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Davis, III et al.

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(54) **RAIL FRICTION STRIP FOR MECHANICALLY ENGAGING TUFTED GEOTEXTILE GROUND COVER**

(58) **Field of Classification Search**
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(71) Applicant: **Watershed Geosynthetics LLC**,
Alpharetta, GA (US)

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(72) Inventors: **Carl M. Davis, III**, Canton, GA (US);
Kyle Ehman, Milton, GA (US)

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(73) Assignee: **Watershed Geosynthetics LLC**,
Alpharetta, GA (US)

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Primary Examiner — Patrick D Hawn

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(74) *Attorney, Agent, or Firm* — Baker Donelson; Carl M. Davis, II

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(57) **ABSTRACT**

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An elongated plate having a rail and defining lateral wings on opposing sides and a plurality of spaced-apart tabs extending below a plane defined by a bottom surface of the plate for engaging a tufted geotextile ground cover, said rail for receiving a fastener for engaging a bracket of a photovoltaic module thereto. Alternatively, a pair of U-shaped racks support adjacent photovoltaic modules in a series on a support surface, comprising a base and a pair of opposing elongated legs each having a support plate for supportingly engaging a respective one of two adjacent photovoltaic modules, and the base including spaced tabs projecting at an angle to dispose a respective distal end vertically spaced from a bottom surface of the base, for engaging a portion of the support surface.

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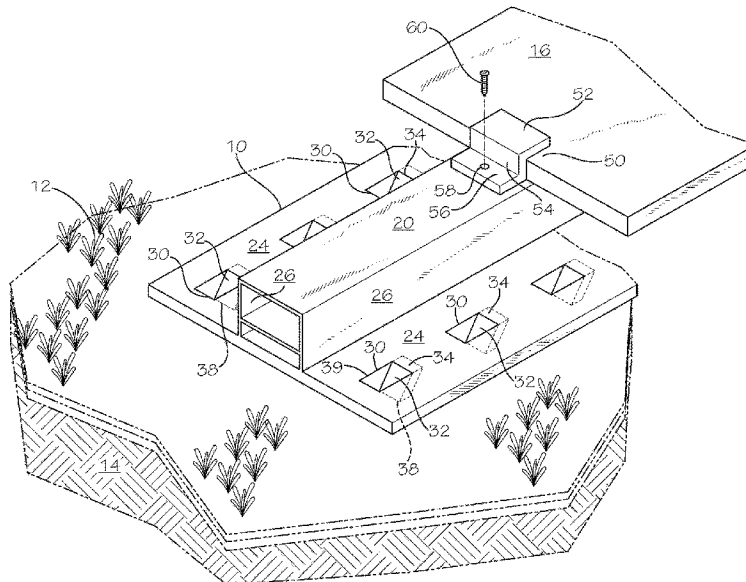
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H02S 20/10 (2014.01)

(52) **U.S. Cl.**
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See application file for complete search history.

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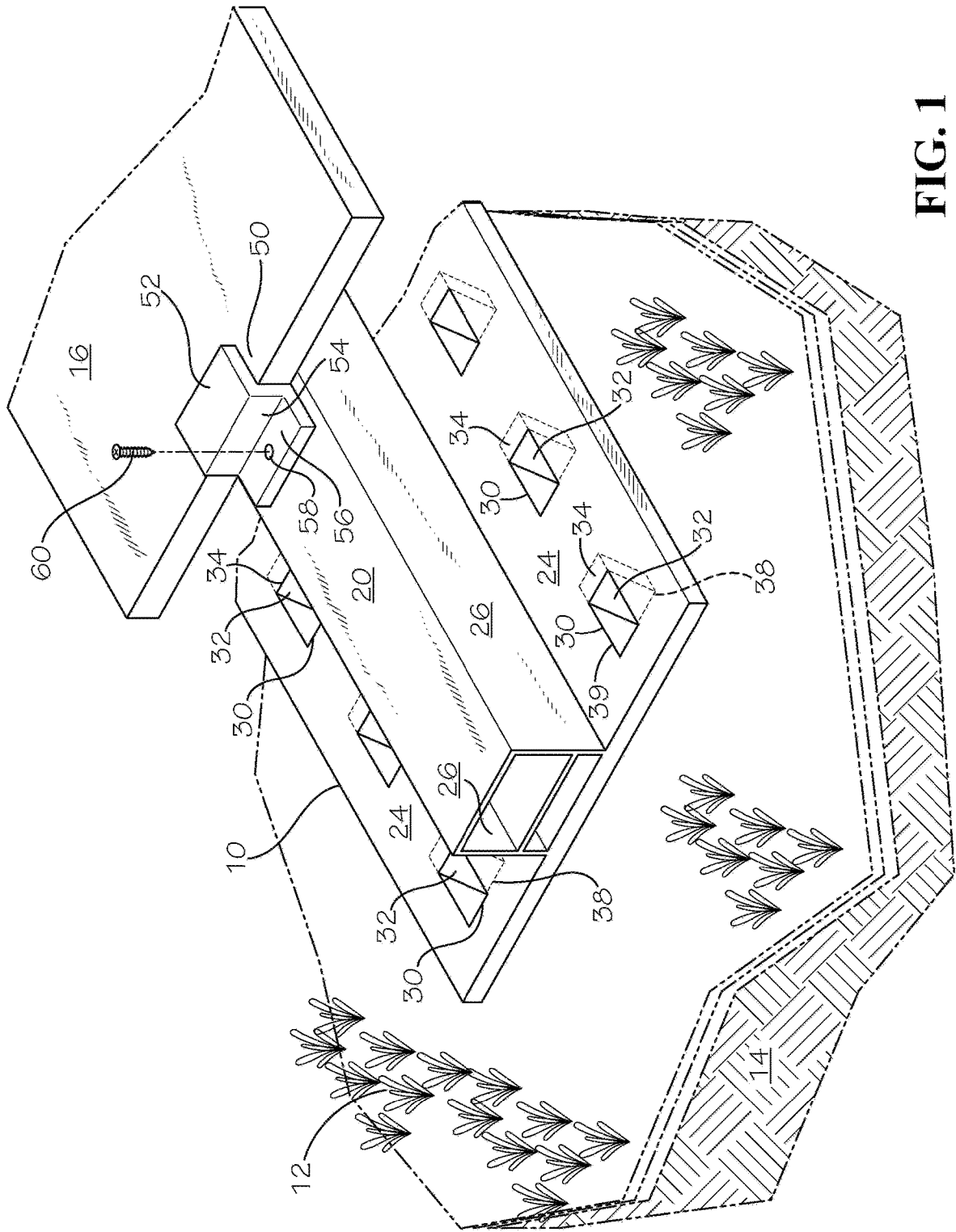


FIG. 1

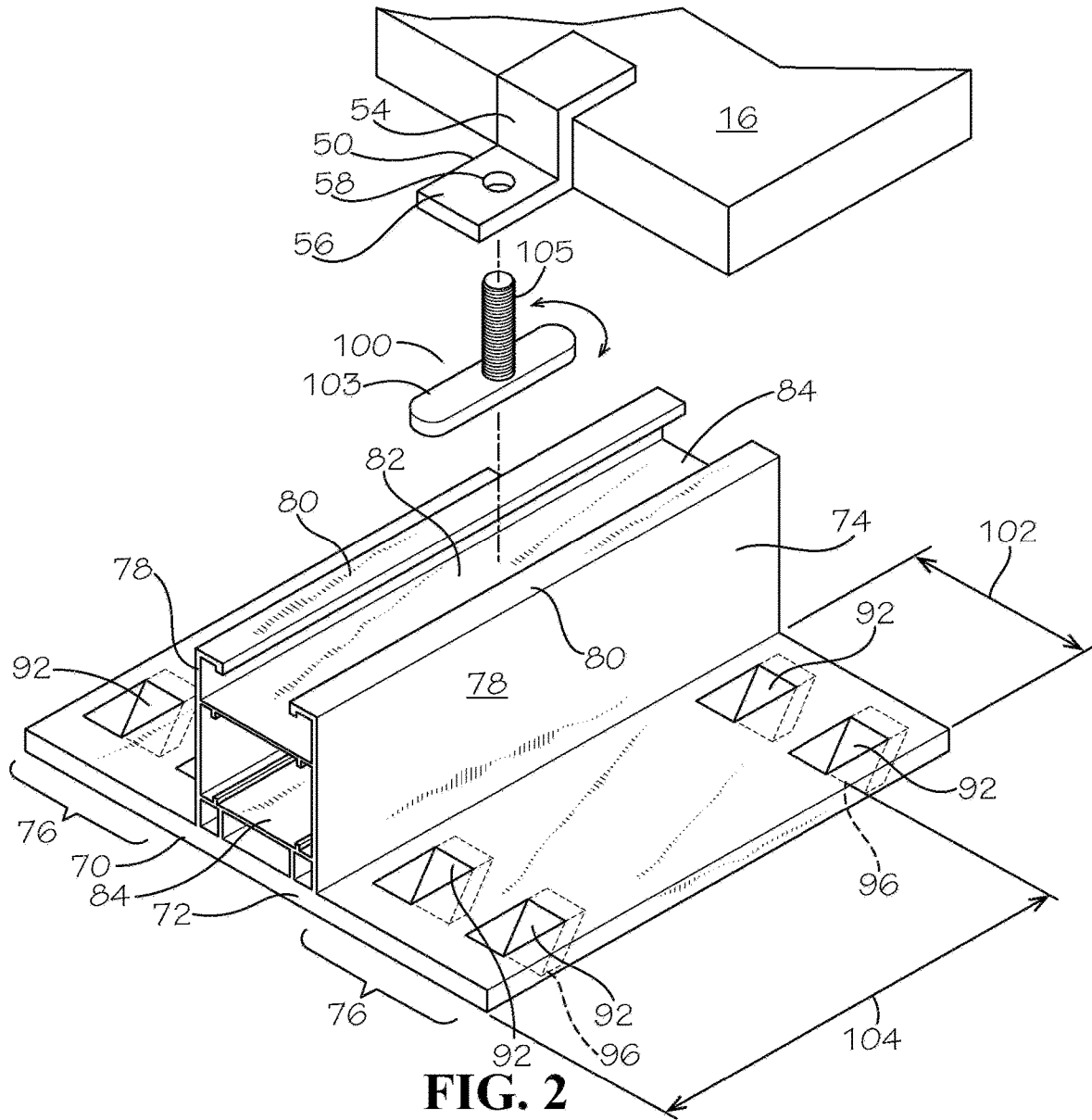


FIG. 2

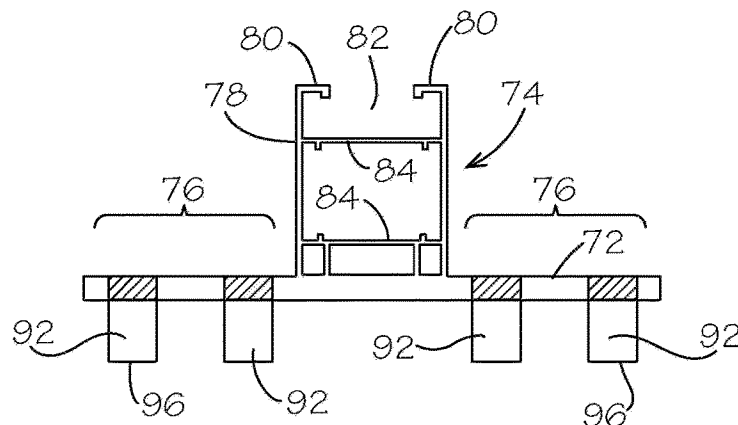


FIG. 3

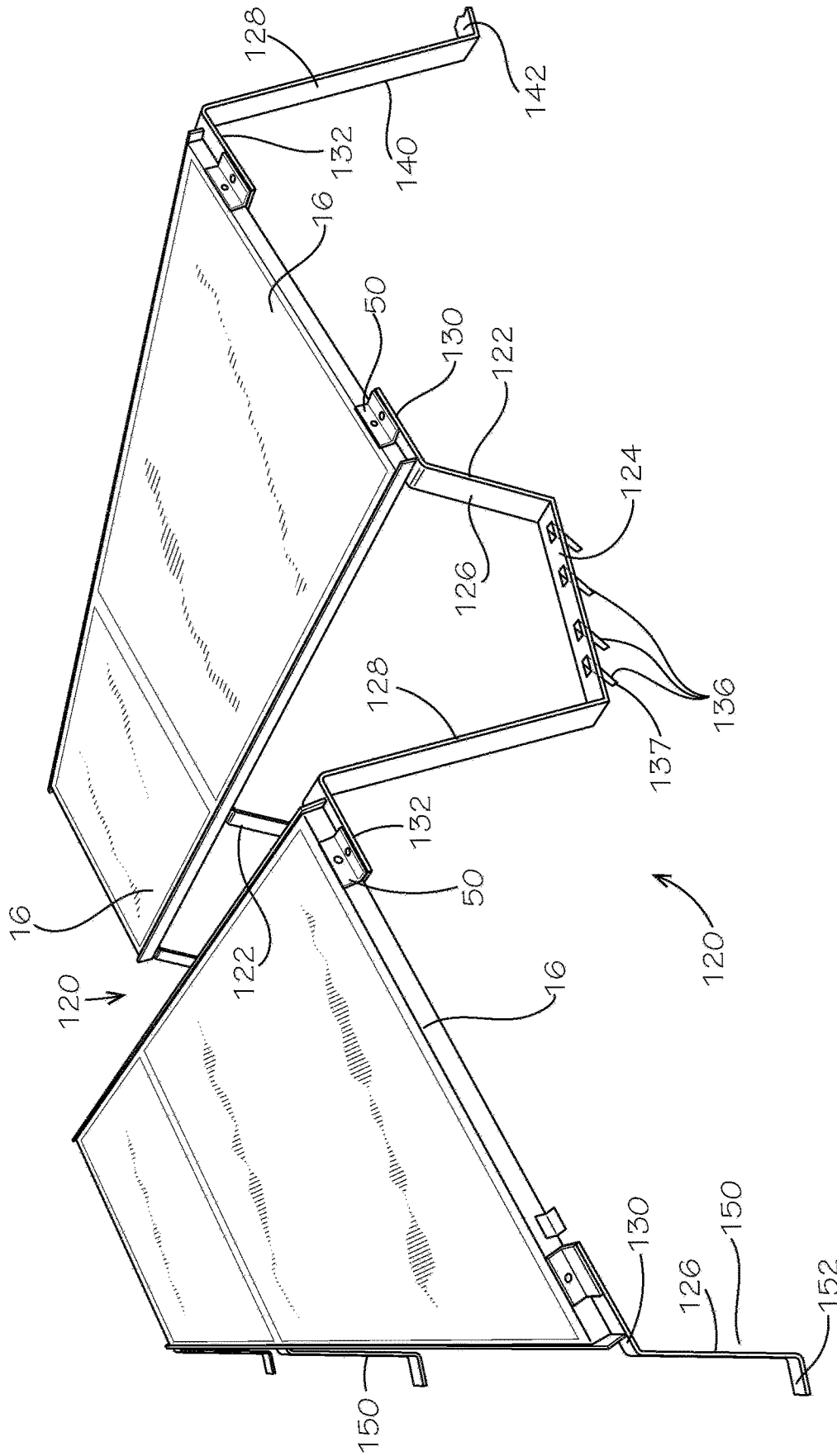


FIG. 4

RAIL FRICTION STRIP FOR MECHANICALLY ENGAGING TUFTED GEOTEXTILE GROUND COVER

TECHNICAL FIELD

The present invention relates to mounting systems and methods for supporting photovoltaic modules on a ground site covered by a tufted geotextile ground cover. More particularly, the present invention relates to an elongated rail system and method mechanically engaged to a tufted geotextile ground cover system covering a ground site for supporting photovoltaic modules attached in spaced-apart relation to the rail system for solar energy generation.

In this application, the following terms will be understood to have the indicated definitions:

- waste sites—refers to earthen berms and to sites where waste is deposited, such as landfills, phosphogypsum stacks, environmentally impacted land, leach pads, mining spoils and environmental closures or material stockpiles that require a closure or cover system;
- synthetic grass—refers to a composite of at least one geotextile (woven or nonwoven) tufted or knitted with one or more synthetic yarns or strands that has the appearance of grass;
- geomembrane—refers to a conventional or textured polymeric material, such as high-density polyethylene, very low-density polyethylene, linear low-density polyethylene, polyvinyl chloride, etc.

BACKGROUND OF THE INVENTION

Photovoltaic solar modules have historically been mounted to rigid racking systems positioned in spaced relation over a variety of surfaces such as rooftops, waste sites, greenfields and brownfields. These rigid racking systems have not been integrated onto the photovoltaic module. Typical systems include racking structures that are positioned on the surface and the photovoltaic module placed upon and then mechanically fastened to the racking structure.

Racking structures are secured from movement by various devices, typically using ballast blocks that sit on ground members of the racking structure. The ballast blocks, typically cementitious blocks or elongate panels, weight the racking structure. Assembly of a photovoltaic field supported by racking structures thus involves large quantities of heavy blocks for transport and delivery to a land site with on-site heavy lifting and positioning of the blocks using manpower and lifting equipment such as front-end loaders having grapple arms or extending forks.

While use of photovoltaic modules for solar energy generation as a renewable alternative energy source has “clean energy” favorabilities, there are drawback to such installations. Solar energy generation sites typically require large tracts of land. In some location circumstances, wooded lands are cleared or farmlands are re-purposed for use as solar energy generation sites. These large acreage sites typically are sloped or “rolling” with hills and valley areas. Often sites are significantly remote from tie-in connections to the power transmission and distribution grid of power generating and supply companies. These remote sites require capital expenditures to install and maintain transmission lines to the electrical grid and such transmission lines occupy additional land. Also, recent changes in power generation capacity has decreased reliance on coal and increased reliance on cleaner combustion fuels such as natural gas and, alternatively,

power plants that generate electricity with turbines operated with steam heated by nuclear fuel sources. The coal-fired power plants nevertheless have large areas of ash holding ponds or storage areas. These areas are subject to closing with covers such as geomembranes that restrict environmental waters, such as rain or other precipitation or surface water flow, from passing through the covered site and leaching into the ground or pond. These sites may also be covered with artificial grass covers such as tufted geotextiles to simulate green fields while minimizing required maintenance of periodic grass cutting, tree removal, and such.

Often the closed waste-containing land sites are covered with the geomembrane and tufted geotextile closure systems noted above. Such sites often have steeply sloped surfaces created as waste is deposited in cells that over time are formed on upper surface across the site. The waste site thus tends to fill vertically but with sides that taper inwardly while receiving additional waste material and thereby creating steep side slopes. Racking systems are difficult to install on such sites, yet covered sites such as those at power generation facilities may have beneficial mechanical and cost-reducing proximity to tie-in connections for power grid electric distribution systems.

There is a need in the solar industry for a mounting system readily usable on large area sites particularly non-traditional sites such as those closed with geomembrane/geotextile cover closure systems for supporting photovoltaic modules for solar energy generation, which provides a secure supporting system for large panel photovoltaic modules yet has economic advantages to the use of labor-intensive rigid racking systems requiring large quantities of materials and labor-intensive installation while allowing flexibility of installation by using non-traditional racking installers, thereby increasing the potential generation of electrical power.

Accordingly, there is a need in the art for an improved mounting system for securing photovoltaic modules over large area sloped surfaces for generating solar power. It is to such that the present invention is directed.

SUMMARY OF THE INVENTION

The present invention meets the need in the art for a mounting system for securing photovoltaic modules over large area sloped surfaces for generating solar power, which mounting system and method mechanically engages a surface and supports the attached photovoltaic for electrical power generation.

More particularly, the present invention in a first aspect provides a support for photovoltaic modules disposed on a land site, comprising an elongated mounting device having a central rail extending from a friction plate to define opposing lateral plates that each have a plurality of spaced-apart depending tabs for mechanically engaging the surface. In a preferred embodiment, the tabs of the mounting system mechanically engage the plurality of tufts of a tufted geotextile cover system overlying a land surface and the photovoltaic module attaches with fasteners to the rail of the mounting system.

In that aspect, the present invention provides a support for photovoltaic modules disposed on a land site, comprising an elongated plate having a rail extending from a first surface intermediate opposing sides and defining lateral wings on opposing sides of the rail, said wings defining a plurality of spaced-apart tabs extending at an angle in a first direction below a plane defined by a bottom surface of the plate for engaging a tufted geotextile ground cover overlying a land

3

site, wherein each of the plurality of spaced-apart tabs is defined by a U-shaped slot formed in the respective wing to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the wing, said rail for receiving a fastener for engaging a bracket of a photovoltaic module thereto.

In another aspect, the present invention provides a method of supporting a photovoltaic module disposed on a land site, comprising the steps of:

- (a) disposing a pair of elongated plates on a tufted geosynthetic ground cover system having a plurality of synthetic grass tufts extending therefrom, said elongated plates having a rail extending from a first surface intermediate opposing sides and defining lateral wings on opposing sides of the rail, said wings defining a plurality of spaced-apart tabs extending at an angle in a first direction below a plane defined by a bottom surface of the plate for engaging respective ones of the tufts of the tufted geotextile ground cover, each of the plurality of spaced-apart tabs is defined by a U-shaped slot formed in the respective wing to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the wing;
- (b) placing a photovoltaic module onto an upper surface of the rail of the respective opposing plates; and
- (c) engaging into the rails a respective fastener of a plurality of brackets for securing the photovoltaic module to the rail.

In a second aspect, the present invention provides a racking system for supporting adjacent spaced photovoltaic panels on a support surface for generation of electrical current upon exposure to ambient light. The racking system comprises a pair of racks for disposing in spaced relation on a support surface, each rack comprising a U-shape member having a base and a pair of opposing elongated legs extending therefrom. The legs each have a support plate extending therefrom for supportingly engaging a respective one of two adjacent photovoltaic modules. The base includes a plurality of spaced tabs projecting from the base at an angle to dispose a respective distal end vertically spaced from a bottom surface of the base, for engaging a portion of the support surface. Each of the plurality of tabs is defined by a U-shaped slot formed in the base to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the base.

In yet another aspect, the present invention provides a method for supporting adjacent spaced photovoltaic panels on a support surface for generation of electrical current upon exposure to ambient light, comprising the steps of:

- (a) attaching a pair of racks to opposing sides of adjacent spaced first and second photovoltaic modules, said racks each comprising a U-shape member having a base and a pair of opposing elongated legs extending therefrom and said legs each having a support plate extending therefrom, a first of the pair of opposing legs attached to a leading edge of the first photovoltaic module and a second of the pair of opposing legs attached to a trailing edge of the second photovoltaic module, said base having a plurality of tabs projecting from the base at an angle, each said tab defined by a U-shaped slot formed in the base to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the base; and
- (b) disposing the base of the rack with the plurality of spaced tabs in engagement with respective tufts of a

4

tufted geosynthetic ground cover system having a plurality of spaced-apart synthetic tufts of grass extending therefrom angle to dispose a respective distal end vertically spaced from a bottom surface of the base.

In another aspect, the present invention provides a method for supporting a photovoltaic panel on a support surface for generation of electrical current upon exposure to ambient light, comprising the steps of:

- (a) disposing a pair of racks in spaced-apart relation on a tufted geosynthetic ground cover having a plurality of spaced-apart synthetic tufts of simulated grass extending therefrom, and overlying a support surface, said racks each comprising a U-shape member having a base and a pair of opposing elongated legs extending therefrom and said legs each having a support plate extending therefrom, said base having a plurality of tabs projecting from the base at an angle, each said tab defined by a U-shaped slot formed in the base to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the base, said tabs engaging respective tufts of the plurality of tufts of the tufted geosynthetic ground cover; and
- (b) attaching a side edge of a photovoltaic module to a respective support plate of each of the pair of racks, whereby the pair of racks support the attached photovoltaic module spaced from the tufted geosynthetic ground cover.

Objects, advantages, and features of the present invention may be readily ascertained upon a reading of the detailed description in view of the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates in perspective view an elongated rail that supports a photovoltaic module which rail mechanically engages a tufted geotextile cover system overlying a ground surface for supporting the photovoltaic module for generation of electrical power, in accordance with the present invention.

FIG. 2 illustrates in perspective view an alternate embodiment of the elongated rail for mechanically engaging a tufted geotextile cover system illustrated in FIG. 1.

FIG. 3 illustrates in end elevational view the elongated rail shown in FIG. 2.

FIG. 4 illustrates in side perspective view a racking system for supporting photovoltaic modules for generation of electrical power.

DETAILED DISCUSSION

With reference to the drawings, in which like parts have like identifiers, FIG. 1 illustrates in perspective view an elongated support member generally 10 mechanically engaged to a tufted geotextile cover system 12 overlying a land surface 14 to support a photovoltaic module 16 for generation of electrical power, in accordance with the present invention. The elongated support member 10 comprises a central rail 20 extending from a friction plate 22 that defines wings 24 lateral of the sides 26 of the central rail. The rail in the illustrated embodiment comprises the opposing side walls 26 and a top plate 27. Each of the wings 24 includes a plurality of spaced-apart openings 30 that define extending members 32 such as tabs, stubs, fingers, or barbs, (hereinafter, tabs 32) extending from a connection portion 34 of the friction plate 22. The tabs 32 are bendable to an oblique angle relative to the friction plate 22 to extend a

5

respective free distal end **38** downwardly below a plane defined by a bottom surface of the friction plate.

The support member **10** may be an elongate extrusion. The openings **30** may be defined by a cutting means or devices configured for forming a slot **39** for a shaped tab in the wing **24**. Such cutter includes but not limited to laser jet, water jet, press die for cutting and then bending the defined tab, or subsequent to cutting the slot a plunger that then bears forcibly centrally of the shaped portion in the wing separated by the cut slot to bend or deform the tab **32** downwardly at the connection portion **34** relative to the friction plate **22** to dispose the distal end **38** below the plane of the bottom of the friction plate **22**. The illustrated tab **32** is rectangular, but may have other shape such as a T-shape, an X-shape, or other. The support member **10** may be made of an extrudable material such as plastic or metal such as aluminum.

The tufted geotextile system **12** comprises at least a tufted geosynthetic cover **40** having a backing sheet **42** tufted with yarns to define a plurality of simulated grass tufts **44** extending from the backing sheet. The geosynthetic cover **40** comprises a fabric (woven or non-woven) tufted with yarn tufts. The tabs **32** of the friction plate **22** engage respective tufts **44** of the tufted geotextile system **12** for mechanical engagement of the support member **10** to the tufted geotextile system.

The geosynthetics ground cover system **12** may include an impermeable geomembrane **46** that covers a large ground surface area for restricting inflow of ambient ground surface water below grade and the tufted geosynthetic cover **40** that overlies the geomembrane. As used herein, "tufted geosynthetics" refers to a cover system which is generally comprised of a synthetic grass of a geotextile or fabric backing sheet having synthetic fibers tufted to define simulated grass blades extending from the backing, and may include the geomembrane and which is adapted to cover waste sites and other environmental closures. Examples of a tufted geosynthetic cover systems are shown in Ayers and Urrutia U.S. Pat. Nos. 7,682,105 and 9,163,375. Examples of landfill covers useful in the solar energy system of this invention are the covers marketed by Watershed Geosynthetics LLC under the registered trademarks ClosureTurf and VersaCap. These covers comprise a composite of at least one geotextile which is tufted with one or more synthetic yarns (i.e., a tufted geosynthetic) and an impermeable geomembrane which is comprised of a polymeric material.

A bracket **50** attaches to the photovoltaic module **16** and receives a fastener to secure the photovoltaic module to the rail **20** for secure support. In the illustrated embodiment, the bracket **50** includes a top plate **52** extending laterally from a side plate **54** and a connector plate **56** extends laterally from the side plate **50** in a direction opposing the extending top plate **52**. The connector plate **56** defines an opening **58** for receiving a fastener **60** to secure the bracket **50** to the rail **12**. The bracket **50** may be pre-attached to the photovoltaic module. Alternatively, the photovoltaic module may have a frame that holds the solar active panel, and a flange may extend laterally from a side member of the frame. The fastener **60** extends through the flange and engages the rail **12** to secure the photovoltaic module to the support member.

FIG. 2 illustrates in perspective view an alternate embodiment of a support member **70** having a friction plate **72** from which an elongate central rail **74** extends. FIG. 3 illustrates in end elevational view the elongated rail **74** and friction plate **72** which may be an extrusion. The central rail **74** preferably is medial opposing sides of the friction plate **72** but there may be applications for which the central rail is offset relative to one side then the other and thus the central

6

rail is positioned intermediate the opposing sides. The friction plate **72** defines the pair of opposing wings **76** lateral of opposing sides **78** of the central rail **74**. The sides **78** in this embodiment extend upwardly to distal ends that each have an inwardly extending lip **80**. The opposing lips **80** define a central slot **82**. The illustrated embodiment includes a pair of spaced-apart transverse support plates **84** extending between the opposing sides **78**.

Each of the wings **76** includes a plurality of spaced-apart openings **90** that define tabs **92** extending from a respective portion **94** of the friction plate **72**. The tabs **92** are formed as explained above for the tabs **32**, with a U-shaped slot cut in the wings. The tabs **92** are bendable at the portion **94** to an oblique angle relative to the plate to extend a respective free distal end **96** downwardly below a plane defined by a bottom surface of the friction plate **72**. In this embodiment, the wings **76** define a plurality of spaced sets **102** of pairs of tabs **92**, which sets are spaced-apart longitudinally **104**. The spaced pairs of tabs **92** mechanically engage the tufts **44** of the tufted geotextile cover system **12** illustrated in FIG. 1. For applications that install the support member **70** over open or natural turf ground surface, the tabs **92** dig into the ground surface and resist movement.

FIG. 2 further illustrates an alternate fastener **100** having an elongated mounting plate **103** and an externally threaded mounting post **105** that extends through the opening **58** in the bracket **50** for securing the photovoltaic module **16** to the rail **74**. The width of the mounting plate **103** is less than the width of the central slot **82** while the length of the mounting plate **103** is greater than the width of the central slot **82**. The mounting plate **103** may be passed widthwise through the central slot **82** (with the longitudinal axis of the mounting plate aligned with the longitudinal axis of the slot **82**). The mounting plate **103** is then rotated so that the mounting plate then cannot pass back through the central slot **82**. The longitudinal ends of the mounting plate engage contactingly on the interior walls of the sides **78**. The corners of the mounting plate **103** may be rounded for bearing against the interior surface of the side walls **78**.

The fastener **100** secures the bracket **50**-engaged photovoltaic module **16** to the rail **74**. The photovoltaic module **16** is placed on the rail **74** with the bracket **50** adjacent the edge, so the connector plate **56** is on the rail and the plate **52** over a portion of the photovoltaic panel **16**. The mounting plate **103** inserts widthwise through the central slot **82** into the rail **74** outwardly of the photovoltaic module **16**. The mounting plate **103** sits on the upper plate **84** and the threaded mounting post **105** extends upwardly past the lips **80**. The mounting post **105** is rotated while also moved longitudinally under the connector plate **56** for inserting the mounting post **105** through the opening **58**. (The side of the photovoltaic module **16** may need to be lifted slightly for inserting the mounting post **105** through the opening **58**.) A nut threads on the extending mounting post and as the nut is tightened, the mounting plate **102** moves upwardly against a bottom of the opposing lips **80**, to secure the photovoltaic module **16** to the rail.

FIG. 4 illustrates in side perspective view a racking system **120** for supporting adjacent photovoltaic modules **16** in a series for generation of electrical power. The racking system **120** comprises at least a pair of members or racks **122**. The illustrated rack **122** defines a general U-shape having a base portion **124** with a first leg **126** extending at an angle relative to the base and a second leg **128** extending at a second angle relative to the base. In the illustrated embodiment, the legs **126**, **128** angle away from each other. The first leg **126** and the second leg **128** each terminate in

a respective plate **130**, **132** extending from a distal end. In the illustrated embodiment, the plates **130**, **132** extend in opposing directions away from the base. In an alternate embodiment, the support plates **130**, **132** extend towards the opposing support plate to be positioned vertically above the base. In the illustrated embodiment, the support plates **130**, **132** are disposed at an angle for orienting the photovoltaic module relative to the sun. While the first leg and the second leg may have the same length, the illustrated embodiment illustrates the first leg **126** having a first length and the second leg **128** having a second length longer than the first length. This difference in leg lengths enables the photovoltaic modules **16** to be orientated at an angle relative to the sun. The plate **130** connects to a first photovoltaic module **16** and the plate **132** connects to a second photovoltaic module adjacent the first photovoltaic module.

The base portion **124** of the rack **122** defines a plurality of spaced tabs **136**. The tabs **136** are formed by cutting a slot in a U-shape slot, and bending a U-shaped portion of the base portion **124** downward at a connection **137** relative to the base to dispose a distal end **139** below a plane defined by a bottom surface of the base portion. The U-shaped slot formed in the base thus separates a portion that is bendable at a connection with the base **124** for disposing the distal end **139** of the tab **136** outwardly of the bottom surface of the base.

As shown in FIG. 2, a leading one of the series of photovoltaic module **16** is supported at an opposing end by separate leading end rack members **140**. The leading end rack member **140** comprises a portion of the rack **122** including the leg **128**, a portion of the base **124** for a foot **142** (including but not shown the projecting tabs **136**), and the support plate **132**. The foot **142** seats on the ground cover **12** and the plate **132** supports the leading edge of the photovoltaic module **16**. A trailing one of a series of photovoltaic modules is supported by separate trailing end rack members **150**. The trailing end rack member **150** comprises a portion of the rack **122** including the leg **126**, a portion of the base **124** for a foot **152** (including but not shown the projecting tabs **136**), and the support plate **130**. The foot **152** seats on the ground cover **12** and the plate **130** supports the trailing edge of the photovoltaic module **16**. The length of the arm **128** of the leading end rack member **140** is greater than the length of the arm **126** of the trailing end rack member **150**, to maintain the photovoltaic module **16** at an angle relative to the ground cover **12**. The rack **122** thus is readily configurable with a respective portion for supporting a respective first or last one of a plurality of the photovoltaic modules **16** disposed in a longitudinal series on the support surface.

With reference to FIG. 4, a series of photovoltaic modules **16** connect to the rack members **122** in series across a ground surface. A first photovoltaic module in the series is supported at the trailing edge by the pair of trailing end rack members **150** while the last photovoltaic module in the series is supported at the leading edge by the pair of leading end rack members **140**.

The trailing end rack members **150** attach on opposing sides of the photovoltaic module **16** with fasteners and brackets to the respective plates **130** at the trailing end of the first photovoltaic module. The leading end of the first photovoltaic module connects to opposing pairs of the racks **122** on opposing sides. The leading end attaches with fasteners and brackets to the plate **132**. The next adjacent photovoltaic module **16** attaches at its leading edge to the respective plates **130** of the opposing racks **122** connected to the first or adjacent photovoltaic module. Subsequent adja-

cent photovoltaic modules **16** are similarly installed to opposed pairs of the racks **122**. A final photovoltaic module in a series of modules attaches to a pair of the leading end leading end rack members **140**.

As shown in FIG. 4, the opposing racks **122** attached to opposing first (trailing) side and second (leading) side of adjacent photovoltaic modules **16**, support the photovoltaic modules at an angle relative to the on a ground surface while the projecting tabs engage tufts of the tufted ground cover system **12**, which racks attach with brackets and fasteners that secure the photovoltaic modules to the respective plates **130**, **132**. The tabs **136** engage the tufts **44** of the tufted geotextile cover system **12** for resisting wind-uplift of the photovoltaic modules.

In an alternate embodiment, a separate elongated member is provided with the tabs **136** and the base member **124** does not include the depending tabs. Rather, the separate elongated member rigidly secures with fasteners to the base portion **124** on a bottom side with the tabs **136** of the separate member extending away from the base portion. The tabs **136** thereafter engage the tufts **44** of the tufted geotextile cover system **12** or engage the ground surface of an uncovered ground site.

With reference to FIG. 1, the support members **10** are disposed on a tufted ground cover system with the tabs **136** projecting in a direction towards the downhill portion of the slope of a down-hill incline. In this way, the tabs engaged with the tufts further resist downward movement of the attached photovoltaic module. The cooperative engagement of the tabs with the tufts resists wind uplift of the spaced photovoltaic modules, which wind flows underneath the photovoltaic modules and upwardly through spacing gaps between adjacent photovoltaic modules.

An elongated support member for mechanically engaging a ground cover system or ground surface, comprising an elongated friction plate having a rail extending from an upper surface and opposing portions of the friction plate that extend laterally from the sides of the rail define a plurality of spaced-apart tabs that each extend downwardly to a distal end spaced from a bottom surface of the friction plate, whereby being disposed on a tufted geotextile ground cover system or on ground surface the tabs mechanically engage the tufts or the ground surface to secure the support member thereto.

The foregoing further discloses a racking system for supporting adjacent spaced photovoltaic panels on a support surface for generation of electrical current upon exposure to ambient light. The racking system comprises a pair of racks for disposing in spaced relation on a support surface. Each rack comprises a U-shape member having a base and a pair of opposing elongated legs extending therefrom, and said legs each having a support plate extending therefrom for supportingly engaging a respective one of two adjacent photovoltaic modules. The base including a plurality of spaced tabs projecting from the base at an angle to dispose a respective distal end vertically spaced from a bottom surface of the base, for engaging a portion of the support surface.

The foregoing discloses illustrative embodiments of support members with projecting tabs for engaging tufted geotextiles of ground cover systems for securing electrical current generating photovoltaic modules or panels over land surfaces, but variations and modifications can be made without departing from the spirit and scope of the invention.

What is claimed is:

1. A support for photovoltaic modules disposed on a land site, comprising an elongated plate having a rail extending

from a first surface intermediate opposing sides and defining lateral wings on opposing sides of the rail, said wings defining a plurality of spaced-apart tabs extending at an angle in a first direction below a plane defined by a bottom surface of the plate for engaging a tufted geotextile ground cover overlying a land site, wherein each of the plurality of spaced-apart tabs is defined by a U-shaped slot formed in the respective wing to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the wing, said rail for receiving a fastener for engaging a photovoltaic module thereto.

2. The support as recited in claim 1, wherein said plurality of tabs are longitudinally aligned in spaced-apart relation on the respective opposing wings.

3. The support as recited in claim 1, wherein said plurality of tabs are disposed in paired spaced relation in said respective opposing wings and said pairs are spaced apart longitudinally.

4. The support as recited in claim 1, wherein said rail comprises a pair of opposing side walls extending from the plate and a top plate for receiving the fastener therein.

5. The support as recited in claim 1, wherein said plate and rail comprise a unitary extrusion.

6. The support as recited in claim 1, wherein said rail comprises a pair of opposing side walls extending from the plate and a pair of laterally opposing flanges extending inwardly to define a slot therebetween.

7. The support as recited in claim 6, wherein the fastener comprises:

an elongated plate having a width less than a distance between the pair of laterally opposing flanges for passing therebetween into the rail; and

a threaded member extending from a surface for passing through an opening in the bracket and receiving a nut thereon for securing the bracket to the rail by the plate bearing against the pair of laterally opposing flanges.

8. The support as recited in claim 1, further comprising a bracket engaged to the fastener for coupling the photovoltaic module to the rail.

9. A method of supporting a photovoltaic module disposed on a land site, comprising the steps of:

(a) disposing a pair of elongated plates on a tufted geosynthetic ground cover system having a plurality of synthetic grass tufts extending therefrom, said elongated plates having a rail extending from a first surface intermediate opposing sides and defining lateral wings on opposing sides of the rail, said wings defining a plurality of spaced-apart tabs extending at an angle in a first direction below a plane defined by a bottom surface of the plate for engaging respective ones of the tufts of the tufted geotextile ground cover, each of the plurality of spaced-apart tabs is defined by a U-shaped slot formed in the respective wing to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the wing;

(b) placing a photovoltaic module onto an upper surface of the rail of the respective opposing plates; and

(c) engaging into the rails a respective fastener of a plurality of brackets for securing the photovoltaic module to the rail.

10. The method as recited in claim 9, further comprising the step of forming the plurality of tabs in longitudinally aligned spaced-apart relation on the respective opposing wings.

11. A racking system for supporting adjacent spaced photovoltaic panels on a support surface for generation of electrical current upon exposure to ambient light, comprising:

a pair of racks for disposing in spaced relation on a support surface, each rack comprising a U-shape member having a base and a pair of opposing elongated legs extending therefrom, said legs each having a support plate extending therefrom for supportingly engaging a respective one of two adjacent photovoltaic modules; said base including a plurality of spaced tabs projecting from the base at an angle to dispose a respective distal end vertically spaced from a bottom surface of the base, for engaging a portion of the support surface,

wherein each of the plurality of tabs is defined by a U-shaped slot formed in the base to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the base.

12. The racking system as recited in claim 11, wherein said respective support plates extend in opposing directions to free distal ends.

13. The racking system as recited in claim 11, wherein said respective support plates extend a same angle from the legs.

14. The racking system as recited in claim 11, wherein a first leg of the pair of opposing legs has a first length and a second leg of the pair of opposing legs has a second length different from the first length.

15. The racking system as recited in claim 11, further comprising a support member for engaging an edge portion of photovoltaic module, said support member having a leg with a foot extending from a first end and a support plate extending from an opposing end, for supporting a respective first or last one of a plurality of the photovoltaic modules disposed in a longitudinal series.

16. A method for supporting adjacent spaced photovoltaic panels on a support surface for generation of electrical current upon exposure to ambient light, comprising the steps of:

(a) attaching a pair of racks to opposing sides of adjacent spaced first and second photovoltaic modules, said racks each comprising a U-shape member having a base and a pair of opposing elongated legs extending therefrom and said legs each having a support plate extending therefrom, a first of the pair of opposing legs attached to a leading edge of the first photovoltaic module and a second of the pair of opposing legs attached to a trailing edge of the second photovoltaic module, said base having a plurality of tabs projecting from the base at an angle, each said tab defined by a U-shaped slot formed in the base to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the base; and

(b) disposing the base of the rack with the plurality of spaced tabs in engagement with respective tufts of a tufted geosynthetic ground cover system having a plurality of spaced-apart synthetic tufts of grass extending therefrom.

17. A method for supporting a photovoltaic panel on a support surface for generation of electrical current upon exposure to ambient light, comprising the steps of:

(a) disposing a pair of racks in spaced-apart relation on a tufted geosynthetic ground cover having a plurality of spaced-apart synthetic tufts of simulated grass extending therefrom, and overlying a support surface, said

racks each comprising a U-shape member having a base and a pair of opposing elongated legs extending therefrom and said legs each having a support plate extending therefrom, said base having a plurality of tabs projecting from the base at an angle, each said tab defined by a U-shaped slot formed in the base to separate a portion bendable at a connection therewith for disposing a distal end of the tab outwardly of the bottom surface of the base, said tabs engaging respective tufts of the plurality of tufts of the tufted geosynthetic ground cover; and

(b) attaching a side edge of a photovoltaic module to a respective support plate of each of the pair of racks, whereby the pair of racks support the attached photovoltaic module spaced from the tufted geosynthetic ground cover.

18. The method as recited in claim 17, further comprising the steps of:

disposing a second pair of racks on the tufted geosynthetic ground cover and each of the second pair of racks aligned longitudinally with a respective one of the pair of racks; and

attaching an opposing side of the photovoltaic module to a respective support plate of the second pair of racks.

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