Recent Patents[a]

Ankle Wrap: Ignatius F. Castiglia, Assignor to Lenox Hill Brace Shop, Inc., New York, N.Y. An elongated elastic panel intended to provide reusable ankle support capable of effectively bracing an ankle, while avoiding excessive constriction of the ankle and without restricting walking and running movements of an ankle. Velcro fastening members are attached to the panel in locations such that they releasably but securely fasten the wrap, both at the beginning of the predetermined wrapping procedure and at its completion. (Patent No. 4,085,746, Apr. 25, 1978; filed Sept. 20, 1976; Appl. No. 724, 495; 12 claims.)

Apparatus for the Identification of Size Numbers of Right and Left Lasts: Ludvik Dokoupil, Oldrich Hrouda, and Josef Zila, assignors to Zavody presneho strojirenstvi, narodni podnik, Gottwaldov, Czechoslovakia. Shoe lasts placed in a shoe manufacturing machine are checked by a pair of photocells which check the distance between the toe and heel of the last (having first determined whether last is for left or right shoe) and control the position of elements which work upon shoes on the shoe manufacturing machine in accordance with the shoe size number determined for the last. (Patent No. 4,092,757, June 6, 1978; filed May 13, 1977; Appl. No. 798,562; 5 claims.)

Appliance for Foot Orthosis: Mario DiGiulio. The foot orthosis appliance preferably comprises an elongated rigid bar with means at each end for attachment to the patient's feet. The bar is scored at intervals so that it can be manually broken to the desired length. Lockable articulated joints, provided for each end of the bar, can be rapidly attached to or detached from releasable clips which can be secured to the soles of the patient's shoes by adhesive. The lockable articulated joints are provided with visible index means to facilitate reproducing predetermined relationships. Adjustment of the joints is easy; however, when locked the prescribed setting is securely maintained, and the device may be removed from the patient's shoes and replaced without disturbing the adjustment of the joints or removing the patient's shoes. Nesting extension attachments, and stabilizer rods for maintaining plantar and dorsi flexion, and for insuring that the device is not defeated by the bending of the knees, are provided. (Patent No. 4,088,129, May 9, 1978; filed Nov. 15, 1976; Appl. No. 741,798; 21 claims.)

Artificial Hand and Forearm: Gary Eroyan. An artifical hand and forearm comprises an elongated housing; a plate within the housing mounts a series of pivoted finger assemblies, and a cam shaft with a series of spaced cams respectively registering with the inner ends of the finger assemblies. A reversible electric motor rotates the cam shaft. (Patent No. 4,094,016, June 13, 1978; filed Dec. 4, 1976; Appl. No. 746,794; 20 claims.)

Artificial Intraocular Lens: Emil W. Deeg and David A. La Marre, assignors to American Optical Corp., Southbridge, Mass. A chemically durable, biologically inert optical implant lens formed of a low density natural or synthetic crystal, such as Corundum, Sapphire, Ruby, Zircon, Strontium Titanate, Diamond, or Anatase. (Patent No. 4,079,470, Mar. 21, 1978; filed Feb. 16, 1977, Appl. No. 769,073; 4 claims.)

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[a]Patents may be ordered by number from the Commissioner of Patents, Washington, D.C., 20231, at 50¢ each.

Double-Wheel Automotive Hand Control System: Anton J. Reichenberger, assignor to the United States of America as represented by the Department of Health, Education, and Welfare. An automotive control system for use by handicapped drivers who have lost the use of the lower limbs. A second wheel, concentric with the steering wheel, is added so that it is within reach of the thumb or fingertips when hands are on a steering wheel in normal driving fashion. Movement of the second control wheel in a direction away from the driver actuates the automotive braking system; pulling the control wheel toward the driver actuates the throttle. The system's brake and throttle electrohydraulic servos interface with existing automotive control systems in such a way that little add-on mechanical equipment is required. (Patent No. 4,078,628, Mar. 14, 1978; filed Aug. 16, 1976, Appl. No. 714,685; 9 claims.)

Drive for an Orthosis or a Prosthesis: Alfred Zadina, assignor to Viennatone Gesellschaft m.b.H., Vienna, Austria. A movable limb rehabilitation device such as an orthosis or prosthesis part is connected to a drive by a transmission which converts rotary into linear reciprocatory motion. The primary object of the invention is to overcome the disadvantage in efficiency experienced when reciprocatory motion is effected in one linear direction against the bias of a spring. Advantages in compactness and uniformity of motion over the length of the stroke were also obtained. (Patent No. 4,084,267, Apr. 18, 1978; filed Sept. 20, 1976; Appl. No. 724,870; 14 claims.)

Electrical Switch for Use by the Disabled: Herbert C. Dickey, assignor to the Ealing Corp., South Natick, Massachusetts. A specialized switch particularly suited for use by the disabled, consists of a pair of resilient, flexible contacting members which are prevented from touching each other only by separators of polyurethane foam of a density of approx. 2 lbs/ft^3. These contacting members are encased in a housing of foam of similar low density, which in turn is covered with soft fabric. The switch, resembling a small cushion in one possible configuration, is meant to be put into contact with a part of the patient's body which is capable of some movement. (It could be placed on a table with the person's elbow above it.) Very slight pressure may be applied to the switch, in comfort and with assurance of closing the circuit: release of pressure opens the circuit. (Patent No. 4,086,458, Apr. 25, 1978; filed Sept. 2, 1976; 17 claims.)

Head Actuated Control Apparatus for Battery-Powered Wheelchair: William Wanet Miller, III. Head actuated control apparatus allows a quadriplegic to control the motion of a conventional battery-powered wheelchair, and to recline or raise the back of the chair, while traveling, as may be helpful to enhance the occupant's control of the chair on hills, etc. Control elements include cup means mounted to engage the back of the head of the occupant, in such a manner that even in the event that a bump or discontinuity is encountered the result (in terms of control loss) in the worst instance would be only to slow the chair's motion. (Patent No. 4,093,037, June 6, 1978; filed May 10, 1976; Appl. No. 684,759; 4 claims.)

Hinge for Knee Brace: Leslie T. Applegate, assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio. A hinge for a knee brace, in which a single fixed and a single removable pin will either selectively lock the hinge elements at 180 deg or limit angulation thereof to no less than a selected one of two different predetermined lesser angles. (Patent No. 4,088,130, May 9, 1978; filed May 16, 1977; Appl. No. 797,120; 4 claims.)

Implantable Structure: Charles A. Homsy. A structure for in vivo implantation, being at least partially of a biocompatible porous material, adapted to be implanted in place of at least a portion of the bony chain of the middle ear, or to serve as an implant electrode. (Patent No. 4,052,754, Oct. 11, 1977; filed July 14, 1976, Appl. No. 705,334; 16 claims.)

Integral-Skin Cushion-Molding Apparatus: Kurt Moser, assignor to the Upjohn Co., Kalamazoo, Mich. When a textile, or plastic film, skin is to be applied to an elastic foamed cushion so that the skin is adhered to the foam during the foam's polymerization in the mold, it has been difficult to obtain a uniform degree of stretch over the surface of the skin. The invention provides an air or gas cushion between the mold and the skin upon which the skin may slide, allowing the skin to attain a substantially uniform stretch or tension throughout its area, and therefore resulting in a skin of uniform thickness or tension on the finished cushion, notwithstanding substantial depth variation in surface contour of the final shaped sheet material. (Patent No. 4,087,224, May 2, 1978; filed Sept. 27, 1976; Appl. No. 726,765; 3 claims.)

Method and Apparatus for Six Degree of Freedom Force Sensing: Paul C. Watson and Samuel H. Drake, assignors to the Charles Stark Draper Laboratory, Inc., Cambridge, Mass. A system for measuring the forces induced in objects while they are being acted upon, or measuring forces exerted by normal or handicapped people in the course of their activities. A force sensor structure is described but practically any desired structure will serve, and as few as six strain gages are required. Signal processing described as simple is required, implemented by means of an analog or digital computer. Components of a load force applied to the sensor may be expressed in a Cartesian or other selected coordinate system without the need to provide for decoupling of the force components within the force sensor. (Patent No. 4,094,192, June 13, 1978; filed Sept. 20, 1976; Appl. No. 724,623; 28 claims.)

Method and Means for Scrambling and Descrambling Speech at Audio Frequencies: Daniel Graupe and G. Donald Causey, assignors to Biosystems Research Group II, Chevy Chase, Maryland. This invention relates to the scrambling of audio signals in a manner that allows transmission by means of a communication channel which can be an acoustic medium, a telephone line, or a CB radio link. An input audiofrequency signal, such as speech, is processed by n-level digitizing, followed by transformation of the levels of the digitized signal to other levels using a preselected transformation code, and finally converting the transformed digitized signal into analog form that is scrambled with respect to the input signal. At the receiving end of the acoustic, telephone, or CB radio link, the described scrambling procedure is reversed to obtain an analog signal representative of the initial input signal. The signal processing means can be realized using microprocessors with fixed or variable programing. (Patent No. 4,086,435, Apr. 25, 1978; filed Sept. 17, 1976; Appl No. 724,170; 18 claims.)

Method of and Means for Adaptively Filtering Near-Stationary Noise from Speech: Daniel Graupe and G. Donald Causey, assignors to Biocommunications Research Corp., Chevy Chase, Md. A method of, and means for, filtering "near-stationary, relatively long duration noise" from speech, whereby hearing aids or other devices can be adapted to operate properly under changing environmental noise situations. (Patent No. 4,025,721, May 24, 1977; filed May 4, 1976, Appl. No. 683,234; 28 claims.)

Methods for Investigating Internal Physiological Phenomena: Jean Duroux. The invention is designed to permit accurate measurement of the variations, over the passage of time, in the electrical resistivity (or in values associated with this resistivity) in relation to a defined volume of the body which is acted upon by an electromagnetic field. The electrodes which are designed to pick up the electric field may be embodied in configurations ranging from a type of jacket comprising a more-or-less dense network of electrodes, to a single row of electrodes which is moved in a given direction as measurements are completed, using methods ranging from a manual switching device to electronic scanning and presentation, computing, and recording. The invention also relates to methods for enclosing the

electrodes in a layer of physiological serum (NaCl in water) to eliminate the effect of irregularities in the skin, bony projections; etc. (Patent No. 4,078,553, Mar. 14, 1978; filed Sept. 24, 1976, Appl. No. 726,341; 10 claims.)

Mixture for Anchoring Bone Implants: Joost Robert deWijn, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland. The doughy bone cement mixture consists of a conventional bone cement to which is admixed a biologically compatible high-viscosity gel soluble in water or body fluid. The aqueous gel considerably reduces the maximum temperature occurring during curing of the water-insoluble bone cement, obviating necrotic damage of the ambient tissue; the gel component then dissolves in the body's own fluids, leaving a network of open intercommunicating pores which are soon invaded by bone tissue, leading to formation of a very strong anchorage of the cement bed in the bone without need for prolonged immobilization. (Patent No. 4,093,576, June 6, 1978; filed April 5, 1976; Appl. No. 673,354; 14 claims.)

Powered Wheel Chair: Woodrow Seamone, assignor to the Government of the United States of America as represented by the Administrator of Veterans' Affairs, Washington, D.C. A powered wheelchair with individual motors driving each of two separate drive wheels. Each motor is controlled by the amount of torque applied to the handrim of that drive wheel by the occupant. (Patent No. 4,050,533, Sept. 27, 1977; filed June 22, 1976, Appl. No. 698,688; 8 claims.)

Prosthesis-to-Bone Interface System: Albert H. Burstein and Bertram L. Koslin, assignors to the Sampson Corp., Pittsburgh, Pa. A woven basket of metal wire is placed over the stem of a prosthesis (implant) serving, with bone cement, as a prosthesis-to-bone interface. (Patent No. 4,064,567, Dec. 27, 1977; filed Sept. 15, 1976, Appl. No. 723,615; 13 claims.)

Prosthetic Appliance: Richard Glabiszewski, assignor to Otto Bock Orthopädische Industrie K.G., Duderstadt, Germany. The object of this invention is to provide a resiliently yieldable cosmetic sheath which does not reveal the connection between a prosthetic foot (or hand) and a prosthetic limb. Simplicity, reliability, aesthetically pleasing appearance regardless of the relative positions of the prosthetic components, plus accessibility of the components and the ability to remove and reattach the prosthetic foot or hand without injury to the cosmetic sheath, are described. (Patent No. 4,089,072, May 16, 1978; filed Jul. 13, 1976; Appl. No. 704,782; 7 claims.)

Prosthetic Foot: Reinhard L. Daher and Frederick Robert Tucker. A foot comprising a keel of hard material such as wood, to which is attached a resilient reinforcing toe portion, keel and toe portion being enveloped within a foamed rubber or foamed plastic foot-shaped body having a skin formed on the exterior, thus giving a smooth finished surface. (Patent No. 4,091,472, May 30, 1978; filed Dec. 27, 1976; Appl. No. 754,501; 16 claims.)

Prosthetic Joint Lock and Cable Mechanism: Woodrow Seamone and John H. Loveless, assignors to the United States of America as represented by the Administrator of Veterans' Affairs, Washington, D.C. A joint lock and cable arrangement for an externally powered prosthesis, the arrangement allowing shoulder and/or elbow joint movement of a prosthesis through the use of a single driving motor, and providing operation of a terminal device when both points are in locked condition. (Patent No. 4,067,070, Jan. 10, 1978; filed Nov. 3, 1976, Appl. No. 738,580; 12 claims.)

Quad Cane: Morton I. Thomas, assignor to Temco Products, Inc., Passaic, N.J. A tubular metal cane with four rubber-tipped feet comprises a handle portion with a hollow sleeve which receives the tubular member of the lower section. The tubular member contains

a spring-loaded pushbutton which is adapted to pop through apertures in the hollow sleeve, as a means of adjusting height. Toward the base of the cane a threaded wing-screw is provided to immobilize the outer sleeve relative to the inner tubular member, to greatly increase rigidity and eliminate rattling noises associated with adjustable metal canes. (Patent No. 4,085,763, Apr. 25, 1978; filed Sept. 2, 1976; Appl. No. 719,741; 2 claims.)

Shock Absorber Attachment for Wheelchairs or the Like: Andrew Marvin Ferguson and Ernest Voshell Keith, assignors to Reme Enterprises, Inc., Dover, Del., and National Patent Search Associates, Inc., Arlington, Va. A shock-absorber or spring-mounting attachment which can be mounted on virtually all existing wheelchair frames. This device cushions the occupant from shock and jolting, and reduces tilting and loss of traction caused by irregularities in the traveled surface. (Patent No. 4,078,817, Mar. 14, 1978; filed June 10, 1976, Appl. No. 694,694; 7 claims.)

Signal Compression and Expansion Apparatus with Means for Preserving or Varying Pitch: Richard F. Koch. An apparatus for compressing, expanding, and reading out audio and other signals while preserving or varying their pitch. (Patent No. 3,816,664, June 11, 1974; filed Sept. 28, 1971, Appl. No. 184,371; 30 claims.)

Speech Recognition System: Lawrence Richard Rabiner and Marvin Robert Sambur, assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J. An unknown segment such as a spoken digit in a continuous speech signal is recognized as a previously identified speech segment by deriving a set of test linear prediction characteristic signals from the voiced interval of the unknown segment. (Patent No. 4,092,493, May 30, 1978; filed Nov. 30, 1976; Appl No. 746,106; 15 claims.)

Speech Synthesizing Apparatus: Michael John Underwood, Michael Joseph Martin, and Michael Victor Iles, assignors to International Computers Limited, London, England. The invention proposes a method of sound generation based on digital specification of sound parameters for use in speech synthesis that will permit more readily the specification of different types of unvoiced sound components and the apparent concurrent generation of speech sounds on a plurality of channels. (Patent No. 4,092,495, May 30, 1978; filed Dec. 13, 1976; Appl. No. 749,748; 6 claims.)

Spinal Column Prosthesis/Orthosis: David Warren Lewis and Robert K. Greenlaw. These spinal column prostheses/orthoses apply compression and/or tension or a combination of forces which are exerted at the inter spaces between two adjacent vertebrae, for the correction of problems involving scoliosis, kyphosis, spinal instability, rotational and other mal-alignments. The force carried by each segment of the device may be adjusted at time of insertion and readjusted without further major surgery. The implanted hardware may be used for children or adults and may be left in place permanently or temporarily. Forces applied may be initially small, and later increased. (Patent No. 4,085,744, Apr. 25, 1978; filed Jan. 31, 1977; Appl. No. 764,049; 2 claims.)

Straightening and Supporting Device for the Spinal Column in the Surgical Treatment of Scoliotic Diseases: Erkki Einari Nissinen. The device, which is intended to be removed after the spinal column has healed, includes a rod-shaped supporting member at least the length of the spinal column area to be treated. A pair of wires run the length of the supporting member, bearing upon its ends. Tractive tension is applied by means of attachment members which are bent around the spines of a number of vertebrae and are also connected (directly or by loops which may be of wire or a resilient material) to the aforementioned pair of wires. The device, according to the invention, can be installed in such a manner that an individual vertebra is subject to a relatively small load. The device allows patient

growth in height (within limits) without special changes in the installation. Twisting of the vertebrae around themselves is effectively prevented. (Patent No. 4,078,559, Mar. 14, 1978; filed May 26, 1976, Appl. No. 690,131; 6 claims.)

Transcutaneous Nerve Stimulator: Curtis H. Miller, assignor to Med. General, Inc., Minneapolis, Minnesota. Transcutaneous nerve stimulating apparatus for alleviating pain through the selective application of variable-amplitude, variable pulse-rate, variable pulse-width electrical pulses to the skin in the area in which the pain is experienced. Amplitude, rate and pulse-width are intended to be selectively varied, over a range of values, by the patient. (Patent No. 4,084,595, Apr. 18, 1978; filed July 15, 1976; Appl. No. 705,677; 7 claims.)

Turning Bed: David John Willis, Dennis Clifford Stevenson, and William Bettle, assignors to Betstone Industries Limited, Christchurch, New Zealand. A tilting assembly comprising mattress frame, lever and tilting mechanism, which may be made and sold separately from the bed frame, and fitted to conventional hospital beds. The mattress-supporting surface or frame is divided in three portions lengthwise, and arranged so that when the turning mechanism is manually or mechanically operated, the outer section of mattress frame on the side toward which the turn is being made tips upward to retain the occupant and provide a sense of security. Variations to suit particular uses, types of patients, and sources of mechanical power are described. (Patent No. 4,084,274, Apr. 18, 1978; filed Apr. 21, 1976; Appl. No. 678,769; 18 claims.)

Weight-Redistribution Orthopedic Appliance: Ignatius F. Castiglia, assignor to Lenox Hill Brace Shop, Inc., New York, N.Y. A weight-redistribution appliance to be attached externally by adhesive to the sole of a shoe for redistributing weight away from the metatarsal heads. It is formed of a hard, non-resilient material such as leather or hard rubber, and longitudinal and latitudinal slits are provided as needed to provide the required flexibility to conform to the shape of the shoe during walking. (Patent No. 4,085,758, Apr. 25, 1978; filed Nov. 15, 1976; Appl. No. 742,146; 12 claims.)