Claims

1. An apparatus for decoding to obtain a reconstructed audio signal envelope, comprising:

a signal envelope reconstructor ~~(110)~~ for generating the reconstructed audio signal envelope depending on one or more splitting points, and

an output interface ~~(120)~~ for outputting the reconstructed audio signal envelope,

wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the reconstructed audio signal envelope such that the one or more splitting points divide the reconstructed audio signal envelope into two or more audio signal envelope portions, wherein a predefined assignment rule defines a signal envelope portion value for each signal envelope portion of the two or more signal envelope portions depending on said signal envelope portion, and

wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the reconstructed audio signal envelope such that, for each of the two or more signal envelope portions, an absolute value of its signal envelope portion value is greater than half of an absolute value of the signal envelope portion value of each of the other signal envelope portions.

2. An apparatus according to claim 1, wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the reconstructed audio signal envelope such that, for each of the two or more signal envelope portions, the absolute value of its signal envelope portion value is greater than 90 % of the absolute value of the signal envelope portion value of each of the other signal envelope portions.

3. An apparatus according to claim 2, wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the reconstructed audio signal envelope such that, for each of the two or more signal envelope portions, the absolute value of its signal envelope portion value is greater than 99 % of the absolute value of the signal envelope portion value of each of the other signal envelope portions.

4. An apparatus according to claim 3, wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the reconstructed audio signal envelope such that the signal envelope portion value of each of the two or more signal envelope

portions is equal to the signal envelope portion value of each of the other signal envelope portions of the two or more signal envelope portions.

5. An apparatus for decoding to obtain a reconstructed audio signal envelope, comprising:

a signal envelope reconstructor ~~(110)~~ for generating the reconstructed audio signal envelope depending on one or more splitting points, and

an output interface ~~(120)~~ for outputting the reconstructed audio signal envelope,

wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the reconstructed audio signal envelope such that the one or more splitting points divide the reconstructed audio signal envelope into two or more audio signal envelope portions, wherein a predefined assignment rule defines a signal envelope portion value for each signal envelope portion of the two or more signal envelope portions depending on said signal envelope portion, and

wherein a predefined envelope portion value is assigned to each of the two or more signal envelope portions, and

wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the reconstructed audio signal envelope such that, for each signal envelope portion of the two or more signal envelope portions, an absolute value of the signal envelope portion value of said signal envelope portion is greater than 90 % of an absolute value of the predefined envelope portion value being assigned to said signal envelope portion, and such that the absolute value of the signal envelope portion value of said signal envelope portion is smaller than 110 % of the absolute value of the predefined envelope portion value being assigned to said signal envelope portion.

6. An apparatus according to claim 5, wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the reconstructed audio signal envelope such that the signal envelope portion value of each of the two or more signal envelope portions is equal to the predefined envelope portion value being assigned to said signal envelope portion.

7. An apparatus according to claim 5 or 6, wherein the predefined envelope portion values of at least two of the signal envelope portions differ from each other.

8. An apparatus according to claim 5 or 6, wherein the predefined envelope portion value of each of the signal envelope portions differs from the predefined envelope portion value of each of the other signal envelope portions.

9. An apparatus according to one of the preceding claims, wherein the signal envelope portion value of each signal envelope portion of the two or more signal envelope portions depends on one or more energy values or one or more power values of said signal envelope portion, or wherein the signal envelope portion value of each signal envelope portion of the two or more signal envelope portions depends on any other value suitable for reconstructing an original or a targeted level of the audio signal envelope.

10. An apparatus according to one of the preceding claims,

wherein the signal envelope reconstructor ~~(110)~~ is configured to generate an aggregation function depending on the one or more splitting points, wherein the aggregation function comprises a plurality of aggregation points, wherein each of the aggregation points comprises an argument value and an aggregation value, wherein the aggregation function monotonically increases, and wherein each of the one or more splitting points indicates at least one of the argument value and the aggregation value of one of the aggregation points of the aggregation function,

wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the audio signal envelope such that the audio signal envelope comprises a plurality of envelope points, wherein each of the envelope points comprises an argument value and an envelope value, and wherein, for each of the aggregation points of the aggregation function, one of the envelope points of the audio signal envelope is assigned to said aggregation point such that the argument value of said envelope point is equal to the argument value of said aggregation point, and

wherein the signal envelope reconstructor ~~(110)~~ is configured to generate the audio signal envelope such that the envelope value of each of the envelope points of the audio signal envelope depends on the aggregation value of at least one aggregation point of the aggregation function.

11. An apparatus according to claim 10, wherein the signal envelope reconstructor ~~(110)~~ is configured to determine the audio signal envelope by determining a ratio of a first difference and a second difference, said first difference being a difference between a first aggregation value ($c(k+1)$) of a first one of the aggregation points of the aggregation function and a second aggregation value ($c(k-1)$; $c(k)$) of a second one of the aggregation points of the aggregation function, and said second difference being a difference between a first argument value ($f(k+1)$) of said first one of the aggregation points of the aggregation function and a second argument value ($f(k-1)$; $f(k)$) of said second one of the aggregation points of the aggregation function.

12. An apparatus according to claim 11, wherein the signal envelope reconstructor ~~(110)~~ is configured to determine the audio signal envelope by applying

$$tilt(k) = \frac{c(k+1) - c(k-1)}{f(k+1) - f(k-1)}$$

wherein $tilt(k)$ indicates a derivative of the aggregation function at the k-th splitting point,

wherein $c(k+1)$ is said first aggregation value,

wherein $f(k+1)$ is said first argument value,

wherein $c(k-1)$ is said second aggregation value,

wherein $f(k-1)$ is said second argument value,

wherein k is an integer indicating an index of one of the one or more splitting points,

wherein $c(k+1) - c(k-1)$ is the first difference of the two aggregated values $c(k+1)$ and $c(k-1)$, and

wherein $f(k+1) - f(k-1)$ is the second difference of the two argument values $f(k+1)$ and $f(k-1)$.

13. An apparatus according to claim 11, wherein the signal envelope reconstructor ~~(110)~~ is configured to determine the audio signal envelope by applying

$$tilt(k) = 0.5 \cdot \left(\frac{c(k+1) - c(k)}{f(k+1) - f(k)} + \frac{c(k) - c(k-1)}{f(k) - f(k-1)} \right)$$

wherein $tilt(k)$ indicates a derivative of the aggregation function at the k-th splitting point,

wherein $c(k+1)$ is said first aggregation value,

wherein $f(k+1)$ is said first argument value,

wherein $c(k)$ is said second aggregation value,

wherein $f(k)$ is said second argument value,

wherein $c(k-1)$ is a third aggregation value of a third one of the aggregation points of the aggregation function,

wherein $f(k-1)$ is a third argument value of said third one of the aggregation points of the aggregation function,

wherein k is an integer indicating an index of one of the one or more splitting points,

wherein $c(k+1) - c(k)$ is the first difference of the two aggregated values $c(k+1)$ and $c(k)$, and

wherein $f(k+1) - f(k)$ is the second difference of the two argument values $f(k+1)$ and $f(k)$.

14. An apparatus according to one of the preceding claims, wherein the apparatus further comprises a splitting points decoder ~~(105)~~ for decoding one or more encoded points according to a decoding rule to obtain a position of each of the one or more splitting points,

wherein the splitting points decoder (105) is configured to analyse a total positions number indicating a total number of possible splitting point positions, a splitting points number indicating the number of the one or more splitting points, and a splitting points state number; and

wherein the splitting points decoder (105) is configured to generate an indication of the position of each of the one or more splitting points using the total positions number, the splitting points number and the splitting points state number.

15. An apparatus according to one of the preceding claims, wherein the signal envelope reconstructor (110) is configured to generate the reconstructed audio signal envelope depending on a total energy value indicating a total energy of the reconstructed audio signal envelope, or depending on any other value suitable for reconstructing an original or a targeted level of the audio signal envelope.

16. An apparatus for reconstructing an audio signal, comprising:

an apparatus (1510) for decoding according to one of claims 1 to 15 to obtain a reconstructed audio signal envelope of the audio signal, and

a signal generator (1520) for generating the audio signal depending on the audio signal envelope of the audio signal and depending on a further signal characteristic of the audio signal, the further signal characteristic being different from the audio signal envelope.

17. An apparatus for encoding an audio signal envelope, comprising:

an audio signal envelope interface (210) for receiving the audio signal envelope, and

a splitting point determiner (220) for determining, depending on a predefined assignment rule, a signal envelope portion value for at least one audio signal envelope portion of two or more audio signal envelope portions for each of at least two splitting point configurations, wherein each of the at least two splitting point configurations comprises one or more splitting points, wherein the one or more splitting points of each of the two or more splitting point configurations divide the audio signal envelope into the two or more audio signal envelope portions, and

wherein the splitting point determiner ~~(220)~~ is configured to select the one or more splitting points of one of the at least two splitting point configurations as one or more selected splitting points to encode the audio signal envelope, wherein the splitting point determiner ~~(220)~~ is configured to select the one or more splitting points depending on the signal envelope portion value of each of the at least one audio signal envelope portion of the two or more audio signal envelope portions of each of the at least two splitting point configurations.

18. An apparatus according to claim 17, wherein the signal envelope portion value of each signal envelope portion of the two or more signal envelope portions depends on one or more energy values or one or more power values of said signal envelope portion, or wherein the signal envelope portion value of each signal envelope portion of the two or more signal envelope portions depends on any other value suitable for reconstructing an original or a targeted level of the audio signal envelope.

19. An apparatus according to claim 17 or 18,

wherein the apparatus further comprises a splitting points encoder ~~(225)~~ for encoding a position of each of the one or more splitting points to obtain one or more encoded points,

wherein the splitting points encoder ~~(225)~~ is configured to encode a position of each of the one or more splitting points by encoding a splitting points state number, and

wherein the splitting points encoder ~~(225)~~ is configured to provide a total positions number indicating a total number of possible splitting point positions, and a splitting points number indicating the number of the one or more splitting points,

wherein the splitting points state number, the total positions number and the splitting points number together indicate the position of each of the one or more splitting points.

20. An apparatus according to one of claims 17 to 19, wherein the apparatus further comprises an energy determiner ~~(230)~~ for determining a total energy of the audio signal envelope and for encoding the total energy of the audio signal envelope, or wherein the apparatus is furthermore configured to determine any other value

suitable for reconstructing an original or a targeted level of the audio signal envelope.

21. An apparatus for encoding an audio signal, comprising:

an apparatus ~~(1410)~~ for encoding according to one of claims 17 to 20 for encoding an audio signal envelope of the audio signal, and

a secondary signal characteristic encoder ~~(1420)~~ for encoding a further signal characteristic of the audio signal, the further signal characteristic being different from the audio signal envelope.

22. A method for decoding to obtain a reconstructed audio signal envelope, comprising:

generating the reconstructed audio signal envelope depending on one or more splitting points, and

outputting the reconstructed audio signal envelope,

wherein generating the reconstructed audio signal envelope is conducted such that the one or more splitting points divide the reconstructed audio signal envelope into two or more audio signal envelope portions, wherein a predefined assignment rule defines a signal envelope portion value for each signal envelope portion of the two or more signal envelope portions depending on said signal envelope portion, and

wherein generating the reconstructed audio signal envelope is conducted such that, for each of the two or more signal envelope portions, an absolute value of its signal envelope portion value is greater than half of an absolute value of the signal envelope portion value of each of the other signal envelope portions.

23. A method for decoding to obtain a reconstructed audio signal envelope, comprising:

generating the reconstructed audio signal envelope depending on one or more splitting points, and

outputting the reconstructed audio signal envelope,

wherein generating the reconstructed audio signal envelope is conducted such that the one or more splitting points divide the reconstructed audio signal envelope into two or more audio signal envelope portions, wherein a predefined assignment rule defines a signal envelope portion value for each signal envelope portion of the two or more signal envelope portions depending on said signal envelope portion, and

wherein a predefined envelope portion value is assigned to each of the two or more signal envelope portions, and

wherein generating the reconstructed audio signal envelope is conducted such that, for each signal envelope portion of the two or more signal envelope portions, an absolute value of the signal envelope portion value of said signal envelope portion is greater than 90 % of an absolute value of the predefined envelope portion value being assigned to said signal envelope portion, and such that the absolute value of the signal envelope portion value of said signal envelope portion is smaller than 110 % of the absolute value of the predefined envelope portion value being assigned to said signal envelope portion.

24. A method for encoding an audio signal envelope, comprising:

receiving the audio signal envelope,

determining, depending on a predefined assignment rule, a signal envelope portion value for at least one audio signal envelope portion of two or more audio signal envelope portions for each of at least two splitting point configurations, wherein each of the at least two splitting point configurations comprises one or more splitting points, wherein the one or more splitting points of each of the two or more splitting point configurations divide the audio signal envelope into the two or more audio signal envelope portions, and

selecting the one or more splitting points of one of the at least two splitting point configurations as one or more selected splitting points to encode the audio signal envelope, wherein selecting the one or more splitting points is conducted depending on the signal envelope portion value of each of the at least one audio signal envelope portion of the two or more audio signal envelope portions of each of the at least two splitting point configurations.

25. A computer program for implementing the method of one of claims 22 to 24 when being executed on a computer or signal processor.