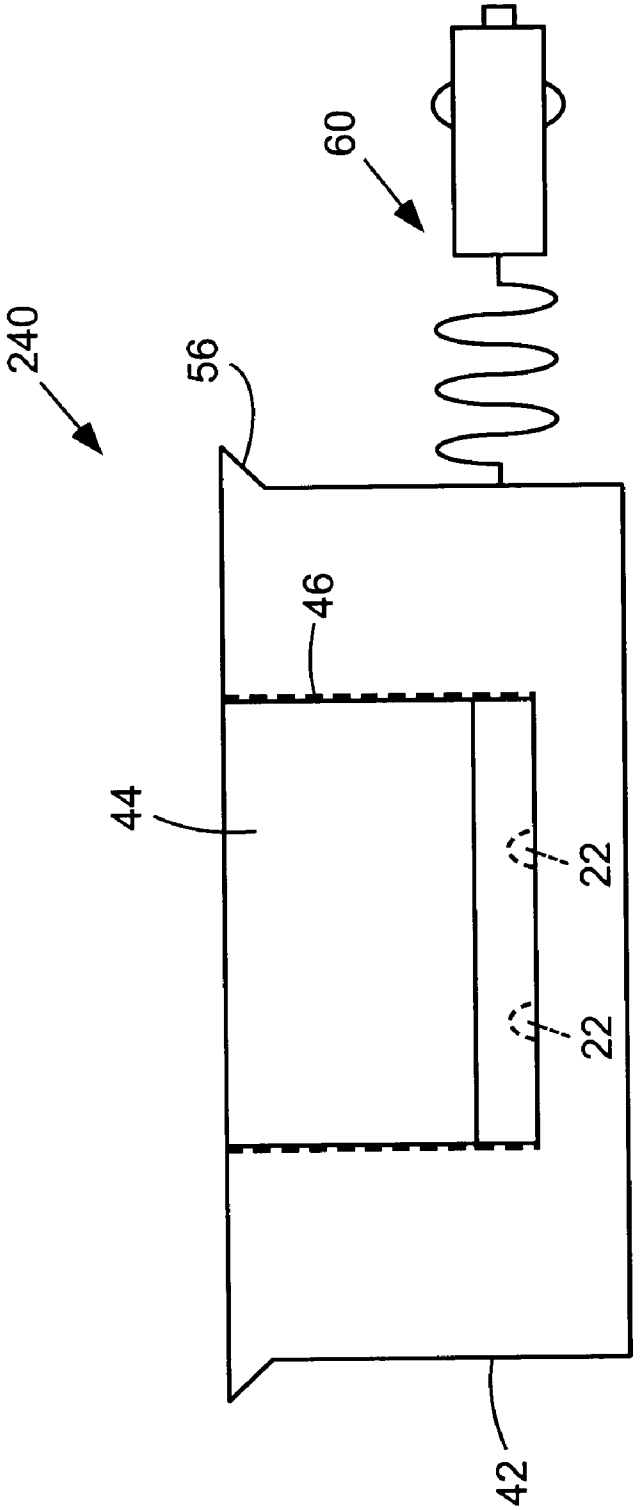


FIG. 16

ELECTRICALLY HEATED CIGARETTE SMOKING SYSTEM

BACKGROUND

Commonly-assigned U.S. Pat. No. 5,388,594, which is incorporated herein by reference in its entirety, discloses an electrical smoking;system that includes an electrically heated cigarette smoking device. An electrical smoking system, such as that disclosed in the '594 patent, can provide sensations of smoking that closely resemble those experienced during smoking of a conventional cigarette, but without certain disadvantages. Other exemplary electrically heated cigarette smoking systems are disclosed in commonly-assigned U.S. Pat. Nos. 5,269,327; 5,878,752; 5,954,979; 5,967,148; and 6,349,728, each of which is incorporated herein by reference in its entirety.

SUMMARY

A stand for an electrically heated cigarette smoking device is provided. A preferred embodiment of the stand is adapted to support an electrically heated cigarette smoking device including a rechargeable power supply, and a charger for the electrically heated cigarette smoking device.

In another preferred embodiment, the stand provides electrical connection to a power source that provides power to the electrically heated smoking device. Charging electronics in the electrically heated cigarette smoking device, or in the stand, control charging of the rechargeable power supply.

In another preferred embodiment, the stand provides charging capabilities for an electrically heated cigarette smoking device.

The stand can include fasteners to allow the stand to be removably or permanently fastened to a surface.

In a preferred embodiment, the stand is configured to fit in a cup holder of a vehicle. In such embodiment, the power source for the electrically heated cigarette smoking device can be a power source in the vehicle.

In a preferred embodiment, the stand includes an opening configured to receive an electrically heated cigarette smoking device. Accordingly, the device can be stored on the stand when not held by a user.

In a preferred embodiment, the stand operates on direct current (DC). Accordingly, a rechargeable DC power supply of the electrically heated cigarette smoking device can be recharged by electrically connecting the stand to a DC power source.

In another preferred embodiment, the stand includes inductive charging electronics operable to convert DC supplied to the stand by a DC power source to alternating current (AC), and convert the AC back to DC, to recharge the power supply of the electrically heated cigarette smoking device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** depicts an embodiment of an electrically heated cigarette smoking device, which can be used with preferred embodiments of the stand.

FIG. **2** is a bottom plan view of the electrically heated cigarette smoking device shown in FIG. **1**.

FIG. **3** is a front perspective view of a charger for an electrically heated cigarette smoking device.

FIG. **4** is a rear perspective view of the charger shown in FIG. **3**.

FIG. **5** is a top plan view of the charger shown in FIG. **3**.

FIG. **6** is a front perspective view of another embodiment of a charger for an electrically heated cigarette smoking device.

FIG. **7** is a top plan view of the charger shown in FIG. **6**.

FIG. **8** is a front, top perspective view of another embodiment of a charger for an electrically heated cigarette smoking device.

FIG. **9** is a front perspective view of another embodiment of a charger for an electrically heated cigarette smoking device.

FIG. **10** is a top plan view of the charger shown in FIG. **9**.

FIG. **11** is a bottom plan view of the charger shown in FIG. **9**.

FIG. **12** is a top plan view of a preferred embodiment of the stand.

FIG. **13** is a sectional view in the direction of line **13-13** of FIG. **12**, further depicting the stand supporting an electrically heated cigarette smoking device and a charger supported on the stand, with the stand received in a receptacle.

FIG. **14** shows the stand, electrically heated cigarette smoking device, and charger depicted in FIG. **13**, with the stand fastened to a surface.

FIG. **15** is a side view of another preferred embodiment of the stand including a base for supporting an electrically heated cigarette smoking device.

FIG. **16** depicts another preferred embodiment of the stand.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

A stand useful for storing an electrically heated cigarette smoking device is provided. The stand can be used in various vehicles including automobiles, trucks, buses, and the like.

FIGS. **1** and **2** illustrate an exemplary electrically heated cigarette smoking device **10** that can be used with preferred embodiments of the stand. The electrically heated smoking device **10** is disclosed in commonly-assigned U.S. Pat. No. D443,717, which is incorporated herein by reference in its entirety. The electrically heated cigarette smoking device **10** includes an internal power supply. The power supply can include one or more batteries and/or capacitors. An opening **12** is sized to allow for the insertion of an electrically heated cigarette into the electrically heated cigarette smoking device **10**. The electrically heated cigarette is heated by a heater inside the electrically heated cigarette smoking device. The electrically heated cigarette smoking device **10** also includes electrical contacts **14** on opposed sides. The electrical contacts **14** provide electrical contact to a charger for the electrically heated cigarette smoking device, as described below.

The electrically heated cigarette is smoked in a similar manner as a traditional cigarette. However, the heater heats the cigarette without lighting or continuous smoldering of the cigarette. These and other characteristics of electrically heated cigarette smoking systems make them attractive for use in confined spaces.

The electrically heated cigarette smoking device **10** can be used with various chargers, such as those illustrated in FIGS. **3-11**, as well as with other chargers. FIGS. **3-5** illustrate an embodiment of a charger **20** disclosed in commonly-assigned U.S. Pat. No. D455,397 which is incorporated herein by reference in its entirety. The charger **20** includes pairs of opposed electrical contacts **22** positioned to

contact the electrical contacts **14** of the electrically heated cigarette smoking device **10** when supported on the charger **20** in an upstanding position. The charger **20** also includes a socket **24** adapted to receive a plug of an electrical conductor to provide electrical connection of the electrically heated cigarette smoking device **10** supported on the charger **20** to an external power source.

The charger **20** has a bottom support surface **26**, which is shaped to rest on a support surface. The charger **20** also includes surfaces **28** and **29**, which are shaped to support the electrically heated cigarette smoking device **10**.

The electrically heated cigarette smoking device **10** can include an internal power supply, and charging electronics operable to control charging of the power supply by an external power source when the electrically heated cigarette smoking device **10** is supported on the charger **20**.

FIGS. **6** and **7** illustrate another embodiment of a charger **120** disclosed in commonly-assigned U.S. Pat. No. D439,219, which is incorporated herein by reference in its entirety. The charger **120** includes electrical contacts **22** for contacting the electrical contacts **14** of the electrically heated cigarette smoking device **10** when supported on the charger **120**, and an electrical conductor **30** for connecting the charger **120** to an external power source. The charger **120** has a bottom surface **26**, which can support the electrically heated cigarette smoking device **10** on a surface, and an inner surface **28** for supporting the electrically heated cigarette smoking device **10**.

FIG. **8** illustrates another embodiment of a charger **220** disclosed in commonly-assigned U.S. Pat. No. D445,760, which is incorporated herein by reference in its entirety. The charger **220** includes electrical contacts **22** for contacting the electrical contacts **14** of the electrically heated cigarette smoking device **10** when supported on the charger **10**, and an electrical conductor **30** for connecting the charger **220** to an external power source. The charger **220** has an inner surface **28** for supporting the electrically heated cigarette smoking device **10**.

FIGS. **9-11** illustrate another embodiment of a charger **320** disclosed in commonly-assigned U.S. Pat. No. D467,868, which is incorporated herein by reference in its entirety. The charger **320** includes electrical contacts **22** for contacting the electrical contacts **14** of the electrically heated cigarette smoking device **10** when supported on the charger **320**, and a socket **24** for receiving a connector of an electrical conductor to connect the charger **320** to an external power source.

FIGS. **12** and **13** illustrate a preferred embodiment of a stand **40**. The stand **40** includes an outer surface **42** and a surface **46** defining an opening **44**. The opening **44** is configured to receive an electrically heated cigarette smoking device **48**, such as the electrically heated smoking device **10** described above, as well as other electrically heated cigarette smoking devices having different constructions, and a charger **49**, such as the charger **20**, **120**, **220** or **320**, as described above, or other chargers having different constructions. The charger **49** preferably supports the electrically heated cigarette smoking device **48** in an upright orientation when the electrically heated cigarette smoking device **48** and the charger **49** are stored on the stand **40**.

The opening **44** can have various shapes and sizes to enable the charger **49**, which can have various configurations, to fit in the opening **44**. For example, the opening **44** can be rectangular as depicted in FIG. **12**. Alternatively, the opening **44** can have various other shapes, such as round, square, oval, or the like, to receive a like-shaped charger.

The outer surface **42** of the stand **40** preferably is configured to mate with a receptacle **50** defined in a body **52**. The body **52** can be a console or other portion of an automobile, truck, bus, or other vehicle, for example. The receptacle **50** is preferably a vehicle cup holder designed to receive a cup, can, or other beverage container.

Accordingly, the stand **40** preferably can have various shapes and sizes that allow it to mate with different shaped and sized receptacles **50**. As depicted in FIG. **12**, the outer surface **42** of the stand **40** can be cylindrical shaped to mate with a cylindrical car cup holder, for example.

The outer surface **42** of the stand **40** preferably includes a peripheral edge **56**. The peripheral edge **56** can be angled outwardly as shown, or alternatively can have other configurations, such as that of a rim. The stand **40** can have a suitable height relative to the depth of the receptacle **50**, such that a portion of the peripheral edge **56** contacts the surface **58** of the body **52** when the stand **40** is placed in the receptacle **50**. In this position, the peripheral edge **56** can be grasped by a user to remove the stand **40** from the receptacle **50**.

An electrical conductor **60** is connected to the charger **49** to electrically connect the internal power supply **62** of the electrically heated cigarette smoking device **10** to an external power source. The power supply **62** is connected to charging electronics **64** via wiring **66**. The electrical conductor **60** preferably is adapted to mate with a socket **68** of the charger **49**, such as the socket **24** depicted in FIG. **4**. The electrical conductor **60** preferably includes an adapter plug **70** constructed to removably mate with a socket of an external power source. For example, the external power source can be a battery powered electrical cigarette lighter of a vehicle.

In a preferred embodiment, the charger **49** and the electrically heated cigarette smoking device **48** operate on direct current (DC). The stand **40** can be constructed to operate with DC power sources, such as vehicle batteries, that supply various voltages, such as 6, 9, 12 or 24 volt power sources.

In another preferred embodiment, the charger **49** includes inductive charging electronics and associated electrical elements that can convert DC from a DC power source to alternating current (AC), and convert the AC back to DC to charge the power supply **62** of the electrically heated cigarette smoking device **48**. For example, an inductive field can be generated in the charger **49** by passing current through a coil. A matching coil can be provided in the charger **49** to produce AC. A diode and other suitable electronics can be provided in the charger **49** convert the AC to DC to charge the internal power supply **62**.

FIG. **14** shows another preferred embodiment of the stand **40** including one or more fasteners **72** for engaging mating fasteners **74** on the surface **58** of the body **52**, to allow attachment of the stand **40** to the surface **58**. The surface **58** can be a surface in a vehicle, for example. The fasteners **72**, **74** can be any suitable fasteners, such as hook and loop-type fasteners (VELCRO™) or the like, to allow the stand **40** to be removably attached to the surface **58**. Alternatively, the fasteners **72** can include a magnetic material to removably attach the stand **40** to a metal surface. The stand **40** can include fasteners for permanent attachment to the surface **58**. Such permanent fasteners can include, screws, bolts, clips, or the like. The stand **40** can alternatively be secured to the surface using an adhesive material.

Another preferred embodiment of the stand **140** is shown in FIG. **15**. The stand **140** includes a base **80** provided on a surface **82**. The base **80** is preferably L-shaped or the like,

to support an electrically heated cigarette smoking device, preferably upright, when not being held by a user. Charging electronics are preferably provided in the base **80**. The base **80** also includes electrical contacts **22**, such as two opposed pairs of electrical contacts as shown in FIGS. **5** and **7**, which mate with electrical contacts of the electrically heated cigarette smoking device (such as electrical contacts **14** shown in FIG. **1**) when supported on the stand **140**. An electrical conductor **60** is also provided on the stand **140**.

The stand **140** can include one or more fasteners (as described above) to allow removable or permanent attachment of the stand **140** to a surface.

As described above, the internal power supply of the electrically heated cigarette smoking device can be charged by supplying DC current directly from an external power source to the power supply, or alternatively the stand **140** can include inductive charging electronics for converting DC to AC and vice versa.

Another preferred embodiment of the stand **240** is shown in FIG. **16**. In this embodiment, charging electronics are provided in the stand **240**. The stand **240** preferably includes electrical contacts **22**, which mate with contacts provided on the electrically heated cigarette smoking device.

The stand **240** can include one or more fasteners (as described above) to allow removable or permanent attachment of the stand **240** to a surface.

As described above, the internal power supply of the electrically heated cigarette smoking device can be charged by supplying DC current directly from an external power source to the power supply, or alternatively the stand **240** can include inductive charging electronics for converting DC to AC and vice versa.

Accordingly, preferred embodiments of the stand are suitable for use in a vehicle, as well as in other means of transportation. In addition, the stand can be configured to mate with receptacles provided in vehicles, and to be compatible with vehicle power sources. The stand provides for convenient storage and recharging of electrically heated cigarette smoking devices in such applications.

As described above, the stand preferably can be used with existing electrically heated cigarette smoking devices, or the stand can be configured to receive future designs of electrically heated cigarette smoking devices.

While the invention has been described in detail with reference to preferred embodiments thereof, it will be apparent to those skilled in the art that various changes and modifications can be made, and equivalents employed, without departing from the scope of the appended claims.

What is claimed is:

1. An electrically heated cigarette smoking system, comprising:

an electrically heated cigarette smoking device including a rechargeable power supply; and

a stand comprising:

a base configured to removably support the electrically heated cigarette smoking device, the base including electrical contacts which electrically contact electrical contacts on the electrically heated cigarette smoking device to electrically connect the rechargeable power supply to the stand, and a surface configured to fit removably in a receptacle and/or to support the stand on an external surface; and

optional charging electronics provided in the base, the charging electronics being operable to control charging of the rechargeable power supply;

wherein the stand is operable to supply electrical power to the rechargeable power supply and charging electronics when the electrically heated cigarette smoking device is supported on the base and the stand is electrically connected to an external power supply via an electrical conductor.

2. The electrically heated cigarette smoking system of claim **1**, wherein the base comprises the charging electronics.

3. The electrically heated cigarette smoking system of claim **1**, wherein the outer surface of the base is cylindrical shaped to fit removably in a cylindrical receptacle.

* * * * *