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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2004/0163667 A1****Learman**(43) **Pub. Date: Aug. 26, 2004**(54) **ELECTROSTATIC MOP, CLEANING DEVICE
AND A METHOD FOR COLLECTING
PARTICLES****Publication Classification**(51) **Int. Cl.⁷** **A47L 13/40**(52) **U.S. Cl.** **134/1; 15/1.52**(76) **Inventor: Thomas J. Learman, Columbus, OH
(US)**(57) **ABSTRACT**

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A dust mop or cleaning device and a method for collecting dust and/or other particles are provided. The dust mop and/or cleaning device emits an electrostatic charge. The electrostatic charge polarizes dust and/or other particles to be attracted to an opposite polarity. The dust mop and/or cleaning device attracts the oppositely charged particles. The dust mop and/or cleaning device restrains dust and/or other particles until after the dust mop is deactivated. The dust mop may be used to collect dust and/or particles from hard-to-reach areas.

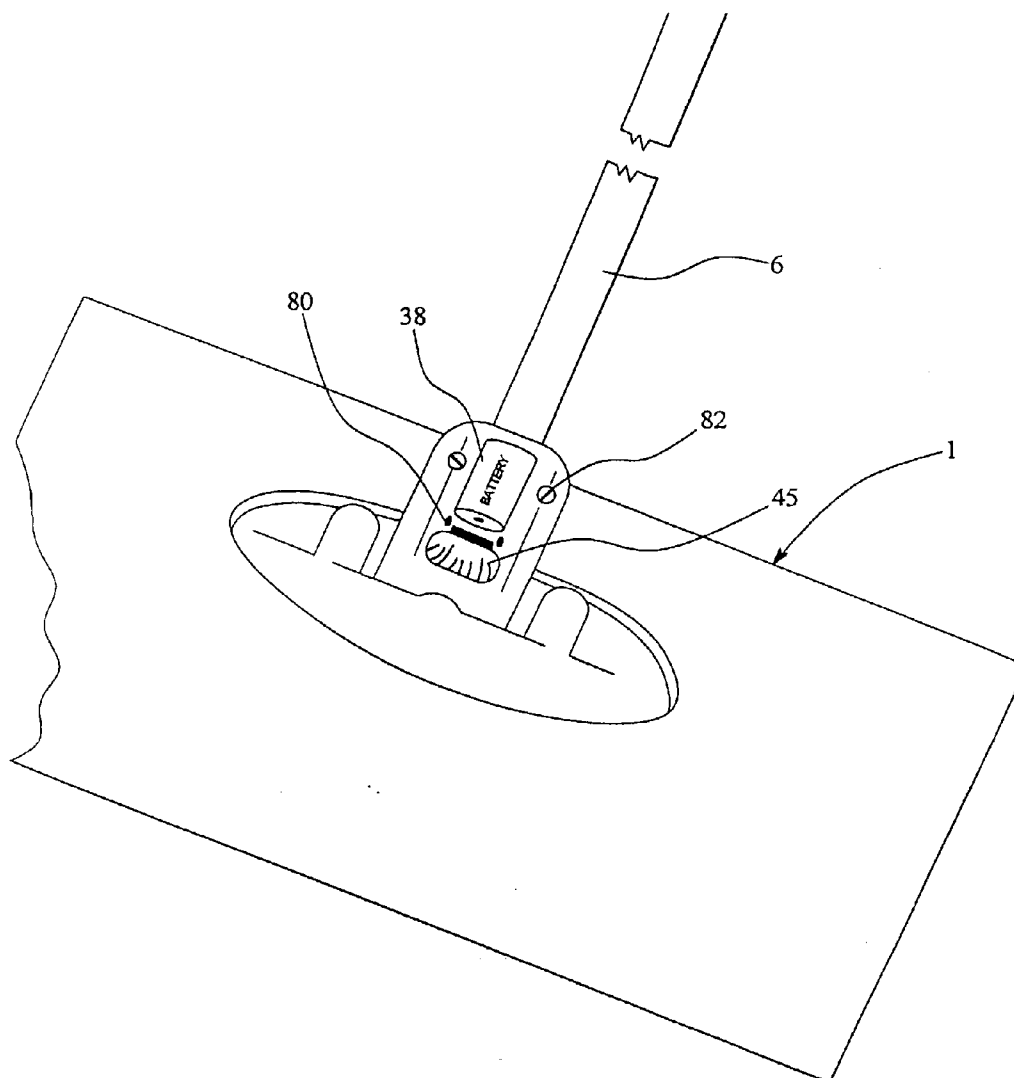
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FIG. 1

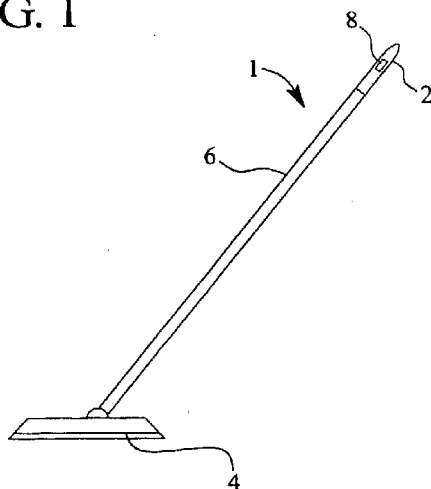


FIG. 3

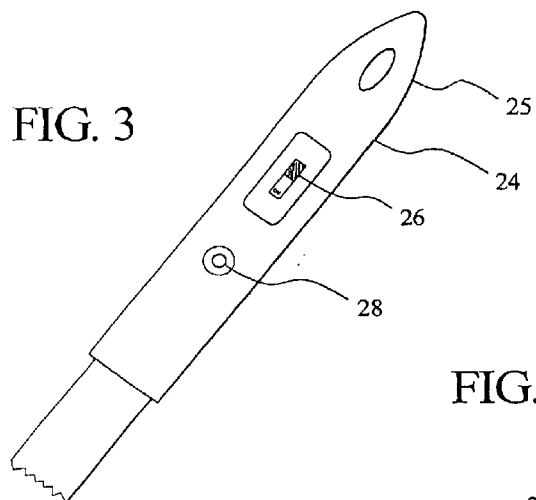


FIG. 4

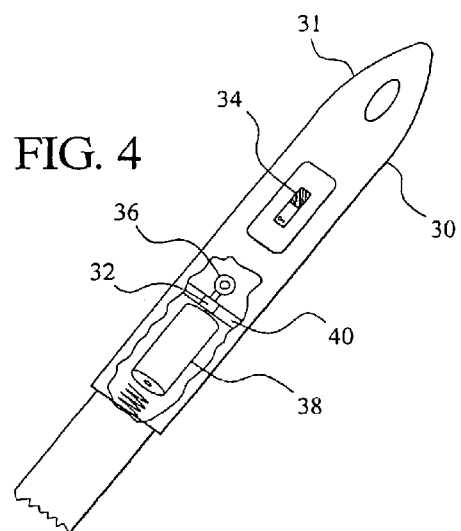


FIG. 2

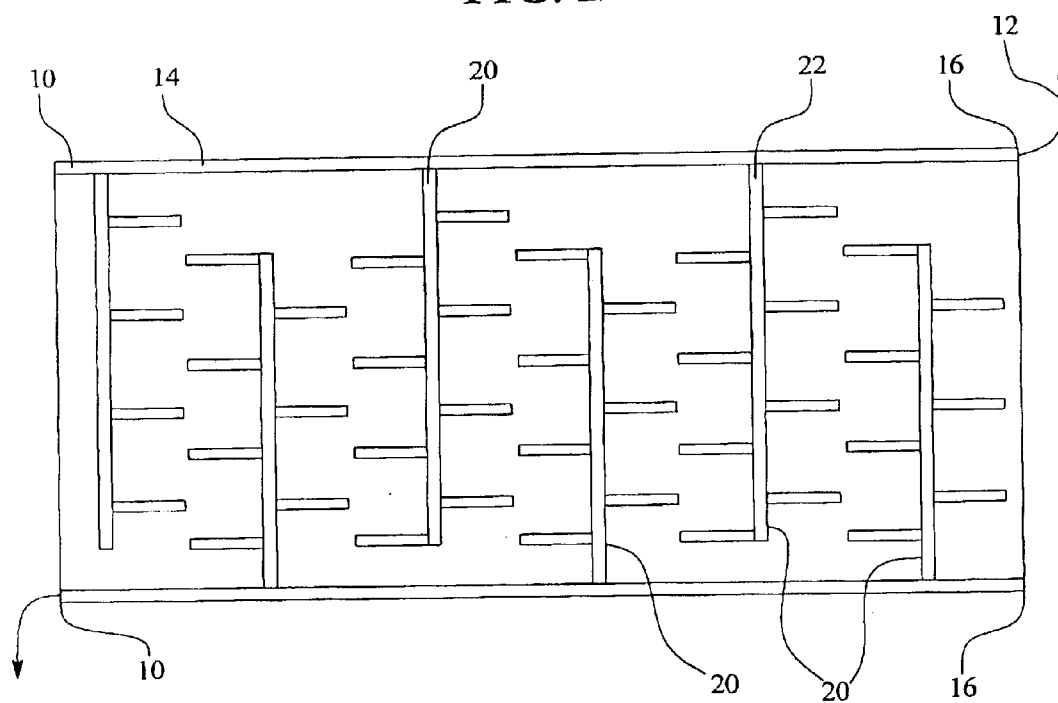


FIG. 5

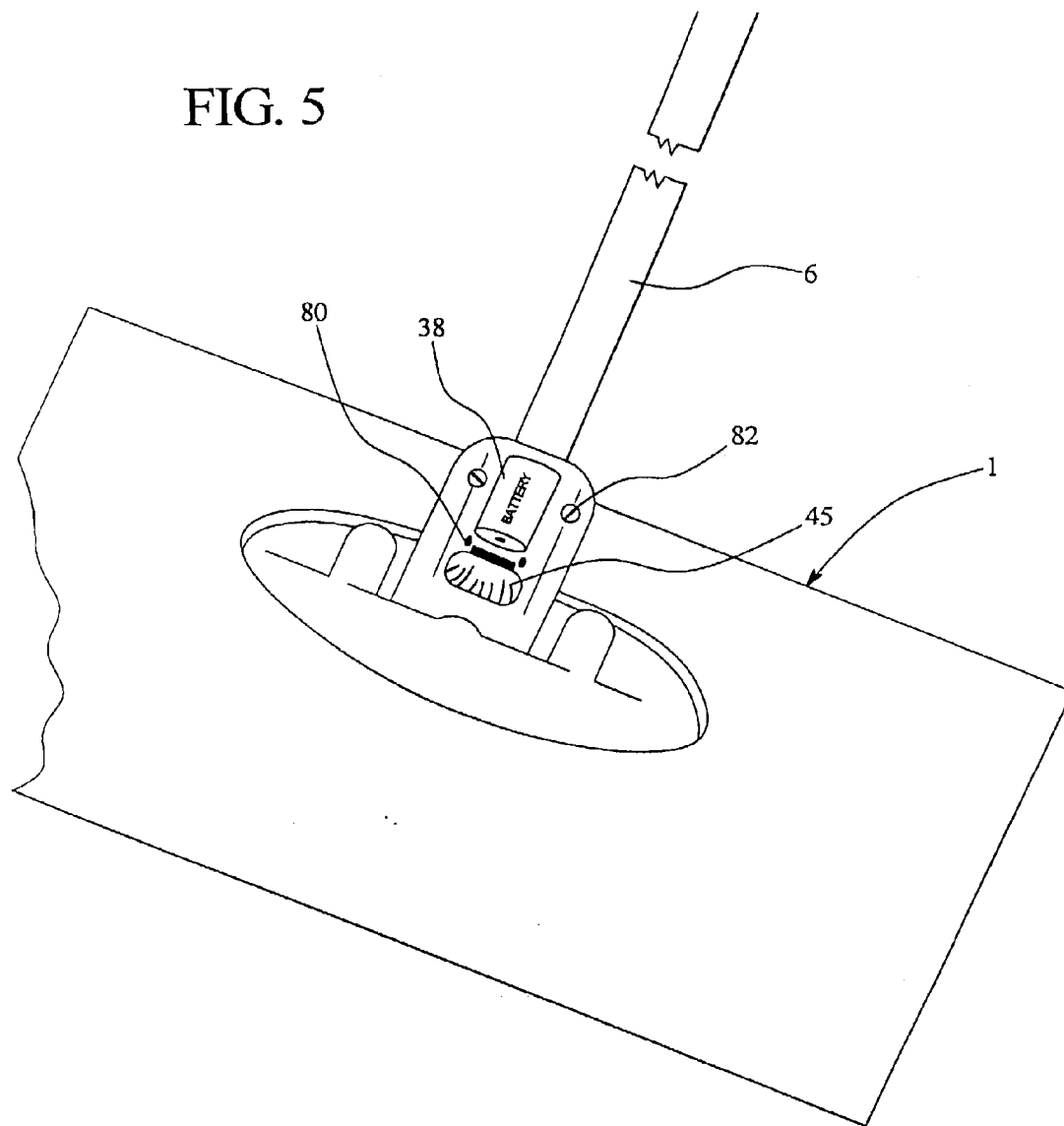


FIG. 6

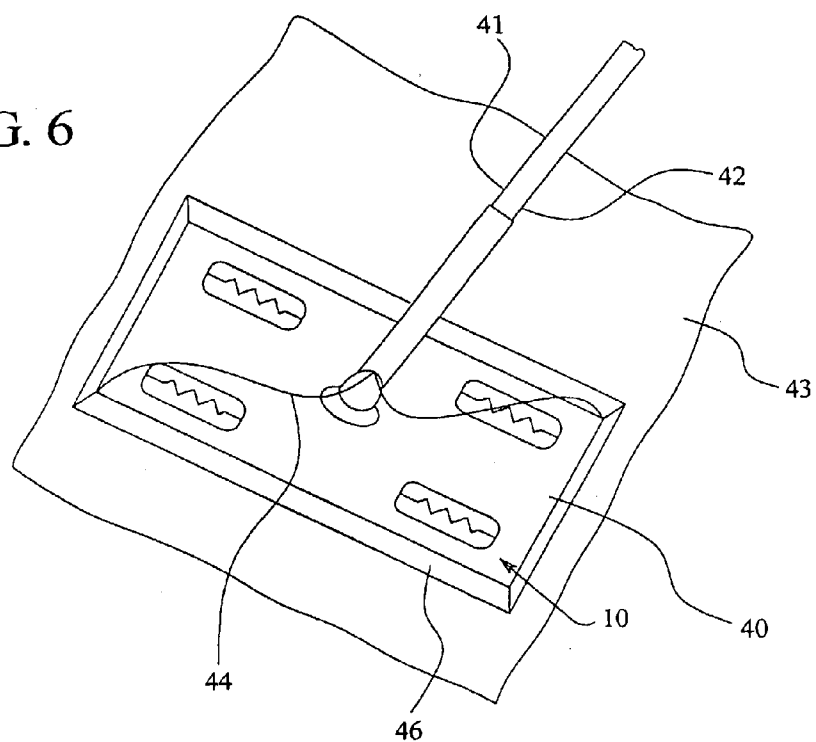
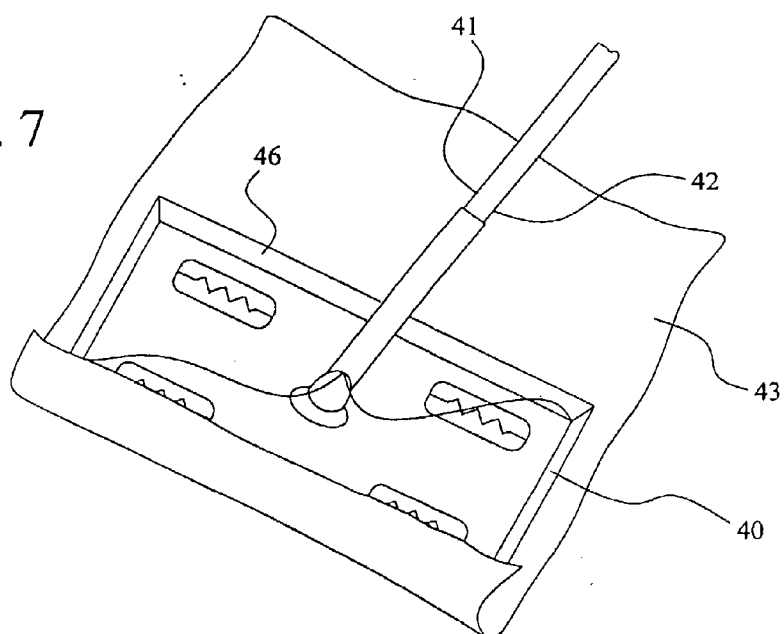


FIG. 7



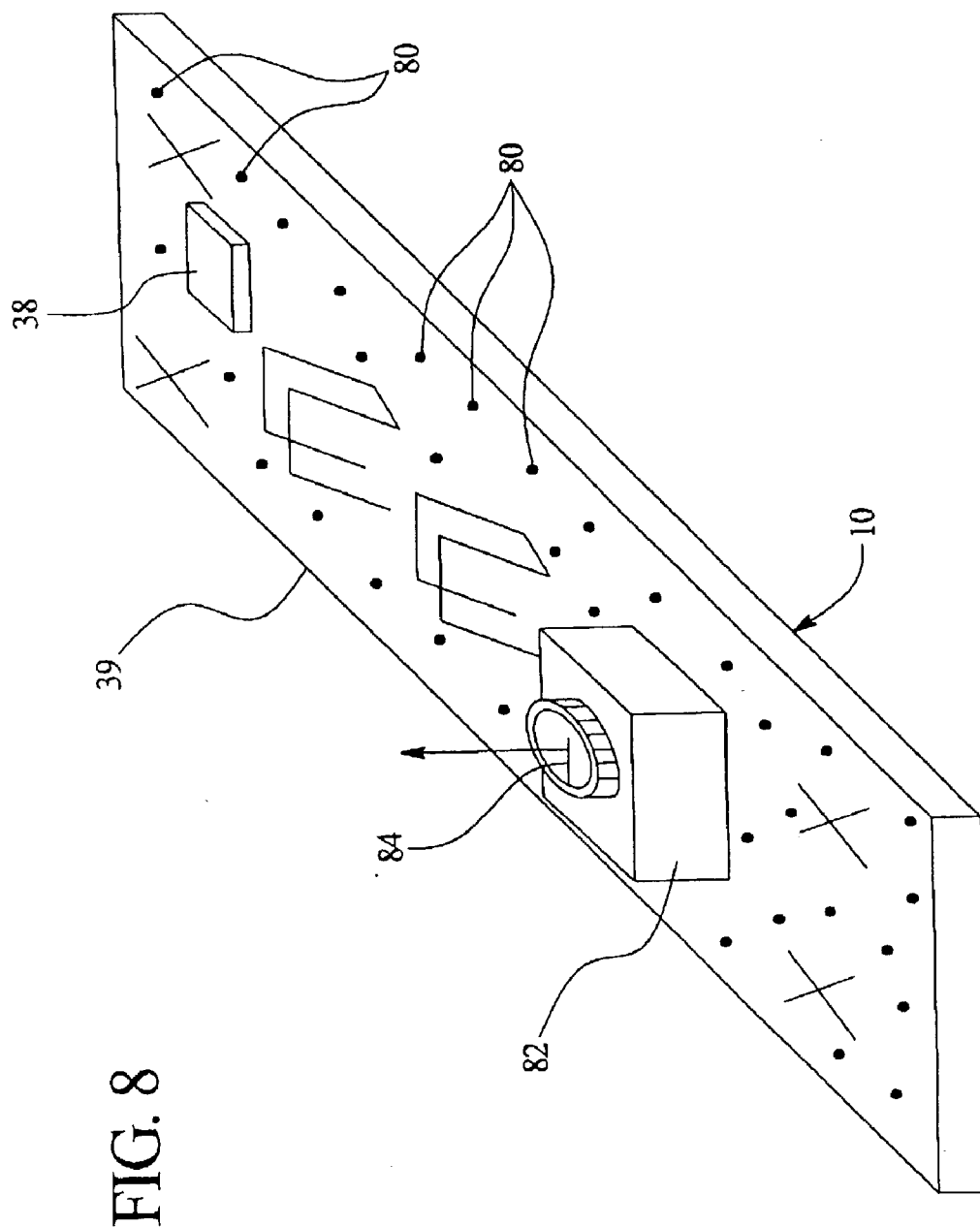


FIG. 8

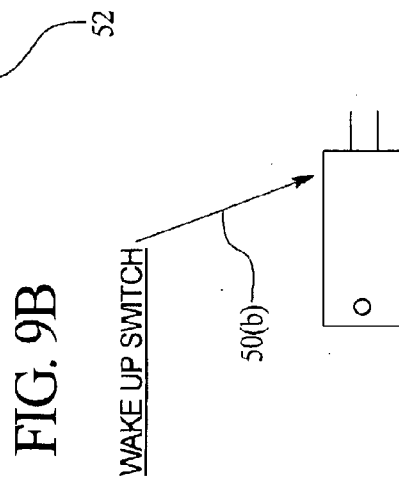
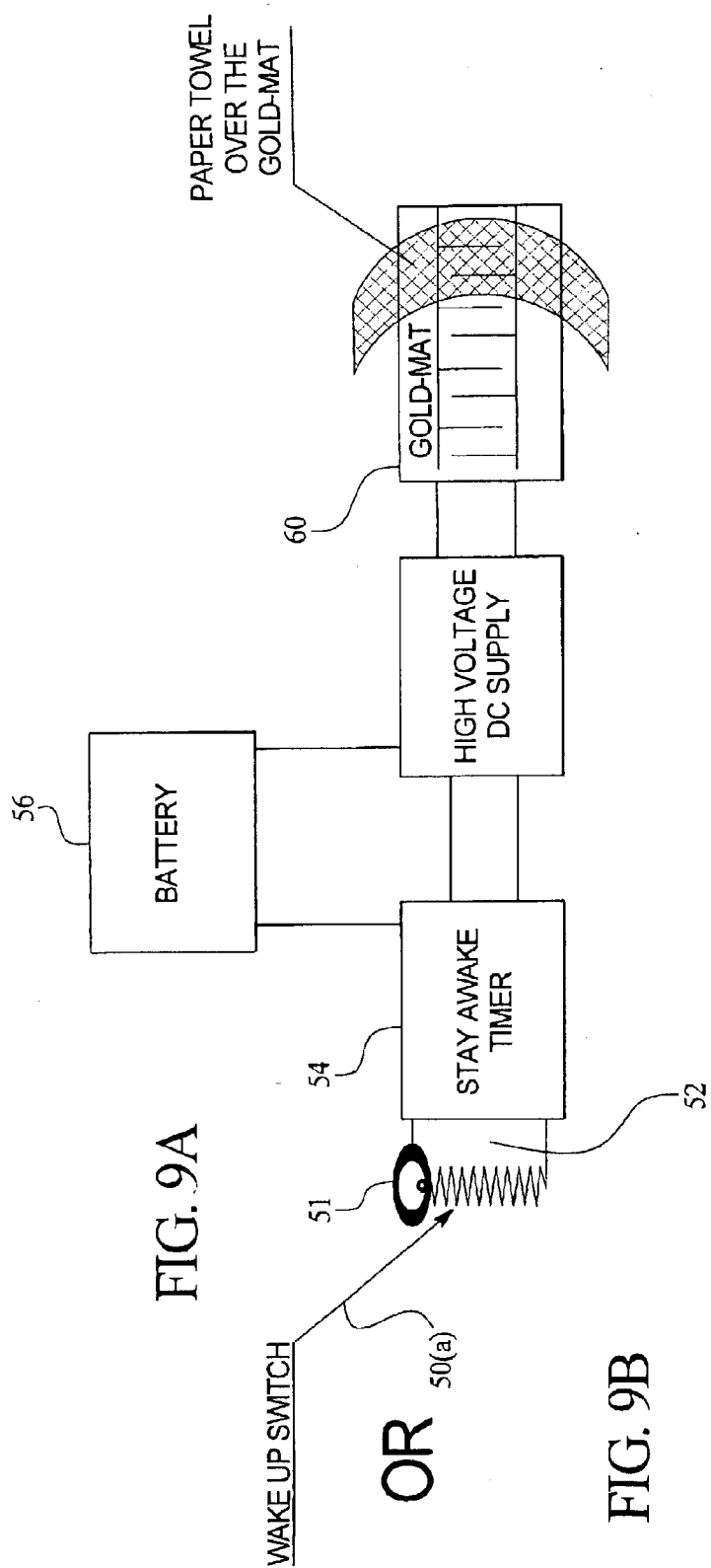
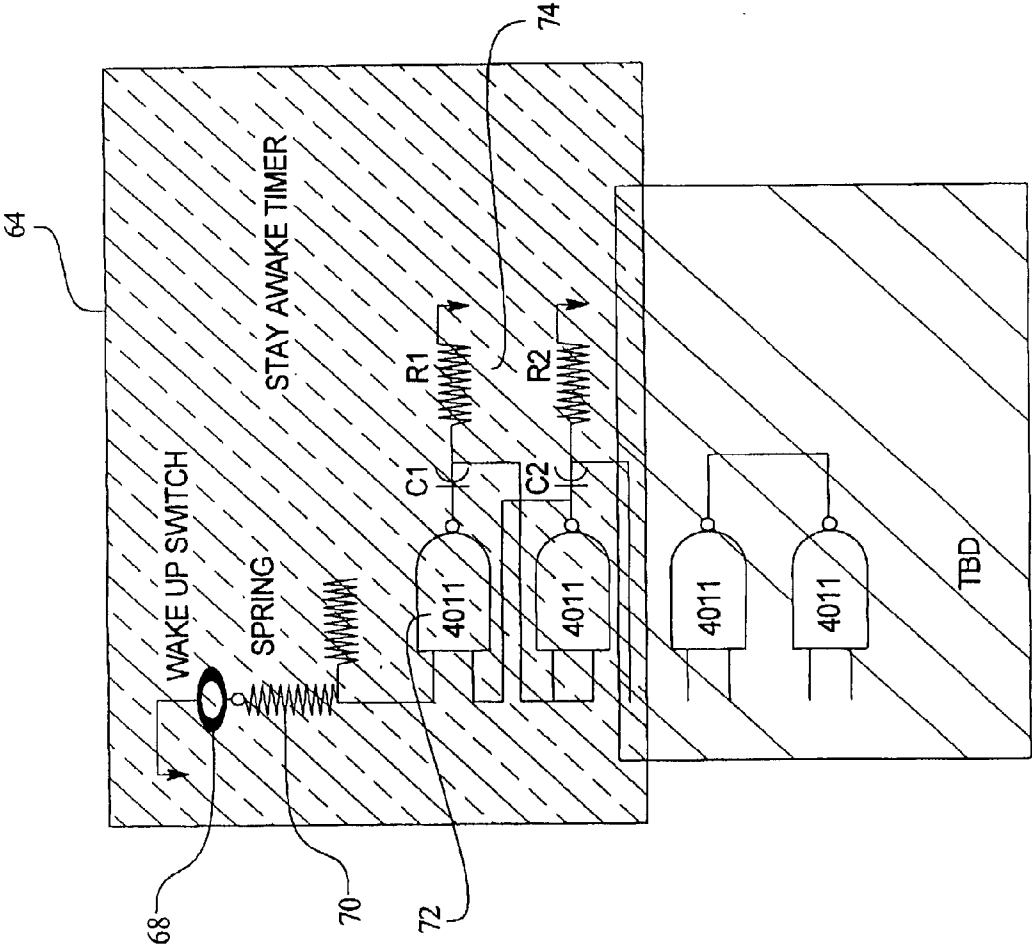


FIG. 10



ELECTROSTATIC MOP, CLEANING DEVICE AND A METHOD FOR COLLECTING PARTICLES

BACKGROUND OF THE INVENTION

[0001] The present invention generally relates to a dust mop and/or cleaning device. More specifically, the present invention relates to a dust mop and/or cleaning device which may emit an electrostatic charge to attract and/or gather oppositely charged particles. Further, the present invention relates to a method for collecting particles using the electrostatic dust mop.

[0002] It is generally known that dusting or mopping is performed by an individual to remove unwanted dust or other particles. Often, dusting or mopping is accomplished by using a dust rag or mop. Mopping or dusting is more complicated when the task involves hard-to-reach areas, nooks and/or bevels in the floor or walls. An individual must spend considerable time and effort dusting and mopping an area to collect dust or other particles. Although the individual expends significant time and energy in mopping or dusting, the individual may not collect all of the dust or other particles in a given space.

[0003] Known dust mops are designed with pockets on an upper side and yarns on a lower side. The pockets form an opening to receive a frame and include a fastener such as ties, snaps or the like, to hold the frame within the pockets. After the frame is received in the pocket, the dust mop is secured for use.

[0004] Another known dry dust mop is a flat, dry string mop that dirties with use and deteriorates when laundered. Other known dust mops are made of sponge and/or foam. The sponge or the foam dust mops require moisture to contact dust and/or other particles. The string mop as well as the sponge mop or foam mop may be used with water to collect dust particles. After the wet mop has been used to collect the particles, a dry mop is often used to dry the area and collect any remaining dust particles. The sponge mop and/or the foam mop often require a bucket or other collection device to collect the water from the mop. Use of the sponge mop and/or the foam mop also requires use of a wringer to expel excess water back into the bucket. The bucket water becomes dirty as dust particles, dirt and other objects are expelled into the bucket. After repeated use and contact with dirty water, the mop deposits a greater amount of dirt than the mop removes from the surface to be cleaned. The sponge mop and/or the foam mop also leave excess water on the floor requiring considerable time to dry, leaving the floor slippery and prone to collecting more dust.

[0005] Another known dust mop has a dust mop head and a handle. The dust mop uses a statically charged cloth to collect dust particles. The dust mop contains a collector made from electrostatically charged, non-woven fabrics. The electrostatic charge enables the collector to detachably mount to the mop head by electrostatic cling. The electrostatic charge improves an ability of the dust mop to collect dust particles.

[0006] However, the electrostatic charge emitted by the fabric is not strong enough to facilitate the attraction of a significant amount of dust particles, especially in hard-to-reach areas. Further, the dust mop has the electrostatic charged cloth attached to a wiper. The charged cloth of the

dust mop is pre-charged to attract dust but only provides a limited amount of charge to be applied and retained to the wiper. In addition, the charge on the wiper is removed or reduced with wax or cleaner that is often applied to floors and moldings.

[0007] A need, therefore, exists for a dust mop that associates an electrostatic charge with a dust collecting portion of the dust mop to enable particle collection in hard to reach areas. A need also exists for an improved dust mop and a method of collecting dust and/or other particles.

SUMMARY OF THE PRESENT INVENTION

[0008] The present invention provides a dust mop and/or cleaning device that may electrically charge dust and/or other particles. The present invention also provides a dust mop and a method for collecting dust and/or other particles. The charged particles may then have a polarity opposite to that of the mop. When charged, the dust particles will be attracted to the dust mop having the opposite polarity.

[0009] To this end, in an embodiment of the present invention, a mop is provided. The mop has a handle with a mat connected to the handle wherein the mat has a first side that conducts an electrical charge. The mop has a power source electrically connected to the mat wherein the power source transmits the electrical charge to the first side of the mat wherein the first side of the mat polarizes a particle and attracts the particle adjacent to the first side.

[0010] In an embodiment, the mop has a switch connected to the power source wherein the switch activates the power source.

[0011] In an embodiment, the mop has a covering on the mat wherein the particle attaches to the covering.

[0012] In an embodiment, the mop has a power source that is a battery.

[0013] In an embodiment, the mop has a power source that is a rechargeable battery wherein the battery is recharged by placing the mop on a charging stand for recharging.

[0014] In an embodiment, the mop has an indicator which signals that the mat is conducting the electrical charge.

[0015] In an embodiment, the mop has a covering positioned over the first side of the mat wherein the covering contains an ink which conducts an electrical charge.

[0016] In an embodiment, the mop has a motion detecting mechanism electrically connected to the power source wherein the motion detecting mechanism activates the power source.

[0017] In an embodiment, the mop has a light source connected to the mat.

[0018] In an embodiment, the mop has a conductive area on the first side of the mat.

[0019] In an embodiment, the mop has a vacuum system drawing air through the first side of the mat to attract dust particles wherein the first side of the mat has a plurality of perforations.

[0020] In an embodiment, the mop has a charging station having magnetic coils to contact and charge the batteries.

[0021] In another embodiment of the present invention, a cleaning device is provided. The cleaning device has a surface that conducts an electrical charge. The cleaning device has a motion detecting mechanism electrically connected to the surface. The surface conducts an electrical charge when the motion detecting mechanism detects movement and further wherein particles are attracted to the surface.

[0022] In an embodiment, the cleaning device has a power source connected to the surface wherein the power source transmits the electrical charge to the surface.

[0023] In an embodiment, the cleaning device has a covering on the surface wherein the particles attach to the covering.

[0024] In an embodiment, the cleaning device has a grid on the surface wherein the grid has an area which conducts the electrical charge.

[0025] In an embodiment, the cleaning device has a timer.

[0026] In another embodiment of the present invention, a method for collecting particles is provided. The method comprises the steps of: providing a surface wherein the surface has a first side; electrically charging the first side of the surface; placing the surface adjacent to the particles to provide the particles with an electrical charge; and attracting the particles to the surface.

[0027] In an embodiment, the method comprises the step of activating the charging of the surface from movement of the mat.

[0028] In an embodiment, the method comprises the step of covering the surface with a material to which the particles attach when the particles are attracted to the surface.

[0029] In an embodiment, the method comprises the step of indicating that the surface is charged.

[0030] In an embodiment, the method comprises the step of selecting a period of time after which the surface no longer receives the electrical charge.

[0031] It is, therefore, an advantage of the present invention to provide an electrostatic dust mop and a method for collecting particles.

[0032] Another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may collect dust particles from hard to reach places.

[0033] Yet another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop emits an electrostatic charge.

[0034] And, another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop uses a DC voltage to charge dust particles.

[0035] A further advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may charge dust and/or other particles.

[0036] A still further advantage of the present invention is to provide an electrostatic dust mop and a method for collecting dust wherein the dust mop is cost efficient.

[0037] Moreover, an advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may reduce an amount of labor required to collect additional dust particles.

[0038] A still further advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may have a grid mat which may conduct the electrostatic charge from the dust mop to the dust particles.

[0039] Another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may have a grid mat which may conduct electrostatic current wherein the grid mat may be covered by a non-conductive material.

[0040] A still further advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may have a switch used to activate and/or deactivate the electrostatic charge of the dust mop.

[0041] Yet another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may have a time delay switch which may deactivate the electrostatic charge of the dust mop when the dust mop is not in motion.

[0042] Another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop deactivates after a set period of time.

[0043] A still further advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may activate to produce the electrostatic charge when the dust mop is moved.

[0044] Another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop charges dust particles by using DC voltage from a battery.

[0045] Yet another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop charges dust particles by using DC voltage from a chargeable battery.

[0046] A still further advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop charges dust particles by connecting the mop to an electrical outlet.

[0047] Yet another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop is simple to use.

[0048] Another advantage of the present invention is to provide an electrostatic dust mop and a method for collecting particles wherein the dust mop may collect dander, thread, hair, bacteria, contagions and/or other items.

[0049] Yet another advantage of the present invention is to provide an electrostatic dust mop and a method for collect-

ing dust wherein the dust mop may be cleaned after the electrostatic charge has been deactivated.

[0050] Additional features and advantages of the present invention are described in, and will be apparent from, the detailed description of the presently preferred embodiments and from the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0051] FIG. 1 is a perspective view of an electrostatic dust mop in an embodiment of the present invention.

[0052] FIG. 2 is a top view of a mat grid system of an electrostatic dust mop in an embodiment of the present invention.

[0053] FIG. 3 is a side view of a handle of an electrostatic dust mop in an embodiment of the present invention.

[0054] FIG. 4 is a side view of a handle of an electrostatic dust mop in an embodiment of the present invention.

[0055] FIG. 5 is a perspective view of a wiper and handle of an electrostatic dust mop in an embodiment of the present invention.

[0056] FIG. 6 is a perspective view of a wiper of an electrostatic dust mop in an embodiment of the present invention.

[0057] FIG. 7 is a perspective view of a wiper of an electrostatic dust mop in an embodiment of the present invention.

[0058] FIG. 8 is a perspective view of a wiper of an electrostatic dust mop in an embodiment of the present invention.

[0059] FIG. 9a is a black box diagram of a motion detection system and power supply of an electrostatic dust mop in an embodiment of the present invention.

[0060] FIG. 9b is a black box diagram illustrating an alternate embodiment of a switch used with the motion detection system shown in FIG. 9a.

[0061] FIG. 10 is a schematic diagram of a motion detection system of an electrostatic dust mop in an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

[0062] The present invention relates to a dust mop for collecting dust and/or particles. More specifically, the present invention relates to a dust mop that emits an electrostatic charge to charge particles and a method for collecting dust and/or other particles. The particles have a charge opposite to a charge of the mop. As a result, the particles are attracted to the mop.

[0063] Referring now to the drawings, wherein like numerals refer to like parts, FIG. 1 illustrates a dust mop 1 which may have a handle 2 and a wiper 4. The handle 2 may be connected to the wiper 4 by a shaft 6. The handle 2 may have a switch 8 which may activate or deactivate an electrostatic charge. The electrostatic charge may be produced from a battery 38 as illustrated in FIG. 4. As a result, current from the battery 38 may be conducted through the shaft 6 via wiring (not shown) to the wiper 4.

[0064] FIG. 2 illustrates an embodiment of a bottom side of the wiper 4 which may be detachably connected to a grid mat 10. In an alternative embodiment, the bottom face of the wiper 4 is used without the grid mat 10. Voltage may be provided to the grid mat 10 by, for example, a battery 38 to conduct an electrostatic charge. The grid mat 10 may conduct the electrostatic charge to polarize the dust and/or other particles. To this end, the grid mat 10 may have a pattern of lines 20 that conduct the electrostatic charge. The grid mat 10 may also have holes 80 in the mat 10 to allow air to travel through the grid mat 10. The pattern of lines 20 on the grid mat 10 may be printed on paper or other material. The pattern of lines 20 may be printed on the paper after the paper is coated with an insulation coating. Coating the paper with an insulation coating may allow the paper to remain dry and may conduct an increased level of voltage than a paper not coated with an insulator.

[0065] The grid mat 10 may handle, for example, from a minimum of zero Ohms to 500 kOhms per linear inch. The DC voltage on the grid mat 10 may range from 500 volts to 18,000 volts. In a preferred embodiment, 5000 volts are utilized. The grid mat 10 may be printed on paper or other material by applying ink having graphite particles. The graphite particles may enable the grid mat 10 to be electrically conductive. The graphite particles may conduct the electric current to negatively polarize dust and/or other particles. In a preferred embodiment of the present invention, the graphite particles are utilized because the graphite may conduct electrical current favorably as opposed to other conductors of electrical current.

[0066] In another embodiment of the present invention, the grid mat 10 may be made electrically conductive by using a round drum (not shown) that may be engraved with a pattern designed for the grid mat 10. By rolling paper through a round drum roller (not shown), the pattern of lines 20 of the grid mat 10 may be transferred onto the paper. The ink may be rolled onto the paper using a conductive carbide and a binder. The ink may have electrostatic conductivity and may be set by thermal or other forces.

[0067] In another embodiment, the conductive ink may be replaced with a conductive plastic material or copper traces. In a preferred embodiment, the grid mat 10 may be printed on an insulator that may conduct the electrostatic charge. In an embodiment, the insulator may be sandblasted Mylar®. In another embodiment, the grid pattern may be silk-screened to a rubber wiper 4 of the dust mop 1. The grid mat 10 may conduct electrostatic energy through the rubber wiper 4 with a conductor (not shown) in the grid mat 10. The ink may be a thermal sensitive binder with a large percentage of one micron graphite powder added to the ink. The ink is printed onto the insulator forming the pattern of lines 20 of the grid mat 10 and an end band 14 of the grid mat 10. The grid mat 10 may be heated to cause the ink, conductive plastic and/or copper traces to set. The end band 14 may have edges 16, 18 that may be rolled and/or sealed with a contact 12 in the edges 16, 18.

[0068] The grid mat 10 may have an electrically conductive grid 22 which may charge dust and/or other particles to cause the dust and/or other particles to have an opposite polarity. The conductive grid 22 may have a pattern of lines 20 which may be close together to permit a higher energy field and to increase the attraction of dust. In an embodi-

ment, the conductive lines **20** may be equidistantly spaced from each other. A second conductive pattern **21** may be located around the outside of the pattern of lines **20**. The second conductive pattern **21** may increase the energy field around the outside of the dust mop **1**. The increased energy field may result in the attraction of more dust to the dust mop **1**. In a preferred embodiment, the pattern of lines **20** may be approximately 0.25 inches apart. Each of the pattern of lines **20** may be as close in proximity to other lines so long as arcing or warping of the grid **22** or contamination on other parts of the grid mat **10** does not occur. A dielectric straight of the grid mat **10** may direct how close the pattern of lines **20** may be to each other on the grid mat **10**. Generally, a higher energy field will be produced when the pattern of lines **20** are closer to each subsequent pattern of lines **20**, and the greater the attraction of dirt to the mop **1**. However, as the voltage increases, the spacing of the pattern of lines **20** may be increased to keep the grid mat **10** from distorting, arcing or warping on the grid **22**.

[0069] FIG. 3 illustrates a handle **25** of the dust mop **1**. In an embodiment, the handle **25** may have a switch **26** for activating and/or deactivating the dust mop **1**. The handle **25** may also have an LED light **28** that may indicate if the dust mop **1** is currently emitting an electrostatic charge to the grid mat **10**.

[0070] FIG. 4 illustrates an embodiment of the handle **25** of the present invention showing a battery **38** within the handle **30** of the dust mop **1**. The battery **38** may charge the electrostatic dust mop **1**. In another embodiment, the battery **38** may be rechargeable. In an embodiment, the dust mop **1** may be connected to an electrical wall outlet (not shown) to recharge the battery and/or to use the dust mop **1**. The battery **38** may have an AC voltage which may be converted to DC voltage by using a generator **40** which may have a transformer **41** to convert the AC voltage of the battery **38** to high voltage DC power. In an embodiment, a chopper circuit (not shown) having a step up transformer (not shown) may be used to generate the DC voltage.

[0071] FIG. 4 further illustrates a motion detecting mechanism **32** which may cause the electrostatic dust mop **1** to activate when the dust mop **1** detects motion, such as when the dust mop **1** is moved, shaken or otherwise agitated. The motion detecting mechanism **32** may also cause the electrostatic dust mop **1** to deactivate if the dust mop **1** is not in use. The motion detecting mechanism **32** may deactivate the dust mop **31** after a pre-set period of time. Inactivity, or the state of rest of the dust mop **1** may determine the pre-set period of time. In an embodiment, the pre-set period of time for deactivation may be between two minutes and three minutes. The motion detecting mechanism **32** may use an accelerometer, a photographic eye **36** or a switch **34** to activate the dust mop **1**.

[0072] FIG. 5 illustrates an embodiment of the bottom of the shaft **6** of the dust mop **1**. In an embodiment of the present invention, the battery **38** may be within the shaft **6** of the dust mop **1**. The battery **38** may be rechargeable. In another embodiment, the dust mop **1** may have electrical nodes **80**, such as electrical nodes found on cordless telephones. The electrical nodes **80** may be integrated into the mop **1** and may be connected to the battery **38**. When the rechargeable batteries are depleted of energy, the dust mop **1** may be connected to a charging stand (not shown) The

charging stand may accept the electrical nodes **80** and provide power to the rechargeable battery **38**. In another embodiment, the charging stand (not shown) may be magnetically coupled to the dust mop **1** which may be placed in the charging stand. Magnetic coils **82** may charge the battery **38** with a charging circuit (not shown). In an another embodiment, the battery **38** may be positioned on the wiper **4**.

[0073] As further illustrated in FIG. 5, the dust mop **1** may include a lighting source **45** which may be, for example, a lamp. The lighting source **45** may illuminate automatically when the dust mop **1** is activated and/or when the motion detection system **32** is triggered. The lighting source **45** may illuminate dust and/or other particles. The lighting source **45** may also illuminate an area to be cleaned by a dust mop, such as, for example, for hard-to-reach-areas.

[0074] FIGS. 6 and 7 illustrate a wiper **39** with a paper and/or cloth material **43** covering the grid mat **10** which may be detachably connected to the bottom side **47** of the wiper **39**. The electrostatic charge may travel through the shaft **42** from the battery **38** in the handle **25**. The electrostatic charge may travel through the shaft **42** via electrical wiring **44** and may contact the edges **46** of the grid mat **10**. Electrical current may be transported into the grid lines **20**. As a result, dust and/or other particles proximate to the dust mop **1** may become oppositely charged. The dust mop **1** may then attract the particles to the wiper **39**. When the electrostatic charge is deactivated, the cloth and/or protective material **43** may be removed from the bottom of the wiper **39** and may be discarded.

[0075] FIG. 8 illustrates an embodiment of the present invention wherein the wiper **39** may incorporate small holes in the wiper **39** to increase the attraction of particles to the mop **1**. The wiper **39** may contain the battery **38** to power the electro-static mop **1**. The wiper **39** may also have a vacuum system **82** that may draw air through the grid mat **10**. The vacuum or suction system **82** may increase the attraction of dust particles to the mop **1**. The increase in attraction may be caused by the combination of an electro-static charge emitted by the mop **1** and the vacuum system **82** which may provide suction of charged particles. The vacuum system **82** may draw air through the wiper **39**, through the grid mat **10** and through a suction fan **84**. The grid mat **10** of the mop **1** may have perforations **80** to assist the vacuum system **82** in drawing air through the grid mat **10**. The perforations **80** may allow for greater air flow through the wiper **39** which may create a greater nexus between the particles and the wiper **39**.

[0076] FIG. 9a illustrates a schematic diagram showing a preferred embodiment of the present invention. A switch **50(a)** may be implemented for activating the electrostatic dust mop **1** when the dust mop **1** is disturbed. The switch **50(a)** may have a conductive ring **51** and a spring **52**. When the dust mop **1** is moved, the spring **52** may also move. The spring **52** may contact the conductive ring **51** which activates a motion detection system **54** of the dust mop **1**. The motion detection system **54** may then trigger the activation of the electrostatic current. The motion detection system **54** may be powered by a battery **56**. The power from the battery **56** may be converted into DC voltage **57** before the power is directed to the grid mat **60**.

[0077] FIG. 9b illustrates another embodiment of a switch **50(b)** for the motion detection system **54** of FIG. 9a. The

switch **50(b)** may activate the motion detection system **54** when triggered. Unlike the switch **50 (a)** of **FIG. 9a** which detects motion, the switch **50(b)** of **FIG. 9b** may be manually triggered by an individual to activate the electrostatic dust mop **1**.

[0078] Referring now to **FIG. 10**, the motion detection system **54** is illustrated which may have a switch **64**. A conductive ring **68** and a spring mechanism **70** may be implemented within the switch **64**. The spring mechanism **70** may contact the conductive ring **68** when the dust mop **1** is moved. The motion detection system **54** may use buffered gates **72** which may be connected to resistors **74** and/or capacitors **76** to facilitate operation of the motion detection system **54**. The buffered gates **72** may be monolithic complementary integrated circuits and may be implemented with transistors (not shown). The gates **72** may be implemented as part of a timing system (not shown) with the addition of resistors **74** and capacitors **76**. The motion detection system **64**, when triggered, may activate the power supply **79** to facilitate charging of the mop **1**. The gates **72** may also have a battery quiescent drain (not shown) which may be less than 1% of the timer.

[0079] The dust mop **1** may have a current limitation such that the electric current may not harm a user when the grid mat **10** is touched. The dust mop **1** may employ a current limiting resistor (not shown) to limit the current output to the grid mat **10**. The current limiting resistor (not shown) may, for example, ensure that if a user touches both sides of the grid mat **10**, the electrostatic charge may not be conducted through the user. Using the current limiting resistor, the electrical energy that may be conducted to a user from the dust mop **1** may be limited to fifteen millijoules.

[0080] It should be understood that the present invention may be a cleaning device, such as, for example, a broom, a dust cloth or other cleaning device having a surface for picking up and/or removing particles or the like from a particular area. The cleaning device may have a surface that conducts an electrical charge and a motion detecting system that is connected to the surface.

[0081] The dust mop **1** may be used in the home, for example, by an individual to clean, for example, the floor or other area or surface. When the dust mop **1** is activated, the dust and/or particles may become charged. The charged particles may be attracted to the dust mop **1**. The dust particles may remain on the dust mop **1** until the electrostatic charge is turned off or de-activated. When the electrostatic charge is de-activated, the particles may be removed from the wiper **39** and thrown away.

[0082] The dust mop **1** or cleaning device may be used by, for example, law enforcement agencies to collect evidence at a crime scene, such as the collection of hair, thread, body dander or other material that may contain, for example, DNA. Further, the dust mop **1** or cleaning device may be used by law enforcement agencies and government agencies to collect and/or to secure bacteria or other contaminants. A law enforcement officer may activate the dust mop, for example, at a crime scene. The dust mop **1** may be maneuvered around the crime scene emitting an electrostatic charge. The electrostatic charge may polarize particles and may attract them to the wiper **39** of the dust mop **1**. The electrostatic charge may then be deactivated after the crime

scene has been surveyed, and the protective material **43** may be removed and/or may be sent for analysis of the collected particles.

[0083] It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications may be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages.

I claim:

1. A mop comprising:

a handle;

a mat connected to the handle wherein the mat has a first side which conducts an electric charge; and

a power source electrically connected to the mat wherein the power source transmits the electrical charge to the first side of the mat wherein the first side polarizes a particle and attracts the particle to the first side.

2. The mop of claim 1 further comprising:

a switch connected to the power source wherein the switch activates the power source.

3. The mop of claim 1 further comprising:

a covering on the mat wherein the particle attaches to the covering.

4. The mop of claim 1 wherein the power source is a battery.

5. The mop of claim 1 wherein the power source is a rechargeable battery.

6. The mop of claim 1 further comprising:

an indicator which signals that the mat is conducting the electrical charge.

7. The mop of claim 1 further comprising:

a covering on the first side of the mat wherein the covering contains a material which conducts the electrical charge.

8. The mop of claim 1 further comprising:

a motion detecting mechanism electrically connected to the power source wherein the motion detecting mechanism activates the power source.

9. The mop of claim 1 further comprising:

a light source connected to the mat.

10. The mop of claim 1 further comprising:

a conductive area on the first side of the mat.

11. The mop of claim 1 further comprising:

a vacuum system drawing air through the first side of the mat to attract dust particles wherein the first side of the mat has a perforation.

12. The mop of claim 1 further comprising:

a charging station having magnetic coils to charge the power source.

13. A cleaning device comprising:

a surface that conducts an electrical charge; and

a motion detecting mechanism electrically connected to the surface wherein the surface conducts the electrical

charge when the motion detecting mechanism detects movement and further wherein particles are attracted to the surface.

14. The cleaning device of claim 13 further comprising:

a power source connected to the surface wherein the power source transmits the electrical charge to the surface.

15. The cleaning device of claim 13 further comprising:

a covering on the surface wherein the particles attach to the covering.

16. The cleaning device of claim 13 further comprising:

a grid on the surface wherein the grid has an area which conducts the electrical charge.

17. The cleaning device of claim 13 further comprising:

a light source attached to the handle which emits a light when the surface conducts the electrical charge.

18. The cleaning device of claim 13 further comprising:

a timer connected to the surface.

19. A method for collecting particles, the method comprising the steps of:

providing a surface wherein the surface has a first side; electrically charging the first side of the surface;

placing the surface adjacent to the particles to provide the particles with an electrical charge; and

attracting the particles to the surface.

20. The method of claim 19 further comprising the step of: activating the charging of the surface from movement of a mat.

21. The method of claim 19 further comprising the step of: covering the surface with a material to which the particles attach when the particles are attracted to the surface.

22. The method of claim 19 further comprising the step of: providing an indication to identify that the surface is charged.

23. The method of claim 19 further comprising the step of: selecting a period of time after which the surface no longer receives the electrical charge.

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