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(12) **United States Patent**
Krause et al.

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(54) **FORCE TRANSMISSION DEVICE WITH A
ROTATIONAL SPEED ADAPTIVE DAMPER
AND METHOD FOR IMPROVING THE
DAMPING PROPERTIES**

(52) **U.S. Cl.** 60/338; 192/30 V
(58) **Field of Classification Search** 60/338;
192/30 V
See application file for complete search history.

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(56) **References Cited**

(73) Assignee: **Schaeffler Technologies AG & Co. KG**,
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U.S. PATENT DOCUMENTS

6,026,940 A * 2/2000 Sudau 192/3.28
6,450,065 B1 * 9/2002 Eckel et al. 74/574.4

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

FOREIGN PATENT DOCUMENTS

DE 198 04 227 A1 8/1999
DE 102 36 752 A1 2/2004
DE 10 2004 004 176 A1 8/2005
EP 1744074 A2 * 1/2007

* cited by examiner

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(65) **Prior Publication Data**

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Related U.S. Application Data

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(30) **Foreign Application Priority Data**

Nov. 29, 2007 (DE) 10 2007 057 447

(57) **ABSTRACT**

The invention relates to a force transmission device for power transmission between an input and an output, comprising at least an input and an output, and a vibration damping device disposed in a cavity that can be filled at least partially with an operating medium, in particular oil, the vibration damping device coupled with a rotational speed adaptive absorber, wherein the rotational speed adaptive absorber is tuned as a function of an oil influence to an effective order q_{eff} , which is greater by an order shift value q_L than an order q of an exciting vibration of a drive system.

(51) **Int. Cl.**
F16D 43/18 (2006.01)
F16F 15/14 (2006.01)

13 Claims, 5 Drawing Sheets

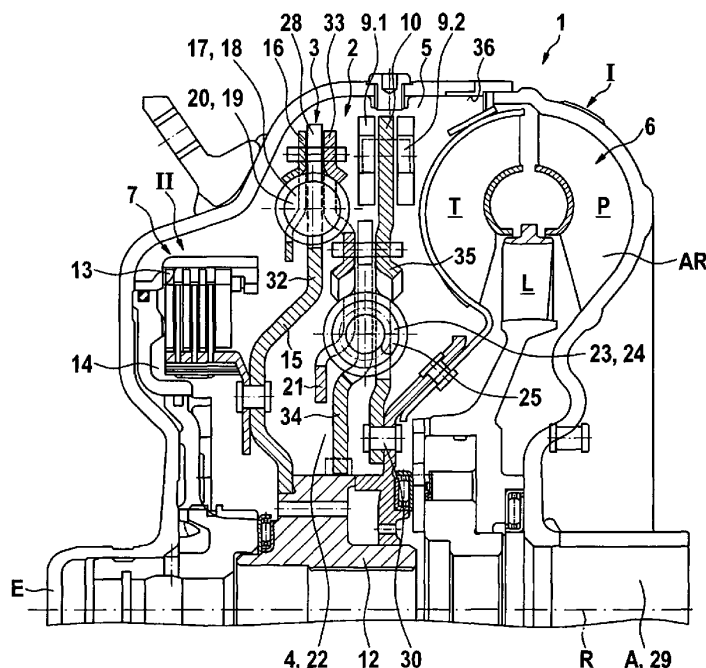


Fig. 1a

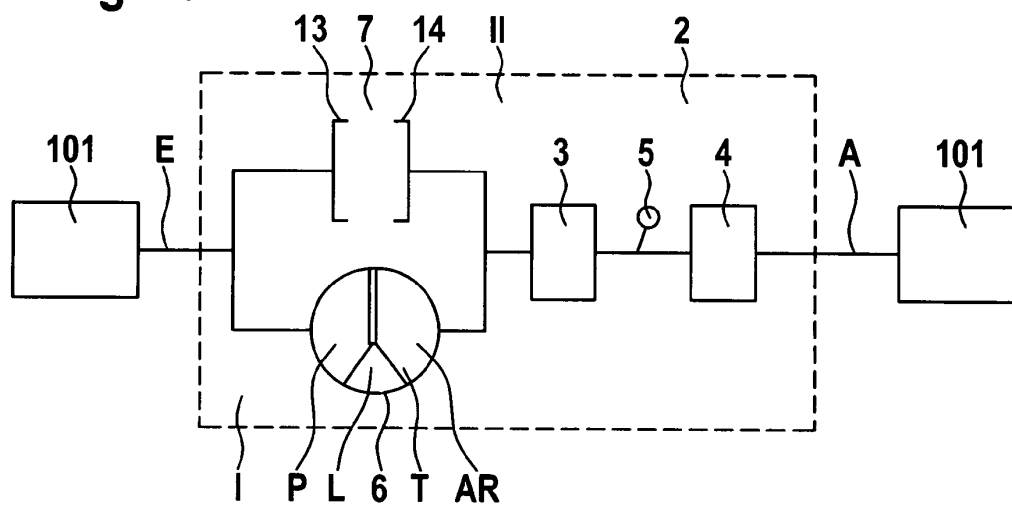


Fig. 1b

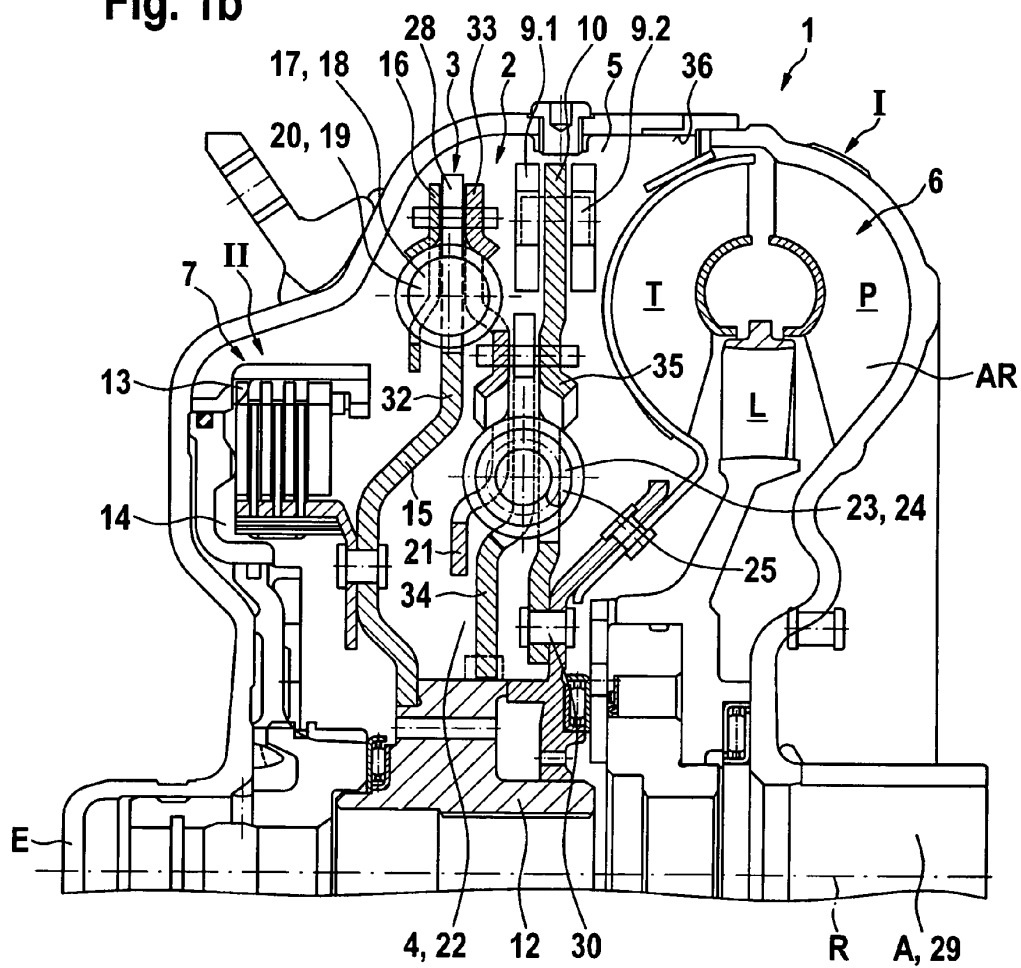


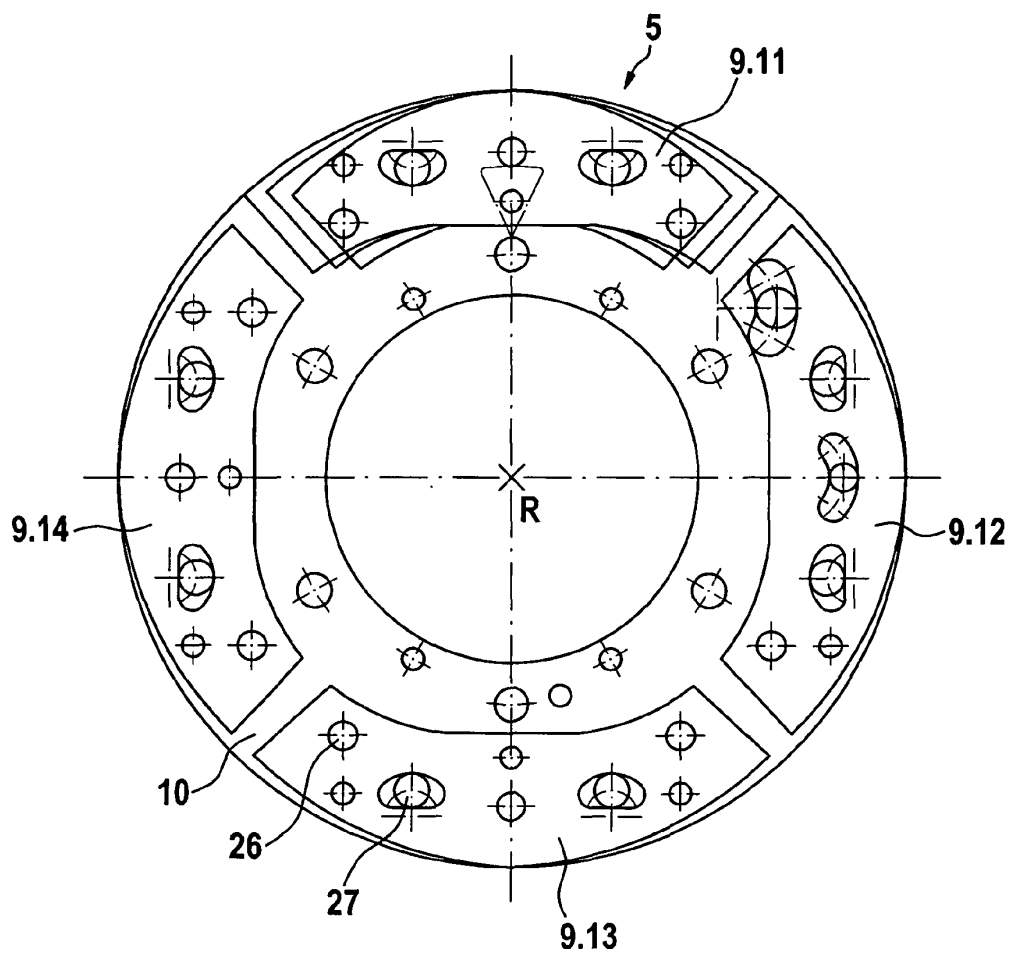
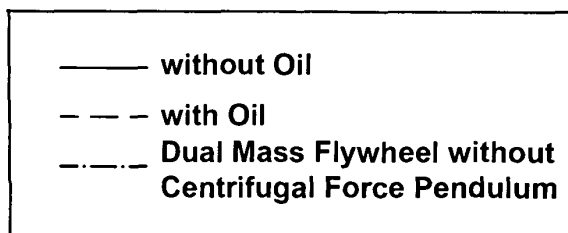
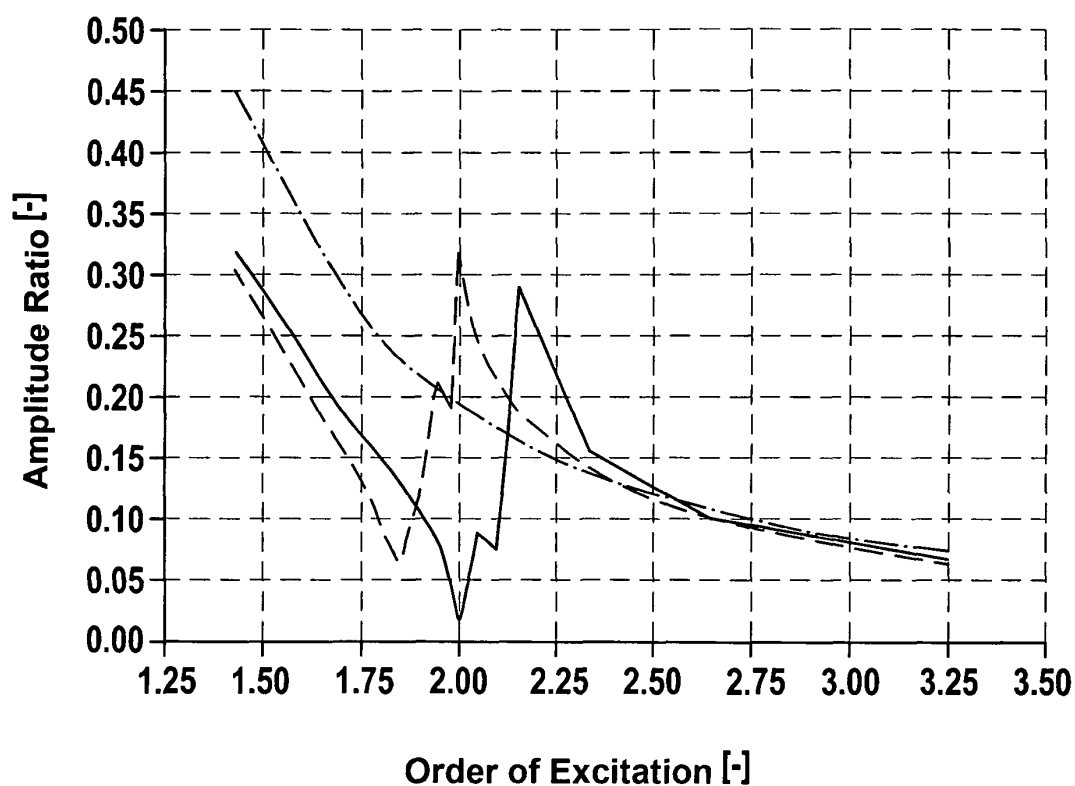
Fig. 2

Fig. 3



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