

Title (en)
HYDRAULIC LIFTING DEVICE

Publication
EP 0230884 A3 19900516 (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.

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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)

Citation (search report)
• [A] DE 3018156 A1 19810903 - OIL DRIVE KOGYO LTD [JP]
• [A] DE 2724383 A1 19781130 - JUNGHEINRICH KG
• [A] US 3947744 A 19760330 - GRACE MICHAEL H, et al
• [AD] DE 2014605 A1 19710304 - ASEA AB

Cited by
EP0669281A1; EP0944100A1; EP0630853A1; US6275368B1

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US 4723107 A 19880202; AT E94149 T1 19930915; DE 3602510 A1 19870730; DE 3602510 C2 19890302; DE 3787292 D1 19931014; EP 0230884 A2 19870805; EP 0230884 A3 19900516; EP 0230884 B1 19930908

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