

Title (en)  
HYDRAULIC LIFTING DEVICE

Publication  
**EP 0230884 B1 19930908 (DE)**

Application  
**EP 87100211 A 19870109**

Priority  
DE 3602510 A 19860128

Abstract (en)  
[origin: US4723107A] A hydraulic lifting mechanism, particularly suitable for a battery-powered industrial truck, including a hydraulic lifting cylinder, a hydraulic unit, operating as a pump in the load lifting operational mode, and supplying the lifting cylinder with pressure medium, and operating as a motor in the load lowering operational mode during which mode it is actuated by the pressure medium exiting from the lifting cylinder, and a DC generator coupled with the hydraulic unit operating as an electromotor in the load lifting operational mode and as a generator in the load lowering operational mode. A control valve arrangement is provided at the halfway point in the pressure path between the hydraulic cylinder and the hydraulic unit, which is controlled by a lifting mechanism control. In addition, the lifting mechanism control controls a regenerative brake circuit supplied by the DC generator in the load lowering operational mode. The control valve arrangement includes a proportional valve which is opened by the lifting mechanism control in the load lowering operational mode in accordance with a ramp-like function. The regenerative brake circuit is switched on depending on the output current of the DC generator working as a generator, if the generator output current exceeds a predetermined value. Undesirable dropping of the load in the lowering operational mode is hereby prevented during transition to regenerative braking.

IPC 1-7  
**B66F 9/22**

IPC 8 full level  
**B66F 9/20** (2006.01); **B66F 9/22** (2006.01); **F15B 21/14** (2006.01)

CPC (source: EP US)  
**B66F 9/20** (2013.01 - EP US); **F15B 21/14** (2013.01 - EP US)

Cited by  
EP0669281A1; EP0944100A1; EP0630853A1; US6275368B1

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