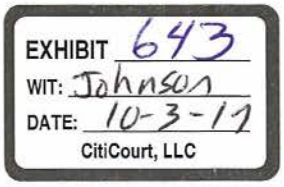
EXPERT REPORT OF NELDON JOHNSON

UNITED STATES OF AMERICA v. RAPOWER-3, LLC, et al.
Case No.: 2:15-0828-DN

I have prepared this expert report to explain the several components to the energy production system designed and operated by International Automated Systems, Inc. (hereafter "IAS System") as well as to critique the expert report submitted by the government's expert, Thomas R. Mancini. I make this report based on my own personal knowledge as well as the experience I have accumulated over the years as I have conceived, designed and engineered devices and methods in various fields of technology that have resulted in over 35 patent applications and 28 issued patents.

The IAS System is many things. Most relevant to these proceedings is a single component sold by RaPower3, the Fresnel lenses used in focusing the sun's rays for the production of useful heat energy. The explanation and application of the different components of the energy production system follow hereafter.

The most significant aspect of this report is that I have formed an opinion, based on practical trials, engineering, and research and development, that the Fresnel lens that are sold by RaPower3 are solar energy equipment specifically designed for and capable of generating useful heat that can be used for the generation of electricity and for other useful purposes, and is specifically designed for and capable of producing concentrated sunlight for use with concentrated photovoltaic cells in the production of electricity. Individuals who have purchased Fresnel lenses from RaPower3 have had those lenses placed into service in the research and development of the IAS System. That solar energy production system has been tested and enhanced over the past eight years or more to the point where the solar arrays using the Fresnel



lenses are being used in commercial applications. Some have produced electricity. All have produced heat above the 150 degree threshold.

All of the lens components sold have been manufactured and are on site at the Delta, Utah facilities. More than 200 solar towers are presently under construction and installation of thousands of lenses is already underway.

The Rankine Cycle

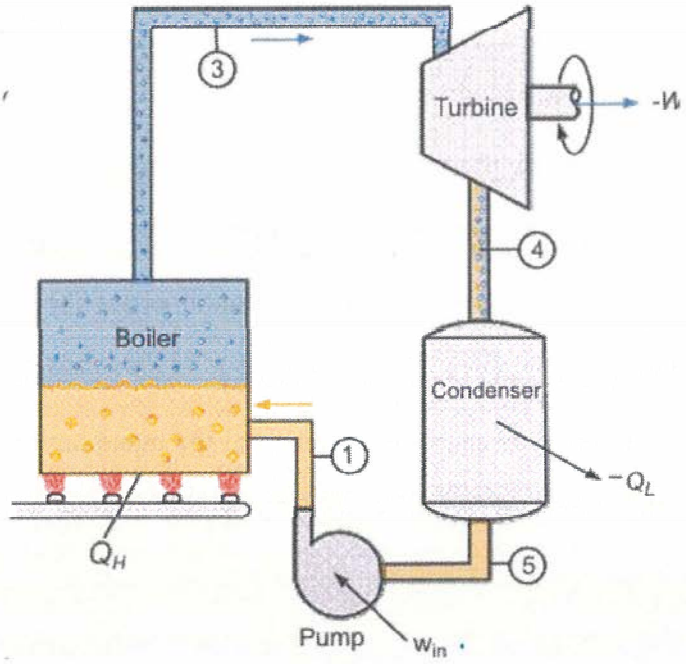
While the Rankine cycle is discussed in the Mancini Report, the discussion fails to adequately relate it to the total energy production system. He also does not make any link between his technical analysis of any of the components, the overall system, and his criticism of the likelihood of the future electrical production, on the one hand, to the issues involved in the dispute between Defendants, including IAS, and the government on the other hand. Accordingly, this response does not attempt to fully explain the Mancini Report deficiencies, but only to clarify some of his mistakes, errors, and omissions.

The Rankine cycle is the fundamental operating cycle of all power generation plants where an operating fluid is continuously evaporated and condensed. The selection of operating fluid depends mainly on the system's available temperature range. The Rankine cycle requires a liquid, such as oil or water, a turbine, a condenser, and a pump. In most systems (BUT NOT THE IAS SYSTEM), a boiler is also required to raise the temperature of the operating fluid to a sufficiently high temperature to create steam. Primarily the Rankine cycle was designed for the purpose of predicting the efficiencies of the fin-type turbines (NOT USED IN THE IAS SYSTEM). The fin-type turbine requires dry steam in order for it to perform at its peak capacities. That is because the turbine itself cannot tolerate wet steam where water might condense in the steam chambers of the turbine to disrupt, corrode and damage the fins.

Condensation of water in the steam chambers of the turbine destroys or damages the fins, reducing its tolerances and making it very inefficient to work with using anything but dry steam.

The Rankine cycle is used mainly in the modern steam turbine systems because of the lower cost in the energy required to create steam from the liquid stage, relative ease of maintenance, and range of temperature and pressure tolerance. Traditionally, the Rankine cycle operates in the following steps: (1) the operating liquid enters the boiler from the feed pump where it is heated to the saturation temperature; (2) the added energy in the boiler through increased temperature and/or pressure causes evaporation of the liquid until it is fully converted to saturated steam; (3) the vaporized steam is expanded in the turbine, thus producing work energy which may be converted to electricity. In practice, the expansion is limited by the temperature of the cooling medium and by the degradation (or erosion) of the turbine blades by liquid entrainment in the vapor stream as the process moves further into the two-phase region; then, (4) the vapor-liquid mixture leaving the turbine is condensed at low pressure, usually in a surface condenser using cooling water (in well designed and maintained condensers, the pressure of the vapor is well below atmospheric pressure, approaching the saturation pressure of the operating fluid at the cooling water temperature); (5) as the cycle nears full rotation, the pressure of the condensate is raised in the feed pump.[1]

[1] RANKINE CYCLE, Muller-Steinhagen, Hans Michael Gottfried. DOI: 10.1615/AtoZ.r.rankine_cycle. http://www.thermopedia.com/content/1072/



2

The efficiency of the Rankine cycle is measured at the output of the condenser and comparison is made to the energy requirement input into the system at the pump and boiler stages. For example, a pump requires energy to move the operational liquid into the boiler. The boiler adds energy in the form of heat and/or pressure to change the liquid to vapor to turn the turbines. Some of the kinetic energy of the vapor-driven turbine is lost when the steam is taken back out halfway through to re-pass through a regenerator and then pass back into the turbine. The condenser then cools at the backend of the steam while maintaining a vacuum on the turbine in order for it to maintain steam rather than condense into any form of liquid drops (usually water) because water in these fin type turbines, as mentioned above, will destroy the fans on the turbine. When the steam comes out of the turbine it has reached entropy, the state where the vapor no longer can produce force against the turbine blades. In other words, the more efficiently the vapor can be drawn out of the turbine, the higher the efficiency of the turbine

system. If vapor is cooled too quickly, energy is lost to condensation that should otherwise be used to produce force against the turbine blade. Early re-condensation may introduce back-pressure in the steam turbine which also lowers its efficiency. From there, the resulting liquid and condensing steam is pushed into a condenser where the latent heat is drawn out of the area liquid or out of the steam, and then this process turns the steam back to liquid as it proceeds back toward the pump to renew the cycle.

The energy required to convert the vapor back to liquid shows up as a loss of efficiency in the system. Therefore, it is an overall systemic efficiency drawback; whereas efficiency is lower the more energy you take out resulting in loss of efficiency in the turbine.

This is old technology, whose inventor lived in the early 1800s. Widely used and well understood, the cycle represents over two centuries of use of a system that needs to be vastly reconsidered and improved.

The Johnson Turbine

The Mancini Report provides an analysis of the Turbine Section based on information having nothing to do with the IAS system. That part of his report is entirely irrelevant. Nevertheless I provide the following response to help clarify what the IAS system does.

The inefficiency of the Rankine cycle is nowhere more apparent than in the turbine. It receives the most wear and, second only to the boiler, requires the most maintenance. As I contemplated the inefficiency of the fin-based turbine, I envisioned a turbine that requires almost no maintenance and would suffer very little operational wear and tear.

The Johnson turbine has been demonstrated numerous times since 2002-2003. There are four patents that have been issued on this turbine alone. The basic design, operation or function of the Johnson turbine has not changed since 2003. It is proven effective, efficient and easy to

reproduce. It is not an R&D system but a fully performing and operational mechanism. It is fully developed. Several videos on the RaPower3.com website demonstrate it in operation.[2]

The Johnson turbine employs the principles of rocket engine propulsion, which is entirely different than a fin-type turbine. There are many advantages in using a rocket engine design in the Johnson turbine system over a fin-type turbine. Fin-types are limited to the quality of the fin material, the nature of the operational liquid and quality of the steam cycle. The regular fin-type turbine requires the use of a boiler steam or generator to preheat and then to super heat the operational liquid in order to get the proper steam quality to release into the turbine blades.

The Johnson turbine uses superheated steam or superheated water, but does not necessarily require a boiler. Superheated steam or superheated water is heated in a pre-heating system or at constant volume by keeping the water in a liquid form. Water is pressurized to 3200 psi. This maintains the water under high pressure all the way through its heating cycle to a point which we call supercritical steam or supercritical water. This is where the pressurized water maintains its liquid form all the way through the heating system, despite being above the critical point.

The Johnson turbine does not require steam to drive blades. Testing was performed at BYU using dry steam and compared to the use of supercritical water. In the test, both the dry steam and the supercritical water were maintained at a temperature of 300°F at only 90 psi. The pounds of thrust per rocket nozzle using the supercritical water was substantially increased over using dry steam with the same mass flow. Because of the results obtained using supercritical water on the inlet side of the turbine, a system was developed that does not require the use of a

[2] https://www.rapower3.com/turbine

boiler system as temperature into the finless Johnson turbine does not need to exceed 450°F and 90 psi.

Removing the boiler system reduces expense, heat regulation, use of heavy steal and other heavy metal materials, system monitoring, and maintenance. This greatly reduces the cost associated with running the power generation system.

By relying on supercritical water, heated to a temperature of between 300°F and 450°F, the IAS power generating system only needs to use a pump and a heat exchanger to maintain appropriate heat and high pressure all the way through the system and to the Johnson turbine. The output is basically steam and water, depending upon the temperature of the saturated critical pressure steam that is driving the rocket nozzle.

Eliminating the boiler also improves the total efficiency of the system. The Johnson turbine allows the use of traditional heat exchangers to cool the steam back to liquid, which we have done in the original designs of the system. In the earliest designs we were using regular heat exchangers using pipes and other coolants to cool the steam back down to a liquid. With the new patented heat exchangers, US9,599,404 "Fluid Direct Contact Heat Exchange Apparatus and Method," we no longer need to use pipes to cool the system. It is many times smaller, many times less expensive, and requires less maintenance than the traditional pipe-type steam condenser.

The new heat exchangers are also well past the point of R&D. We have been using the new type of heat exchangers that can be used in a closed thermal system or that can be modified for heat storage or eliminated altogether in a water purification system. They are in full production.

The solar process heat generated in solar array using the Fresnel lenses can be captured and the resulting heat energy, in the form of BTUs generated by the solar lenses, can be regulated by the rate at which the heat source fluid is pumped through the solar receiver system. This heat is then transferred into the power generation system to heat the working fluid, normally water, that will be used to turn the turbine. The solar process heat raises the temperature of the working fluid and drives the turbine, providing for the generation of electricity. These two components (turbine and solar lens arrays) have been working for some time and we have been using them for research and development to make sure all the systems function adequately. Again, there will be improvements to the system to make the system more reliable, effective and more energy-efficient. However, they are very efficient even in the present format and they will work better than do traditional turbines without the limitations of the fin turbine system.

To get a more accurate picture of what we are talking about in a comparison between traditional turbines and the Johnson Turbine, it is better to be understood by seeing the contrast between the two and the limitations of each one in comparison.

The fin-type turbine requires a boiler system, which greatly increases the cost of the system. When you expand the gas in the first phase change in the boiler to get the latent heat in, there is a loss of energy efficiencies that is eliminated in the Johnson turbine, which requires lower temperature water.

The other problem in a fin-type turbine is the extreme wear in the fins. A change of a few thousandths of an inch due to wear on the fins is much like taking a few thousands of an inch off of a traditional piston-ring system in an automobile or diesel engine, which will greatly reduce engine compression and therefore the efficiency of the engine and reduce power output.

Maintenance and repair of the fins is a cost component that is completely eliminated in the Johnson turbine. There are no fins and very little exposure to wear and tear.

A third problem is the traditional Rankine cycle requires a cooling process on the back end to cool the operating fluid to about a 70°F temperature to maintain a vacuum in the turbine where it will draw the steam across the fins to generate power without allowing the steam to condense. It is a very complicated system, a very expensive system, and is difficult to maintain. The Johnson turbine does not need a cooling process as part of the turbine. The discharge from the rocket nozzles can be collected and merely subjected to a typical heat exchange condenser to recover and recycle the water. The heat collected by the condenser is merely recycled.

Lastly, a traditional turbine has about 48,000 hours of useful life before it starts to degrade to a point where efficiency is detrimental to the amount of power being produced. We expect to get many times the useful life expected in the Rankine cycle from the Johnson turbine.

The Advantage of Using Superheated Water in the Johnson Turbine

The Johnson turbine has several advantages over regular turbines and/or steam producing generators or turbines. This is because the Johnson turbine itself can use superheated water. The temperature of the water that can be used could be as high as 2000°F to produce energy. The Johnson turbine was developed using the same rocket science used to send rockets that have reliably gone to the moon, delivered satellites to orbit and delivered battle-field ordinance accurately and reliably. Steam powered rockets are very efficient engines with estimated efficiencies of around 75%, which is higher than other types of engines. They are much more efficient than burning fuel.

There has been a lot of research recently on how to develop a system that can use high temperature, high critical superheated water, to make energy. Presently, energy is being spent

when high temperature water has to be cooled in a system using traditional turbines. The Johnson turbine can use the superheated water directly, making it much more efficient and using all the energy available for creating electricity. The Johnson turbine's advantage is the wide range of temperatures that can be used. We have tested the Johnson turbine above 1000° and it worked very well at that temperature range.

Solar Energy Field using Fresnel Lenses

Mancini visited the Delta site and saw the solar towers and arrays first-hand. When he viewed the solar towers, Mancini said the Fresnel lens is equivalent to mirrors and can be a direct replacement. The Mancini Report involves a lengthy discussion of entirely irrelevant material, having no bearing on the issues to be decided by the court in this case. The solar energy equipment sold by RaPower3 is the Fresnel lens. None of the turbines, the heat exchangers, towers, the metal structures or other components of the IAS power generation plant are part of the solar energy systems for which solar tax credits or depreciation have been claimed by taxpayers. Therefore, the only component that ought to be at issue in this litigation is whether the Fresnel lenses sold to customers qualifies as solar energy equipment, not the actual workings of the turbine, heat exchangers or other components.

The primary purpose of the solar field is to produce BTUs that are sold for the purpose of heating water or other working fluid that goes to the turbines or to produce concentrated solar radiation that is sold for irradiating concentrated photovoltaic receivers. The turbines then use the heat, or the concentrated photovoltaic receivers use the concentrated solar radiation from the solar field, to generate electricity. However, the power production is by a separate power entity. Only the Fresnel lenses are being sold to the public. The customer leases their Fresnel lens to a leasing company, LTB O&M, LLC (or other appropriate entity(ies) yet to be formed). LTB1,

LLC or other entity will then install the lens into a frame and place the frame, with 33 other lenses, into a steel structure (a solar array) that is engineered to move the lens along the solar path to maximize exposure to the sun's rays. The steel structure itself is part of the IAS power plant operation, but is not part of the RaPower3 solar lens ownership.

Income is generated by LTB O&M, LLC (or other appropriate entity(ies) yet to be formed) when it sells the BTU's produced, or the concentrated solar radiation delivered to concentrated photovoltaic receivers, to the separate power company(ies) on the basis of what the separate power company(ies) conclude would be a fair price for the amount of BTUs produced or concentrated solar radiation produced by the leased Fresnel lenses.

Alternatively, the concentrated photovoltaic receivers may be owned and operated by LTB O&M, LLC (or other appropriate entity(ies) yet to be formed) and that separate power company(ies) may sell the power generated in a separate commercial transaction. Again, however, the photovoltaic cells are likewise not involved with this dispute. LTB O&M, LLC (or other appropriate entity(ies) yet to be formed), as the leasee of the solar lenses, has the freedom to implement the application of the solar arrays to maximize revenue with which to pay on its lease agreements.

There are limitless uses for which the Fresnel lenses can be put such as the traditional Rankine Cycle to produce superheated working fluid, solar process heat for buildings, greenhouses, reconcentrating sulfuric acid, and many other real applications and uses.

Each Fresnel lens is sold with a 35-year warranty. Should the lens become damaged, broken or taken out of commission, the warranty guarantees that a replacement lens will be put back into use for that customer. Other benefits to the purchaser of lenses is outlined and described in the purchase agreement so that further economic benefits will inure to a purchaser

that has put its trust in RaPower3 and been an early purchaser of lenses and been patient during the R&D phase of development.

Fresnel lenses are in full production. They are being produced by large plastic manufacturing companies that guarantee the lenses to be good for 20 years without being damaged by the sun. The manufacturer has assured that the plastic will maintain its clarity for at least 20 years of operation without a significant amount of degradation in the transfer of light through the system. The lenses themselves are produced in a very inexpensive way using a roll plastic system making the lenses very inexpensive to produce. The lens frames now are being produced in high quantities and arrays are being assembled.

A high-scale production system is now available to us. Sufficient quantities of lenses have been manufactured and delivered to the solar field to satisfy all customer requirements and future sales expectations. The towers themselves have been in production for at least 10 years and new solar arrays are being assembled at present, ready to be installed onto towers under construction at the Delta site. The towers will be equipped with a tracking system that automatically tracks the sun using mathematical formulas and hydraulic equipment. The tracking system is a stiff and stable way of moving the solar arrays affixed to the towers to maintain accurate positioning while tracking the sun. The tracking system is engineered for very slow incremental changes while maintaining the hydraulic pressure on both sides of the towers. This maintains accurate positioning and avoids jerky or sudden movements that might misalign or damage the solar array.

In paragraph #77 of his report, Mr. Mancini improperly cites a report by Murray and French who ran a laboratory simulated test on a mirror with an aluminum backing coated with

3mm of acrylic[3] to criticize our assertion that the Fresnel lenses maintain their clarity and efficiency for up to 20+ years. However, the construct of the Murray and French experiment was not intended to be used as a benchmark for an application such as the RaPower3 Fresnel lens. In fact, this simulation diverges so far from the application of the Fresnel lenses that it would be akin to taking a blow torch to a rubber tire to formulate how much tread would wear on a bike tire after skidding 10 feet.

The Fresnel lenses are not coated onto or attached to a mirror of any kind. Instead, lenses are free of any backing. As a result, solar irradiance passes through the Fresnel lenses in a single pass.

In the Murray and French simulation, solar irradiance passes though the acrylic upon entry, then bounces off the mirror and passes back through the acrylic. Not only is the acrylic in Murray and French's simulation exposed to approximately 200% more solar irradiance than in our solar array application, there is no control data sited to delineate how much of the degradation in the acrylic might also be due to the coupled heat of the mirror and the associated degradation from expansion/contraction for that system which is absent from the clear Fresnel lenses used in the IAS application.

Perhaps a more appropriate report Dr. Mancini might have cited is "Operational, Reliability, and Maintenance Experience with Photovoltaic Concentrator Arrays," E.L. Burgess and B.D. Shafer, Sandia National Laboratories, Albuquerque, New Mexico, 1980. Unlike simulations by Murray and French, Burgess and Shafer rely upon real-world data from actual acrylic lenses in the field. According to Burgess and Shafer's report, "Analysis of acrylic sheet

[3] Solar Radiation Durability of Materials, Components and Systems for Photovoltaics, Myles P. Murray, Roger H. Grench, at page 2 ("Assumptions).

exposed to 22 years of sunlight and blowing sand revealed only a 10% total degradation in specular transmittance. Thus, very stable Fresnel lenses are predicted."

Mancini could also have referred to a United States Department of Energy NREL report, "Durability of Poly(Methyl Methacrylate) Lenses Used in Concentrating Photovoltaics", Proc. SPIE, 2010, 7773-02, David C. Miller, Lynn M. Gedvilas, Bobby To , Cheryl E. Kennedy, and Sarah R. Kurtz. In this real-world study it was determined that with proper cleaning, degradation in solar transmittance for acrylic lenses is <0.3% per year. This equates to only a 6% decrease after 22 years. This number aligns very closely to the Sandia National Laboratories' study. A much different result than the 22% reduction Dr. Mancini erroneously cites and tries to conform to his study.

Having worked at Sandia National Laboratories, it begs the question as to why Dr. Mancini, a government-paid expert witness, would omit two easily accessible studies—one by his former employer, Sandia National Laboratories and a second by the NREL. Both were government funded and reference applications far more congruent with the RaPower3 Fresnel lenses.

The Solar Receivers and Heat Exchangers for the Solar Energy Side

Initially, I should note again, that in responding to the Mancini Report in regard to the issues raised about the solar receivers and the heat exchangers, I do not intended to suggest that the solar receivers or the heat exchangers are relevant to any issue in the case. They clearly are not.

Secondly, it must also be noted that the current implementation and operation plan for the Delta, Utah solar site is for respective portions of the lenses, and the solar towers that they are installed in, to be devoted respectively to (a) power production utilizing a bladeless turbine under

one or more U.S. Patents 6,533,539 - 6,783,320 - 6,997,674 or 7,314,347; (b) power production utilizing a concentrated photovoltaic receiver, which may incorporate the photovoltaic technology of US Patent No. 7,705,560 to Johnson (Voltage Controller), US Patent Application No. 20150108939 to Johnson (Photovoltaic Controller), and US Patent Application No. 20160365730 to Johnson (Capacitor Enhanced Multi-element Photovoltaic Cell); (c) research and development, and testing, of various components for various embodiments of the IAS Solar Technology, including but not limited to bladeless turbine embodiments and concentrated photovoltaic embodiments; and (d) other beneficial uses of the concentrated solar radiation from the lenses and the towers they are installed in. It is anticipated that the Delta solar site will be a solar energy, multi-use site for the foreseeable future, wherein the lenses and towers are used for power production, component R&D and testing, and alternative use R&D.

Heat exchanger technology is highly advanced as heat exchangers have been utilized for numerous industrial, commercial, vehicular, mobile equipment and residential applications for decades. Existing, highly efficient heat exchangers are readily adaptable for use with water, oil, molten salt or various other fluids, of varying temperatures and pressures, as the heat source fluid, and for the transfer of heat from the heat source fluid to water as the working fluid of the Johnson turbine version of the IAS Solar System. These existing, highly efficient heat exchangers are readily available and readily adaptable for use with the Johnson turbine version of the IAS System.

In addition to the commercially available heat exchangers, it is anticipated that a portion of the solar towers will continue to be devoted to further testing of alternative heat exchange systems, such as the Fluid Direct Contact Heat Exchange Apparatus and Method of U.S. Patent No. 9,599,404 to Johnson.

As stated, the heat exchangers, whether commercially available exchangers or alternative exchangers such as that described in U.S. Patent No. 9,599,404 to Johnson, are adaptable to use with various types of heat source fluid, including water, oil and molten salt. Accordingly, the Johnson turbine version of the IAS System may utilize a variety of solar receivers that are capable of receiving the concentrated solar energy from the collectors of each tower, and transferring that energy to a heat source fluid. Overall efficiency, as well as other operational considerations, are considered in selecting the solar receiver and the heat source fluid. Testing has been completed with several types of solar receivers, including the Solar Energy Receiver disclosed in U.S. Patent No. 9,068,763 to Johnson. Other types of receivers that have been tested are described below.

The first is a vacuum tube system. In the vacuum tube system, the inside of the inner tube is coated first with copper and then a black absorber. This heat exchanger has been tested to be 95% absorbent and 98% holding (the ability to maintain temperature) for a period of time long enough to transfer the liquid for use in the Johnson turbine. The vacuum tube system is nonconductive because of its design. This system is currently built by other manufacturers, and to their specifications.

The next type of solar receiver is similar to the type used with parabolic lens collectors. For the parabolic collectors, a flat receiver panel is created out of several exchangers in a row, large enough to cover approximately 150% of the area needed to capture all of the solar energy concentrated by the parabolic lenses. The oversizing is used to accommodate for vibration added in the system by wind or other natural causes. For the Fresnel solar arrays, the heat exchangers tested operate in the same manner described in the previous paragraph. The solar receiver is made larger than needed to allow for any misalignment, vibration, or movement that takes place

on the system. While other systems require direct and precise focus of the solar energy on a very small area, with this type of receiver installed on the solar arrays, movement of six or seven inches is allowed without any loss of the efficiency of the solar receiver. By oversizing the receiver, lower accuracy is also tolerated for the solar energy focal point from the lens components, but still results in a 90% absorbency rate.

The most recently developed heat exchanger appears to be more economical than the two described above, in terms of production and material cost, yet continues to have similar efficiencies of the other two systems. This heat exchanger is created by using three layers of glass enclosing a container with a coiled piping system. The use of the layers of glass makes the container highly insulated (using between 3 and 6 cm of glass surrounding the containers, with a layer of gas with low conductivity). The three layers of glass sitting on top of this container provide a clear area for the solar energy to penetrate onto the piping of this type of heat exchanger. The first layer of glass is a very high temperature glass, having a temperature rating into the 1650° temperature range. It also then has linear metal infused throughout that will confine potential cracks to small areas of its surface and yet maintain the overall integrity of this layer of glass. Although the design of this system allows for the solar energy (less infrared rays) to penetrate directly through, in the event carbon material is deposited on the glass, the carbon material will absorb the concentrated solar energy and burn off. This design, in addition to the insulation properties, also has the secondary effect of eliminating bird waste (which is the most common environmental disturbance to the surface) by burning it off, acting as a protectant to the rest of the system. The space between the second two layers of glass is infused with gas having a very high coefficient of conductance (.0016 W per MK), which insulates the system and prevents most of the heat from being dissipated back through the glass. The coils and area inside the

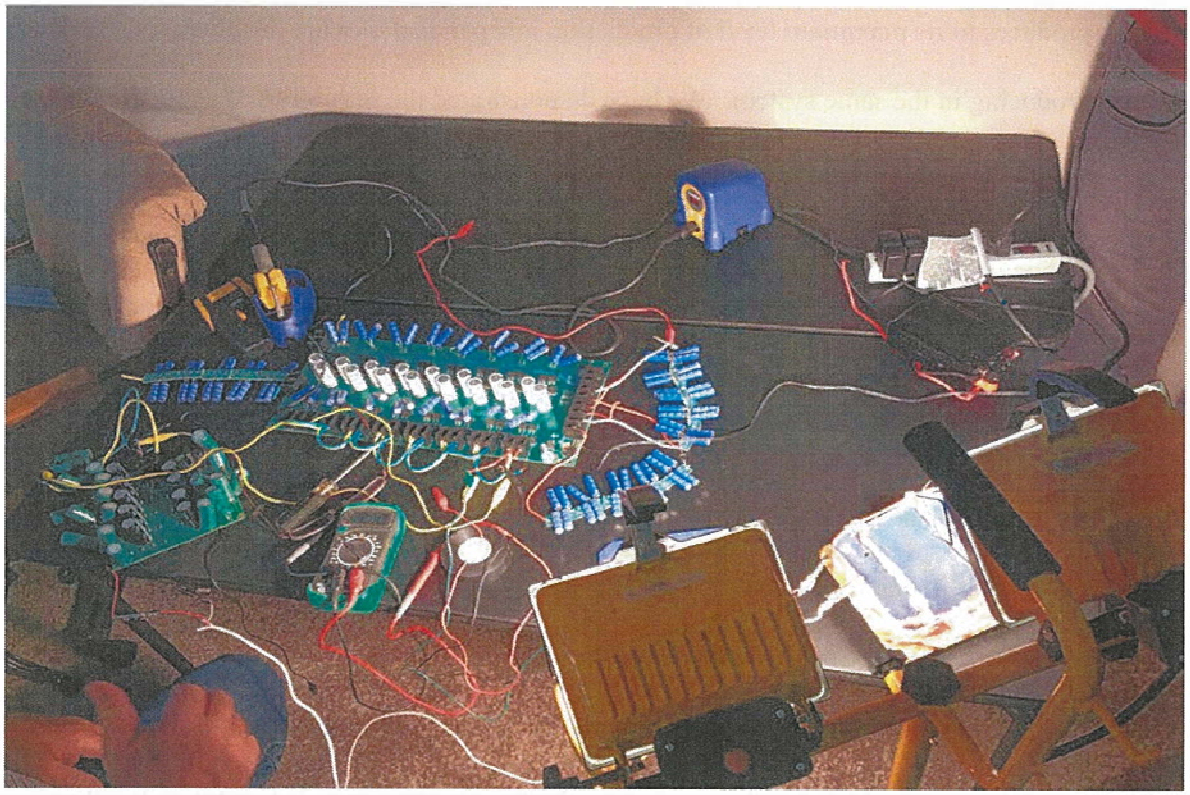
chamber itself are made larger than is required to allow for movement of between 6 and 8 inches of the focal point, but still create the necessary heat for the system. Molten salts, oil, and water can be used as the heat source fluid. The type and design of transfer piping used for this system also add to its efficiency. In each case, high quality metal piping is used. The variety used in each system depends upon the fluid used. In every case, the piping is coated with an insulation having a heat transfer coefficient of .0664 W per MK, and impenetrable by water. Further insulation in approximately 4 cm of thickness surrounds the heat pipe, which serves to reduce heat loss in the piping system to between 2% and 3% over 2,000 feet. This can also be placed underground where additional types of insulation can also be used to further reduce any heat loss. This system is approximately 95% heat absorbent. It retains between 95 to 98% of the heat put into the system, and loses a minimal amount of heat. These findings can be supported both by actual tests and is mathematically verifiable.

As stated above, the current implementation and operation plan includes the devotion of a portion of the lenses, and the towers they installed in, to continuing R&D and testing of solar system components. It is anticipated that ongoing R&D and testing will continue for each of the foregoing solar receivers and improved embodiments of each of them, as well as other types of solar receivers.

Solar Energy CPV Project

Beyond the heat-producing ability of the Fresnel lens to concentrate solar energy onto a receiver for the purpose of creating a temperature-based thermal PVR solar system, IAS is in the final stage of developing a converter system of concentrated thermal solar energy using the Fresnel lens system for a concentrated photovoltaic system ("CPV system"), which has been mentioned above.

This is a new application of the Fresnel lens system that we intend to use with our patented Photovoltaic Controller.[4] Our design will separate out the chips and make them individually isolated from each other, allowing them to be used in a CPV system in a way that no other company has ever been able to achieve. The Fresnel lens system allows for a more diffused, less concentrated, focal point -- rendering the standard highly accurate focal point unnecessary.



The solar PV cells are connected, not in a parallel, nor are they connected in the usual serial format, each solar cell is completely independent and it is controlled by what we call a voltage control board, which makes it so that each solar cell is completely independent from every other solar cell. In the traditional solar cells that are being used today, they are connected

[4] https://www.rapower3.com/voltage-control

in series because the solar cells themselves only put out a half a volt (.5 V). This is very low voltage and requires a large amount of current in order to produce any significant power to be produced by the silver solar cells themselves. This power, or current, has to then pass through each solar cell in which there is an internal resistance that will be lost and converted to unwanted (and unusable) heat by the system itself.

Our system reduces current inefficiencies in standard solar arrays because each cell produces to its maximum level of production independent of what the other solar cells are producing in the same system. We have demonstrated the feasibility of using the Fresnel lenses in this manner and generated electricity from the solar cells. The RaPower3 solar lenses can generate a 100-sun system where we are multiplying the ambient sunlight one hundred times. That means we can concentrate our solar PV material by nearly the same factor (100 times) that is used in a traditional one-sun system.

With a 5 W in a 6 x 6" solar cell, the Fresnel lens system is targeted to produce 1000 amps, and a half a volt from each cell. Traditional systems would require a wire almost an inch or 2 inches in diameter to carry that load. *This would be very hard to connect, very expensive* and would therefore not be very efficient.

However, our system has produced energy and a minimum of 24 V and we have tested it and have gone as high as 80 V. We now can produce at 2000 V if we couple it with our new voltage control board system.

Each of the solar lens arrays can and will produce electrical energy if we choose to use the concentrated photovoltaic systems to generate electricity using Fresnel lenses as they are presently in place.

Criticism of Thomas Mancini Conclusions

Mancini is wrong in his conclusion that the IAS system is non-functional and could never become commercially operational. Mancini is wrong because he does not understand the innovations in the IAS system and is measuring it against his existing knowledge and experience with photovoltaic systems using mirrors and refraction, as opposed to a solar lens array to superheat water for a uniquely designed and patented Johnson turbine.

In much the same way as an aeronautical engineer looking at a jet airplane concludes it will never fly because it doesn't have any propellers and therefore cannot create lift because all he knows is propellers, Mancini fails to appreciate the new technology and innovations that form the substance of the IAS system.

- **Conclusion 1: Status of the IAS Solar Dish Technology: The IAS Solar Dish Technology is in the research State 1 of development. The "technology" comprises separate component parts that do not work together in an operational solar energy system. The IAS Solar Dish Technology does not produce electricity or other useable energy from the sun.**

Mancini wrongly concludes that the IAS Technology is nonfunctional, does not produce electricity or any useable energy from the sun, and therefore is in the research stage of development.

Mancini's position seems to be based only on personal dis-belief that the IAS System can be fully developed and commercialized. He ignores the fact that IAS has, with very minimal technical support, fully developed and patented (four U.S. patents) a process for manufacturing plastic Fresnel lens components which cures a multitude of problems experienced by pre-existing Fresnel lens technology, including particularly focus distortion and scatter, which makes the IAS system technically feasible. (See list of U.S. Patents attached as Exhibit "A"). The Fresnel lens used in the solar arrays have been successfully tested and confirmed to perform as intended. Thousands of these lenses are stockpiled in Delta, Utah, and are installed or ready to install.

Mancini also ignores the fact that IAS has, with very minimal technical support, conceived, designed, tested and constructed the solar array towers. The towers have been engineered to successfully provide for continuous and accurate solar tracking and for secure horizontal stowing of the arrays in the event severe wind conditions are experienced.

Mancini further ignores the fact IAS has with very minimal technical support, built a manufacturing operation that has been and is efficiently and cost-effectively manufacturing the solar collector tower components. To date, the components for hundreds of solar array towers have been manufactured and erection is well underway. Mancini has seen this himself, yet discounts the progress that is evident upon seeing the solar field in Delta, Utah.

Mancini further ignores the fact IAS has, with very minimal technical support, designed and tested several concentrated solar receivers to work in conjunction with the Fresnel lens solar energy production system, and that we are currently testing other receivers, including a concentrated sunlight photovoltaic receiver. I have obtained two U.S. Patents for concentrated solar receivers, and have another concentrated photovoltaic technology that is patent pending before the USPTO. I have also obtained a U.S. Patent for a voltage controller which provides for enhanced efficiency of the concentrated photovoltaic receiver.

While the IAS solar power production system could certainly employ one of many readily available heat exchange systems to interface between the solar receivers and the turbines, Mancini further ignores the fact IAS has designed, developed, fabricated, and tested several new heat exchange systems. In that process, we have obtained a U.S. Patent for a direct fluid contact heat exchange system and have other heat exchange technology that is patent pending before the USPTO. (See Exhibit "A")

Mancini further ignores the fact IAS holds the patent for the pressurized gas bladeless turbine and a pressurized fluid bladeless turbine. (See Exhibit "A") The pressurized fluid bladeless turbine eliminates the need for a boiler system and provides for flashing of the heated and pressurized water to steam at or near the nozzles of the bladeless turbine. The simplicity and inherent reliability of the turbine is a very important feature of the versions of the IAS system utilizing a turbine and a generator.

In short, Mancini's conclusion concerning the non-performance of the component parts of the IAS system and the status of the solar technology is untrue.

Conclusion 2: Commercialization Potential of the IAS Solar Dish Technology: The IAS Solar Dish Technology is not now nor will it ever be a commercial-grade dish solar system converting sunlight into electrical power or other useful energy.

Mancini wrongly concludes that the IAS system is not now nor will it ever be a commercial-grade solar energy production system converting sunlight into electrical power or other useful energy.

The IAS system has been selling for several years and so it is already commercialized and, therefore, by definition, commercial grade. Once again, Mancini in handicapped in his perspective much like a transportation expert scoffs at the idea of rubberized tires, since in his experience, only wooded spokes and steel rims are strong enough to support a load being carried over rough terrain. Innovation and technology shakes up the status quo. Mancini can't see the innovative nature of the IAS system because he is limited in his focus to exclusively regarding what has been done in the past.

Mancini compares the IAS system with the Fresnel lens and the Johnson turbine system to the Dish/Stirling Engine CSP system. (Mancini, paragraphs 21-31). He opines that because

the Dish/Stirling Engine CSP system has not been successfully commercialized, that the Johnson turbine system could not be successfully commercialized either.

The Mancini analysis is not applicable because: (1) the two power generations systems are substantially different and there is no relevant comparison; and, (2) there would be no DOJ action against RaPower3 if its power generation system had not already been successfully commercialized.

Mancini opines that a Johnson turbine suffers from the same limitation that has rendered the Dish/Stirling Engine CSP system economically unviable. (Mancini, paragraphs 29-31). However, Mancini fails to acknowledge that the Johnson turbine is significantly different than the Stirling engine. Mancini explains, "the Stirling engine is heated by the concentrated solar radiation from the dish. Inside the engine, the working fluid, typically hydrogen or helium, is contained and goes through a series of expansions, compression, and heat transfer processes resulting in mechanical work that turns the generator producing electricity." (Mancini, paragraph 25). However, the Johnson turbine is a much simpler machine that relies on super-heated water to turn the bladeless turbine resulting in low cost and low energy input to produce the resulting mechanical work. The Johnson turbine is not subject to the same cost concerns raised by Mancini, but rather is a low cost component to the IAS system and therefore Mancini's criticism is not well placed.

Lastly, RaPower3 has been selling its system in the open market for many years. It has gained a distinctive level of commercial application; otherwise, the government would not be pursuing these claims. As far as commercial application, meaning sale of solar energy, IAS has been in the testing and development phase of operations through the present. It has taken millions of dollars and hundreds of thousands of hours of testing to get to where the IAS system

is today. However, the viability of the system is proven to be sound. It will produce solar based energy. Even Dr. Mancini concedes that each part of the IAS system has its merits, albeit as he claims each remains in early stage development.

The transition from stage one development to operational energy production is not a quantum leap, but is like hooking a trailer to a truck. It takes some planning and direction, but once lined up, will fall into place and be locked together to form a fully operational system.

Solar Energy Project

The greatest defect in the Mancini Report is its expansive coverage of things which are not involved in any dispute before the court. The only part of our project that can be regulated by the federal government is what is being sold for which tax payers are claiming a tax credit or a depreciation deduction. This means that the only items that the government can challenge are the lenses and the only question is whether the solar Fresnel lens are solar equipment that produce solar process heat or electric power.

It is my opinion that: 1) the lenses exist and are in full production - they are manufactured by a U.S. company and we have 34,000 lenses that have been bought at this particular time; 2) the lenses produce usable heat[5] - this is not debatable and cannot be in dispute; and, 3) The lenses are part of a solar array that can be used to produce solar process heat and electric power. In conjunction with the solar arrays in which they are installed, the solar receivers, the heat exchangers, the Johnson Turbine, and the generators, and/or the CPV system, the Fresnel lenses can be used to create heat and electric power in a solar energy production system as explained herein.

[5] https://www.youtube.com/watch?v=mj83JwrUbzE

This opinion is within a reasonable degree of scientific certainty and can be replicated and demonstrated with great ease. Every part of the system has proven scientific logic. However, perhaps the most important (and relevant) point is that RaPower3's Fresnel lenses set a board on fire while Mancini was visiting our site. They indisputably focus solar energy to produce heat.

Neldon Johnson
September 15, 2017

QUALIFICATIONS

Mr. Neldon P. Johnson is the founder of International Automated Systems Inc. and has been its President and Chief Executive Officer since 2001, he also serves as its Chairman of the Board. Mr. Johnson is the primary inventor of the Self-Check system, AFIM and the DWM technologies. He directs International Automated Systems's research and development program. Mr. Johnson has been developing the Self-Check system since 1983.

Mr. Johnson has taken training courses and has taught courses in electronics programming, microwave and wave switch programs. From 1965 to 1968, he served as an engineer at American Telephone and Telegraph, Inc. From 1975 to 1990, he was employed at Ream's Grocery Store and had management responsibilities for operations. He has real estate holdings, one of which was a supermarket of approximately 25,000 square feet in Salem, Utah. The supermarket was called U-Check. It was his time at U-Check that the self checkout system he invented was developed.

Mr. Johnson studied physics and mathematics at Brigham Young University in Provo, Utah and graduated from Utah Technical College's Electronics Technology Program in 1964.

Mr. Johnson, inventor of the IAS technologies, developed his patented bladeless turbine over a decade ago. He thought his turbine would match up well with concentrated solar power energy, but found that conventional polished glass mirror technology that reflected the sun's rays to a tiny focal point was expensive, inefficient and used too much water. He turned to a Fresnel lens where the sun's rays would refract while bending the sun's rays to a much larger focal point. He hooked up Fresnel lenses to his turbine and produced electricity. Thus, he had proof of concept.

Mr. Johnson has filed for patents to protect approximately 60 inventions. Attached hereto is a listing of patents that includes patent applications that are pending as well as patents that have already been granted by the United States Patent and Trademark Office (USPTO).

PUBLICATIONS:

Mr. Johnson has not been published in the previous 10 years.

OTHER EXPERT TESTIMONY:

Mr. Johnson has not given testimony as an expert at trial or by deposition in the previous 4 years.

COMPENSATION:

Mr. Johnson is not being compensated for his expertise or his testimony in this case.

Patents by Inventor Neldon P. Johnson

Neldon P. Johnson has filed for patents to protect the following inventions. This listing includes patent applications that are pending as well as patents that have already been granted by the United States Patent and Trademark Office (USPTO).

Fluid direct contact heat exchange apparatus and method

Patent number: 9599404

Abstract: A fluid direct contact heat exchanger having a contact chamber with a source fluid inlet provided by a source fluid inlet pipe, a source fluid outlet provided by a source fluid outlet pipe, a transfer fluid inlet provided by a transfer fluid inlet pipe, and a transfer fluid outlet provided by a transfer fluid outlet pipe. The source fluid and the transfer fluid have substantially different specific gravities and the source fluid and the transfer fluid are each insoluble in the other. The heat exchanger incorporates a heat transfer inducement element in the contact chamber which has a rotatable inducer shaft and a transfer accelerator element attached to the inducer shaft.

Type: Grant

Filed: August 27, 2013

Date of Patent: March 21, 2017

Assignee: Black Night Enterprises, INC.

Inventor: Neldon P. Johnson

CAPACITOR ENHANCED MULTI-ELEMENT PHOTOVOLTAIC CELL

Publication number: 20160365730

Abstract: A multi-element photovoltaic cell having two or more photovoltaic elements with an isolation layer interposed between all contiguous photovoltaic elements. Each photovoltaic element has an element front conductor and an element rear conductor which are in electrical contact with the photovoltaic layer of the photovoltaic element. The current from a respective photovoltaic element which is generated as incident solar radiation irradiates the photovoltaic cell, flows independently of the other photovoltaic elements to one or more capacitor banks controlled by a photovoltaic controller. The photovoltaic controller controls charging and discharging of element capacitors of the capacitor banks so as to optimize the efficiency of the photovoltaic cell.

Type: Application
Filed: June 12, 2015
Publication date: December 15, 2016
Inventor: Neldon P. Johnson

Folded stack segmented film capacitor

Patent number: 9418791
Abstract: A folded stack, segmented capacitor having a continuous capacitor base element which is folded two or more times, in one or more first stack folds and one or more second stack folds, to form three or more stack layers. Each of the stack layers has a primary electrode, which may be a continuous metallic film, and a segmented secondary electrode comprised of a plurality of secondary electrode elements electrically connected to a conductor element by a fuse element. The primary electrode is separated from the segmented secondary electrode and the plurality of secondary electrode elements by a continuous primary dielectric element. The secondary electrode elements are separated from the conductor element by a conductor insulation layer. The fuse elements pass through the conductor insulation layer from the secondary electrode elements to the conductor element.
Type: Grant
Filed: October 17, 2014
Date of Patent: August 16, 2016
Assignee: Black Night Enterprises, Inc.
Inventor: Neldon P. Johnson

WATER RECLAMATION SYSTEM AND METHOD

Publication number: 20150225256
Abstract: A water reclamation system and method incorporating a solar collector or other energy source, an energy source heat transfer element, a primary heat exchanger, a bladeless turbine, a collection chamber, a reclaimed water condenser, and a sludge scraper assembly. One or more pumps, control valves or other flow control devices may provide pressurization and control the flow of unheated transfer fluid, heated transfer fluid, raw water, and heated raw water. Embodiments vary from highly automated embodiments which incorporate an intricate system of sensors, control valves, pumps, and other components connected to and controlled by a control module which uses a complex algorithm to continuously and autonomously monitor and control the operation of all system components, to a totally manual system with no sensors, no

automated components, and no control module.
Type: Application
Filed: February 12, 2014
Publication date: August 13, 2015
Inventor: Neldon P. Johnson

SOLAR RECEIVER WITH DIRECT ABSORPTION MEDIA IRRADIATION

Publication number: 20150219364
Abstract: A solar receiver having a receiver vessel with a receiver chamber, a receiver cover with a receiver window, a receiver fluid inlet, a receiver fluid outlet, and an absorption media matrix in the receiver chamber. In operation of the solar receiver, incident solar radiation is transmitted through the receiver window to the absorption media matrix. Receiver fluid is circulated through the receiver chamber and the absorption media matrix. Heat is transferred from the absorption media matrix to the receiver fluid.
Type: Application
Filed: February 5, 2014
Publication date: August 6, 2015
Inventor: Neldon P. Johnson

Solar energy receiver

Patent number: 9068763
Abstract: Solar receiver having a receiver funnel, a solar absorber, and an absorber rotation drive mechanism. The receiver funnel has a funnel entrance and a funnel exit. The solar absorber may have a spherical shape and has an absorber rotation axis. The solar absorber is rotatably positioned in the funnel exit. The solar absorber has an internal absorber fluid chamber, an absorber fluid intake and an absorber fluid outlet. The absorber rotation drive mechanism provides for rotating the solar absorber about the absorber rotation axis.
Type: Grant
Filed: February 20, 2013
Date of Patent: June 30, 2015
Assignee: Black Night Enterprises, Inc.
Inventor: Neldon P. Johnson

PHOTOVOLTAIC CONTROLLER AND METHOD FOR PHOTOVOLTAIC ARRAY

Publication number: 20150108939

Abstract: A photovoltaic controller for a photovoltaic array of photovoltaic cells. The photovoltaic controller incorporates a capacitor charge circuit electrically connected to each photovoltaic cell, cell capacitors connected to each photovoltaic cell by the capacitor charge circuit, capacitor charge switches, a capacitor discharge circuit electrically connected to each cell capacitor, an output circuit connected to the capacitor discharge circuit, capacitor discharge switches, a plurality of capacitor voltage sensors, and a photovoltaic control module in communication with the capacitor voltage sensors, the capacitor charge switches and the capacitor discharge switches.

Type: Application

Filed: October 23, 2013

Publication date: April 23, 2015

Inventor: Neldon P. Johnson

APPARATUS AND METHOD FOR SECURED COMMERCIAL TRANSACTIONS

Publication number: 20150088742

Abstract: A transaction security code database and a method and apparatus for generating the transaction security code database. The transaction security code database is comprised of multiple transaction security codes, each transaction security code constituting a transaction code generated based upon a transaction initiated by a user, which is appended to or linked to a security code which is based upon a biometric sensor code generated by a biometric sensor from a biometric presentation of a biometric feature of the user.

Type: Application

Filed: September 26, 2013

Publication date: March 26, 2015

Inventor: Neldon P. Johnson

FLUID DIRECT CONTACT HEAT EXCHANGE APPARATUS AND METHOD

Publication number: 20150060024

Abstract: A fluid direct contact heat exchanger having a contact chamber with a source fluid inlet provided by a source fluid inlet pipe, a source fluid outlet provided by a source fluid outlet pipe, a transfer fluid inlet provided by a transfer fluid inlet pipe, and a transfer fluid outlet provided by a transfer fluid outlet pipe. The source fluid and the

transfer fluid have substantially different specific gravities and the source fluid and the transfer fluid are each insoluble in the other. The heat exchanger incorporates a heat transfer inducement element in the contact chamber which has a rotatable inducer shaft and a transfer accelerator element attached to the inducer shaft.
Type: Application
Filed: August 27, 2013
Publication date: March 5, 2015
Inventor: Neldon P. Johnson

Facet deformation minimizing fresnel lens die roller and manufacturing method

Patent number: 8900500
Abstract: A die roller and method for making a die roller for use in manufacturing Fresnel lens angular segments or sub-segments, the die roller having one or more segment dies and curvilinear Fresnel facet dies, the Fresnel facet dies having a collar, a peak, and a base, the collar being sloped, the peak being rounded, and the base being rounded, according to a die algorithm based upon one or more facet factors, in order to reduce the deformation of Fresnel lens angular segments or sub-segments extruded with the die roller.
Type: Grant
Filed: January 8, 2011
Date of Patent: December 2, 2014
Assignee: Black Night Enterprises, Inc.
Inventor: Neldon P. Johnson

SOLAR ENERGY RECEIVER

Publication number: 20140230808
Abstract: Solar receiver having a receiver funnel, a solar absorber, and an absorber rotation drive mechanism. The receiver funnel has a funnel entrance and a funnel exit. The solar absorber may have a spherical shape and has an absorber rotation axis. The solar absorber is rotatably positioned in the funnel exit. The solar absorber has an internal absorber fluid chamber, an absorber fluid intake and an absorber fluid outlet. The absorber rotation drive mechanism provides for rotating the solar absorber about the absorber rotation axis.
Type: Application
Filed: February 20, 2013
Publication date: August 21, 2014

Inventor: Neldon P. Johnson

Apparatus and method for secured commercial transactions

Patent number: 8571996

Abstract: A transaction security code database and a method and apparatus for generating the transaction security code database. The transaction security code database is comprised of multiple transaction security codes, each transaction security code constituting a transaction code generated based upon a transaction initiated by a user, which is appended to or linked to a security code which is based upon a biometric sensor code generated by a biometric sensor from a biometric presentation of a biometric feature of the user.

Type: Grant

Filed: April 20, 2007

Date of Patent: October 29, 2013

Assignee: N.P. Johnson Family Limited Partnership

Inventor: Neldon P. Johnson

FACET DEFORMATION MINIMIZING FRESNEL LENS DIE ROLLER AND MANUFACTURING METHOD

Publication number: 20120177768

Abstract: A die roller and method for making a die roller for use in manufacturing Fresnel lens angular segments or sub-segments, the die roller having one or more segment dies and curvilinear Fresnel facet dies, the Fresnel facet dies having a collar, a peak, and a base, the collar being sloped, the peak being rounded, and the base being rounded, according to a die algorithm based upon one or more facet factors, in order to reduce the deformation of Fresnel lens angular segments or sub-segments extruded with the die roller.

Type: Application

Filed: January 8, 2011

Publication date: July 12, 2012

Applicant: N. P. JOHNSON FAMILY LIMITED PARTNERSHIP

Inventor: Neldon P. Johnson

SYSTEM AND METHOD FOR SECURED VOTING TRANSACTIONS

Publication number: 20120037701

Abstract: A secured electronic system and method for taking and counting votes. A

database of unique ballot security codes, each ballot security code consisting of a ballot code representing the ballot selections of a voter and a security code derived from sensing with a biometric sensor a biometric presentation of a biometric feature of the voter. Each ballot security code is checked before entry into the database to verify that the security code component is not within a voter template of the security code component for any prior ballot security code, to prevent multiple votes being cast by any voter. Recounts are validated by verifying the uniqueness of the security code component of each ballot security code and verifying that each security code is not within a voter template of any other security code. Each ballot security code may also be checked against a registration data base thereby verifying that the voter is registered.
Type: Application
Filed: October 31, 2011
Publication date: February 16, 2012
Inventor: Neldon P. Johnson

System and method for secured voting transactions
Patent number: 8047435
Abstract: A secured electronic system and method for taking and counting votes. A database of unique ballot security codes, each ballot security code consisting of a ballot code representing the ballot selections of a voter and a security code derived from sensing with a biometric sensor a biometric presentation of a biometric feature of the voter. Each ballot security code is checked before entry into the database to verify that the security code component is not within a voter template of the security code component for any prior ballot security code, to prevent multiple votes being cast by any voter. Recounts are validated by verifying the uniqueness of the security code component of each ballot security code and verifying that each security code is not within a voter template of any other security code. Each ballot security code may also be checked against a registration data base thereby verifying that the voter is registered.
Type: Grant
Filed: January 31, 2007
Date of Patent: November 1, 2011
Assignee: N.P. Johnson Family Limited Partnership
Inventor: Neldon P. Johnson

Presnel lens angular segment manufacturing apparatus and method
Patent number: 7789651

Abstract: A roller extruder for manufacturing Fresnel lens angular segments from raw plastic, the roller extruder having a blank roller and a die roller positioned a desired roller clearance from the blank roller, the die roller having two peripheral lens dies with an angular displacement between the lens dies increasing linearly from a die junction at the inside roller edge to approximately one hundred eighty degrees at the outside roller edge, and the die roller having peripheral Fresnel facet dies.
Type: Grant
Filed: July 11, 2007
Date of Patent: September 7, 2010
Assignee: N. P. Johnson Family Limited Partnership
Inventor: Neldon P. Johnson

Fresnel lens angular segment manufacturing apparatus and method
Patent number: 7789650
Abstract: A roller extruder for manufacturing Fresnel lens angular segments from raw sheet plastic, the roller extruder having a blank roller and a die roller positioned a desired roller clearance from the blank roller, the die roller having two peripheral lens dies with an angular displacement between the lens dies increasing linearly from a die junction at the inside roller edge to approximately one hundred eighty degrees at the outside roller edge, and the die roller having peripheral Fresnel facet dies.
Type: Grant
Filed: December 22, 2006
Date of Patent: September 7, 2010
Assignee: N.P. Johnson Family Limited Partnership
Inventor: Neldon P. Johnson

Fresnel lens angular segment manufacturing apparatus and method
Patent number: 7789652
Abstract: A roller extruder for manufacturing Fresnel lens angular segments from raw plastic, the roller extruder having a blank roller and a die roller positioned a desired roller clearance from the blank roller, the die roller having two peripheral lens dies with an angular displacement between the lens dies increasing linearly from a die junction at the inside roller edge to approximately three hundred sixty degrees at the outside roller edge, and the die roller having peripheral Fresnel facet dies.
Type: Grant
Filed: December 24, 2007

Date of Patent: September 7, 2010
Assignee: N.P. Johnson Family Limited Partnership
Inventor: Neldon P. Johnson

Voltage controller

Patent number: 7705560
Abstract: A voltage controller having an input distribution network with imbedded input switches, a number of charge storage elements such as capacitors, an output distribution network with imbedded output switches, and a switch actuator which controls the input switches and output switches to provide for the controlled charging and discharging of the charge storage elements.
Type: Grant
Filed: August 15, 2006
Date of Patent: April 27, 2010
Assignee: N. P. Johnson Family Limited Partnership
Inventor: Neldon P. Johnson

Magnetic transmission

Patent number: 7449807
Abstract: A magnetic transmission having an input shaft and an output shaft with two or more gear assemblies, each gear assembly having an input sprocket affixed to the input shaft, an output armature with peripheral electromagnets affixed to the output shaft, a transfer drum concentric with the output armature and having electromagnets inset from the inside surface of the transfer drum and a drum sprocket on the periphery of the transfer drum, and a transfer chain engaging the input sprocket and the drum sprocket. A gear assembly actuator is used to select and energize a desired gear assembly. A hysteresis clutch can also be used in lieu of the output armature and the transfer drum.
Type: Grant
Filed: February 9, 2006
Date of Patent: November 11, 2008
Assignee: N.P. Johnson Family Limited Partnership
Inventor: Neldon P. Johnson

Patents by Inventor Neldon P. Johnson

Neldon P. Johnson has filed for patents to protect the following inventions. This listing includes patent applications that are pending as well as patents that have already been granted by the United States Patent and Trademark Office (USPTO).

Apparatus and method for secured commercial transactions

Publication number: 20080262973

Abstract: A transaction security code database and a method and apparatus for generating the transaction security code database. The transaction security code database is comprised of multiple transaction security codes, each transaction security code constituting a transaction code generated based upon a transaction initiated by a user, which is appended to or linked to a security code which is based upon a biometric sensor code generated by a biometric sensor from a biometric presentation of a biometric feature of the user.

Type: Application

Filed: April 20, 2007

Publication date: October 23, 2008

Inventor: Neldon P. Johnson

System and method for secured voting transactions

Publication number: 20080184037

Abstract: A secured electronic system and method for taking and counting votes. A database of unique ballot security codes, each ballot security code consisting of a ballot code representing the ballot selections of a voter and a security code derived from sensing with a biometric sensor a biometric presentation of a biometric feature of the voter. Each ballot security code is checked before entry into the database to verify that the security code component is not within a voter template of the security code component for any prior ballot security code, to prevent multiple votes being cast by any voter. Recounts are validated by verifying the uniqueness of the security code component of each ballot security code and verifying that each security code is not within a voter template of any other security code. Each ballot security code may also be checked against a registration data base thereby verifying that the voter is registered.

Type: Application
Filed: January 31, 2007
Publication date: July 31, 2008
Inventor: Neldon P. Johnson

Presnel lens angular segment manufacturing apparatus and method

Publication number: 20080150189
Abstract: A roller extruder for manufacturing Fresnel lens angular segments from raw plastic, the roller extruder having a blank roller and a die roller positioned a desired roller clearance from the blank roller, the die roller having two peripheral lens dies with an angular displacement between the lens dies increasing linearly from a die junction at the inside roller edge to approximately one hundred eighty degrees at the outside roller edge, and the die roller having peripheral Fresnel facet dies.
Type: Application
Filed: July 11, 2007
Publication date: June 26, 2008
Inventor: Neldon P. Johnson

Fresnel lens angular segment manufacturing apparatus and method

Publication number: 20080150175
Abstract: A roller extruder for manufacturing Fresnel lens angular segments from raw sheet plastic, the roller extruder having a blank roller and a die roller positioned a desired roller clearance from the blank roller, the die roller having two peripheral lens dies with an angular displacement between the lens dies increasing linearly from a die junction at the inside roller edge to approximately one hundred eighty degrees at the outside roller edge, and the die roller having peripheral Fresnel facet dies.
Type: Application
Filed: December 22, 2006
Publication date: June 26, 2008
Inventor: Neldon P. Johnson

Fresnel lens angular segment manufacturing apparatus and method

Publication number: 20080150179
Abstract: A roller extruder for manufacturing Fresnel lens angular segments from raw plastic, the roller extruder having a blank roller and a die roller positioned a desired

roller clearance from the blank roller, the die roller having two peripheral lens dies with an angular displacement between the lens dies increasing linearly from a die junction at the inside roller edge to approximately three hundred sixty degrees at the outside roller edge, and the die roller having peripheral Fresnel facet dies.
Type: Application
Filed: December 24, 2007
Publication date: June 26, 2008
Inventor: Neldon P. Johnson

Voltage controller
Publication number: 20080054327
Abstract: A voltage controller having an input distribution network with imbedded input switches, a number of charge storage elements such as capacitors, an output distribution network with imbedded output switches, and a switch actuator which controls the input switches and output switches to provide for the controlled charging and discharging of the charge storage elements.
Type: Application
Filed: August 15, 2006
Publication date: March 6, 2008
Inventor: Neldon P. Johnson

Pressurized fluid bladeless turbine engine with opposing fluid intake assemblies
Patent number: 7314347
Abstract: A bladeless pressurized fluid turbine engine having a bladeless turbine, internal, concentric or circumferential shaft fluid ways which transmit pressurized gas to the turbine, and a pair of opposing pressurized fluid intake assemblies. Each intake assembly has a fixed outer housing, two or more shaft seals sealing between the shaft and the outer housing forming fluid supply chambers between adjacent shaft seals, and a pair of shaft bearings bearing between the shaft and the outer housing. The outer housing has one or more fluid intake ports for each fluid supply chamber and each shaft fluid way has a shaft fluid intake which is hydraulically connected to a fluid supply chamber.
Type: Grant
Filed: October 7, 2004
Date of Patent: January 1, 2008
Assignee: N.P. Johnson Family Limited Partnership

Inventor: Neldon P. Johnson

Pressurized fluid turbine engine

Patent number: 6997674

Abstract: A bladeless pressurized fluid turbine engine having a bladeless turbine, internal, concentric or circumferential shaft fluid ways which transmit pressurized gas to the turbine, and a pressurized fluid intake assembly. The intake assembly has a fixed outer housing, two or more shaft seals sealing between the shaft and the outer housing forming fluid supply chambers between adjacent shaft seals, and a pair of shaft bearings bearing between the shaft and the outer housing. The outer housing has one or more fluid intake ports for each fluid supply chamber and each shaft fluid way has a shaft fluid intake which is hydraulically connected to a fluid supply chamber.

Type: Grant

Filed: May 4, 2004

Date of Patent: February 14, 2006

Assignee: N. P. Johnson Family Limited Partnership

Inventor: Neldon P. Johnson

Pressurized gas turbine engine with electrothermodynamic enhancement

Patent number: 6783320

Abstract: Pressurized gas turbine engine with efficiency enhanced by an electrothermodynamic power convertor. The turbine has peripheral nozzles which are supplied with pressurized gas or pressurized liquid by internal nozzle gas ways. Pressurized liquid is flashed by the nozzles. The electrothermodynamic power convertor has a collector plate which envelopes the turbine engine expansion chamber and a charged screen which is positioned radially between the gas nozzles and the collector plate. Collector plate insulation is affixed between the collector plate and the walls of the expansion chamber.

Type: Grant

Filed: March 18, 2003

Date of Patent: August 31, 2004

Assignee: International Automated Systems, Inc.

Inventor: Neldon P. Johnson

Pressurized gas turbine engine with electrothermodynamic enhancement

Publication number: 20040005214
Abstract: Pressurized gas turbine engine with efficiency enhanced by an electrothermodynamic power convertor. The turbine has peripheral nozzles which are supplied with pressurized gas or pressurized liquid by internal nozzle gas ways. Pressurized liquid is flashed by the nozzles. The electrothermodynamic power convertor has a collector plate which envelopes the turbine engine expansion chamber and a charged screen which is positioned radially between the gas nozzles and the collector plate. Collector plate insulation is affixed between the collector plate and the walls of the expansion chamber.
Type: Application
Filed: March 18, 2003
Publication date: January 8, 2004
Inventor: Neldon P. Johnson

Shelf pricing display apparatus
Patent number: 6624757
Abstract: An electronic display strip is attached to the shelf front of retail shelves, each shelf having an address code assigned through a control computer. Display fields of variable locations and lengths within each display strip are assigned to each product on a shelf through the control computer. Shelf and display field address codes, product information and product price information are transmitted on a continuous or intermittent basis by the control computer through a communications link to signal processors at each display strip. A control circuit for the display strip stores the information in a display memory and energizes the display field matching the display field address code for the product, thereby displaying the product information and product price in the display field.
Type: Grant
Filed: April 12, 2000
Date of Patent: September 23, 2003
Inventor: Neldon P. Johnson

Pressurized gas turbine engine
Patent number: 6533539
Abstract: A pressurized gas turbine engine is disclosed which utilizes a new turbine design. Pressurized gas is supplied by nozzle gas ways in the turbine to gas nozzles affixed to the perimeter of the turbine. The gas nozzles may be recessed in the turbine

perimeter or extend from the turbine perimeter. The gas nozzles may be equipped with gas exit cones to enhance the efficiency of the nozzles. The axis of the nozzles have an oblique angle with the direction of rotation of the turbine. Pressurized gas is supplied to the nozzle gas ways through one or more shaft gas ways in the turbine shaft, or is supplied through engine gas ports in the front wall of the turbine engine to gas supply zones which are hydraulically separated by seal rings on the front face of the turbine, each gas supply zone being hydraulically connected to one or more nozzle gas ways.
Type: Grant
Filed: March 21, 2001
Date of Patent: March 18, 2003
Assignee: International Automated Systems, Inc.
Inventor: Neldon P. Johnson

PRESSURIZED GAS TURBINE ENGINE
Publication number: 20030049119
Abstract: A pressurized gas turbine engine is disclosed which utilizes a new turbine design. Pressurized gas is supplied by nozzle gas ways in the turbine to gas nozzles affixed to the perimeter of the turbine. The gas nozzles may be recessed in the turbine perimeter or extend from the turbine perimeter. The gas nozzles may be equipped with gas exit cones to enhance the efficiency of the nozzles. The axis of the nozzles have an oblique angle with the direction of rotation of the turbine. Pressurized gas is supplied to the nozzle gas ways through one or more shaft gas ways in the turbine shaft, or is supplied through engine gas ports in the front wall of the turbine engine to gas supply zones which are hydraulically separated by seal rings on the front face of the turbine, each gas supply zone being hydraulically connected to one or more nozzle gas ways.
Type: Application
Filed: March 21, 2001
Publication date: March 13, 2003
Inventor: Neldon P. Johnson

Fingerprint sensor and method
Patent number: 6444969
Abstract: A device for sensing and digitizing a fingerprint from a subject finger comprising a prism, a pixilated LED array affixed to the bottom surface of the prism and providing for the internal illumination, with a plurality of sub-beams, of the contact surface where the finger of the subject is pressed on the top surface of the prism, and a

photoelectric sensor to detect the sub-beam radiation reflected from the fingerprint valley points. A sensor lens may also used for focusing the sub-beam radiation on the sensor. A lens wafer may be affixed between the prism and the LED array for focusing the radiation from each LED on its corresponding illumination point on the contact surface. The fingerprint ridge contact points do not reflect incident sub-beam radiation.
Type: Grant
Filed: January 26, 2001
Date of Patent: September 3, 2002
Assignee: International Automated Systems, Inc.
Inventor: Neldon P. Johnson

Fingerprint sensor and method
Publication number: 20020018584
Abstract: A device for sensing and digitizing a fingerprint from a subject finger comprising a prism, a pixilated LED array affixed to the bottom surface of the prism and providing for the internal illumination, with a plurality of sub-beams, of the contact surface where the finger of the subject is pressed on the top surface of the prism, and a photoelectric sensor to detect the sub-beam radiation reflected from the fingerprint valley points. A sensor lens may also used for focusing the sub-beam radiation on the sensor. A lens wafer may be affixed between the prism and the LED array for focusing the radiation from each LED on its corresponding illumination point on the contact surface. The fingerprint ridge contact points do not reflect incident sub-beam radiation.
Type: Application
Filed: January 26, 2001
Publication date: February 14, 2002
Inventor: Neldon P. Johnson

Fingerprint sensing device and method
Patent number: 6255641
Abstract: A device for sensing and digitizing a fingerprint from a subject finger comprising a prism, a pixilated illuminating radiation source such as a surface-emitting laser or a radiation source and a LCD affixed to the bottom surface of the prism and providing for the internal illumination, with a plurality of sub-beams, of the contact surface where the finger of the subject is pressed on the top surface of the prism, a photoelectric sensor to detect the sub-beam radiation reflected from the fingerprint valley points, and a lens for focusing the sub-beam radiation on the sensor. The

fingerprint ridge contact points do not reflect incident sub-beam radiation. A computer can provide for sequential emission of the sub-beams so that a single cell photoelectric sensor can be used to detect the reflected sub-beams or a multiple cell photoelectric sensor can be used, with each cell corresponding to a particular sub-beam. Reflected sub-beam radiation corresponds to a fingerprint valley point.
Type: Grant
Filed: November 19, 1999
Date of Patent: July 3, 2001
Assignee: International Automated Systems, Inc.
Inventor: Neldon P. Johnson

Signal demodulation method and apparatus
Patent number: 6236691
Abstract: A method and apparatus for separating multiple frequency information signals. This invention provides a method and apparatus for separating a communications signal, which is comprised of multiple component information waves of distinct frequencies, into its component waves for demodulation. The extraction of the component information waves is accomplished by determining the mid-cycle zero crossing points of the component information waves by reference to a reference wave, determining the amplitude of the combined wave at these zero crossing points and generating amplitude equations for each of these zero crossing points. These amplitude equations are solved to determine the amplitude coefficients of the component information waves, thereby extracting the transmitted information.
Type: Grant
Filed: March 16, 1999
Date of Patent: May 22, 2001
Assignee: International Automated Systems, Inc.
Inventor: Neldon P. Johnson

Fingerprint sensing apparatus and method
Patent number: 6191410
Abstract: A device for sensing and digitizing a fingerprint from a subject finger comprising a prism, a pixilated illuminating radiation source such as a surface-emitting laser or a radiation source and a LCD affixed to the bottom surface of the prism and providing for the internal illumination, with a plurality of sub-beams, of the contact surface where the finger of the subject is pressed and the top surface of the prism, and a

photoelectric sensor to detect the sub-beam radiation reflected from the fingerprint valley points. The fingerprint ridge contact points do not reflect incident sub-beam radiation. A computer can provide for sequential emission of the sub-beams so that a single cell photoelectric sensor can be used to detect the reflected sub-beams or a multiple cell photoelectric sensor can be used, with each cell corresponding to a particular sub-beam. Reflected sub-beam radiation corresponds to a fingerprint valley point. Non-reflected sub-beam radiation corresponds to a fingerprint ridge point.
Type: Grant
Filed: June 23, 1999
Date of Patent: February 20, 2001
Assignee: International Automated Systems, Inc
Inventor: Neldon P. Johnson

Method and apparatus for reducing receiver imposed distortion
Patent number: 6137831
Abstract: Method and apparatus for reducing the distortion imposed upon a combined information wave by a receiver filter or other signal processor. The method includes a step of adjusting the amplitude of the positive and negative segments of the combined information wave such that the positive and negative segments have pre-selected and equal amplitudes. The apparatus includes an adder circuit for combining the component information waves and the reference wave to form the combined information wave, a wave shaper to produce an equalized wave, and a wave multiplier for proportionally adjusting, on a half cycle basis, the amplitudes of the equalized positive and negative segments. The method further includes a step of pre-distorting the combined information wave to compensate for the distortion effect of a receiver filter or other signal processor.
Type: Grant
Filed: June 20, 1997
Date of Patent: October 24, 2000
Inventor: Neldon P. Johnson

Apparatus and method for digital information transfer
Patent number: 6122323
Abstract: A method and apparatus for multiple frequency, multiple channel digital information transfer through time slot allocation. The apparatus consists of one or more transmitting devices and one or more receiving devices. Multiple source signals are each

allocated a time slot and a frequency. A continuous synchronizing wave defines the time slots and provides for time slot tracking. Digital signals from each source are allocated a time slot and assigned one of the information wave frequencies in that time slot. The information waves are combined with the synchronizing wave and transmitted to one or more receivers as one signal in each time slot. The manner in which the waves are combined allows the components to be extracted by the receivers largely through the use of curve fitting techniques rather than through the use of filters.

Type: Grant

Filed: March 23, 1998

Date of Patent: September 19, 2000

Assignee: International Automated Systems, Inc.

Inventor: Neldon P. Johnson

PREV 1 2 3 NEXT

Patents by Inventor Neldon P. Johnson

Neldon P. Johnson has filed for patents to protect the following inventions. This listing includes patent applications that are pending as well as patents that have already been granted by the United States Patent and Trademark Office (USPTO).

Signal extraction method and apparatus

Patent number: 6088403

Abstract: A method and apparatus for separating multiple frequency information signals. This invention provides a method and apparatus for separating a communications signal, which is comprised of multiple component information waves of distinct frequencies, into its component waves for demodulation. The extraction of the component information waves is accomplished by determining the mid-cycle zero crossing points of the component information waves by reference to a reference wave, determining the amplitude of the combined wave at these zero crossing points and generating amplitude equations for each of these zero crossing points. These amplitude equations are solved to determine the amplitude coefficients of the component information waves, thereby extracting the transmitted information.

Type: Grant

Filed: November 19, 1999

Date of Patent: July 11, 2000

Inventor: Neldon P. Johnson

Communications method and apparatus for digital information

Patent number: 5689529

Abstract: A method and apparatus for single signal, multiple channel digital information transfer through pulses with time slot allocation. The apparatus consists of one or more transmitting devices and one or more receiving devices. Multiple source signals are each allocated a unique time slot between successive synchronization pulses. Digital signals from each source are converted to analog information pulses synthesized from a combination of a fundamental frequency wave and a finite number of its harmonics. The total signal, which consists of successive synchronization pulses interspersed with information pulses for each signal source, each within its allocated

time slot, is transmitted to the receivers. Each receiving device extracts the fundamental frequency and harmonic components through the use of narrow bandpass, high Q filters for each information pulse in its time slot and uses the known algorithm to reproduce the input digital signals.
Type: Grant
Filed: April 5, 1996
Date of Patent: November 18, 1997
Assignee: International Automated Systems, Inc.
Inventor: Neldon P. Johnson

Digital communications modulation method and apparatus

Patent number: 5640422
Abstract: A method and apparatus for single signal, multiple channel digital information transfer through waves with time slot allocation. The apparatus consists of one or more transmitting devices and one or more receiving devices. Multiple source signals are each allocated a unique time slot between successive synchronization waves. Digital signals from each source are converted to analog information waves having a positive wave segment and a negative wave segment. The ratio of the amplitude of the positive wave segment to the amplitude of the negative wave segment, the positive-to-negative ratio, for each signal source, is a function of the magnitude of the source digital. The sum of the amplitude of the positive wave segment and the absolute value of the amplitude of the negative wave segment, the positive-to-negative offset, is maintained at a pre-set value at transmission.
Type: Grant
Filed: September 26, 1995
Date of Patent: June 17, 1997
Assignee: International Automated Systems, Inc.
Inventor: Neldon P. Johnson

Process for encrypting a fingerprint onto an I.D. card

Patent number: 5598474
Abstract: The invention and process utilizes any number of biological parts to provide a proof of legitimacy and from them generate and verify a personal identification card (ID). This rendition of the invention deals mainly with fingerprints, but does not preclude the use of other biological parts. The invention is unique in being able to render complex forms into unique biological characteristic codes of the unique

biological parts, especially the fingerprint, and then to be able to encode that code onto the magnetic strip of an ID card or credit card. The invention renders complex biological forms into numeric representations of the unique biological parts and especially the fingerprint. The number generated thereby is encoded onto the magnetic strip of an ID card or credit card.
Type: Grant
Filed: March 10, 1995
Date of Patent: January 28, 1997
Inventor: Neldon P. Johnson

Modulation method and apparatus for digital communications
Patent number: 5517528
Abstract: A method and apparatus for single signal, multiple channel digital information transfer through pulses with time slot allocation. The apparatus consists of one or more transmitting devices and one or more receiving devices. Multiple source signals are each allocated a unique time slot between successive synchronization pulses. Digital signals from each source are converted to positive analog information spikes which are combined in their respective time slot with a negative reference spike of uniform magnitude to form an information pulse. The total signal, which consists of successive synchronization pulses interspersed with information pulses for each signal source, each within its allocated time slot, is transmitted to the receivers. Each receiving device extracts the maximum information spike values and the reference spike values for one or more of the signal sources.
Type: Grant
Filed: August 2, 1994
Date of Patent: May 14, 1996
Assignee: International Automated Systems, Inc.
Inventor: Neldon P. Johnson

Automated self-service checkout system
Patent number: 4787467
Abstract: An apparatus for self-service check out which calculates, within a main computer, the cumulative total weight of items, based on pre-determined and pre-programmed weights, and compares the computerized cumulative total weight to the weight determined by a second weigh scale means which determines the total weight of all items placed in a receiving container means. Items scanned by electronic means are

itemized by the computer which directs the printing of an itemized register tape. Fraudulent mishandling of items by the customer is overcome by communication between the computer and ending weigh scale when weights calculated by each correspond within a determined tolerance level. In an alternate embodiment, a weighing of pre-scanned items in total is required to correspond with the total weight calculated by the computer and the end weigh scale, within a determined tolerance level.

Type: Grant
Filed: July 31, 1987
Date of Patent: November 29, 1988
Inventor: Neldon P. Johnson

PREV 1 2 3

EXHIBIT A

Exhibit "A" - Neldon Johnson Patents

Application Number	Patent or Publication Number	Title of Invention	Docket Number	Application Date
07/079,951	4,787,467	Automated self-service checkout system		07-31-1987
08/402,014	5,598,474	Process for encrypting a fingerprint onto an I.D. card		03-10-1995
08/285,030	5,517,528	Modulation method and apparatus for digital communications	NJ-001	08-02-1994
08/533,618	5,640,422	Digital communications modulation method and apparatus	NJ-002	09-26-1995
08/628,280	5,689,529	Method and apparatus for reducing receiver imposed distortion	NJ-003	04-05-1996
09/043,478	6,122,323	Apparatus and method for digital information transfer	NJ-004	03-23-1998
08/879,755	6,137,831	Method and apparatus for reducing receiver imposed distortion	NJ-005	06-20-1997
09/268,707	6,236,691	Signal demodulation method and apparatus	NJ-006	03-16-1999
09/444,131	6,255,641	Fingerprint sensing device and method	NJ-007	11-19-1999
09/443,905	6,088,403	Signal extraction method and apparatus	NJ-008	11-19-1999
09/547,636	6,624,757	Shelf pricing display apparatus	NJ-010	04-12-2000
09/339,464	6,191,410	Fingerprint sensing apparatus and method	NJ-011	06-23-1999
09/771,331	6,444,969	Fingerprint sensor and method	NJ-012	01-26-2001
09/814,498	6,533,539	Pressurized gas turbine engine	NJ-013	03-21-2001
10/391,397	6,783,320	Pressurized gas turbine engine with	NJ-021	03-18-2003

Exhibit "A" - Neldon Johnson Patents

		electrothermodynamic enhancement		
10/839,697	6,997,674	Pressurized fluid turbine engine	NJ-026	05-04-2004
10/962,051	7,314,347	Pressurized fluid bladeless turbine engine with opposing fluid intake assemblies	NJ-029	10-07-2004
11/351,738	7,449,807	Magnetic transmission	NJ-030	02-09-2006
11/644,233	7,789,650	Fresnel lens angular segmentmanufacturing apparatus and method	NJ-031	12-22-2006
11/069,160	US 2006-0191411 A1 (Abandoned)	Water extraction apparatus and method	NJ-032	02-28-2005
11/504,481	7,705,560	Voltage controller	NJ-033	08-15-2006
11/065,965	Abandoned	US 2006-0218039 A1	NJ-035	02-25-2005
11/827,399	7,789,651	Fresnel lens angular segment manufacturing apparatus and method	NJ-041	07-11-2007
12/005,211	7,789,652	Fresnel lens angular segment manufacturing apparatus and method	NJ-042	12-24-2007
11/788,835	8,571,996	Apparatus and method for secured commercial transactions	NJ-044	04-20-2007
11/701,102	8,047,435	System and method for secured voting transactions	NJ-045	01-31-2007
12/987,094	8,900,500	Facet deformation minimizing fresnel lens die roller and manufacturing method	NJ-050	01-08-2011
14/517,797	9,418,791	Folded stack segmented film capacitor	NJ-052	10-17-2014
13/772,272	9,068,763	Solar energy receiver	NJ-053	02-20-2013
14/010,854	9,599,404	Fluid direct contact heat exchange apparatus and method	NJ-054	08-27-2013
14/179,343	US 2015-0225256 A1	Water reclamation system and method	NJ-055	02-12-2014

Exhibit "A" - Neldon Johnson Patents

14/173,790	Abandoned	US 2015-0219364 A1	NJ-056	02-05-2014
14/061,731	Abandoned	US 2015-0108939 A1	NJ-057	10-23-2013
14/038,486	US 2015-0088742 A1	Apparatus and method for secured commercial transactions	NJ-058	09-26-2013
14/738,138	US 2016-0365730 A1	Capacitor enhanced multi-element photovoltaic cell	NJ-059	06-12-2015
15/261,811	Un-published	VTOL rotor assembly with stowable blades	NJ-062	09-09-2016
15/354,829	Un-published	Shock dampening pump	NJ-069	11-17-2016