

Title (en)  
DRAWING APPARATUS FOR SHAPING SHEET METAL BLANKS

Publication  
**EP 0333052 A3 19900926 (DE)**

Application  
**EP 89104248 A 19890310**

Priority  
DE 3808262 A 19880312

Abstract (en)  
[origin: EP0333052A2] The motion of the blank holder (15) can be converted by a hydraulic unit of the drawing apparatus into a simultaneous but opposite motion of the drawing punch (17). The hydraulic unit has a central working piston (12), an annular piston (13) surrounding the latter, and a cylinder (10d) surrounding the annular piston. The working piston (12) and the annular piston (17) can be pressurised from hydraulically separated cylinder spaces (51, 52; 48) which communicate with one another via at least two alternative flow paths (lines 20; 20a; 20b). Due to their different hydraulic design, the flow paths entail a pressure variation on a different pressure level in the intercommunicating cylinder spaces (51, 52; 48). A pressure transducer (21) detecting the pressure of the hydraulic fluid in the cylinder spaces (51, 52; 48) connects up the alternative flow paths when limiting pressures are exceeded. It is thereby possible to manufacture even drawn components which are extremely difficult as regards deformation profile and/or material and/or drawing depth without the necessity to sacrifice the cost- and space-saving construction of the drawing apparatus.  
<IMAGE>

IPC 1-7  
**B21D 24/14**

IPC 8 full level  
**B21D 24/00** (2006.01); **B21D 24/04** (2006.01); **B21D 24/08** (2006.01); **B21D 24/10** (2006.01); **B21D 24/14** (2006.01); **B30B 1/34** (2006.01); **B30B 15/18** (2006.01)

CPC (source: EP US)  
**B21D 24/14** (2013.01 - EP US)

Citation (search report)  
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• [A] DE 3333687 A1 19850328 - UNIPLANUNG GMBH & CO KG [DE]  
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• [A] PATENT ABSTRACTS OF JAPAN vol. 9, no. 242 (M-417)(1965) 28 Oktober 1985, & JP-A-60 96332 (AIDA ENGINEERING KK) 29 Mai 1985,

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