PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT8397021

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
KNOWLES ELECTRONICS, LLC	12/19/2023

RECEIVING PARTY DATA

Name:	SAMSUNG ELECTRONICS CO., LTD.
Street Address:	129, SAMSUNG-RO, YEONGTONG-GU
City:	SUWON-SI, GYEONGGI-DO
State/Country:	KOREA, REPUBLIC OF
Postal Code:	16677

PROPERTY NUMBERS Total: 25

Property Type	Number
Patent Number:	8615392
Patent Number:	8488805
Patent Number:	8718290
Patent Number:	8848935
Patent Number:	8700391
Patent Number:	8473287
Patent Number:	8606571
Patent Number:	9343073
Patent Number:	8798290
Patent Number:	8781137
Patent Number:	8880396
Patent Number:	9245538
Patent Number:	9558755
Patent Number:	8447596
Patent Number:	8761410
Patent Number:	8611552
Patent Number:	8311817
Patent Number:	8682006
Patent Number:	8831937
Patent Number:	8606249

Property Type	Number
Patent Number:	8526628
Patent Number:	9307321
Patent Number:	8378871
Patent Number:	9076456
Patent Number:	8363823

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

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NAME OF SUBMITTER:	MAENG-HO SHIN
SIGNATURE:	/Maeng-Ho SHIN/
DATE SIGNED:	01/23/2024

Total Attachments: 8
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Form **PTO-1595** (Rev. 07/05)
OMB No. 0651-0027 (exp. 6/30/2008)

U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

RECORDATION FORM COVER SHEET
PATENTS ONLY

To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below.

1. Name of conveying party(ies)

Knowles Electronics, LLC

Additional name(s) of conveying party(ies) attached? ☐ Yes ☑ No

2. Name and address of receiving party(ies)

Name: Samsung Electronics Co., Ltd.

Internal Address:

Street Address: 129, Samsung-ro, Yeongtong-gu

City: Suwon-si, Gyeonggi-do

State:

Country: Republic of Korea Zip: 16677

Additional name(s) & address(es) attached? ☐ Yes ☑ No

3. Nature of conveyance/Execution Date(s):

Execution Date(s) December 19, 2023

☑ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Joint Research Agreement
☐ Government Interest Assignment
☐ Executive Order 9424, Confirmatory License
☐ Other

4. Application or patent number(s):

☐ This document is being filed together with a new application.

A. Patent Application No.(s)

B. Patent No.(s)

Please see page 2.

Additional numbers attached? ☑ Yes ☐ No

5. Name and address to whom correspondence concerning document should be mailed:

Name: Jefferson IP Law, LLP

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6. Total number of applications and patents involved: 25

7. Total fee (37 CFR 1.21(h) & 3.41) $

☐ Authorized to be charged by credit card
☐ Authorized to be charged to deposit account
☐ Enclosed
☐ None required (government interest not affecting title)

8. Payment Information

a. Credit Card Last 4 Numbers
Expiration Date

b. Deposit Account Number

Authorized User Name

9. Signature:

/Maeng-Ho SHIN/ Reg. #53,859
Signature

January 23, 2024
Date

Maeng-Ho Shin
Name of Person Signing

Total number of pages including cover sheet, attachments, and documents: 8

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1450, Alexandria, V.A. 22313-1450

Additional application or patent number(s):

Patent Nos.:

1. 8,615,392	2. 8,488,805	3. 8,718,290	4. 8,848,935
5. 8,700,391	6. 8,473,287	7. 8,606,571	8. 9,343,073
9. 8,798,290	10. 8,781,137	11. 8,880,396	12. 9,245,538
13. 9,558,755	14. 8,447,596	15. 8,761,410	16. 8,611,552
17. 8,311,817	18. 8,682,006	19. 8,831,937	20. 8,606,249
21. 8,526,628	22. 9,307,321	23. 8,378,871	24. 9,076,456
25. 8,363,823			

PATENT ASSIGNMENT

THIS PATENT ASSIGNMENT (the "Assignment") is effective as of 19 December 2023 by and between

KNOWLES ELECTRONICS, LLC, a Delaware entity having its principal place of business at 1151 MAPLEWOOD DRIVE, ITASCA, ILLINOIS 60143 USA (the "ASSIGNOR"), and

SAMSUNG ELECTRONICS CO., LTD. of 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO 16677, REPUBLIC OF KOREA (the "ASSIGNEE").

WHEREAS, ASSIGNOR is an assignee by duly executed assignments recorded in the U.S. Patent and Trademark Office of inventions and improvements described and set forth in the Applications for United States Letters Patents and United States Letters Patents identified in the Appendix attached hereto (the "Assigned Patents").

WHEREAS, Brian P. Crannell, Senior Vice President, is a duly authorized representative of KNOWLES ELECTRONICS, LLC having authority to sell, assign, and transfer the Assigned Patents to a third party.

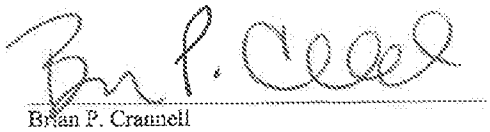
WHEREAS, ASSIGNEE is desirous of acquiring an entirety of ASSIGNOR's interest in and to the Assigned Patents;

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN: Be it known that, for good and valuable consideration, receipt of which is hereby acknowledged by ASSIGNOR, ASSIGNOR has sold, assigned and transferred, and by these presents does hereby sell, assign, and transfer unto the ASSIGNEE, and ASSIGNEE's successors and assigns, 100% of its right, title, and interest in and to the Assigned Patents, subject to any and all encumbrances, including any corresponding foreign applications, and in and to any Letters Patent which may hereafter be granted on the same in the United States and in any corresponding foreign applications, the interest to be held and enjoyed by the ASSIGNEE as fully and exclusively as it would have been held and enjoyed by the ASSIGNOR had this Assignment and transfer not been made, to the full end and term of any Letters Patent which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

ASSIGNOR further agrees that it will, without charge to ASSIGNEE, but at ASSIGNEE's expense, cooperate with ASSIGNEE in the prosecution of any applications, execute, verify, acknowledge and deliver all such further papers, including applications for Letters Patents and for the reissue thereof, and instruments of assignment and transfer thereof, and will perform such other acts as ASSIGNEE lawfully may request, to obtain or maintain the Assigned Patents for the inventions and improvements, and to vest title thereto in ASSIGNEE, or ASSIGNEE's successors and assigns.

IN TESTIMONY WHEREOF, ASSIGNOR has signed this Assignment on the date indicated below.

19 December 2023



Brian P. Crannell
Senior Vice President

APPENDIX

No.	Description	KN Ref	Pat. No.	Type	Title	Appl. No.
1	Audio	A-0004-US	US6792118	patent	Computation of multi-sensor time delays	US10004141
2	Audio	A-0008-US	US7508948	patent	Reverberation removal	US10959408
3	Audio	A-0009-US-02	US8315857	patent	Systems and methods for audio signal analysis and modification	US11444060
4	Audio	A-0014-US-02	US8345890	patent	System and method for utilizing inter-microphone level differences for speech enhancement	US11343524
5	Audio	A-0016-US	US8150065	patent	System and method for processing an audio signal	US11441675
6	Audio	A-0017-US-02	US8194880	patent	System and method for utilizing omni-directional microphones for speech enhancement	US11699732
7	Audio	A-0020-US	US8744844	patent	System and method for adaptive intelligent noise suppression	US11825563
8	Audio	A-0021-US	US8194882	patent	System and method for providing single microphone noise suppression fallback	US12072931
9	Audio	A-0022-US	US8143620	patent	System and method for adaptive classification of audio sources	US12004897
10	Audio	A-0023-US-02	US8259926	patent	System and method for 2-channel and 3-channel acoustic echo cancellation	US12004899
11	Audio	A-0024-US-02	US8849231	patent	System and method for adaptive power control	US12228034
12	Audio	A-0025-US	US8160064	patent	System and method for providing voice equalization	US12004788
13	Audio	A-0026-US	US8189766	patent	System and method for blind subband acoustic echo cancellation postfiltering	US12004896
14	Audio	A-0028-US	US8355511	patent	System and method for envelope-based acoustic echo cancellation	US12077436
15	Audio	A-0029-US	US8204252	patent	System and method for providing close microphone adaptive array processing	US12080115
16	Audio	A-0031-US	US8521530	patent	System and method for enhancing a monaural audio signal	US12217076
17	Audio	A-0032-US	US8204253	patent	Self Calibration of Audio Device	US12286909
18	Audio	A-0033-US-02	US8798289	patent	Adaptive power saving for an audio device	US12536374
19	Audio	A-0034-US	US8774423	patent	System and method for controlling adaptivity of signal modification using a phantom coefficient	US12286995
20	Audio	A-0035-US	US8934641	patent	Systems and methods for reconstructing decomposed audio signals	US12319107
21	Audio	A-0037-US-02	US8472616	patent	Self calibration of envelope-based acoustic echo cancellation	US12435322

No.	Description	KN Ref	Pat. No.	Type	Title	Appl. No.
22	Audio	A-0039-US-02	US8405552	patent	Asynchronous sample rate converter	US12790552
23	Audio	A-0040-US-02	US9104510	patent	Multi-function floating point unit	US12772146
24	Audio	A-0041 P1-US	US9838784	patent	Directional audio capture	US14957447
25	Audio	A-0041-US	US9210503	patent	Audio zoom	US12896725
26	Audio	A-0042-US	US8615392	patent	Systems and methods for producing an acoustic field having a target spatial pattern	US12893208
27	Audio	A-0043-US	US8488805	patent	Providing background audio during telephonic communication	US12649121
28	Audio	A-0044-US	US8718290	patent	Adaptive noise reduction using level cues	US12693998
29	Audio	A-0045-US-02	US8848935	patent	Low latency active noise cancellation system	US12950431
30	Audio	A-0048-US-02	US8700391	patent	Low complexity bandwidth expansion of speech	US12895254
31	Audio	A-0050-US-02	US8473287	patent	Method for jointly optimizing noise reduction and voice quality in a mono or multi-microphone system	US12832901
32	Audio	A-0055-US-02	US8606571	patent	Spatial selectivity noise reduction tradeoff for multi-microphone systems	US12837340
33	Audio	A-0056-US-02	US9343073	patent	Robust noise suppression system in adverse echo conditions	US12860428
34	Audio	A-0057-US-02	US8798290	patent	Systems and methods for adaptive signal equalization	US12841098
35	Audio	A-0058-US-02	US8781137	patent	Wind noise detection and suppression	US12868622
36	Audio	A-0059-US-02	US8880396	patent	Spectrum reconstruction for automatic speech recognition	US12860515
37	Audio	A-0064-US-02	US9245538	patent	Bandwidth enhancement of speech signals assisted by noise reduction	US12907788
38	Audio	A-0065-US-02	US9558755	patent	Noise suppression assisted automatic speech recognition	US12962519
39	Audio	A-0068-US-02	US8447596	patent	Monaural noise suppression based on computational auditory scene analysis	US12860043
40	Audio	A-0073-US-02	US8761410	patent	Systems and methods for multi-channel dereverberation	US12963497
41	Audio	A-0074-US	US8611552	patent	Direction-aware active noise cancellation system	US12868417
42	Audio	A-0077-US	US8311817	patent	Systems and methods for enhancing voice quality in mobile device	US13288858
43	Audio	A-0078-US	US8682006	patent	Noise suppression based on null coherence	US13157238
44	Audio	A-0081-US-02	US8831937	patent	Post-noise suppression processing to improve voice quality	US13295981

No.	Description	KN Ref	Pat. No.	Type	Title	Appl. No.
45	Audio	A-0084-US-02	US8606249	patent	Methods and systems for enhancing audio quality during teleconferencing	US13414121
46	Audio	A-0087-US-02	US8526628	patent	Low latency active noise cancellation system	US13493648
47	Audio	A-0088-US-02	US9307321	patent	Speaker Distortion Reduction	US13492737
48	Audio	A-0090-US-02	US8378871	patent	Data directed scrambling to improve signal-to-noise ratio	US13565751
49	Audio	A-0091-US	US9076456	patent	System and method for providing voice equalization	US13452490
50	Sensor	A-0094-US-02	US8363823	patent	Two microphone uplink communication and stereo audio playback on three wire headset assembly	US13568989
51	Audio	A-0099-US-02	US8750526	patent	Dynamic bandwidth change detection for configuring audio processor	US13734208
52	Audio	A-0101-US-02	US8737188	patent	Crosstalk cancellation systems and methods	US13664299
53	Audio	A-0103-US-02	US8615394	patent	Restoration of noise-reduced speech	US13751907
54	Audio	A-0105-US-02	US8618961	patent	Sample rate conversion using infinite impulse response filters	US13797344
55	Audio	A-0106-US	US8473285	patent	Method for jointly optimizing noise reduction and voice quality in a mono or multi-microphone system	US13424189
56	Sensor	A-0109-US	US8787587	patent	Selection of system parameters based on non-acoustic sensor information	US13529809
57	Audio	A-0111-US	US8867759	patent	System and method for utilizing inter-microphone level differences for speech enhancement	US13705132
58	Audio	A-0113-US-02	US9640194	patent	Noise suppression for speech processing based on machine-learning mask estimation	US14046551
59	Audio	A-0127-US	US9431023	patent	Monaural noise suppression based on computational auditory scene analysis	US13859186
60	Audio	A-0132-US-02	US9536540	patent	Speech signal separation and synthesis based on auditory scene analysis and speech modeling	US14335850
61	Audio	A-0134 CO1-US	US9502048	patent	Adaptively reducing noise to limit speech distortion	US14850911
62	Audio	A-0138-US-02	US9633655	patent	Voice sensing and keyword analysis	US14285585
63	Audio	A-0142-US	US8611551	patent	Low latency active noise cancellation system	US13935847
64	Audio	A-0144-US	US9438992	patent	Multi-microphone robust noise suppression	US13959457
65	Sensor	A-0149 P1-US	US10353495	patent	Personalized operation of a mobile device using sensor signatures	US15098177

No.	Description	KN Ref	Pat. No.	Type	Title	Appl. No.
66	Sensor	A-0149-US-02	US9772815	patent	Personalized operation of a mobile device using acoustic and non-acoustic information	US14542327
67	Audio	A-0153-US-02	US9953634	patent	Passive training for automatic speech recognition	US14573846
68	Sensor	A-0154-US-02	US9532155	patent	Real time monitoring of acoustic environments using ultrasound	US14549325
69	Sensor	A-0155-US-02	US9781106	patent	Method for modeling user possession of mobile device for user authentication framework	US14548207
70	Sensor	A-0162-US-02	US9500739	patent	Estimating and tracking multiple attributes of multiple objects from multi-sensor data	US14666312
71	Audio	A-0164-US	US9437180	patent	Adaptive noise reduction using level cues	US14222255
72	Audio	A-0169-US-02	US9437188	patent	Buffered reprocessing for multi-microphone automatic speech recognition assist	US14667650
73	Audio	A-0172-US-02	US9830302	patent	Sparse matrix vector multiplication	US14685277
74	Audio	A-0177-US	US9699554	patent	Adaptive signal equalization	US14341697
75	Audio	A-0191-US	US9343056	patent	Wind Noise Detection and Suppression	14/313883
76	Audio	A-0193 CO1-US	US9462552	patent	Adaptive power control	US14818258
77	Audio	A-0193-US	US9119150	patent	System and method for adaptive power control	US14464621
78	Audio	A-0194-US	US9799330	patent	Multi-sourced noise suppression	US14838133
79	Audio	A-0196-US	US9830899	patent	Adaptive noise cancellation	US14591802
80	Sensor	A-0200-US	US8223121	patent	Host system and method for determining an attitude of a device undergoing dynamic acceleration	US12338896
81	Sensor	A-0211-US-02	US8775128	patent	Selecting feature types to extract based on pre-classification of sensor measurements	US13939126
82	Sensor	A-0213-US-02	US9726498	patent	Combining monitoring sensor measurements and system signals to determine device context	US14090965
83	Sensor	A-0216-US-02	US9607725	patent	Determining a spatial relationship between different user contexts	US14683057
84	Audio	A-0225-US	US9978388	patent	Systems and methods for restoration of speech components	US14852445
85	Audio	A-0230 CO1-US	US10469967	patent	Utilizing digital microphones for low power keyword detection and noise suppression	US16043105
86	Audio	A-0230-US	US10045140	patent	Utilizing digital microphones for low power keyword detection and noise suppression	US14989445
87	Audio	A-0232-US	US9668048	patent	Contextual switching of microphones	US15011287

No.	Description	KN Ref	Pat. No.	Type	Title	Appl. No.
88	Audio	A-0239-US	US10403259	patent	Multi-microphone feedforward active noise cancellation	US15780836
89	Audio	A-0241-US	US10045122	patent	Acoustic echo cancellation reference signal	US15404988
90	Audio	A-0244-US	US9820042	patent	Stereo separation and directional suppression with omni-directional microphones	US15144631
91	Audio	K-0037 CO1-US	US9830913	patent	VAD Detection Apparatus and Method of Operating the Same	US14851113
92	Audio	K-0053-US	US9712915	patent	Reference microphone for non-linear and time variant echo cancellation	US14944474
93	Audio	K-0194-US	US9830930	patent	Voice-Enhanced Awareness Mode	US14985112
94	Audio	K-0211-US	US9812149	patent	Method and system for providing consistency in noise reduction during speech and non-speech periods	US15009740
95	Audio	K-0233-US	US10979824	patent	Transducer Assemblies and Methods	US16343835
96	Audio	K-0298-US	US10636410	patent	Adaptive acoustic echo delay estimation	US15993944
97	Audio	K-0329-US	US11061642	patent	Multicore audio processor with flexible memory allocation	US16649952
98	Audio	K-0330-US	US11074032	patent	Multi-core audio processor with low-latency sample processing core	US16649945
99	Audio	K-0331-US	US11029914	patent	Multi-core audio processor with phase coherency	US16650845
100	Audio	K-0332-US	US11461069	patent	Multi-core Audio Processor With Deadline Scheduler	US16651177
101	Audio	K-0379-US	US10937409	patent	Predictive acoustic echo cancellation	US16678339
102	Audio	K-0382-US	US20210110838	publication	ACOUSTIC AWARE VOICE USER INTERFACE	US17129075
103	Audio	K-0425-US	US11335331	patent	MULTIBEAM KEYWORD DETECTION SYSTEM AND METHOD	US16938428
104	Audio	K-0427-US	US11303758	patent	System and method for generating an improved reference signal for acoustic echo cancellation	US16885298
105	Audio	K-0429-US	US11184729	patent	Synchronization of multiple audio processing chains	US16888596
106	Audio	K-0430-US	US11184011	patent	Clock detection and automatic PLL output bypass switching for an audio processor	US16888627
107	Audio	K-0464-US	US20210375270	publication	Method and system for confusion reduction for compressed acoustic models	US17335663