CLAIMS

1. A signal encoding method, comprising:

predicting a comfort noise according to a currently-input frame assuming that the currently-input frame is encoded into a silence descriptor, SID, frame, wherein an encoding manner of a previous frame of the currently-input frame is a continuous encoding manner, the currently-input frame is a silence frame, and a comfort noise feature parameter of the comfort noise is predicted according to hangover frame feature parameters of L hangover frames preceding the currently-input frame and a current frame feature parameter of the currently-input frame, and L comprises a positive integer;

determining an actual silence signal, wherein an actual silence signal feature parameter of the actual silence signal is determined according to statistics of feature parameters of M silence frames, the M silence frames comprises the currently-input frame and (M–1) silence frames preceding the currently-input frame, and M comprises a positive integer;

determining a deviation degree between the comfort noise and the actual silence signal;

determining an encoding manner according to the deviation degree, wherein the encoding manner comprises a hangover frame encoding manner or an SID frame encoding manner; and

encoding the currently-input frame according to the encoding manner when the encoding manner is the hangover frame encoding manner.

2. The method according to claim 1, wherein the predicting a comfort noise according to the currently-input frame in a case in which the currently-input frame is encoded into an SID frame, and determining an actual silence signal comprises:

predicting a feature parameter of the comfort noise, and determining a feature parameter of the actual silence signal, wherein the feature parameter of the comfort noise is in a one-to-one correspondence to the feature parameter of the actual silence signal; and

the determining a deviation degree between the comfort noise and the actual silence signal comprises:

determining a distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal,

and wherein the determining an encoding manner according to the deviation degree comprises:

determining, in a case in which the distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal is less than a corresponding threshold in a threshold set, that the encoding manner is the SID frame encoding manner, wherein the distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal is in a one-to-one correspondence to the threshold in the threshold set; and

determining, in a case in which the distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal is greater than or equal to the corresponding threshold in the threshold set, that the encoding manner is the hangover frame encoding manner,

wherein the feature parameter of the comfort noise comprises code excited linear prediction, CELP, excitation energy of the comfort noise and a line spectral frequency, LSF, coefficient of the comfort noise, and the feature parameter of the actual silence signal comprises CELP excitation energy of the actual silence signal and an LSF coefficient of the actual silence signal; and

the determining a distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal comprises:

determining a distance De between the CELP excitation energy of the comfort noise and the CELP excitation energy of the actual silence signal, and determining a distance Dlsf between the LSF coefficient of the comfort noise and the LSF coefficient of the actual silence signal.

3. The method according to claim 2, wherein the determining, in a case in which the distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal is less than a corresponding threshold in a threshold set, that the encoding manner is the SID frame encoding manner comprises:

in a case in which the distance De is less than a first threshold and the distance Dlsf is less than a second threshold, determining that the encoding manner is the SID frame encoding manner; and

the determining, in a case in which the distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal is greater than or equal to the corresponding threshold in the threshold set, that the encoding manner is the hangover frame encoding manner comprises:

in a case in which the distance De is greater than or equal to the first threshold or the distance Dlsf is greater than or equal to the second threshold, determining that the encoding manner is the hangover frame encoding manner.

4. The method according to claim 3, further comprising:

acquiring the preset first threshold and the preset second threshold; or

determining the first threshold according to CELP excitation energy of N silence frames preceding the currently-input frame, and determining the second threshold according to LSF coefficients of the N silence frames, wherein N is a positive integer.

5. The method according to claim 1, wherein the predicting a comfort noise according to the currently-input frame in a case in which the currently-input frame is encoded into an SID frame comprises:

predicting the comfort noise in a first prediction manner, wherein the first prediction manner is

the same as a manner in which a decoder generates the comfort noise.

6. A signal encoding device, comprising:

a first determining unit, configured to: predict a comfort noise according to a currently-input frame assuming that the currently-input frame is encoded into a silence descriptor, SID, frame, wherein an encoding manner of a previous frame of the currently-input frame is a continuous encoding manner, the currently-input frame is a silence frame, and a comfort noise feature parameter of the comfort noise is predicted according to hangover frame feature parameters of L hangover frames preceding the currently-input frame and a current frame feature parameter of the currently-input frame, and L comprises a positive integer and determine an actual silence signal, wherein an actual silence signal feature parameter of the actual silence signal is determined according to statistics of feature parameters of M silence frames, the M silence frames comprises the currently-input frame and (M–1) silence frames preceding the currently-input frame, and M comprises a positive integer;

a second determining unit, configured to determine a deviation degree between the comfort noise determined by the first determining unit and the actual silence signal determined by the first determining unit;

a third determining unit, configured to determine an encoding manner according to the deviation degree determined by the second determining unit, wherein the encoding manner comprises a hangover frame encoding manner or an SID frame encoding manner; and

an encoding unit, configured to encode the currently-input frame according to the encoding manner determined by the third determining unit when the encoding manner is the hangover frame encoding manner.

7. The device according to claim 6, wherein the first determining unit is specifically configured to predict a feature parameter of the comfort noise, and determine a feature parameter of the actual silence signal, wherein the feature parameter of the comfort noise is in a one-to-one correspondence to the feature parameter of the actual silence signal; and

the second determining unit is specifically configured to determine a distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal.

8. The device according to claim 7, wherein the third determining unit is specifically configured to: in a case in which the distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal is less than a corresponding threshold in a threshold set, determine that the encoding manner is the SID frame encoding manner, wherein the distance between the feature parameter of the comfort noise and the feature parameter of the actual silence signal is in a one-to-one correspondence to the threshold in the threshold set; and in a case in which the distance between the feature parameter of the comfort noise and the feature parameter of the actual silence

signal is greater than or equal to the corresponding threshold in the threshold set, determine that the encoding manner is the hangover frame encoding manner.

9. The device according to claim 7 or 8, wherein the first determining unit is specifically configured to: predict the feature parameter of the comfort noise according to a comfort noise parameter of the previous frame of the currently-input frame and a feature parameter of the currently-input frame.

10. The device according to any one of claims 7 to 9, wherein the first determining unit is specifically configured to: determine that the feature parameter of the currently-input frame is the feature parameter of the actual silence signal.

11. The device according to claim 8, wherein the feature parameter of the comfort noise comprises code excited linear prediction, CELP, excitation energy of the comfort noise and a line spectral frequency, LSF, coefficient of the comfort noise, and the feature parameter of the actual silence signal comprises CELP excitation energy of the actual silence signal and an LSF coefficient of the actual silence signal; and

the second determining unit is specifically configured to determine a distance De between the CELP excitation energy of the comfort noise and the CELP excitation energy of the actual silence signal, and determine a distance Dlsf between the LSF coefficient of the comfort noise and the LSF coefficient of the actual silence signal.

12. The device according to claim 11, wherein the third determining unit is specifically configured to: in a case in which the distance De is less than a first threshold and the distance Dlsf is less than a second threshold, determine that the encoding manner is the SID frame encoding manner; and

the third determining unit is specifically configured to: in a case in which the distance De is greater than or equal to the first threshold or the distance Dlsf is greater than or equal to the second threshold, determine that the encoding manner is the hangover frame encoding manner.

13. The device according to claim 12, further comprising:

a fourth determining unit, configured to: acquire the preset first threshold and the preset second threshold; or determine the first threshold according to CELP excitation energy of N silence frames preceding the currently-input frame, and determine the second threshold according to LSF coefficients of the N silence frames, wherein N is a positive integer.

14. The device according to any one of claims 6 to 13, wherein the first determining unit is specifically configured to predict the comfort noise in a first prediction manner, wherein the first prediction manner is the same as a manner in which a decoder generates the comfort noise.