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(21) International Application Number: PCT/US00/09911 (22) International Filing Date: 14 April 2000 (14.04.00) (30) Priority Data: 60/129,839 16 April 1999 (16.04.99) US 09/521,878 9 March 2000 (09.03.00) US (71) Applicant: PARKERVISION, INC. [US/US]; 8493 Baymeadows Way, Jacksonville, FL 32256 (US). (71)(72) Applicants and Inventors: SORRELLS, David, F. [US/US]; 5250 Siesta Rio Drive South, Jacksonville, FL 32258 (US). COOK, Robert, W. [US/US]; 1432 Roberts Road, Switzerland, FL 32259 (US). LOOKE, Richard, C. [US/US]; 3170 Ricky Drive, Jacksonville, FL 32223 (US). BULTMAN, Michael, J. [US/US]; 2244 Aztec Drive West, Jacksonville, FL 32246 (US). MOSES, Charley, D., Jr. [US/US]; 4314 Naranja Drive, Jacksonville, FL 32217 (US). RAWLINS, Gregory, S. [US/US]; 299 Leslie Lane, Lake Mary, FL 32746 (US). RAWLINS, Michael, W. [US/US]; 665 Brightview Drive, Lake Mary, FL 32746 (US).		(74) Agents: SOKOHL, Robert, E. et al.; Sterne, Kessler, Goldstein & Fox P.L.L.C., 1100 New York Avenue, N.W., Suite 600, Washington, DC 20005-3934 (US). (81) Designated States: AE, AG, AL; AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: METHOD AND SYSTEM FOR DOWN-CONVERTING AN ELECTROMAGNETIC SIGNAL, AND TRANSFORMS FOR SAME <pre> graph TD 4601 --> 4602[RECEIVING AN EM SIGNAL] 4602 --> 4604[RECEIVING AN ENERGY TRANSFER SIGNAL HAVING AN ALIASING RATE] 4604 --> 4605[TRANSFERRING ENERGY FROM THE EM SIGNAL AT THE ALIASING RATE TO DOWN-CONVERT THE EM SIGNAL] </pre> (57) Abstract Methods, systems, and apparatuses, and combinations and subcombinations thereof, for down-converting an electromagnetic (EM) signal are described herein. Briefly stated, in embodiments the invention operates by receiving an EM signal and recursively operating on approximate half cycles (1/2, 1, 2, etc.) of the carrier signal. The recursive operations can be performed at a sub-harmonic rate of the carrier signal. The invention accumulates the results of the recursive operations and uses the accumulated results to form a down-converted signal. In an embodiment, the EM signal is down-converted to an intermediate frequency (IF) signal. In another embodiment, the EM signal is down-converted to a baseband information signal. In another embodiment, the EM signal is a frequency modulated (FM) signal, which is down-converted to a non-FM signal, such as a phase modulated (PM) signal or an amplitude modulated (AM) signal.		