Title: LIGHT BLOCKING APPARATUS FOR PHOTOVOLTAIC SYSTEMS

Abstract: A safety protection system for a photovoltaic power system. An electrically activatable light blocking element is located in juxtaposition with the light incident plane of a photovoltaic power source. Electronic controls are used to determine and control the state of the electrically activatable light blocking element. Thus, the production of both current and voltage from the photovoltaic power source can be controlled on demand.
AMENDED CLAIMS
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1. An apparatus comprising:
   a light blocking element held in juxtaposition with a photovoltaic power source and
   formed to have a material that may be activated electronically to block either fully or partially
   transmission of incident light; and
   a controller coupled to the light blocking element and the photovoltaic power source,
   the controller configured to detect an unsafe electrical condition, whereupon detection of the
   unsafe electrical condition, the controller applies a first signal to the light blocking element to
   drive the electronically activated material to at least partially block the transmission of
   incident light.

2. The apparatus of claim 1, wherein the first signal is applied automatically by the
   controller to the light blocking element upon detection of the unsafe electrical condition in
   the photovoltaic power source or a connected power circuit.

3. The apparatus of claim 1, further comprising the controller configured to detect a
   signal from a user or an external device, wherein the first signal is applied automatically by
   the controller to the light blocking element upon detection of the signal from the user or the
   external device.

4. The apparatus of claim 1, wherein the light blocking element is incorporated into
   an assembly with the photovoltaic power source.

5. The apparatus of claim 1, wherein the light blocking element is formed from a
   suspended particle material, an electrochromic material, a liquid crystal material, or a phase
   dispersed liquid crystal material.

6. The apparatus of claim 1, further comprising a first insulating light transmitting
   material and a second insulating light transmitting material coupled to the first insulating
   light transmitting material and forming a sealed area therebetween, wherein the light blocking
element is contained within the sealed area between the first and second insulating light transmitting materials.

7. The apparatus of claim 6, further comprising at least one conductive light transmitting layer formed adjacent to the light blocking element within the sealed area.

8. The apparatus of claim 7, further comprising:
   a photovoltaic power source contained within the sealed area; and
   a third insulating light transmitting material between the conductive light transmitting layer and the photovoltaic power source.

9. The apparatus of claim 1, wherein the unsafe electrical condition includes a short circuit, a disconnecting device feedback signal, or an electrical fault.

10. The apparatus of claim 3, further comprising:
    a reset element coupled to the controller, wherein the reset element must be selected before the light blocking element can be deactivated to allow the transmission of incident light.

11. The apparatus of claim 1, wherein the light blocking element is automatically deactivated by the controller to allow transmission of incident light in the absence of the unsafe electrical condition or a signal from a user or an external device.

12. The apparatus of claim 1, further comprising a plurality of light blocking elements and a plurality of photovoltaic power sources, each light blocking element held in juxtaposition with a corresponding photovoltaic power source, wherein a first group of the light blocking elements and corresponding photovoltaic power sources are controlled separately from a second group of the light blocking elements and corresponding photovoltaic power sources.

13. The apparatus of claim 12, further comprising a temperature sensor coupled to the controller.
14. The apparatus of claim 12, further comprising a voltage sensor coupled to the controller.

15. A method, comprising:
   providing a system having a light blocking element in juxtaposition with a photovoltaic power source, the light blocking element formed with a material that can be electronically activated to either fully or partially block transmission of incident light;
   monitoring the system to detect an unsafe electrical condition, whereupon detection of the unsafe electrical condition, a first signal is applied to the light blocking element to drive the electronically activated material to at least partially block the transmission of incident light.