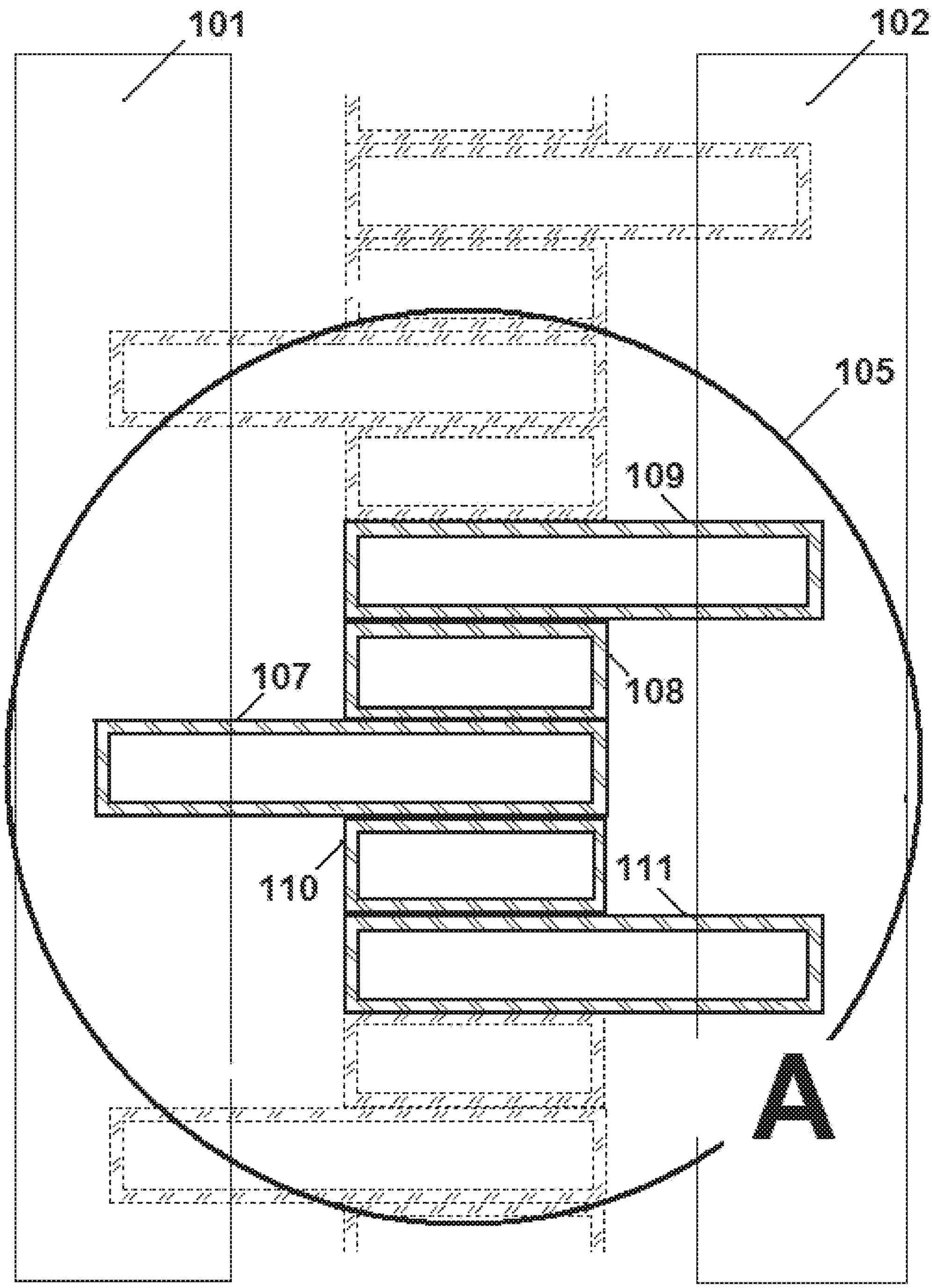

Fig. 1a

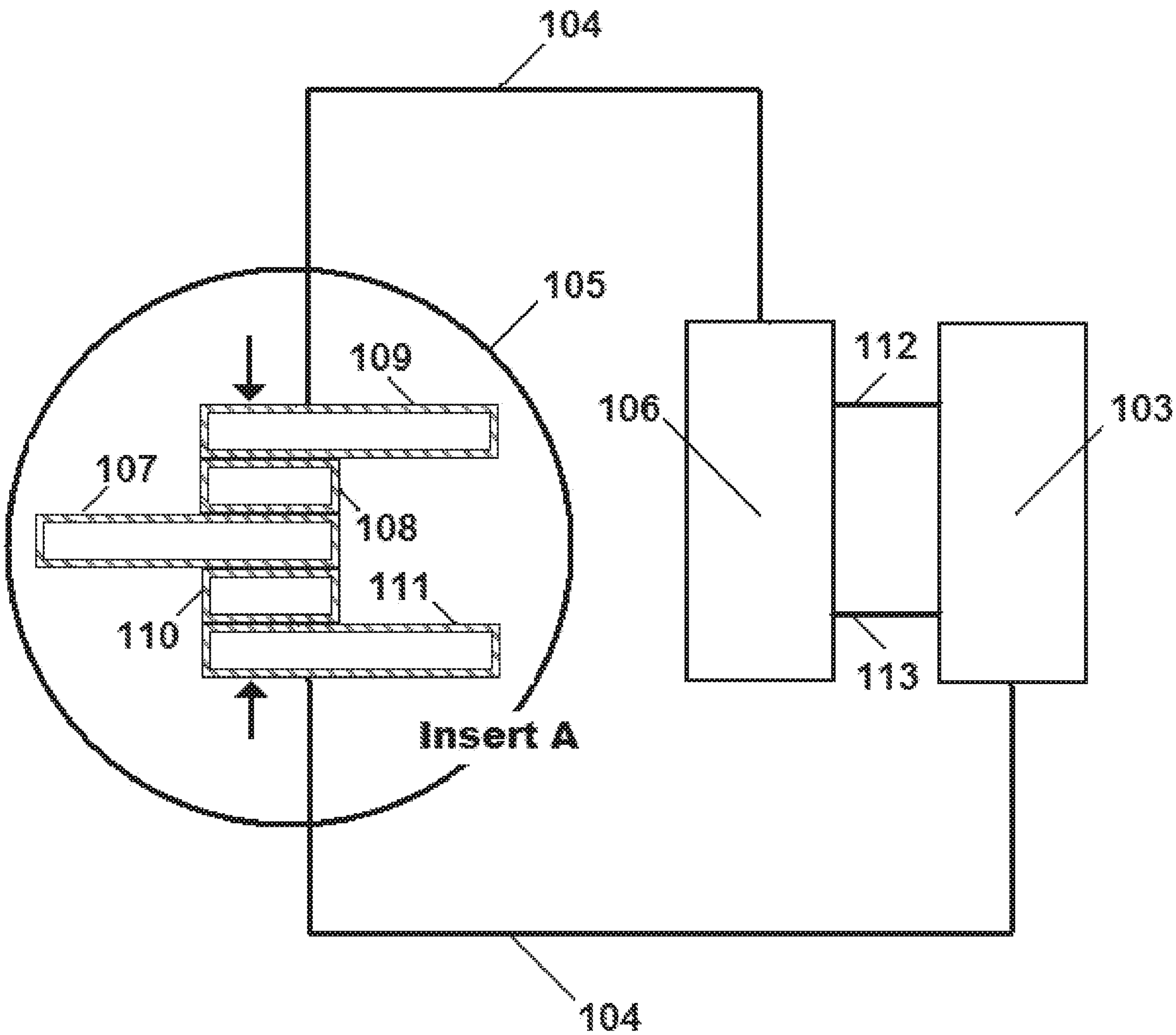

Fig. 1b

Fig. 2

HOT AND COLD LAYERS
METAL BAR STOCK PROCCESS

Cut hot and cold layers to appropriate size. [201]

Coat layers using atactic polypropylene or propylene glycol - coating processes. [202]

Cure coating using superconducting polymer curing process [203]

Fig. 3

HOT AND COLD LAYERS
POWDER METAL PROCCESS

Form hot and cold layers under pressure into appropriate size and density of 88-98% using copper powder material in the micro to nanometer size range. [301]

Sinter and anneal hot and cold layers in reducing atmosphere near the melting temperature of copper. [302]

Coat hot and cold layer using atactic polypropylene or propylene glycol - coating processes [303]

Cure coating using superconducting polymer curing process [304]

Fig. 4

HOT AND COLD LAYERS PROCESS WITH INTEGRAL SEMICONDUCTOR LAYER

Supply formed layers. [401]

Deposit a layer of N-Type or P-Type semiconductor material using but not limited to electro plating, vapor deposition, vacuum deposition or plasma sputtering processes. [402a]

Alternative to [402a] deposit a composite layer of N-Type or P-Type semiconductor material particles suspended in a polymer using any appropriate process. [402b]

Coat semiconductor layer using atactic polypropylene or propylene glycol - coating processes [403]

Cure coating using the superconducting polymer curing process [404]

Fig. 5

SEMICONDUCTOR LAYER FORMATION - BRIDGEMAN MOLDING PROCESS

Measure P-Type or N-Type semiconductor material in the proper proportion [500]

Mix the P-Type or N-Type semiconductor material. [501]

Melt the P-Type or N-Type semiconductor mixture. [502]

Cool mixture slowly to form thermoelectric ingot. [503]

Slice the ingot into layers of appropriate size. [504]

Lapping, grinding or polishing. [505]

Anneal the layers in a reducing atmosphere. [506]

Optional Coating of layer with metal ion diffusion barrier. [507]

Coat the semiconductor layer using atactic polypropylene or propylene glycol - coating processes. [508]

Cure coating using superconducting polymer curing process. [509]

Fig. 6

SEMICONDUCTOR LAYER FORMATION and CONCURRENT SUPERCONDUCTING POLYMER COATING

DIRECT MELTING PROCESS

Measure P-Type or N-Type semiconductor material in the proper proportion. [601]

Melt measured semiconductor material in carbon crucible. [602]

Form mold cavity the thickness of finished layers from fly ash, sand or other mold material with propylene glycol or Atactic Polypropylene solution. [603]

Pour molten measured semiconductor material into mold. [604]

Heated solution produces thick white fumes as semiconductor material cools. [605]

Remove coated semiconductor material from mold. [606]

Cut material into appropriate layer sizes. [607]

Fig. 7

SEMICONDUCTOR LAYER FORMATION

POWDERED METAL PROCESS

Measure P-Type or N-Type semiconductor material in the proper proportion. [701]

Form measured semiconductor layers under pressure into appropriate size and density of 90-98% using powder semiconductor material in the micrometer to nanometer size range. [702]

Sinter and Anneal layer in reducing atmosphere at a temperature of near melting temperature. [703]

Perform Lapping, grinding or polishing of layer surfaces. [704]

Anneal layer in reducing atmosphere. [705]

Optional coating of layer with metal ion diffusion barrier. [706]

Coat layer using atactic polypropylene or propylene glycol - coating processes. [707]

Cure coating using superconducting polymer curing process. [708]

Fig. 8

PROPYLENE GLYCOL
COATING PROCESS

Pour propylene glycol into container approximately 1/8 to 1/4" deep. [801]

Set screen into container suspended above the propylene glycol. [802]

Suspend recipient substrate on a screen that placed above the level of the propylene glycol. [803]

Cover the container partially. [804]

Apply heat until white fumes/mist fills the container. [805]

Fume/mist substrate for 20 minutes allowing propylene gerivative to form and coat the substrate. [806]

Cure coating using superconducting polymer curing process [807]

Fig. 9

ATACTIC POLYPROPYLENE
COATING PROCESS

Supply atactic polypropylene, heptane and a dopant. [900]

Dissolve atactic polypropylene in heptane. [901]

Add a dopant to the solution. [902]

Dip, spray coat, brush, sponge or any other application method to coat the layer with the solution. [903]

Apply atactic polypropylene solution to layer using any method. [904]

Cure coating using superconducting polymer curing process [905]

Fig. 10

SUPERCONDUCTING POLYMER
CURING PROCESS

Expose both sides of coated substrate or layer to UV light for one hour. (this step and following two steps may be combined or performed in any order). [1001]

Expose both sides of substrate or layer to microwave radiation for five minutes. [1002]

Heat substrate or layer on hot surface to 100deg.C for ten minutes. [1003]

Cool coated layer in air. [1004]

Fig. 11

ELECTRIC FIELD CONDITIONING
ENERGY CONVERTER ASSEMBLLY
(to insure superconductivity and electrical contact between layers and coatings)

Connect the negative terminal of a power source (DC power supply or pulse width modulator) to all of the hot layers and the positive terminal to all of the cold layers, placing the P-Type and N-Type semiconductors in a parallel electrical circuit. [1101]

Energize the power source for a time that is a function of the paramaters of the apparatus to condition the conductive paths. [1102]

Energize the power source with the terminals reversed for a time that is a function of the paramaters of the apparatus to condition the semiconductor paths. [1103]

Confirm conditioning of entire apparatus by measuring its conductivity with the parallel circuit removed. [1104]

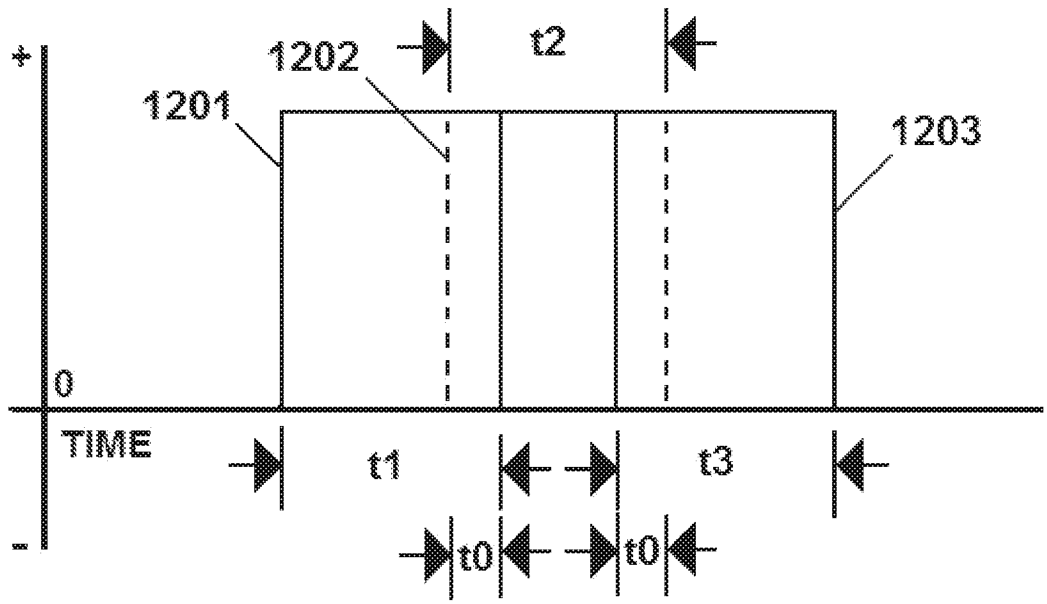

Fig. 12a

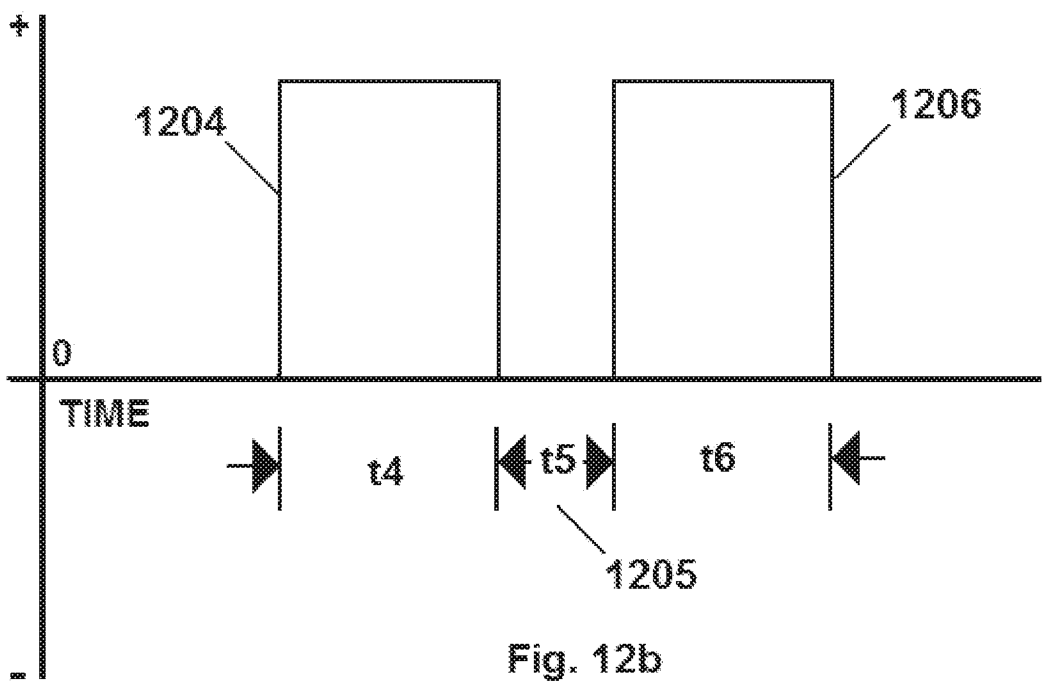

Fig. 12b

Fig. 13
PROCESS FOR COATING LAYERS WITH SUPERCONDUCTING PASTE

Supply a dopant. [1301]

Supply a polymer in solution. [1302]

Mix the dopant and polymer solution to form a paste. [1303]

Apply the paste to all or part of a layer. [1304]

Assemble two or more layers mechanically. [1305]

Heat the assembled layers. [1306]

Apply DC voltage to assembled layers during heating. [1307]

Fig. 14
ELECTRO-DEPOSITION PROCESS FOR COATINGS OF SUPERCONDUCTING POLYMERS

Supply layer. [1401]

Supply electrical and polar magnetic cell for coating. [1402]

Submurge layer in dissolved monomer or polymer. [1403]

Apply voltage across the cell. [1404]

Apply a polar magnetic field across the cell. [1405]

Remove superconducting polymer coated layer from the cell. [1406]

Fig. 15

SUPERCONDUCTING POLYMER COATING OF ASSEMBLED DEVICE USING ELECTRO-DEPOSITION PROCESS

Supply assembled layers. [1501]

Supply electrical and magnetic cell for coating. [1502]

Submurge assembled layers in dissolved monomer, polymer or doped polymer. [1503]

Apply voltage across the cell. [1504]

Apply a polar magnetic field across the cell. [1505]

Remove coated and assembled layers from the cell. [1506]

Fig. 16

SUPERCONDUCTING POLYMER COATING OF SEMICONDUCTOR LAYER

Measure P-Type or N-Type semiconductor material in the proper proportion. [1601]

Supply a solution of a polymer, solvent and dopant. [1602]

Form carbon mold cavity the thickness of finished layers. [1603]

Insulate contact edges of the mold. [1604]

Apply polymer solution to mold halves. [1605]

Assemble mold with clamp. [1606]

Electrify mold halves. [1607]

Melt semiconductor material in a carbon crucible. [1608]

Pour semiconductor material into mold cavity. [1609]

Observe conductivity of molded layer. [1610]

Disassemble mold to extract superconducting polymer coated semiconductor layer. [1611]

Fig. 17

ACTIVATING SUPERCONDUCTIVITY of DOPED POLYMER COATED LAYERS

Supply coated layer. [1701]

Supply UV light source. [1702]

Supply polar magnet. [1703]

Supply microwave source. [1704]

Expose coated layer to UV light. [1705]

Expose coated layer to polar magnetic field. [1706]

Expose coated layer to microwave radiation. [1707]

Fig. 18
FURTHER ACTIVATING SUPERCONDUCTIVITY of DOPED POLYMER COATED LAYERS

Supply assembled layers. [1801]

Supply heat source and direct towards hot layer. [1802]

Supply heat sink and direct towards cold layer. [1803]

Supply pulsating DC current to layer electrical connection with DC power supply or pulse width modulator. [1804]

Ionized polarons will cross between P-Type and N-Type semiconductors carrying electrons through the superconducting polymer. [1805]

Polymer coating will impede phonons flow. [1806]

Pulsating current accelerates electron flow making superconducting polymer threads. [1807]

Electrons separate from phonons enhancing the voltage and current flow from the layers. [1808]

Enhanced flow of electrons triggers Peltier, magnetocaloric and electrocaloric effect causing cold layer to be cool. [1809]

Increased temperature difference across the semiconductor layers increases Seebeck effect yielding higher voltage and current output. [1810]

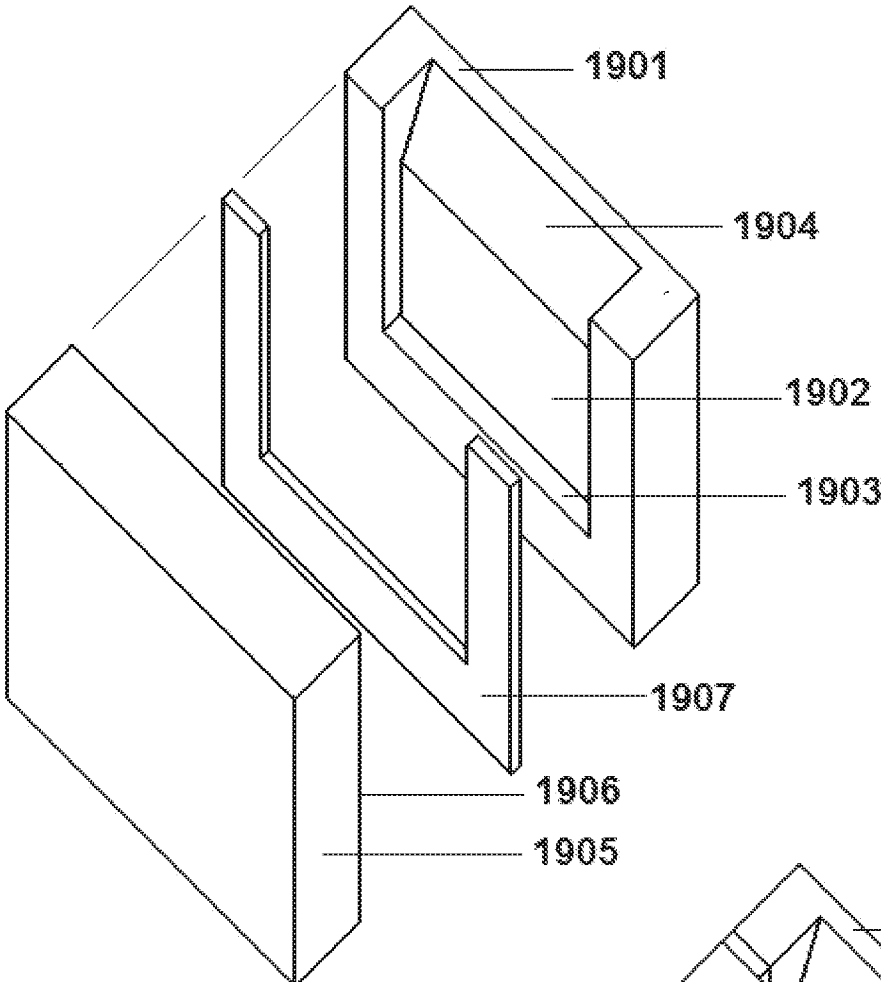

Fig. 19a

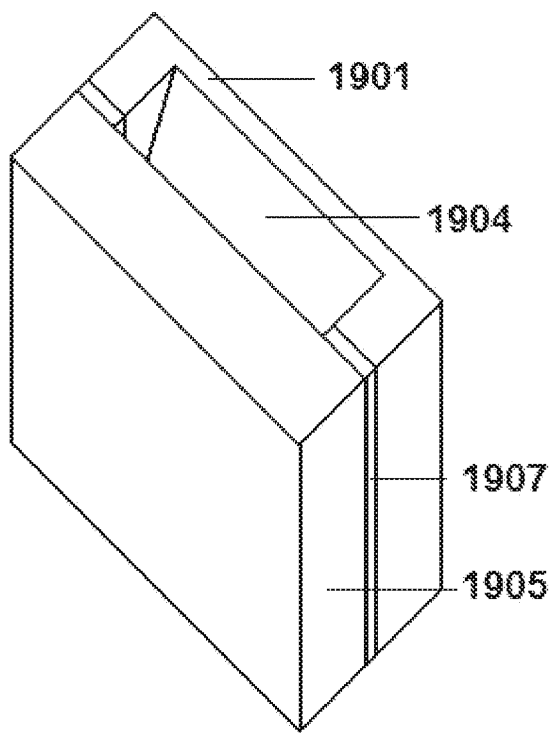

Fig. 19b

Fig. 20
CRYOGENIC MEMBER
INSTALLATION PROCESS

Supply cryogenic cooling source operating at cryogenic temperature. [2001]

Supply thermoelectric stack requiring application of pressure to improve contact between layers. [2002]

Supply cryogenic treatable member having a smaller inner dimension than the outer dimension of the thermoelectric stack. [2003]

Cool cryogenic treatable member to cryogenic temperature in the cryogenic cooling source. [2004]

Supply a mechanical device for stretching cryogenic treatable members. [2005]

Stretch cryogenic treatable member to a larger inner dimension than the outer dimension of the thermoelectric stack. [2006]

Assemble cryogenic treatable member around thermoelectric stack before appreciable member temperature rise. [2007]

Allow cryogenically treatable member to warm to room temperature causing shrinkage of the member thereby applying pressure to the thermoelectric stack. [2008]

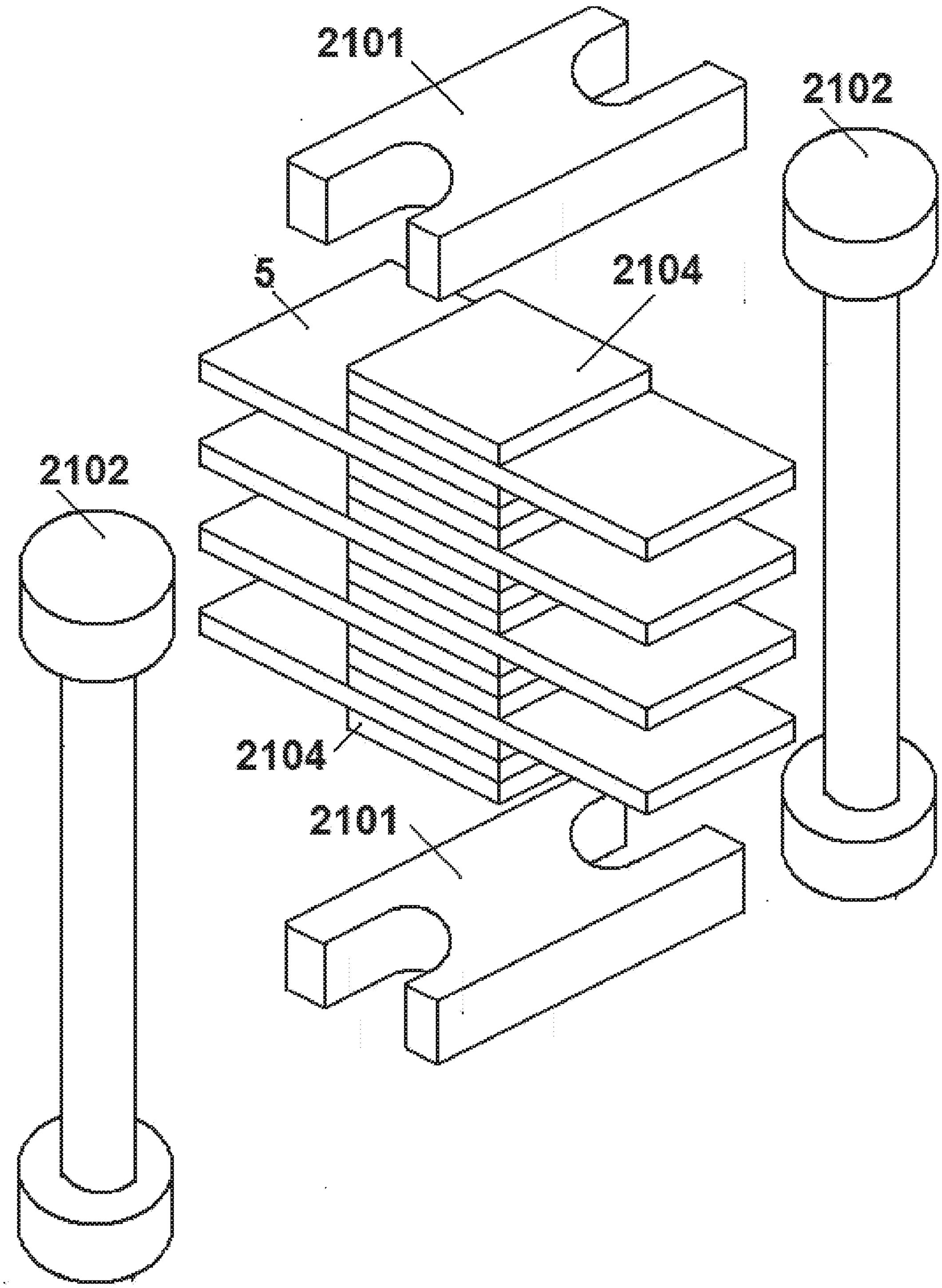

Fig. 21a

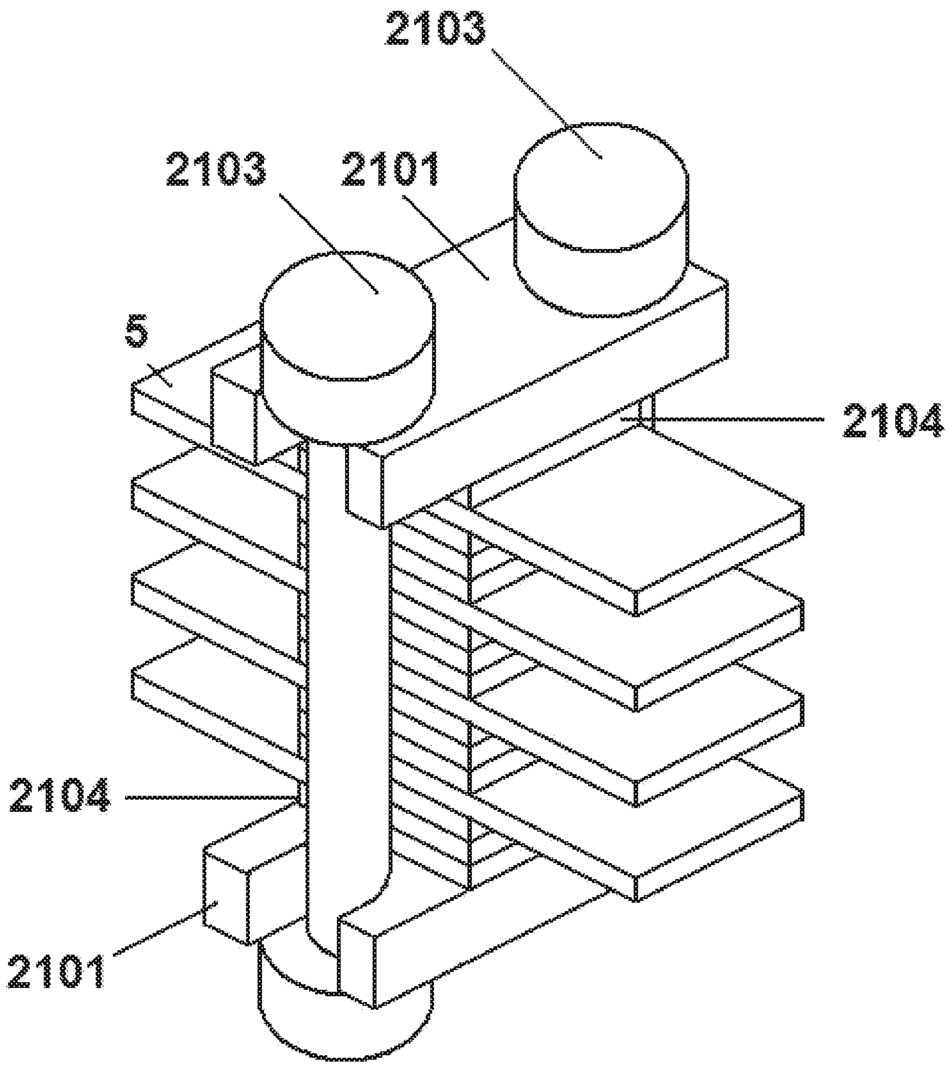

Fig. 21b