

PERSONALISED AUDIO VISUAL AIDCross Reference to Related Application

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5 Technical Field

This invention relates to a method and means for providing an expert knowledge base in an instructional or informational and which in one aspect may be used as a teaching aid for example as a teaching aid for teaching of
10 movements and techniques, such as used in sports for the game of golf. The present invention, however, is applicable to other movements, sports, pastimes, techniques or information presentation.

In a further aspect the present invention relates
15 to a method and means for providing an expert visual or audio-visual assessment of a particular proposal relating to geographical locations. One such application is to generate a visual display of a particular tract of land for a golf course layout made up from a number of pre-stored
20 hole designs or computer generated hole designs which have taken into account all aspects of the final layouts design on the overall development, with the inclusion of audio or audio-visual data pertaining to structural methods for producing the layout.

25 The present invention has further application in providing an assessment on a particular object or target by for example comparing properties of that object or target with those of a preferred or known object or target. Thus the present invention may also be applied to the medical
30 field to allow doctors to go about their work and still give personalised audio-visual medical advice without having to view patient information presented visually on a monitor. The present invention may also be applied to allow a person to receive more personalised audio visual
35 shopping advice at home. The present invention may further be applied to allow a person to receive professional design advice services at home.

Background Art

As golf has become an increasingly popular pastime over the years, many players wishing to improve their own personal techniques, have pursued professional assistance. Often players, be they professionals or amateurs, may wish to emulate successful movements of top players or coaches who are exposed in the mass media. At the present time, these players have a number of choices available to them in attempting to try to emulate such movements, which may include general practice, private coaching, viewing current audio-visual instruction tapes, recording their own personal movements and analysing same, or studying photographs, slides, etc. of their swing in action.

In all the above cases, the onus is placed upon the individual or coach, to perceive those areas of movement that differ between the current technique of the player and that of the preferred technique they are trying to achieve. Even for a specialised person working in their own chosen sport or profession, such differences in movement can be so minute or hard to detect, for example a person's weight shift or pressure in their grip or arms, that they can go undetected and so handicap that person's potential rate of improvement. The reason for this particularly in the above instructional visual teaching cases is that the viewer watches information flowing to him in one direction only regarding the current or preferred technique and thus the viewer cannot perceive all aspects of the movement because of no corresponding physical forces or certain performance data with which to relate specifically because such visual presentations do not show their current technique along with the preferred technique with the addition of bio-mechanical information. Also current general prerecorded instructional audio visual presentations direct their information towards a mass audience as a whole without any allowance for a person's particular technique or requirement of problem solving.

In other situations where conceptual

instructional advice is required, the quality of advice can vary, for example, when a person is considering whether or how to best construct a particular tract of land he owns or is considering acquiring. For example, for the development
 5 or remodelling of a golf course, normally expensive preliminary surveying, design and feasibility works are carried out, to which he is reliant on all aspects of the development being expertly covered, which is not always the case. Similarly, if alternative ventures in particular
 10 areas are proposed, no audio-visual means are presently available which provides a customised or personalised completely regenerated, expertly compiled computer analysis in the visual or audio-visual form of potential works, described within.

15 In other situations, persons may require to receive expert advice on a particular subject such as in the medical field, home shopping field or personal design service field. No current means are available to provide this advice in the form of an audio-visual presentation
 20 which is personalised for that particular person.

Summary of the Invention

The present invention aims to provide in one aspect an expertly analysed instructional or informational aid employing visual or audio-visual techniques which
 25 allows for a flow of information in both directions, for example between selected experts and viewers so as to provide the viewer with personalised audio/visual information based on information concerning that particular person or a particular target or subject of interest.

30 The present invention in a further preferred aspect provides a method and means for teaching or instructing such movements or techniques in precise ways, that enables a person or mechanism to more clearly emulate another movement. Whilst the present invention is
 35 particularly suited in one application to sports coaching it may also be applied to other areas where an emulation of a precise movement or procedure is required, as will become more apparent from the following operating description.

The present invention may additionally be applied to providing expertly compiled opinion in the form of a visual or audio-visual overview of a particular location or target altered in accordance with selected criteria.

5 With the above, and other objects in view, the present invention provides in a first preferred aspect, a method for providing a personalised audio-visual aid based upon captured visual characteristics of a particular target, said method comprising the steps of visually
10 scanning, sensing and capturing visual and informational data signals representative of a particular target, comparing said representative visual and informational data signals with corresponding pre-stored signals of a selected target, generating further visual and informational data
15 signals comprising said signals of said particular target analysed against said pre-stored selected target signals, and converting said further generated visual and informational data signals into a format which enables viewing to provide a personalised audio-visual aid.

20 In a second aspect, the present invention provides apparatus for providing a personalised audio visual aid based upon captured visual characteristics of a particular target comprising:

 means for visually scanning, sensing and
25 capturing visual and informational data signals representative of a particular target, means for comparing representative visual and informational data signals with corresponding pre-stored signals of a selected target, means for generating further visual
30 and informational data signals comprising said signals of said particular target analysed against said pre-stored selected target signals, and converting said further generated visual and informational data signals into a format which enables viewing to provide
35 a personalised audio-visual aid.

 The term "image signals" as used herein includes signals representative of such images such as digital information which can be converted into visual images.

Preferably the characteristics of the target which, for example, may be an object, are sensed using imaging and/or non-imaging sensor systems. Preferably also means are provided for adding dialogue or informational data to the generated format, the dialogue or informational data being selected and retrieved from prestored dialogue or informational data.

Preferably the visual images of a particular target are captured and stored in digital form using known video recording techniques such as with a video camera which produces a video cassette containing the images of the particular target. Alternatively, other means may be provided for capturing and storing the visual images as described further below.

Visual images of a preferred result are preferably stored in digital form in a data base of a computer so that a selected preferred image can be readily accessed. The computer may be located at a remote location so as to be accessible from a number of different locations.

Preferably means are provided to transmit the captured images in digital form for receipt by the computer. The transmitting means preferably transmits the images over the normal telephone network, however, other communications links may be employed.

As an alternative, the computer may be located at or adjacent the image capturing means or storage means. The computer, alternatively may be incorporated into the image capturing means.

The comparison in the computer can be carried out using either software techniques or hardware techniques and various sampling procedures. The computer is also preferably software or hardware programmed to take into account the size of the user and other physical characteristics.

In an application in the golf field, characteristics, such as length of arm may be taken into account so that a compensation factor may be included

whereby the movements such as swings of the player and the preprogrammed stored movements or swing in the computer can be truly compared. This comparison can take place at different times or positions in for example a swing to
5 produce signals representative of the differences between the swings. This comparison signal may comprise a measurement of distance, angle, speed of swing or other parameters. Such signals may then be employed in generating the new visual image which approximates the captured image
10 altered to emulate the preferred image.

Whilst the invention has application to teachings in sport, so as to help and assist a person emulate a particular movement or technique, it may also be applied to many other situations and fields where an emulation or
15 overview of a precise movement is required. Thus, the invention may be applied to various applications in the art fields, for example, the teaching of dance steps or within the medical field where precise movements are required to be studied, and expert advice given such as with human body
20 movements.

Additionally, the present invention may be applied to fields where expert systems appraisals and emulations may be required, for example in the medical field, design field or in the property field for precise
25 calculations and designs of future development proposals or where expert appraisal of a particular object or subject is required by comparison with a preferred or ideal object. or subject.

Brief Description of the Drawings

30 Reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention and wherein:

Fig. 1 illustrates in block diagram the instructional aid according to the present invention
35 applied to the game of golf;

Fig. 2 is a flow chart showing the procedure involved in the invention; and

Fig. 3 illustrated in block diagram a further

application of the instructional aid of the invention.
Detailed Description of the Preferred Embodiment

Fig. 1 illustrates the apparatus for use in the present invention described below in reference to emulation of a golf swing but useable in any situation where emulation of movement is required. The apparatus includes a visual image capturing device 11 which is adapted to capture movement of the person undertaking a golf swing for subsequent analysis and correction as described below with reference to Fig. 1 and the flow chart of Fig. 2.

To capture the initial detailed visual images relating to physical characteristics including movement techniques employed during the golf swing, various scanning or electronic collecting procedures are used. For this purpose the image capturing device 11 preferably incorporates a portable electronic camera such as a video camera 12 or the like having an associated recording or signal storage means 13 as is known in the art to form and store signals representative of the characteristics of movements etc. being viewed.

Where recording of movements takes place, bio-information data, may also be transmitted or collected upon the same storage means 13 contained within the framework of the portable video camera 12, so as to enhance further final specialised teaching or information features. Such bio-mechanical information data may be transmitted to the recording or storage means 13 by an electronic means, hard wiring or other communication means, either at the same time as the captured visual signals relating to scanned images of the person being viewed, or at a different time. In the embodiment illustrated, bio-mechanical information may be captured using a weight sensing pad or pads 13' which will sense weight transference during the swing.

The means used to collect and transmit such bio-mechanical information data, is at all times non-restrictive in its overall performance, so as to allow the

pupil being analysed to achieve normal free flowing movement without restriction. One such means may take the form of mechanical device's affixed, or attached, to the person or golf club moved by the person so as to show data such as pressures transferred through the arms or hands, proper releasing techniques, velocities achieved etc. Alternatively or additionally, sensing devices may be positioned alongside, below or above the person whose image is being captured. Such sensing devices as above may comprise weight or load sensitive pads, monitors, electronic light beaming device's or the like. Bio-mechanical, signals may also be obtained by various scanning, editing and digital techniques, used within a remote computer data base as described further below, once the signal has been received by the remote data base, to determine also the many characteristics of the person being studied.

The image capturing device 11 is preferably of portable construction, and of high recording quality, so as to scan, receive and store images and information data, in broadcast quality. These visual or information signals are converted by sensors or the like, into electrical charge patterns, etc, which are read out or scanned to produce, digital electronic signals representative thereof, from electrical or light signals, produced by an electronic pick-up tube, charge-coupled device (CCD), or the like means within the camera framework, or by the information signalling devices referred to above.

For initially capturing the necessary signals for analysis, more than one image capturing device 11 may be used, so as to channel information regarding various visual details, information and data or the like, to one recording or storage medium. In this regard various switching techniques may also be used to switch between selected image capturing devices 11.

The signal storage or recording means may take the form of magnetic tape or disk, laser based or optical video disk, magneto-optic disk, magnetic-laser-optical disk

or other storage medium. Alternatively digitised signals representative of the scanned images or bio-mechanical and information data may be also transferred or stored onto a computer memory chip or the like, held within the camera
5 framework.

The apparatus 10 also includes an audio-visual signal transceiver 14 adapted to receive and transmit audio-visual signals and other information signals in the manner described below.

10 The image capturing device 11 referred to above in one form is a unit discrete from the audio-visual signal transceiver 14 and adapted to be connected thereto or the two may be one and the same, so that the image capturing device 11 also incorporates a unit for transmission and
15 reception of signals to and from remote data bases.

The audio-visual signal transceiver 14 may take the form of a portable signal unit or a personal computer (PC), which can convert, compress or suitably accept, a down-loading of captured signals, stored within the storage
20 means 13 of the portable camera unit and then reform, record or store such signals in a suitable digital state for later transmission over a communications network 15. The communication network 15 may comprise the general switched telephone network, satellite links, television
25 quality cable links or the like over which the signals representative of the persons movement together with bio-mechanical information where stored are directed as electrical or light signals to a remote computer 16 for storage in a computer data base 17 for later analysis
30 against selected preferred signals also stored in a database of the computer or a further computer. As is conventional a modem or other similar signal conversion device may be associated with the computer 16 to receive the transmitter signals and convert those signals into a
35 suitable form for reading by the computer 16. The modem or other similar signal conversion device may also be employed for transmission of signals from the computer 16 as described further below.

Initial capturing of audio, visual and data signal information, may also be undertaken using the audio-visual signal transceiver 14 (if not a personal computer) to which a video camera 12 may be directly connected so as to enable signals captured by the camera 12 to be recorded directly onto suitable storage medium held within the transceiver 14. The transceiver 14 is then able to transmit these captured signals to remote locations, when directly connected to the communications network described above. Thus, a single unit may perform all functions of recording, transmitting and receiving audio, visual and data signal information. The transceiver 14 for this purpose may include dual signal storage facilities, to achieve the above functions, however, the transceiver 14 may also be constructed so as to enable all functions of recording and playback in each mode within a single signal storage device.

In an alternative arrangement, the captured signals may be transmitted by the transceiver 14 at the same time the signals are captured. That is, no storage means may be required to store the captured signals which are transmitted upon capture.

The transceiver 14 is software and hardware programmed and may offer some of the following features:

- 1). The sender's details for later personalising effects to the final video presentation i.e., name and spoken language and means for selecting the person with whom the golf swing of the person is to be compared;
- 2). The transmitting party's or agents details for account keeping purposes and security for the system i.e. digitised security code;
- 3). Circuitry for increased transmission speed;
- 4). Circuitry and displays for showing details regarding signalling times to reach data base and regeneration times once retransmitted back to pupils or agent's remote location, for account keeping purposes;
- 5). Circuitry and displays for showing the format of

transmitted or requested signals in PAL, NTSC or SECAM etc;
 6). Circuitry for Time, Date, Auto Dial - Redial,
 Stop, Start, Receive, Send and possibly an Advertising
 channel, etc.; and

- 5 7). Circuitry and displays for showing to whom the
 regenerated signals belong and to enable the retransmitted
 regenerated signal to be added to the already prerecorded
 signal, described below, if desired.

As stated above, the computer 16 is arranged
 10 normally at a remote location from the audio-visual
 transceiver 14 and includes a data base 17 which stores
 selected prerecorded video signals in digital form which in
 the case of golf swings may include a selection of swings
 showing the movement of different golf professionals which
 15 are required to be emulated. As the computer 16 and image
 capturing device 11 are not physically affixed or attached
 together, the computer 16 and data base 17 may be of a
 sufficient size and capacity to enable the desired
 functions to be achieved at one and the same location.

20 The computer 16 may be at many remote locations
 and holds within its database the following prerecorded
 information in digital form, which provide a basis for
 forming the regenerated audio-visual signals:

- 1). A digitised audio visual library of selected
 25 coaches, advisers, professional, or mechanism (such as a
 golf simulation machine) movements, techniques, steps or
 procedures, that have been previously analysed, recorded
 and reformed into suitable digitised signals, for later
 analysis and regeneration in the data base against the
 30 remote signals received.

2). A digitised bio-mechanical library of selected
 coaches or mechanism movements measured individually or as
 a group, for later display with the regenerated audio-
 visual signals.

35 The computer 16 incorporates a means for
 receiving and editing the transmitted visual data or bio-
 mechanical and information data signals, relating to the
 movement of the golfer and arranges same in such a way as

to be able to match the received visual signals with the previously established and selected data base signals of their preferred applications using software techniques, such as pattern recognition software, and generate a new video signal to enable the viewer to see personally, in regenerated form, those differences that exist in (a) a teaching mode, between the two movements, that of the pupil and the selected professional or coach; and (b) in an analysis mode, those ideas that might be possible for their preferred swings (or applications in development fields where the method and apparatus of the invention is used in this application). For this purpose, the computer is software and/or hardware programmed to compare the respective swings of the person being analysed and the selected preferred swing with adjustments made such as for size of person, speed of swing and other parameters to allow a correct comparison. The differences between the swings are measured by software sampling or by other techniques and this difference added or subtracted from a person's recorded swing and new visual images generated on this basis which emulates the preferred movements.

The computer 16 may also include a means for selecting and adding dialogue to the regenerated audio visual signal recordings, in accordance with the analysis of the captured signals and stored signals, so that the viewer can receive personalised instruction or advice from afar, similar to having private instruction or personal consultation.

The computer 16 may further include a means for converting received signals, if needed, in one broadcasting mode, into those of another countries e.g. PAL, NTSC, SECAM, etc. To accomplish this within the computer, a Standards Converter or the like may be used, using Optical Scan or Digital Standards features or the like.

The computer 16 may additionally include a means for determining the cost of each and every received and regenerated signal that passes through the system, based upon the following information:

- (a) Signal transmission time to and from the computer.
- (b) The amount of analysis and regeneration time required, for each and every presentation, such as with the showing of audio-visual faults, bio-mechanical and characterised data graphs, dialogue, and broadcasting changes etc,;

5 The computer 16 is software and hardware
 10 programmed, to accept digitised signals transmitted to it, from remote locations, associated with the audio visual transceiver 14, so as to personally relate in the final regeneration and editing phases to the viewer, this being performed by, using various digital editing techniques and
 15 procedures as described below.

 The audio-visual presentation generated by the computer 16 can take the form of split-screening (generating new visual images of the preferred technique displayed alongside the present technique), as previously
 20 captured or superimposing (where the preferred technique is superimposed over the present technique) or other display. Graphics and charts, etc. for bio-mechanical and information displays, so that the viewer can clearly see those changes that are required or need to be performed, to
 25 develop or pursue the preferred movement, procedure or proposal are also displayed. These superimposing effects or the like, may take the form of stick figures, detailed drawings, etc. to normal human or visual appearances, so as to show the viewer any variances between his stroke and the
 30 preferred stroke. For ease of editing the subject material within this computer data base, a time code or the like, maybe also burned into the original recorded signal, so as to make final editing much more efficient within the remote data base. This procedure may also be linked with an edit
 35 controller or the like, within the computer 16, which locks the two signals electronically together during editing.

 To personalise the regenerated signal, dialogue is also added when required, so that the selected

instructor or adviser may relate to the viewer or pupil more personally, than with other audio-visual presentations. Part of this personalising effect is initially accomplished in the original transmission phase, by the name, spoken language, broadcasting mode or location statistics:, etc of the final viewer being captured, within this data base, to which dialogue can also be added when required, in the regeneration signal phase, showing those changes they need to perform or consider, to obtain the preferred movement, thus totally personalising the new regenerated signal to the viewer.

For this purpose such dialogue, may only take the form of a brief statement, so as to make the viewer fully aware of those changes that are required, or need their consideration, to perfect the movement, procedure or development etc.

The means for adding such dialogue may take the form of a voice energy monitor or the like, contained within the computer, which on analysis scans a memory bank of learned or prestored words or phrases to find suitable terms, to bring attention to these problem areas or matters needing their attention.

Dialogue from the data base may also be added relating to recommendations for the viewer's consideration in regards to suitability of equipment being used to perform the desired movements and techniques.

To increase acceptance as a true teaching aid, scientific data, which in many applications could only be assumed before, such as with personalised coaching, may be presented to a viewer, when needed, in the form of graphs, charts, or the like, set either above, below, alongside or within the total regenerated video signal recording. This information is gathered from their received signals, being matched to, their preferred established signals contained within the data base 17 so that the person or pupil can clearly see those bio-mechanical differences that exist between, their current procedures/techniques and that of their selected coach's or professional,s procedures or

techniques.

Once the new audio-visual signal is regenerated, the signal is then retransmitted back by the computer 16 and via a modem or the like and the communications network 5 15 to the remote sender's or agents transceiver 14. This procedure may be performed, from within the computer 16 itself, using various digital, compression and sampling techniques, or it can be again sent back by a further audio-visual transceiver associated with the computer 16.

10 On receipt at the remote pupil's or agent's receiving location, the regenerated signal may already be in suitable form, for direct saving on suitable storage means such as video tape, disk or the like which enables home viewing such as by means of a video cassette player 15 and playback through a monitor 18. If not in a suitable form for direct saving, the signal may be reformed for storage as above on storage means which permits home viewing other than through a computer monitor by the use of either the receiving audio-visual transceiver, or by other 20 suitable conventional means, offering various slowing down or speeding up signal procedures. If desired the regenerated audio/visual signal may be stored on the original storage means e.g., video tape containing the player's current movements or techniques, or stored on a 25 new storage means.

In the embodiment described and shown, the image capturing device 11 stores the captured images on a video cassette 19 of known form and the regenerated images are stored on the same cassette 19 or, alternatively, an 30 additional cassette. The regenerated image in this embodiment is in the form of a stick figure 20 which is superimposed on the true visual image 21 (see figure. 1) of the player's swing or movement and which indicates to the player the angles and positions which he must adopt to 35 emulate the swing.

To add further to this advanced audio-visual teaching aids value, as a complete instructional system, compared to other audio-visual presentations, previously

recorded instructional material, of a non-personalised nature, may also be added, to the final home storage presentation means such as a video cassette. Thus this regenerated transmitted signal of the pupil's audio-visual presentation and data pertaining to movements, may be then simply added to the prerecorded material already held at the sender's or agent's remote location. In this format the single recording may then show: (a) an initial complete recorded procedure of instruction, as currently presented with audio-visual presentations, (b) an addition of their current movements, procedures or images etc. taken before regeneration and (c) the final regenerated personalised audio-visual changes, that are required, or affect, the desired changes needed by the viewer.

A typical presentation with a preferred format and structure in the final video tape or other viewable means could be as follows:-

Pupil: Mr.Rick Baker

Selected coach : Mr.Bobby Jones

Applications for: Golf

Dialogue in: English

1. Preferred audio-visual introduction:

"Hi, Rick, I am Bobby Jones, it is my pleasure to have studied your golf swing and these are the points I feel you should be concentrating on.;"

2. Preferred audio visual presentation in progress:

During the presentation whilst the pupil, Mr. Baker is viewing the subject matter, the viewing monitor is showing segments of the previously recorded swing, taken at the recording facility, with superimposed preferred movements of Mr. Jones against Mr. Baker's current movements and pointing out with the addition of dialogue, those areas that he should be concentrating on, so as to improve his current technique.

Bio-mechanical data in the form of graphs or charts etc., are also added during the presentation, so as that he and his local coach may also quite clearly see scientific data pertaining to those performed movements.

Dialogue may also be added regarding suitability of equipment being used at this stage.

3. Towards the conclusion of this audio visual presentation, the coach could conclude by saying:

5 "Thank you Rick for allowing me to help you improve your game, but please continue to work on these points with the help of your local professional, who is also there to assist you in overcoming these problems. Good golfing, Bobby Jones."

10 The above embodiment has been described with reference to a golf swing movement, however, as previously stated the invention may readily be applied where other movements are required to be emulated. Such movement may comprise movements of persons, movements of objects, or
15 mechanisms of which emulation is required.

In a further form, the invention may be applied to the property field to enable professional assessments and presentations of designs for future development proposals or the like. In this form visual images and data
20 relating to signals of a particular area of ground are captured using remote sensing techniques. For this purpose a camera and a remote sensing device may be fixed to the underside of an aircraft so as to capture and record geometrical or statistical information of the earth or
25 objects featured beneath. Geographical data achieved through using this remote sensing as above may be computer coded or digitised using video cameras, array scanners, laser beam, microwave or other means.

Information regarding the geographical area being
30 scanned is then transmitted as before using a transceiver to a remote computer containing a data base of pre-stored expert information or attributes required of a particular area of land. Thus, where the best standard of golf course is required to be laid out upon a specific parcel of land
35 the data base may include a library of selected hole layouts from different courses. The computer which is software programmed may then select preferred hole layouts to match to the area of land of which geographical features

has been scanned and recorded. Alternatively, the computer may itself design the appropriate hole layouts to best fit the area of land and proposed development. The computer data base may additionally include feasibility study means
5 for determining and displaying measurements, costs and other procedures required to achieve the end result. The computer may further be programmed to take into account residential housing around the course and the location of same, so as to maximise the view of the course etc.

10 As before, dialogue previously recorded and stored in the data base may be added by the computer to the regenerated audio-visual presentation as well as statistical graphs or other information relating to the development being studied.

15 The present invention may also be applied to enable a particular object to be analysed against pre-stored data relating to a currently known object. In this embodiment and as before an object is scanned so that its characteristics may be determined. Scanning is carried out
20 to obtain the optical photometric characteristics of the object using imaging and/or non-imaging sensor systems. As before the data obtained is stored and then transmitted to a remote location for analysis in a computer against the corresponding data of a preferred object whose data
25 information is captured in a data base. After comparison and adding, where appropriate, suitable dialogue from say an expert in that field, carried out automatically by the computer upon analysis between the scanned object over the preferred object, a regenerated signal is formed and
30 transmitted back to the sender so that the sender has an expert assessment of the differences between the respective objects. A particular application in this embodiment is for component parts as used in an assembly. The data information obtained relating to that part may be compared
35 to a perfect component part whose data is stored at the remote location so that the differences may be assessed. This embodiment may also be employed for detecting for example faults in a particular component part.

It will be apparent that the latter embodiment may be applied to any suitable target of which analysis is required.

A further typical applications of this embodiment will now be described with reference to the block diagram of Fig. 3 which is of similar form to that of Fig. 1 and in which like components to that of Fig. 1 have been given like numerals.

The embodiment of Fig. 3 is shown in an application to the medical field, for example for skin cancer detection where patient image data information obtained relating to a skin condition may be compared to normal skin conditions whose image data information is stored at a remote location so differences may be assessed and audio visual advice given. As in the embodiment of Fig. 1, capturing means 11 in the form of a video camera 12 is used to capture the patient's medical condition and personal details for identification purposes. Imaging and/or non-imaging sensor systems may be used for image capturing purposes. As before the data obtained is preferably stored in storage means 13 such as a video tape 19. The storage means 13, however, may comprise a computer or compact or optical disc 22 or semi conductor storage means 23, such as a memory chip. The information captured in the storage means 13 may then be transmitted to a remote location by transceiver means 14 or directly without storage, from the image capturing device which may incorporate a transmitter, and over a communications network 15 for receipt, analysis and comparison in a computer 16 with corresponding data of normal medical conditions stored in memory 17 of the computer 16. After comparison and adding, where appropriate, suitable dialogue from a specialist in that field, which dialogue has been prestored in a data base and which is selected by the computer 16 from the analysis between the captured image signals and prestored image signals, a further audio-visual signal is formed and transmitted back to the patient so the patient can see and hear how their medical condition

is progressing. The embodiment may also be employed for detecting and advising in other medical situations.

In a further application applied to home shopping, the apparatus 10 described in Fig. 3 may be used, however, in this case the target may comprise a person's physical features. These features, together with other personal details are captured using imaging and/or non-imaging sensor systems. As before the data obtained is stored and then transmitted to a remote location for analysis in a computer with corresponding data of general interest that the person wishes to match their particular physical features to, such as a specialised advice on hair styling, clothing and cosmetic.

After comparison and adding, where appropriate, suitable dialogue from an expert in that field, a regenerated audio visual signal is formed and transmitted back to a sender so the sender has an expert audio visual assessment of what they need to purchase to gain a new look. A particular application in this embodiment is for clothing advice. The visual data information obtained relating to a persons physical features can be compared to a manufactures fitting recommendation and individual clothing design images stored at a remote location, so the sender can receive from a clothing manufacturer a personalised audio visual advice signal of their captured features together with the most suitable clothing fitted to their physical features along with an addition of a selection of prestored dialogue advising why the manufacture made the suggestion. This embodiment may also be employed for giving personalised audio visual advice for hairstyles and cosmetics.

In a further application of the apparatus 10 of Fig. 3, for professional design advice service, images and details of a person's personal property are captured using imaging and non imaging sensor systems. As before, the data obtained is stored and then transmitted to a remote location for analysis in a computer with corresponding data to successfully implement a design.

After comparison and adding, where appropriate, suitable dialogue from an expert in that field, a generated audio visual assessment signal is formed and transmitted back to the sender so the sender has an expert audio visual
5 assessment of how to arrange item to gain an overall effect. A particular application in this embodiment is for interior decorating advice. The data information obtained relating to a persons property design features can be captured using a video camera and compared to a successful
10 interior designers ideas stored at a remote location so a sender can receive back a personalised audio visual presentation of their captured interior design features together with suggested design ideas from a selected interior designer advising why they made the suggestions.

15 The present invention thus provides a method and means for expertly teaching or instructing procedures, strategies, assessments or perceptions in audio-visual form to enable a viewer to more closely emulate, calculate, develop or use techniques suitable to their various
20 applications.

Whilst the image capture devices and computer containing the data base for comparison are normally located at remote locations requiring the use of transmitting means for transmitting the signals between the
25 locations, the computer may also be at the same location as the image capturing device. It is envisaged also that the computer and associated data base may be incorporated into the image capturing means. Of course, the term "computer" as used herein includes any form of computing means.

30 Whilst the above has been given by way of illustrative embodiment of the invention, all such modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of the invention as herein defined by
35 the appended claims.

CLAIMS

1. A method for providing a personalised audio-visual aid based upon captured visual characteristics of a particular target, said method comprising the steps of
5 visually scanning, and particular target and sensing and capturing visual and informational data signals representative of said particular target, comparing said representative visual and informational data signals with corresponding pre-stored signals of a selected target,
10 generating further visual and informational data signals comprising said signals of said particular target analysed against said pre-stored selected target signals, and converting said further generated visual and informational data signals into a format which enables viewing to provide
15 a personalised audio-visual aid.
2. A method according to Claim 1, wherein said initial visual and informational data signals relating to said particular target are captured using selectively
20 imaging or non-imaging sensing devices.
3. A method according to Claim 1, wherein said visual and informational data signals of selected targets are stored in a data base of a computer and wherein a
25 selected target is accessed from said data base for comparison with said particular target.
4. A method according to Claim 3, wherein said visual and informational data signals are captured and
30 stored at a first location.
5. A method according to Claim 4, wherein said computer is located at a second location remote from said first location and wherein means are provided for
35 transmitting said captured signals from said first location to said computer at said second location.
6. A method according to Claim 5 wherein said

transmitting means are selected from an independent signal transmitting means or a computer.

7. A method according to Claim 5, wherein said
5 transmitting means transmits said visual and informational data signals over a communications network to said computer.

8. A method according to Claim 5, wherein said
10 generated signals are transmitted from said remote second location to said first location.

9. A method according to Claim 8, wherein said
15 generated visual and informational data signals are stored in image presentation means or displayed on a monitor for viewing thereof.

10. A method according to Claim 9 wherein dialogue
20 is added for personalising the presentation with said generated visual and informational data signals.

11. A method according to Claim 10, wherein said
25 dialogue is selected from stored words and phrases within and data base.

12. Apparatus for providing a personalised audio
visual aid based upon captured visual characteristics of a particular target comprising:

30 means for visually scanning, sensing and capturing visual and informational data signals representative of a particular target, means for comparing said representative visual and informational data signals with corresponding pre-stored signals of a selected target, means for generating further visual
35 and informational data signals comprising said signals of said particular target analysed against said pre-stored selected target signals, and converting said further generated visual and informational data

signals into a format which enables viewing to provide a personalised audio-visual aid.

13. Apparatus according to Claim 12, wherein said
5 generated format further comprises means for adding selectively one of dialogue and informational data to said generated format.

14. Apparatus according to Claim 12, wherein said
10 target scanning means comprises selectively one of an imaging sensor system and a non-imaging sensor system.

15. Apparatus according to Claim 12 further including means for storing said representative visual and
15 informational data signals, and means for transmitting said representative visual and informational data signals to a remote location for analysis with said pre-stored selected target signals.

20 16. Apparatus for providing a personalised audio-visual aid based upon a visual image signal of a particular target comprising:

means for visually scanning a particular target
and for producing image and informational data signals
25 representative of said particular target, means for storing said representative visual and informational data signals, means for transmitting said representative visual and data informational data signals to a remote location, means at said remote
30 location for comparing said representative visual and informational data signals with the signals of a selected pre-stored target, means at said remote location for generating further visual data and informational signals based on said signals of said
35 particular target analysed against said selected pre-stored target, means at said remote location for adding dialogue and informational data to said generated signals, means for transmitting said

generated image and informational data signals from
said remote location, and converting said generated
image and informational signals into a format which
enables viewing to provide a personalised audio-visual
aid.

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ABSTRACT OF THE DISCLOSURE
PERSONALISED AUDIO VISUAL AID

An audio visual aid for providing expert advice on a subject of interest, including an image/data capturing device for scanning capturing and storing the image/data signals of the person or the subject of interest, and a transceiver for transmitting the image/data signals over a communications network to a remote computer. The computer contains a data base which stores in digital form image signals and bio-mechanical data of a number of preferred subjects. A library of prerecorded words or phrases are also stored in data base. The computer analyses the subject image/data signals against image/data of a preformed subject and generates in digital form further visual images/data signals together with inserted dialogue which are transmitted back to the person for visual display.

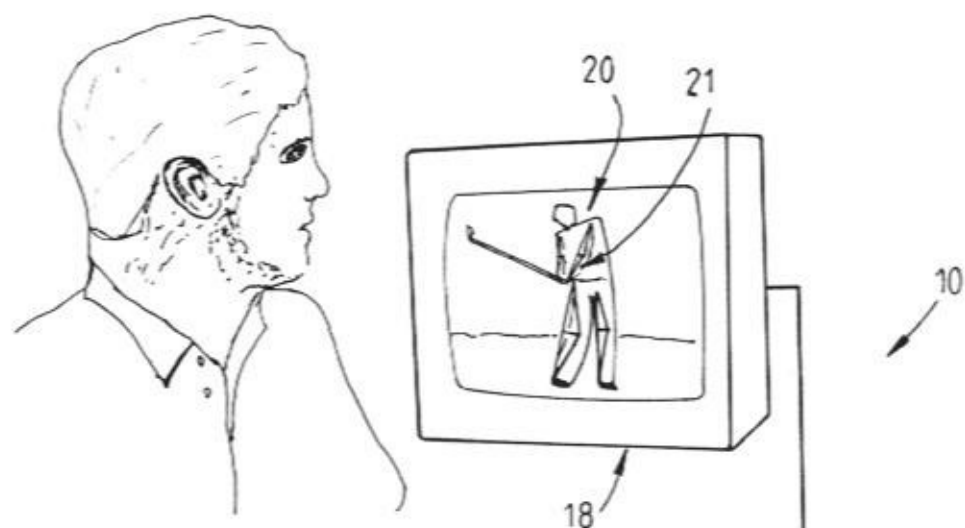
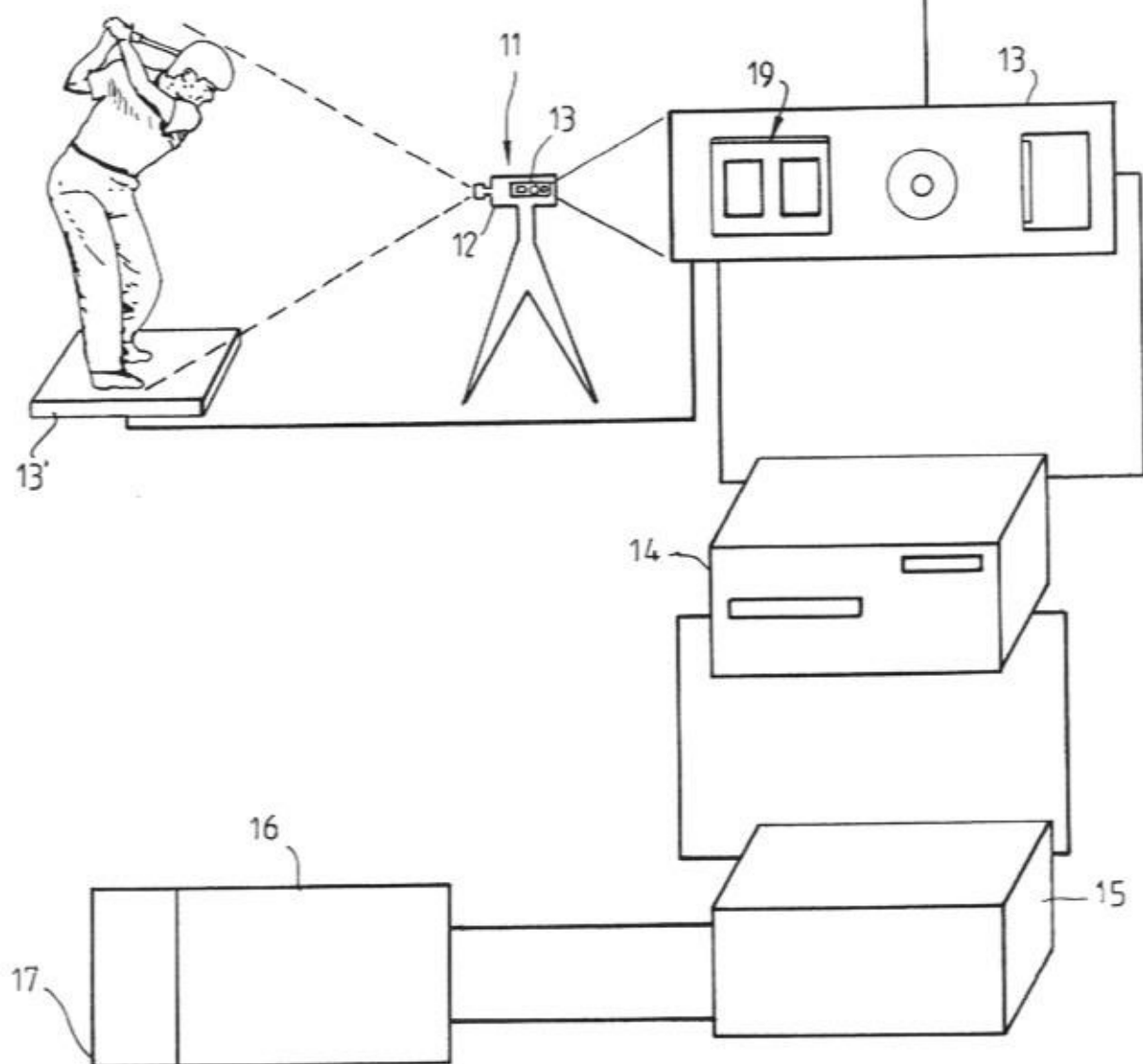


FIG. 1



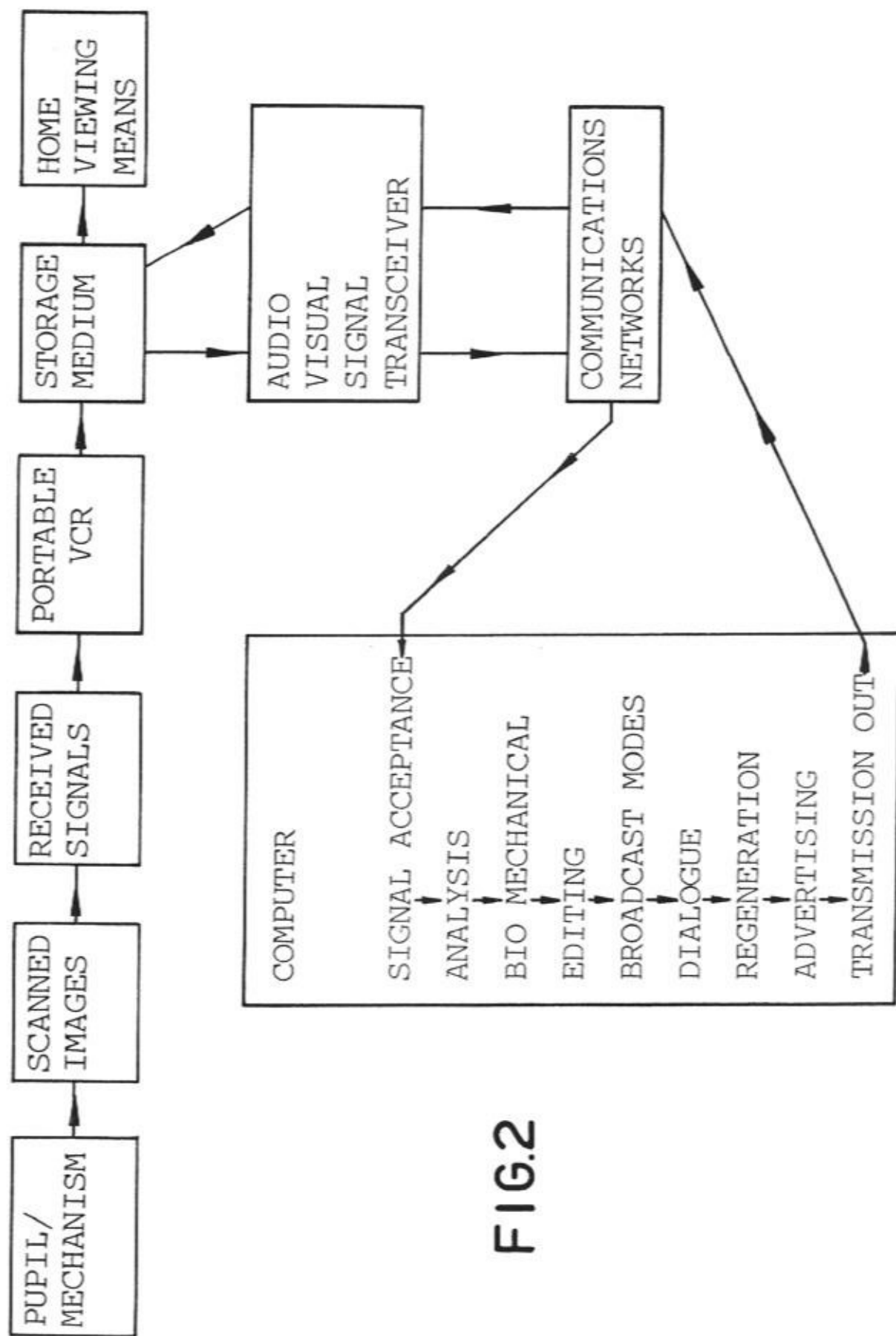


FIG.2

SPECIFICATION OF PATENT APPLICATION

APPLICANTS : RICHARD JOHN BAKER

TITLE : PERSONALISED AUDIO VISUAL AID

COUNTRY : UNITED STATES OF AMERICA

FILING DATE : 19 JANUARY 1996

NUMBER :

PRIORITY : CONTINUATION-IN-PART
PATENT OF U.S. APPLICATION
SER NO. 08/146016

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COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY

(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET NUMBER

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PERSONALISED AUDIO-VISUAL AID

the specification of which (check only one item below):

☒ is attached hereto.

☐ was filed as United States application

Serial No. _____

on _____

and was amended

on _____ (if applicable).

☐ was filed as PCT international application

Number _____

on _____

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY or PCT INDICATOR PCT I	APPLICATION NUMBER	DATE OF FILING day month year	PRIORITY CLAIMED UNDER 35 USC 119
PCT	PCT/AU92/00253	1 JUNE 1992	☐ YES ☒ NO
AUSTRALIA	PK 6405	30 May 1991	☐ YES ☒ NO
AUSTRALIA	19259/92	1 June 1992	☐ YES ☒ NO
EUROPE	92911409.8	1 June 1992	☐ YES ☒ NO
New Zealand	245082	1 June 1992	☐ YES ☒ NO

Combined Declaration For Patent Application and Power of Attorney (Continued)

ATTORNEY'S DOCKET NUMBER

Includes Reference to PCT International Applications

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS (Check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
08/146016	21 April 1994		X	
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)		

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

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201	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
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	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
202	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201

DATE

18 January 1996

SIGNATURE OF INVENTOR 202

DATE

SIGNATURE OF INVENTOR 203

DATE

Applicant or Patentee: RICHARD JOHN BAKER Attorney's
Serial or Patent No.: _____ Docket No.: _____
Filed or Issued: _____
For: PERSONALISED AUDIO VISUAL AID

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9 (f) and 1.27 (b)) — INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9 (c) for purposes of paying reduced fees under section 41 (a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled PERSONALISED AUDIO VISUAL AID described in

- ☒ the specification filed herewith
☐ application serial no. _____, filed _____
☐ patent no. _____, issued _____

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9 (c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9 (d) or a nonprofit organization under 37 CFR 1.9 (e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ no such person, concern, or organization
☐ persons, concerns or organizations listed below*

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME _____
ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME _____
ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME _____
ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28 (b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

RICHARD JOHN BAKER

NAME OF INVENTOR NAME OF INVENTOR NAME OF INVENTOR


Signature of Inventor Signature of Inventor Signature of Inventor

Date 18 January 1996 Date Date