

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS (NOTES omitted)

INSTRUMENTS

G10 MUSICAL INSTRUMENTS; ACOUSTICS (NOTES omitted)

G10K SOUND-PRODUCING DEVICES ([sound-producing toys A63H 5/00](#)); METHODS OR DEVICES FOR PROTECTING AGAINST, OR FOR DAMPING, NOISE OR OTHER ACOUSTIC WAVES IN GENERAL; ACOUSTICS NOT OTHERWISE PROVIDED FOR

NOTES

1. This subclass covers arrangements for generating mechanical vibrations in fluids.
2. This subclass covers also the production of sounds which may not be audible to human beings but which are audible to animals.
3. In this subclass, the following terms are used with the meanings indicated:
 - "acoustics" and "sound" cover the technical field dealing with mechanical vibrations at all infrasonic -, sonic - and ultrasonic frequencies. However, generation or transmission of mechanical waves, in general, is covered by subclass [B06B](#), subject to the exception specified in Note (1) above.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00	Devices in which sound is produced by striking a resonating body, e.g. bells, chimes, gong (combinations with clocks or watches G04B , G04C ; carillons G10F 1/10 ; {for percussion instruments G10D 13/00 })	1/34	. . . . Operating mechanisms
1/06	. the resonating devices having the shape of a bell, plate, rod, or tube (bells for towers G10K 1/28)	1/341	. . . . {for a still-standing bell}
1/062	. . electrically operated {(self-interrupting relays H01H 51/34)}	1/342	. . . . {electrically operated}
1/063	. . . the sounding member being a bell	1/344	. . . . {for an oscillating bell which is driven once per cycle}
1/064	. . . . Operating or striking mechanisms therefor	1/345	. . . . {electrically operated}
1/0645	. . . . {provided with loudness adjustment}	1/347	. . . . {for an oscillating bell which is driven twice per cycle}
1/065	. . . . for timed or repeated operation {(alarm-clocks G04C 21/00)}	1/348	. . . . {electrically operated}
1/066	. . . the sounding member being a tube, plate or rod	1/36	. . . Means for silencing or damping (means or arrangements for avoiding or reducing out-of-balance forces due to motion F16F 15/00)
1/067	. . . . Operating or striking mechanisms therefor	1/38	. . . Supports; Mountings
1/068	. . hydraulically operated; pneumatically operated	3/00	Rattles or like noise-producing devices {, e.g. door-knockers}
1/07	. . mechanically operated; Hand bells; Bells for animals	5/00	Whistles
1/071	. . . Hand bells; Bells for animals	5/02	. Ultrasonic whistles
1/072	. . . Operating or striking mechanisms therefor	7/00	Sirens
1/074	. . . . with rotary clappers or shells	7/005	. {Ultrasonic sirens}
1/076	. . . . for timed or repeated operation {(alarm-clocks G04B 23/00)}	7/02	. in which the sound-producing member is rotated manually or by a motor (G10K 7/06 takes precedence ; musical tops A63H 1/28)
1/08	. . Details or accessories of general applicability	7/04	. . by an electric motor
1/10	. . . Sounding members; Mounting thereof; Clappers or other strikers	7/06	. in which the sound-producing member is driven by a fluid, e.g. by a compressed gas {(fluidically operated vibrators B06B 1/18)}
1/26	. . . Mountings; Casings		
1/28	. Bells for towers or the like		
1/30	. . Details or accessories		
1/32	. . . Sounding members; Clappers or other strikers		

9/00	Devices in which sound is produced by vibrating a diaphragm or analogous element, e.g. fog horns, vehicle hooter, buzzer (loudspeakers or like acoustic electromechanical transducers H04R {; arrangement or adaptation for ships B63B 45/08; mechanically driven vibrators B06B 1/10})	11/08	• Non-electric sound-amplifying devices, e.g. non-electric megaphones (amplifying by horns G10K 11/02; amplifying by focusing G10K 11/26)
9/02	• driven by gas; e.g. suction operated	11/16	• Methods or devices for protecting against, or for damping, noise or other acoustic waves in general (G10K 11/36 takes precedence)
9/04	• . by compressed gases, e.g. compressed air		NOTE
9/06	• . produced by detonation		This group <u>does not cover</u> protecting against, or damping of, acoustic waves adapted for particular applications, which are covered by the subclasses for these applications, provided that there is a specific provision for this aspect.
9/08	• driven by water or other liquids		
9/10	• driven by mechanical means only		
9/12	• electrically operated		
	NOTE		
	This group <u>does not cover</u> the construction of, or circuits for, broadband-transducers such as loudspeakers or microphones, which are covered by subclass H04R .	11/161	• . {in systems with fluid flow (G10K 11/162 takes precedence; gas flow silencers or exhaust apparatus for machines or engines in general or for internal combustion engine F01N , noise absorbers in pipes or pipe systems F16L 55/02 ; noise absorption in air conditioning and ventilation F24F 13/24 ; silencing exhaust or propulsion jets in aircraft B64D 33/06)}
9/121	• . {Flexensional transducers}	11/162	• . Selection of materials
9/122	• . using piezo-electric driving means {(G10K 9/121 takes precedence)}	11/165	• . . Particles in a matrix
9/125	• . . with a plurality of active elements	11/168	• . . Plural layers of different materials, e.g. sandwiches
9/128	• . using magnetostrictive driving means {(G10K 9/121 takes precedence)}		NOTE
9/13	• . using electromagnetic driving means		When classifying in this group, classification is also made in subclass B32B , in so far as any layered product is concerned.
	NOTE		
	<u>see provisionally also G10K 9/12</u>		
9/15	• . . Self-interrupting arrangements	11/172	• . using resonance effects
9/16	• . with means for generating current by muscle power	11/175	• . using interference effects; Masking sound
9/18	• Details, e.g. bulbs, pumps, pistons, switch, casing {(cones, diaphragms G10K 13/00)}		NOTES
9/20	• . Sounding members		1. Sound/noise masking, classified in G10K 11/1752 - G10K 11/1754 ,
9/22	• . Mountings; Casings		2. Acoustic noise cancellation, classified in G10K 11/178
11/00	Methods or devices for transmitting, conducting or directing sound in general; Methods or devices for protecting against, or for damping, noise or other acoustic waves in general		WARNING
11/002	• {Devices for damping, suppressing, obstructing or conducting sound in acoustic devices (G10K 1/06 - G10K 1/10 take precedence; for electro-mechanical transducers for communication H04R 3/002)}		Group G10K 11/175 is impacted by reclassification into groups G10K 11/1752 and G10K 11/1754 .
11/004	• {Mounting transducers, e.g. provided with mechanical moving or orienting device (mountings specially adapted to a particular sound-producing device, <u>see</u> the preceding groups G10K 1/00 - G10K 9/00 , e.g. G10K 1/26 , G10K 1/28 , G10K 9/22 ; arrangements of sonic watch equipment on submarines B63G 8/39 ; buoys B63B 22/00)}		Groups G10K 11/175 , G10K 11/1752 , and G10K 11/1754 should be considered in order to perform a complete search.
11/006	• . {Transducer mounting in underwater equipment, e.g. sonobuoys}	11/1752	• . . {Masking}
11/008	• . . {Arrays of transducers (seismic streamers, <u>see</u> G01V 1/20)}		WARNING
11/02	• Mechanical acoustic impedances; Impedance matching, e.g. by horns; Acoustic resonators		Group G10K 11/1752 is incomplete pending reclassification of documents from group G10K 11/175 .
11/025	• . {horns for impedance matching (<u>see</u> provisionally also G10K 11/28)}		Groups G10K 11/175 and G10K 11/1752 should be considered in order to perform a complete search.
11/04	• . Acoustic filters {; Acoustic resonators}		

11/1754	{Speech masking}	11/17875	{using an error signal without a reference signal, e.g. pure feedback}
	WARNING	11/17879	{using both a reference signal and an error signal}
	Group G10K 11/1754 is incomplete pending reclassification of documents from group G10K 11/175 .	11/17881	{the reference signal being an acoustic signal, e.g. recorded with a microphone}
	Groups G10K 11/175 and G10K 11/1754 should be considered in order to perform a complete search.	11/17883	{the reference signal being derived from a machine operating condition, e.g. engine RPM or vehicle speed}
11/178 . . .	by electro-acoustically regenerating the original acoustic waves in anti-phase	11/17885	{additionally using a desired external signal, e.g. pass-through audio such as music or speech}
	NOTE		NOTE
	{When classifying in any of the groups G10K 11/1781 - G10K 11/17861 , classification is also made in at least one subgroup of G10K 11/1787 .}		{When classifying in this group, classification is also made in the other appropriate groups under G10K 11/1787 .}
11/1781	{characterised by the analysis of input or output signals, e.g. frequency range, modes, transfer functions}	11/18	Methods or devices for transmitting, conducting, or directing sound (G10K 11/02 , G10K 11/36 take precedence; medical stethoscopes A61B 7/02)
11/17813	{characterised by the analysis of the acoustic paths, e.g. estimating, calibrating or testing of transfer functions or cross-terms}	11/20	Reflecting arrangements (G10K 11/28 takes precedence)
11/17815	{between the reference signals and the error signals, i.e. primary path}	11/205	{for underwater use}
11/17817	{between the output signals and the error signals, i.e. secondary path}	11/22	for conducting sound through hollow pipes, e.g. speaking tubes
11/17819	{between the output signals and the reference signals, e.g. to prevent howling}	11/24	for conducting sound through solid bodies, e.g. wires
11/17821	{characterised by the analysis of the input signals only}	11/26	Sound-focusing or directing, e.g. scanning { (horns for impedance matching G10K 11/02 ; megaphones G10K 11/08) }
11/17823	{Reference signals, e.g. ambient acoustic environment}	11/28	using reflection, e.g. parabolic reflector { (hearing aids A61F 11/008) }
11/17825	{Error signals}	11/30	using refraction, e.g. acoustic lenses
11/17827	{Desired external signals, e.g. pass-through audio such as music or speech}	11/32	characterised by the shape of the source
11/1783	{handling or detecting of non-standard events or conditions, e.g. changing operating modes under specific operating conditions}	11/34	using electrical steering of transducer arrays, e.g. beam steering { (constructional aspects B06B 1/0607 , B06B 1/085) }
11/17833	{by using a self-diagnostic function or a malfunction prevention function, e.g. detecting abnormal output levels}	11/341	{Circuits therefor}
11/17835	{using detection of abnormal input signals}	11/343	{using frequency variation or different frequencies}
11/17837	{by retaining part of the ambient acoustic environment, e.g. speech or alarm signals that the user needs to hear}	11/345	{using energy switching from one active element to another}
11/1785	{Methods, e.g. algorithms; Devices (G10K 11/1781 , G10K 11/1783 take precedence)}	11/346	{using phase variation}
11/17853	{of the filter}	11/348	{using amplitude variation}
11/17854	{the filter being an adaptive filter}	11/35	using mechanical steering of transducers {or their beams}
11/17855	{for improving speed or power requirements}	11/352	{by moving the transducer}
11/17857	{Geometric disposition, e.g. placement of microphones}	11/355	{Arcuate movement}
11/17861	{using additional means for damping sound, e.g. using sound absorbing panels}	11/357	{by moving a reflector}
11/1787	{General system configurations}	11/36	Devices for manipulating acoustic surface waves (electro-acoustic amplifiers H03F 13/00 ; networks comprising electro-acoustic elements H03H 9/00)
11/17873	{using a reference signal without an error signal, e.g. pure feedforward}	13/00	Cones, diaphragms, or the like, for emitting or receiving sound in general (for electromechanical transducers H04R 7/00)
		15/00	Acoustics not otherwise provided for
		15/02	Synthesis of acoustic waves (synthesis of speech G10L)
			NOTE
			see provisionally G10H e.g. G10H 1/26

15/04	. Sound-producing devices (G10K 15/02 takes precedence)	2210/12	. . Rooms, e.g. ANC inside a room, office, concert hall or automobile cabin
15/043	. . {producing shock waves (G10K 15/046 , G10K 15/06 take precedence; generating seismic energy G01V 1/02)}	2210/121	. . Rotating machines, e.g. engines, turbines, motors; Periodic or quasi-periodic signals in general
15/046	. . {using optical excitation, e.g. laser bundle}	2210/122	. . Seismics
15/06	. . using electric discharge	2210/123	. . Synchrophasors or other applications where multiple noise sources are driven with a particular phase relationship
15/08	. Arrangements for producing a reverberation or echo sound {(modifying acoustic properties to change reverberation time G10K 11/002)}	2210/124	. . Traffic
15/10	. . using time-delay networks comprising electromechanical or electro-acoustic devices	2210/125	. . Transformers
15/12	. . using electronic time-delay networks	2210/126	. . Transients
2200/00	Details of methods or devices for transmitting, conducting or directing sound in general	2210/127	. . Underwater acoustics, e.g. for submarine
2200/10	. Beamforming, e.g. time reversal, phase conjugation or similar	2210/128	. . Vehicles
2200/11	. Underwater, e.g. transducers for generating acoustic waves underwater	2210/1281	. . . Aircraft, e.g. spacecraft, airplane or helicopter
2210/00	Details of active noise control [ANC] covered by G10K 11/178 but not provided for in any of its subgroups	2210/1282	. . . Automobiles
2210/10	. Applications	2210/12821	. . . . Rolling noise; Wind and body noise
2210/101	. . One dimensional	2210/12822	. . . . Exhaust pipes or mufflers
2210/102	. . Two dimensional	2210/1283	. . . Trains, trams or the like
2210/103	. . Three dimensional	2210/129	. . Vibration, e.g. instead of, or in addition to, acoustic noise
2210/104	. . Aircos	2210/1291	. . . Anti-Vibration-Control, e.g. reducing vibrations in panels or beams
2210/105	. . Appliances, e.g. washing machines or dishwashers	2210/30	. Means
2210/1051	. . . Camcorder	2210/301	. . Computational
2210/1052	. . . Copiers or other image-forming apparatus, e.g. laser printer	2210/3011	. . . Single acoustic input
2210/1053	. . . Hi-fi, i.e. anything involving music, radios or loudspeakers	2210/3012	. . . Algorithms
2210/1054	. . . Refrigerators	2210/3013	. . . Analogue, i.e. using analogue computers or circuits
2210/106	. . Boxes, i.e. active box covering a noise source; Enclosures	2210/3014	. . . Adaptive noise equalizers [ANE], i.e. where part of the unwanted sound is retained
2210/107	. . Combustion, e.g. burner noise control of jet engines (internal combustion engines G10K 2210/121)	2210/3015	. . . Averaging, e.g. exponential
2210/108	. . Communication systems, e.g. where useful sound is kept and noise is cancelled	2210/3016	. . . Control strategies, e.g. energy minimization or intensity measurements
2210/1081	. . . Earphones, e.g. for telephones, ear protectors or headsets	2210/3017	. . . Copy, i.e. whereby an estimated transfer function in one functional block is copied to another block
2210/1082	. . . Microphones, e.g. systems using "virtual" microphones	2210/3018	. . . Correlators, e.g. convolvers or coherence calculators
2210/109	. . Compressors, e.g. fans	2210/3019	. . . Cross-terms between multiple in's and out's
2210/11	. . Computers, i.e. ANC of the noise created by cooling fan, hard drive or the like	2210/3021	. . . Eigenfrequencies; Eigenvalues, e.g. used to identify most significant couplings between actuators and sensors
2210/111	. . Directivity control or beam pattern	2210/3022	. . . Error paths
2210/112	. . Ducts (vehicle exhausts G10K 2210/12822)	2210/3023	. . . Estimation of noise, e.g. on error signals
2210/113	. . Elevators	2210/30231	. . . . Sources, e.g. identifying noisy processes or components
2210/114	. . Feeders, i.e. of the vibrating kind	2210/30232	. . . . Transfer functions, e.g. impulse response
2210/115	. . Impact noise, e.g. from typewriter or printer	2210/3024	. . . Expert systems, e.g. artificial intelligence
2210/116	. . Medical; Dental	2210/3025	. . . Determination of spectrum characteristics, e.g. FFT
2210/1161	. . . NMR or MRI	2210/3026	. . . Feedback
2210/117	. . Nonlinear	2210/3027	. . . Feedforward
2210/118	. . Panels, e.g. active sound-absorption panels or noise barriers	2210/3028	. . . Filtering, e.g. Kalman filters or special analogue or digital filters
2210/119	. . Radiation control, e.g. control of sound radiated by vibrating structures	2210/30281	. . . . Lattice filters
		2210/3029	. . . Fuzzy logic; Genetic algorithms
		2210/3031	. . . Hardware, e.g. architecture
		2210/3032	. . . Harmonics or sub-harmonics
		2210/3033	. . . Information contained in memory, e.g. stored signals or transfer functions
		2210/3034	. . . Integrators
		2210/3035	. . . Models, e.g. of the acoustic system

2210/30351	. . . .	Identification of the environment for applying appropriate model characteristics	2210/32291	. . . .	Plates or thin films, e.g. PVDF (foil-type piezo-electric elements B06B 1/0688)
2210/3036	. . .	Modes, e.g. vibrational or spatial modes	2210/50	.	Miscellaneous
2210/3037	. . .	Monitoring various blocks in the flow chart	2210/501	. .	Acceleration, e.g. for accelerometers
2210/3038	. . .	Neural networks	2210/502	. .	Ageing, e.g. of the control system
2210/3039	. . .	Nonlinear, e.g. clipping, numerical truncation, thresholding or variable input and output gain	2210/503	. .	Diagnostics; Stability; Alarms; Failsafe
2210/30391	. . . .	Resetting of the filter parameters or changing the algorithm according to prevailing conditions	2210/504	. .	Calibration
2210/3041	. . .	Offline	2210/505	. .	Echo cancellation, e.g. multipath-, ghost- or reverberation-cancellation
2210/3042	. . .	Parallel processing	2210/506	. .	Feedback, e.g. howling
2210/3043	. . .	Phase locked loops [PLL]	2210/507	. .	Flow or turbulence
2210/3044	. . .	Phase shift, e.g. complex envelope processing	2210/508	. .	Reviews on ANC in general, e.g. literature
2210/3045	. . .	Multiple acoustic inputs, single acoustic output	2210/509	. .	Hybrid, i.e. combining different technologies, e.g. passive and active
2210/3046	. . .	Multiple acoustic inputs, multiple acoustic outputs	2210/51	. .	Improving tonal quality, e.g. mimicking sports cars
2210/3047	. . .	Prediction, e.g. of future values of noise	2210/511	. .	Narrow band, e.g. implementations for single frequency cancellation
2210/3048	. . .	Pretraining, e.g. to identify transfer functions	2210/512	. .	Wide band, e.g. non-recurring signals
2210/3049	. . .	Random noise used, e.g. in model identification			
2210/3051	. . .	Sampling, e.g. variable rate, synchronous, decimated or interpolated			
2210/3052	. . .	Simulation			
2210/3053	. . .	Speeding up computation or convergence, or decreasing the computational load			
2210/3054	. . .	Stepsize variation			
2210/3055	. . .	Transfer function of the acoustic system			
2210/3056	. . .	Variable gain			
2210/3057	. . .	Variation of parameters to test for optimisation			
2210/321	. .	Physical			
2210/3211	. . .	Active mounts for vibrating structures with means to actively suppress the vibration, e.g. for vehicles			
2210/3212	. . .	Actuator details, e.g. composition or microstructure			
2210/32121	. . . .	Fluid amplifiers, e.g. modulated gas flow speaker using electrovalves			
2210/3213	. . .	Automatic gain control [AGC]			
2210/3214	. . .	Architectures, e.g. special constructional features or arrangements of features			
2210/3215	. . .	Arrays, e.g. for beamforming			
2210/3216	. . .	Cancellation means disposed in the vicinity of the source			
2210/3217	. . .	Collocated sensor and cancelling actuator, e.g. "virtual earth" designs			
2210/3218	. . .	Filters other than the algorithm-related filters			
2210/3219	. . .	Geometry of the configuration			
2210/3221	. . .	Headrests, seats or the like, for personal ANC systems			
2210/3222	. . .	Manual tuning			
2210/3223	. . .	Materials, e.g. special compositions or gases			
2210/3224	. . .	Passive absorbers			
2210/3225	. . .	Radio or other sources used in ANC for transfer function estimation; Means to avoid interference between desired signals, e.g. from a car stereo, and the ANC signal			
2210/3226	. . .	Sensor details, e.g. for producing a reference or error signal			
2210/3227	. . .	Resonators			
2210/32271	. . . .	Active resonators			
2210/32272	. . . .	Helmholtz resonators			
2210/3228	. . .	Shunts			
2210/3229	. . .	Transducers			