Divisional Application Number: US 19/195,998 of parent Patent US 12,324,295 B2

Pertinent Figures (partial):

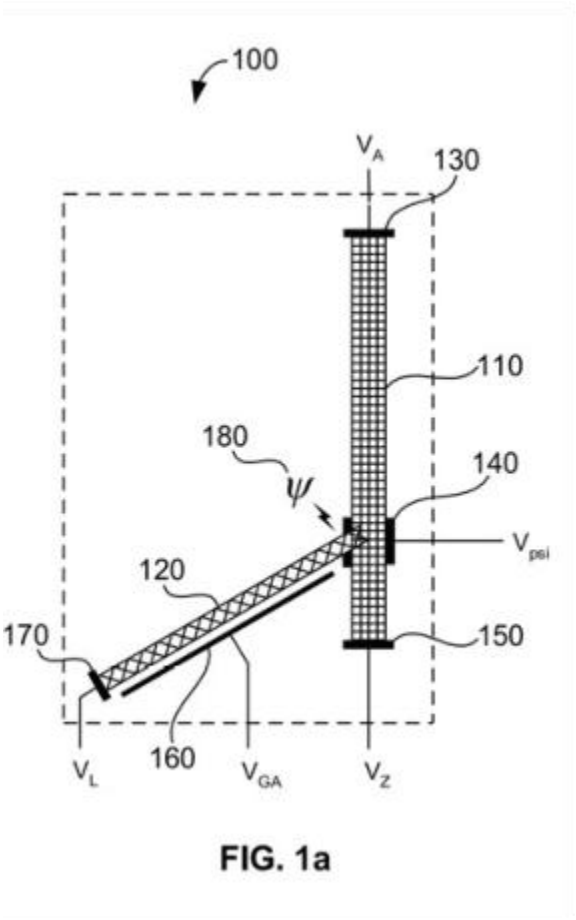

FIG. 1a

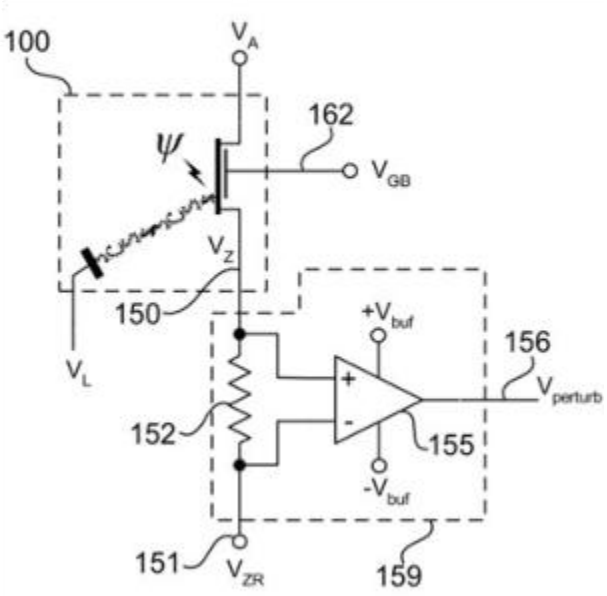

FIG. 1i

Listing of Claims:

1. A complex nanostructure, comprising:

a first nanostructure component having a first end, a second end, and an aperture in a side thereof;

a second nanostructure component having a first end and a second end, wherein the first end of the second nanostructure is inserted through the aperture in the first nanostructure, thereby forming a junction; and

voltage means for creating at least one difference in potential between the first end of the first nanostructure component and at least one of the second end of the first nanostructure component and the second end of the second nanostructure component, thereby enabling current to flow selectively through the second end of the first nanostructure or the second end of the second nanostructure.

2. The complex nanostructure as recited in claim 1, wherein the complex nanostructure is a bifurcated nanostructure transistor, and wherein:

the first nanostructure component is a first linear carbon nanotube forming a nanostructure trunk;

the second nanostructure component is a second linear carbon nanotube forming a nanostructure L, wherein:

the first end of the nanostructure L is inserted through the side of the nanostructure trunk via the aperture, thereby forming the junction, and

the nanostructure L is angled away from the first end of the nanostructure trunk;

a first electrical contact at the first end of the nanostructure trunk;

a second electrical contact at the second end of the nanostructure trunk; and

a third electrical contact at the second end of the nanostructure L;

wherein whenever a voltage potential across two or more of the first, second, and third electrical contacts is present, current flows selectively from any of the electrical contacts having greater potential to any of the contacts having lesser potential, thereby providing a transistor effect.

3. The complex nanostructure as recited in claim 2, wherein:

the first linear carbon nanotube is metallic;

the second linear carbon nanotube is semiconducting; and

a charge with field strength sufficient to allow current to flow extends along the second linear carbon nanotube.

4. The complex nanostructure as recited in claim 2, wherein:

the first linear carbon nanotube is metallic; and

the second linear carbon nanotube is metallic.

5. The complex nanostructure as recited in claim 2, wherein:

the first linear carbon nanotube is semiconducting;

the second linear carbon nanotube is metallic; and

a charge with field strength sufficient to allow current to flow extends along the first linear carbon nanotube.

6. The complex nanostructure as recited in claim 2, wherein at least one of the first and second linear carbon nanotubes includes defects that alter electrical characteristics of the bifurcated nanostructure transistor.

7. The complex nanostructure as recited in claim 2, wherein at least one of the first and second linear carbon nanotubes is decorated with a genetic material.

8. The complex nanostructure as recited in claim 2, wherein:

the first and second linear carbon nanotubes are semiconducting and share a single field; and

the first linear carbon nanotube is decorated with a genetic material.

9. The complex nanostructure as recited in claim 2, wherein:

the first linear carbon nanotube is decorated with a genetic material;

the first and second linear carbon nanotubes are semiconducting and share a first field extending from the first end of the first linear carbon nanotube to the junction of the first and second linear carbon nanotubes and from the junction to the second end of the second linear carbon nanotube; and

the first linear carbon nanotube has a second field extending from the junction of the first and second linear carbon nanotubes to the second end of the first linear carbon nanotube;

wherein when different potentials are applied to the first and second fields, the first linear carbon nanotube is made to function as a P-N junction diode.

10. The complex nanostructure as recited in claim 1, wherein the complex nanostructure is a bifurcated nanostructure transistor, and wherein:

the first nanostructure component is a metallic linear carbon nanotube forming a nanostructure trunk;

the second nanostructure component is a genetic material functioning as a wire for a nanostructure L after being inserted into the metallic linear carbon nanotube trunk;

wherein the bifurcated nanostructure transistor further comprises:

a first electrical contact at the first end of the nanostructure trunk;

a second electrical contact at the second end of the nanostructure trunk; and

a third electrical contact at the second end of the nanostructure L;

wherein whenever a voltage potential across two or more of the first, second, and third electrical contacts is present, current flows selectively from any of the electrical contacts having greater potential to any of the contacts having lesser potential, thereby providing a transistor effect.

11. The complex nanostructure as recited in claim 10, wherein the genetic material is impregnated with silver or nickel nanoparticles.

12-20. (Canceled)

21. The complex nanostructure as recited in claim 2, wherein:

the nanostructure L has a narrower diameter than the nanostructure trunk, and the first end of the nanostructure L is inserted through the side of the nanostructure trunk via the aperture into the interior of the nanostructure trunk at an angle away from the first end of the trunk;

wherein the nanostructure L forms an electron scooper within a first portion of the interior of the nanostructure trunk, said electron scooper providing a first electron exit

path, said first electron exit path enabling the electrons to exit the bifurcated nanostructure transistor through the nanostructure L.

22. The complex nanostructure as recited in claim 21, wherein the first end of the nanostructure L extends into the interior of the nanostructure trunk such that a longitudinal center axis of the nanostructure L intersects a longitudinal center axis of the nanostructure trunk.

23. The complex nanostructure as recited in claim 21, wherein the nanostructure L is angled toward the second end of the nanostructure trunk at an angle of 30 degrees past perpendicular from a longitudinal axis of the nanostructure trunk.

24. The complex nanostructure as recited in claim 21, wherein a remaining portion of the interior of the trunk adjacent to the electron scooper provides a second electron exit path, said second electron exit path enabling the electrons to exit the bifurcated nanostructure transistor through the nanostructure trunk.

25. The complex nanostructure as recited in claim 24, further comprising at least one electron detector electrically connected to at least one of the second end of the nanostructure trunk or the second end of the nanostructure L.

26. The complex nanostructure as recited in claim 2, wherein the first and second linear carbon nanotubes each include a plurality of carbon atoms, and at least one of the first and second linear carbon nanotubes includes at least one carbon atom extracted from a living organism.