

Claims

1. An apparatus ~~(100)~~ for generating two or more audio output channels from three or more audio input channels, wherein the apparatus ~~(100)~~ comprises:

a receiving interface ~~(110)~~ for receiving the three or more audio input channels and for receiving side information, and

a downmixer ~~(120)~~ for downmixing the three or more audio input channels depending on the side information using a weight for each audio input channel to obtain the two or more audio output channels,

wherein the number of the audio output channels is smaller than the number of the audio input channels,

wherein the side information indicates a characteristic of at least one of the three or more audio input channels, or a characteristic of one or more sound waves recorded within the one or more audio input channels, or a characteristic of one or more sound sources which emitted one or more sound waves recorded within the one or more audio input channels, and

wherein the downmixer is configured to determine the weight for each audio input channel depending on the side information,

wherein the apparatus ~~(100)~~ is configured to feed each of the two or more audio output channels into a loudspeaker of a group of two or more loudspeakers,

wherein the downmixer ~~(120)~~ is configured to downmix the three or more audio input channels depending on each assumed loudspeaker position of a first group of three or more assumed loudspeaker positions and depending on each actual loudspeaker position of a second group of two or more actual loudspeaker positions to obtain the two or more audio output channels,

wherein each actual loudspeaker position of the second group of two or more actual loudspeaker positions indicates a position of a loudspeaker of the group of two or more loudspeakers,

wherein each audio input channel of the three or more audio input channels is assigned to an assumed loudspeaker position of the first group of three or more assumed loudspeaker positions,

5 wherein each audio output channel of the two or more audio output channels is assigned to an actual loudspeaker position of the second group of two or more actual loudspeaker positions,

10 wherein the downmixer ~~(120)~~ is configured to generate each audio output channel of the two or more audio output channels depending on at least two of the three or more audio input channels, depending on the assumed loudspeaker position of each of said at least two of the three or more audio input channels and depending on the actual loudspeaker position of said audio output channel,

15 wherein the side information comprises an amount of ambience of each of the three or more audio input channels, and

20 wherein the downmixer ~~(120)~~ is configured to downmix the three or more audio input channels depending on the amount of ambience of each of the three or more audio input channels to obtain the two or more audio output channels.

2. An apparatus ~~(100)~~ according to claim 1, wherein the downmixer ~~(120)~~ is configured to generate each audio output channel of the two or more audio output channels by modifying at least two audio input channels of the three or more audio input channels depending on the side information to obtain a group of modified audio channels, and by combining each modified audio channel of said group of modified audio channels to obtain said audio output channel.

3. An apparatus ~~(100)~~ according to claim 2, wherein the downmixer ~~(120)~~ is configured to generate each audio output channel of the two or more audio output channels by modifying each audio input channel of the three or more audio input channels depending on the side information to obtain the group of modified audio channels, and by combining each modified audio channel of said group of modified audio channels to obtain said audio output channel.

4. An apparatus ~~(100)~~ according to claim 2 or 3, wherein the downmixer ~~(120)~~ is configured to generate each audio output channel of the two or more audio output channels by generating each modified audio channel of the group of modified

audio channels by determining a weight depending on an audio input channel of the one or more audio input channels and depending on the side information and by applying said weight on said audio input channel.

5 | 5. An apparatus ~~(100)~~ according to one of the preceding claims,

wherein the side information indicates a diffuseness of each of the three or more audio input channels or a directivity of each of the three or more audio input channels, and

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wherein the downmixer ~~(120)~~ is configured to downmix the three or more audio input channels depending on the diffuseness of each of the three or more audio input channels or depending on the directivity of each of the three or more audio input channels to obtain the two or more audio output channels.

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6. An apparatus ~~(100)~~ according to one of the preceding claims,

wherein the side information indicates a direction of arrival of the sound, and

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wherein the downmixer ~~(120)~~ is configured to downmix the three or more audio input channels depending on the direction of arrival of the sound to obtain the two or more audio output channels.

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7. An apparatus ~~(100)~~ according to one of the preceding claims, wherein the downmixer ~~(120)~~ is configured to downmix four or more audio input channels depending on the side information to obtain three or more audio output channels.

8. A system comprising:

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an encoder ~~(810)~~ for encoding three or more unprocessed audio channels to obtain three or more encoded audio channels, and for encoding additional information on the three or more unprocessed audio channels to obtain side information, and

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an apparatus ~~(100)~~ according to one of the preceding claims for receiving the three or more encoded audio channels as three or more audio input channels, for receiving the side information, and for generating, depending on the side