★★★ ＜第31回知的財産翻訳検定試験【第15回英文和訳】＞ ★★★

≪１級課題 -電気・電子工学-≫

【解答にあたっての注意】

１．問題の指示により和訳してください。

２．解答語数に特に制限はありません。適切な箇所で改行してください。

３．課題文に段落番号がある場合、これを訳文に記載してください。

４．課題は３題あります。それぞれの課題の指示に従い、３題すべて解答してください。

問１．次の英文クレームを、日本語に訳してください。

1. An axial brushless DC motor comprising:

a stator including a plurality of coils, a base of the stator defining a central through-hole;

a rotor including a magnet with a plurality of pairs of magnetic poles and adapted for movement relative to the stator in one or more full steps;

an elongate sleeve bushing extending through the stator, the sleeve bushing further defining an interior through-hole therein;

an elongate motor shaft extending through the interior through-hole of the sleeve bushing and including an upper end and a lower end, the lower end extending through the interior through-hole of the stator;

a bearing mounting the motor shaft to the sleeve bushing for rotation relative to the sleeve bushing and the base of the stator, the bearing positioned against an end of the sleeve bushing, the end of the sleeve bushing extending into the central through-hole defined in the base of the stator; and

a generally Y shaped coil phase circuit including first, second, and third coil phase circuit segments with respective first ends coupled to each other at a common connection point;

the coil phase circuit being adapted for moving the rotor on the upper end of the motor shaft relative to the stator a fractional step less than the one or more full steps and holding the rotor at the one or more fractional or full steps, wherein each of the first, second, and third coil phase circuit segments are energizable for holding the rotor at the one or more fractional steps between the one or more full steps relative to the stator.

2. The axial brushless DC motor of claim 1, wherein the coil phase circuit is a three phase circuit adapted to switch the orientation of one or more of the plurality of pairs of magnetic poles of the rotor during operation of the motor and hold the rotor at a half step between the one or more full steps.

問２．次の英文は、ある特許明細書の従来技術の記載です。日本語に訳してください。

Computing systems typically employ data storage systems for storage and retrieval of data accessed by users. Various types of storage devices can be employed in these data storage systems, such as hard disk drives (HDDs) or solid-state drives (SSDs), among others. SSDs employ various underlying storage technology, such as NAND flash arrays. Payload data stored in these arrays is typically encoded using various error correction codes to ensure more reliable data storage despite random read/write errors, interfacing errors, and physical flaws in the underlying storage media. However, these error correction codes consume finite computing resources and take time to converge to corrected data values during data read decoding.

Media and latency limitations of certain computer/server types or data access styles might preclude encoding data with large error correction overheads, due in part to latency involved in decoding processes. For example, many users who use Internet services access content storage in specific ways, where content is initially written and then that same content is read many times when different clients need to consume the same content. Such applications can include sharing of popular songs or videos on content websites that are read many thousands of times in close temporal proximity to one another. Moreover, content media servers and systems many times forgo large random-access memory (RAM) caches in lieu of large data storage devices due in part to cost.

問３．次の英文は、ある特許明細書の実施形態の記載です。図面を参照して、***(START)***から***(END)***までの部分を日本語に訳してください。

The following describes a process for fabricating a top-gate graphene field effect transistor. Referring to FIG. 1(a), in some implementations, electrochemical deposition is performed using a three-electrode cell. Initially, a graphene layer 102 is formed on a substrate 104 using, e.g., exfoliation or chemical vapor deposition. The graphene layer 102 is patterned using, e.g., electron beam lithography. A drain electrode 106 and a source electrode 108 are formed on the graphene using, e.g., electron beam lithography (EBL) and electron beam evaporation (EBE). The substrate 104, the graphene 102, and the electrodes 106, 108 are then immersed in a solution 110 in an inert container 112, in which the solution includes, e.g., phenol and sulfuric acid.

(START)

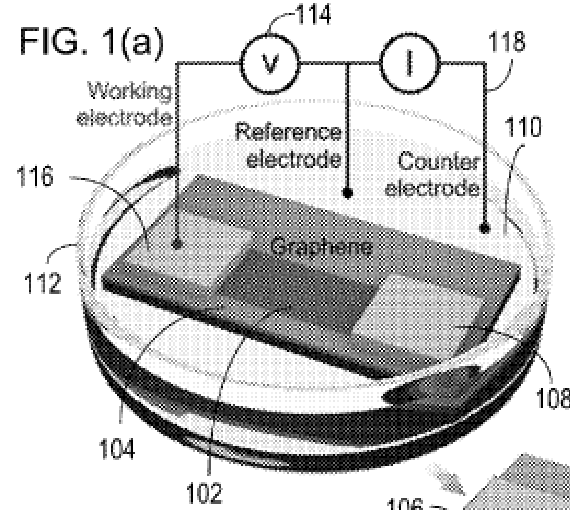
During electrochemical deposition, the drain and source electrodes 106, 108 are connected together so that the graphene 102 and the drain and source electrodes 106, 108 have the same electric potential. The graphene 102 functions as the working electrode. A voltage is applied to the drain electrode 106 through a bond wire attached to the drain electrode 106. A potentiostat 114 controls the electric potential of the graphene 102 versus a silver reference electrode 116. A platinum wire is used as the counter electrode 118.

Electrochemical deposition of poly(phenylene oxide) can be accomplished by repeatedly cycling the potential between the graphene 102 and the reference electrode 116. For example, referring to FIG. 1(d), a graph 120 shows an example in which the potential cycles between about 0.1 V and 0.9 V. In this example, a triangular voltage waveform can be used, and the ramp rate can be 100 mV/s. Other waveforms and ramp rates (or signal frequencies) can also be used. The graph 120 shows cyclic voltammetry (CV) of poly(phenylene oxide) deposition on a graphene device comparing the first cycle 122, second cycle 124, tenth cycle 126, and 360th cycle 128. In this example, in the first cycle 122, the current varies from about 0.1 to –3.2 μA, in the second 124, the current varies from about 0.1 to −1.4 μA, in the tenth cycle 126, the current varies from about 0 to –0.3 μA, and in the 360th cycle 122, the current remains about 0 μA.

(END)

In an inset, a graph 130 shows a curve 132 representing the logarithm of the current at +0.9 V plotted vs. the cycle number. The curve 132 indicates that the current becomes very small after a few hundred cycles. Poly(phenylene oxide) is non-conducting, so as more poly(phenyleneoxide) is deposited on the graphene 102, the resistance becomes larger, and the current becomes smaller. As the current decreases, the deposition rate of poly(phenylene oxide) also decreases. This results in a self-limiting effect of the electropolymerization, in which the thickness of the poly(phenylene oxide) stops increasing after a certain number of cycles. The final thickness of poly(phenylene oxide) is affected by several factors, such as the concentration of phenol and sulfuric acid, the cycling potential, and the cycling frequency. The self-limiting effect also results in a self-leveling effect that results in the poly(phenylene oxide) layer having a substantially uniform thickness. During the electrochemical deposition, when there is uneven thickness in the polymer layer, the deposition of the polymer occurs faster at the thinner portions and slower at the thicker portions, eventually forming a substantially smooth and even polymer layer.

FIG. 1(a)



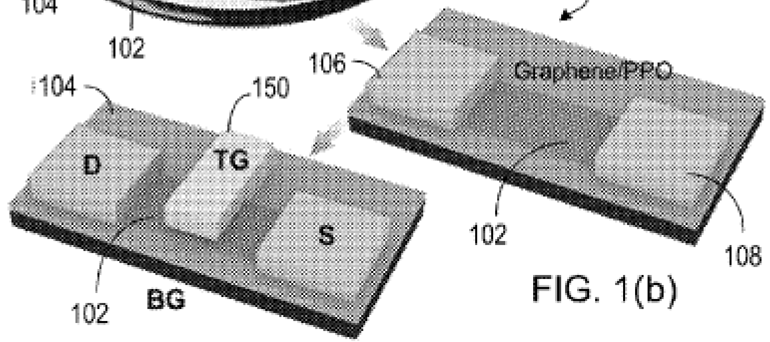


FIG. 1(b)

FIG. 1(c)

FIG. 1(d)

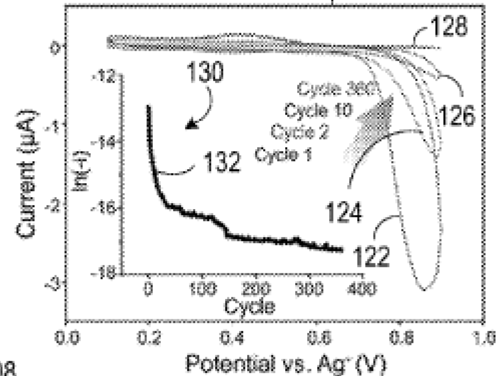
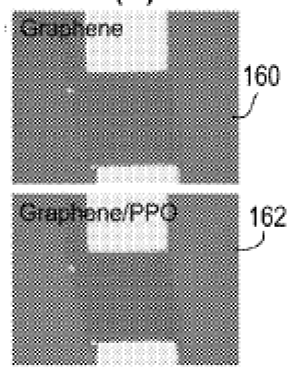


FIG. 1(e)



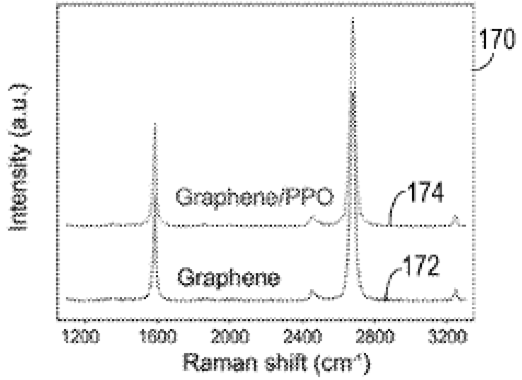


FIG. 1(f)