FCR 4

Office of the President
February 25, 2003

Members, Board of Trustees:

PATENT ASSIGNMENT REPORT

Recommendation: that the patent assignment report for the period October 1, 2002 through January 31, 2003 be accepted.

Background: FCR 5, dated March 4, 1997, authorized that all future copyright and patent filings and prosecutions be conducted by the University of Kentucky Research Foundation (UKRF), and that the Vice President for Research and Graduate Studies or his designee be authorized to execute any needed documents to obtain appropriate patent or copyright protection. Quarterly reports on patent and copyright applications are to be submitted to the Finance Committee of the Board.

Action Taken: ☑ Approved ❑ Disapproved ❑ Other _____

PATENT ASSIGNMENT
QUARTERLY FOR THE PERIOD OCTOBER 1, 2002 THROUGH JANUARY 1, 2003

Patents

The following assignments on behalf of the Board of Trustees to the University of Kentucky Research Foundation have been executed:

1. U.S. Patent Serial Number: (to be assigned), filed (to be filed), titled "CATALYTIC CONVERSION OF HYDROCARBONS TO HYDROGEN AND HIGH-VALUE CARBON". Inventors: Drs. Naresh Shah, Devadas Panjala and Gerald P. Huffman. This invention provides novel catalysts for accomplishing catalytic decomposition of undiluted light hydrocarbons to a hydrogen product, and methods for preparing such catalysts. In one aspect, a method is provided for preparing a catalyst by admixing an aqueous solution of an iron salt, at least one additional catalyst metal salt, and a suitable oxide substrate support, and precipitating metal oxyhydroxides onto the substrate support. An incipient wetness method, comprising addition of aqueous solutions of metal salts to a dry oxide substrate support, extruding the resulting paste to pellet form, and calcining the pellets in air is also disclosed. In yet another aspect, a process is provided for producing hydrogen from an undiluted light hydrocarbon reactant, comprising contacting the hydrocarbon reactant with a catalyst as described above in a reactor, and recovering a substantially carbon monoxide-free hydrogen product stream. In yet another aspect, a process is provided for catalytic decomposition of an undiluted light hydrocarbon reactant to obtain hydrogen and a valuable multi-walled carbon nanotube coproduct.

2. U.S. Patent Serial Number: (to be assigned), filed (to be filed), titled "PROCESS FOR NANO-MACHINING USING CARBON NANOTUBES". Inventors: Drs. Robert R. Vallance, Apparao M. Rao and M. Pinar Menguc. This invention provides novel methods and devices for nano-machining a desired pattern on a surface of a conductive workpiece. In one aspect, the method comprises using an electron beam emitted from one or more nanotubes to evaporate nanoscale quantities of material from the workpiece surface. The surface of the workpiece to be machined may be excited to a threshold energy to reduce the amount of power required to be emitted by the nanotube. In another aspect, a device is described for nanomachining a desired pattern on a surface of a conductive workpiece, comprising a vessel capable of sustaining a vacuum, a leveling support, a nanopositioning stage, and a laser for heating the workpiece. A nanotool is provided comprising at least one nanotube supported on an electrically conductive base, adapted to emit an electron beam for evaporating material from an electrically conductive workpiece.

3. U.S. Patent Serial Number: (to be assigned), filed (to be filed), titled "DYNAMIC SHADOW REMOVAL FOR FRONT PROJECTION DISPLAYS".

Inventors: Dr. Christopher O. Jaynes, Steven B. Webb and Robert M. Steele. This invention provides a technique and system for detecting a radiometric variation/artifacts of a front-projected dynamic display region under observation by at least one camera. The display is comprised of one or more images projected from one or more of a plurality of projectors; the system is preferably calibrated by using a projective relationship. A predicted image of the display region by the camera is constructed using framebuffer information from each projector contributing to the display, which has been geometrically transformed for the camera and its relative image intensity adjusted. A detectable difference between a predicted image and the display region under observation causes a corrective adjustment of the image being projected from at least one projector. The corrective adjustment may be achieved by way of pixel-wise approach (an alpha-mask is constructed from delta pixels/images), or bounding region approach (difference/bounding region is sized to include the area of the display affected by the radiometric variation). Also: a technique, or method, for detecting a radiometric variation of a display region under observation, as well as associated computer executable program code on a computer readable storage medium, therefor.