

Title (en)

METHOD AND DEVICE FOR CRYOGENIC AIR SEPARATION

Title (de)

VERFAHREN UND VORRICHTUNG ZUR TIEFTEMPERATURZERLEGUNG VON LUFT

Title (fr)

PROCEDE ET DISPOSITIF DE SEPARATION DE L'OXYGENE A TRES BASSE TEMPERATURE

Publication

EP 1102954 A1 20010530 (DE)

Application

EP 99939452 A 19990805

Priority

- EP 99939452 A 19990805
- DE 19835474 A 19980806
- DE 19852020 A 19981111
- EP 9905678 W 19990805
- EP 98123463 A 19981211

Abstract (en)

[origin: EP0978699A1] Removal of nitrous oxides in an air separation plant involves treatment of liquid, from the high-pressure column, in which it is concentrated. It is important to remove nitrous oxide, which has a comparatively high melting point, from the circuit before solid particles block the heat exchangers. This is done by occasionally purging the sump of high pressure column (6) at (16) and passing the liquid, which will contain all of the nitrous oxide, into a cleaning vessel (17) in which the nitrous oxide is removed by physical adsorption. Alternatively the purge liquid is warmed in a heat exchanger to a point where the nitrous oxide can be separated as a solid or liquid fraction. A counterflow material exchange method could also be used. The cleaned fluid then rejoins the process via line (18). The main flow of the oxygen enriched portion is removed at (13), at least one theoretical, or practical, floor (material exchange section (15)) above the air inlet (5), to continue the process in a conventional manner in the low-pressure column (7). Krypton and Xenon, also present in the sump liquid, can be concentrated and separated from the nitrous-oxide-free liquid leaving vessel (17). Methods for recovering cooling energy, involving further compression and conventional expansion through a turbine, are described.

IPC 1-7

F25J 3/04; **F25J 3/08**

IPC 8 full level

F25J 3/04 (2006.01); **F25J 3/08** (2006.01)

CPC (source: EP US)

F25J 3/0409 (2013.01 - EP US); **F25J 3/04284** (2013.01 - EP US); **F25J 3/04333** (2013.01 - EP US); **F25J 3/04412** (2013.01 - EP US); **F25J 3/04745** (2013.01 - EP US); **F25J 3/04854** (2013.01 - EP US); **F25J 3/04969** (2013.01 - EP US); **F25J 2200/32** (2013.01 - EP US); **F25J 2200/34** (2013.01 - EP US); **F25J 2200/94** (2013.01 - EP US); **F25J 2205/60** (2013.01 - EP US); **F25J 2215/52** (2013.01 - EP US); **F25J 2235/52** (2013.01 - EP US); **F25J 2245/02** (2013.01 - EP US); **Y10S 62/925** (2013.01 - EP US)

Citation (search report)

See references of WO 0008399A1

Cited by

EP2312248A1; DE102009014556A1; US8443625B2

Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)

EP 0978699 A1 20000209; AT E228637 T1 20021215; AU 5373799 A 20000228; CN 1171065 C 20041013; CN 1311850 A 20010905; DE 19852020 A1 20000210; DE 59903564 D1 20030109; EP 1102954 A1 20010530; EP 1102954 B1 20021127; ES 2188211 T3 20030616; TW 429301 B 20010411; US 6418753 B1 20020716; WO 0008399 A1 20000217

DOCDB simple family (application)

EP 98123463 A 19981211; AT 99939452 T 19990805; AU 5373799 A 19990805; CN 99809402 A 19990805; DE 19852020 A 19981111; DE 59903564 T 19990805; EP 9905678 W 19990805; EP 99939452 A 19990805; ES 99939452 T 19990805; TW 88113317 A 19990804; US 76219601 A 20010205