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(54) Title (EN): ULTRASOUND SYSTEM AND ULTRASONIC PULSE TRANSMISSION METHOD

(54) Title (FR): SYSTÈME À ULTRASONS ET PROCÉDÉ DE TRANSMISSION D'IMPULSIONS ULTRASONORES

(57) Abstract:

(EN): An ultrasound system is disclosed comprising a probe (10) including an array (110) of CMUT (capacitive micromachined ultrasound transducer) cells (100), each cell comprising a substrate (112) carrying a first electrode (122) of an electrode arrangement, the substrate being spatially separated from a flexible membrane (114) including a second electrode (120) of said electrode arrangement by a gap (118), the flexible membrane comprising a mass element (140) in a central region (17, 17'); and a voltage supply (45) coupled to said probe and adapted to, in a transmission mode of the ultrasound system, provide the respective electrode arrangements of at least some of the CMUT cells with a voltage including a bias voltage component driving the at least some of the CMUT cells into a collapsed state in which a central part of the flexible membrane contacts the substrate, said central part including the central region; and a stimulus component having a set frequency for resonating the respective flexible membranes of the at least some of the CMUT cells in said collapsed state, wherein the mass element of each of the at least some CMUT cells forces at least the central region of the flexible membrane of said cell to remain in contact with the substrate during said resonating. A pulse transmission method for such a system is also disclosed.

(FR): L'invention concerne un système à ultrasons comportant une sonde (10) comprenant un réseau (110) de cellules (100) de CMUT (transducteur capacitif à ultrason micro-usiné), chaque cellule comprenant un substrat (112) portant une première électrode (122) d'un dispositif d'électrodes, le substrat étant spatialement séparé d'une membrane souple (114) comprenant une seconde électrode (120) de l'agencement d'électrodes par un intervalle (118), la membrane souple comprenant un élément de masse (140) dans une région centrale (17, 17') ; et une alimentation en tension (45) couplée à ladite sonde et conçue pour, dans un mode de transmission du système à ultrasons, fournir aux dispositifs d'électrodes respectifs d'au moins certaines des cellules de CMUT, une tension comprenant une composante tension de polarisation amenant lesdites cellules de CMUT dans un état replié dans lequel une partie centrale de la membrane souple entre en contact avec le substrat, ladite partie centrale comprenant la région centrale ; et une composante stimulus ayant une fréquence prédéterminée destinée à amener en résonance les membranes souples respectives desdites cellules de CMUT dans ledit état replié, l'élément de masse de chacune desdites cellules de CMUT forçant au moins la

région centrale de la membrane souple de ladite cellule à rester en contact avec le substrat pendant ladite résonance. L'invention concerne également un procédé de transmission d'impulsions pour un tel système.

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Declarations:

Declaration made as applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate