

Title (en)  
Loudspeaker with low-frequency oscillation

Title (de)  
Lautsprecher mit niederfrequenter Schwingung

Title (fr)  
Haut-parleur avec oscillation à basse fréquence

Publication  
**EP 1841278 A1 20071003 (EN)**

Application  
**EP 06006235 A 20060327**

Priority  
EP 06006235 A 20060327

Abstract (en)  
A loudspeaker with low-frequency oscillation, comprising: a housing (21) with a ring portion (211) extending inwardly from the bottom thereof; and a reed element (22) having a top end attached to an oscillatable sound assembly, the reed element (22) further having an external ring (221) and two vibration arms (222) symmetrically extending from the internal side of the external ring (221) to the internal side of the loudspeaker in a bent manner, each of the vibration arms (222) having a free end (223) extending to the center of the reed element (22), the oscillatable sound assembly including either a magnetic ring (25) or a coil (28) disposed within the housing (21), the ring portion (211) being attached to either another coil corresponding to the magnetic ring (25) or another magnetic ring corresponding to the coil (28), whereby, when the coil (28) is fed with electric current, a magnetic force is created to impart an up and down vibration to the oscillatable sound assembly, thereby enhancing the effect of the low-frequency sound field as well as the resonance effect.

IPC 8 full level  
**H04R 1/28** (2006.01); **H04R 1/10** (2006.01)

CPC (source: EP)  
**H04R 1/2811** (2013.01); **H04R 11/02** (2013.01); **H04R 1/1016** (2013.01); **H04R 2400/03** (2013.01); **H04R 2400/07** (2013.01)

Citation (applicant)  
• TW 515219 B 20021221 - CITIZEN ELECTRONICS [JP]  
• TW 515218 B 20021221 - CITIZEN ELECTRONICS [JP]  
• US 6690809 B2 20040210 - MIYAMOTO KAZUMI [JP], et al  
• US 6400825 B1 20020604 - MIYAMOTO KAZUMI [JP], et al  
• TW 504099 B

Citation (search report)  
• [A] US 4720868 A 19880119 - HIRANO MUTSUO [JP]  
• [A] US 6377145 B1 20020423 - KUMAGAI TORU [JP]  
• [A] US 5894263 A 19990413 - SHIMAKAWA SHINICHI [JP], et al  
• [A] EP 0845920 A2 19980603 - MATSUSHITA ELECTRIC IND CO LTD [JP]

Cited by  
CN101990151A; CN103634727A; EP2701400A3; EP3509322A1; US10462560B2; US9712907B2; US10070213B2; US9609421B2; US10484792B2; US11172302B2; US9860629B2; US9942650B2; US10872592B2; US11335313B2; US11688382B2

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