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(54) Sound transmission device and apparatus

(57) The invention which is the subject of this application relates to apparatus for use with children such as a seat for a vehicle adapted for use and safety of children, cots, prams, high chairs and the like and to a device for use with the apparatus which allows sound to be emitted at the apparatus via speakers positioned in or on the apparatus. The sound is generated from an audio reproduction means which can also be mounted on the apparatus or alternatively can be a conventional unit such as a vehicle stereo, household stereo system, television, video or the like. The signals from the reproduction means are sent via a signal emitter to a signal receiver connected to the speakers and allows the child in the apparatus to be entertained and/or educated by the sound. In one embodiment the device can also be used as a listening device.

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Description

The invention which is the subject of this patent application relates to an entertainment and/or communication device principally for children and which can be used in conjunction with children's apparatus such as a seat for a vehicle, for a child, a pram, cot or the like.

Children's apparatus is required to be inherently safe and this is one of the main considerations for manufacturers of the products. The device of the current invention allows both safety to be increased and entertainment to be provided to the child.

One particular type of apparatus, namely child safety seats are used extensively to carry children from the ages 0-12 safely in cars. The seats are anchored to existing vehicle seats by passing seat belts through location points or, alternatively, can be anchored to the chassis of the car, possibly via universal anchorage systems, and are themselves provided with safety belts thereby providing a seat which is of the correct size for the child and providing safety for them if a crash was to happen.

However one problem with the safety seat is that as the child is securely held in position their scope for movement during car travel is extremely restricted and thus they can become bored and restless thus adding to the stress of the journey to the child and other car occupants and also creating a distraction for the driver. It is known to provide small travel versions of board games but these do not solve the problem.

Another problem caused by the restlessness of the child, especially in the car, is that a lone driver of the vehicle invariably has to talk and communicate with the child which entails eye contact with the child, hence causing potential danger and hazard when driving.

The same problems of boredom and frustration apply to children kept in prams, pushchairs and cots where it is difficult to maintain their interest and/or encourage them to go to sleep.

The aim of the current invention is to provide a communication and entertainment means for a child in the form of a device which can be provided integrally within apparatus for use with a child such as a seat, cot, pushchair, pram or other apparatus thereby allowing the device to be used and activated by the child and/or parent so as to make the child's time in the apparatus more interesting and enjoyable while ensuring that the safety of the child is maintained. Furthermore, the communication and entertainment means of the invention can perform an educational role by providing information while the child is awake and even when asleep.

In a first aspect of the invention there is provided apparatus for use with a child, said apparatus including a device for reproducing sound to the child in the vicinity of the apparatus and characterised in that there is provided at least one speaker and there is provided as part of the device a signal emitting means to emit a signal to be received by the speaker and translated into sound which is played to the child.

Typically the signal emitting means is remote from the speakers. The signal emitting means can also be connected to audio reproduction means which include a recording function.

In one embodiment the apparatus is a safety seat for use by babies or children and fitted to existing seats of a vehicle or the vehicle chassis. In this arrangement the signal emitting means can be remote from the speakers and can be fitted as part of the seat or alternatively may be fitted to another part of the vehicle, in connection with the stereo/tape/CD system so as to relay the signals for the sounds from the system to the speakers. It is envisaged that the vehicles can be any of cars, buses, minibuses, trains and the like.

In an alternative arrangement the seat is a high seat for use by children when feeding or is a pram or buggy in which the child is transported. It is also possible that the device can be incorporated into a cot for use when the child is lying down. The speakers can be incorporated into the frame of the said articles or may be incorporated into padded areas such as seat cushioning, cot bumpers, mattresses and the like.

In one embodiment the apparatus includes the device in the form of an audio reproduction unit which can be of any suitable form such as a compact disc or music cassette player, a power source, at least one speaker and signal emitting and receiving means. In whichever embodiment the speaker or speakers are mounted within the apparatus at positions thereon such that when the child is sitting or lying their head is adjacent to the speakers thereby allowing them to listen comfortably to the sound therefrom. In an alternative embodiment the speaker or speakers are demountable from the seat to be fitted into the child's ear or ears. The speakers can be connected by speaker leads to the seat, however it is envisaged that the speakers will again be positioned close to the location area of the child's head so as to minimise the length of the speaker leads required and thereby prevent any risk of the child becoming entangled with the leads.

The signal emitting and receiving means can be a transponder/ receiver system which allows the sound signals to be transmitted from the audio reproduction means and received remotely by receivers in the speakers thereby allowing a no-wiring device to be used. Typically the signals will be transmitted using infra red signals.

In whichever embodiment it is preferred that the speakers are designed and/or mounted so that the sound emitting therefrom is localised to the environment of the apparatus so as to minimise the noise which can be heard by other persons such as passengers of a car. Typically the volume of the speakers is adjustable but the controls are preferably fitted with volume limiting means so as to prevent the volume from being too high and thereby avoiding damage to the more sensitive ears of the child. It is also preferred that the speakers be embedded in a cavity in the material of manufacture of the

apparatus, such as, if the apparatus is a seat, in the polystyrene foam from which they can be formed, so as to minimise vibration and increase the quality of the sound.

In one embodiment the power supply and audio reproduction unit are located within and attached to the apparatus and are hidden from view. Access can be gained to the audio reproduction unit to allow the cassette or disc to be changed as appropriate.

The apparatus may be provided with a speaker or speakers and they are configured to receive signals from a remote audio reproduction means to which the signal emitting means is connected such as a stereo, radio, television or other sound generating apparatus. Equally, a number of the apparatus or apparatus types can each be configured to receive signals from a common source. This is of particular use where there may be a number of seats, such as in a coach or train carriage and speakers are embedded in each of the seats and also in domestic premises where, for example, a pram, cot and high chair can all be provided with speakers and signal receiving means, and are configured to receive the same or different signals from a common signal emitting means and common audio reproduction means.

In a further aspect of the invention the apparatus is provided with a games console and in one embodiment the games console is mounted on the apparatus as an integral part thereof, and preferably as part of a lap portion of a seat, thereby improving the safety of the apparatus for the child when sitting in the same. In this arrangement the games console can be plugged into the power supply in the seat when the lap portion is placed in position.

In one embodiment the console can be detached from the seat to allow the child to hold the console when playing with the same thereby allowing improved enjoyment and indeed it is conceivable that the console can be provided with, or connected to interact with, a television screen mounted in the seat and which can be viewed by the child. In one embodiment the games console is adapted to receive game cartridges which can be inserted therein to provide the required game for the child.

In a further aspect of the invention there is provided an entertainment device comprising a signal emitting device and speakers including a signal receiver, said emitting device connected to an audio reproduction means to transmit signals representing the audio sound and to be received for transmission via the speakers.

In one preferred embodiment the audio reproduction means is the stereo of a vehicle and the speakers are incorporated into apparatus and in particular, into a children's safety seat or alternatively the speakers can be worn by a passenger of the vehicle.

In one embodiment the fader controls of the stereo can be used to selectively control the listening of the audio sound by the passengers of the vehicle. In any embodiment of the device and to whichever apparatus the device is fitted, the control of the reproduction means can be achieved using a remote control device.

It should also be noted that the term audio reproduction means and unit includes within its scope, equipment which can also generate visual images, such as televisions, in addition to the sound signals.

It is envisaged that this invention is particularly attractive for use with children and may be used for children in a pram, high chair or cot in a house and where the speakers are mounted in the apparatus to receive signals from, for example, the hi-fi stereo unit in the house. It is also envisaged that the device can be provided to act as a listening device so that, in addition to generating signals to be heard via the speakers by the child, the device can also include a microphone or other listening device and emitter, so that signals can be sent back to allow the child to be listened to through speakers, such as the speakers of the audio reproduction means by the carers for the child and in this embodiment there will be provided a signal receiver at the audio reproduction means also.. Indeed it is possible that in one embodiment the device is provided so that the generation of the sound signals to be received by the device at the apparatus where the child is, is only commenced when a noise is detected by the child. It is envisaged that this will be of particular use in sending sound to children to encourage sleep in cots and the like.

A specific embodiment of the invention will now be described with reference to the accompanying drawing wherein Figure 1 illustrates an exploded perspective view of the components of child's apparatus in the form of a child safety seat according to one embodiment of the invention.

The seat 2 comprises a back support 4, base 6 and lap portion 8 made of expanded polystyrene foam. In this embodiment the back support 4 includes mounted therein speakers 10 which are mounted in cavities formed in the foam and positioned adjacent the position of the head of a child when sitting in the seat so as to maximise the quality of sound heard by the child. The speakers 10 are provided with signal receiving means for receiving signals from a signal emitting means connected to audio reproduction means 12 shown in broken lines which, in this embodiment, is mounted within the body of the seat and provided with an opening 14 which allows the cassettes, discs or other audio means to be inserted. The audio reproduction means 12 is in turn connected to a power supply 16 which again is mounted within the seat but which can be accessed to allow the change of batteries as required. The equipment may in an alternative embodiment be mounted under the covers of the seat and/or in a pocket of said covers. Alternatively, or in addition, the power source can be provided with an adaptor to allow the same to be powered from the cigarette lighter socket of a vehicle, or, if the seat is to be in the vehicle for a long period of time the seat can be connected to the vehicle electricity circuit via a plug in socket. Control means for the playing of the audio re-

production means can be provided at any suitable point on the seat for convenient use, or via a remote control device, but in one embodiment can be provided as part of a games console 18 which is provided as part of the lap portion 8 of the seat.

In one embodiment a games console can be connected to the power supply 16 and, if required, to the audio reproduction means and speakers 10 to allow control of the same and can include any of control means 20 for the game to be played and a monitor screen 22 by which arcade style games can be viewed. Alternatively the screen can be provided as a separate part of the seat. It is envisaged that the console can be removed from the seat to allow the same to be used more easily by the child when playing the game.

Thus it will be readily appreciated that the invention of this application allows a child sitting in a seat to be entertained and/or educated when in the same thereby minimising their restlessness and minimising the distraction to the driver. The seat allows the child to be entertained and/or educated with their own favourite music or story and can also be used to send the child to sleep. Furthermore the safety of the child is maintained as there is no need for headphones or other uncomfortable or sharp edged objects to be used and the volume of the audio reproduction means can be limited to be within acceptable volumes for children. The ability to allow the generation and reception of signals which carry the sounds means that standard audio reproduction means such as stereos, hi-fi, television and the like can be used to generate the sound. The signals can be infra red if required and if visual contact between the emitter and receiver can be maintained or, alternatively, other signal carrying media can be used such as radio waves or microwaves or power line carriers or the like.

It should also be appreciated that although this embodiment has been described with reference to a child safety seat all of the features can clearly be incorporated in any children's apparatus to advantageous effect for the child sitting therein. Figure 2 illustrates a system according to a further embodiment of the invention wherein the child's apparatus is a cot 102 and said cot is provided with speakers 110 which, in this case are housed in the mattress 119 and are connected to a signal receiver 111 adapted to receive signals from an emitter 113 connected to a stereo system 115 in the house in which the cot is located. The signal emitter is arranged to transmit signals which carry sound produced by the stereo system and allows the sound to be played through the speakers 110 to a child (not shown) in the cot 102. In a further embodiment, not shown, there may be provided a microphone in the cot connected to a signal emitter to send signals to the stereo system provided with a signal receiver and which includes a signal receiver to allow sounds made by the child in the cot to be heard and relayed to person in the vicinity of the speakers of the stereo system.

It should therefore be appreciated that the invention of this patent application has many potential uses so that the device can be used to good effect if the same is incorporated in a similar manner into a high chair, pram, buggy or high chair for example, as well as safety seats and cots.

Claims

1. Apparatus for use with a child, said apparatus including a device for reproducing sound to the child in the vicinity of the apparatus and characterised in that there is provided at least one speaker and there is provided as part of the device a signal emitting means to emit signals to be received by a signal receiver connected to the speakers and translated into sound which is played to the child.

2. Apparatus according to claim 1 wherein the signal emitting means is remote from the at least one speaker.

3. Apparatus according to claim 1 wherein the apparatus is a child safety seat and the signal emitting means is remote from the at least one speaker and is fitted as part of the seat or another part of the vehicle, so as to relay signals relating to sounds from audio reproduction means to the at least one speaker.

4. Apparatus according to claim 1 wherein the apparatus is any of a high seat, pram, pushchair or cot.

5. Apparatus according to any of the preceding claims wherein the apparatus includes an audio reproduction unit which can be of any suitable form such as a compact disc or music cassette player, a power source, at least one speaker and signal emitting and receiving means.

6. Apparatus according to any of the preceding claims wherein the speaker or speakers are mounted within the apparatus at positions thereon such that when the child is sitting or lying their head is adjacent to the speakers thereby allowing them to listen comfortably to the sound therefrom.

7. Apparatus according to any of claims 1-5 wherein the speaker or speakers are demountable from the seat to be fitted into the child's ear or ears.

8. Apparatus according to any of the preceding claims wherein the signal emitting and receiving means are a transponder/ receiver system which allows the sound signals to be transmitted from the audio reproduction means and received remotely by a receiver connected to the at least one speaker thereby allowing a no-wiring device to be used.

9. Apparatus according to claim 8 wherein infra red signals are used.

10. Apparatus according to claim 1 wherein the speaker or speakers are mounted in the apparatus along with signal receiving means configured to receive signals from a remote source to which the signal emitting means is connected such as a stereo, radio, television or other sound generating apparatus.

11. Apparatus according to claim 10 wherein a number of the apparatus or apparatus types are each configured to receive signals from a common audio reproduction source.

12. Apparatus according to any of the preceding claims wherein the apparatus is provided with a games console mounted on the apparatus as an integral part thereof.

13. Apparatus according to claim 12 wherein the games console is provided in the form of a lap portion to sit on the child's lap when sitting.

14. An entertainment device comprising a signal emitting device and speakers connected to a signal receiver, said emitting device connected to an audio reproduction means to transmit signals representing the audio sound and to be received for transmission via the speakers by the signal receiver.

15. A device according to claim 14 wherein the audio reproduction means is the stereo of a vehicle or a premises and the speakers are incorporated into apparatus for use by a child.

16. A device according to claims 14 and 15 wherein the device acts as a listening device and includes a microphone positioned adjacent the child in the apparatus and means to allow the transmission of sounds detected by the microphone to audio reproduction means to emit the detected sounds.

17. A device according to claim 16 wherein the generation of the sound signals to be received by the speaker at the child's apparatus is only commenced when a noise is made by the child and detected by the microphone.

18. A device according to claim 17 characterised in that the generation of sound signals is stopped after a preset time with no further child's noise being detected.

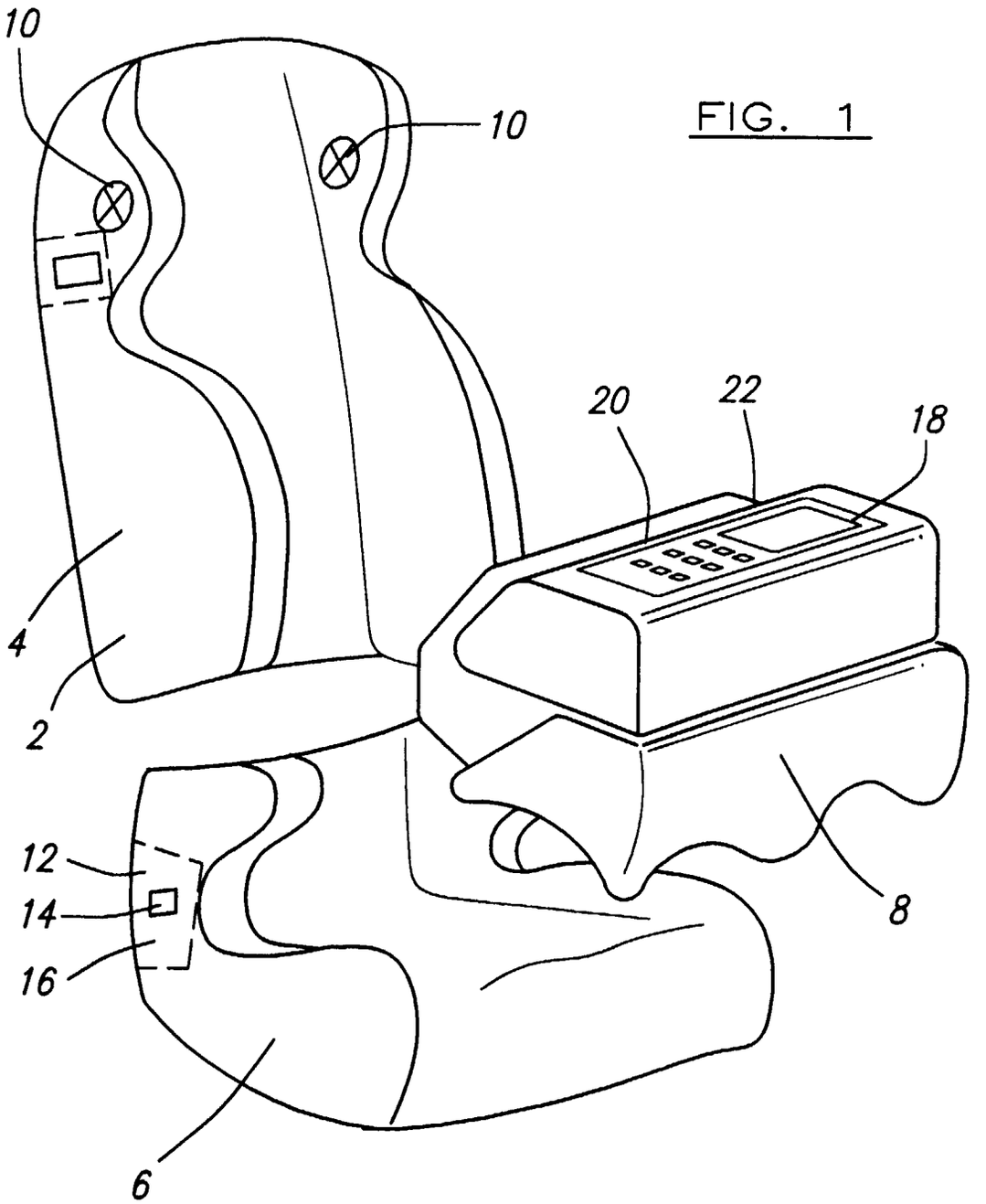

FIG. 1

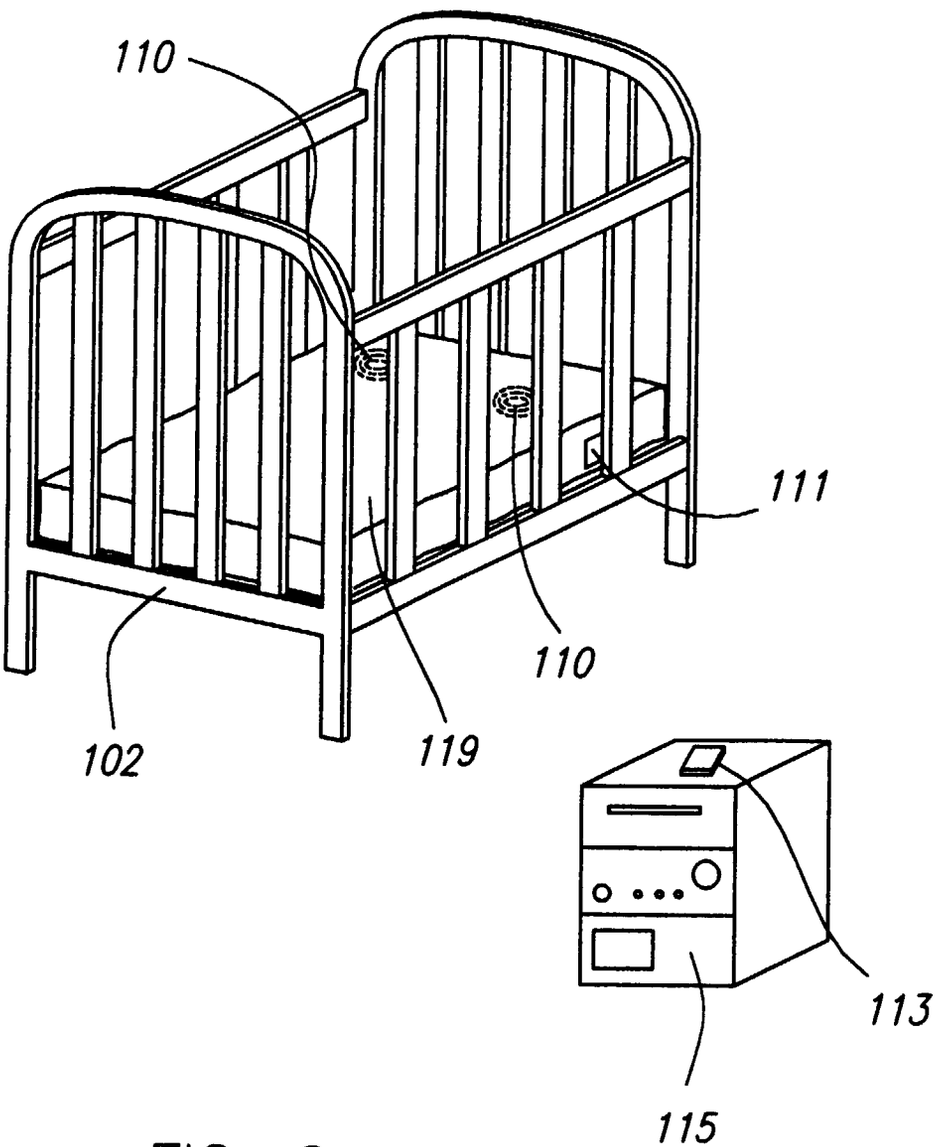

FIG. 2