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(19) **United States**(12) **Patent Application Publication**  
**Harthcock**(10) **Pub. No.: US 2022/0376193 A1**(43) **Pub. Date: Nov. 24, 2022**(54) **COMPLEX NANOSTRUCTURE  
CONFIGURABLE AS A TRANSISTOR,  
MULTIPLEXER, OR INFORMATION  
UNFOLDER**(52) **U.S. Cl.**  
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5/00 (2013.01)(71) Applicant: **Jerry D. Harthcock**, Boerne, TX (US)(72) Inventor: **Jerry D. Harthcock**, Boerne, TX (US)(21) Appl. No.: **17/350,805**(22) Filed: **Jun. 17, 2021****Related U.S. Application Data**(60) Provisional application No. 63/053,907, filed on Jul.  
20, 2020.**Publication Classification**(51) **Int. Cl.**  
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*H01L 51/00* (2006.01)(57) **ABSTRACT**

A complex nanostructure, which includes a first nanostructure component having at least one aperture in a side thereof; at least one second nanostructure component having a first end and a second end, wherein the first end of each of the at least one second nanostructure is inserted through a corresponding one of the at least one aperture in the first nanostructure, thereby forming at least one junction. Embodiments of the complex nanostructure include a bifurcated nanostructure transistor constructed of linear carbon nanotubes, a multiplexer constructed of a circular carbon nanotube and multiple linear carbon nanotubes, and an information unfolders constructed of linear or a combination of linear and circular carbon nanotubes. The nanotubes may optionally be decorated with genetic material such as single-strand or double-strand human DNA segments and/or may be modified by e-beam or ozone gas to add defects into the nanotubes to alter electrical/functional characteristics.

