T18-517

Joining method for high-temperature oxide superconducting tape wire

Able to product high-temperature oxide superconducting tape wire over several kilometers without degrading superconducting properties

Summary

Since the discovery of a copper oxide superconductor, the hightemperature (HT) oxide superconducting tape wire that can be used for ¹ cables has been developed. Currently, a joining method that can minimize the degradation of superconducting property is required to obtain stable low resistance. However, in the case of solder joint, superconducting property degradation and joining resistance variation have been a problem due to the need of temperature adjustment to ensure wettability and pressure. It was also difficult to produce long, stable-quality HT oxide superconducting tape wire of more than several kilometers.

This invention is able to provide a method of joining HT oxide superconducting tape wires that enables joining homogeneous or dissimilar tape wires that can suppress superconducting property degradation. This invention is characterized by the ultrasonic joining of overlapping portions of two tape wires through indium at room temperature and in an atmospheric environment.

Effect

Joining HT oxide superconducting tape wires together while suppressing superconducting property degradation

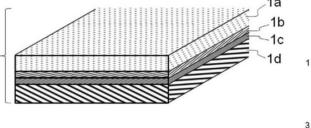
Produce long and stable quality HT oxide superconducting tape wires

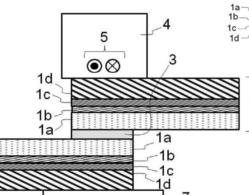
Application

Cable, coil, magnet and magnet system

Patent Data Sheet

Patent publication number (Serial number): JP2020-187999 (T18-517) Inventors: HASHIZUME Hidetoshi, SATO Yutaka





1. Rare earth-based copper oxide superconducting tape wire 1a. Stabilizing material 1b. Rare earth-based copper oxide HT superconductor 1c. Intermediate layer 1d. Substrate 3. Indium foil 4. Horn 5. Ultrasonic vibration 6. Anvil 7. Metal plate

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[Up left] Rare earth-based copper oxide superconducting tape wire used in the joining method of HT oxide superconducting tape wire
[Up right] Joining morphology of rare earth-based copper oxide superconducting tape wire
[Down left] Joining part for ultrasonic joining of rare earth-based copper oxide superconducting tape wires to each other

Contact

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