

Samuel Louis Sachs

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Profile

Admitted to practice law before: the Supreme Court of the United States of America; the Third Circuit Court of Appeals; the Court of Appeals for the Federal Circuit; the United States District Court for the District of New Jersey; and all courts in the State of New Jersey including the Supreme Court of New Jersey. Actively practiced patent law since 1976 in the mechanical, electro-mechanical, electrical, and bio-medical arts.

Served as a Municipal Public Defender, a Municipal Prosecutor, and as a Municipal Court Judge from 1989 to 1998. Since leaving the bench, in full time private practice devoted to motor vehicle and criminal matters. Editor of Municipal Court Practice, a textbook used by the Institute of Continuing Legal Education (ICLE) for educating lawyers as to Municipal Court practice, and is a regular lecturer at ICLE since 1992. Has also lectured on the law at Trenton State College and at the Administrative Office of the Courts Orientation Program for Newly Appointed Municipal Court Judges.

Named Municipal Court Attorney of the Year for 2006 by the New Jersey State Bar Association because of his work as the lead attorney on all hardware and software issues in State v Chun before the New Jersey Supreme Court. State v Chun is a landmark case involving the scientific reliability of an embedded computer controlled breath testing instrument, the Dräger Alcotest®7110 Mark IIIC.

Education

J.D., with honors, George Washington University, Washington DC *May 1982*

B.A., Magna Cum Laude, Trenton State College, New Jersey *May 1977*
(course work study in Physics, Electronics, Computer Programming, & Statistics)

Registered Patent Attorney/Agent Requirements

United States Patent & Trademark Office, U.S.

1976 - Present

Attorney/Agent (Registration # 28356)

An Attorney and/or Agent must demonstrate that he or she possesses the scientific and technical training necessary to provide valuable service to patent applicants and bears the burden of showing their requisite scientific and technical training to be admitted to take the patent bar exam and be registered to practice.

To be registered as an Attorney/Agent one who possesses a Bachelors degree in a non-technical subject must establish to the satisfaction of the United States Patent & Trademark Office that he or she possesses scientific and technical training or life experience equivalent to that received at an accredited US college or university.

Certifications

**Dräger Alcotest 7110 Mark IIIC
Factory Certified**

Dec 2008

State v Chun mandated Alcotest®7110 MarkIIIC Dräger Factory Training Course and Certification.

Licensing

**Federal Communications Commission
Amateur Radio General Class license W2ESQ**

1967-Present

Authorized to and have built, repaired, and operated various radio transmission and receiving devices, antennas, and power supplies.

Career History**Self-Employed, New Jersey & Maryland***August 1974-Aug 1977***Patent Agent Apprentice & Patent Agent**

Private practice, preparing and prosecuting patent applications before the United States Patent and Trademark Office for inventors and numerous clients of several Patent Attorneys, performing patent infringement and patent validity studies.

Johns Hopkins University, Applied Physics Laboratory,*Laurel, MD**August 1977-May 1982***Office of Counsel – Senior Staff** (*Nationally renowned research institution – Granted United States “Secret” clearance*)

Responsibilities included practice before the United States Patent and Trademark Office as a Registered Patent Agent preparing and prosecuting patent applications, performing patent validity and infringement studies and reports, negotiating intellectual property agreements, and general counseling of University staff in intellectual property matters. Patents were prepared and/or prosecuted, in many areas of technology including satellite and submarine components, energy storage devices, electronically controlled human mobility devices, ocean thermal energy conversion devices, and numerous electronic biomedical devices.

Lerner, David, Littenberg, Krumholz, and Mentlik, Westfield,*NJ**June 1982-March 1984***Associate** (*Pre-eminent New Jersey Intellectual Property Firm*)

Counseling clients in all aspects of Intellectual Property Law and related legal matters including comprehensive practice before the United States Patent and Trademark Office, preparation of legal memoranda on varying topics, drafting of legal opinions on matters including patent and trademark validity and infringement, and litigation, in all areas of technology.

East Windsor Public Defender, East Windsor, NJ*Sept 1983-Jan 1987***Public Defender**

Represented indigent Defendants before the Court.

East Windsor Planning Board, East Windsor, NJ*Jan 1987-Dec 1987***Planning Board Attorney**

Advised Board at each meeting as to the substance and procedural aspects of the planning process and land use.

East Windsor Municipal Court, East Windsor, NJ*Jan 1988-Dec 1988***Prosecutor**

Regularly prosecuted all types of matters within the jurisdiction of the court.

East Windsor Municipal Court, East Windsor, NJ *Jan 1988-March 1998*
Municipal Court Judge

Regularly presided at all sessions of Court and supervised all functions of a six person violations bureau.

Sachs & Sachs, P.A., East Windsor, NJ *April 1984-August 1995*
Partner

Intellectual Property Law and General practice including preparation and prosecution of patent and trademark applications in the United States and Worldwide. Copyright filings, and general intellectual property counseling for corporate clients; Negotiated and drafted numerous intellectual property agreements in all areas of technology including software applications; general law practice.

The Law Offices of Samuel Louis Sachs, Esq., East Windsor, NJ *Sept 1995-Present*
Owner

Experience includes Intellectual Property Law practice including preparation and prosecution of patent and trademark applications in diverse technical arts in the United States and Worldwide. Copyright filings and general intellectual property counseling for corporate clients. Extensive experience in motor vehicle and criminal matters.

**Teaching &
Lecturing History**

N.J. Judges Orientation Seminar, New Jersey *1993-1996*
Lecturer

Lecture on Municipal Court practice.

N.J. Institute of Continuing Legal Education, New Jersey *July 1993-Present*
Lecturer

Bi-annual lectures on Municipal Court practice, including fundamentals of alcohol breath testing.

Trenton State College, Law & Justice Dept., New Jersey *Spring 1992*
Adjunct Professor

Taught Senior Law Seminar.

Breath Testing Equipment (Source Code) Seminar, Atlanta, GA *January 2008*
Lecturer

Lecture on Breath Test Equipment and Source Code

Abstracts of Representative U.S. Patents Prepared and/or Prosecuted by Samuel L. Sachs

(Full text copies available upon request)

Implantable Programmable Medication Infusion System – Patent 4,373,527

An implantable programmable medication infusion system comprises an implantable portion having a medication reservoir at below body pressure and isolated at its input from the body in which it is implanted by an antechamber the pressure integrity of which is checked before filling the medication reservoir. Safety features include a leak detector, inlet and outlet valves used with flow impeding filters, and a maximum allowable pressure in a pulsatile bellows pump all of which prevent undesired infusion of medication. Medication flow from the pulsatile bellows pump is in response to programming commands from a drug programming system and processed in an electronics section which uses the commands to program memory units and to request pulses of medication. Hardwired limit controls prevent excessive dosage requests from reaching the pulsatile bellows pump. For patient convenience and safety, the memory units are programmed with running integral limits. A record of medication dispensing can be communicated to a physician by means of a telemetry transmitter which sends signals by telemetry to the communications head which information is displayed on the drug programming unit.

Ultrasonic Cleaning Method and Apparatus – Patent 4,375,991

An ultrasonic cleaning apparatus which is configured for transportation to an object positioned for use for situ cleaning and a method for accomplishing the cleaning. In one embodiment, the present invention provides a substantially planar transducer array which can be employed to clean biofouling from heat exchangers or other devices that are disposed in a contaminated liquid environment. Sufficient levels of power can be generated so that the liquid medium in which the cleaning apparatus is disposed can be caused to undergo cavitation to effect the desired cleaning action. Through the use of various types of instrumentation, areas which need to be cleaned as well as effectiveness of cleaning and the operating parameters of the apparatus can be determined. The transducers are oriented so that they radiate in alternative directions to produce bi-directional radiation and are energized by a pulsating power input.

(Mr. Sachs was also the co-inventor of this device)

Fluid Leakage Sensors – Patent 6,112,579

A conductive fluid leakage sensor capable of detecting a leak from a first electrically conductive or non-conductive container with a conductive liquid disposed therein, has a second or outer electrically conductive coating surrounding a first conductive or non-conducting inner container. An electrical connection is made between the outer member and to the conductive fluid disposed within the container, so that conductive fluid leaking from the container that comes into contact with the outer electrically conductive coating creates a pulse, which may be sensed by a sensing apparatus providing an indication thereof.

Automatic Injector for Hypodermic Syringes or the Like and Lancet Holders for Use in Conjunction with an Automatic Injector – Patent 4,445,510

An apparatus for propelling an elongated device including a sharp object such as a hypodermic syringe and needle or the like into biological tissue, the apparatus including an inner sleeve for carrying the hypodermic syringe or the like and an outer sleeve in which the inner sleeve reciprocates, biasing means being provided for biasing the inner sleeve relative to the outer sleeve. The locking sleeve received therein the outer sleeve and through at least one recess and ball bearing arrangement, the inner sleeve can be locked relative to the outer sleeve. When the locking sleeve is forced against biological tissue, the ball bearing or bearings release the locked relationship between the inner and outer sleeves and propel the needles of the hypodermic syringe or the like into the biological tissue. An improvement is assembly is provided by the present invention such that the ball bearings can be placed in position without the boring of a ball bearing loading aperture in the locking sleeve. Additionally, a lancet holder is provided which simulates the shape of a syringe. The lancet holder carries a lancet for insertion into the aforescribed apparatus for utilization in taking of blood samples or the like.

Intracranial Pressure Implant – Patent 4,265,252

An implantable transducer device containing a passive RF resonant circuit having a natural frequency influenced by the pressure of the sensor's environment in a body cavity of a living entity. The circuit of the transducer includes an inductor and a capacitor, at least one of which varies in value in direct relation to variation of environmental pressure to change the resonant frequency of the circuit. The circuit can be externally interrogated to determine the resonant frequency thereof at any point in time by the imposition thereon of swept frequency electromagnetic radiation provided by a monitoring device which determines when some of the radiation is absorbed as a result of the frequency of the

radiation being the same as the resonant frequency of the transducer circuit. An imposed relationship exists between the sensed environment pressure, and the reactance of the reactive components of the circuit. A natural relationship exists between pressure sensitive reactance, and the resonant frequency of the circuit. As a result, an increase in environmental pressure causes a corresponding increase in frequency and a decrease in environmental pressure causes a decrease in frequency.

Ultrasonic Cleaning Method and Apparatus for Heat Exchangers – Patent 4,244,749

Biofouling is removed from the external surfaces of spaced apart pipes of a heat exchanger which are in contact with a liquid by positioning a plurality of ultrasonic transducers between the pipes and operating the transducers at sufficient power levels to cause cavitation within the liquid to effect the desired cleaning action. The transducers are arranged in a planar configuration to produce bi-directional acoustic radiation. Various types of instrumentation are provided for determining extent of biofouling and effectiveness of cleaning as well as for monitoring transducer operating parameters.

(Mr. Sachs was also the co-inventor of this device)

Method and Apparatus for Achieving Penile Erection in a Human Male – Patent 4,596,242

A method and apparatus for achieving penile erection in a human male. The apparatus includes at least one distensible cylinder which is in communication with pressure reservoir means through a valve means. A fluid pressure generator acts upon a working fluid in the pressure reservoir means and when the valve means is opened, the distensible cylinder distends. The method concerns implantation and use of the apparatus.

Low Axial Force Servo Valve Spool – Patent 4,155,535

A valve spool characterized by significantly lower flow induced axial force, the force being sufficiently low to render single stage servomechanical valves practical for small and moderately powered servomechanical apparatus. The present valve spool and servomechanical apparatus has a zero force metering edge which results from selection of a slope for the exit portion of the flow contour which is between that of a prior art rectangular port and that of the shallow slope typical of large negative axial force design. The present valve spool is further configured to allow metering across a small portion of the spool circumference in order to increase valve stroke and to minimize spool leakage. Preferably, a wedge is cut on two of the metering spool edges by grinding symmetrical flats across the valve spool edge to form the metering edges, the metering orifice then being defined by the intersection of the insert edge and the valve spool flat. Use of a partial circumferential opening, such as a wedge cut, in combination with a low force flow contour results in a valve spool with long stroke, low axial flow force, negligible leakage, and which can be manufactured with low tolerances.

Robotic Collision Sensors and Compliance Devices – Patent 4,638,231

A collision sensor and compliance device for use with computer controlled robotic arms adapted to have a robotic hand disposed on the distal end thereof includes a housing affixed to the robotic arm on one end with a robotic hand affixed upon the other end thereof. The front and rear walls of the housing includes triangular-shaped apertures disposed in a common plane with the apex of each of the triangularly-shaped apertures being positioned equally distant from the lower edges of each of the walls. Light emitting diodes are centrally disposed in one pair of the oppositely disposed walls with photoelectric light sensors disposed in the robotic hand support bracket. The robotic hand or support bracket includes at least a pair of bearings (preferably two pair) disposed at right angles to each other and adapted to be received and cooperate with a pair of the triangularly-shaped apertures provided in the housing. The bearings have free movement within the apertures and a spring has one end thereof affixed to the bracket or robotic hand and the other end affixed to the housing in order to urge each of the bearings to the same relative position in each of the triangularly-shaped apertures aligning the light emitting diodes and light sensing devices so that a collision of the robotic hand with an object will cause the light sensor to either provide an electrical output signal or not provide electrical output signal, thereby causing the control computer to correct for the movement of the robotic arm to avoid or guarantee the collision at the selected location.

Method for Proportioning Fuel Usage by a Fluid Fueled Apparatus – Patent 4,565,207

A fluid proportioning system for apportioning fuel usage among several discrete fluid fuel supplies which are used to supply fluid fuel to a single commonly used apparatus. An application for the invention is in a multi-dwelling unit wherein each unit is heated from a common furnace. Each tenant's metered gas line is tapped in proportion to the amount of heat necessary to heat their dwelling unit by the adjustment of precision valves, the gas from each line being combined in a manifold. Means are provided to preclude interaction of the individually metered gas lines when the furnace is not consuming gas.

Superflywheel Energy Storage Device – Patent 4,359,912

An inertial energy storage rotor device or superflywheel having a hub means affixed to a rim means by a plurality of spokes formed from a single filament which is wrapped partially around the rim means and alternately engages the upper and lower surfaces of the hub means to join the spokes. In one embodiment, the hub is secured by a single filament wound into a plurality of spokes to a ring means about which a rim means is wound. The ring means is secured to the rim means of this embodiment at a plurality of discrete locations about the circumference thereof.

Epidural Lead Electrode and Insertion Needle – Patent 4,141,365

Tissue stimulation apparatus for positive positioning of an electrode-bearing lead proximate to tissue which is to be stimulated electrically, the invention particularly includes a body penetration and insertion assembly which carries an elongated flexible strip of physiologically inert plastic material having at least one electrode positioned thereon into contacting relation with said tissue. The insertion assembly comprises a hollow needle having a slot formed longitudinally along the length of one wall thereof, the slot allowing transverse removal of the flexible lead from the needle after proper positioning of the lead and after removal of the needle from the body. The present slotted assembly allows use of a flexible electrode lead having electrical connections at the external end thereof which are too large to pass through the hollow needle.

Slide Hammer Having Spot Weldable Surface Engaging Capability – Patent 4,376,385

A tool for re-contouring metal such as dents in the body of an automobile, for use in conjunction with an electrical welding apparatus, including a shaft on which a weight reciprocates, the weight being permitted to selectively collide with structure provided by the shaft to impart a force to the shaft along the longitudinal axis thereof, a portion of the shaft being electrically conductive and electrically connected to the electrical welding apparatus, the electrically conductive portion of the shaft for contacting the metal surface to be straightened, activation of the electrical welding apparatus welding the electrically conductive portion of the shaft to the surface to be straightened so that the forces transferred to the shaft by the weight can act upon the surface to be straightened. One embodiment of the present invention is configured to cooperate with the electrode provided by commercial electrical welding apparatuses while a second embodiment shows a configuration for wiring the tool directly to a cable which in turn can be connected to various types of welding apparatuses.

Socket Drive Wrench and Pawl and Ratchet Assembly – Patent 4,419,911

A pawl and ratchet assembly for use in socket drive wrenches or the like which includes a pair of arcuate pawls that encircle a ratchet gear means. A single control is provided for positioning the pawls so that either of the pawls can individually engage the ratchet gear means to provide clockwise and counterclockwise ratcheting, both of the pawls can engage the ratchet gear means to provide a lockup mode and so that both of the pawls can be disengaged from the ratchet gear means to permit a freewheeling mode. In one embodiment, the pawl control means is mounted on the handle of the socket drive wrench to enhance its accessibility in confined areas of use.

Elastic Internal Flywheel Gimbal – Patent 4,244,240

An elastic joint mounting and rotatably coupling a rotary inertial energy storage device or flywheel, to a shaft, the present gimbal structure reduces vibration and shock while allowing precession of the flywheel without the need for external gimbal mounts. The present elastic joint usually takes the form of an annular elastic member either integrally formed into the flywheel as a centermost segment thereof or attached to the flywheel or flywheel hub member at the center thereof, the rotary shaft then being mounted centrally to the elastic member.

Combination Power and Communication Line Protection Apparatus – Patent 4,438,477

A combination power and communication line protection apparatus includes a housing which contains a power line plug adapted to be received by a conventional wall power receptacle and a receptacle suitable for receiving a male line plug from equipment to be protected in addition to a pair of communication line or modular phone jacks into which an outgoing communication line may be received together with a data link communication line in parallel therewith. The apparatus provides an overvoltage protection for a pair of communication lines and an overvoltage surge protector for the power lines and utilizes the power line ground connection to provide the necessary ground to protect the communication lines from over-voltages thereon.

Method and Apparatus for Proportioning Fuel Usage by a Fluid Fueled Apparatus – Patent 4,478,246

A fluid proportioning system for apportioning fuel usage among several discrete fluid fuel supplies which are used to supply fluid fuel to a single commonly used apparatus. An application for the invention is in a multi-dwelling unit wherein each unit is heated from a common furnace. Each tenant's metered gas line is tapped in proportion to the amount of heat necessary to heat their dwelling unit by the adjustment of precision valves, the gas from each line being combined in a manifold. Means are provided to preclude interaction of the individually metered gas lines when the furnace is not consuming gas.

Self-Retaining Electrical Contacts – Patent 4,529,260

A self-retaining electrically conductive contact suitable for use in insulated terminal blocks and connectors requiring a minimum of spaces between the conductive elements includes a first section which may be formed as a male or female element, a middle section provided with semi-circularly shaped ears which are sloped in a manner to guide the retaining ears around a retaining surface provided in an insulating member when inserted therein and retaining the contact therein once the contact is inserted in the insulated member. The other end section is formed to receive an electrical conductor thereon as required.

Liquid Sampling Apparatus and Method for Manufacturing – Patent 4,561,315

A liquid sampling apparatus for use in sampling the liquid in a well pipe to determine surface contaminants contained therein includes a unitary tubular housing formed to provide a valve seat therein. A ball, freely movable within the tube, is inserted to cooperate with the valve seat to form a valve which remains closed once the sampling tube is filled with water. The opposite end includes a retaining device onto which is affixed a flexible line that has its opposite end affixed to the removable well cap. The flexible line is used to remove the liquid sampling apparatus from the well after a sample of the liquid contained therein has been obtained.

Uninterruptible Switching Power Supply System – Patent 4,564,767

A power supply system for providing uninterruptible DC output power with momentary failure of the primary or AC mains supply utilizing a DC power source for back-up includes a power transformer having two primary windings, rectifying means, a serially-connected high voltage switching device coupling one primary winding to the AC primary mains supply, and a low voltage switching device coupling the second primary winding to the back-up DC supply. An output winding on the power transformer is coupled to a rectifying device for providing a DC output voltage. A transition circuit arrangement senses the DC output voltage and the resulting DC voltage generated by rectifying the AC mains supply and controls the duty cycle of the high voltage and low voltage switching devices by gradually increasing the duty cycle of the low voltage switching device to supply additional power when the AC mains voltage and resulting DC voltage decreases, thereby providing a virtually transient-free DC output voltage. The present circuit arrangement is capable of supplying continuous output power with severe or minor brown-out conditions of the AC mains supply.

Ultrasonic Transducer Apparatus and Method for High Temperature Measurements – Patent 4,567,770

A non-destructive method and apparatus for inspecting materials in excess of 500.degree. C. includes a dual transducer disposed upon a delay line suitable for operation at the elevated temperatures. The delay line is divided into two parts acoustically isolated and is cooled by a fluid to maintain the surface upon which the transducers are mounted at a safe operating temperature.

Robotic End Effectors – Patent 4,591,198

An end effector suitable for use on a robotic arm associated therewith and coupled to a computer includes a universal mounting plate permitting the end effector to be mounted on the distal end of a robotic arm; a gripper mechanism slideably retained within the end effector is responsive to electronic command signals permitting the finger members disposed therein to cooperate with and removably retain a plurality of tools and components upon receiving computer controlled electronic command signal. The electronic command signal controls the driving power from a power source which is coupled to the end effector.

Voltage Arrester with Auxiliary Air Gap – Patent 4,603,368

An overvoltage surge arrester having an auxiliary breakdown path includes an elongated conductive electrode extension device received by one terminal of a gas tube arrester which has disposed thereon a pair of graphite washers with a mica washer sandwiched therebetween and a resilient insulating washer disposed between the extension device retaining head and one of the conductive washers. The other conductive washer is in intimate electrically conductive contact with the gas tube electrode that receives the electrode extension device. The assembly forms a creepage path in parallel with the surge arrester spark gap, when inserted into a conventional conductive cage and its associated tubular cap utilized with a station protector housing.

Automatic Apparatus for Pick-Up Sewing of Curved Edges of a Fabric Piece of Clothing – Patent 4,577,570

In an automatic pick-up sewing system for curved edges of a fabric piece such as an outer pocket on clothing such as a jacket, the clothing kept in a horizontal state with the fabric piece pressed against a sewing needle is displaced two dimensionally during pick-up sewing as programmed under computer control while the sewing needle is driven for concurrent horizontal rotation so that the point of the sewing needle should always be directed in tangential directions of a sewing line on the fabric piece. Beautiful pick-up sewing is achieved quite at high efficiency without any need for highly skilled manual operation.

Device for Monitoring Consumption of Electrical Power – Patent 4,717,872

To enable a user to conveniently determine the amount of AC electrical power supplied by a cable assembly being consumed by appliances at any time, and to thereby enable control of power consumption, a meter indicating power consumption is installed at a convenient remote location and is wired to a sensing unit which is applied externally to the supply cable assembly. No penetration of or other physical connection with cable conductors is necessitated. An induction type sensor or Hall effect sensor may be utilized. The device is applicable to residential, commercial and industrial user/applications and may be built in or portable.

Exchangeable Multi-Function End Effector Tool – Patent 4,723,353

An exchangeable multiple function end effector tool suitable for use on the distal end of a robotic end effector includes, in combination; a mechanism for removably affixing the multiple function end effector tool onto a pair of extending fingers provided on a robotic end effector. The multiple function tool is provided with a first gripping device for acquiring a first element or component and releasably retaining it and further incorporates a second gripping device which is capable of acquiring a second element or component and releasably retaining it in the tool. Provision is made for engaging and disengaging the elements either separately or in unison. Movement, assembly or disassembly of the elements remains a function of the end effector and its control mechanisms.

Measurement System and Method for Determining the Amount of Electromagnetic Radiation Energy Being Absorbed by Living Beings – Patent 5,350,999

A measurement system and method for determining the amount of radiation absorbed by living beings includes a measurement device capable of measuring the amount of radiation emanating from power lines and any other source of radiation of electromagnetic energy (non-ionizing) at a particular location and electrically conductive contact devices for connecting the measurement device to a living being and to a ground and requires that a reference reading be taken and then a second reading obtained by connecting the measurement device to an appendage on a living being with the other end of the meter being connected to ground, a subtraction device indicates the amount of radiation being absorbed by the living being.

Station Interface and Protector Apparatus – Patent 4,624,514

A station interface and protector apparatus for use on a telephone line pair includes a protector device having terminals connected from each line to a round terminal, via a gas discharged tube and/or a protective air gap and includes an insulated cover which covers the protector device and is provided with a telephone receptacle (jack) to which the incoming telephone line pair is connected. A cable having a plurality of wires therein is terminated on one end with a cooperating telephone line plug disposed within the receptacle with the other end of the cable wires being connected to a plurality of terminals provided in the cover which is additionally adapted to receive the subscribers telephone line pairs. By removing the cable plug from the jack provided in the cover the incoming telephone line may be isolated from the subscribers wiring, thus inserting a known operating telephone into the housing receptacle and operating the telephone will immediately determine if the problem exists in the incoming telephone lines or the subscriber's wiring.

Exchangeable Multi-Function End Effector Tools - Patent 4,627,785

An exchangeable multiple function end effector tool suitable for use on the distal end of a robotic end effector includes, in combination; a device for removably affixing the multiple function and effector tool onto a pair of extending fingers provided on a robotic end effector. The multiple function tool is provided with an apparatus for acquiring a first element or component and releasably retaining same and further incorporates a second gripping device which is capable of acquiring a second element or component and releasably retaining same in the tool. Provision is made for engaging and disengaging the elements either separately or in unison. Movement, assembly or disassembly of the elements remains a function of the end effector and its control mechanisms.

Controlled Infusion Containers and Method of Manufacturing – Patent 4,651,870

A controlled infusion container suitable for infusing substances into a liquid into which it is immersed includes a container for the infusible material fabricated from porous sheet material folded upon itself providing a reservoir for the infusible material. The distal edges are folded upon themselves to form a relatively small overlap portion which is then sealed to provide a centrally disposed opening. A handle is inserted into the opening extending therein and is fastened to the remaining open edge of the container retaining the infusible substance therein. By inserting the assembly into a liquid and gently providing for up and down and lateral motion a pumping action created by the handle provides efficient infusion of the infusible substances into the liquid.

Gastrostomy Belt – Patent 4,738,661

A belt for use on patients having had a gastrostomy surgical procedure performed wherein a flexible entrance tube extends outwardly, via a stoma, from the patient's body. The belt includes a pocket into which extends the flexible tube so that any excretions emanating therefrom will be absorbed by the absorbent material of the pocket and may include anti-bacterial medicaments and/or odor neutralizing medicaments therein, fits comfortably around the patient's body and may be reused many times without deterioration.

Milling Device with Universal Gear and Automatic Indexation – Patent 4,657,453

The invention relates to a milling device with universal gear and automatic indexation, removably mounted on a milling head bearing a machining spindle, comprising a main body mounted on the milling head and capable of occupying several positions of indexation with respect to said head by rotation about an axis XX.sub.1 lying in line with the axis of the spindle of the milling head, said main body laterally bearing a spindle-holder unit capable of occupying several positions of indexation with respect to the main body by rotation about an axis YY.sub.1 perpendicular to axis XX.sub.1, the spindle of the unit itself being perpendicular to axis YY.sub.1, wherein the spindle of the milling head is connected to the spindle of the spindle-holder unit by a kinematic chain comprising a shaft or sleeve disposed along axis YY.sub.1 and on which is mounted a gear which is in mesh with a ring gear fast with the spindle-holder unit during the operation of indexation and which is not of mesh with said ring during the work operation.

Multi-Event Biomedical Electrode Assembly – Patent 4,660,562

An electrode assembly for multi-event biomedical event measuring which has a device for sensing more than one physiological parameter of a patient and includes a housing having an upwardly extending portion adapted to receive a mating connector that includes a plurality of electrically conductive paths. The electrically conductive paths are positioned to coincide with electrically conductive paths provided in the upwardly extending housing portion. The housing base includes at least a plurality of compartments; at least one of the compartments circumferentially surround the upwardly extending portion and is open in the opposite direction therefrom. The remaining compartments are disposed beneath the upwardly extending portion and are also open in the opposite direction therefrom. Each of the remaining compartments are adapted to receive a transducer therein with the transducer terminals being connected to

the upwardly extending portion conductive paths. An adhesive pad having a centrally disposed aperture is adapted to receive the base portion of the housing therein and is retained in position by a retaining ring. An electrolyte gel is disposed in at least the circumferentially disposed compartment. A semi-permeable membrane is received by the base portion and covers all of the compartment openings.

Orthodontic Band and Seating Tool – Patent 4,192,068

An orthodontic band and band seating tool therefore includes a seamless tubular band dimensioned to closely encircle a tooth. The band is provided with a plurality of integrally formed protrusions having an engagement surface adapted to cooperate with the band seating tool during the installation of the band about the tooth. The band seating tool provides an elongated handle and a seating element rotatably affixed to one end of the elongated handle, the seating element having a surface for cooperating with the engagement surface of the integrally formed protrusion.

Light Show Apparatus – Patent 4,158,982

A light show apparatus for projecting an image upon a viewing surface in response to a variable sound source such as music or the like including illumination means directed through a light transmitting surface having a plurality of moveable particles disposed thereon wherein the illumination means is varied and the like transmitting surface is vibrated by vibrating means, simultaneously, to produce an ever-changing display of light projected upon the viewing surface by projection means.

Pressure Responsive Switch – Patent 4,110,576

A pressure-responsive mechanical switch for use in conjunction with integral rocket-ramjet engines. The switch may only be activated when two pressure sources acting thereon meet certain preselected conditions and includes a pair of selectively interlocking pistons mounted within a pair of bores disposed in a housing. The pistons are independently acted upon by the forces produced by pressure sources to effect activation of the switch.

Strip Cutting Apparatus – Patent 4,056,025

A cutting apparatus for cutting strip material including a housing with a longitudinal and transverse axis and having an enclosed portion and an open work receiving portion, rollers for feeding strip material along the transverse axis of the open portion, and scissor-like means transversely disposed within the open work receiving portion for shearing the strip material.

Clippable Trouser Retaining Strap – Patent 4,115,906

A clippable trouser retaining strap for maintaining a cuff of an unmodified leg of a pair of trousers worn by a user in a downward position including an elongated elastic member of adjustable length, a first locking clip disposed on one end of the elongated elastic member, and a second locking clip disposed on the other end of the elastic member. The elongated elastic member is positioned beneath the foot of the user and the first and second locking clips are secured to first and second portions of the cuff which are substantially opposite each other. The retaining strap is customarily used in pairs with one strap for retaining each trouser cuff in position.

Paint Distributing Plate – Patent 4,145,789

A paint distributing plate for insertion into an open mouthed receptacle such as a paint bucket or the like including a planar sheet dimensioned for insertion into the receptacle, the planar sheet dividing the receptacle into two compartments and means for locking the planar sheet in a selective position within the receptacle. The planar sheet provides a surface against which a paint brush or roller may be wiped to evenly distribute paint thereon.

Apparatus for Monitoring the Delivery of Material – Patent 4,286,487

An apparatus for monitoring the delivery of material from a spool or the like to a machine which is to perform some work upon the material and draws the material from the spool. The apparatus includes a shaft for accommodating and fixedly securing the spool thereon, apparatus for positioning the shaft at a predetermined location wherein the positioning apparatus also permits the free rotation of the shaft about the longitudinal axis thereof, apparatus for providing a pulsed electrical signal upon rotation of the shaft, the pulsed electrical signal device having an element thereof directly coupled to the shaft for rotation as a result of the rotation of the shaft, and apparatus for indicating the output of the pulsed electrical signal device wherein the apparatus which does work on the material can be shut off if the material being fed from the spool becomes tangled, snarled, or otherwise jammed or is consumed.

Torso Garment Incorporating Removable Hand Coverings – Patent 4,297,746

A sweater type garment for covering the upper torso, arms, and hands of a wearer which includes a body portion, arm portions, and a pair of hand covering portions integrally formed with the arm covering portions to form a total upper torso enclosure. Means are provided so that the hand covering portions can be removed from the hands of the user while the garment is disposed on the wearer to free the wearer's hands for use. The unused hand covering portions can then be inserted into the arm portions for storage until the user decides to wear them again.

Dental Wedge – Patent 4,337,041

A dental wedge, for interproximal insertion in the interdental space between teeth for fixing a matrix band in position including depressions in the lateral surfaces thereof for positively engaging the teeth and locking the wedge therebetween. Means are also provided for simulating the contour of the concave bulbous papillia of the gingiva disposed in the interdental space when the matrix band is affixed about the tooth and the wedge is interproximally positioned.

Musical Instrument Case – Patent 4,427,113

A musical instrument case for wind instruments providing a body having an instrument storage chamber formed therein. The instrument is placed into the storage chamber through a mouth, a lid being provided to cover the mouth and at the same time to be inserted into the bell of the instrument to secure the same in position. A storage chamber can be provided in the lid and the body is tapered to conform on the inside thereof as well as on the exterior thereof substantially to the shape of the instrument to be stored.

Incrementally Adjustable Vent – Patent 4,557,183

An energy saving incrementally adjustable vent, for permitting the passage of air from one defined space to another which can be mounted on a vertical or horizontal surface includes a frame for mounting over an opening communicating therebetween. The frame has a central passageway disposed therethrough and a flap movably mounted to the frame, so as to be movable from a closed position substantially blocking the passageway, to an open position, permitting the flow of air therethrough. An adjustment device has a detent apparatus affixed to the frame. The adjustment device cooperates with the flap to provide a means for selectively adjusting the amount of air flow therethrough.

Adjustable Bottom Closure for a Resonator on Sound Bar Type Percussive Musical Instruments – Patent 4,570,525

A bottom closure for resonator of a sound bar on percussive musical instruments has a radially expandable construction for uniform pressure contact of a gasket with the resonator inner wall. Ideal follow-up of the bottom closure to the current shape of the resonator bottom end resulted from its elastic deformation assures almost perfect air leak prevention under any conditions.

Acupressure Apparatus – Patent 4,575,878

An acupressure apparatus for applying vibrational pressure evenly to a plurality of preselected points on a shaded portion of a living body such as upon the face thereof includes a housing and a flexible membrane secured to the housing to form an enclosed chamber between the housing and the flexible membrane for containing therein a liquid. A plurality of protrusions are carried on the flexible membrane and, when the housing is placed adjacent to the shaped portion of the living body, the plurality of protrusions contact preselected acupuncture points. The fluid is excited by vibrational energy such that this energy is transferred to the plurality of protrusions evenly so that the protrusions exert vibrational pressure on the preselected acupressure points. The fluid can be heated if desired.

Automatic Damper Assembly – Patent 4,582,250

An automatic temperature responsive damper assembly for use within the conduit of a ventilating system designed to exhaust the air from a confined space to the atmosphere when the confined space reaches a preselected temperature greater than that in the conduit adjacent to the atmosphere includes at least one vane pivotally mounted within the conduit and preferably two. The vane or vanes are mounted so that they are movable between a generally opened position, wherein air can pass freely through the conduit, and a generally closed position, wherein air passage through the conduit is restricted. A temperature responsive drive assembly that detects the temperature of the air within the conduit is mounted therein and opens and closes the vanes. Biasing the vanes to a normally closed condition is accomplished by placing a greater portion of each vane beyond its pivotal axis and having the smaller portion of one vane cooperate with the larger portion of the other to maintain the generally closed position. Auxiliary biasing springs may also be utilized.

Adjustable Door Jam Assembly – Patent 4,589,229

A door jamb assembly for varied installations in a conventional rough cut door opening disposed in a wall, the assembly including first, second, and third elongated members for mounting on the sides and top of the rough cut door opening to form a pair of door jambs and a header. Two of the elongated members are configured so that they will mate on one end thereof to the first elongated member and on the other end thereof to a portion of the other elongated member between the ends thereof, these two elongated members being essentially mirror images of each other. As a result, a door jamb assembly is provided which can be installed in various width door openings to provide jambs for doors which can be hung with left or right hinges and which open in or out. Additionally, the width of the jambs and header is variable to accommodate walls of different thicknesses.

Self-Contained –Aerial-Maintenance Platform – Patent 4,676,339

An apparatus for maintaining and inspecting a dockside container crane which includes at least one aerial work platform unit rigidly attached to one end of an ISO container. A spreader attached to the crane is used to grasp the ISO container for permitting the crane to lift the apparatus to an operating position, where an inspector or repairman manipulates controls on a work platform to operate a turret and telescopic boom, connected between the work platform and the turret, to position the work platform for inspecting or servicing some portion of the crane.

Method for Producing Magnetic Recording Media – Patent 4,681,669

In production of magnetic recording media by anode oxidation of an Al predominant substrate, deposition of ferromagnetic substance in substrate pores and final grinding, use of a substrate having a surface K-value of 0.5 or larger enables easy production of media with surface roughness well suited for ideal high density magnetic recording. The K-value is the ratio of X-ray reflection intensity of the crystal plane S(1,1,1) and the total X-ray reflection intensity of all crystal planes.

Automatic Damper Assembly – Patent 4,697,736

An automatic temperature responsive damper assembly for use within the conduit of a ventilating system designed to exhaust the air from a confined space to the atmosphere when the confined space reaches a preselected temperature greater than that in the conduit adjacent to the atmosphere includes at least one vane pivotally mounted within the conduit and preferably two. The vane or vanes are mounted so that they are movable between a generally opened position, wherein air can pass freely through the conduit, and a generally closed position, wherein air passage through the conduit is restricted. A temperature responsive drive assembly that detects the temperature of the air within the conduit is mounted therein and opens and closes the vanes. Biasing the vanes to a normally closed condition is accomplished by placing a greater portion of each vane beyond its pivotal axis and having the smaller portion of one vane cooperate with the larger portion of the other to maintain the generally closed position. Auxiliary biasing springs may also be utilized.

Line Protector – Patent 4,701,825

A line protector device for providing an electrical conducting path between a line and ground upon an overvoltage appearing on the line includes an overvoltage device having a pair of longitudinally spaced conductive terminals forming an arc gap therebetween. One of the terminals includes a longitudinally extending portion and an insulation circumscribing the extending portion which is inserted into a longitudinally circumscribing shorting clip and is provided with a centrally disposed slit in one end which receives the extending portion of the overvoltage device. The clip and overvoltage device are received within a conductive cartridge which then may be inserted into a conventional terminal block.

Method for Producing Wood-Type Golf Club Head – Patent 4,803,023

In production of a wood-type golf club head having a FRP shell and a foam resin core, a seat hole is formed in the sole portion of the club head and closed by a support plate having a threaded through hole at the center of gravity thereof; foamable resin is infused into the FRP shell cavity in the form of fine beads or solution, a plug as a weight balance adjusting piece is screwed into the support plate in direct contact with the foam resin core for secure holding of the weight balance adjusting piece during use of the club.

Programmable Sprinkler System – Patent 4,723,714

A programmable sprinkler system ideally suited for use in an enclosure such as a nursery and/or arboretum includes a first overhead rail and a water pipe connected to a pressurized source of water. The water pipe is provided with a plurality of water valves placed at discreet intervals along its length and extend outwardly therefrom and is positioned alongside and close to the first overhead rail and parallel thereto. A source of electrical power is positioned close to and generally parallel with the first rail on the other side thereof and extends essentially its entire length. A plurality of second overhead rails have one end of each positioned near the valves and the first rail and extends outwardly therefrom, preferably at right angles thereto, defining a path along which the water is to be dispensed. A carrier mechanism rests on the first rail. Nested upon the carrier mechanism is a detachable car that includes a second coupling device to bring electrical power to it. The car also includes a plurality of water dispensing heads, a mating coupling for the valves on the water pipe, and a hose for carrying the water from the valve along the full length of the second rail in order to dispense water along the path provided by the second rail. Reflective devices together with a light source provide an electrical signal which controls the amount of water to be dispensed and the speed that the car and carrier are to move along the first and second rails, respectively. These signals are coupled to the programmable computer which is located in the detachable car.

Extension Level Apparatus – Patent 4,733,475

An extension level apparatus suitable for use with a carpenter's level includes in combination a pair of elongated frame members adapted to receive therein the carpenter's level and also includes a spring loaded extension member which permits the extension level to be retained in a wall opening into which a door is to be inserted. The extension level permits the user thereof to determine rapidly the exact vertical position of one vertical edge of the door jamb, allowing for shimming where necessary, and permits a measurement to be taken from a starting point to an end point where the second edge of the door opening is to occur. Hereagain the vertical alignment may be rapidly obtained with the use of shimming when necessary, thereby permitting the door jambs to be inserted rapidly and with accuracy.

Current Sensing Apparatus – Patent 4,754,218

A current sensing apparatus suitable for sensing the amount of current flowing in a power feeder cable without the necessity for any ohmic connection between the meter and the circuit being measured that does not require separation of the wires in a cable and in fact utilizes both current carrying wires simultaneously includes a magnetically permeable core suitable for concentrating the magnetic fields generated by the current flowing in the pair of wires and includes a single coil disposed upon the core. The core includes a pair of poles which are placed proximate to the feeder cable and the coil yields an induced output voltage proportionate to the current flowing in the feeder cable and may be held in position on the feeder cable with the aid of a resilient member which permits ready removal of the sensing apparatus.

End Effector Tool – Patent 4,781,519

An exchangeable end effector tool includes, in combination; an engaging mechanism, accessible to the extending fingers of a cooperating end effector disposed on the distal end of a robotic arm. The tool includes an indexing structure for mating and cooperating with the indexing device provided on the distal end of the end effector extending fingers and structure for cooperating with the mating locking device provided in the distal end of the end effector extending fingers which retains or releases the tool upon the end effector extending fingers responsive to a computer command signal coupled to the end effector locking device. The tool has the engaging mechanism affixed thereon, and includes a device for performing a prescribed function.

Adaptable, Programmable Production System – Patent 4,809,425

An adaptable, programmable production system for manufacturing articles in which a plurality of operations are required includes an electronically programmable robot having a controllable arm with an end effector disposed thereon. The robot is placed proximate a surface, preferably movable, to be used for the assembly of the articles. A passive, non-interactive storage tray is provided proximate the robot and within range of the extended robot arms. The end effector disposed on the distal end of the robot arm may be programmed to remove and replace a particular tool, component or any of the implement or component from the storage trays, bins or from a moving conveyor when within range and may be utilized to perform a plurality of functions, such as inserting components into the article being manufactured, or performing multiple operations thereon by exchanging tools.

Single Knob Adjustment Apparatus – Patent 4,836,522

An adjustment apparatus which is capable of selectively securing to elongated members in a predetermined positional relationship includes a housing member having an eyebolt slidably positioned within a through aperture disposed longitudinally within a housing member; the eye portion of the eyebolt has a pivotal pin disposed therein affixing it to a T-bracket disposed proximate one end of the housing member. A sensing rod is disposed in a through aperture provided proximate the other end of the housing member which is permitted to flex. The eyebolt extending through the housing member is adapted to receive a threaded knob thereon and tightening the threaded knob simultaneously secures the housing member and sensing rod in a fixed position.

Robotic End Effectors – Patent 4,852,928

An end effector suitable for use on a robotic arm associated therewith and coupled to a computer includes a universal mounting plate permitting the end effector to be mounted on the distal end of a robotic arm; a gripper mechanism slideably retained within the end effector is responsive to electronic command signals permitting the finger members disposed therein to acquire, lock and release, a plurality of tools and components upon receiving computer controlled electronic command signal. The electronic command signal controls the driving power from a power source which is coupled to the end effector.

Station Interface and Protector Apparatus – Patent 4,853,960

A station interface and protector apparatus for use on a telephone line pair includes a protector device having terminals connected from each line to a ground terminal, via a gas discharged tube and/or a protective air gap and includes an insulated cover which covers the protector device and is provided with a telephone receptacle (jack) to which the incoming telephone line pair is connected. A cable having a plurality of wires therein is terminated on one end with a cooperating telephone line plug disposed within the receptacle with the other end of the cable wires being connected to a plurality of terminals provided in the cover which is additionally adapted to receive the subscribers telephone line pairs. By removing the cable plug from the jack provided in the cover the incoming telephone line may be isolated from the subscribers wiring, thus inserting a known operating telephone into the housing receptacle and operating the telephone will immediately determine if the problem exists in the incoming telephone lines or the subscriber's wiring. The bracket is provided to permit the subscriber to lock the interface and protector apparatus while still permitting the telephone company serviceman to override the locking mechanism for service of the overvoltage protection device and/or the incoming telephone line pair.

Retrofit Network Interface Apparatus – Patent 4,860,350

A retrofit telephone network interface apparatus for use in the subscriber loop of a telephone transmission system, i.e., connected to a non-telephone company owned premise wiring (a consumer household) and a telephone company owned portion of such loop at the junction where the two connect to each other. The apparatus is superimposed upon an existing station overvoltage protector and provides limited access, i.e., only a portion of the apparatus is made readily accessible to the consumer by providing a cover readily opened by him and a shield cover which may be readily opened by telephone company employees in order to provide access to electronic components owned by the telephone company. The device includes a base structure which includes a first and second set of terminals and a plug and receptacle arrangement for disconnecting the premise wiring from the telephone transmission system. The first set of terminals and the plug and receptacle are accessible to the consumer and access is denied to the remaining portion of the base member which includes a second set of terminals and a plurality of electronic components, unless opened by a telephone company employee having the proper tool therefor.

Wheel Locking Apparatus – Patent 4,888,969

A wheel locking apparatus for hampering the rotation of a vehicle wheel is mounted on the vehicle by utilizing a pair of mounting wheel studs and its locking nuts, includes a pair of rods extending beyond the diameter of the wheel that are connected by rods spaced therebetween. Hinges are provided on the ends of the elongated members affixed to the wheel studs which have disposed thereon a pair of pivotable arm means which may be pivoted into a closed position and locked with a key device.

Automatic Film Processors – Patent 4,890,131

An automatic film processor for processing roll, sheet or disk film houses the film to be developed, which is disposed in a light tight housing, preheats the chemical solutions to the proper temperature and pumps them, in turn, into the reservoir formed by the base of the removable film drum in which the film is positioned and provides rotary and linear agitation for the film. The machine includes a linear selective valve capable of selecting any one of a plurality of chemical solutions for use in developing of the film and carefully purges the system prior to preheating and supplying the next chemical for use in the developing process.

Weatherproofing Apparatus for Telephone Connectors – Patent 4,917,617

A flexible boot adapted to receive a telephone cable plug includes an opening through which a telephone retaining lever projects. The boot receives the telephone cable through an opening provided therein and slips over the telephone plug. Upon insertion of the plug into a mating telephone jack, the boot frictionally engages the jack circumference and seals the connections from the environment. A similar boot may be utilized to protect and seal a telephone jack

Detachable Self-Contained Aerial Maintenance Platform – Patent 4,936,414

An apparatus for maintaining and inspecting a dockside container crane includes a framework and a base for supporting thereon a rotatable turret having a telescopic boom and platform member. The base and framework is removably attachable to a standard ISO container, and once attached the ISO container may then be raised by the dockside container crane, via a standard spreader, where an inspector or workman manipulates controls on the platform member to operate the turret and telescopic boom, to position the platform member near a portion of the crane requiring inspection or service.

Ultrasonic Toothbrush – Patent 4,991,249

An ultrasonic toothbrush for use in personal dental hygiene care includes an exchangeable toothbrush member which is removably attached to an ultrasonic power member and may be readily removed therefrom with less than one revolution and inserted on to the ultrasonic power member in a like manner. Provision is made for locking the toothbrush to the power member and is arranged to transfer the ultrasonic energy from the power member to the toothbrush with minimum energy loss.

Retinol Skin Care Composition – Patent 5,002,760

A skin care composition to prevent premature photoaging of the skin of the user includes in addition to basic ingredients, in combination, retinol, a UV absorber and a moisturizer.

Endotracheal Intubation Apparatus – Patent 5,016,614

A medical instrument for facilitating endotracheal intubation in a patient, the instrument including a handle and an elongated obturator element extending therefrom, the obturator element for releasably retaining thereon a selected endotracheal tube for positioning within the patient, a mechanism being provided for selectively retaining and ejecting the endotracheal tube from the obturator element, the obturator element accommodating therethrough an endoscope to permit visualization at the end thereof to facilitate placement of the endotracheal tube, the apparatus also including structure for providing controlled suction at the end of the obturator element.

Utility Meter to Telephone Line Interface – Patent 5,018,192

A telephone line to utility meter interface for use in connecting a telephone line pair to a plurality of utility meters, includes a weather sealed and lockable housing with a telephone line cord plug and receptacle and a terminal block disposed therein. The incoming telephone line pair may be isolated from the utility meters for testing, via the insertion of a known operating telephone having a standard telephone plug into the receptacle within the housing which is integrally molded into the terminal block. The terminal block also includes integrally molded test cable retainer. The utility meters may individually be interrogated by the aid of electrical interrogation circuitry activated by a specific electrical signal appearing on the subscriber telephone line.

Back-Up Surge Arresters – Patent 5,050,033

A back-up surge arrester is combined with a conventional gas filled surge arrester in axial alignment. The size of the air gap is held to a predetermined distance by aid of the mechanical configuration specified herein and further includes a heat sensitive material in a parallel breakdown path.

Automatic Method and Apparatus for Scattering Wood Pieces in Production of a Decorative Board – Patent 5,058,777

In production of a decorative board with overlaid wood pieces used for surface covering of various furniture, building materials and car interior decoration, wood pieces supplied from an overhead hopper by gravity are dispersed on a flat feeder by application of vibration and are transferred in a dispersed state onto base boards successively supplied by a transfer conveyor in a horizontal direction. Almost no need for manual operation raises production efficiency and dispersion by mechanical vibration assures high degree of uniformity of patterns on the products. Fully automatic processing enables reproduction of patterns with commercially acceptable fidelity.

Multiple Choice Mathematical Game Apparatus – Patent 5,083,793

A mathematical game apparatus includes a game board having a plurality of concentric circles providing paths or playing paths divided into a plurality of sections, each section being provided with indicia (numerals) therein for the purpose of having the players learn and/or improve their ability to count from 1 to 125 by multiple units in addition to increasing their acuity in utilizing prime numbers and factors; perfect squares and cubes; and exponential powers of 10.

Weatherproof Telephone Terminal Apparatus – Patent 5,153,911

A weatherproof telephone terminal apparatus includes a terminal assembly having a pair of terminal members included therein suitable for splicing insulated telephone wires of the same or different wire sizes in a single housing which is impervious to atmospheric conditions and may be used indoors and outdoors and may be installed in a clamshell-like housing, thereby eliminating the need for conventional splicing techniques.

Solid State Station Protectors – Patent 5,210,677

A miniature solid state surge protection device having an unsealed solid state device having first and second electrodes with the first electrode in contact with a fusible pellet is provided. When a surge occurs the pellet melts to thereby short the first and second electrodes together.

Sabot for Chambering Conventional Bullets in a Shotgun – Patent 5,214,238

A sabot for retaining therein a conventionally shaped tapered-nose bullet when the sabot is seated in place in a shotgun shell casing, so that the shotgun can be used to fire conventional lead or copper jacketed lead bullets in a shotgun. The sabot includes a unitary body having a cylindrical portion and a truncated conical portion, the cylindrical portion and the truncated conical portion sharing a common longitudinal axis, the conical portion having a wide diameter at one end thereof and a narrow diameter at the other end thereof, the narrow diameter end being adjacent to the cylindrical portion, the unitary body having longitudinally disposed therein a chamber, the longitudinally disposed chamber for receiving therein a conventionally shaped tapered-nose bullet, the unitary body being distortable such that the wide diameter of the conical portion can assume a diameter substantially the same as the interior diameter of the shotgun shell casing when the unitary body is inserted therein, the distortion of the unitary body causing impingement of the longitudinal chamber on the tapered-nose of the conventionally shaped tapered-nose bullet, said distortion for retaining in the longitudinal chamber the conventionally shaped tapered-nose bullet, release of the unitary body from the shotgun shell causing the unitary body to return to the undistorted shape thereof so as to release the conventionally shaped tapered-nose bullet.

Body Unit for a String Musical Instrument – Patent 5,218,149

In construction of a body unit for a string musical instrument such as an electric guitar, a planar pattern panel bearing a fashionable graphic design is interchangeably sandwiched between a body top of the musical instrument and a substantially transparent cover panel detachably coupled to the body top. Aesthetic properties of the musical instrument can be easily adjusted by an individual user without any assistance by professionals in accordance with personal preference and/or situation in performance by interchanging the pattern panel.

Solid State Station Protectors – Patent 5,224,012

A miniature solid state surge protector apparatus for use in telephone central offices, or the like, that are provided with terminal blocks for communication lines which may include an in-line overcurrent coil arrangement that grounds each communication line if an overcurrent flows therethrough and is additionally provided with a solid state miniaturized surge protection device disposed across a pair of communication lines and a common ground terminal, thus providing overvoltage and overcurrent protection (fail short) to a pair of telephone communication lines.

Miniature Station Protectors Modules – Patent 5,224,013

A miniature station protector module for communication systems includes a hollow housing into which is disposed a pair of line terminals with a ground terminal therebetween. The line terminals extend into the hollow housing and include thereon a back-up surge arrester in axial alignment with each of the terminals, either a three terminal surge arrester or a pair of two terminal arresters may be utilized having one electrode connected to the ground terminal with the other electrodes being connected to the line terminals. The holding assembly for the surge protectors includes a ground bracket which is adapted to receive the surge protectors and includes a thermally sensitive material disposed between the surge arrester electrodes and the ground connection thereby providing both overheat protection by positively shorting the line terminals to ground if the overvoltage protection should overheat as well as providing back-up surge arrester protection by means of a back-up air gap provided by a dielectric disposed between the line terminals and the ground connection.

Inertial Dilution Filter Probe – Patent 5,237,881

A filter probe for sampling components of a stack gas which includes means for extracting a flow sample of the stack gas, means for inertial filtering of the flowing stack gas sample extracted by the extracting means, means for collecting the flowing stack gas sample after filtering by the filtering means, means for conditioning the filtered and collected stack gas sample based on predetermined criteria such as cooling and drying, and means for flowing the filtered and collected stack gas sample from the collecting means to the extracting means so that a constant flow of the filtered stack gas sample is presented to the conditioning means to permit essentially instantaneous analysis of the stack gas sample.

Apparatus for Collecting and Killing Insects – Patent 5,241,779

An apparatus for collecting and killing insects which includes a heat source for attracting the insects to a housing, electric conductor means, for connection to a power source, to stun or kill the insects, means for collecting the insects after they are stunned or killed, and means for vacuuming the insects into a collection vessel so that they can be transported away from the apparatus and disposed. The collection vessel may be filled with oil to assure suffocation of the insects. The subject invention also can be employed in combination with conventional appliances having a heat producing element so that insect infestations attracted to the appliance can be easily disposed of by employment of the subject invention.

Weatherproof Telephone Network Interface Modules – Patent 5,291,553

A weatherproof network interface module for providing connection between a customer's equipment and the telephone company owned portion of the customer loop includes an overvoltage protection device disposed therein in addition to the circuitry which provides a prescribed line test termination impedance having particular characteristic signature to the telephone central office when a continuity test is made on a subscriber line and may include an illumination device and test switch for indicating when the telephone company owned portion of the customer loop is in operating order, or may include a device for connecting or disconnecting the telephone company owned portion of the customer loop from the customer loop portion wherein all of terminals are weatherproof (protected from the environment).

Self-Sealing Washers – Patent 5,306,108

A self-sealing washer for use on a fluid containing housing includes a semi-rigid circular member having a horizontal portion and a relatively short vertical portion disposed at the distal edge thereof suitable to be received into a channel provided on a flat surface of the housing. The horizontal portion of the circular member includes a centrally disposed through aperture to receive the screw therein, the screw has a relatively large head portion. A first elevation portion is provided on the circular member which is disposed remote from the distal edge and a second elevation portion generally centrally disposed within the first elevation portion which terminates in a relatively sharp edge. Preferably the second elevation portion is higher than the first elevation portion.

Weatherproof Station Protections Modules – Patent 5,307,231

A weatherproof station protector module for communication systems includes a hollow housing on which is disposed a pair of weatherproof line terminals that extend into the hollow housing and a ground terminal. A holding assembly is affixed to the ground terminal within the hollow housing and is adapted to receive a surge arrester therein. The surge arrester may be a three terminal device or a pair of two terminal arresters with one electrode of each connected to the ground terminal and each one of the other electrodes being connected to a line terminal. The holding assembly for the surge protector may include a thermally sensitive material disposed between the surge arrester ground electrode and the

line connections, thereby providing both overheat protection by positively shorting the line terminals to ground if the overvoltage protection should overheat as well as providing back-up surge arrester protection by means of a back-up air gap provided by a dielectric disposed between the line terminals and the ground connection. The unit is completely sealed and therefore impervious to the weather.

Multi-Functional End Effectors – Patent 5,360,249

A multifunctional end effector includes a quick release finger locking mechanism disposed in each of the pair of fingers which maintains system accuracy and integrity by providing a positive pressure force between the end effector finger and the mating locking plates provided on the tools adapted to cooperate with the end effector. In one embodiment the mating locking plate intrudes into the fingers of the end effector and an alternative embodiment the end effector finger engaging mechanisms grasp and lock on ledges provided on the cooperating mating locking plates.

Network Interface Modules – Patent 5,367,569

A network interface module for providing connection between a customer's equipment and the telephone company owned portion of the customer loop is provided with a miniaturized easily removable module which includes the overvoltage protection device and the circuitry necessary to provide a prescribed line test termination impedance having a particular characteristic signature to the telephone central office when a continuity test is made on a subscriber line.

Soundboard for Musical Instruments – Patent 5,469,769

In a laminated construction of a soundboard for use in musical instruments such as the piano, the use of a core having larger shearing elastic modulus and/or smaller shearing loss tangent than that of the fore and rear plates assures small shearing loss in the treble range, and greatly improves the total tonal balance over the entire tonal range.

Mulch Shovel – Patent 5,791,706

A mulch shovel includes a longitudinal extending handle having a longitudinal axis and a first and second distal end with a transverse member disposed proximate the first distal end transverse to the longitudinal axis; a scoop shaped-member has a rear end with a device disposed therein for receiving the second distal end of the handle; also included on the scoop-shaped member are side upwardly extending walls and a front end having a plurality of loops displaced from the front end, which are aligned in a plurality of rows with each being suitable for receiving a tine therein. The scoop-shaped member front end has a leading edge disposed parallel to the transverse member and side edges sloped at an acute angle from the leading edge.

Wind Instrument Having a Compact Slide Configuration – Patent 5,834,666

A brass wind instrument which changes pitch by varying the tube lengths thereof which includes a slide portion which is substantially half the physical length of a conventional slide. The slide assembly comprises two substantially U-shaped tubes which slidably engage corresponding tubes on a fixed portion of the trombone. The fixed portion of the trombone accommodates a conventional bell and a conventional mouthpiece. The slide assembly includes first and second substantially U-shaped slide tube members each having a pair of adjacent legs that slidably engage the fixed portion of the trombone. The slide assembly is configured such that customary pitch positions are obtainable.

Water Leakage Protector Apparatus – Patent 5,992,218

A water leakage protector apparatus for appliances subject to leakage includes a first device for detecting water leakage from the water supply line coupled to the appliance and a second device for detecting water leaking from the appliance itself. A control apparatus is coupled to a valve, affixed to the water supply line, is connected to a source of electrical power, and controls the water flowing to the appliance. The appliance is connected to the control apparatus to obtain electrical power for operation. The first and second sensing devices are coupled to the control apparatus so that when a water leak is detected by either the first or the second detecting device the control apparatus stops the water from flowing in the water supply line and interrupts electrical power to the appliance.

Vehicle Washing Apparatus – Patent 6,289,544

A vehicle washing apparatus for mounting on a rotatable shaft which includes a substantially cylindrical surface having an inner face and an outer face, said substantially cylindrical surface having a plurality of spaced apart slots disposed therethrough; and a plurality of flexible elongated pads, each of said pads for insertion through adjacent said spaced apart slots for radically extending from the outer face of the cylindrical surface, a portion of each of the pads being exposed adjacent to the inner face of the cylindrical surface.

Swing Mechanism for Winder Nozzles – Patent 4,641,542

A crank is connected to a prime shaft, a differential gear unit is coupled to the prime shaft, nozzles for passage of wires and for winding are mounted to a tube, a rotation stopper is coupled to one of facing gears of the differential gear unit, a guide rail is arranged for parallel movement with the tube, and rotation of the crank provides the nozzles with swing angle and lateral displacement. The nozzles perform winding while rotating around field cores corresponding to the rotation angle of the crank.

Laundry Presser for Simultaneously Pressing Multiple Clothing Sections – Patent 4,634,030

A laundry presser includes body, shoulder and tack presser units which are driven for substantially concurring pressing of several sections of an article of clothing such as a shirt, for saving of time, labor and a reduction in necessary equipment space.

Visual Presentation Projection Apparatus – Patent 4,609,268

A visual presentation projection apparatus for creating dramatic visual presentations from a single transparency which simulates motion and therefore gives the viewer the feeling of moving with a scene includes illumination means for directing a beam of light through a transparency, optical means for projecting the image disposed on a transparency, and means for moving the transparency within the path of light projected by the illumination means during projection, the movement of the transparency permitting continuous selection and projection of various portions of the transparency on a viewing surface, the portion to be projected being randomly selectable.