

Title (en)

Heat treatment with an autoregulating heater.

Title (de)

Wärmebehandlungsverfahren mittels selbstregulierender Heizvorrichtung.

Title (fr)

Procédé de traitement thermique au moyen d'un dispositif chauffant auto-régulateur.

Publication

EP 0156545 A2 19851002 (EN)

Application

EP 85301501 A 19850305

Priority

US 58671984 A 19840306

Abstract (en)

Apparatus and process for selectively heat treating at least a portion of an article in the field with autoregulated heating. The autoregulated heating is provided by a heater including at least a first magnetic material disposed along the portion of the article to be heat treated. The first magnetic material has a magnetic permeability which sharply changes at temperatures at or near the autoregulating (AR) temperature thereof. The changes in permeability result in corresponding changes in the skin depth of the first magnetic material and, hence, the heating produced therein responsive to a.c. current passing therethrough. By maintaining the a.c. current constant in amplitude and frequency, the first magnetic material and the portion of the article are regulated at substantially the AR temperature of the first magnetic material. By selecting the first magnetic material to have AR temperature substantially corresponding to the temperature at which metal anneals, tempers, hardens, softens, stress relieves or the like, heat treating at an autoregulated temperature is achieved. The autoregulated heater can be incorporated into the article or can be applied to the article thereafter, in each case permitting in field heat treating. Autoregulated heating can also be achieved by any of various multilayer structures to provide desired autoregulation effects.

IPC 1-7

C21D 1/40; H05B 3/12; H05B 6/10

IPC 8 full level

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CPC (source: EP)

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