

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202431066132 A

(19) INDIA

(22) Date of filing of Application :31/08/2024

(43) Publication Date : 13/09/2024

(54) Title of the invention : A hydraulic back pressure attachment for equal channel angular pressing (ECAP) for magnesium and its alloys and the method of working

(51) International classification :B21C0023000000, C22F0001060000, F16H0061060000, C22C0023020000, B21C0025020000

(86) International Application No :NA

Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA

Filing Date :NA

(62) Divisional to Application Number :NA

Filing Date :NA

(71)Name of Applicant :

1)INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD

Address of Applicant :Dhanbad - 826004, Jharkhand, India Dhanbad -----

Name of Applicant : NA

Address of Applicant : NA

(72)Name of Inventor :

1)Vivek Sharma

Address of Applicant :Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, Dhanbad - 826004, Jharkhand, India Dhanbad -----

2)Ashis Mallick

Address of Applicant :Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, Dhanbad - 826004, Jharkhand, India Dhanbad -----

(57) Abstract :

The present invention relates to a hydraulic back pressure attachment for equal channel angular pressing (ECAP) for magnesium and alloys. Applying a back pressure of at least 50 MPa helps prevent shearing or cracking of the material when the procedure is performed at temperature below 150°C. The problem is solved by utilizing automatic back pressure control system known as ECAP attachment with back pressure. The attachment includes a back pressure dual-acting cylinder (2) for generating back pressure on ECAP dies (6), a manually driven hydraulic pump (1) , a pressure control valve(5), a 4/2 flow directional control valve (4), an ECAP die (6) with a temperature control system acting together to control the back pressure in ECAP without any external servo control system. The attachment is compatible with a motorized hydraulic press or universal testing machine (UTM) that has variable speed capabilities. The calibration of ECAP speed is performed by the flow control valve (11). Once the ram reaches the desired speed, the flow control valve is fixed. Fig 1 (b)

No. of Pages : 20 No. of Claims : 7