

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

ADVANCED CODING TECHNOLOGIES, LLC,
Patent Owner.

Case IPR2024-00062
Patent 6,845,128

**PETITIONER'S REPLY TO
PATENT OWNER'S PRELIMINARY RESPONSE**

The analysis in the Petition satisfies the constructions of the terms “emphasis processing” and “emphasis level” advanced in Patent Owner’s Preliminary Response (“POPR”). Further, Patent Owner’s interpretation of “at least one factor among” is incorrect and inconsistent with the intrinsic record. Therefore, the Board should reject the arguments advanced in the POPR and grant institution.

I. THE PETITION ESTABLISHED THAT FUKUDA SATISFIES THE POPR’S CONSTRUCTIONS OF “EMPHASIS PROCESSING” AND “EMPHASIS LEVEL” IN MULTIPLE WAYS

Patent Owner (“ACT”) alleges that Fukuda does not satisfy the proposed constructions for “emphasis processing” (“*increasing the amplitude of the high frequency components of a video signal*”) and “emphasis level” (“*a value that represents the amount by which the amplitude of the high frequency components of the video signal is increased*”). POPR, pp. 15-16. On the contrary, multiple embodiments of Fukuda mapped in the petition satisfy these constructions. As explained in the Petition, Fukuda uses an “*emphasis* circuit” to perform the same type of emphasis processing described in the ’128 Patent. Pet., 8-28. As the background of the ’128 Patent explains, “[a]n emphasis processing is a *known* technique” in which “an *emphasis circuit* gives emphasis effects on high frequency components of video or audio signals.” SAMSUNG-1001, 1:15-26. Nothing in the record suggests that Fukuda’s use of the same term—emphasis circuit—is something other than the admittedly “known technique” described by

the '128 Patent.¹ In fact, Fukuda's enhancement and then suppression of high frequency noise aligns directly with the goal of the '128 Patent. *Id.* (“emphasized high-frequency components are eliminated by a deemphasis circuit” such that “[n]oises ... can be attenuated”). The Petition referred to Fukuda's emphasis processing of “noise” throughout its discussion of the “emphasis processing” and “emphasis level” limitations claimed by the '128 Patent. *See, e.g.*, Pet., 14 (“the generated noise components are enhanced and suppressed with a large degree”). Indeed, as discussed in more detail below, the examples from the Petition highlighted below demonstrate that Fukuda's “emphasis circuit” emphasizes the high frequency components of a video signal in a manner that meets the constructions set forth in the POPR.

¹ As explained in the Petition, the mapping of Fukuda's “emphasis circuit” to emphasis processing during prosecution of the Japanese counterpart to the '128 Patent provides further evidence that Fukuda's disclosure of “emphasis” processing equates to the known “emphasis” processing referred to in the '128 Patent. Pet., 6-7, 16, 22. The '128 Patent also admits that “emphasis processing is disclosed, for example, in Japanese Un-examined Patent Publication No. 7-162862 [same disclosure as Fukuda].” SAMSUNG-1001, 2:25-32.

A. Fukuda’s “emphasis circuit having a nonlinear characteristic” satisfies the proposed constructions

As established in the Petition (pp. 14-16), Fukuda discloses an “emphasis circuit having a nonlinear characteristic” that includes a “limiter” that “limits the amplitude of the output signal” (“*a value that represents the amount by which the amplitude of the high frequency components of the video signal is increased*” – an “emphasis level”) based on whether amplitude of the input signal is greater than a set parameter “L.” SAMSUNG-1005, 6:21-30. In so doing, Fukuda’s emphasis circuit sets “the degree of enhancement ... smaller than the degree of suppression” removing “more coding noise ... at high compression rate, so that the picture quality may be improved.” SAMSUNG-1005, 8:3-25. Fukuda explains that when “higher frequency components of signals are enhanced [(“*increasing the amplitude of the high frequency components of a video signal*” – “emphasis processing”)] ... the enhanced components are suppressed more in the signal suppression, and hence deterioration occurs in the higher frequency components as compared with the original signal.” *Id.*, 4:39-48, 5:51-59, 6:18-20 (describing that the “output of the subtracter 303” – the input to limiter 304 – “corresponds to the high frequency components of the input signal”).

This reduction of noise by enhancing high frequency components is consistent with the ’128 patent’s description of emphasis processing, which describes applying “emphasis effects on high-frequency components” which are

then “eliminated by a de-emphasis circuit,” thus attenuating “[n]oise and aliasing generated during storage or transfer.” SAMSUNG-1001, 1:15-26; POPR, pp. 4-5.

B. Fukuda’s “high compression rate” mode signal satisfies the proposed constructions

As established in the Petition (pp. 16-22), Fukuda describes different “mode signals” (“*a value that represents the amount by which the amplitude of the high frequency components of the video signal is increased*” – an “emphasis level”) that are used to control the operation of the deemphasis circuit in various embodiments. SAMSUNG-1005, 11:57-59, 14:52-63, 15:52-16:5. Included in Fukuda’s various mode signals is a “high compression rate” mode (“mode 1”) that sets the “enhancement degree” smaller than the “suppression degree” to remove “the high frequency component of the original signal” (“*increasing the amplitude of the high frequency components of a video signal*” – “emphasis processing”) and thereby reduce “coding noise generated in the high frequency components.” SAMSUNG-1005, 14:3-13, 17:5-15.

II. ACT’S PROPOSED INTERPRETATION OF “AT LEAST ONE FACTOR AMONG” SHOULD BE REJECTED

In the POPR, ACT advanced an interpretation of “setting an emphasis level to the input video signal in accordance with *at least one factor among* control data ..., a picture state ... and encoding conditions” (“element 1.5”) that requires *all three* of the recited factors (“control data ... ,” “a picture state ... ,” *and* “encoding conditions ...”). POPR, pp. 17-19. This interpretation should be rejected.

In *SuperGuide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870 (Fed. Cir. 2004), the Court construed a phrase that recited “at least one of” followed by a list of categories separated by the word “and.” *Id.*, 885-888. The Court asked “what does ‘at least one of’ modify?” *Id.*, 885-886. The Court relied on a treatise on grammar that explained how “an article of a preposition applying to all members of the series must either be used only before the first term or else be repeated before each term.” *Id.*, 886. The Court concluded that “[a]pplying this grammatical principle here, the phrase ‘at least one of’ modifies each member of the list” and therefore the claimed phrase requires “at least one value for each category.” *Id.* In *SIMO Holdings Inc. v. Hong Kong uCloudlink Network Technology Ltd.*, 983 F.3d 1367 (Fed. Cir. 2021), the Court reached a similar construction of “a phrase grammatically comparable to ‘a plurality of’ at the start of a list of items joined together by ‘and.’” *Id.*, 1376.

The claim language at issue here is different, reciting “setting an emphasis level to the input video signal in accordance with ***at least one factor***.” In this phrase, “at least one” modifies the term “factor,” not the list that follows. The term “among” (absent in *SuperGuide* and *SIMO*) signifies a list of possible factors that can satisfy the claim. It does not signify a requirement that at least one of each factor is required. Applying the grammatical principle used in *SuperGuide* would not distribute the “at least one” to the list because the noun “factor” is used before

the list is reached. If anything were to be distributed to the claimed list, it would have to be the entire clause “at least one factor among” and that would make little grammatical sense—“at least one factor among control data,” “at least one factor among a picture state,” and “at least one factor among encoding conditions.”

Additionally, Courts have not interpreted *SuperGuide* as setting forth a *per se* rule that the use of “at least one of” followed by “and” necessarily connotes a conjunctive list. *Fujifilm Corp. v. Motorola Mobility LLC*, Case No. 12-CV-03587-WHO, 2015 WL 1265009, at *8 (N.D. Cal. 2015) (summarizing cases and noting that “*SuperGuide* did not erect a universal rule of construction for all uses of ‘at least one of’ in all patents”). In particular, Courts have found *SuperGuide* inapplicable when the listed items following “at least one of” are not categories containing many possible values. *Id.*; *TQ Delta, LLC v. Comcast Cable Commc’ns, LLC*, No. 1:15-CV-00611-RGA, 2016 WL 7013481, at *8 (D. Del. 2016) (list following “at least one of” was of parameters to be selected from, not categories). The Board also has distinguished *SuperGuide* on this basis. *Hewlett–Packard Co. v. MPHJ Tech. Invs., LLC*, IPR2013-00309, Paper 9, 8 (PTAB 2013); *Daifuku Co., Ltd. v. Murata Machinery, Ltd.*, IPR2015-00083, Paper 63, 4-5 (PTAB 2016); *Apple Inc. v. Evolved Wireless LLC*, No. IPR2016-01177, Paper 27, 8-10 (PTAB 2017); *Apple Inc. v. CPC Patent Technologies PTY. LTD.*, No. IPR2022-00602, Paper 31, 24-25 (PTAB 2023).

Here, the items that follow “at least one of” are not categories containing many possible values, but rather individual factors having only one value. The ’128 patent specification confirms this in describing the claimed list as “the following three factors” and describing “[p]referred embodiments ... with reference to the attached drawings” that do not require all three factors and would be excluded in ACT’s construction. SAMSUNG-1001, 8:33-44; 8:49-55 (“at least one of three factors such as”); 3:66-67; FIG. 1 (only encoding conditions); FIG. 3 (only a picture state); *On-Line Techs., Inc. v. Bodenseewerk Perkin-Elmer GmbH*, 386 F.3d 1133, 1138 (Fed. Cir. 2004)(“a claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”).

Because the claimed list recites single factors, not categories of factors, the claim language only makes sense if it is disjunctive. In other words, the term “among” designates the list of possible factors, at least one of which is all that is required to satisfy the claimed requirement of “at least one factor.” With this structure, the claims of the ’128 Patent are more similar to claims drafted in *Markush* style where claim language of “a material selected from the group consisting of A, B, **and** C” is interpreted as “wherein the material is A, B, **or** C.” M.P.E.P. 2117; *Abbott Labs. v. Baxter Pharmaceutical Products, Inc.*, 334 F.3d 1274, 1280-1281 (Fed. Cir. 2003). For these reasons, the Board should reject ACT’s overly narrow construction and grant institution.

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4) and 42.205(b), the undersigned certifies that on April 26, 2024, a complete and entire copy of this Petitioner's Reply to Patent Owner's Preliminary Response was provided by email to the Patent Owner by serving the correspondence address of record as follows:

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