FIG. 3A is an alternate embodiment of a cartridge containing a roll having a story depicted therein in sequential frames and being provided with bar encoded information;

FIG. 4A is a segment of the story belt from the cartridge of FIG. 3 showing the first several pages of a story along with the bar coding of the interactive talking picture machine of FIG. 1, including multiple frame groups for branching;

FIG. 4B is a segment of the story belt from FIG. 4A including multiple rows of bar coding;

FIG. 4C is a continuation of the story belt of FIG. 4A;

FIG. 5 is a block diagram of the electronic functions of the electronic interactive talking picture machine of FIG. 1;

FIGS. 6–9 are the first four sequential pages or frames of an illustrative story which explain the operation of the interactive talking picture machine of FIG. 1;

FIG. 10 is a flow diagram for the story of FIGS. 6–9; and

FIG. 11A is a plan view, and FIG. 11B is a side elevation view of an alternative embodiment of this invention used for depicting cartoons or comic books with character movement.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1, 2 and 3 an interactive talking picture machine in accordance with the present invention is shown generally at 10. Interactive talking picture machine 10 comprises a top and bottom, preferably molded housing 12 having a cartridge cavity 14, allowing for cartridge to be slidably inserted so as to mate with said housing a speaker portion 16, and a controls section 18. A handle 20 is molded into the housing 12. In the preferred embodiment, a cartridge 21 comprising a window portion 23, a story roll or belt 40 and a protrusion 25. The protrusion 25 is shaped to mate with a slot 27 located in the cartridge cavity 14 which functions to retain the cartridge 21 therein. Spindles 29 also located in cavity 14 mate with spools 35 for advancing the story roll 40 forward. Spindles 29 are interconnected with either a crank (not shown) or a motor e.g. battery operated and controlled by a switch 24. The front surface of housing 10 also includes a reverse button 22, and interaction buttons 26 (YES) and 28 (NO). An ON/OFF slide switch for turning on system is optionally employed. The reverse button 22 operates to reverse direction of belt movement for review of a picture which will be more fully described hereinafter. The cartridge cavity 14 also includes a membrane key pad and in this embodiment, the membrane key pad comprises e.g, a platform 13 of (6)×(8) switches. A battery and motor mechanism is located in the bottom housing handle area. In accordance with an important feature of the present invention belt 40 also comprises bar coding which includes an encoded stopping point, speech, sound effects branching, and question and answer instructions for each frame which will be more fully described hereinafter.

In a less preferred embodiment shown in FIG. 2A a slot 30 leading to a chamber 31 for receiving a story cartridge 32 (FIG. 3A) is provided through upper surface 33 of housing 12. Cartridge 32 contains the story roll 40 and is advanced forward as previously described by either turning a crank (not shown) attached or by pressing switch 24 to energize a battery powered motor to advance the story belt.

As shown in FIG. 3A, a less preferable cartridge 32 comprises a molded plastic housing with a window 42 for viewing a picture or frame on the belt 40 which is movable between two rotatable spools 43 and 44. Of course, in a less complicated but more fragile form of this invention, rather than combining each story roll with a discrete cartridge (protective housing) or enclosure, the story rolls are placed on spools and (having bar coding thereon) are simply directly inserted into cavity 30 and operate in a manner similar to the music roll in a "player piano".

FIG. 5 is a block diagram depicting the electronic components housed within housing 10. These components include a microprocessor 60 powered by e.g. batteries 62 of power circuit 63. A crystal oscillating circuit 65 is also employed and communicates with microprocessor 60. A bar code reader 67 (optical sensor) (see also FIG. 2) and a sound transducer 68 also communicates with the processor 60. FIG. 5 also shows the four switches 22, 24, 26 and 28 as well as the display platform membrane key pad 13. It will be appreciated that "next" block sequencing function 24 may comprise a hand-crank or a motor drive system. All of the components shown in FIG. 5 are well known and readily commercially available. Examples of suitable components for the interactive talking picture machine of this invention are described in my earlier U.S. Pat. No. 5,026,058, all of the contents of which are incorporated herein by reference. The microprocessor preferably is a 4 bit microprocessor with self contained Ram and Rom, for example, Hitachi HM C44 or National semi conductor's Cops 400.

In accordance with the present invention, stories can be created as if they were books. The stories are inexpensively written, type-set and printed preferably on paper belts 40. To protect the belt one could laminate a plastic film over the paper belt 40 which can be up to any suitable length that will fit within the cartridge 21 or preferably use a thin clear plastic, e.g. polycarbonate, for window for 23.

Referring to FIGS. 4A and 4C, preceding each page or frame (e.g. first nine inches) is the appropriate coding for that frame which is preferably a bar coding 54 or some other photo-optically sensed code. The initial section of each roll (e.g. first nine inches) includes only a bar code (which loads the sound, and other data) and the next section (e.g. three inches) includes the picture or frame which should be visible through the window 23. Each subsequent picture will be preceded by enough space to enable sufficient bar coded data for that picture. The number of alternative stories which are operable at a given time determine the number of side by side pages (hereinafter called a frame or page group). Each page in a group is for a different branch of the story. The bar code for the main story could be, for example, the highest or second row 58 row at the middle of the belt. The first story branch would in this example use the second page of each group, and the second row of bar code. In the case of a single optical sensor 66, to read the code for the first branch, the selection key could lower the cartridge slightly (i.e., ⅛th of an inch), to position the second row of bar code over the optical sensor. However, the preferred method is to use a single sensor in combination with a single row of bar code 54 and use "start" and "stop" codes within bar code 54 to distinguish the first set of data and the second corresponding to the main and the branch pictures. In a less preferred method multiple rows of bar coding are employed and multiple sensors 66 (FIG. 2) are also employed (see FIG. 4B).

An index or start and stop code is employed which tells the microprocessor 60 to start saving data from a certain point and stop at an ending point. Thus branching info is just part of a long stream of data folded into one, two or more lines. Once the microprocessor "knows" what branch to use it stops the motor at the appropriate place. For use with a