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<p>(21) International Application Number: PCT/US95/02327</p> <p>(22) International Filing Date: 24 February 1995 (24.02.95)</p> <p>(30) Priority Data: 08/201,677 25 February 1994 (25.02.94) US</p> <p>(71)(72) Applicants and Inventors: D'AMICO, Joyce, Links [US/US]; 61143 Dogwood Drive, LaCombe, LA 70445 (US). JIN, Ko [-/-]; 24 Estate Court, South San Francisco, CA 94080 (US).</p> <p>(74) Agent: PUGH, C., Emmett; 4917 St. Charles Avenue, New Orleans, LA 70115 (US).</p>		<p>(81) Designated States: AU, BR, CA, CN, KR, MX, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>
<p>(54) Title: AUDIOPLAYBACK SYSTEM WITH INTERRELATED VISUAL DISPLAY USING STATIC CARD "SOFTWARE"</p>		
<p>(57) Abstract</p>		
<p>An audio playback unit (10) and a series of plastic audio "software" cards (20) each containing an embedded voice synthesizer chip (21) with memory, such as a single-chip synthesizing CMOS VLSI that can synthesize voice. The integrated chip contains most of the necessary circuitry for voice reproduction. An interrelated colored pictorial or graphic image and information indicia (23) are printed on the audio card, which is as flat as a regular credit card. A light, hand-held audio playback unit (10) plays the audio data stored on the audio card through a speaker (13). When the audio card is inserted into and held stationary in the slotted area (11) of the playback unit, the audio card's indicia is viewable through the playback unit's window (14).</p>		

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- 1 -

**Audio-Playback System With Interrelated Visual Display
Using Static Card "Software"**

Technical Field

5 The present invention relates to an electrical audio
playback system which uses a relatively thin, static card
for the audio "software". During playback the audio card,
which contains an embedded sound or voice synthesizer chip
with programmed, audio data (typically a voice message)
10 stored in memory, is held static within the playback unit,
preferably while a face of the card which includes interre-
lated visual indicia is displayed or is viewable during the
audio playback. The card's internal sound or voice
synthesizer chip thus has internally stored within it audio
15 data, preferably voice or other pertinent recording, which
is interrelated to the visual indicia on the exterior of
the card.

Background Art

20 It is known to use compacts disks (CDs), tape cas-
settes, etc., as the "software" media which contain audio
"tracks" or recordings to be played back when desired using
appropriate electrical playback devices. However, in such
systems there are moveable parts, and in particular the
25 software media typically is rotated or otherwise moved
during playback. Additionally, although some informational
indicia is usually contained on the exterior of the
software media (CD) or the container (cassette) for the

- 2 -

software media, such is not usually visible or on display during playback.

The present invention overcomes these drawbacks, as well as other problems, of the prior art, by providing in its preferred embodiment a small, light playback unit which uses small, relatively thin cards, preferably similar in size to a plastic credit card, having fixed sound or voice synthesizer chips within them, containing the audio information or data to be played back, while also preferably having on at least one of its faces visual information or graphical indicia which is displayed in a window or through an opening in the unit during playback. The card is held stationary during playback.

In another, non-analogous art, it is known to have so called "Smart Cards" which are used, for example, for banking purposes and have an embedded memory chip that stores, for example, a customer's credit related information, which can be accessed and manipulated using appropriate, supplemental computer systems and updated as it is used. "Smart Cards" have no audio capability.

In contrast, the audio cards of the present invention are directed specifically to their audio capabilities and include much more than mere memory chips but instead use audio data stored in connection with a voice synthesizer chip containing in an integrated fashion significant voice playback circuitry, in addition to programmable memory, which audio data typically would not change once initially

- 3 -

programmed with, for example, a person's voice message.

Also, none of the uses of the "Smart Cards" has been analogous to that taught in the present invention nor is an audio playback unit such as that used in the present
5 invention used in connection with the known "Smart Cards," which instead requires the use of complex computer systems at very great expense. In short, the audio cards of the present invention are totally different from the "Smart Cards" and the supplemental equipment used with the
10 respective cards are likewise totally different.

- 4 -

General Summary Discussion of Invention

Thus, the present invention is directed to an audio playback system using a relatively thin card containing an embedded audio or voice synthesizer chip which is held static or stationary during playback, preferably with a face of the card being viewable during playback through a window or opening in the playback unit during playback of the audio data contained in the sound or voice synthesizer chip. The viewable face of the card preferably contains some graphical information or indicia interrelated to the audio data stored in the chip.

An exemplary application is a series of "software" playback cards on which are displayed on each a different picture or other graphical indicia, similar to, for example, a "baseball card," with the audio data for that card containing, for example, a message from the player in the player's own voice, and/or a recording of a related key event (e.g. a "World Series" winning home run with crowd reaction and announcer's comments, etc.) involving the player, and/or an announcer providing information about the player. The user could purchase or otherwise acquire and collect a related series of such cards for individual playback of the audio data or information when desired, with simultaneous viewing of the graphical indicia or picture with pertinent printed information.

The foregoing, of course, is merely exemplary of the many, nearly numberless possible applications for the

- 5 -

invention.

The playback unit is relatively light weight and small, being holdable, for example, in the palm of the user's hand and preferably can be easily carried about in, 5 for example, the user's pocket for ready availability when desired. When playback is desired, the user merely selects a desired card, inserts it into a slot in the playback unit, preferably with the graphical indicia or picture on the card viewable through a window or opening. The 10 circuitry in the unit is activated, playing the audio data in the sound chip on the card through an internal speaker or, if desired, headphones. After the use of the card has been completed, it is removed and another card can be inserted to listen to its audio message or data while 15 viewing its interrelated picture, and the process repeated until the user is finished.

It is thus an object of the invention to provide an audio playback system which uses statically held or stationary cards containing the audio "software" to be 20 played back.

It is a further object of the invention to provide such a system preferably with graphical or pictorial indicia on at least one face of the card which is interrelated to the audio data on each card and preferably can be 25 viewed or seen while the audio data on the static card is being played back.

It is a still further an object of the invention to

- 6 -

provide such cards in related series or groupings, each one of which contains different audio data and interrelated pictorial or graphical indicia.

- 7 -

Brief Description of Drawings

For a further understanding of the nature and objects of the present invention, reference should be had to the following detailed description, taken in conjunction with the accompanying drawings, in which like elements are given the same or analogous reference numbers and wherein:

Figure 1 is a perspective view showing a "software" card with its internal sound or voice synthesizer chip, with the card being inserted into a generalized, simplified playback unit so that the external contacts (shown in phantom line) on the underside of the card are contacted and engaged by the spring contacts within the slotted aperture of the playback unit to allow the audio data stored in the voice synthesizer chip ultimately to be played back while the pictorial indicia on the card is viewable through an opening or window in the unit.

Figure 1A is a plan view of an exemplary "software" card having exemplary graphical or pictorial indicia on one of its faces, which indicia is viewable when the card's audio data is played back in the playback unit of the exemplary embodiment of the system of the invention illustrated in the following figures.

Figure 2 is a schematic view of exemplary playback and amplification circuitry for the playback unit of the exemplary embodiment of the invention.

Figure 3 is a plan view of a playback unit of the exemplary embodiment of the system of the present invention

- 8 -

showing its slotted card window, speaker and basic controls.

Figure 4 is a plan view of the exemplary embodiment of Figure 3, similar to Figure 3, but with the internal housing structure of the playback unit housing shown in phantom line; while

Figures 5-8 are left-side, right-side, top-end and bottom-end views, respectively, of the playback unit of Figures 3 & 4, with the side views showing the internal structure of the playback unit housing in phantom line. It is noted that in Figure 8 the playback unit is up-side down.

- 9 -

Exemplary Mode for Carrying Out the Invention

As can be seen in the generalized view of Figure 1, the exemplary embodiment of the present invention includes an audio playback unit 10 and an audio "software" card 20
5 containing an embedded voice synthesizer chip 21, such as, for example, the Mosel MSS2201 or MSS2202 voice synthesizer (voice ROM) integrated chip having external, gold, electrical contacts or surface tabs 22a-h. This exemplary chip is commercially available from MOSEL (3F., No. 52, Park
10 Avenue II Rd., Hsinchu Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.).

This exemplary chip is a single-chip synthesizing CMOS VLSI that can synthesize voice for varying lengths of time using the PCM qualified coding method. The integrated chip
15 contains most of the necessary circuitry for voice reproduction, including an oscillator, PLA, D/A converter, sequence control logic and interface circuitry for key switch and microcomputers, for voice or other sound data of about, for example, twenty-two (22) or more seconds in
20 duration. Longer, as well as shorter, times are also possible, although a twenty-two to sixty-six (22-66) seconds capability is typically sufficient for the particular, preferred use presently planned.

The voice or audio card 20, typically made of plastic,
25 is very light and thin, comparable in size to a charge card (e.g. "VISA," "Master Card," etc.) or a cardboard card having exemplary face dimensions of two hundred and twenty-

- 10 -

five by three hundred and twenty-five (225x325 mm) millimeters and a thickness of about a millimeter (1 mm). The exemplary audio card 20 is as flat as a regular credit card (and the same size but thinner including the embedded chip 5 21) or trading card and stores all of the memory and voice or other audio data needed for a significant amount of audio data in the form of, for example, a synthesized voice message.

The chip 21 is embedded in the plastic card 20 doing 10 the manufacturing of the card in a process known in the industry, the details of which are not part of the present invention.

As can be seen in Figure 1A, the card 20 preferable has printed on at least one face a colored pictorial or 15 graphic image and information indicia 23, which in the exemplary illustration is a color printed picture of Roger Clemens of the Boston Red Sox in a pitching motion, while the voice synthesizer chip 21 has stored within it via "software" programming the speaking voice of Mr. Clemens 20 providing a voice message to the user for playback. The audio data stored in the chip 21 and the pictorial image 23 are thus interrelated together.

The cards (an exemplary one being the card 20) can be provided in a logically grouped series of, for example, 25 baseball players, football players, or other sports figures, celebrities, political figures, etc. The cards likewise could be used for educational, as well as other,

- 11 -

purposes. The memory units of the cards 20 can be programmed with messages or other audio of different lengths from a number of seconds to minutes and can have thousands of specific embodiments, varying in style, content and application.

The generalized base or playback unit 10 includes a slotted area 11, into which the card 20 is inserted for playing back its stored audio data, which typically will include synthesized voice data. The chip 21 and its stored data is accessed by the suitably positioned and dimensioned spring contacts 12a+, which electrically interface with and mechanically engage the appropriate ones of the card's external electrical contacts 22, it being noted that there are more external card contacts 22a-h, namely, eight (8), than the five (5) needed for the purposes of the playback unit 10.

The housing of the particular, exemplary playback unit 10 of Figures 3-8 includes appropriate power & amplifying circuitry such as that illustrated in Figure 2, preferably mounted on a circuit board, driving a speaker 13 for playing back the audio data stored in the chip 21. Alternatively or conjunctively, a headphone jack could be included in the housing for privately listening to the audio playback.

An "On/Off" switch 15 and "Play" button 16 are included, for example, on the top of the unit 10 to activate the unit when it is desired to play back the audio

- 12 -

data programmed into the chip 21 of a card, whose end is inserted into the slotted area 11. Preferably a sliding or, alternatively, a rotatable volume control (not illustrated) could also be included, if desired, to control the volume level of the voice or other audio being played back by the unit. Internal DC batteries are included to power the unit, and an AC power unit with a transformer AC-to-DC converter can also be provided as an alternate power source through an appropriate jack provided on the exterior of the playback unit's housing.

When the proper end of the card 20 is inserted into the slot area 11 of the playback base unit 10 for playback, graphical or pictorial indicia is viewable through the transparent window 14. This concurrent playback and viewing of the interrelated audio data and indicia significantly enhances the user's enjoyment in using the system. The presence of the pictorial indicia on the upper, main face of the card 20 assists in guiding the user as to the proper orientation of the card when it is inserted in the playback unit.

The particular, exemplary playback unit 10 of Figures 3-8 is very light, having a weight of only some ounces, with exemplary dimensions of sixty-five by one hundred and twenty-five by seventeen and a half (65x125x17.5 mm) millimeters. This allows the unit 10 to be easily held in, for example, the palm of the user's hand and to be readily portably stored between uses in, for example, the user's

- 13 -

pocket.

It is noted that the embodiment described herein in
5 detail for exemplary purposes is of course subject to many
different variations in structure, design, application and
use. Because many varying and different embodiments may be
made within the scope of the inventive concept(s) herein
taught, and because many modifications may be made in the
10 embodiment herein detailed in accordance with the descrip-
tive requirements of the law, it is to be understood that
the details herein are to be interpreted as illustrative
and not in a limiting sense.

- 14 -

Claims

1. A playback system for stored audio data, comprising:

5 at least one, relatively thin card having a voice synthesizer chip embedded therein with audio data stored therein and having a set of external electrical contacts for electrically outputting said audio data; and

10 an associated playback unit having at least a partial slot therein of a suitable size and dimension to receive at least one edge of said card and hold said card statically in position while its audio data is played back through said unit, a set of playback electrical contacts associated with said slot and positioned and dimensioned to mechanically interface with said external electrical contacts on said card, said unit containing electrical, 15 amplifying and playback circuitry connected to said electrical contacts associated with said slot, said circuitry being suitable for receiving said audio data and playing it back ultimately through at least one speaker while the card is statically held during playback.

- 15 -

2. The playback system of Claim 1, wherein:

said card includes two main faces, at least one of said faces having graphical indicia thereon related to said audio data; and

5 wherein said unit has:

a viewable area associated with said slot of a size and dimension allowing said graphical indicia to be viewed while said card is inserted in said slot and has its audio data played back through said unit.

3. The playback system of Claim 1, wherein:

said playback unit is relatively small, holdable in the palm of the user.

4. The playback system of Claim 1, wherein:

said embedded chip includes an oscillator, PLA, D/A converter, sequence control logic and interface circuitry.

- 16 -

5. The playback system of Claim 1, wherein said playback unit:

includes a housing having a printed circuit board contained therein, said circuitry being incorporated into said printed circuited board.

6. The playback system of Claim 5, wherein:

said playback unit has over-all dimensions of the order of about sixty-five by one hundred and twenty-five by seventeen and a half (65x125x17.5 mm) millimeters.

7. The playback system of Claim 1, wherein:

said card has over-all dimensions of the order of about two hundred and twenty-five by three hundred and twenty-five (225x325 mm) millimeters and a thickness of about a millimeter (1 mm).

8. The playback system of Claim 1, wherein:

said slotted area has an area sufficient to hold at least one end of the card within it.

9. The playback system of Claim 8, wherein:

said slotted area has a transparent window cover through which said card can be viewed while it is being played back.

- 17 -

10. A method of playing back stored audio data, comprising the following steps:

5 a) providing at least one, relatively thin card having a voice synthesizer chip embedded therein with audio data stored therein and having a set of external electrical contacts for electrically outputting said audio data;

10 b) providing an associated playback unit having at least a partial slot therein of a suitable size and dimension to receive at least one edge of said card and hold said card statically in position while its audio data is played back through said unit, a set of playback electrical contacts associated with said slot and positioned and dimensioned to mechanically interface with said external electrical contacts on said card, said unit
15 containing electrical, amplifying and playback circuitry connected to said electrical contacts associated with said slot, said circuitry being suitable for receiving said audio data and playing it back ultimately through at least one speaker while the card is statically held during
20 playback; and

c) inserting said card into said slot mechanically and electrically interfacing said external electrical contacts with said playback electrical contacts; and

25 d) activating said playback unit to playback the audio data stored in said card through said speaker while holding said card stationary.

- 18 -

11. The method of Claim 10, wherein there is further included the step of:

5 providing at least one of the faces of said card with graphical indicia thereon related to said audio data, and providing said playback unit with a viewable area associated with said slot of a size and dimension for viewing said graphical indicia; and

displaying said graphical indicia for viewing in said viewable area while said card is inserted in said slot and has its audio data played back through said unit.

12. The method of Claim 11, wherein there is further included the step of:

providing a multiple number of said cards each with different audio data and interrelated graphical indicia forming a related set of cards.

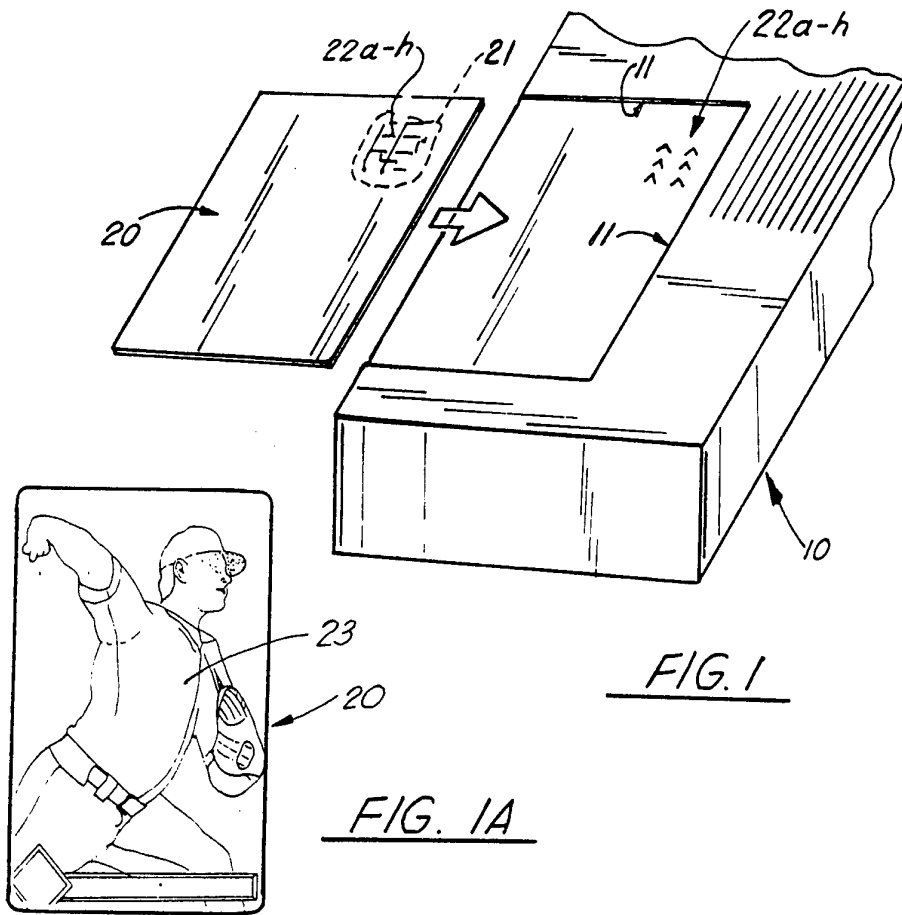


FIG. 1

FIG. 1A

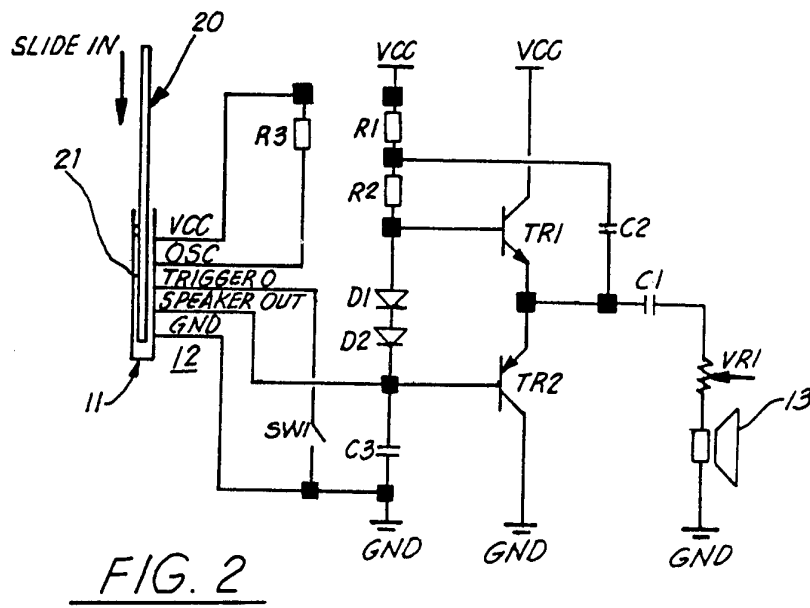
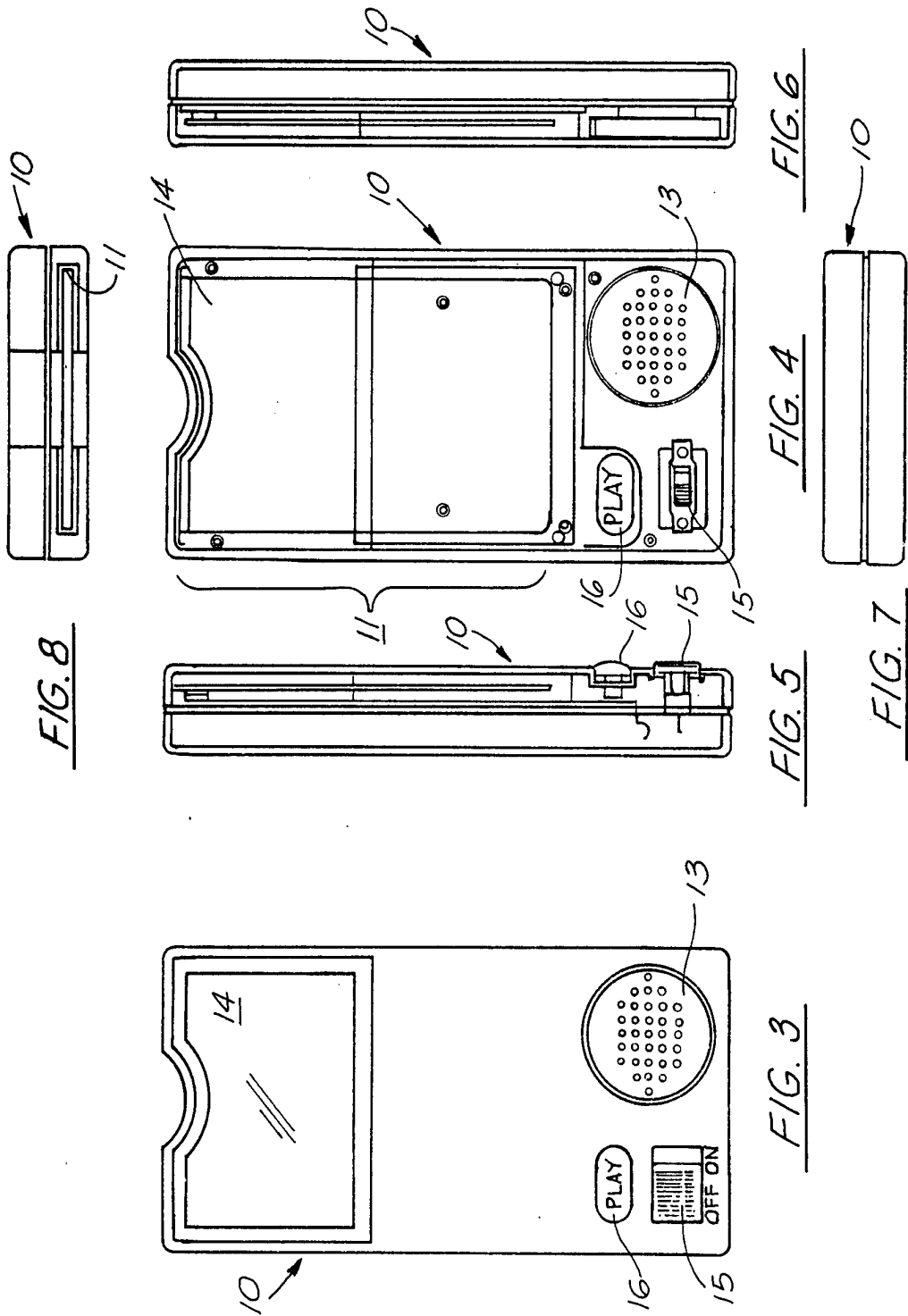


FIG. 2



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/02327

A. CLASSIFICATION OF SUBJECT MATTER		
IPC(6) :G10L 9/00 US CL :395/2.81; 40/455 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 395/2.67, 2.79-2.81; 381/51; 40/124.1, 152, 156, 455, 906; 446/147-152; 273/308; 364/410; 369/68		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P ---- Y,P	US, A, 5,365,686 (SCOTT) 22 November 1994, Figs. 1-6; col. 2, line 13 - col. 3, line 22; claims 1, 2, and 5.	1-3, 5, 8, 10-11 ---- 4, 6-7, 9, 12
Y	Information Storage Devices ISD1012A/1016A/1020A, February 1992, page 1, Block Diagram.	4
Y	US, A, 5,179,517 (SARBIN ET AL.) 12 January 1993, Fig. 2; col. 2, lines 49-61.	1, 3-4, 7, 10, 12
A	US, A, 4,648,086 (KIOKE) 03 March 1987, Fig. 1.	1-12
A	US, A, 5,048,327 (TARLOW ET AL.) 03 September 1991, Figs. 3-5.	1-12
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* *A* *E* *L* *O* *P*	Special categories of cited documents: document defining the general state of the art which is not considered to be part of particular relevance earlier document published on or after the international filing date document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed	*T* *X* *Y* *&* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art document member of the same patent family
Date of the actual completion of the international search 14 APRIL 1995		Date of mailing of the international search report 27 JUN 1995
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/02327

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 5,056,145 (YAMAMOTO ET AL.) 08 October 1991, Fig. 2.	1-12