

## SECTION H — ELECTRICITY

## H04 ELECTRIC COMMUNICATION TECHNIQUE

**H04R LOUDSPEAKERS, MICROPHONES, GRAMOPHONE PICK-UPS OR LIKE ACOUSTIC ELECTROMECHANICAL TRANSDUCERS; DEAF-AID SETS; PUBLIC ADDRESS SYSTEMS** (generating mechanical vibrations in general B06B; transducers for measuring particular variables G01; transducers in clocks G04; producing sounds with frequency not determined by supply frequency G10K; transducers in recording or reproducing heads G11B; transducers in motors H02) [6]

**Note(s)**

- This subclass covers:
  - loudspeakers, microphones, gramophone pick-ups or like transducers producing acoustic waves or variations of electric current or voltage;
  - arrangements actuated by variations of electric current or voltage for cutting grooves in records;
  - circuits for the above-mentioned arrangements;
  - monitoring or testing the above-mentioned equipment.
- Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "micro-structural devices" and "micro-structural systems".

**Subclass index**

## TYPES OF TRANSDUCER

With magnetic circuit:

moving coil; moving armature; magnetisable diaphragm; magnetostriction.....9/00, 11/00, 13/00, 15/00

Without magnetic circuit:

piezo-electric; electrostatic; with variable resistance.....17/00, 19/00, 21/00

Other types.....23/00

Details

general; circuits; diaphragms and cones.....1/00, 3/00, 7/00

## APPLICATIONS

Stereophonic arrangements; deaf-aid; public address systems.....5/00, 25/00, 27/00

MONITORING, TESTING; MANUFACTURE.....29/00, 31/00

<b>1/00</b>	<b>Details of transducers</b> (diaphragms H04R 7/00; characterised by the nature of the transducer, <i>see</i> the relevant group of main groups H04R 9/00-H04R 23/00; mounting radio sets or communication systems in helmets A42B 3/30; mountings specially adapted for telephone equipment H04M 1/02)	1/22	• • for obtaining desired frequency characteristic only (circuits for combining transducers having different responses H04R 3/00)
1/02	• Casings; Cabinets; Mountings therein (H04R 1/28 takes precedence)	1/24	• • • Structural combinations of separate transducers or of parts of the same transducer and responsive respectively to two or more frequency ranges
1/04	• • Structural association of microphone with electric circuitry therefor (in deaf-aid sets H04R 25/00)	1/26	• • • Spatial arrangement of separate transducers responsive to two or more frequency ranges
1/06	• Arranging circuit leads; Relieving strain on circuit leads	1/28	• • • Transducer mountings or enclosures designed for specific frequency response; Transducer enclosures modified by provision of mechanical or acoustic impedances, e.g. resonator, damping means
1/08	• Mouthpieces; Attachments therefor	1/30	• • • Combinations of transducers with horns, e.g. with mechanical matching means (horns in general G10K)
1/10	• Earpieces; Attachments therefor	1/32	• • for obtaining desired directional characteristic only
1/12	• Sanitary or hygienic devices for mouthpieces or earpieces, e.g. for protecting against infection	1/34	• • • by using a single transducer with sound reflecting, diffracting, directing or guiding means
1/14	• Throat mountings for microphones	1/36	• • • • by using a single aperture of dimensions not greater than the shortest operating wavelength
1/16	• Mounting or connecting stylus to transducer with or without damping means		
1/18	• • Holders for styli; Mounting holders on transducers		
1/20	• Arrangements for obtaining desired frequency or directional characteristics (for stereophonic purposes H04R 5/00; speech enhancement by processing of the speech signal G10L 21/02)		

## H04R

- 1/38 • • • • in which sound waves act upon both sides of a diaphragm and incorporating acoustic phase-shifting means, e.g. pressure-gradient microphone
- 1/40 • • • by combining a number of identical transducers
- 1/42 • Combinations of transducers with fluid-pressure or other non-electrical amplifying means
- 1/44 • Special adaptations for subaqueous use, e.g. for hydrophone
- 1/46 • Special adaptations for use as contact microphones, e.g. on musical instrument, on stethoscope (throat mountings H04R 1/14)
- 3/00 Circuits for transducers** (for stereophonic arrangements H04R 5/04; arrangements for producing a reverberation or echo sound G10K 15/08; amplifiers H03F)
  - 3/02 • for preventing acoustic reaction
  - 3/04 • for correcting frequency response
  - 3/06 • • of electrostatic transducers
  - 3/08 • • of electromagnetic transducers
  - 3/10 • • of variable-resistance microphones
  - 3/12 • for distributing signals to two or more loudspeakers
  - 3/14 • • Cross-over networks
- 5/00 Stereophonic arrangements** (stereophonic pick-ups H04R 9/16, H04R 11/12, H04R 17/08, H04R 19/10)
  - Note(s)**

In this group, the following expression is used with the meaning indicated:

    - "stereophonic arrangements" covers quadrasonic or similar arrangements.
  - 5/02 • Spatial or constructional arrangements of loudspeakers
  - 5/027 • Spatial or constructional arrangements of microphones, e.g. in dummy heads [3]
  - 5/033 • Headphones for stereophonic communication [3]
  - 5/04 • Circuit arrangements (combinations of amplifiers H03F 3/68; stereophonic systems H04S)
- 7/00 Diaphragms for electromechanical transducers** (in general F16J 3/00); **Cones** (for musical instruments G10)
  - 7/02 • characterised by the construction
  - 7/04 • • Plane diaphragms
  - 7/06 • • • comprising a plurality of sections or layers
  - 7/08 • • • • comprising superposed layers separated by air or other fluid
  - 7/10 • • • • comprising superposed layers in contact
  - 7/12 • • Non-planar diaphragms or cones
  - 7/14 • • • corrugated, pleated, or ribbed
  - 7/16 • Mounting or tensioning of diaphragms or cones
  - 7/18 • • at the periphery
  - 7/20 • • • Securing diaphragm or cone resiliently to support by flexible material, springs, cords, or strands
  - 7/22 • • • Clamping rim of diaphragm or cone against seating
  - 7/24 • • Tensioning by means acting directly on free portion of diaphragm or cone
  - 7/26 • Damping by means acting directly on free portion of diaphragm or cone (air damping H04R 1/28)
- 9/00 Transducers of moving-coil, moving-strip, or moving-wire type**
  - 9/02 • Details
  - 9/04 • • Construction, mounting, or centering of coil
  - 9/06 • Loudspeakers
  - 9/08 • Microphones
  - 9/10 • Telephone receivers
  - 9/12 • Gramophone pick-ups using a stylus; Recorders using a stylus
  - 9/14 • • comprising two or more styli or transducers (H04R 9/16 takes precedence)
  - 9/16 • • signals being recorded or played-back by vibration of a stylus in two orthogonal directions simultaneously
  - 9/18 • Resonant transducers, i.e. adapted to produce maximum output at a predetermined frequency
- 11/00 Transducers of moving-armature or moving-core type** (acoustic diaphragm of magnetisable material directly co-acting with electromagnet H04R 13/00)
  - 11/02 • Loudspeakers
  - 11/04 • Microphones
  - 11/06 • Telephone receivers
  - 11/08 • Gramophone pick-ups using a stylus; Recorders using a stylus
  - 11/10 • • comprising two or more styli or transducers (H04R 11/12 takes precedence)
  - 11/12 • • signals being recorded or played-back by vibration of a stylus in two orthogonal directions simultaneously
  - 11/14 • Resonant transducers, i.e. adapted to produce maximum output at a predetermined frequency
- 13/00 Transducers having an acoustic diaphragm of magnetisable material directly co-acting with electromagnet**
  - 13/02 • Telephone receivers
- 15/00 Magnetostrictive transducers** (magnetostrictive elements in general H01L 41/00)
  - 15/02 • Resonant transducers, i.e. adapted to produce maximum output at a predetermined frequency
- 17/00 Piezo-electric transducers; Electrostrictive transducers** (piezo-electric or electrostrictive elements in general H01L 41/00; details of piezo-electric or electrostrictive motors, generators or positioners H02N 2/00)
  - 17/02 • Microphones
  - 17/04 • Gramophone pick-ups using a stylus; Recorders using a stylus
  - 17/06 • • comprising two or more styli or transducers (H04R 17/08 takes precedence)
  - 17/08 • • signals being recorded or played-back by vibration of a stylus in two orthogonal directions simultaneously
  - 17/10 • Resonant transducers, i.e. adapted to produce maximum output at a predetermined frequency
- 19/00 Electrostatic transducers**
  - 19/01 • characterised by the use of electrets [3]
  - 19/02 • Loudspeakers (H04R 19/01 takes precedence) [3]
  - 19/04 • Microphones (H04R 19/01 takes precedence) [3]
  - 19/06 • Gramophone pick-ups using a stylus; Recorders using a stylus (H04R 19/01 takes precedence) [3]
  - 19/08 • • comprising two or more styli or transducers (H04R 19/10 takes precedence)
  - 19/10 • • signals being recorded or played-back by vibration of a stylus in two orthogonal directions simultaneously

- 21/00 Variable-resistance transducers** (gaseous-resistance transducers H04R 23/00; magneto-resistive transducers H04R 23/00)
- 21/02 • Microphones
- 21/04 • Gramophone pick-ups using a stylus; Recorders using a stylus
- 23/00 Transducers other than those covered by groups H04R 9/00-H04R 21/00**
- 23/02 • Transducers using more than one principle simultaneously
- 25/00 Deaf-aid sets** (constructions of transducers *per se* H04R 9/00-H04R 23/00; structural combination with spectacle frames G02C 11/06; processing of speech signals G10L 21/00)
- 25/02 • adapted to be supported entirely by ear
- 25/04 • comprising pocket amplifiers
- 27/00 Public address systems** (circuits for preventing acoustic reaction H04R 3/02; circuits for distributing signals to loudspeakers H04R 3/12; amplifiers H03F)
- 27/02 • Amplifying systems for the deaf
- 27/04 • Electric megaphones
- 29/00 Monitoring arrangements; Testing arrangements**
- 31/00 Apparatus or processes specially adapted for the manufacture of transducers or diaphragms therefor** (processes or apparatus specially adapted for the manufacture of micro-structural devices or systems, e.g. in combination with electrical devices, B81C)