comprises a vent **105** and generates the selective haptic excitation of a neck portion **103** of the user by generating a turbulent airflow **104** through the vent **105** in accordance with the audio signal **101** to be reproduced. Therefore, in addition to the audio perception of the ear **106**, the user can experience a haptic signal **104** being a tactile fingerprint of the audio data **101** on the naked skin of the neck **103**. By this synergetic perception of audio and tactile stimuli, particularly relatively small audio amplitudes in the bass range may be compensated at least partly, thereby allowing the user to have a better overall experience.

**[0074]** The ear **106** is used for detecting the acoustic waves **108**, and the tactile-sensitive neck **103** is used for experiencing or perceiving the turbulent air stream **104**. In order to increase the velocity of the air of the air stream **104**, it may also be possible that a ventilator or a pump or another air acceleration member (not shown) is provided in the device **100**.

**[0075]** It is also possible that only a bass part of the audio data **101** is taken as a basis for generating the tactile stimulus **104**, whereas treble and mid-frequency components may be not used for this purpose. Particularly in the bass regime, small devices may have problems of reproducing bass sound with sufficient amplitude, whereas this problem may be less pronounced in the higher frequency ranges.

**[0076]** Additional to or in stead of the audio data source, a visual data source (not depicted) may be provided. In such case a video signal to be reproduced by the device **100** may be transmitted to the control unit **109** for processing, where after the selected visual data may be reproduced on a screen (not depicted), such as a LCD screen or the like. The video signal may also be transmitted to the haptic excitation generation unit **102** for generating a selective haptic excitation of a portion of the user by generating a turbulent airflow through a vent, e.g. the vent **105**, in accordance with the video signal.

**[0077]** FIG. **2** is a diagram **200** illustrating a dependency of the audio amplitude plotted along ordinates **201**, **202** in dependence of a frequency plotted along abscissas **203**, **204**.

**[0078]** The upper diagram in FIG. **2** shows the sound pressure level (SPL). A low SPL area of sound is denoted with reference numeral **205** and a high SPL area (sound) is denoted with reference numeral **206**.

**[0079]** A loudspeaker driver cone output is denoted with reference numeral **207**, a vent output is plotted with reference numeral **208**, and a total system sound pressure level (cone plus vent) is denoted with reference numeral **209**.

**[0080]** The bottom diagram in FIG. **2** shows the airflow at the vent output. A high airflow area (from the vent) is denoted with reference numeral **210**, and a low airflow area (from the vent) is denoted with the reference numeral **211**. A curve **212** shows the airflow of the vent (assuming a linear flow).

**[0081]** The airflow may be much higher in the vicinity of the vent than at the driver, since the diameter of the vent may be much smaller than that of the driver. The airflow will become very obvious to the user when the turbulent, non-linear regime of the flow in the vent is reached.

**[0082]** Embodiments of the invention provide a way to mechanically (with airflow) stimulate the body of the user with the lower tones of the audio signal that are not properly reproduced acoustically.

**[0083]** According to an exemplary embodiment, a vent is integrated in a sound reproduction product, the mechanical design of the product being such that the vent outlet is:

**[0084]** directed toward a naked part of the body of the person (preferably a highly touch-sensitive part, but in principle it can be any part, for instance hands, wrist, neck, face, etc.).

**[0085]** positioned at a given distance from the body which should be less than five times diameter of the loudspeaker used.

**[0086]** FIG. **3** shows a device **300** according to an exemplary embodiment of the invention.

**[0087]** A loudspeaker driver is denoted with reference numeral **301**, and a diameter of the loudspeaker is denoted with reference numeral **302**. A user skin is indicated with reference numeral **303**. Reference numeral **304** indicates a turbulent airflow. As can be taken from FIG. **3**, a vent distance **305** shall be less than five times the loudspeaker diameter **302**.

**[0088]** FIG. **4** shows a device **400** according to an exemplary embodiment of the invention implementing an earphone **401**.

**[0089]** As can be taken from FIG. **4**, a vent opening **402** is directed towards and (nearly) touches skin above the jawbone. Therefore, airflow **403** is streaming in the defined direction.

**[0090]** FIG. **5** shows a channel **500** through which a stream of air may flow so that the air stream **403** may be emitted at an end hole.

**[0091]** FIG. **6** shows a handheld device **600** according to another exemplary embodiment of the invention.

**[0092]** The handheld device **600** comprises a loudspeaker **107** and a vent tube **601** at the end of which the airflow **403** is emitted and directed towards a hand **604** of a user. The hand **604** of the user grips the handheld device **600** and is capable of actuating buttons **603**. A display device **602** is provided as well. As can further be taken from FIG. **6**, the vent **601** opening is directed towards the fingers of the user's hand **604**. For example, the handheld device **600** may be a mobile phone on which an acoustic output may also generate a correlated air stream **403** directed towards the skin of the hand **604**.

**[0093]** FIG. **7** schematically illustrates a portable gaming console **700** according to an exemplary embodiment of the invention.

**[0094]** Two hands **604** of a user carry the handheld device **700** and operate a cross-like control button **701**. A display **602** is shown as well as loudspeakers **107**. Vent openings **601** are shown at the end of which an air stream **403** is emitted towards the hands **604**.

**[0095]** FIG. **8** shows a human user **800** carrying a wearable jacket **801**.

**[0096]** High frequency acoustic waves **108** are emitted by a loudspeaker **107** directly to the ear of the human listener **800**. However, the low frequency audio contributions have an amplitude which shall be effectively increased by generating an airflow **403**.

**[0097]** FIG. **9** shows a portion of the wearable jacket **800** in more detail.

**[0098]** A collar **900** is shown having a loudspeaker **107** and a vent hole **402**. An airflow **403** is directed directly towards the neck of the human **800**. An enclosed air volume is denoted with reference numeral **901**. A tube **902** is provided for directing the air from the enclosed air volume **901** to the vent hole **402**.

**[0099]** FIG. **10** shows a headrest **1000** according to an exemplary embodiment of the invention. Another view of the headrest **1000** is shown in FIG. **11**.