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(21) International Application Number: PCT/US00/03201 (22) International Filing Date: 9 February 2000 (09.02.00) (30) Priority Data: 09/247,065 9 February 1999 (09.02.99) US (71) Applicant: PHILIP MORRIS PRODUCTS INC. [US/US]; 3601 Commerce Road, Richmond, VA 23234 (US). (72) Inventors: HAJALIGOL, Mohammad, R.; 2902 Sweetspire Ridge, Midlothian, VA 23113 (US). SIKKA, Vinod, K.; 115 Dansforth Lane, Oak Ridge, TN 37830 (US). (74) Agents: SKIFF, Peter, K. et al.; Burns, Doane, Swecker & Mathis, L.L.P., P.O. Box 1404, Alexandria, VA 22314-1404 (US).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: METHOD OF MANUFACTURING METALLIC PRODUCTS SUCH AS SHEET BY COLD WORKING AND FLASH ANNEALING		
(57) Abstract A metallic alloy composition is manufactured into products such as press formed or stamped products or rolled products such as sheet, strip, rod, wire or band by one or more cold working steps with intermediate or final flash annealing. The method can include cold rolling an iron, nickel or titanium aluminide alloy and annealing the cold worked product in a furnace by infrared heating. The flash annealing is preferably carried out by rapidly heating the cold worked product to an elevated temperature for less than one minute. The flash annealing is effective to reduce surface hardness of the cold worked product sufficiently to allow further cold working. The product to be cold worked can be prepared by casting the alloy or by a powder metallurgical technique such as tape casting a mixture of metal powder and a binder, roll compacting a mixture of the powder and a binder or plasma spraying the powder onto a substrate. In the case of tape casting or roll compaction, the initial powder product can be heated to a temperature sufficient to remove volatile components. The method can be used to form a cold rolled sheet which is formed into an electrical resistance heating element capable of heating to 900°C in less than 1 second when a voltage up to 10 volts and up to 6 amps is passed through the heating element.		