single cassette control button may be used to provide multiple functions such the "Eject" and "Stop" features. The mechanisms controlling these functions are well know in the audio cassette player prior art, and therefore are not further described herein.

Referring now to FIG. **3**, a cut-away view of the fully-assembled, interactive audio-visual toy **100** is shown. The stand portion **121** houses (i) the audio cassette drive mechanism **130** coupled to a printed circuit board **150** and proximate to the AV cassette slot and (ii) an audio speaker **147**. The drive pins **131** and **132** of the audio cassette drive mechanism **130** engage the reels of the audio cassette tape **117** when the AV cassette **110** is inserted into the AV cassette carrier **124** (FIG. **1**). The audio cassette drive mechanism **130** includes the read heads to read recorded information (e.g., audio and/or control) from the tape and couple the information to a control circuitry (illustrated as **180** in FIG. **5**) coupled to the printed circuit board **150**. Depending on the format of the information, it may be converted (if recorded as digital information) or simply routed (if recorded as analog information) to the audio speaker **140** which produces audible audio.

The stand portion **121** further houses a power supply **160** and a pictorial drive control mechanism (shown in FIG. **4**) to control the indexing of the picture scroll. The power supply **160** may include, but is not limited to, a number of D-cell batteries as found in conventional toys to provide portability. It is contemplated, however, that the power supply may also include an AC-DC adapter to convert AC power from a source (e.g., a wall-socket) into low voltage DC power if the interactive audio-visual toy **100** is being used within a residence to conserve battery power.

Referring now to FIG. **4**, a cut-away face view of the fully assembled, interactive audio-visual toy **100** illustrating the pictorial drive control mechanism that controls the automatic rotation of the rollers **112** and **113** for indexing the picture scroll **114** may be seen. It is contemplated that any well-known pictorial drive control mechanism may be employed in the interactive audio-visual toy **100**, provided the unwinding of the picture scroll **114** from the first or second roller **112** or **113** is equal to the amount of picture scroll **114** wound by the second roller **113** or first roller **112**, respectively.

As shown in FIG. **4**, the pictorial drive control mechanism **170** of this embodiment includes a motor **171** (which could be a stepper motor or a small gear motor) rotationally coupled to a first pulley **172**. The first pulley **172** is rotationally coupled to the scroll drive pin **126*a*** through a one-way drive which disengages if the first pulley **172** is driven in the clockwise direction, and is further coupled to a belt **173** to drive a second pulley **174** to rotate the scroll drive pin **126*b*** through an opposite direction one-way drive which disengages if the second pulley is driven in the counterclockwise direction. The direction of motor rotation and its powered duration are controlled by a controller as described for FIG. **5** and subsequently for FIG. **8**.

The operations of the pictorial drive control mechanism for automatic pictorial scene indexing (as well as manual pictorial scene indexing) are as follows. When the controller needs to index the picture scroll **114**, it applies power to the motor in the proper polarity to determine its rotational direction. In response, the motor **171** may rotate the first pulley **172** in a clockwise rotational direction. This causes the first pulley **172** to rotate the belt **173** coupling the first and second pulleys **172** and **174** in the clockwise rotational direction. The one-way drive to scroll drive pin **126*a*** however, disengages, and does not rotate the first roller **112** in the clockwise rotational direction. Instead, the belt **173** rotates the second pulley **174** in the clockwise rotational direction which, in turn, rotates the second roller **113** through the respective one-way drive. Hence, pictorial scene **116** printed on the picture scroll is rolled up on and indexed toward the second roller **113**. This unwinds the picture scroll **114** from the first roller **112** against a slight drag to maintain a slight tension in the scroll to allow another pictorial scene to be seen through the viewing window **115**. Reversal of the polarity of power on the motor will cause the scroll to similarly be rolled in the opposite direction.

The duration in which the motor is allowed to rotate the rollers **112** and **113** may be a specific time period, or so long as a scroll advance control button is pushed. However, it is preferred that the duration be controlled by sensor(s) employed within the base unit **120**.

An exemplary sensing system is shown in FIG. **6**. Here a light source/optical sensor **164** is shown below the AV cassette near the edge thereof, monitoring the picture scroll as the same is taken up or played out from one of the scroll reels. The sensor **164** is monitoring the printed side of the picture scroll, but at a longitudinal edge thereof not viewable through the viewing window **115** (FIG. **1**). An idle roller **165** of the AV cassette **110** is situated in line with the scrolling of the picture scroll **116** and opposite the sensor **164**. Thus, codes may be printed along this longitudinal edge of the scroll in flat black and white and read by the sensor **164** as the scroll is advanced or rewound to command the stopping of the scroll at each predetermined position. The codes would typically include a stop code at each desired scroll stopping position, and a screen identification code to identify the screen to assure synchronization of the audio with the screen by the control circuitry **180**. As an example, a bar code may be printed near an edge of the picture scroll **114** to be read by a bar code sensor to signal the controller to identify the screen and discontinue supplying power to the motor at the proper position.

Referring back to FIG. **5**, a cross-sectional view of the fully assembled, interactive audio-visual toy taken along lines **5—5** of FIG. **4** is shown. Mounted on the printed circuit board **150**, the controller **180** (e.g., microprocessor, micro-controller or any appropriate controlling device) transfers control signals to the audio cassette drive mechanism **130** in response to control signals received from the interactive control panel **125**, the cassette control panel **127**, the sensor **164** (if implemented) and/or the control (tone) signals on the audio cassette itself.

Although automatic indexing of the picture scroll through sensor-related mechanisms is preferred, it is contemplated that manual pictorial scene indexing is be used by implementing scene index buttons **128** and **129** as shown in FIG. **7**. When depressed by the user, the scene index buttons **128** and **129** index the picture scroll **114** to adjust a pictorial scene **116** to be visible through the viewing window **115**. The user is told when to index the picture scroll **114** through pre-recorded audio messages on the audio cassette tape. Unnecessary to manual pictorial scene indexing, the audio cassette tape does not require control information placed on its channels. Moreover, the controller powers and signals the motor to rotate the first and second rollers, based on control signals from circuitry associated with the scene index buttons, rather than the audio cassette drive mechanism.

Now referring to FIG. **8**, a block diagram of the overall control system of an exemplary embodiment of the present invention may be seen. As shown therein, a micro-controller