

Publication

**EP 0781610 A3 19970709**

Application

**EP 96120849 A 19961223**

Priority

JP 34247195 A 19951228

Abstract (en)

[origin: EP0781610A2] A process for producing a flat heat exchange tube (A) having parallel refrigerant passages (6) in its interior and comprising flat upper and lower walls (1,2), opposite side walls (3,4) and a plurality of reinforcing walls (5) connected between the upper and lower walls (1,2), extending longitudinally of the tube (A) and spaced apart from one another by a predetermined distance, using a rolling mill (33) comprising a central work roll (35) and a plurality of planetary work rolls (36) arranged around a portion of the periphery of the central work roll (35) and spaced apart circumferentially thereof, the central work roll (35) being formed with parallel annular grooves (39,40) in the periphery thereof. An aluminum sheet blank (30) comprising a brazing sheet is rolled by the mill (33) and thereby thinned to a predetermined thickness to form a flat portion serving as the lower wall (2), cause the annular grooves (39) at opposite roll ends to form upright portions (12) providing the respective side walls (3,4) and the other annular grooves (40) to form vertical ridges providing the reinforcing walls (5), the upright portions and the vertical ridges projecting from the flat portion integrally therewith. An aluminum sheet (20) comprising a brazing sheet is placed over all the ridges to provide the upper wall (1) and joined to the upright portions to make the upright portions serve as the opposite side walls (3,4), and the ridges of the lower wall are joined to the upper wall to form the reinforcing walls (5).

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Citation (search report)

- [YA] EP 0617250 A2 19940928 - SHOWA ALUMINUM CORP [JP]
- [YA] DE 3622926 A1 19870312 - DOWA MINING CO [JP], et al
- [A] US 4805693 A 19890221 - FLESSATE DENNIS S [US]
- [A] US 5271151 A 19931221 - WALLIS BERNARD J [US]
- [A] SAITO Y ET AL: "DEVELOPMENT OF SATELLITE MILL AND TRIAL ROLLING OF PROFILED METAL STRIP", JOURNAL OF HEAT TREATING, vol. 1, no. 6, 1 December 1992 (1992-12-01), pages 789 - 795, XP000356248

Cited by

CN113340129A; EP1635964A4; EP1114681A4; WO0123823A1; US6739167B2; DE102008051894A1; WO2018017003A1; WO2008064228A1; US7421873B2; US7802439B2

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