

RECENT PATENTS ^a

Apparatus for Stimulating Muscles Controlled by the Same Muscles: Samuel Anderson Vincent, Fabian Charles Monds, and David Roger Armstrong, assignors to National Research Development Corporation, London, England. An EMG-controlled muscle stimulator, used particularly in controlling bladder incontinence due to sphincter weakness. As the bladder fills, the muscles of the pelvic floor produce an EMG signal, which is sensed by two electrodes located on the levator ani muscles. This signal is amplified, filtered, and rectified, and then applied to a circuit which switches on a stimulator to the affected muscles. The system incorporates a feedback mechanism that will return the circuit to the sensing mode when the output EMG signal reaches a predetermined level. If the signal falls below this level, the circuit again will revert to the stimulation mode. (Patent No. 3,628,538, Dec. 21, 1971; filed Sept. 4, 1969, Serial No. 855,281; 9 claims.)

Artificial Leg Having a Preset Automatic Friction Band Tension Control: Brian G. Blatchford, assignor to Chas. A. Blatchford & Sons, Ltd., Basingstoke, England. A mechanical friction knee unit used in conjunction with a pneumatic swing control. The unit provides stance control by means of a friction band connected to the thigh section; the band is looped around a drum connected to the upper shank portion. Predetermined tension on the band is maintained by a preset clock-type coil spring, which automatically compensates for wear in the mechanism and resulting slack or stretching. (Patent No. 3,599,245, Aug. 17, 1971; filed June 23, 1969, Serial No. 835,583; 4 claims.)

Artificial Limbs: Dennis W. Collins, assignor to Hugh Steeper (Roehampton) Ltd., London, England. A body-powered upper-extremity endoskeletal prosthesis, featuring telescopic linkages which pivot about the elbow joint. The device provides mechanical elbow locking by means of a spring-loaded ball-and-groove arrangement, located between the inner and the outer portions of the telescopic element. The inner portion will slide freely through the outer shell when tension is applied to an attached cable. When tension on the cable is released, the locking balls are seated into any of the several grooves that are located along the inner portion of the telescoping element. Elbow locking is maintained until tension is again applied to the cable. (Patent No. 3,619,818, Nov. 16, 1971; filed Oct. 1, 1969, Serial No. 862,667; 2 claims.)

Biological Electrode Amplifier: Laurice J. West, assignor to Microcom Corporation, Horsham, Pa. A biopotential-sensing electrode with a self-contained amplifier. The high-input impedance, low-noise amplifier is bonded to the surface electrode by a non-conducting epoxy. (Patent No. 3,628,527, Dec. 21, 1971; filed Oct. 8, 1969, Serial No. 864,769; 5 claims.)

Conductive Rubber Electrode: Riley D. Woodson. A disposable surface electrode composed of a flexible conductive plastic material and coated with a pressure-sensitive adhesive for attachment to the skin. A terminal is mounted on the non-contacting surface of the electrode for connection of a lead to a measuring instrument. (Patent No. 3,606,881, Sept. 21, 1971; filed Feb. 20, 1970, Serial No. 12,904; 2 claims.)

Control System for Electrically Powered Artificial Limbs: Tsutomu Suzuki, Fumio Hayakawa, and Kouichi Yaida, assignors to Omron Tateisi Electronics Co., Kyoto-fu, Japan. An externally powered upper-extremity prosthesis and control system with speed and torque feedback capability. The device is operated by either a two-way switch or a push-button, which actuates one or more motors to provide hand opening and closing, elbow flexion and extension, wrist rotation, and shoulder motion. The user is able to detect speed, force, torque,

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and position by means of a feedback loop in the control mechanism. (Patent No. 3,609,769, Oct. 5, 1971; filed April 2, 1969, Serial No. 812,742; 12 claims.)

Disposable Stump Sock: Laura McKeehan. A disposable, moisture-absorbing stump sock, which is composed of porous paper and plastic sheets laminated together to form a closed-end cover for an amputation stump. (Patent No. 3,600,717, Aug. 24, 1971; filed Sept. 26, 1969, Serial No. 861,371; 8 claims.)

Flexible Cutaneous Electrode Matrix: Carter C. Collins and Robert Bowen, assignors to the Institute of Medical Sciences, San Francisco, Calif. A visual substitution system consisting of a flexible, porous electrocutaneous interface which produces tactile stimulation. The skin receptor network consists of two portions, an inner porous sheet containing an array of surface electrodes, and an outer resilient sheath with adjustable fastening means. Images are transmitted to the electrode matrix by means of an artificial receptor, such as a TV camera, are projected and impressed as tactile information upon the subject's skin, are perceived at the receptor level and then conducted to the brain, where the original visible image is reconstructed. (Patent No. 3,612,061, Oct. 12, 1971; filed Feb. 20, 1969, Serial No. 800,948; 8 claims.)

Hearing Aid Using Multiple Frequency Translation: Emanuele Biondi and Leonardo Biondi. An aid for the deaf which uses the principle of frequency band translation. The audio or speech signal is filtered, amplified, and converted into a sound signal which is of a lower frequency and thus more comprehensible to a deaf person. (Patent No. 3,600,524, Aug. 17, 1971; filed July 9, 1968, Serial No. 743,460; 3 claims.)

Hearing Systems: Henry K. Puharich and Joseph L. Lawrence, assignors to Intelelectron Corporation, New York, N.Y. A system of electrically stimulating the facial nerves to provide improved sensation of hearing. The "acoustic" signal is applied by means of transducers, which may be contained in the temple portions of eyeglass frames. (Patent No. 3,629,521, Dec. 21, 1971; filed Jan. 8, 1970, Serial No. 1,334; 11 claims.)

Liquid Electrode Material: Robert J. Adolph and Aribert H. Bernstein. A skin electrode consisting of a viscous, adhesive, electrically conductive liquid which is applied directly to a wire lead and the adjacent skin. The wire lead, which is sandwiched between two layers of an adhesive tape, is exposed through an aperture in the tapes where the conductive liquid is applied. The material dries quickly and forms a mechanical, flexible, conductive bond between the skin and the wire lead. (Patent No. 3,607,788, Sept. 21, 1971; filed Nov. 20, 1967, Serial No. 687,955; 3 claims.)

Myoelectric Brace: Allan G. Potter, assignor to Iowa State University Research Foundation, Ames, Iowa. A myoelectric upper-extremity orthosis consisting of movable finger supports, a fixed wrist-hand splint portion, and a hydraulic pump. Contraction of the patient's muscle produces myopotentials that are sensed by skin electrodes and then amplified to actuate the hydraulic pump, resulting in hand opening. Relaxation of the muscle causes hand closing. (Patent No. 3,631,542, Jan. 4, 1972; filed Aug. 11, 1969, Serial No. 848,919; 2 claims.)

Orthopedic Bandage: Franklin Boardman, assignor to Johnson & Johnson. A casting bandage consisting of cotton or other open-mesh fabrics impregnated with a solid, water-soluble vinyl monomer. The bandage is immersed in water in the presence of a catalyst, and then applied to the body portion to be immobilized. Flexibility or rigidity of the bandage can be controlled by mixing various amounts of the vinyl monomer substances. (Patent No. 3,630,194, Dec. 28, 1971; filed May 22, 1970, Serial No. 39,754; 25 claims.)

Orthopedic Device Having a Resin Curable by Ultrasonic Energy: Leroy E. Beightol, assignor to Merck & Co., Rahway, N.J. A resin-impregnated fabric which produces a hard, lightweight, porous cast when exposed to ultrasonic energy. The orthopedic cast is applied to the appropriate body member and briefly exposed at room temperature to an ultrasonic energy source, such as an ultrasonic transducer. The initially dry, flexible fabric becomes rigid and is light in weight, porous, physiologically inert, non-toxic, and strong. (Patent No. 3,618,599, Nov. 9, 1971; filed Aug. 4, 1969, Serial No. 847,433; 9 claims.)

Oxidized Surface Biopotential Skin Electrode: Edwin Gordy, assignor to Lexington Instruments, Waltham, Mass. A disposable skin electrode composed of deformable, electrically insulating materials, into which two passageways are provided for the introduction of an electrolyte paste. At least one hollow area, or socket, is molded into the wafer-like electrode. The sockets act as the electrical connections for plug-in terminals leading to the biopotential measuring instrument. (Patent No. 3,599,629, Aug. 17, 1971; filed Aug. 28, 1968, Serial No. 755,872; 11 claims.)

Vehicle Steered by Tilting the Body: Darrell A. Frigaard. A wheeled platform consisting of a lengthwise body, sides which extend over the axles, and a rear extension for braking. The sides contain slots which receive the axles, and the front pair of slots slope downward to turn the vehicle by laterally tilting the vehicle body. The rear extension provides braking by engaging against the riding surface when the front portion of the body is raised. (Patent No. 3,618,970, Nov. 9, 1971; filed Mar. 16, 1970, Serial No. 19,937; 4 claims.)