

Title (en)  
Unidirectional single piston ultrasonic transducer

Title (de)  
Einkolben Ultraschallrichtwandler

Title (fr)  
Transducteur ultrasonore à piston unique

Publication  
**EP 1060798 A1 20001220 (EN)**

Application  
**EP 99810539 A 19990618**

Priority  
EP 99810539 A 19990618

Abstract (en)  
Unidirectional sandwich transducer which includes a center mass (4) freely placed between two active transducer element stacks (2' and 2'') and two end masses (3', 3'') where all of them are coupled only by rigid stress rod between two end masses and where one of two active transducer element stacks can be replaced by solid and acoustically passive isolator stack. The center mass is performing free and not attenuated single piston oscillations between two active transducer element stacks and two end masses realized by mutually opposite phase polarity of active transducer elements while driven by the same input electrical signal. The center mass is also performing free and not attenuated single piston oscillations between one active transducer element stack and one solid and acoustically passive isolator stack and two end masses. The transducer is using electrical and emitting acoustic energy only when placed in contact with some external mass and shape and size of externally contacted mass have no influence to transducer's center mass vibrations. When center mass is performing single piston movement and when transducer is not mechanically loaded the total transducer length is constant and two end masses are not oscillating. The transducer is ideal for agitating arbitrary distant and arbitrary shaped liquid and solid masses placed in different vessels or pipes transferring its vibrations via waveguide solid rod connected between the transducer and a loading mass. The single piston transducer connected perpendicularly to a solid tube can agitate different radial and circumferential tube vibration modes without the need of exciting longitudinal and axial tube modes. The transducer can also be used as vibration receiver or sensor. <IMAGE>

IPC 1-7  
**B06B 1/06**

IPC 8 full level  
**B06B 1/06** (2006.01); **B06B 3/00** (2006.01)

CPC (source: EP)  
**B06B 1/0611** (2013.01); **B06B 3/00** (2013.01)

Citation (search report)

- [XY] US 5483502 A 19960109 - SCARPITTA ALAIN A [FR], et al
- [Y] US 5047683 A 19910910 - BUTLER JOHN L [US], et al
- [X] GB 1487203 A 19770928 - NAT RES DEV
- [X] US 5363345 A 19941108 - BOUCHER DIDIER [FR], et al
- [A] FR 2641612 A1 19900713 - THOMSON CSF [FR]
- [DA] EP 0209238 A2 19870121 - GOULD INC [US]

Cited by  
CN108311361A; DE10302089B3; EP3243572A1; GB2556300A; GB2556300B; US8652397B2; US10316387B2; US10052714B2; US7309279B2; WO2017039964A1; US10065212B2; US10233515B1; US8574336B2; US8844897B2; US9617617B2; US10640846B2; EP4000763A1

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