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- (71) **Applicant:** E. I. DU PONT DE NEMOURS AND COMPANY [US/US]; 1007 Market Street, Wilmington, Delaware 19898 (US).
- (72) **Inventor:** KONTOMARIS, Konstantinos; 702 Abbey Road, Wilmington, Delaware 19808 (US).
- (74) **Agent:** TUCKER, N., Lynn; E. I. du Pont de Nemours and Company, Legal Patent Records Center, 4417 Lancaster Pike, Wilmington, Delaware 19805 (US).
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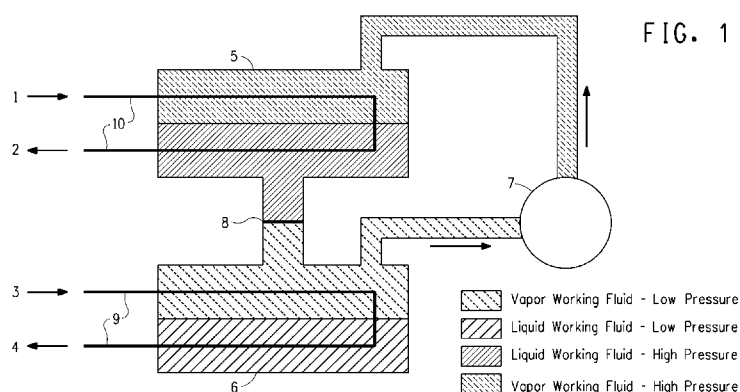
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(54) **Title:** PRODUCING HEATING IN CASCADE HEAT PUMPS USING WORKING FLUIDS COMPRISING Z- 1,1,1,4,4,4-HEXAFLUORO-2-BUTENE IN THE FINAL CASCADE STAGE



(57) **Abstract:** Disclosed is a method for producing heating in a cascade heat pump having a lower cascade stage and an upper cascade stage, said method comprising condensing a vapor working fluid comprising Z-1,1,1,4,4,4-hexafluoro-2-butene, in a condenser in the upper cascade stage, thereby producing a liquid working fluid; wherein the lower cascade stage contains a working fluid selected from the group consisting of CO₂, N₂O, E-HFO-1234ye, HFC-1243zf, HFC-125, HFC-143a, HFC-152a, HFC-161 and mixtures thereof; or mixtures thereof with HFC-134a, HFC-32, HFO-1234yf or trans-HFO-1234ze. Also disclosed is a cascade heat pump apparatus containing a working fluid comprising Z-1,1,1,4,4,4-hexafluoro-2-butene in an upper cascade stage and containing a working fluid selected from the group consisting of CO₂, N₂O, E-HFO-1234ye, HFC-1243zf, HFC-125, HFC-143a, HFC-152a, HFC-161 and mixtures thereof; or mixtures thereof with HFC-134a, HFC-32, HFO-1234yf or trans HFO-1234ze.

