

[DESCRIPTION]

[Title of Invention] CONFERENCE SYSTEM

[Technical Field]

[0001]

5 The present invention relates to a conference system.

[Background Art]

[0002]

10 Conventionally, a masking device is known which outputs
masking sound to the sound (voice) of a speaker. As an example of
this type of conventional technique, Patent Literature (PTL) 1
discloses a masking device which includes a sound input unit which
receives the sound of a speaker as an input sound, and a sound output
controller which processes the input sound received by the sound
input unit to generate masking sound determined by an output sound
15 determiner, and performs control so that the generated masking
sound is output.

[Citation List]

[Patent Literature]

[0003]

20 [PTL 1] Japanese Patent No. 4336552

[Summary of Invention]

[Technical Problem]

[0004]

25 When a teleconference is held in an open space, it is difficult
for a person who participates in the teleconference from a remote
location to understand the surroundings of the space. Hence, the
remote participant is likely to casually say something including
confidential information, resulting in leakage of the confidential
information. On the other hand, the person who participates in the
30 teleconference from the remote location is unable to efficiently
participate in the discussion if what the remote participant says is
restricted so as not to leak confidential information, which leads to
an inefficient teleconference.

[0005]

35 In view of the above, the present invention provides a

conference system which makes it difficult for confidential information to leak, and allows a teleconference to proceed efficiently.

[Solution to Problem]

[0006]

5 A conference system according to one aspect of the present invention includes: a first loudspeaker device which outputs a masking sound for masking a sound in a teleconference to make the sound less audible to a person who is not participating in the teleconference; a conference device which is used to hold the
10 teleconference; a second loudspeaker device which outputs a sound of an other party of the teleconference; an obtaining device which obtains at least one of conference information or presence information, the conference information relating to the teleconference, the presence information indicating whether or not a person who is not
15 participating in the teleconference is present at a predetermined place; and a control device which controls the first loudspeaker device based on the at least one of the conference information or the presence information.

[Advantageous Effects of Invention]

20 [0007]

The conference system according to the present invention is capable of making it difficult for confidential information to leak and allows a teleconference to proceed efficiently.

[Brief Description of Drawings]

25 [0008]

[FIG. 1]

FIG. 1 illustrates a conference system according to an embodiment.

[FIG. 2]

30 FIG. 2 is a block diagram illustrating a functional configuration of the conference system of FIG. 1.

[FIG. 3]

FIG. 3 is a flowchart illustrating operation example 1 of the conference system of FIG. 1.

35 [FIG. 4]

FIG. 4 is a flowchart illustrating operation example 2 of the conference system of FIG. 1.

[FIG. 5]

FIG. 5 is a flowchart illustrating operation example 3 of the conference system of FIG. 1.

[FIG. 6]

FIG. 6 is a flowchart illustrating operation example 4 of the conference system of FIG. 1.

[FIG. 7]

FIG. 7 is a flowchart illustrating operation example 5 of the conference system of FIG. 1.

[FIG. 8]

FIG. 8 is a flowchart illustrating operation example 6 of the conference system of FIG. 1.

[FIG. 9]

FIG. 9 illustrates a conference system according to another embodiment.

[FIG. 10]

FIG. 10 illustrates another example of a space where a teleconference is held.

[Description of Embodiment]

[0009]

Hereinafter, an embodiment will be specifically described with reference to the drawings.

[0010]

The embodiment described below shows a general or specific example. The numerical values, shapes, materials, structural elements, the arrangement and connection of the structural elements, steps, the processing order of the steps etc. shown in the following embodiment are mere examples, and therefore do not limit the present disclosure. Among the structural elements in the following embodiment, structural elements not recited in any one of the independent claims defining the most generic concept are described as arbitrary structural elements.

[0011]

Note that the Drawings are schematic drawings, and are not necessarily exact depictions. Moreover, the same structural elements share the same reference numerals in the Drawings.

[0012]

5 (Embodiment)

FIG. 1 illustrates conference system 10 according to an embodiment. Conference system 10 will be described with reference to FIG. 1.

[0013]

10 As illustrated in FIG. 1, conference system 10 is a conference system which is capable of preventing sound in a teleconference held in space 1 from being heard by a person (or persons) who is not participating in the teleconference. For example, space 1 where the teleconference is held is an open space inside a building. Conference
15 system 10 includes a plurality of pillar portions 12, a plurality of beam portions 14, desk 16, a plurality of chairs 18, a plurality of first loudspeaker devices 20, conference device 22, second loudspeaker device 24, obtaining device 26, and a plurality of second microphone devices 32.

20 [0014]

A plurality of pillar portions 12 are disposed around space 1. Each of beam portions 14 is disposed above space 1. Each of beam portions 14 has a duct rail (not illustrated). Desk 16 and a plurality of chairs 18 are disposed in space 1.

25 [0015]

Each of first loudspeaker devices 20 outputs masking sound for masking the sound in the teleconference to make the sound less audible to a person who is not participating in the teleconference. For example, a teleconference is a conference held between a person
30 (persons) in space 1 and a person (persons) in a place remote from space 1. Moreover, for example, the sound in the teleconference is the sound of the persons who are participating in the teleconference, and includes the sound of a person who is in space 1 when the teleconference is held in space 1 and the sound output from second
35 loudspeaker device 24. Moreover, for example, a person who is not

participating in the teleconference is a person outside space 1. Moreover, for example, the masking sound is white noise or environmental sound in the city.

[0016]

5 The masking sound output from each of first loudspeaker devices 20 further masks the sound generated outside space 1 to make the sound less audible to a person (persons) who is participating in the teleconference. For example, the person who is participating in the teleconference is the person in space 1.

10 [0017]

 Each of first loudspeaker devices 20 is a directional loudspeaker device. Each of first loudspeaker devices 20 is attached to beam portion 14, and outputs masking sound toward the outside of space 1. For example, each of first loudspeaker devices 20 outputs
15 masking sound to a place in the vicinity of the boundary between space 1 and the space outside space 1.

[0018]

 Note that, for example, conference system 10 may include one first loudspeaker device 20 instead of a plurality of first loudspeaker
20 devices 20. The masking sound does not have to mask the sound generated outside space 1 to make the sound less audible to a person who is participating in the teleconference. Moreover, first loudspeaker device 20 does not have to be a directional loudspeaker device. In this case, the masking sound can be output over a wide
25 range in the outside of space 1. Moreover, first loudspeaker device 20 does not have to be attached to beam portion 14, but may be attached to pillar portion 12, the ceiling, floor, or the like.

[0019]

 Conference device 22 is a conference device that is used to hold
30 a teleconference. Conference device 22 is provided on desk 16 in space 1. For example, conference device 22 is a terminal device such as a personal computer on which a teleconference software is installed. Note that conference device 22 does not have to be provided on desk 16.

35 [0020]

Second loudspeaker device 24 outputs the sound of the other party in the teleconference. For example, the other party in the teleconference is a person who is having a teleconference with a person in space 1 from a location remote from space 1.

5 [0021]

Second loudspeaker device 24 is a directional loudspeaker. Second loudspeaker device 24 is slidably attached to the duct rail (not illustrated) of beam portion 14, and outputs sound downward. For example, second loudspeaker device 24 is positioned above a person
10 who is participating in the teleconference in space 1.

[0022]

For example, a sound absorbing material (not illustrated) may be disposed at a location where the sound output from second loudspeaker device 24 is reflected. For example, the location is the
15 floor. With this, it is possible to prevent the sound output from second loudspeaker device 24 from being reflected in space 1 and leaking to the outside of space 1.

[0023]

For example, conference system 10 may include a plurality of
20 second loudspeaker devices 24. Second loudspeaker device 24 does not have to be a directional loudspeaker device. Second loudspeaker device 24 does not have to be attached to beam portion 14, but may be provided on desk 16, or may be attached to the ceiling, floor, or the like.

25 [0024]

Obtaining device 26 is an obtaining device which obtains at least one of conference information relating to a teleconference and presence information indicating whether or not a person who is not participating in the teleconference is present at a predetermined place.
30 In this embodiment, obtaining device 26 is a device which obtains both the conference information and the presence information. Obtaining device 26 includes first microphone device 28 and a plurality of sensor devices 30.

[0025]

35 For example, the conference information includes sound

information relating to the sound input to first microphone device 28, information indicating participants in the teleconference, and information indicating the level of confidentiality of the teleconference. Moreover, for example, the sound information includes information indicating the sound pressure of the sound input to first microphone device 28, information indicating the frequency of the sound input to first microphone device 28, and information indicating words included in the sound input to first microphone device 28. Moreover, for example, the information indicating the participants of the teleconference and the information indicating the level of confidentiality of the teleconference are determined in advance by a person who holds the teleconference.

[0026]

Moreover, for example, the predetermined place is a place where the sound in the teleconference can be easily heard, specifically, a place around space 1. For example, the presence information includes detection information obtained by each of sensor devices 30. The detection information is information indicating the detection result obtained by sensor device 30.

[0027]

First microphone device 28 is a first microphone device to which the sound in the teleconference is input. First microphone device 28 is provided on desk 16 in space 1.

[0028]

Each of sensor devices 30 detects a person who is present at a predetermined place and who is not participating in the teleconference. Each of sensor devices 30 is attached to beam portion 14. For example, each of sensor devices 30 is a motion sensor device, an infrared sensor device, an ultrasonic sensor device, or a visible light sensor device.

[0029]

For example, obtaining device 26 may include a plurality of first microphone devices 28, or may include one sensor device 30 instead of a plurality of sensor devices 30. For example, obtaining device 26 may include a camera which captures an image of a predetermined

place. In this case, the presence information includes imaging information captured by the camera.

[0030]

For example, first microphone device 28 does not have to be provided on desk 16, but may be a wearable microphone device worn by a person who is participating in the teleconference. Sensor device 30 does not have to be attached to beam portion 14, but may be attached to column portion 12, the ceiling, floor, or the like.

[0031]

Each of second microphone devices 32 is a second microphone device to which sound generated outside space 1 where the teleconference is held is input. For example, the sound is environmental sound, and includes background music and the voice of a person who is not participating in the teleconference. Each of second microphone devices 32 is attached to pillar portion 12.

[0032]

For example, conference system 10 may include one second microphone device 32 instead of a plurality of second microphone devices 32. Second microphone device 32 does not have to be attached to pillar portion 12, but may be attached to beam portion 14, the ceiling, floor, or the like.

[0033]

FIG. 2 is a block diagram illustrating a functional configuration of conference system 10 illustrated in FIG. 1. The functional configuration of conference system 10 will be described with reference to FIG. 2.

[0034]

As illustrated in FIG. 2, conference system 10 further includes player device 34 and control device 36.

[0035]

Player device 34 reproduces the sound source in which masking sound is stored, and transmits a sound signal for outputting the masking sound to first loudspeaker device 20. First loudspeaker device 20 outputs masking sound based on the sound signal transmitted from player device 34.

[0036]

Control device 36 controls first loudspeaker device 20 based on at least one of the conference information or the presence information.

[0037]

5 For example, control device 36 controls first loudspeaker device 20 based on the sound information included in the conference information. The details of the control of control device 36 based on the sound information will be described later. For example, control device 36 controls first loudspeaker device 20 based on the
10 information, which indicates the participants of the teleconference, included in the conference information. Specifically, for example, when a predetermined person is included in the participants of the teleconference, control device 36 increases the volume of the masking sound in the teleconference compared to a predetermined volume.
15 Moreover, for example, control device 36 controls first loudspeaker device 20 based on information indicating the level of confidentiality of the teleconference included in the conference information. Specifically, for example, when the level of confidentiality of the teleconference is higher than a predetermined level, control device
20 36 increases the volume of the masking sound in the teleconference compared to a predetermined volume.

[0038]

 Moreover, for example, control device 36 controls first loudspeaker device 20 based on the detection information included in
25 the presence information. The details of the control of control device 36 based on the detection information will be described later. Moreover, for example, when obtaining device 26 includes the camera described above, control device 36 controls first loudspeaker device 20 based on the imaging information included in the presence
30 information. Specifically, for example, when the camera has detected a person who is not participating in the teleconference, control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to when the camera has not detected a person who is not participating in the teleconference.

35 [0039]

Moreover, for example, control device 36 controls first loudspeaker device 20 based on both the conference information and the presence information. For example, when a person is present at a predetermined place and the person is not participating in a teleconference with a confidentiality level that is higher than a predetermined confidentiality level, control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to the volume of the masking sound when a person is present at a predetermined place and the person is not participating in a teleconference with a confidentiality level that is lower than the predetermined confidentiality level.

[0040]

For example, control device 36 is realized by a processor.

[0041]

FIG. 3 is a flowchart illustrating operation example 1 of conference system 10 illustrated in FIG. 1. Operation example 1 of conference system 10 will be described with reference to FIG. 3.

[0042]

As illustrated in FIG. 3, when a teleconference starts, control device 36 obtains, from first microphone device 28, information indicating the sound pressure of the sound input to first microphone device 28 (step S1).

[0043]

When obtaining the information, control device 36 determines whether or not the sound pressure of the sound input to first microphone device 28 is higher than a predetermined threshold (step S2). For example, the predetermined threshold is determined in advance.

[0044]

In the case where the sound pressure of the sound input to first microphone device 28 is higher than the predetermined threshold (Yes in step S2), control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to when the sound pressure is lower than or equal to the predetermined threshold (step S3). In this way, when the sound pressure of the sound input

to first microphone device 28 is higher than the predetermined threshold, control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to when the sound pressure is lower than or equal to the predetermined threshold.

5 [0045]

In the case where the sound pressure of the sound input to first microphone device 28 is not higher than the predetermined threshold (No in step S2), control device 36 causes first loudspeaker device 20 to decrease the volume of the masking sound compared to when the sound pressure is higher than the predetermined threshold (step S4). In this way, when the sound pressure of the sound input to first microphone device 28 is not higher than the predetermined threshold, control device 36 causes first loudspeaker device 20 to decrease the volume of the masking sound compared to when the sound pressure is higher than the predetermined threshold.

15

[0046]

For example, control device 36 causes first loudspeaker device 20 to set the volume of the masking sound to be 0 dB when the sound pressure is lower than or equal to the predetermined threshold, and set the volume of the masking sound to be 20 dB only when the sound pressure is higher than the predetermined threshold.

20

[0047]

FIG. 4 is a flowchart illustrating operation example 2 of conference system 10 of FIG. 1. Operation example 2 of conference system 10 will be described with reference to FIG. 4.

25

[0048]

As illustrated in FIG. 4, when a teleconference starts, control device 36 obtains, from first microphone device 28, information indicating the frequency of the sound input to first microphone device 28 (step S11).

30

[0049]

When obtaining the information, control device 36 causes first loudspeaker device 20 to change the frequency of the masking sound according to the frequency of the sound input to first microphone device 28 (step S12).

35

[0050]

For example, control device 36 causes first loudspeaker device 20 to change the frequency of the masking sound according to a change in frequency of the sound input to first microphone device 28 such that the masking sound having a frequency that is identical to the frequency of the sound input to first microphone device 28 is output. For example, control device 36 causes first loudspeaker device 20 to change the frequency of the masking sound according to a change in frequency of the sound input to first microphone device 28 such that the masking sound having a frequency that is lower than the frequency of the sound input to first microphone device 28 is output.

[0051]

FIG. 5 is a flowchart illustrating operation example 3 of conference system 10 of FIG. 1. Operation example 3 of conference system 10 will be described with reference to FIG. 5.

[0052]

As illustrated in FIG. 5, when a teleconference starts, control device 36 obtains, from first microphone device 28, information indicating the frequency of the sound input to first microphone device 28, and obtains, from second microphone device 32, information indicating the frequency of the sound input to second microphone device 32 (step S21).

[0053]

When obtaining the information described above, control device 36 causes first loudspeaker device 20 to change the frequency of the masking sound according to the frequency of the sound input to first microphone device 28 and the frequency of the sound input to second microphone device 32 (step S22).

[0054]

For example, when the frequency of the sound input to first microphone device 28 is higher than the frequency of the sound input to second microphone device 32, control device 36 causes first loudspeaker device 20 to output masking sound having a frequency that is identical to the frequency of the sound input to second

microphone device 32. Moreover, for example, when the frequency of the sound input to first microphone device 28 is lower than the frequency of the sound input to second microphone device 32, control device 36 causes first loudspeaker device 20 to set the sum of the frequency of the sound input to second microphone device 32 and the frequency of the masking sound to be lower than or equal to the frequency of the sound input to first microphone device 28. Moreover, for example, control device 36 outputs masking sound having a frequency lower than the frequency of the sound input to first microphone device 28 and the frequency of the sound input to second microphone device 32. Accordingly, the masking sound is capable of masking the sound generated outside space 1 to make the sound less audible to a person who is participating in the teleconference in space 1.

[0055]

FIG. 6 is a flowchart illustrating operation example 4 of conference system 10 of FIG. 1. Operation example 4 of conference system 10 will be described with reference to FIG. 6.

[0056]

As illustrated in FIG. 6, when a teleconference starts, control device 36 obtains, from first microphone device 28, information indicating words included in the sound input to first microphone device 28 (step S31).

[0057]

When obtaining the information, control device 36 determines whether or not a predetermined word is included in the sound input to first microphone device 28 (step S32). For example, the predetermined word is a word determined in advance.

[0058]

When the sound input to first microphone device 28 includes a predetermined word (Yes in step S32), control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound (step S33). For example, control device 36 causes first loudspeaker device 20 to output masking sound with a volume higher than the volume of the masking sound at the time of the determination (step

S32).

[0059]

When the sound input to first microphone device 28 does not include the predetermined word (No in step S32), control device 36 causes first loudspeaker device 20 to maintain the volume of the masking sound (step S34). For example, control device 36 causes first loudspeaker device 20 to output masking sound having a volume that is identical to the volume of the masking sound at the time of the determination (step S32).

[0060]

FIG. 7 is a flowchart illustrating operation example 5 of conference system 10 of FIG. 1. Operation example 5 of conference system 10 will be described with reference to FIG. 7.

[0061]

As illustrated in FIG. 7, when a teleconference starts, control device 36 obtains, from first microphone device 28, information indicating the frequency of the sound input to first microphone device 28 and information indicating words included in the sound input to first microphone device 28 (step S41).

[0062]

When obtaining the information described above, control device 36 infers the speaker (step S42) and determines whether or not a predetermined speaker is speaking (step S43). For example, control device 36 obtains in advance the frequency of the sound obtained when a predetermined speaker says something including a predetermined word, and infers the speaker by comparing the frequency obtained in advance and the frequency of the sound input to first microphone device 28.

[0063]

In the case where the predetermined speaker is speaking (Yes in step S43), control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to when the predetermined speaker is not speaking (step S44). In this way, when the predetermined speaker is speaking, control device 36 causes first loudspeaker device 20 to increase the volume of the

masking sound compared to when the predetermined speaker is not speaking.

[0064]

In the case where the predetermined speaker is not speaking
5 (No in step S43), control device 36 causes first loudspeaker device
20 to decrease the volume of the masking sound compared to when
the predetermined speaker is speaking (step S45). In this way, when
the predetermined speaker is not speaking, control device 36 causes
first loudspeaker device 20 to decrease the volume of the masking
10 sound compared to when the predetermined speaker is speaking.

[0065]

For example, control device 36 causes first loudspeaker device
20 to set the volume of the masking sound to be 0 dB when the
predetermined speaker is not speaking, and set the volume of the
15 masking sound to be 20 dB only when the predetermined speaker is
speaking.

[0066]

FIG. 8 is a flowchart illustrating operation example 6 of
conference system 10 of FIG. 1. Operation example 6 of conference
20 system 10 will be described with reference to FIG. 8.

[0067]

As illustrated in FIG. 8, when a teleconference starts, control
device 36 obtains detection information from sensor device 30 (step
S51).

25 [0068]

When control device 36 obtains the detection information,
control device 36 determines whether or not sensor device 30 has
detected a person who is not participating in the teleconference (step
S52).

30 [0069]

In the case where sensor device 30 has detected a person who
is not participating in the teleconference (Yes in step S52), control
device 36 causes first loudspeaker device 20 to increase the volume
of the masking sound compared to when sensor device 30 has not
35 detected a person who is not participating in the teleconference (step

S53). In this way, when sensor device 30 has detected a person who is not participating in the teleconference, control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to when sensor device 30 has not detected a person who is not participating in the teleconference.

[0070]

In the case where sensor device 30 has not detected a person who is not participating in the teleconference (No in step S52), control device 36 causes first loudspeaker device 20 to decrease the volume of the masking sound compared to when sensor device 30 has detected a person who is not participating in the teleconference (step S54). In this way, when sensor device 30 has not detected a person who is not participating in the teleconference, control device 36 causes first loudspeaker device 20 to decrease the volume of the masking sound compared to when sensor device 30 has detected a person who is not participating in the teleconference.

[0071]

For example, control device 36 causes first loudspeaker device 20 to set the volume of the masking sound to be 0 dB when sensor device 30 has not detected a person who is not participating in the teleconference, and to set the volume of the masking sound to be 20 dB only when sensor device 30 has detected a person who is not participating in the teleconference.

[0072]

Conference system 10 according to the embodiment has been described above.

[0073]

Conference system 10 according to the embodiment includes: first loudspeaker device 20 which outputs masking sound for masking sound in a teleconference to be less audible to a person who is not participating in the teleconference; conference device 22 which is used to hold the teleconference; second loudspeaker device 24 which outputs sound of the other party in the teleconference; obtaining device 26 which obtains at least one of conference information relating to the teleconference and presence information indicating

whether or not a person who is not participating in the teleconference is present at a predetermined place; and control device 36 which controls first loudspeaker device 20 based on the at least one of the conference information or the presence information.

5 [0074]

With this, since first loudspeaker device 20 which outputs the masking sound is controlled based on at least one of the conference information or the presence information, it is possible to prevent the sound in the teleconference from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it difficult for confidential information that is kept secret to a person other than the person who is participating in the teleconference to leak, and to proceed with the teleconference efficiently.

[0075]

15 Moreover, in conference system 10 according to the embodiment, obtaining device 26 includes first microphone device 28 to which the sound in the teleconference is input, the conference information includes sound information relating to the sound input to first microphone device 28, and control device 36 controls first loudspeaker device 20 based on the sound information.

[0076]

This facilitates an appropriate output of the masking sound according to the sound in the teleconference, so it is possible to further prevent the sound in the teleconference from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it more difficult for confidential information to leak, and to proceed with the teleconference more efficiently.

[0077]

Moreover, in conference system 10 according to the embodiment, the sound information includes information indicating the sound pressure of the sound input to first microphone device 28, and when the sound pressure is higher than a predetermined threshold, control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to when the sound pressure is lower than or equal to the predetermined threshold.

[0078]

With this, the volume of the masking sound can be easily increased only when the sound in the teleconference increases. Hence, while preventing the masking sound from interfering with the teleconference, it is possible to further prevent the sound in the teleconference from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it more difficult for confidential information to leak, and to proceed with the teleconference more efficiently.

10 [0079]

Moreover, in conference system 10 according to the embodiment, the sound information includes information indicating the frequency of the sound input to first microphone device 28, and control device 36 causes first loudspeaker device 20 to change the frequency of the masking sound according to the frequency of the sound indicated by the information.

[0080]

This facilitates an output of the masking sound having a frequency that can easily mask the sound in the teleconference, so that it is possible to further prevent the sound in the teleconference from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it more difficult for confidential information to leak, and to proceed with the teleconference more efficiently.

25 [0081]

Moreover, in conference system 10 according to the embodiment, obtaining device 26 further includes second microphone device 32 to which sound generated outside space 1 where the teleconference is held is input, and control device 36 causes first loudspeaker device 20 to change the frequency of the masking sound according to the frequency of the sound input to first microphone device 28 and the frequency of the sound input to second microphone device 32.

[0082]

35 With this, taking into consideration the frequency of the sound

generated outside space 1 facilitates an output of the masking sound with a frequency that can easily mask the sound in the teleconference. Hence, it is possible to further prevent the sound in the teleconference from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it more difficult for confidential information to leak, and to proceed with the teleconference more efficiently.

[0083]

Moreover, in conference system 10 according to the embodiment, the sound information includes information indicating words included in the sound input to first microphone device 28, and control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound when the sound input to first microphone device 28 includes a predetermined word.

[0084]

With this, the volume of the masking sound can be easily increased only when the sound in the teleconference includes confidential information. Hence, while preventing the masking sound from interfering with the teleconference, it is possible to further prevent the sound in the teleconference from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it more difficult for confidential information to leak, and to proceed with the teleconference more efficiently.

[0085]

Moreover, in conference system 10 according to the embodiment, the sound information includes information indicating the frequency of the sound input to first microphone device 28 and information indicating words included in the sound input to first microphone device 28. Control device 36 infers the speaker based on the information indicating the frequency of the sound input to first microphone device 28 and the information indicating words included in the sound input to first microphone device 28. When the predetermined speaker is speaking, control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to when the predetermined speaker is not speaking.

[0086]

With this, the volume of the masking sound can be easily increased only when a person, who is likely to say something including confidential information, is speaking. Hence, while preventing the masking sound from interfering with the teleconference, it is possible to further prevent the sound in the teleconference from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it more difficult for confidential information to leak, and to proceed with the teleconference more efficiently.

[0087]

Moreover, in conference system 10 according to the embodiment, obtaining device 26 includes sensor device 30 which detects a person who is present at a predetermined place and who is not participating in the teleconference. The presence information includes detection information obtained by sensor device 30. When sensor device 30 has detected a person who is not participating in the teleconference, control device 36 causes first loudspeaker device 20 to increase the volume of the masking sound compared to when sensor device 30 has not detected a person who is not participating in the teleconference.

[0088]

With this, the volume of the masking sound can be easily increased only when a person who is not participating in the teleconference is present at a place where the sound in the teleconference can be easily heard. Hence, while preventing the masking sound from interfering with the teleconference, it is possible to further prevent the sound in the teleconference from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it more difficult for confidential information to leak, and to proceed with the teleconference more efficiently.

[0089]

Moreover, in conference system 10 according to the embodiment, first loudspeaker device 20 and second loudspeaker

device 24 are directional loudspeakers.

[0090]

With this, while preventing the masking sound from interfering with the teleconference, it is possible to further prevent the sound of the other party in the teleconference output from second loudspeaker device 24 from being heard by a person who is not participating in the teleconference. As a result, it is possible to make it more difficult for confidential information to leak, and to proceed with the teleconference more efficiently.

[0091]

Moreover, in conference system 10 according to the embodiment, the masking sound further masks the sound generated outside space 1 to be less audible to a person who is participating in the conference.

[0092]

With this, it is possible to prevent the sound generated outside space 1 from being heard by a person who is participating in the teleconference. Hence, it is possible to prevent the sound generated outside space 1 from interfering with the teleconference, and to proceed with the teleconference more efficiently.

[0093]

(Other Embodiments)

Although the embodiment has been described above, the present invention is not limited to the above embodiment.

[0094]

FIG. 9 illustrates conference system 10a according to another embodiment. As illustrated in FIG. 9, conference system 10a includes first loudspeaker device 20a that is different from first loudspeaker device 20. First loudspeaker device 20a includes sound absorbing material 38 at the center, and is configured so that the sound output from first loudspeaker device 20a spreads downward in a ring (doughnut) shape (see dashed lines in FIG. 9). With this, while preventing the masking sound from being heard by a person who is participating in the teleconference, it is possible to prevent the sound in the teleconference from being heard by a person who is not

participating in the teleconference. Hence, it is possible to make it more difficult for confidential information to leak and to proceed with the teleconference more efficiently.

[0095]

5 Although the case has been described in the above embodiment where space 1 where the teleconference is held is open space 1 inside the building, the present disclosure is not limited to such an example. FIG. 10 illustrates another example of a space where a teleconference is held. For example, as illustrated in FIG. 10, the space where the
10 teleconference is held may be open space 2 inside a vehicle such as a bullet train. In this case, for example, a first loudspeaker device, which outputs masking sound for masking the sound in the teleconference to make the sound less audible to a person who is not participating in the teleconference, is disposed between the seats.
15 Moreover, for example, the space where the teleconference is held may be an outdoor open space.

[0096]

 Moreover, a person who is participating in the teleconference may adjust the volume or the like of the masking sound by using a
20 volume controller or the like.

[0097]

 Moreover, in the above embodiment, the conference system is realized by a plurality of devices, but may be realized as a single device. For example, the conference system may be realized as a
25 single device corresponding to the control device or the first loudspeaker device. When the conference system is realized by a plurality of devices, the structural elements (in particular, functional structural elements) included in the conference system may be distributed to the plurality of devices in any manner.

30 [0098]

 Moreover, the information transmission path in the above embodiment is an example, and is not particularly limited. In the above embodiment, when two devices transmit and receive information via communications, a relay device (not illustrated) may
35 be present between the two devices.

[0099]

Moreover, in the above embodiment, the processes executed by a specific processor may be executed by another processor. Moreover, the order of the processes may be changed, and the
5 processes may be executed in parallel.

[0100]

Moreover, in the above embodiment, each structural element may be realized by executing a software program suitable for each structural element. Each of the structural elements may be realized
10 by means of a program executing unit, such as a CPU or a processor, reading and executing the software program recorded on a recording medium such as a hard disk or a semiconductor memory.

[0101]

Each structural element may be realized by hardware. For
15 example, each structural element may be realized by a circuit (or integrated circuit). These circuits may form one circuit as a whole, or may be separate circuits. These circuits may be general-purpose circuits or dedicated circuits.

[0102]

20 The general and specific aspects of the present invention may be realized using a system, a device, a method, an integrated circuit, a computer program, or a computer-readable recording medium such as a CD-ROM. Moreover, the general or specific aspects of the present invention may be realized in any combination of systems,
25 devices, methods, integrated circuits, computer programs and recording media.

[0103]

For example, the present invention may be realized as a method executed by a computer such as a conference system, or as
30 a program for causing a computer to execute such a method. The present invention may be realized as a non-transitory computer-readable recording medium in which such a program is recorded.

[0104]

In addition, a form obtained by making various modifications
35 conceivable by those skilled in the art to the embodiment, and a form

realized by arbitrarily combining the structural elements and functions in the embodiment without departing from the gist of the present disclosure are also included in the present invention.

[Reference Signs List]

5	[0105]	
	10,10a	conference system
	20,20a	first loudspeaker device
	22	conference device
	24	second loudspeaker device
10	26	obtaining device
	28	first microphone device
	30	sensor device
	32	second microphone device
	36	control device
15		

[CLAIMS]

[Claim 1]

A conference system comprising:

5 a first loudspeaker device which outputs a masking sound for masking a sound in a teleconference to make the sound less audible to a person who is not participating in the teleconference;

a conference device which is used to hold the teleconference;

a second loudspeaker device which outputs a sound of an other party of the teleconference;

10 an obtaining device which obtains at least one of conference information or presence information, the conference information relating to the teleconference, the presence information indicating whether or not a person who is not participating in the teleconference is present at a predetermined place; and

15 a control device which controls the first loudspeaker device based on the at least one of the conference information or the presence information.

[Claim 2]

20 The conference system according to claim 1, wherein the obtaining device includes a first microphone device to which the sound in the teleconference is input,

the conference information includes sound information relating to the sound input to the first microphone device, and

25 the control device controls the first loudspeaker device based on the sound information.

[Claim 3]

The conference system according to claim 2,

30 wherein the sound information includes information indicating a sound pressure of the sound input to the first microphone device, and

when the sound pressure is higher than a predetermined threshold, the control device causes the first loudspeaker device to
35 increase a volume of the masking sound compared to when the sound

pressure is lower than or equal to the predetermined threshold.

[Claim 4]

The conference system according to claim 2 or claim 3,
5 wherein the sound information includes information indicating
a frequency of the sound input to the first microphone device, and
the control device causes the first loudspeaker device to change
a frequency of the masking sound according to the frequency of the
sound input to the first microphone device.

10

[Claim 5]

The conference system according to claim 4, further comprising
a second microphone device to which a sound generated
outside a space where the teleconference is held is input,
15 wherein the control device causes the first loudspeaker device
to change the frequency of the masking sound according to the
frequency of the sound input to the first microphone device and a
frequency of the sound input to the second microphone device.

20 [Claim 6]

The conference system according to any one of claims 2 to 5,
wherein the sound information includes information indicating
a word included in the sound input to the first microphone device, and
the control device causes the first loudspeaker device to
25 increase the volume of the masking sound when the sound input to
the first microphone device includes a predetermined word.

[Claim 7]

The conference system according to any one of claims 2 to 6,
30 wherein the sound information includes information indicating
a frequency of the sound input to the first microphone device and
information indicating a word included in the sound input to the first
microphone device, and
the control device infers a speaker based on the information
35 indicating the frequency of the sound input to the first microphone

device and the information indicating the word included in the sound input to the first microphone device, and when a predetermined speaker is speaking, the control device causes the first loudspeaker device to increase a volume of the masking sound compared to when
5 the predetermined speaker is not speaking.

[Claim 8]

The conference system according to any one of claims 1 to 7,
wherein the obtaining device includes a sensor device which
10 detects a person who is present at the predetermined place and is not participating in the teleconference,
the presence information includes detection information obtained by the sensor device, and
when the sensor device has detected the person who is not
15 participating in the teleconference, the control device causes the first loudspeaker device to increase the volume of the masking sound compared to when the sensor device has not detected the person who is not participating in the teleconference.

20 [Claim 9]

The conference system according to any one of claims 1 to 8,
wherein the first loudspeaker device and the second loudspeaker device are directional loudspeaker devices.

25 [Claim 10]

The conference system according to any one of claims 1 to 9,
wherein the masking sound further masks a sound generated outside a space where the teleconference is held to make the sound less audible to a person who is participating in the teleconference.