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Hughes, II et al.

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(54) **DIPOLE AND MONOPOLE SURROUND SOUND SPEAKER SYSTEM**

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H04R 5/02 (2006.01)

(52) **U.S. Cl.** **381/304**; 381/335

(58) **Field of Classification Search** 381/300, 381/304, 310, 335–336, 332, 386, 160, 17, 381/28, 387; 181/145, 148, 155

See application file for complete search history.

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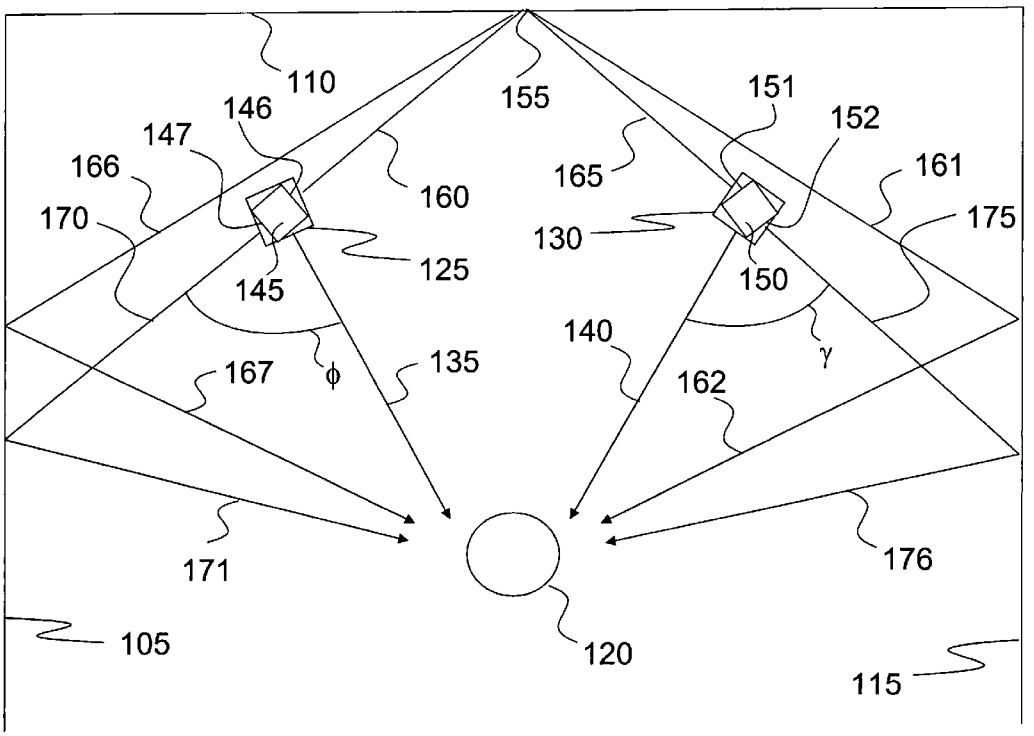
(57) **ABSTRACT**

A speaker system utilizes dipole speaker drivers in conjunction with monopole speaker drivers in a listening area to disperse a surround sound effect to a listener. The dipole speaker drivers are physically mounted on top of the front left and right speakers and are angled in a way that the surround information is delivered to the listener via wall/room reflections. By reflecting the sound off the walls, the system provides a delayed diffuse audio signal from the dipole speakers, enhancing the surround effect.

20 Claims, 7 Drawing Sheets



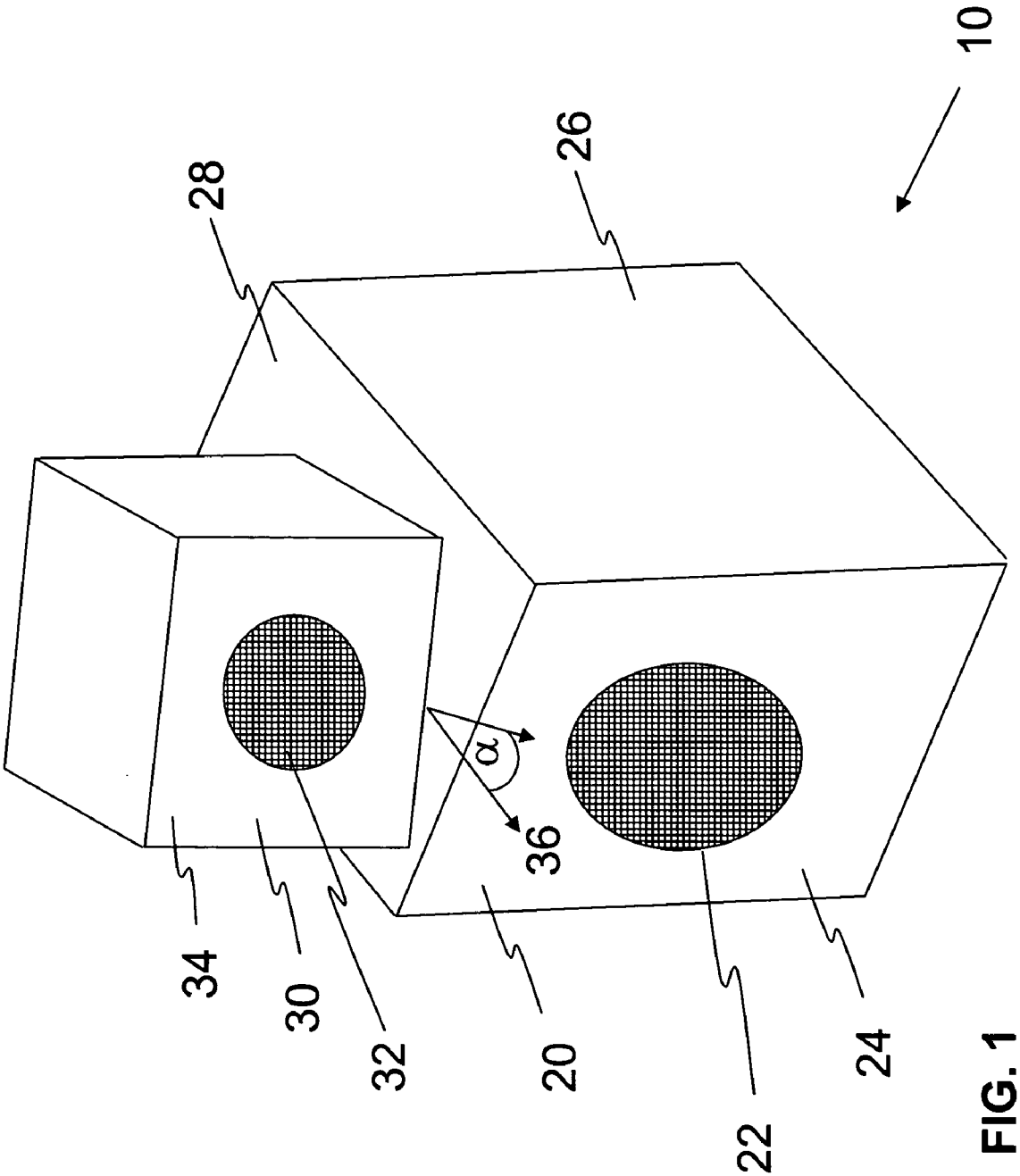


FIG. 1

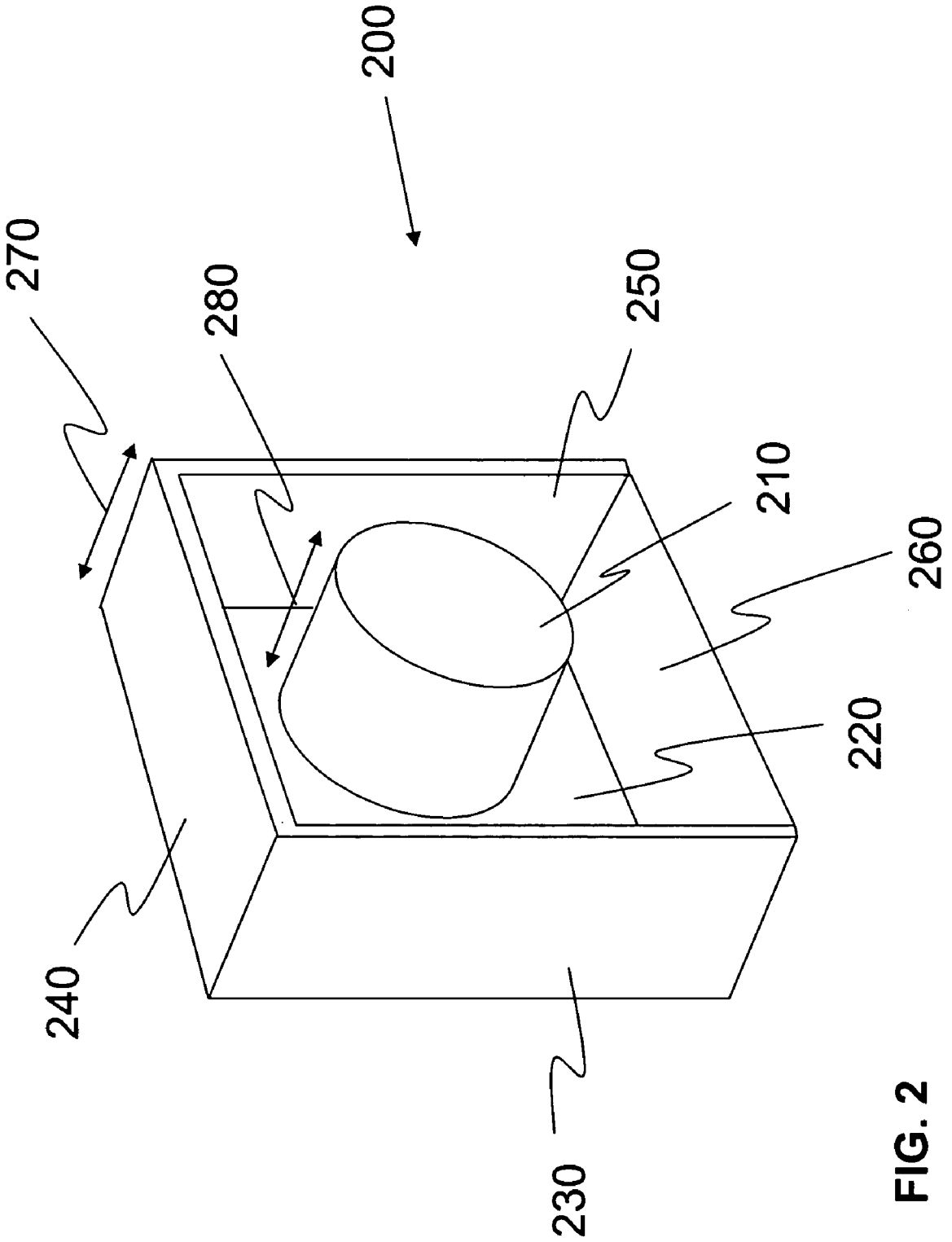


FIG. 2

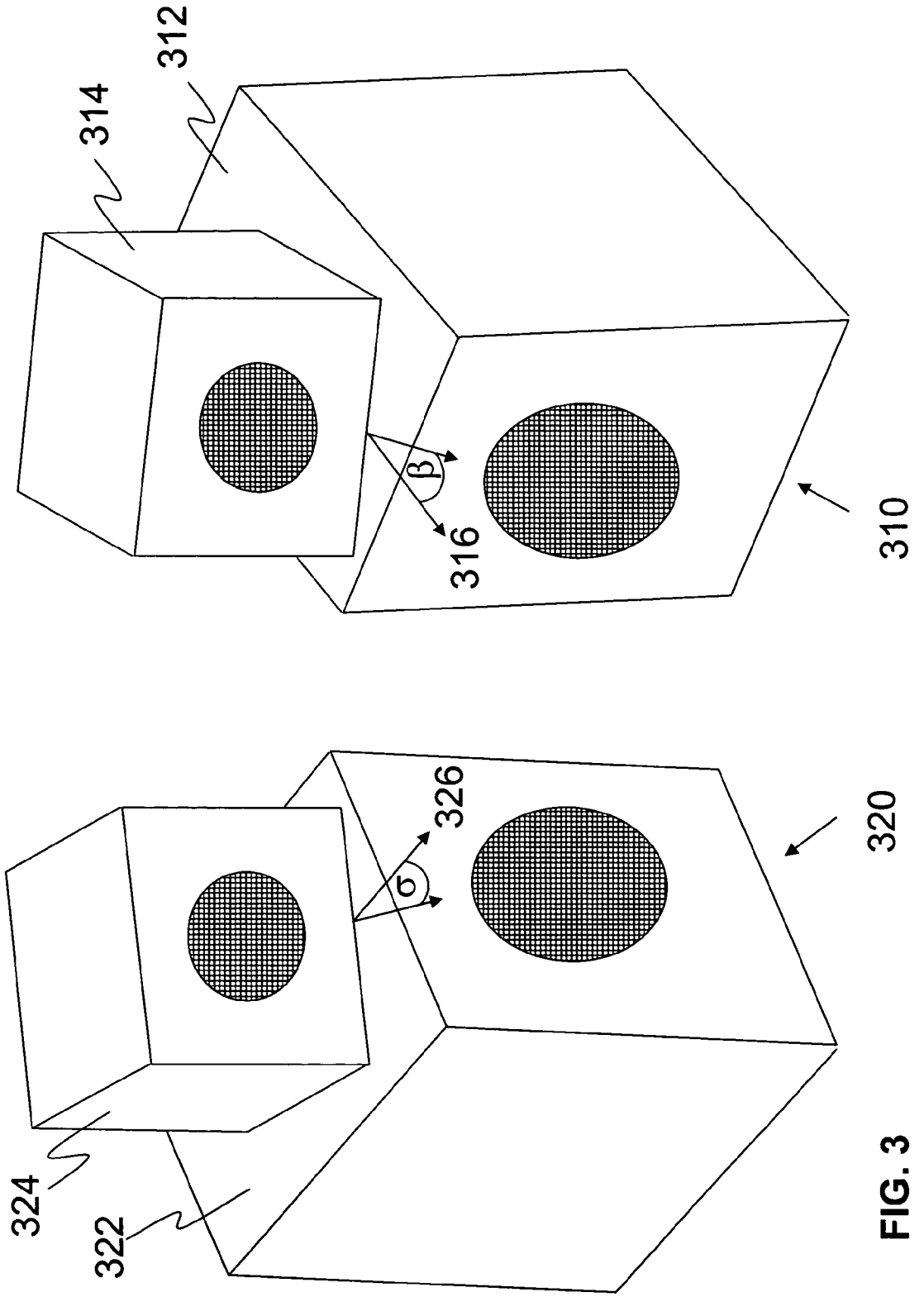


FIG. 3

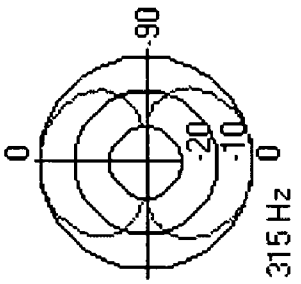


FIG. 4

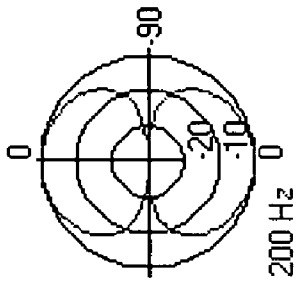


FIG. 5

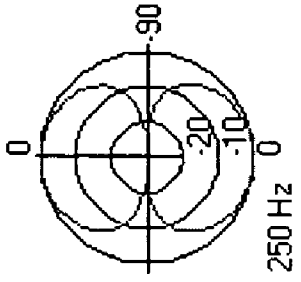


FIG. 6

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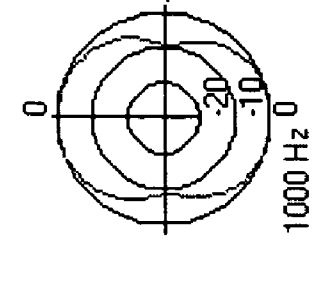

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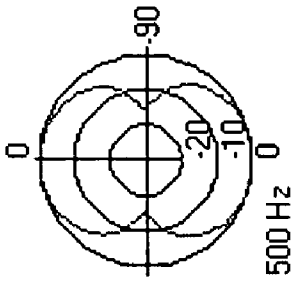


FIG. 9

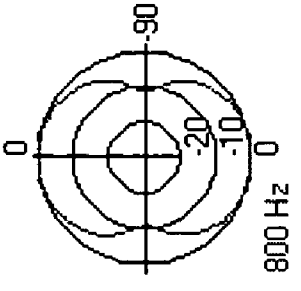


FIG. 10

FIG. 11

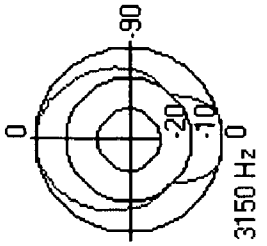


FIG. 12

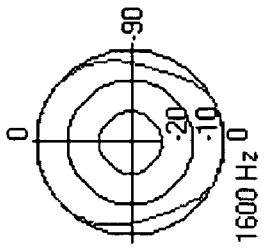


FIG. 13

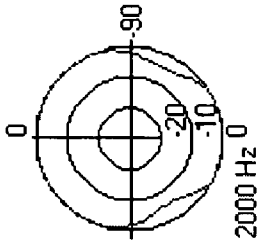
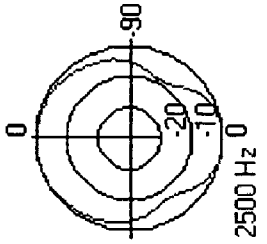


FIG. 14



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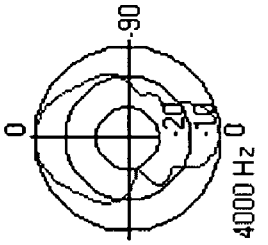

FIG. 17

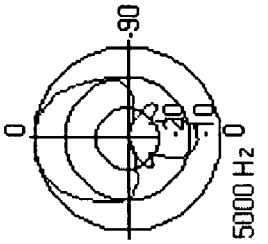

FIG. 18

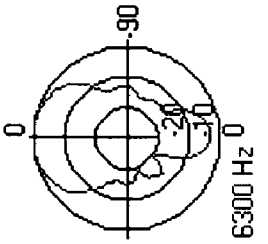

FIG. 19

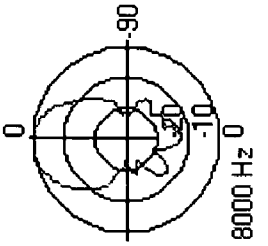

FIG. 20

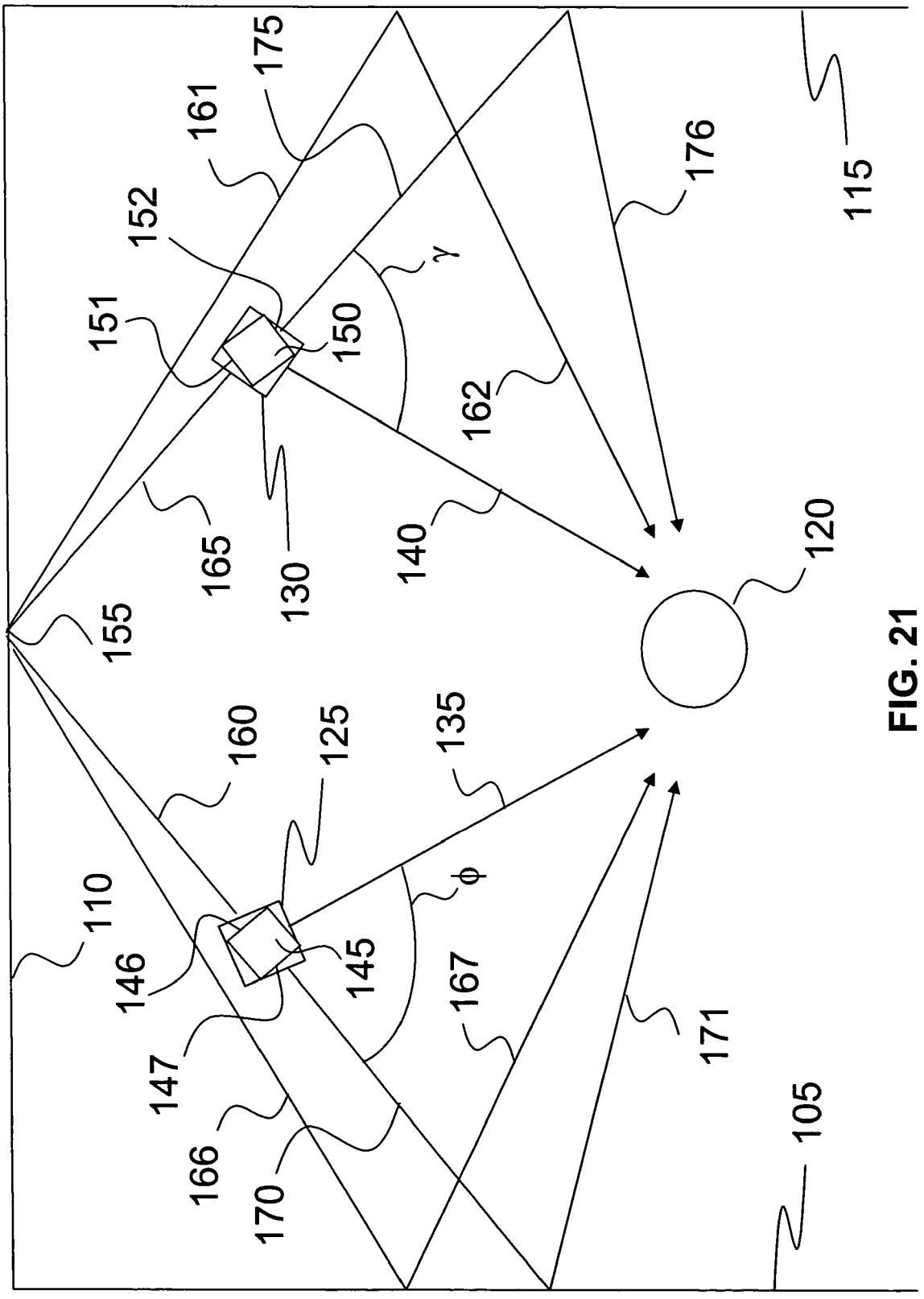
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FIG. 21

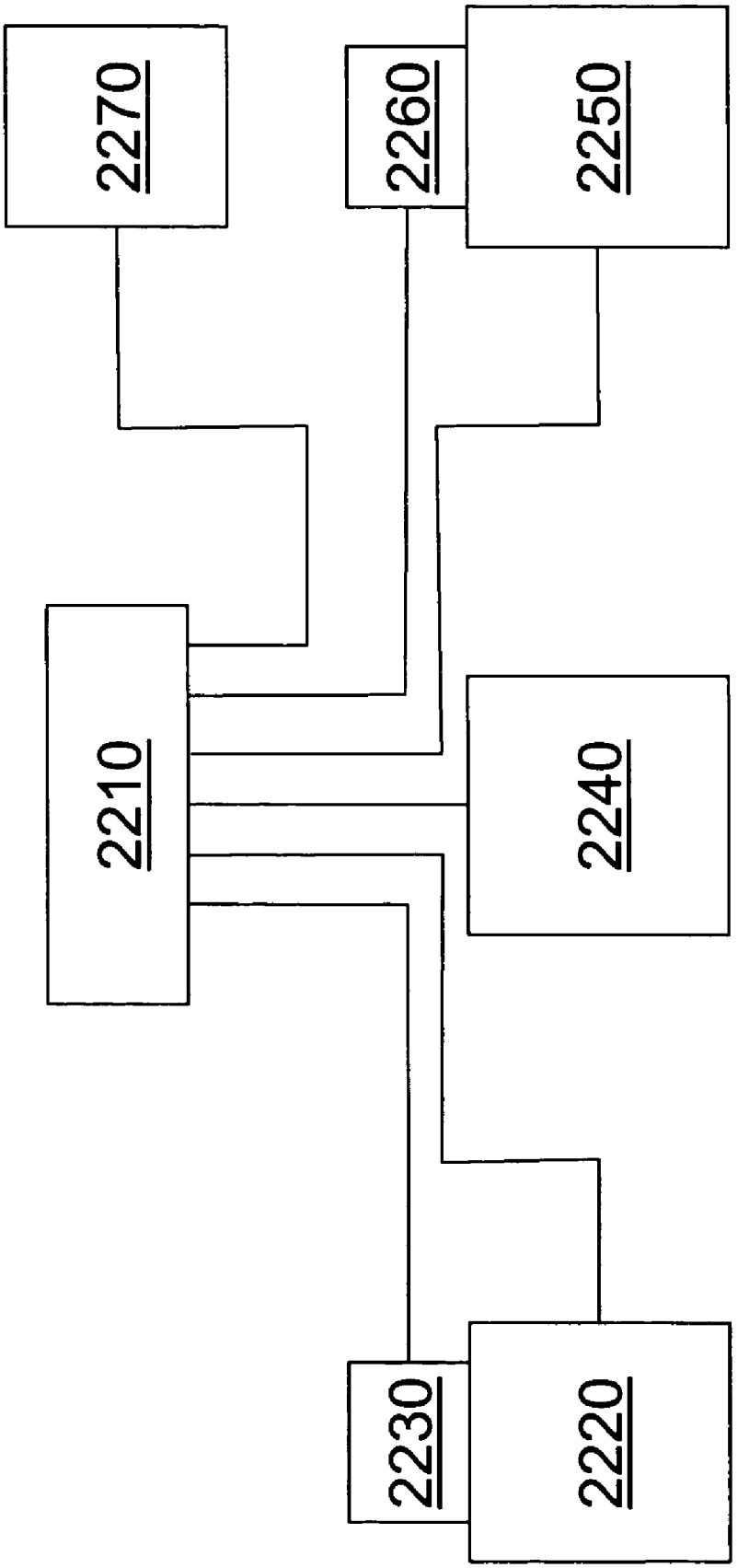

FIG. 22

DIPOLE AND MONOPOLE SURROUND SOUND SPEAKER SYSTEM

FIELD OF THE INVENTION

The present invention relates to the field of audio speakers used to provide sound from multiple directions to the listener.

BACKGROUND OF THE INVENTION

Audio systems often include at least two speakers positioned to the front left and right of a listener. In a conventional home theater setting, the two speakers are positioned to the left and right of a television screen. In a conventional desktop setting having a computer, the two speakers are positioned to the left and right of a computer screen. Optionally, bass units or subwoofers are added, which can deliver the lower frequency range and permit smaller speakers. The subwoofer can be placed at almost any location. An optional center speaker may be positioned directly in front of the listener, between the left and right speakers. A conventional audio system having left and right speakers and a subwoofer (known as a "2.1" configuration) and the optional center speaker (known as a "3.1" configuration) is compact, but does not provide surround sound to the listener.

One conventional approach to providing surround sound to the listener is to add rear speakers to the listening area, located behind or to the sides of the listener. The speakers form a circular, square or rectangular array with the listener at or near the center. A surround sound processor may incorporate positional encoding by means of specific phase differences and amplitude ratios to enhance the effect of spatially surrounding the listener. A five speaker arrangement with a subwoofer (known as a "5.1" configuration) provides a desired surround sound effect. It is desirable, however, to achieve a surround sound effect with a more compact configuration.

U.S. Pat. No. 5,109,416 to Croft discloses a dipole speaker for producing ambient sound in a multichannel sound reproduction system. Used in conjunction with direct path speakers connected to the audio system, the additional surround dipole speakers are placed in front of and behind the listener on the centerline of the listening setup. The radiation from the dipole speaker is such that one lobe of the sound pressure output is 180 degrees out of phase with the other so that they cancel each other out to produce a null zone aligned towards the listener. The sound pressure lobes are directed toward the walls so the acoustical signal of the dipole is reflected therefrom and arrives at the listener by an indirect path. The delayed indirect path of the signal from the dipole enhances the ambience of the effect of the dipole speaker. However, Croft does not achieve a compact design because a rear dipole speaker is required directly behind a listener. If the listener is using the Croft system with a computer on a desktop, the use of a rear dipole speaker may not be feasible.

One conventional system attempts to provide a system with a surround sound effect for use with a computer. U.S. Pat. No. 5,809,150 to Eberbach discloses a surround speaker system that utilizes skewed hypercardioid sound energy fields from right front and left front "surround" speakers with the principle nulls directed at the expected listener location. This

produces the effect of side wall and rear wall speakers in a home theater setting without actual side wall or rear wall speakers. The effect is enhanced by secondary nulls that are directed so as to reflect off the front wall of the room toward the expected listener location. Each surround speaker contains an antiphase driver and circuitry that powers the drivers to create the skewed hypercardioid sound energy field. However, Eberbach's hypercardioid sound energy fields do not produce a sufficient dispersion of sound. With a very tight pattern, hypercardioid speakers do not provide a wide distribution across the horizontal plane. As a result, the surround sound effect is minimized.

Conventional surround sound systems generally require rear speakers for proper production of a surround sound effect. It would be desirable, therefore, to have a system which is capable of producing such surround sound effect without speakers positioned in the rear of the listening area.

SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to a speaker system that substantially obviates one or more of the problems due to limitations and disadvantages of the related art. In particular, the present invention provides a surround sound effect without positioning speakers in the rear of the listening area. The conventional surround sound configuration having rear speakers is less desirable in a smaller listening area or where rear speakers cannot be properly positioned. It is desired to use a speaker configuration, e.g., a 2.1 or 3.1 configuration, that provides a 5.1 configuration surround sound effect without the use of rear speakers.

The present invention provides a surround sound effect to a home theater or other setting having speakers positioned only in front of the listener. The speaker arrangement can provide a 5.1 configuration surround sound effect with a 2.1 or 3.1 configuration in a reflective or reverberant space such as an office or living room. When the speaker system is used in conjunction with a center speaker and a subwoofer, the resultant 5.1 soundstage offers a more homogenous and cohesive effect when sounds are panned across the speakers as compared to a conventional 5.1 configuration where the sounds seem to appear in each speaker. The invention in its preferred embodiment provides a dipole/monopole combination in a speaker system which allows a more compact and user-friendly set up with fewer speaker units, less wiring, and less space required, while still providing a full 5.1 soundstage. This is useful in combination with a desktop or laptop computer as well as in a home theater that is placed in a normal listening space that has reflective surfaces.

The speaker system utilizes dipole speakers in conjunction with monopole speakers in a listening area to disperse a surround sound effect to a listener. In one embodiment, the dipole speakers are physically mounted on top of the front left and right speakers and are angled in a way that the surround information is delivered to the listener via wall/room reflections. The left and right information from the sealed enclosures are on a direct path to the listener's ears while the signals from the angled dipole speakers, which contain the surround information, are reflected off of the room boundary walls and eventually arrive at the listening position. This reflected signal path provides the time delay and diffusion that enhances the surround effect even though the sealed and dipole speakers are in a coincident position.

In one embodiment, a speaker system has one speaker unit to front left and one speaker unit to the front right of a listener. The speaker unit comprises a monopole driver directed at the listener's location and a dipole driver having an area of con-

sistently lower output directed in the general vicinity of the listener. The speaker system may also comprise a center speaker or subwoofer. The dipole driver is located above the monopole driver in each speaker unit. The direction of the dipole driver is rotated from the direction of the monopole driver, wherein the degree of rotation is related to the location of the area of consistently lower output of the dipole driver. The left dipole driver is preferably rotated 45 to 75 degrees left from the direction of the left monopole driver direction, and the right dipole driver is preferably rotated 45 to 75 degrees right from the direction of the right monopole driver direction. In an alternative embodiment, the dipole driver is rotated 60 to 70 degrees from the direction of the monopole driver. In another alternative embodiment, the dipole driver is rotated 68 degrees from the direction of the monopole driver. The dipole driver has a straight baffle. Alternatively, the dipole driver has a wrapped baffle. The depth of the baffle is substantially equal to depth of the dipole driver.

In another embodiment, a method for providing a surround sound effect comprises the steps of providing a room for listening to the surround sound effect; positioning a left monopole speaker to the front left of a listener in the room, wherein the left monopole speaker provides a signal directed at the listener; positioning a right monopole speaker to the front right of a listener in the room, wherein the right monopole speaker provides a signal directed at the listener; positioning a left dipole speaker to the front left of a listener in the room, wherein the left dipole speaker provides a signal having an area of consistently lower output directed at the listener and the signal reflecting off a wall in the room; and positioning a right dipole speaker to the front right of a listener in the room, wherein the right dipole speaker provides a signal having an area of consistently lower output directed at the listener and the signal reflecting off a wall in the room. The left dipole speaker is directed at an angle of 45 degrees to 75 degrees to the left of the left monopole speaker. The right dipole speaker is directed at an angle of 45 degrees to 75 degrees to the right of the right monopole speaker. A center speaker is positioned between the right monopole speaker and the left monopole speaker, wherein the center speaker is directed at the listener. The left and right dipole speakers have a straight baffle.

In yet another embodiment, a system for providing a surround sound effect to a listening area comprises a front left speaker having a left monopole driver and a left dipole driver, the left monopole driver being directed at a listening area and the left dipole driver rotated to the left of the left monopole driver such that the area of consistently lower output of the left dipole driver is directed towards the listening area; and a front right speaker having a right monopole driver and a right dipole driver, the right monopole driver being directed at a listening area and the right dipole driver rotated to the right of the right monopole driver such that the area of consistently lower output of the right dipole driver is directed towards the listening area. The left and right dipole drivers have a wrapped baffle that extends substantially the length of the dipole driver. In one embodiment, the left and right dipole drivers have a straight baffle.

Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent from the description, or may be learned by practice of the invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of at least one embodiment of the invention.

In the drawings:

FIG. **1** is a speaker unit according to an embodiment of the present invention.

FIG. **2** is rear view of a dipole speaker according to an embodiment of the present invention.

FIG. **3** shows left and right speaker units according to an embodiment of the present invention.

FIGS. **4** to **20** are polar plots of various multiple one-third octave spans for a dipole speaker according to an embodiment of the present invention.

FIG. **21** illustrates the direction of sound energy toward a listener according to an embodiment of the present invention.

FIG. **22** is a schematic diagram of the speaker system according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

The present invention provides a speaker system that allows for surround sound without the use of rear speakers. Although the exemplary embodiments do not discuss the use of the system in a particular setting, the system may be configured for use in a home, office, theater, vehicle, or other arena where a surround sound effect is desired. The system may be used for a home theater with a television or other means of viewing video. Similarly, the system may be used with a computer to achieve a surround sound effect at a desktop. A desktop application for the system may be two speakers, along with an optional subwoofer and center speaker. Alternatively, the system may be used to listen to audio, such as music, without a video feed.

The speaker system has at least two speaker units, each speaker having a monopole speaker and a dipole speaker. Optionally, the system may also include a center speaker and/or a subwoofer. Referring to FIG. **1**, an exemplary speaker unit **10** is shown. Speaker unit **10** is constructed of a monopole speaker **20** and a dipole speaker **30**.

Monopole speaker **20** has at least one driver **22** installed on a single face **24** of a speaker cabinet **26**. Cabinet **26** is directed towards a listener or listening area. Because cabinet **26** completely encloses driver **22**, the sound is emitted in only one direction. In a surround sound system, the front left, front right, and center speakers are typically monopole speakers due to their directional sound. In the present embodiment, the front left, front right, and optional center speaker all have at least one monopole speaker.

In order to complete a 5.1 configuration for surround sound, dipole speaker **30** is positioned atop monopole speaker **20**. In this exemplary embodiment, dipole speaker **30** is fixed to a top surface **28** of monopole speaker **20**. However, dipole speaker **30** may be alternatively positioned to the side or below monopole speaker **20**.

Dipole speaker **30** emits sound in opposite directions. With a wide dispersion of sound, dipole speaker **30** emits the sound in a controlled pattern, substantially covering the room with limited output in the direction of the listener. Dipole speaker **30** is able to create a more diffuse sound due to the structure of dipole speaker **30**. Unlike monopole speaker **20**, dipole speaker **30** is not completely enclosed in a cabinet.

Dipole speaker **30** has a driver **32** installed on a face **34**. In this exemplary embodiment, the driver **32** is substantially wrapped. However, the rear of the driver remains exposed.

In a first embodiment, the dipole speaker has a straight baffle. As compared to straight and wrapped baffle designs of varying sizes the straight baffle has the highest attenuation of low frequencies with little affect on higher frequencies. In an alternative embodiment using a wrapped baffle, the low frequency response improves with a small baffle but there is no appreciable low frequency extension with an increase in baffle size. However, frequencies related to the size of the frontal surface area of the baffle may be affected at various levels as the frontal surface area of the baffle changes. As the frontal surface area of the wrapped baffle grows larger, the attenuation is less and moves slightly lower in frequency. There is no attenuation in this range without the baffle.

In a preferred embodiment, the dipole speaker has a wrapped baffle. The wrapped baffle substantially covers the sides of the driver. As the frontal area of the baffle increases, the attenuation of frequencies between 1 kHz and 3 kHz becomes slightly higher. Additionally, the increase in the low frequency response as compared to the straight baffle is limited. Preferably, the wrapped baffle is as deep as the driver itself. This configuration yields the flattest response between 1 kHz and 20 kHz and matches the low frequency response of speakers incorporating larger baffles.

Referring to FIG. **2**, the rear side of a dipole speaker **200** is shown. A driver **210** is installed in a face **220** of dipole speaker **200** and housed within walls **230**, **240**, **250**, **260**. The rear of driver **210** remains exposed. In order to achieve desirable sound dispersion, walls **230**, **240**, **250**, **260** extend a length **270** substantially equal to a length **280** representing the depth of driver **210**. Also, wall **260** may be incorporated into the upper surface of a monopole speaker. The length of walls **230**, **240**, **250**, **260** may be varied. Length **270** may be greater or less than length **280**. In one embodiment of the present invention, driver **210** is in a wrapped baffle, having one wall in common with a monopole speaker. In yet another alternative embodiment, the rear of driver **210** is substantially covered by a screen, dust cover, or similar material known in the art that does not affect the sound emissions. Similarly, driver **210** may be substantially surrounded by side walls, exposing only the rear of driver **210** through the rear wall.

Dipole speaker **30** is positioned on top surface **28** of monopole speaker **20** at an angle α. Monopole speaker **20** is directed towards a listener or listening area and dipole speaker **30** is rotated at an angle α from a direction **36** of monopole speaker **20**. Angle α corresponds to an area of consistently lower output for dipole driver **32** and may vary depending on the driver and baffle configuration used in dipole speaker **30**.

The area of consistently lower output is generally the direction of radiation with decreased, but similar in level, audio output compared to the level on-axis over a range of frequencies. FIGS. **4** through **20** depict a series of polar plots of sound pressure level that illustrate a range of angles of consistently lower output for a dipole speaker between 45 degrees and 75 degrees. The concentric rings illustrate 10 dB intervals of pressure differential. The reference numbers to frequency in Hz refer to center frequencies for lower and upper octave bands that bound the frequency range of the test result. The polar plots range in frequency from 160 Hz to 8000 Hz and the angle of consistently lower output remains between 45 and 75 degrees.

The dipole speaker position is fixed such that an area of consistently lower output is directed in the general vicinity of the listener. In this embodiment, an angle of consistently lower output is between 45 and 75 degrees so angle α is between 45 and 75 degrees. In an exemplary embodiment, this angle is at 68 degrees. As a result, angle α is a rotation of 68 degrees from the monopole speaker position.

Both the left and right speaker units have a monopole speaker and a dipole speaker. In order to optimize the diffused sound emanating from the dipole speakers, the dipole speakers are rotated in different directions on the left and right speaker units. Referring to FIG. **3**, a right speaker unit **310** and a left speaker unit **320** are shown. Right speaker unit **310** has a monopole speaker **312** and a dipole speaker **314**. Left speaker unit **320** has a monopole speaker **322** and a dipole speaker **324**.

On right monopole speaker **312**, dipole speaker **314** is rotated left an angle β from a direction **316** of monopole speaker **312**. Conversely, on left monopole speaker **322**, dipole speaker **324** is rotated right an angle σ from a direction **326** of monopole speaker **322**.

Referring now to FIG. **21**, a listener **120** in a room utilizing the system of an embodiment of the present invention is shown. The room is shown with three walls **105**, **110**, **115** in a rectangular shape. However, walls **105**, **110**, **115** may be configured in a non-rectangular shape. A listener **120** is positioned substantially centered between wall **105** and wall **115**. Although referred to in the singular, listener **120** represents at least one person that is subjected to the surround sound effect according to the embodiment. For example, listener **120** may represent a person listening in a room of a house, a person sitting at desk having a computer, many people listening in a movie theater, or at least one passenger in an automobile. Additionally, listener **120** does not need to be positioned in the center of the room. Listener **120** may be located at any position in the room facing the speaker system of the present invention. The surround sound experience may even be enhanced if listener **120** is not centered, the speaker system of the present invention is not centered, or the room is not substantially symmetrical.

Listener **120** faces the speaker system of the present invention. The speaker system has a left monopole speaker **125** and a right monopole speaker **130** positioned to face listener **120**. The front face of monopole speaker **125**, **130** is directed substantially to listener **120** in a direction **135**, **140**. Due to the highly directional nature of a monopole speaker, sound emanates from monopole speakers **125**, **130** to listener **120** in direction **135**, **140**.

An optional center speaker, not shown, may be positioned between monopole speakers **125**, **130**. This optional center speaker may also be a monopole speaker. An optional subwoofer, not shown, may be positioned at substantially any location in the listening area.

A pair of dipole speakers **145**, **150** are positioned atop monopole speakers **125**, **130**. Dipole speakers **145**, **150** are rotated an angle ϕ, γ from direction **135**, **140**. Angle ϕ, γ corresponds to the area of consistently lower output of dipole speakers **145**, **150**. In order to direct the area of consistently lower output towards listener **120**, dipole speakers **145**, **150** are rotated by angle ϕ, γ. Left dipole speaker **145** is rotated by angle ϕ to the left and right dipole speaker **150** is rotated by

angle γ to the right. Alternatively, these angles need not be equivalent to accommodate for the properties of the room or the speakers.

Dipole speakers **145**, **150** emit sounds that reflect off walls of the room before reaching listener **120**. Because the sound reflects off the walls as opposed to the highly directed monopole speaker sounds, the reflected dipole speaker sounds arrive at listener **120** shortly after the monopole speaker sounds. The delay caused by the reflections enhances the surround sound effect. Rather than utilizing conventional rear speakers having a signal delay, the present invention has speakers positioned in front of the listener and takes advantage of the delay caused by reflected soundwaves.

The rotation of dipole speakers **145**, **150** allows the sounds to be emitted in two directions, such that each direction reflects off a different wall. Each dipole speakers **145**, **150** has a driver installed on a front side **147**, **152** and the back of the driver is exposed on a rear side **146**, **151**. Both the straight baffle and wrapped baffle design of the speakers allows for sound to be emitted in both the front and rear directions.

The front sides **147**, **152** of dipole speakers **145**, **150** emit sound in a first direction. Dipole speaker **145** emits sound in a direction **170** to wall **105**, which reflects the sound in a direction **171** to the left side of listener **120**. Dipole speaker **150** emits sound in a direction **175** to wall **115**, which reflects the sound in a direction **176** to the right side of listener **120**.

Dipole speaker **145**, located to the front left of listener **120**, also emits sound in a reverse direction on side **146** in the direction **160** to location **155** on wall **110**. The sound reflects in a direction **161** to wall **115**. The sound reflects from wall **115** in a direction **162** to the right side of listener **120**. Similarly, dipole speaker **150**, located to the front right of listener **120**, emits sound from the driver on side **151** in the direction **165** to location **155** on wall **105**. The sound reflects in a direction **166** to wall **105**. The sound reflects from wall **105** in a direction **167** to the left side of listener **120**.

Sound from the drivers in direction **160**, **165** does not need to be aimed directly at location **155**, but may be preferable in a symmetrical listening area where listener **120** is positioned at a center point between walls **105**, **115**. In a non-symmetrical setup, the delay of the reflected sounds may reach listener **120** at different times. However, this delay usually less than one second may serve to enhance the surround sound effect.

In operation, a user positions the speakers around the listening area to obtain a surround sound effect. A left speaker unit is positioned to the front left of the listener. A right speaker unit is positioned to the front right of the listener. An optional center speaker is positioned substantially directly in front of the listener. An optional subwoofer is positioned anywhere in the room.

A 5.1 configuration sound source may be used to provide a surround sound effect. Referring to FIG. **22**, a schematic diagram of the signal distribution is shown. A sound source **2210** supplies signals to the speakers. A separate signal is provided to each of a front left monopole speaker **2220**, front left dipole speaker **2230**, center speaker **2240**, front right monopole speaker **2250**, front right dipole speaker **2260**, and subwoofer **2270**. This signal distribution allows for a 5.1 configuration with only three speaker units and a subwoofer. Alternatively, a sound source that produces fewer signals may be utilized. For example, the sound source provides only left and right audio signals which are distributed to the appropriate speakers.

While the invention has been described in detail and with reference to specific embodiments thereof, it will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope thereof. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A speaker system having one speaker unit for use at the front left of a listener location and one speaker unit for use at the front right of the listener location, comprising:

a right speaker unit having a right monopole driver directed at the listener location and

a right dipole driver that consists of a single driver directed in a direction other than toward the listener location, said right dipole driver having a front output and a rear output directed in opposite directions toward at least two walls and reflected toward the listener location, said right dipole driver having an area of consistently lower output directed at the listener location; and,

a left speaker unit having a left monopole driver directed at the listener location and a left dipole driver directed in a direction other than toward the listener location, said left dipole driver having a front output and a rear output directed in opposite directions toward at least two walls and reflected toward the listener location, said left dipole driver having an area of consistently lower output directed at the listener location,

wherein said right dipole driver and said left dipole driver each consist of a single driver, the rear of said single driver being at least partially exposed,

wherein a first enclosure surrounds at least four sides of said right monopole driver, including a side to the rear of said right monopole driver, and a second enclosure surrounds at least four sides of said left monopole driver, including a side to the rear of said left monopole driver.

2. The speaker system of claim **1**, further comprising a center speaker.

3. The speaker system of claim **1**, further comprising a subwoofer.

4. The speaker system of claim **1**, wherein the left and right dipole drivers are located above the left and right monopole drivers, respectively.

5. The speaker system of claim **1**, wherein:

the direction of the left dipole driver is rotated with respect to the direction of the left monopole driver by a degree of rotation corresponding to the location of the area of consistently lower output of the left dipole driver; and,

the direction of the right dipole driver is rotated with respect to the direction of the right monopole driver by a degree of rotation corresponding to the location of the area of consistently lower output of the right dipole driver.

6. The speaker system of claim **5**, wherein the direction of the left dipole driver is rotated 45 to 75 degrees left from the direction of the left monopole driver, and the direction of the right dipole driver is rotated 45 to 75 degrees right from the direction of the right monopole driver.

7. The speaker system of claim **6**, wherein the direction of the left dipole driver is rotated 60 to 70 degrees left from the direction of the left monopole driver, and the direction of the right dipole driver is rotated 60 to 70 degrees right from the direction of the right monopole driver.

8. The speaker system of claim **7**, wherein the direction of the left dipole driver is rotated 68 degrees left from the direction of the left monopole driver, and the direction of the right dipole driver is rotated 68 degrees right from the direction of the right monopole driver.

9. The speaker system of claim 1, wherein each dipole driver comprises a straight baffle.

10. The speaker system of claim 1, wherein each dipole driver comprises a wrapped baffle.

11. The speaker system of claim 10, wherein the depth of each baffle is substantially equal to depth of the respective dipole driver.

12. A method for providing a surround sound effect, the method comprising the steps of:

positioning a left monopole speaker to the front left of a listener location in a room, wherein the left monopole speaker provides a first signal directed at the listener location;

positioning a right monopole speaker to the front right of the listener location in the room, wherein the right monopole speaker provides a second signal directed at the listener location;

positioning a left dipole speaker that consists of a single driver to the front left of the listener location in the room, wherein the left dipole speaker provides a third signal having an area of consistently lower output directed at the listener location;

directing the left dipole speaker in a direction other than toward the listener location, wherein the left dipole speaker provides a front output and a rear output directed in opposite directions toward at least two walls and reflected toward the listener location;

positioning a right dipole speaker that consists of a single driver to the front right of a listener location in the room, wherein the right dipole speaker provides a fourth signal having an area of consistently lower output directed at the listener location; and

directing the right dipole speaker in a direction other than toward the listener location, wherein the right dipole speaker provides a front output and a rear output directed in opposite directions toward at least two walls and reflected toward the listener location,

wherein said right dipole speaker and said left dipole speaker each consist of a single driver, the rear of said single driver being at least partially exposed,

wherein a first enclosure surrounds at least four sides of said right monopole speaker, including a rear side of said right monopole speaker, and a second enclosure surrounds at least four sides of said left monopole speaker, including a rear side of said left monopole speaker.

13. The method of claim 12, further comprising the step of directing the left dipole speaker at an angle of 45 degrees to 75 degrees to the left of the left monopole speaker.

14. The method of claim 12, further comprising the step of directing the right dipole speaker at an angle of 45 degrees to 75 degrees to the right of the right monopole speaker.

15. The method of claim 12, further comprising the step of positioning a center speaker between the right monopole speaker and the left monopole speaker, wherein the center speaker is directed at the listener location.

16. The method of claim 12, wherein the left and right dipole speakers comprise a straight baffle.

17. A system for providing a surround sound effect to a listening area, the system comprising:

a front left speaker having a left monopole driver and a left dipole driver that consists of a single driver, the left monopole driver being directed at the listening area and the left dipole driver rotated to the left of the left monopole driver such that the left dipole driver is directed in a direction other than toward the listener location, a front output and a rear output of the left dipole driver are directed in opposite directions toward at least two walls and reflected toward the listener location, and an area of consistently lower output of the left dipole driver is directed towards the listening area; and

a front right speaker having a right monopole driver and a right dipole driver that consists of a single driver, the right monopole driver being directed at a listening area and the right dipole driver rotated to the right of the right monopole driver such that the right dipole driver is directed in a direction other than toward the listener location, a front output and a rear output of the right dipole driver are directed in opposite directions toward at least two walls and reflected toward the listener location, and an area of consistently lower output of the right dipole driver is directed towards the listening area,

wherein said right dipole driver and said left dipole driver each consist of a single driver, the rear of said single driver being at least partially exposed,

wherein a first enclosure surrounds at least four sides of said right monopole driver, including a side to the rear of said right monopole driver, and a second enclosure surrounds at least four sides of said left monopole driver, including a side to the rear of said left monopole driver.

18. The system of claim 17, wherein the left and right dipole drivers each comprise a wrapped baffle.

19. The system of claim 18, wherein each wrapped baffle extends substantially the length of the dipole driver.

20. The system of claim 17, wherein the left and right dipole drivers each comprise a straight baffle.

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