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(54) Title: SYSTEM FOR CONTACTLESS CLEANING OF GLASS SURFACE

(57) Abstract: According to embodiments of the invention, a contactless dust cleaning system for a glass surface is disclosed. The system includes a transparent conductive coating on the glass surface, a first conductor, located along at least a first edge of the glass surface and a second conductor, located along at least a second edge of the glass surface. The arrangement being such that the transparent conductive coating, the first conductor and the second conductor are configured to selectively conduct a potential of a specific polarity. The polarity of the potential in the transparent conductive coating and the first conductor is opposite to the polarity of potential in the second conductor.

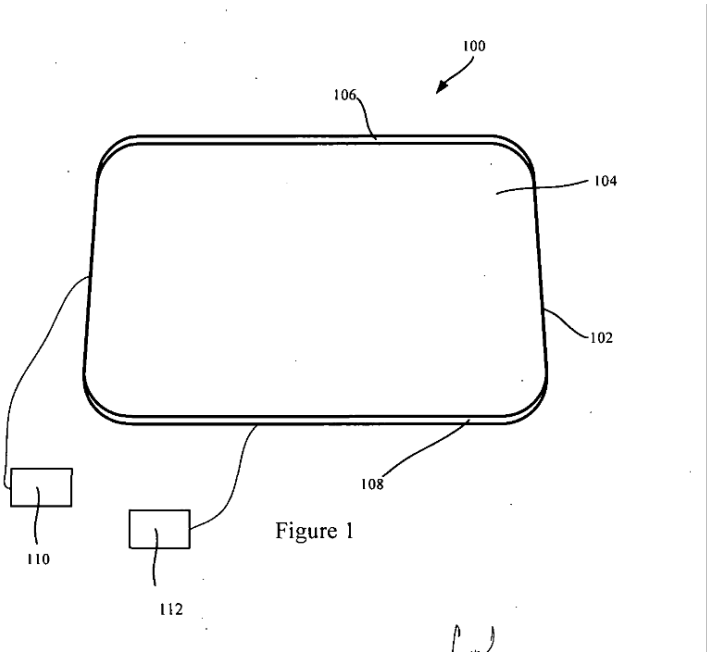

Figure 1

ABSTRACT

SYSTEM FOR CONTACTLESS CLEANING OF GLASS SURFACE

According to embodiments of the invention, a contactless dust cleaning system for a glass surface is disclosed. The system includes a transparent conductive coating on the glass surface, a first conductor, located along at least a first edge of the glass surface and a second conductor, located along at least a second edge of the glass surface. The arrangement being such that the transparent conductive coating, the first conductor and the second conductor are configured to selectively conduct a potential of a specific polarity. The polarity of the potential in the transparent conductive coating and the first conductor is opposite to the polarity of potential in the second conductor.

We Claim:

1. A contactless dust cleaning system for a glass surface, the system comprising:

a transparent conductive coating on the glass surface;

a first conductor located along at least a first edge of the glass surface; and

a second conductor located along at least a second edge of the glass surface, wherein the first conductor and the second conductor are configured to selectively have an electric potential of a specific polarity such that the polarity of potential in the first conductor is opposite to the polarity of the voltage in the second conductor.

2. The system as claimed in claim 1, wherein the transparent conductive coating is configured to selectively have an electric potential of a specific polarity such that the polarity of the potential in the transparent conductive coating is same as the polarity of the potential in the first conductor.

3. The system as claimed in claim 2, wherein the system is configured to provide potential either in the first and the second conductor or in the transparent conductive coating.

4. The system as claimed in claim 2, wherein the system is configured to provide potential in the first conductor, the second conductor and the transparent conductive coating simultaneously.

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FIELD OF INVENTION

This invention generally relates to contactless system and method of glass surface cleaning, and, more particularly, to a system and method of contactless cleaning of a windshield of a vehicle.

BACKGROUND

At times, it is required to clean the dust particles from a glass surface, particularly windshields of a vehicle. Typically vehicles are equipped with wipers to clean the windshield and rear view window. The wipers have one or more rubber blades that clean glass surface by to and fro stock. It is advisable to wet the glass surface before operating wipers to avoid damage of the glass surface by rubbing duct particles. However at times, the wipers start operation even before the surface is completely wet and eventually may damage the glass surface. To avoid damage, people prefer to clean the windshield and rear view window manually with a dry cloth or manually soaking complete surface before using wipers.

Accordingly, there is a need for an improved system and method for contactless cleaning of glass exteriors of a vehicle.

SUMMARY OF THE INVENTION

According to embodiments of the invention, a contactless dust cleaning system for a glass surface is disclosed. The system includes a transparent conductive coating on the glass surface, a first conductor, located along at least a first edge of the glass surface and a second conductor, located along at least a second edge of the glass surface. The arrangement being such that the transparent conductive coating, the first conductor and the second conductor are configured to selectively conduct a potential of a specific polarity. The polarity of the

potential in the transparent conductive coating and the first conductor is opposite to the polarity of potential in the second conductor.

BRIEF DESCRIPTION OF DRAWINGS

Other objects, features, and advantages of the invention will be apparent from the following description when read with reference to the accompanying drawing:

Figure 1 illustrates contactless dust cleaning system for a glass surface according to an embodiment of the invention.

DETAILED DESCRIPTION OF DRAWING

In the drawing and specification there has been set forth preferred embodiments of the invention, and although specific terms are employed, these are used in a generic and descriptive sense only and not for purposes of limitation. Changes in the form and the proportion of parts, as well as in the substitution of equivalents, are contemplated as circumstances may suggest or render expedient without departing from the spirit or scope of the invention.

Figure 1 illustrates an exemplary contactless dust cleaning system 100 for a glass surface 102. According to an embodiment, the glass surface 102 may be a windshield or glass window of a vehicle. As illustrated the system 100 may include a transparent conductive coating/film 104 on the glass surface 102. Transparent conductive coating and transparent conductive film are interchangeably used throughout the specification. According to an exemplary embodiment, the transparent conductive coating/film 104 may be a thin deposition/covering of an optically transparent and electrically conductive material.

According to yet another embodiment, the optically transparent and electrically conductive material may be inorganic such as, but not limited to, indium tin oxide, fluorine doped tin oxide, doped zinc oxide, etc. and organic material such as carbon nanotube networks and graphene, which can be fabricated to be highly transparent to infrared light, along with networks of polymers such as poly (3, 4-ethylenedioxythiophene) and its derivatives.

The system may include a first conductor 106. The first conductor 106 may be located along at least a first edge of the glass surface. According to an embodiment, the first conductor 106 may be a wire arranged along the edge of glass surface 102. According to another embodiment, the first conductor 106 may be a strip of an electric conductor such as, but not limited to, metal. According to yet another embodiment, the first conductor 106 may extend downwardly on each side edge of the glass surface 102.

The system may include a second conductor 108, located along at least a second edge of the glass surface 102. According to an embodiment, the second conductor 108 may be a wire arranged along the edge of glass surface 102. According to another embodiment, the second conductor 108 may be a strip of an electric conductor such as, but not limited to, metal. According to yet another embodiment, the second edge of the glass surface may be located downward opposite to the first edge of the glass surface 102. According to yet another embodiment, the second conductor 108 may extend upwardly on each side edge of the glass surface 102.

The system may receive electric potential from one or more power source such as, but not limited to, battery. According to an embodiment, the transparent conductive coating/film 104

and the first conductor 106 may receive electric potential from a first power source 110 and the second conductor 108 may receive electric potential from a second power source 112.

According to an embodiment, the arrangement being such that the first conductor 106 and the second conductor 108 are configured to selectively receive an electric potential of a specific polarity such that the polarity of potential in the first conductor 106 may be opposite to the polarity of the voltage in the second conductor 108.

According to another embodiment, the arrangement being such that the transparent conductive coating 104, the first conductor 106 and the second conductor 108 are configured to selectively conduct a potential of a specific polarity. The polarity of the potential in the transparent conductive coating 104 and the first conductor 106 may be opposite to the polarity of potential in the second conductor 108.

According to yet another embodiment, the system may be configured to provide potential either in the first conductor 106 and the second conductor 108 or in the transparent conductive coating 104.

According to yet another embodiment, the system may be configured to provide potential in the first conductor 106, the second conductor 108 and the transparent conductive coating 104 simultaneously.

According to yet another embodiment, the potential may be operated manually. According to yet another embodiment, the potential may be operated automatically. According to one embodiment, the operation of the system may be trigged manually. According to yet another

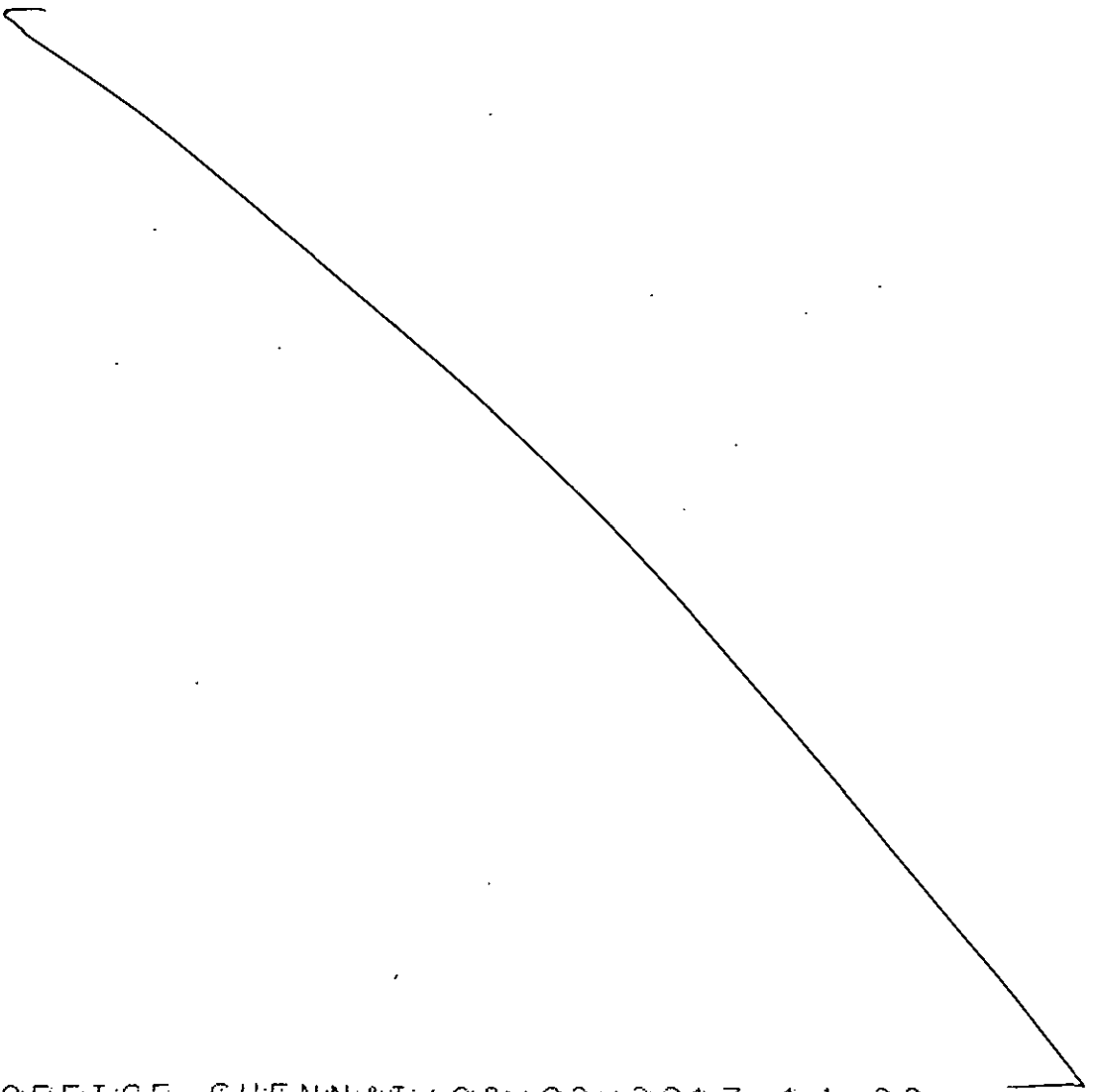
embodiment, the system may work automatically on a regular interval. According to yet another exemplary embodiment, the system may be operated by a processor. According to an embodiment, the processor may be a system on chip. According to yet another embodiment, the processor may be a programmable processor.

According to an exemplary illustration, the system may start by providing a specific potential/charge such as, but not limited to, a negative potential to the transparent conductive coating 104. The charge on the conductive coating 104 will help in providing a similar potential on the dust and dirt particles resting on the glass surface 102. After operating the charge in the conductive coating 104 for a pre-defined time, the electric potential may be supplied in the first conductor 106 and the second conductor 108 such that the polarity of electric potential in the first conductor 106 is same as the polarity of the electric potential in the conductive coating 104 and the polarity of electric potential in the second conductor 108 is opposite to the polarity of the electric potential in the conductive coating 104. For the sake of illustration, the polarity in the first conductor 106 may be negative and the polarity of electric potential in the second conductor 108 may be positive. The positive polarity in the second conductor 108 may attract negatively charged dust and dirt particles resting on the glass surface 102, whereas the negative polarity in the first conductor 106 may help in pushing/repelling the negatively charged dust and dirt particles resting on the glass surface 102 towards the second conductor 108.

Throughout the various contexts described in this disclosure, the embodiments of the invention further encompass computer apparatus, computing systems and machine-readable media configured to carry out the foregoing systems and methods. In addition to an embodiment consisting of specifically designed integrated circuits or other electronics, the

present invention may be conveniently implemented using a conventional general purpose or a specialized digital computer or microprocessor programmed according to the teachings of the present disclosure, as will be apparent to those skilled in the computer art.

Appropriate software coding can readily be prepared by skilled programmers based on the teachings of the present disclosure, as will be apparent to those skilled in the software art. The invention may also be implemented by the preparation of application specific integrated circuits or by interconnecting an appropriate network of conventional component circuits, as will be readily apparent to those skilled in the art.



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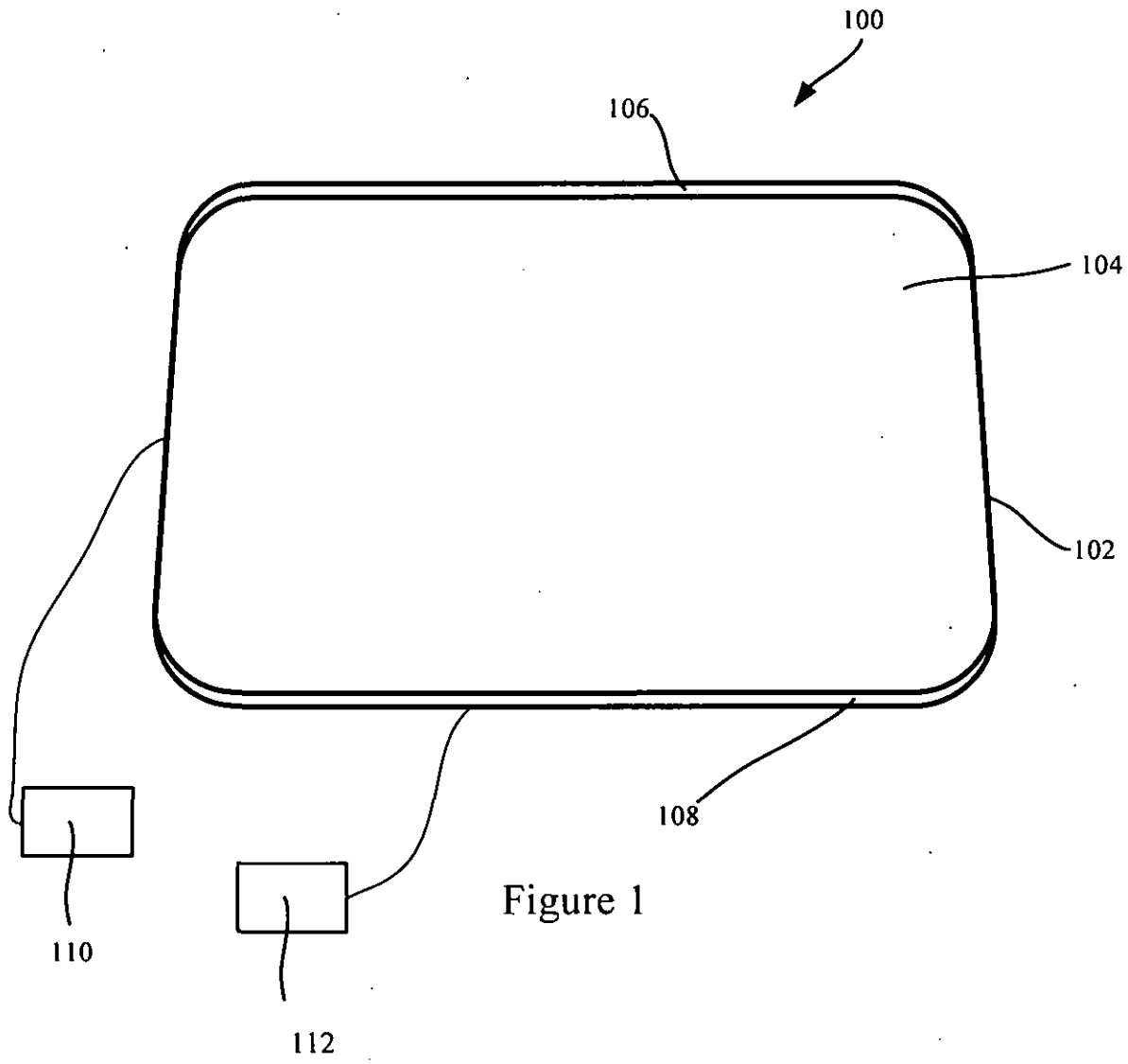

Figure 1

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