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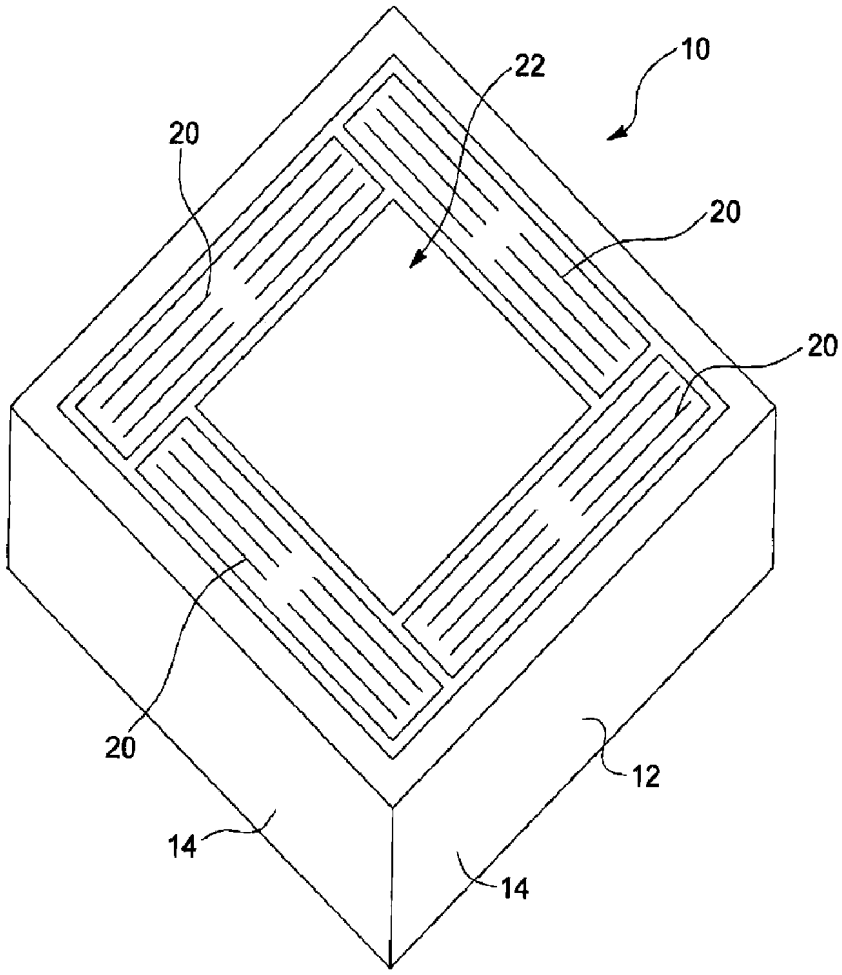
(54) Titre : CARRE DE PAVAGE/BRIQUE MUNI D'UN SYSTEME D'ECLAIRAGE INTEGRE
(54) Title: PAVING/BRICK UNIT WITH INTEGRATED LIGHTING SYSTEM



(57) Abrégé/Abstract:
A paving/brick unit with an integrated lighting system that can be recharged through solar power means. The paving/brick unit with integrated lighting system includes a housing having a bottom panel and side panels defining a top opening. The unit also has a

(21) 2 688 207

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(57) Abrégé(suite)/Abstract(continued):
light source for emitting light through said top opening and energy storage means connected to the light source. Solar power cells are connected to the energy storage means and receive solar energy through the top opening of the housing. A cover is clipped on top of the housing, covers the light source and solar power cells, and allows passage of light from the light source to an outside environment, and from said environment to the solar power cells.

ABSTRACT

A paving/brick unit with an integrated lighting system that can be recharged through solar power means. The paving/brick unit with integrated lighting system includes a housing having a bottom panel and side panels defining a top opening. The unit also has a light source for emitting light through said top opening and energy storage means connected to the light source. Solar power cells are connected to the energy storage means and receive solar energy through the top opening of the housing. A cover is clipped on top of the housing, covers the light source and solar power cells, and allows passage of light from the light source to an outside environment, and from said environment to the solar power cells.

PAVING/BRICK UNIT WITH INTEGRATED LIGHTING SYSTEM

FIELD OF THE INVENTION

The present invention generally relates to paving/brick units. More particularly, it relates to a paving/brick unit with an integrated solar-powered lighting unit.

BACKGROUND OF THE INVENTION

Paving/brick systems are often used for landscaping and construction applications. Paving/brick systems can be used for walkways, patios, wall units or any surface for which aesthetics are important.

Several people seek to improve lighting conditions in environments where paving/brick systems are used. Several different systems are used for illuminating pathways, driveways or any other type of flat surface.

There are various challenges in installing paver/brick units with lighting systems as opposed to other types of lighting systems as the light source must integrate well with the other paving/brick units such as stone, concrete or all other types of paving/brick units.

Prior art paver/brick lights often have to be connected to external power sources. This becomes problematic as underground wiring has to be provided to the paving/brick units that have the light sources.

WO 2006/113169 discloses a solar paver/brick light having a solar cell and power storage unit within the housing. However, this paver/brick light design is bulky for certain types of installation of paver/brick units.

Consequently, there is still presently a need for a paving/brick unit that provides a solar-powered lighting system in order to enhance the aesthetic value of a paving/brick system or unit, while being compact in size.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a paving/brick unit that addresses at least one of the above-mentioned needs.

According to the present invention, there is provided a paving/brick unit with an integrated lighting system that can be recharged through solar power means.

More particularly, there is provided a paving/brick unit with integrated lighting system comprising:

- a housing having a bottom panel and side panels defining a top opening;
- a light source for emitting light through said top opening;
- energy storage means connected to the light source;
- solar power cells connected to the energy storage means and receiving solar energy through the top opening of the housing; and
- a cover clipped on top of the housing, covering the light source and solar power cells, and allowing passage of light from the light source to an outside environment and from said environment to the solar power cells.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the invention will become apparent upon reading the detailed description and upon referring to the drawings in which:

Figure 1 is a perspective view of a paving/brick unit according to a preferred embodiment of the present invention;

Figure 2 is a top view of the paving/brick unit shown in Figure 1;

Figure 3 is a top view of the paving/brick unit shown in Figure 1, with the top cover and solar power cells removed;

Figure 4 is a perspective view of paving/brick units according to the present invention installed in a walkway;

Figure 5 is a perspective view of two of the paving/brick units shown in Figure 4;

Figure 6 is a perspective view of one of the paving/brick units shown in the foreground of Figure 4;

Figure 7 is a top view of one of the paving/brick units shown in Figure 4;

Figure 8 is a closer top view of the paving/brick unit shown in Figure 7;

Figure 9 is a perspective view of two of the paving/brick units shown in Figure 4;

Figure 10 is a perspective view of two paving/brick units installed in a walkway;

Figure 11 is a perspective view of four paving/brick units installed in a walkway.

BRIEF DESCRIPTION OF PREFERRED EMBODIMENTS

As shown in Figures 1 to 3, there is provided a paving/brick unit 10 with an integrated lighting system that can be recharged through solar power means. The

paving/brick unit with integrated lighting system includes a housing 12 having a bottom panel and side panels 14 defining a top opening. The unit also has a light source 16 for emitting light through said top opening and energy storage means 18 connected to the light source. Solar power cells 20 are connected to the energy storage means 18 and receive solar energy through the top opening of the housing 12. A cover 22 is clipped on top of the housing, covers the light source 16 and solar power cells 20, and allows passage of light from the light source 16 to an outside environment, and from said environment to the solar power cells 20.

Preferably, the solar power cells 20 are monocrystalline solar cells.

Preferably, the energy storage means 18 comprises batteries of AA type ranging from 1.2 volts to 1.5 volts, or more depending on the total surface of the paving/brick unit.

Preferably, two solar cells should be provided for each AA battery, in order to provide up to seven days of solar energy storage. For example, if two batteries are used, four or more solar cells should be used.

Preferably, the top cover 22 can be made from a transparent rigid plastic such as polycarbonate or glass or any transparent material. The center of the top cover can be made of a plastic of a different color depending on the desired use for the light source. This second plastic can be preferably made of Lexan™ or any polycarbonate resin thermoplastic.

Paving/brick units according to the present invention have been tested in external environments in order to confirm that they can operate at temperatures down to - 40° C, while being resistive to corrosive materials such as salt.

Preferably, in accordance with another preferred embodiment of the present invention, the top surface of the paving/brick unit can comprise a rough surface in order to provide anti-slip or antiskid properties to the paving/brick unit.

The paving/brick unit comprises a solar-powered lighting system. A plurality of paving/brick units can be integrated with similar paving/brick units or complementary paving/brick units in order to form a paving/brick system through coupling means between each paving/brick unit. The paving/brick system can be used to form a wall or a ground paving/brick system.

The solar energy power system can recharge quickly, resist to cold, precipitation and snow. The paving/brick unit according to the present invention does not create pollution for the environment, does not require electrical wiring and does not require regular maintenance.

Preferably, the bottom surface and sides of the paving/brick unit are made of rigid plastic. The paving/brick unit rigid plastic can be black or any other color as chosen by a user of the paving/brick unit.

Preferably, a top surface of the paving/brick unit comprises solar cells in order to provide solar energy to the lighting system as well as a lighting system adjacent to the solar cells. The lighting system and the solar cells are covered with a transparent polyterephtalate cover or any other cover made of an equivalent material. The cover can be tinted for different applications.

Preferably, the paving/brick unit comprises coupling means to couple the paving/brick unit with an adjacent equivalent paving/brick unit. However, the coupling means are not mandatory and the paving/brick unit can be used on its own for certain applications. For example, the paving/brick unit can be configured to display numbers and can therefore be used to identify the address of a household for

example with the numbers being lit by the lighting system provided with the paving/brick unit.

Although preferred embodiments of the present invention have been described in detail herein and illustrated in the accompanying drawings, it is to be understood that the invention is not limited to these precise embodiments and that various changes and modifications may be effected therein without departing from the scope or spirit of the present invention.

WHAT IS CLAIMED IS:

1 - A paving unit with integrated lighting system comprising:

- a housing having a bottom panel and side panels defining a top opening;
- a light source for emitting light through said top opening;
- energy storage means connected to the light source;
- solar power cells connected to the energy storage means and receiving solar energy through the top opening of the housing; and
- a cover clipped on top of the housing, covering the light source and solar -power cells, and allowing passage of light from the light source to an outside environment and from said environment to the solar power cells.

2 - The paving unit according to claim 1, wherein the solar power cells are monocrystalline solar cells.

3 - The paving unit according to claim 1 or 2, wherein the energy storage means comprises batteries of type AA ranging between 1.2 volts to 1.5 volts.

4 - The paving unit according to claim 3, wherein two solar cells are provided for each AA battery.

5 - The paving unit according to any one of claims 1 to 4, wherein the top cover is made from a transparent rigid material.

6 - The paving unit according to claim 5, wherein the transparent rigid material is polycarbonate plastic.

7 - The paving unit according to claim 6, wherein a center of the top cover is made from a polycarbonate resin thermal plastic.

8 - A brick unit with integrated lighting system comprising:

- a housing having a bottom panel and side panels defining a top opening;
- a light source for emitting light through said top opening;
- energy storage means connected to the light source;
- solar power cells connected to the energy storage means and receiving solar energy through the top opening of the housing; and
- a cover clipped on top of the housing, covering the light source and solar -power cells, and allowing passage of light from the light source to an outside environment and from said environment to the solar power cells.

9 - The brick unit according to claim 8, wherein the solar power cells are monocrystalline solar cells.

10 - The brick unit according to claim 8 or 9, wherein the energy storage means comprises batteries of type AA ranging between 1.2 volts to 1.5 volts.

11 - The brick unit according to claim 10, wherein two solar cells are provided for each AA battery.

12 - The brick unit according to any one of claims 8 to 11, wherein the top cover is made from a transparent rigid material.

13 - The brick unit according to claim 12, wherein the transparent rigid material is polycarbonate plastic.

14 - The brick unit according to claim 13, wherein a center of the top cover is made from a polycarbonate resin thermal plastic.

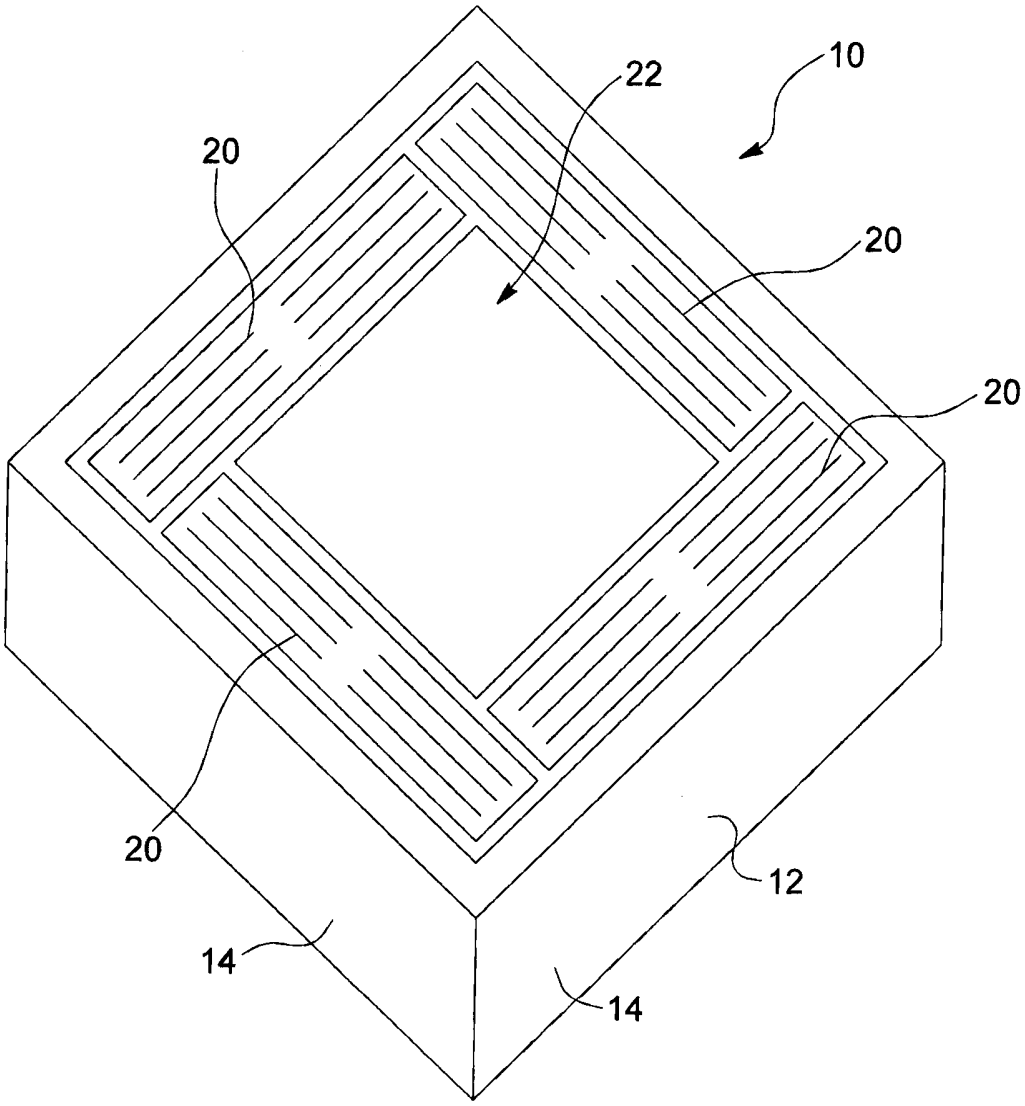


FIG. 1

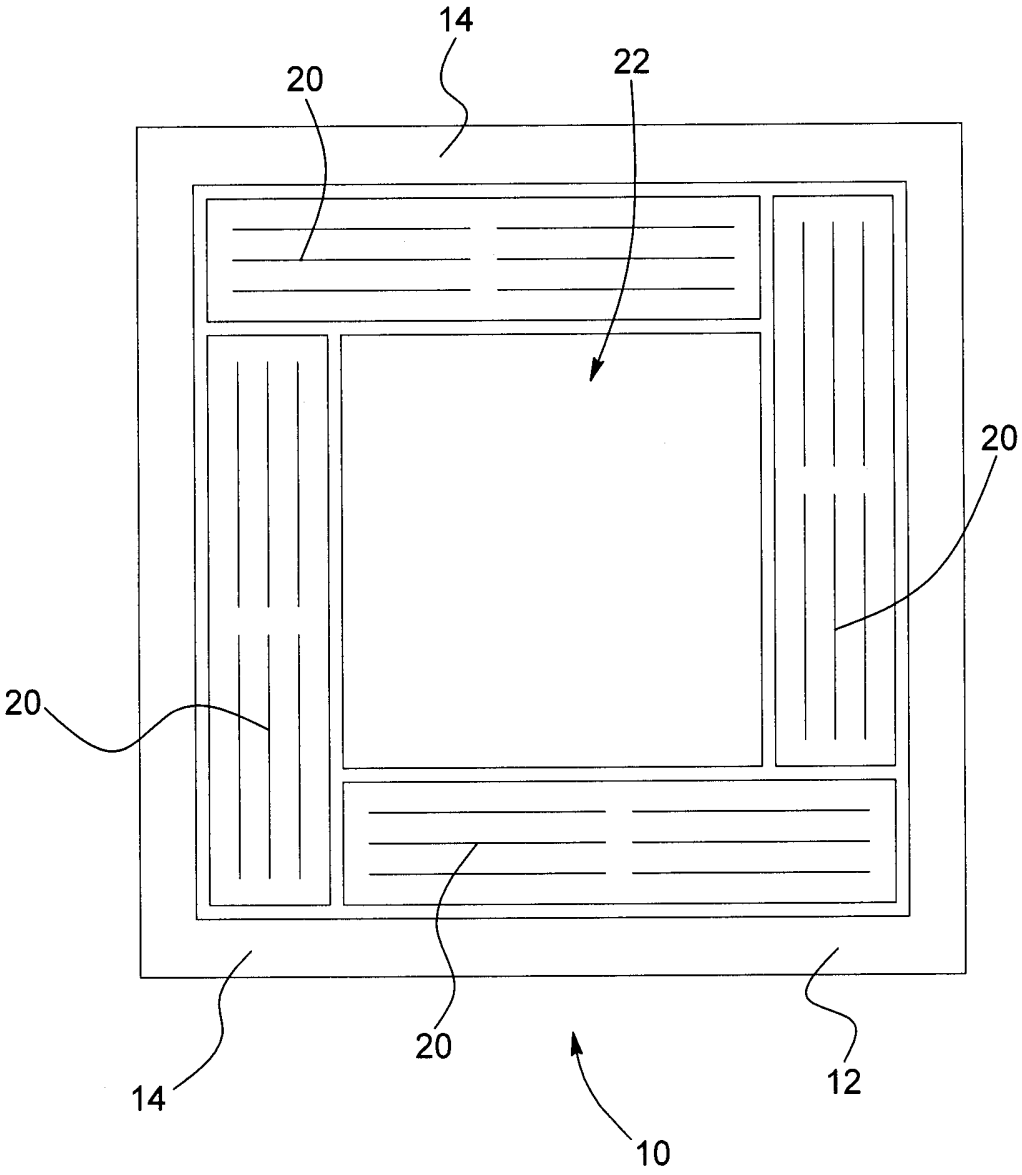


FIG. 2

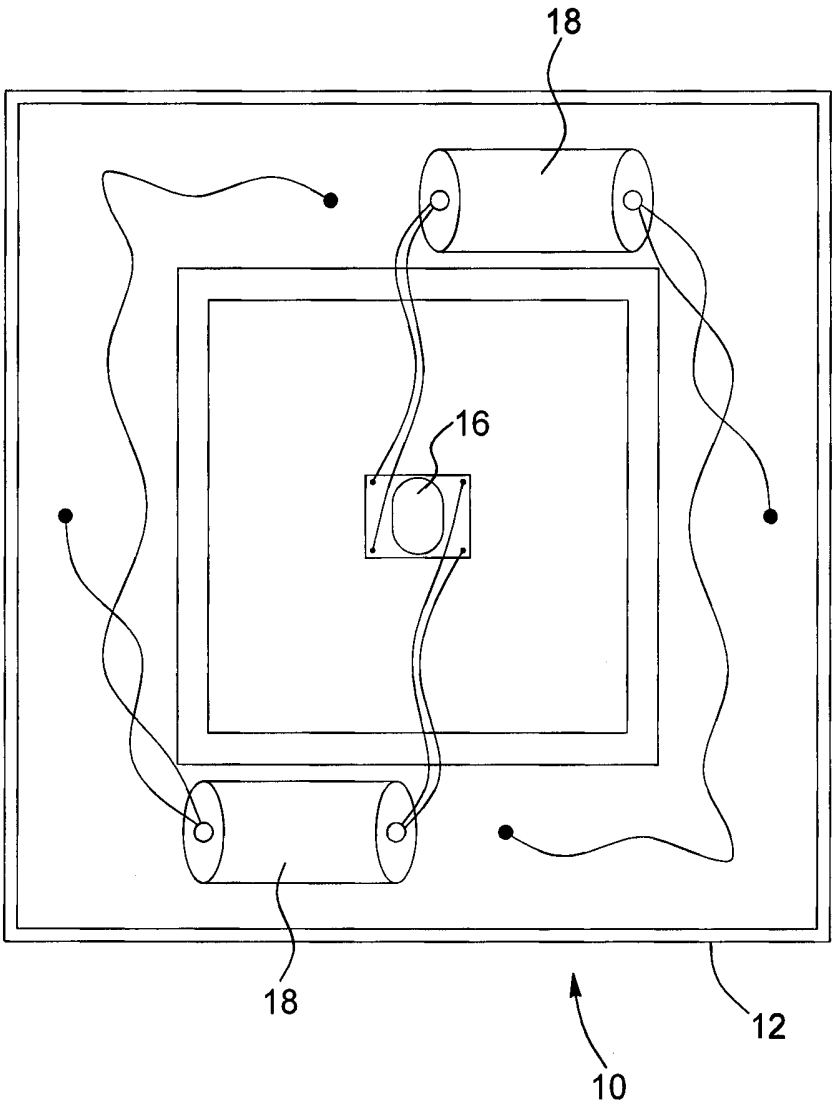


FIG. 3

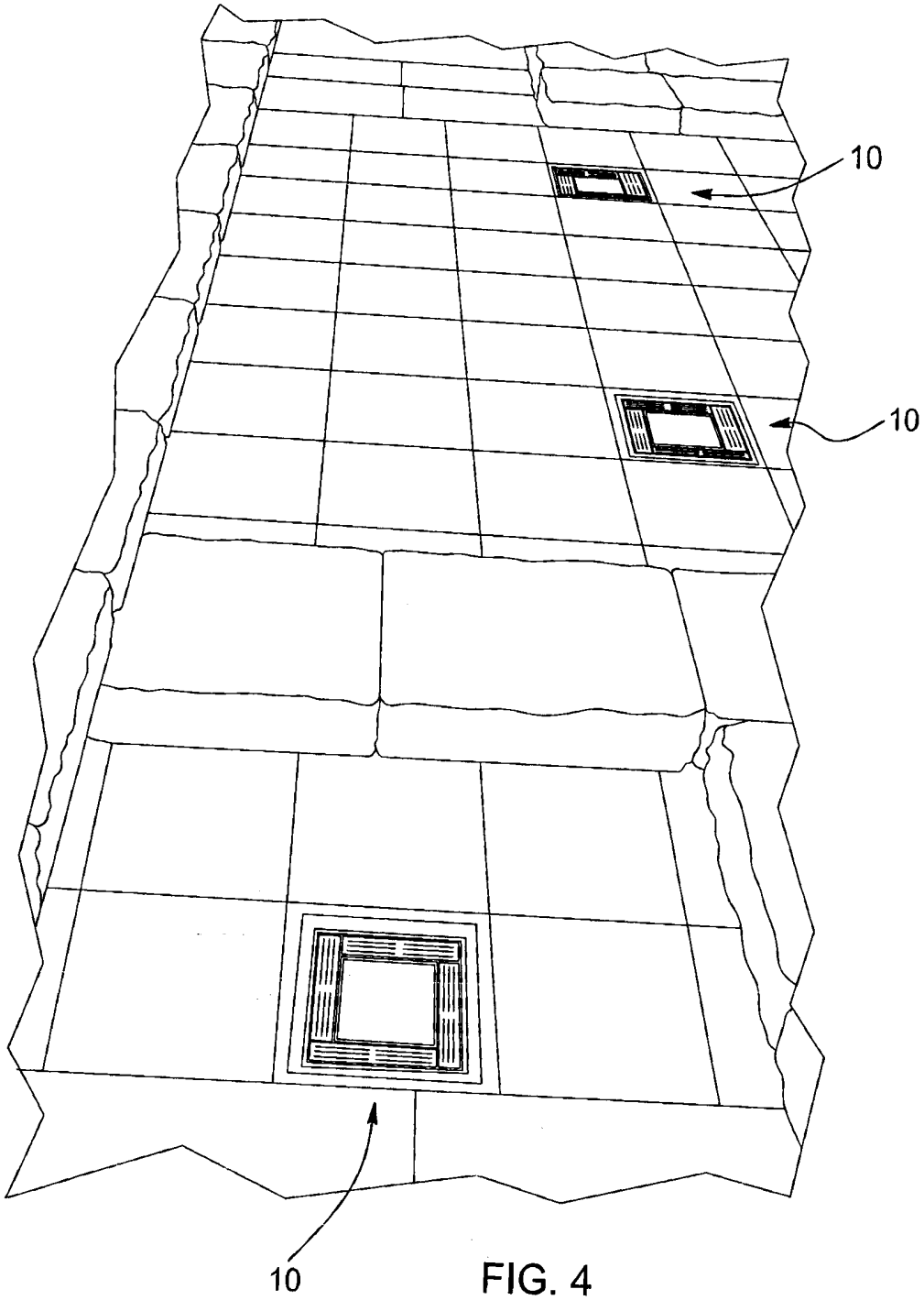


FIG. 4

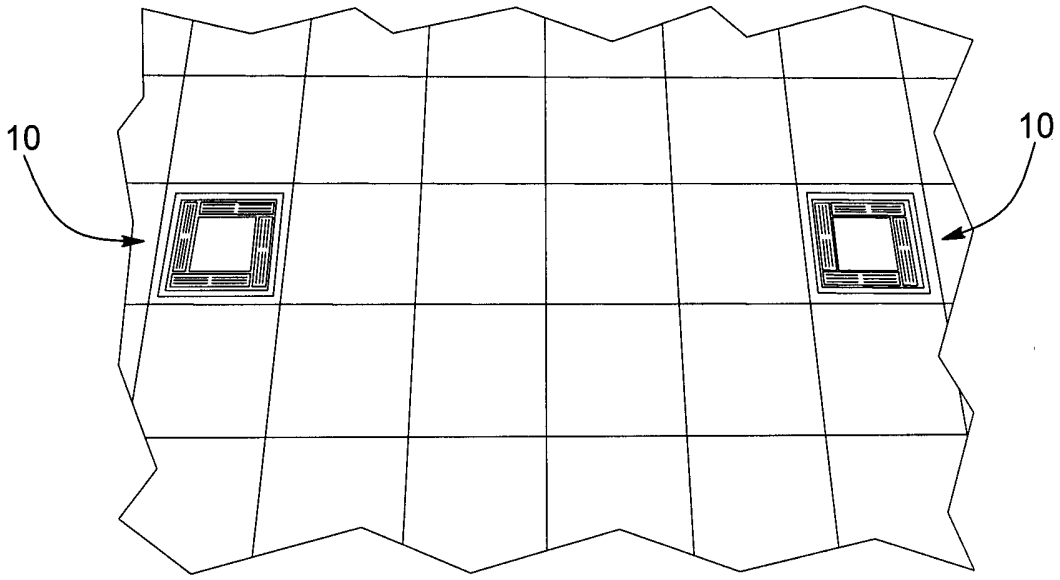


FIG. 5

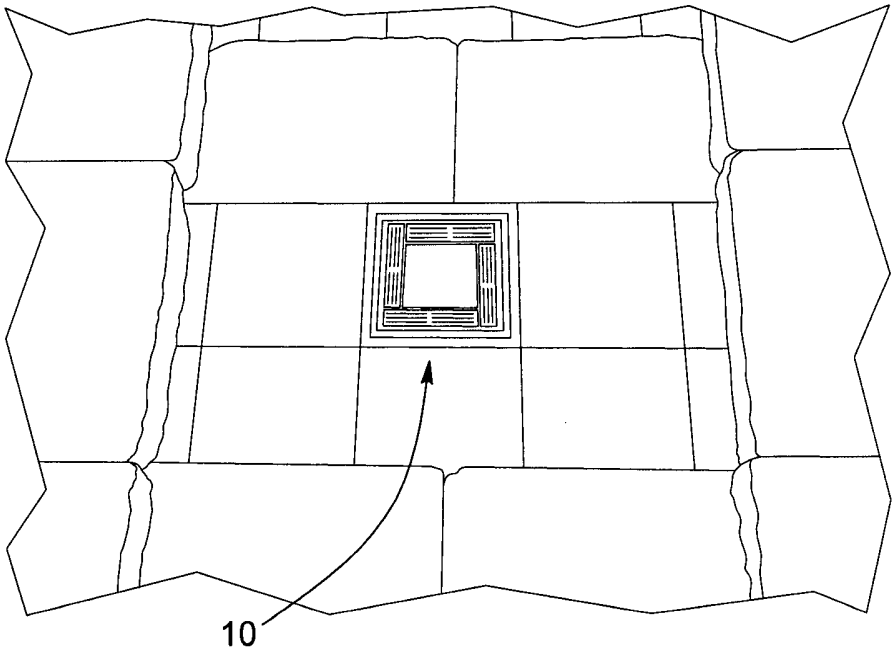


FIG. 6

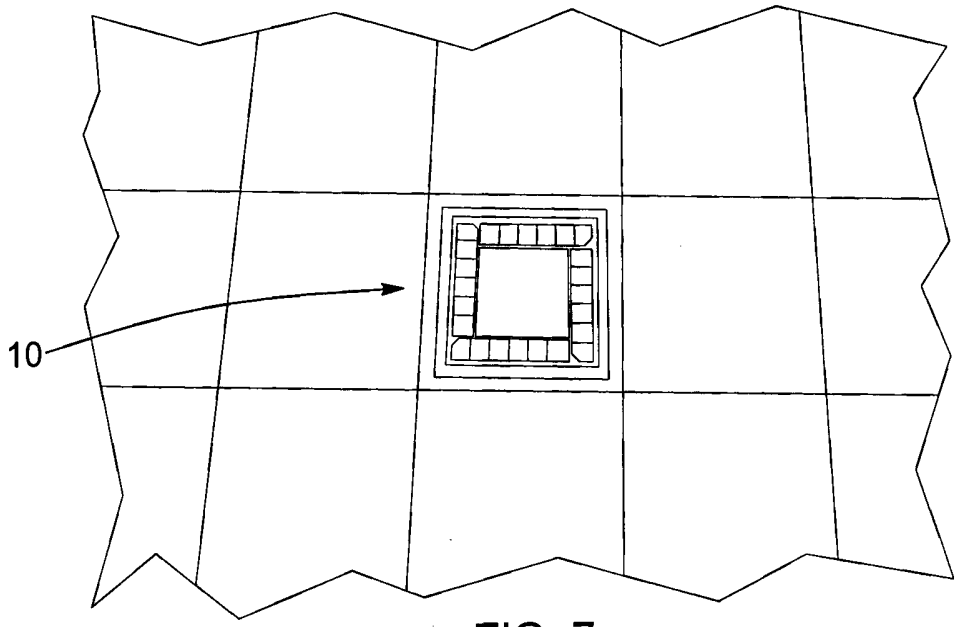


FIG. 7

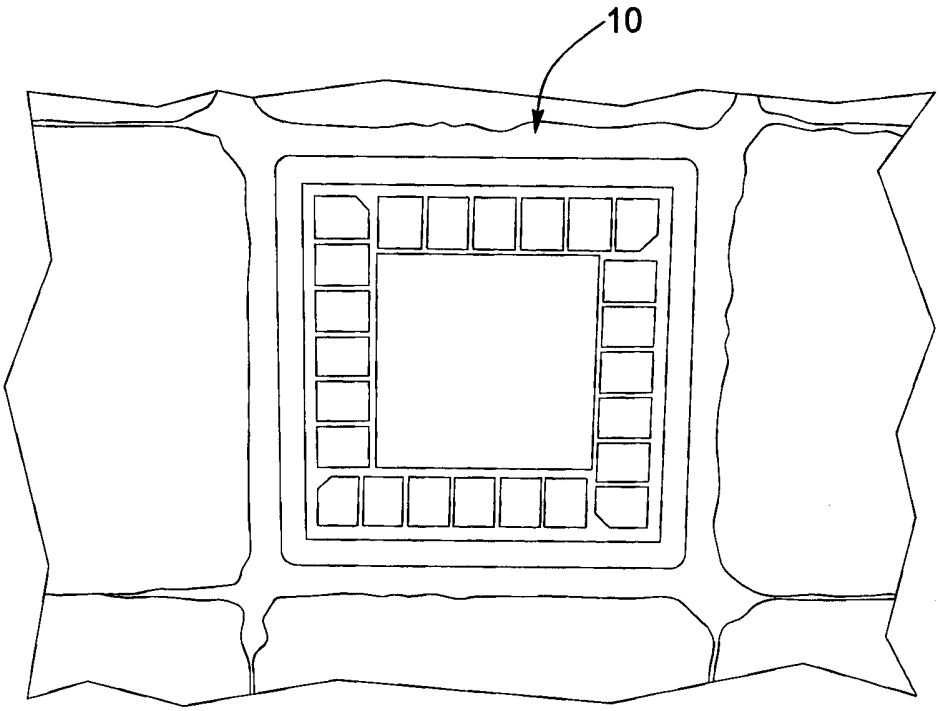


FIG. 8

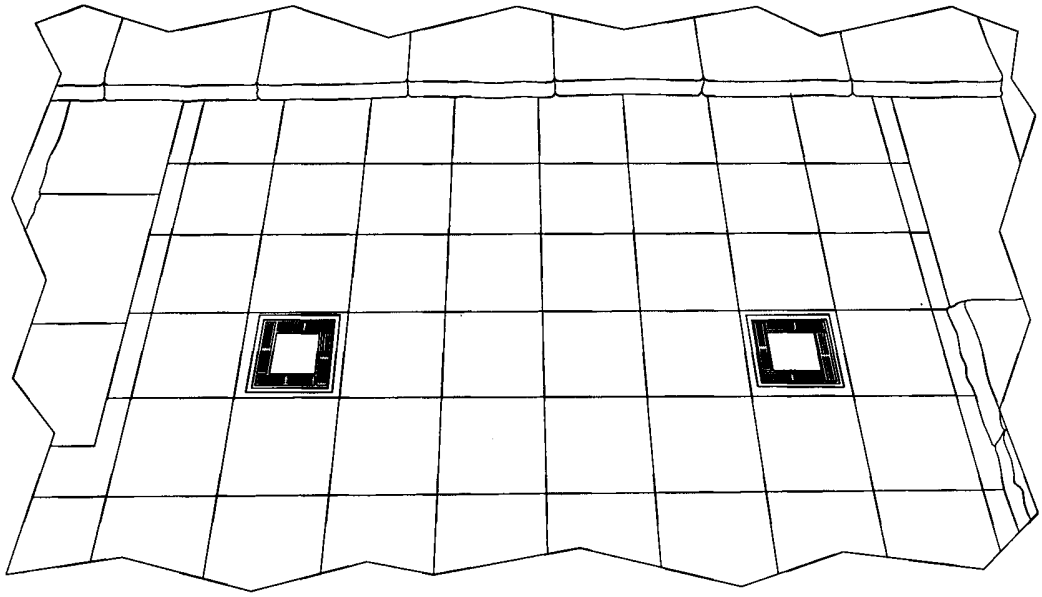


FIG. 9

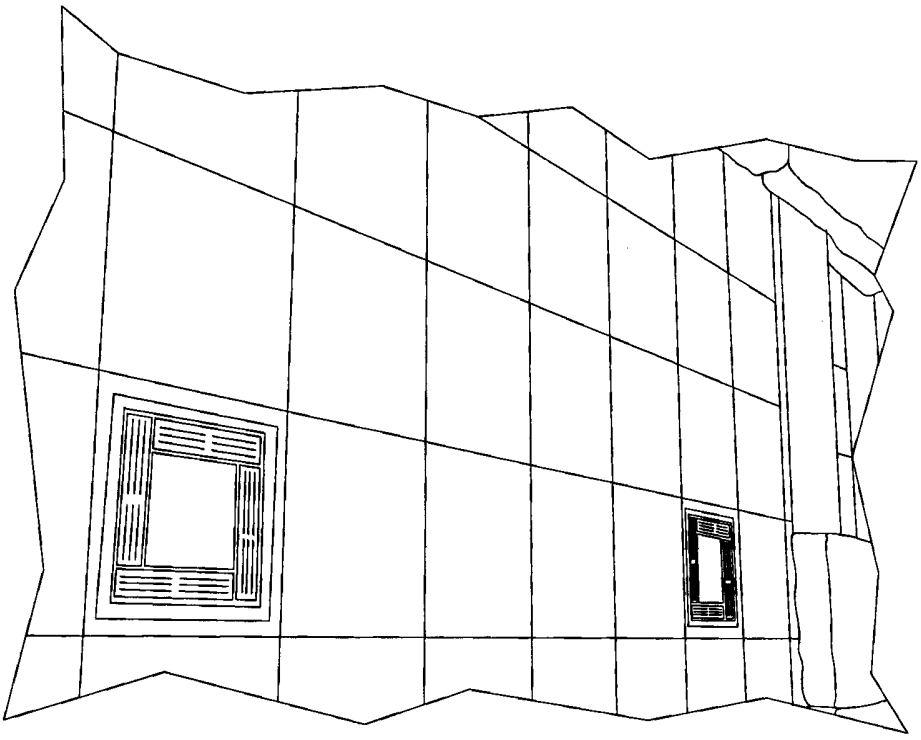


FIG. 10

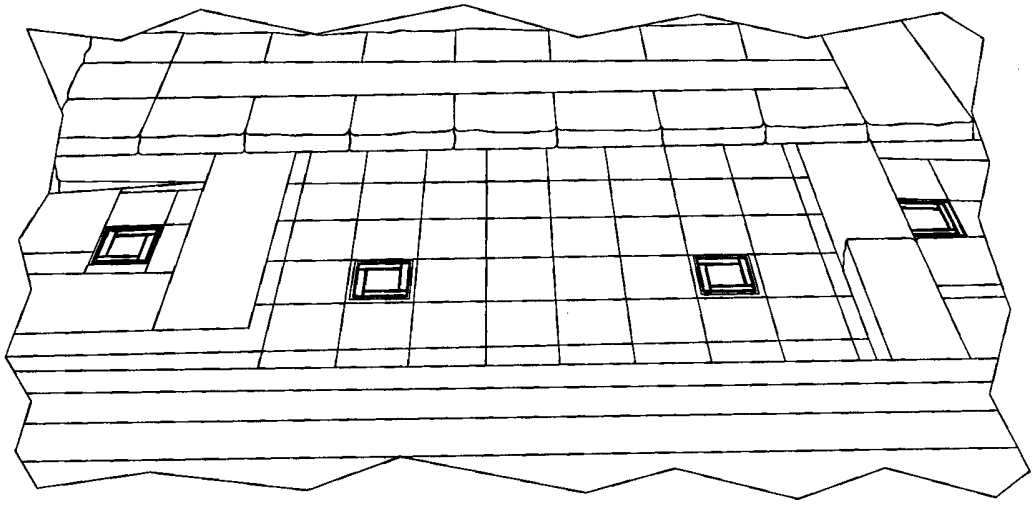
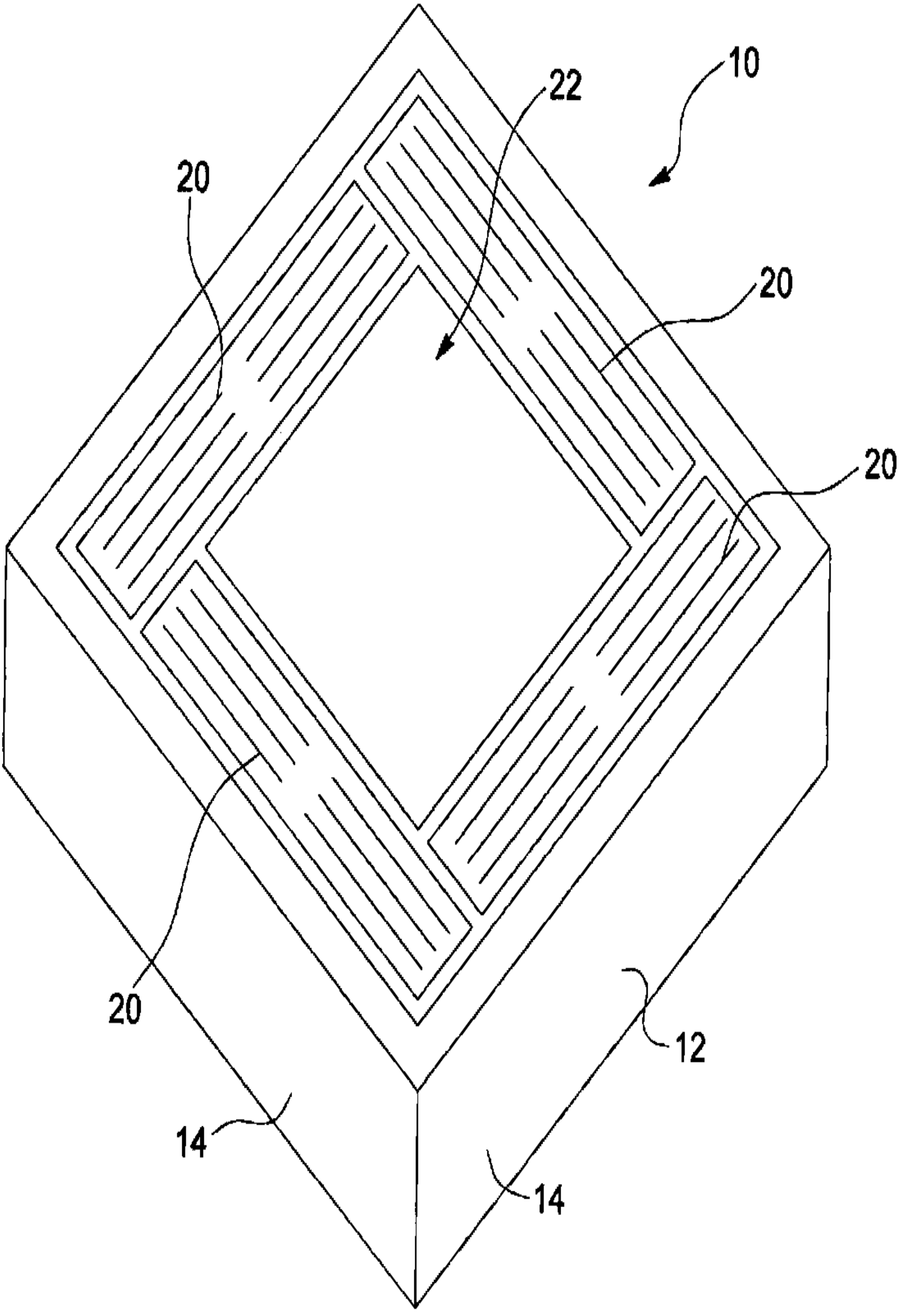


FIG. 11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