

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FIRST SOLAR, INC.

Petitioner,

v.

ROVSHAN SADE,

Patent Owner.

Case IPR2023-00881, 00827
U.S. Patent Nos. 9,057,546 and 9,917,546

DECLARATION OF MATTHEW N. SCHNEIDER

Patent Nos. 9,057,546 and 9,917,546
Petition for *Inter Partes* Review

I, Matthew N. Schneider, being of legal age, hereby declare affirm, and state the following:

1. I have prepared this declaration in connection with *First Solar v. Rovshan Sade*, IPR2023-00881 and *First Solar v. Rovshan Sade*, IPR2023-00827. I have personal knowledge of the facts and opinions set forth in this declaration, and, if called upon to do so, I would testify competently thereto.

2. My background and employment information is contained in **Appendix A**. I am over 18 years of age and competent to make this declaration.

3. I have been asked by Petitioner to provide my understanding and knowledge regarding the availability and publication of one or more printed publications describing a prior solar panel sun tracker system, the RayTracker GC System. The RayTracker GC system is described in at least Petitioner's prior art references contained in *RayTracker Webpage* (EX1005), *RayTracker* (EX1006), and *RayTracker Specification* (EX1007), collectively referred to as the RayTracker Collection. The RayTracker Collection was available from a single source at least by October 16, 2008 and describe certain features, functionality, and technical details of the RayTracker GC single axis solar tracker system.

4. I examined, worked on, and otherwise had personal knowledge of the RayTracker GC system around the time it was released and subsequently advertised on RayTracker's website from approximately 2008 to 2011.

5. In particular, I worked for RayTracker (or its predecessor or successor entities) from March 2003 to June 2013. For example, I worked for Energy Innovations from 2003 to 2008. In 2008, RayTracker was spun out of Energy Innovations, and I worked for RayTracker from 2008 to 2010. In 2011, RayTracker was purchased by First Solar, where I continued to work until 2013. And it is my belief and opinion that *RayTracker* (Petitioner's EX1006) was published by at least October 16, 2008. For example, EX1006 was available, at the time, on RayTracker's website at <http://www.raytracker.com/products/>.

6. To confirm the availability <http://www.raytracker.com/products/> on the Internet, I searched Internet Archive for records. Internet Archive is a digital library that provides access to websites, webpages, and other web resources, and provides free access to its contents for researchers, scholars, and the general public. The content on EX1005 is a true and correct copy of the RayTracker GC Overview website at <http://www.raytracker.com/products/> archived by the Internet Archive on October 16, 2008. I personally located, identified and obtained this record, and its availability date and content conforms to my understanding at the time of my employment with RayTracker.

7. I have used Internet Archive in the past and am familiar with the Internet Archives' practice of assigning an extended URL to an archived file in the format of [http://www.archive.org/web/\[Year in yyyy\]\[Month in mm\]\[Day in](http://www.archive.org/web/[Year in yyyy][Month in mm][Day in)

dd][Time code in hh:mm:ss]/[Archived URL] to show the point of time an archived file was captured. The URL of the archived website means this website was archived on “20081016035440” (i.e., October 16, 2008, 3 a.m., 54 minutes and 40 seconds). Because Internet Archive does not capture web resources as soon as they appear on the Internet, the archive date means the archived resource would have been available for public access no later than the archive date. The archive date of EX1005 therefore means that this website would have been available for public access no later than October 16, 2008. These archived records from the Internet Archive inform my opinion that EX1005 was available on the Internet no later than October 16, 2008 to the general public.

8. In addition, Internet Archive records for <http://www.raytracker.com/products/> states that this webpage was archived 9 times between October 16, 2008 and November 9, 2011. (https://web.archive.org/web/20230000000000*/http://www.raytracker.com/products/). I have also reviewed an affidavit from the Internet Archive confirming this understanding. EX1010.

9. Based on my personal knowledge and experience, and confirmed and substantiated by Internet Archive records, it is my opinion that EX1005 would have been publicly accessible by October 16, 2008, on the Internet, and no later than July 5, 2009.

10. In addition, it is my belief and opinion that EX1006 and EX1007 were also publicly accessible at the same time as EX1005 (i.e., by October 16, 2008 and no later than July 5, 2009) as I understand and believe that hyperlinks to these documents were provided at <http://www.raytracker.com/products/>.

11. While the Internet Archive does not have archived dates as early for EX1006 and EX1007 as it does for EX1005, I have personal knowledge that these two documents were published on the Internet and accessible to the general public at that time. And I corroborated my beliefs and this understanding by reviewing my personal business records, such as emails and change control documents governing these documents. In addition to my personal beliefs and records, the archived version of <http://www.raytracker.com/products/> available by October 16, 2008 includes links that I believe and recollect were used to access EX1006 and EX1007.

12. For example, as depicted in the annotated snapshot below, EX1005 illustrates a clickable link titled “RAYTRACKER GC BROCHURE.”

Overview

 RayTracker GC: Rugged, Reliable, Cost-Effective Solar Tracking

RayTracker GC is a single-axis tracker system that significantly increases the lifetime energy yield of a photovoltaic system, improving the return on investment for commercial-scale, ground- or carport-mount installations. The RayTracker GC robust construction, distributed actuation, and use of standard photovoltaic modules delivers an exceptionally reliable and cost-effective tracking system.



Performance

RayTracker GC improves energy yield by optimally positioning the solar panels throughout the day. Energy boosts of up to 38% are possible compared to flat-mounted panels. Single-axis trackers outperform fixed-tilt installations most importantly during peak energy demand periods. RayTracker GC achieves this with a simple, low-profile, low-parts-count mechanism.

Distributed Actuation

The RayTracker GC system features distributed actuation — each unit has an individual, low-voltage DC actuator motor. Distributed actuation provides advantages for system reliability, installation, tracking accuracy and plant layout flexibility. This means that RayTracker GC installations are readily scalable — from kilowatts to gigawatts.

 Custom actuator; proprietary shade avoidance technology

Technology

RayTracker GC maximizes energy production with Shade Avoidance Technology — a feature that eliminates energy-robbing tracker-to-tracker shading.

 [Get Pricing](#)

 **RAYTRACKER GC BROCHURE**

 **RAYTRACKER GC SPEC SHEET**

13. It is my understanding, belief, and opinion that clicking on the “RAYTRACKER GC BROCHURE” link redirected to http://www.raytracker.com/documents/raytracker_brochure.pdf, to arrive at the original web document captured in EX1006.

14. The availability of this brochure captured in EX1006 is further evidenced by US Patent No. 9,917,546, which represented that a later version of this brochure (Rev. D, titled “Solar tracking you can count on,”) was publically available at least by January 1, 2009.

OTHER PUBLICATIONS

Raytracker, Inc., “Solar tracking you can count on”, brochure, Jan. 1, 2009, pp. 1-6, posted online Mar. 28, 2015, retrieved on Feb. 17, 2016, retrieved from internet:chttp://documents.mx/documents/raytrackerbrochure.html.

US Patent No. 9,917,546, Cover Sheet

15. In addition, Petitioner’s prior art reference contained in EX1007 further describes the RayTracker GC system in greater and more specific technical detail. It is my belief and opinion that Petitioner’s EX1007 was published by at least October 16, 2008. For example, EX1007 was available, at the time, on RayTracker’s website at <http://www.raytracker.com/products/> (annotated snapshot below).

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 [Get Pricing](#)

 **RAYTRACKER GC BROCHURE**

 **RAYTRACKER GC SPEC SHEET**

16. It is my understanding, belief, and opinion that clicking on the “RAYTRACKER GC SPEC SHEET” link, at the time in 2008, redirected to http://www.raytracker.com/documents/raytracker_specsheet.pdf, to arrive at the original web document captured in EX1007.

17. The foregoing is consistent with the documents of EX1006 and EX1007. Specifically, EX1006 (Rev. B (60-00172_B Brochure, RayTracker.pdf)) includes a copyright notice dated 2008 and EX1007 (Rev. D (60-00125_D Product Specifications, RayTracker 200 Series.pdf)) includes a copyright notice dated 2008.

18. Based on my personal knowledge and experience, and confirmed and substantiated by Internet Archive records, it is my opinion that EX1006 and EX1007 would have been publicly accessible by October 16, 2008, on the Internet, and no later than July 5, 2009.

19. I am being compensated at a rate of \$500 per hour for my services. This compensation is in no way based on the content of my opinions or the outcome of this matter.

20. I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 28, 2023



By: Matthew N. Schneider

MATTHEW N SCHNEIDER

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QUALIFICATIONS

Leadership

- Track record of starting, growing, and exiting venture capital backed product development companies.
- Aptitude for developing strategic plans, including: exit strategy, product strategy, risk mitigations strategy, and IP strategy.
- Ability to drive cross-organization execution – product development, product management, program management, supply chain.
- Experience with pre-revenue startups through \$3B public companies.

Personal

- Exceptional personal drive drawn from alternative energy's impact on environmental, social, and economic landscapes.
- Enjoy building teams through effective organizational structures, definition of roles and responsibilities, goal setting, and mentoring.
- Appreciate the interplay between big picture goals and low-level detailed work
- Ability to engage local and international partners to reduce manufacturing complexity, time to market, and product cost.

Technical

- Extensive experience in product development, product management, manufacturing processes, and supplier collaboration.
- Skilled at finding innovative solutions among complex and competing technical, regulatory, environmental, and economic requirements.
- Gifted at distilling and presenting technically complex topics to non-technical audiences.
- Strong background in physics, mechanical principles, photovoltaics, heat transfer, polymerics, mechatronics, and volume manufacturing.

Solar

- Experience developing ground mount and rooftop products delivered at commercial (kW) and utility scale (hundreds of MW)
- Knowledge of the dynamics, economics, and technologies within the solar energy market, including photovoltaic (PV), solar thermal (CSP), and concentrated photovoltaics (CPV).
- Understanding of balance of system and PV components within photovoltaic plants and with permitting through PV plant operations.

KEY ACCOMPLISHMENTS

RayTracker – Built spin-off with no revenue (2008) into one of the top solar acquisitions in 22 months.

- Recognized horizontal single axis tracker market opportunity, pitched RayTracker spin-off, landed \$1.5M in seed capital.
- Capitalized on “Great Recession” by developing exit strategy and building industry “Dream Team.”
- Identified opportunities for code compliant wind mitigation technologies enabling a multiyear technology roadmap
- Eliminated sales bankability bottleneck by creating and executing the industry-leading bankability strategy.
- Upended industry-wide myth that thin film modules would never benefit from horizontal single axis trackers.

Net Result:

- 2010 → 3X sales growth for 3 consecutive quarters
- 2011 → Acquired by First Solar the industry leading PV supplier - delivering a 12X multiple to investors.

First Solar – Restored First Solar competitiveness amid falling module prices and a “low efficiency BOS penalty.”

- Executed wind mitigation technology roadmap resulting in a 46% reduction in total installed cost in 2011, 2012.
- Established a product pathway to an additional 31% reduction in total installed cost and a ~5% yield improvements (absolute) by 2015.

Net Result:

- 2012 → Delivered largest solar tracking site in the United States (Avra Valley Solar Project: 34MW). Independent Engineer declared “most bankable tracker in the industry.”
- 2013 → 230MW of projects under construction or with full notification to proceed.
- 2014 and beyond → Product improvements have enabled more than \$1B (~1 GW) in new contracts in the US and international markets.

PROFESSIONAL EXPERIENCE

Sunfolding

2014 – 2021

Chief Product Officer

- Responsible for end-to-end product and business strategy
- Led product management, program management, product development, product reliability, supply chain, operations, project deployment, and customer experience.

VP Product

- Responsible for product strategy, product definition, product messaging & positioning, early sales, supply chain, bankability strategy, team recruiting & development and fundraising support.

Schneider Solar Consulting

2013 - Present

Owner, Principal

- Developed and coordinated sales strategy to sell balance of system components for client. Resulted in client's largest project ever (200MW, ~\$34M revenue).
- Provided market intelligence and technical due diligence for a major Los Angeles Private Equity firm to support a ~\$70M acquisition in the solar space.

First Solar

2011 – 2013

Director, Global Product Development, DC Structures

- Product development responsibility for all of First Solar's "DC Structures" for domestic and international markets (2013 R&D budget ~\$6.5M)
- Developed product development roadmap including areas of energy yield improvement and cost reduction.
- Reorganized DC Structures team around expert/mentor relationships to improve quantity and quality of technical output.
- Expanded successful "product culture" and "cross functional product teams" to all of First Solar's structural products.
- Led the creation of an international product strategy: including product standardization and local, regional and/or global supply chain decisions.

Director, Tracker Technology

- Full product development responsibility for First Solar's Horizontal Single Axis Tracker program (after acquisition of RayTracker, Inc). Set strategic and tactical direction for entire "Cross Functional Product Team." Grew team from 10 to 34 members.
- Forged a "product culture" in the Tracker Development Group by combining of RayTracker's Product Development Process and First Solar's "Theory of Constraints" approach.
- Direct day-to-day responsibility for product development technical groups (Firmware, Software, Electrical, Mechanical, and Structural groups).
- "Cross Functional Product Team" delivered fully tooled production-ready design and documentation in 18 months. Design reduced the total installed product cost by 36%.

RayTracker, Inc.

2008 – 2010

Founder and Executive Team Member

- Drove technical, product, and bankability strategy, customer due diligence, stakeholder identification, independent engineer relationships, and customer technical interface
- Collaborated on market selection, exit strategy development, acquisition leads courting, VC materials and presentations, board materials and presentations, strategic stakeholder relationships, compensation, and equity decisions.

Senior Director, Engineering

- Led teams responsible for product development, engineering and functional verification of RayTracker products.
- Developed "WindShift" technology that substantially reduced the total wind load while simultaneously reducing customer risk of wind-based damage.

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- Implemented gated release of product via Product Lifecycle Management (PLM)
- Determined European market requirements and worked with TUV to gain CE certification

Energy Innovations – RayTracker Business Group

2007 – 2008

Senior Management Team

- Created product development strategy, product roadmap, and IP strategy. Supported business plan development, strategic marketing direction, and personnel decisions.
- Developed, pitched, and executed RayTracker Business Unit spin-off.

Senior Director, System Development and Verification

- Led teams responsible for system level product development and for functional verification of the product. Served as the technical interface between the customer and internal technical teams.
- Led margin improvement projects, including process development, team organization, concept generation, and execution.
- Created the solar industry's most comprehensive tracker reliability test program and served as technical gatekeeper to determine customer readiness.

Energy Innovations – Concentrated Photovoltaic Business Group

2003 – 2007

Senior Director, Energy Conversion Devices

- Led cost and manufacturing optimization (DFM, DFA, DFX) of the optical, thermal, and photovoltaic subsystems in the concentration photovoltaic (CPV) product. Improved product performance by 30%, reduced material cost by 50%, and reduced time assembly by 10X.

Director, Photovoltaic Module Development

- Led product development and early manufacturing phases of the 3rd generation Concentrated Photovoltaic Module (CPV).
- Responsibilities included requirements, concepts, design, manufacturing process, supplier relationships, performance, reliability, and certification of the optical, thermal, and photovoltaic subsystems systems.
- Contributed to the Energy Innovations' Product Development Process
- Developed first CPV module ever to receive UL certification, first ever optical adhesive to pass an accelerated 25 year 1000X UV test, improved initial manufacturing yields by 40%

Senior System Engineering Manager

- Led the system architecture optimization for the 2nd generation Concentrated Photovoltaic (CPV) product.
- Developed engineering budgets, product requirements, performance models, and facilitated system level design trades.

Lead Test Engineer

- Started Energy Innovations' first test program, including determining testing infrastructure and resource requirements, creating equipment specifications and test suites, and supervising staff.
- Led data analysis of early Concentrated Solar Thermal Power (CSP) Stirling Dish prototypes and 1st generation Concentrated Photovoltaic (CPV) product.

Stirling Energy Systems

2002

Lead Control Engineer – Developed the initial hardware and firmware to control the power conversion unit on a Concentrated Solar Thermal Power (CSP) Stirling Dish.

Microsoft – Network Internet Access Group

2000 – 2001

Software Test Engineer – Tested component and end-to-end scenarios of MSN's content filtering and broadband internet access server software.

NASA – Ames Research Center

2000

Student Mechatronics Engineer – Developed the motion control software of a 3D scanning instrument used to inspect the space shuttle's heat shield after reentry.

US Department of Veterans Affairs – Rehabilitation R&D Center

2000

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Student Engineering Consultant – Designed a 3 degree of freedom motion control system to imitate arm movement on a full scale human simulator.

NASA – Johnson Space Center

1998

Research Intern – Studied biological and organic contamination sources in the lunar and meteorite laboratories in preparation for the Mars sample return laboratory

St. Olaf College – Physics Department

1997

Research Assistant – Improved a software analysis technique to determine the branching ratios of titanium and cobalt spectra

EDUCATION

Stanford University

Mechanical Engineering (1998 – 2000)
Bachelor of Science

St. Olaf College

Physics (1995 – 1999)
Bachelor of Arts, Magna Cum Laude