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(54) **APPARATUS, SYSTEM AND METHOD FOR RECORDING AND/OR RETRIEVING AUDIO INFORMATION**

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G10L 13/02 (2006.01)

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(58) **Field of Classification Search** 704/270, 704/272
See application file for complete search history.

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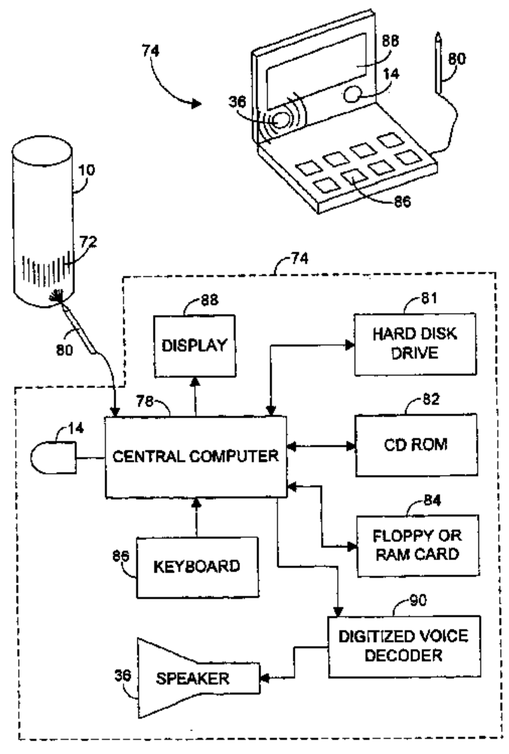
(57) **ABSTRACT**

An apparatus, system and method is provided for recording and retrieving voice information into a label attachable to a product. The voice information provides a more readily identifiable indicator of the characteristics or contents of the product than conventional written information or labels attached to the product. The label can be accessed from voice information submitted into or from a remote programmer attachable to, or in communication with, the label.

39 Claims, 4 Drawing Sheets



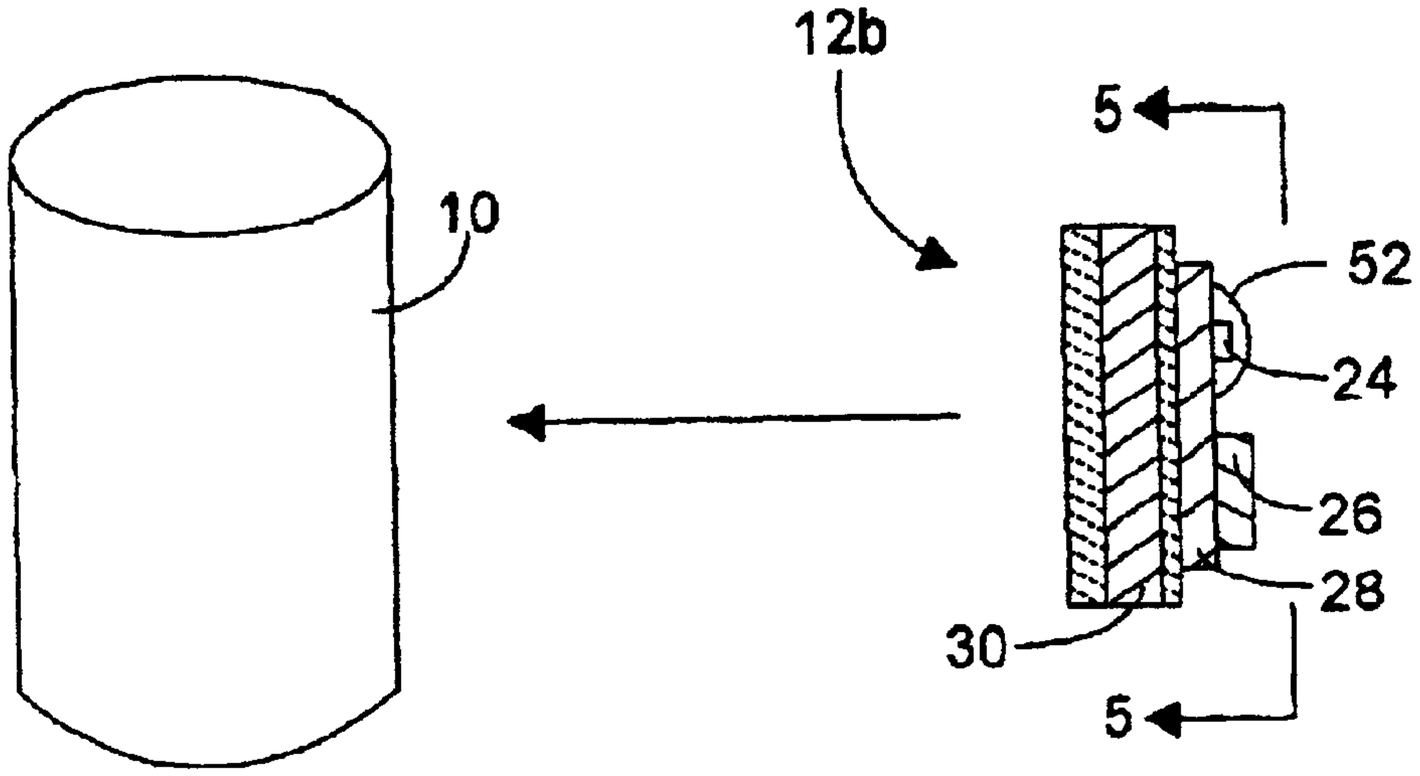


FIG. 1

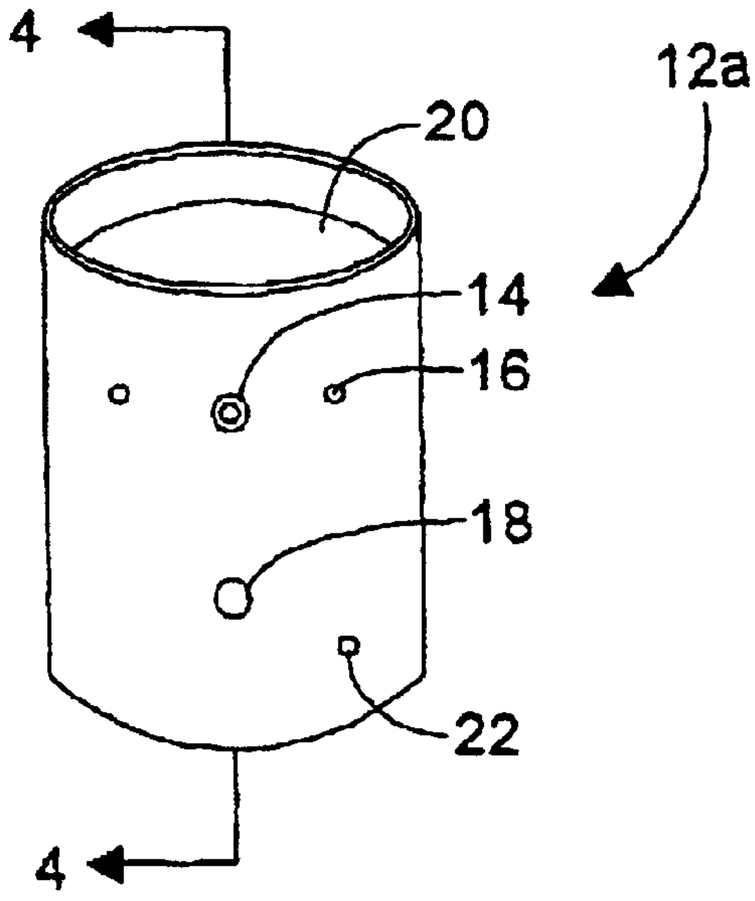


FIG. 2

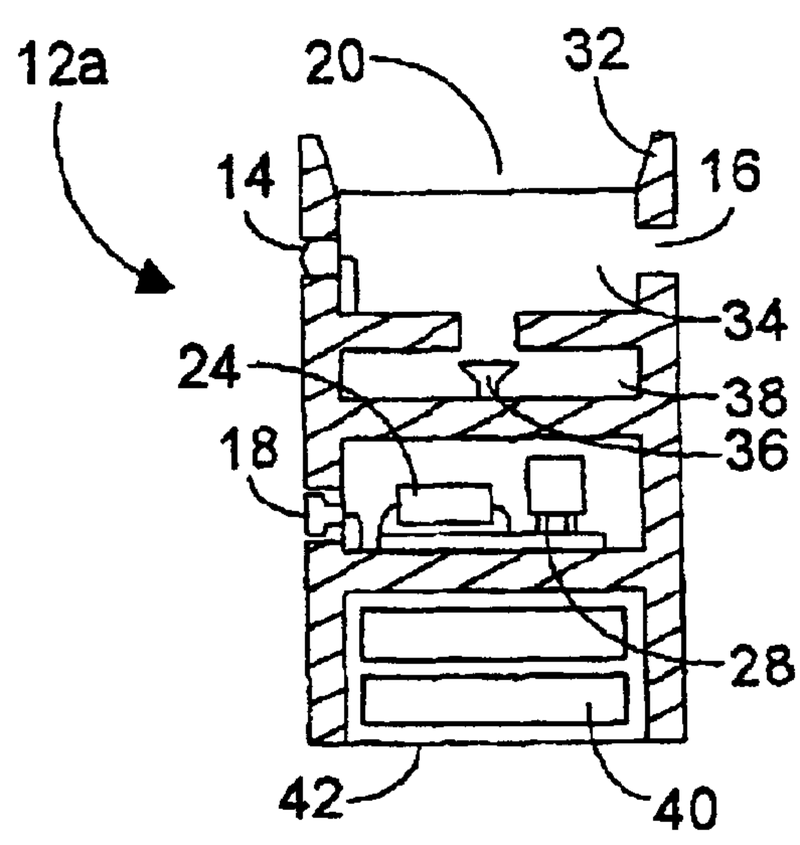


FIG. 3

FIG. 4

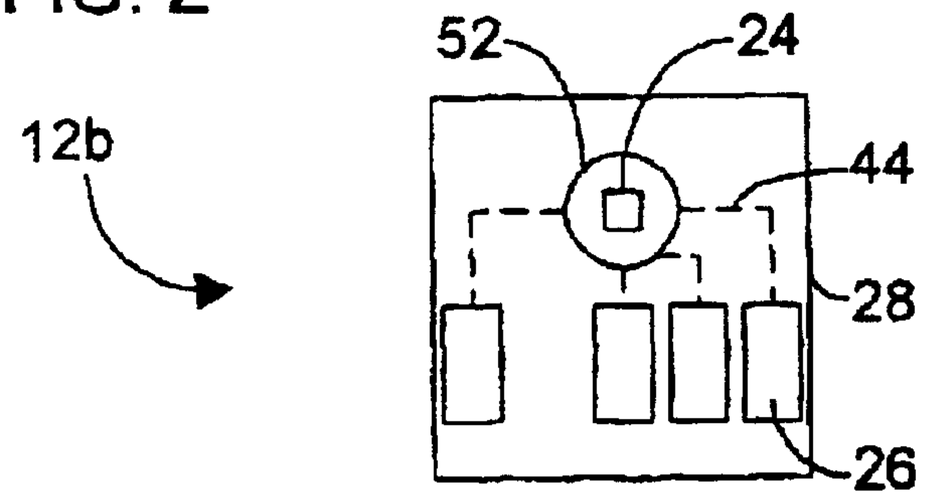


FIG. 5

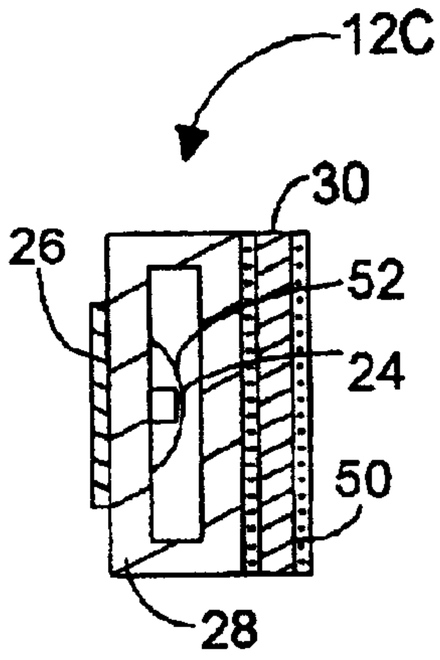


FIG. 6

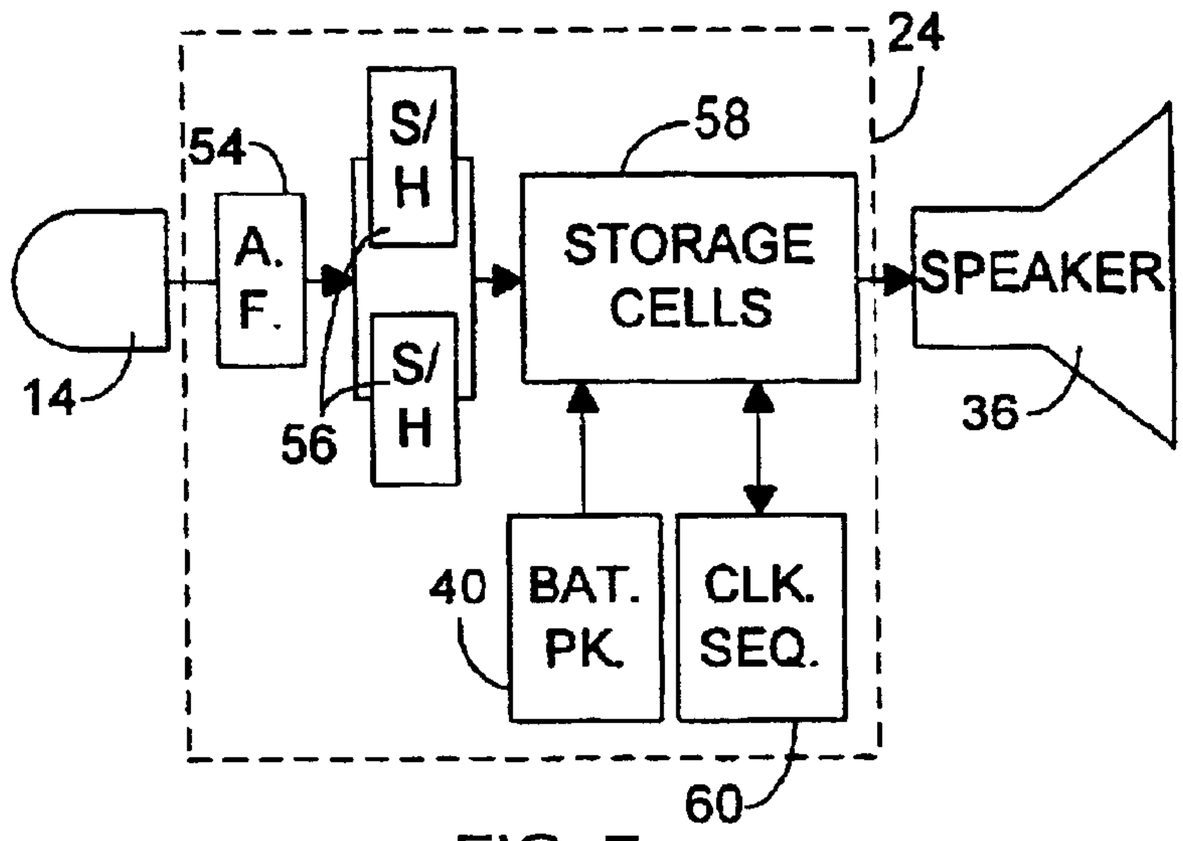


FIG. 7

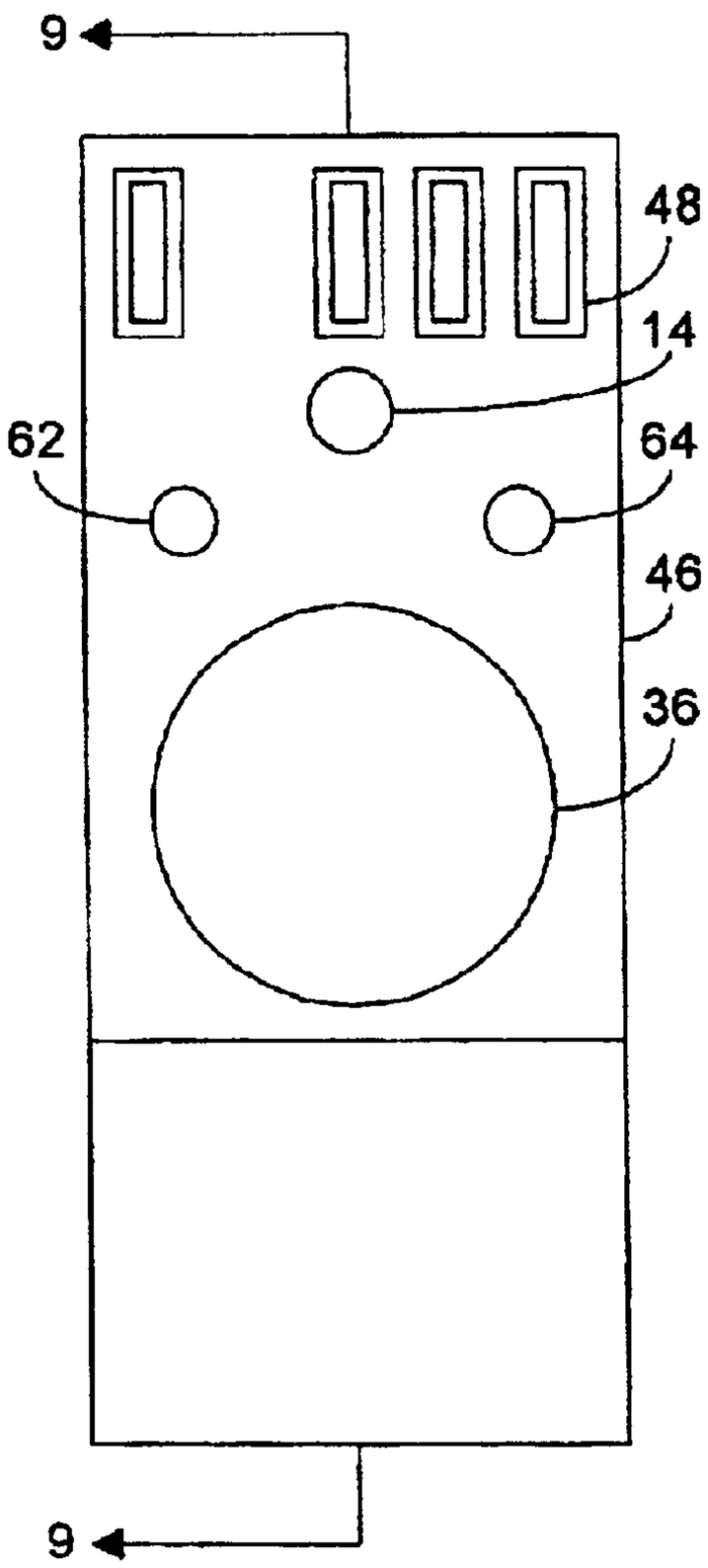


FIG. 8

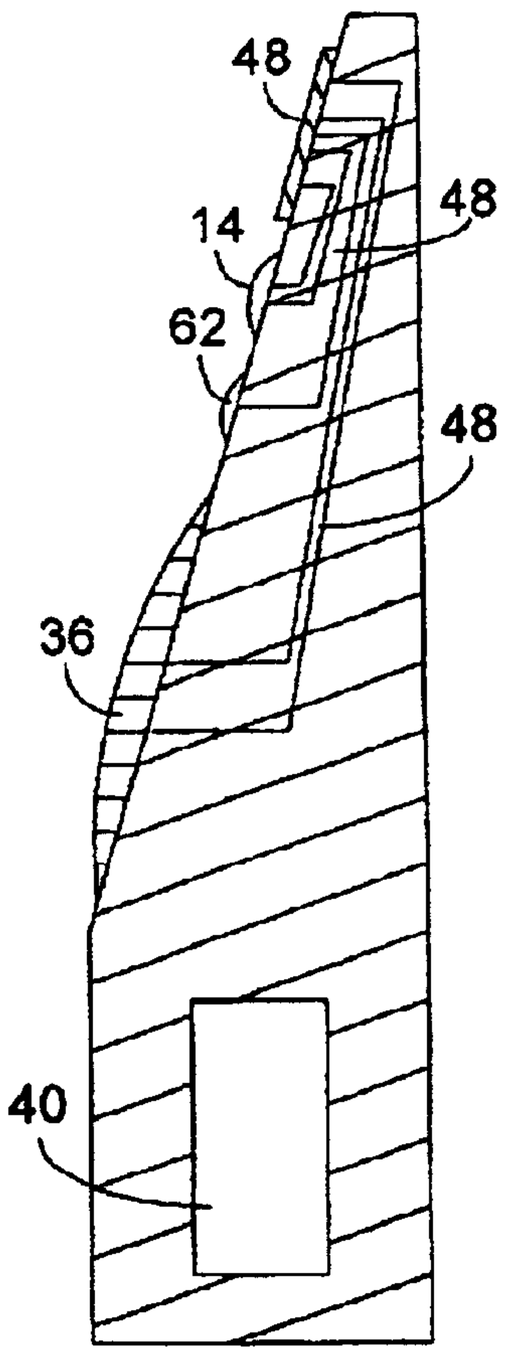


FIG. 9

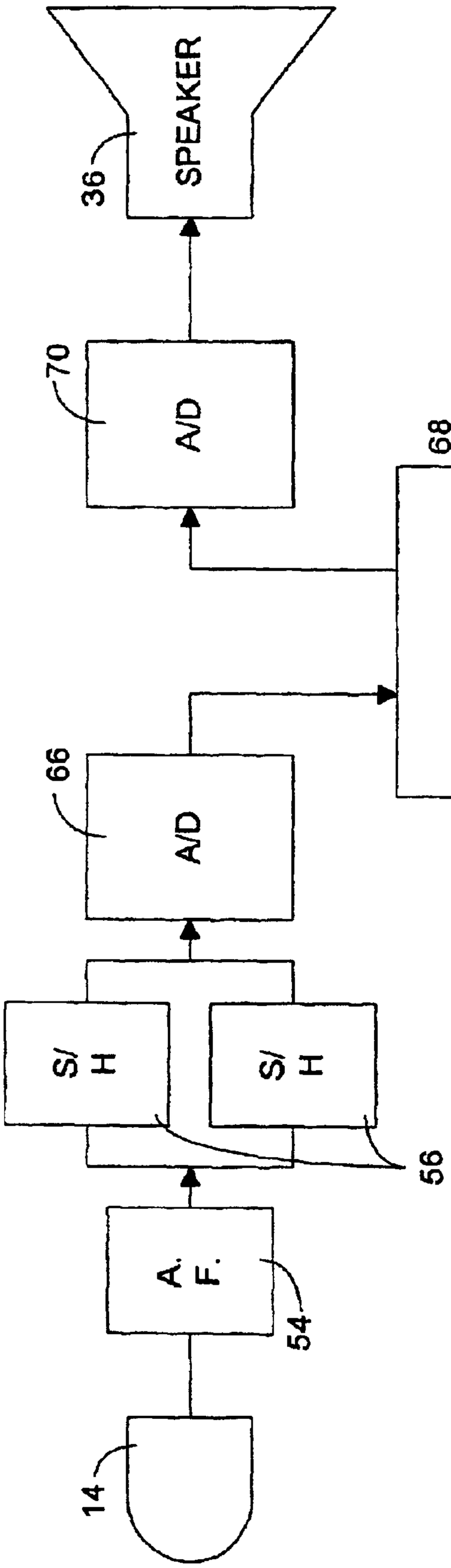


FIG. 10

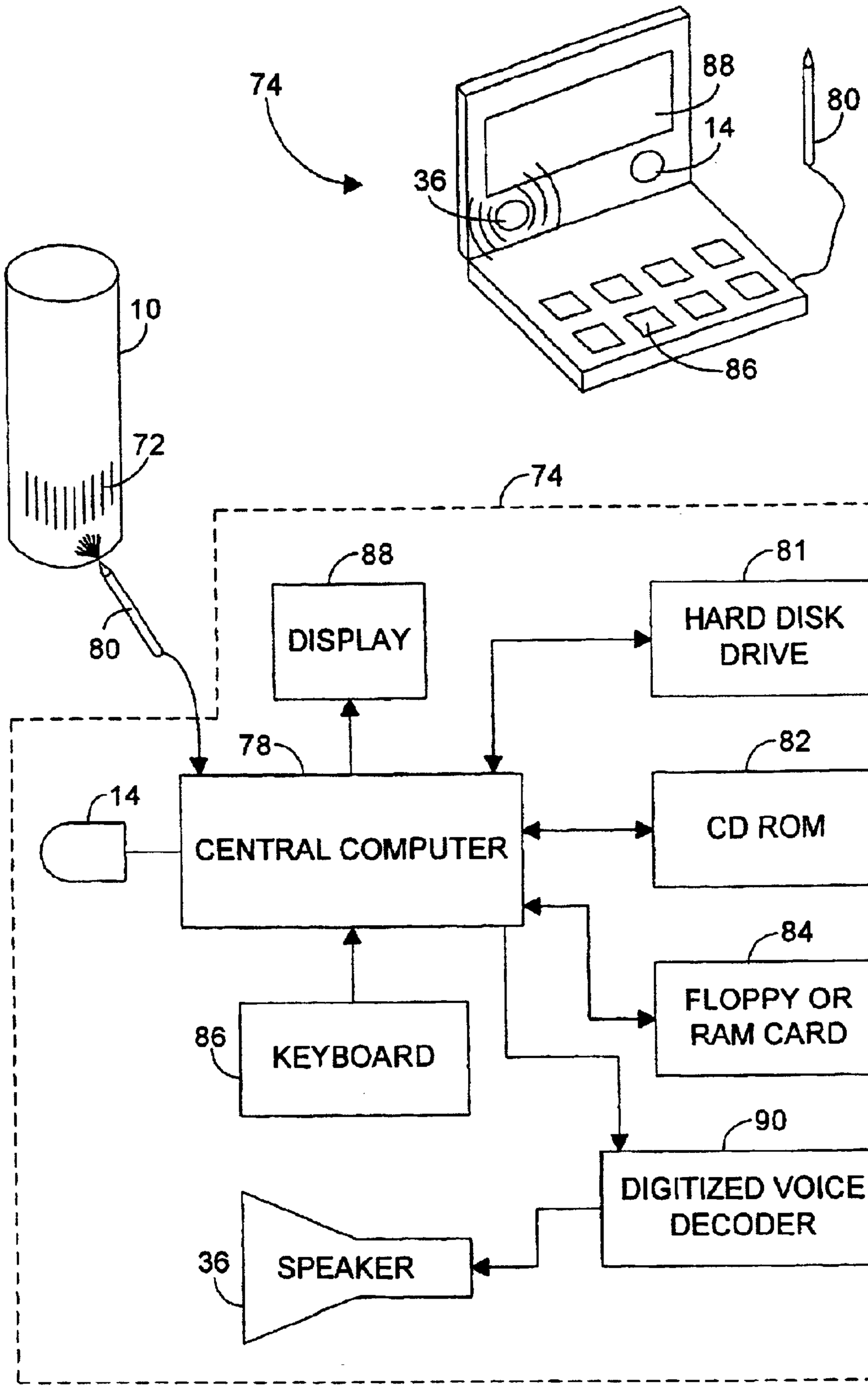

74
88
80
14
36
86
10
72
74
88
DISPLAY
81
HARD DISK DRIVE
78
82
14
CENTRAL COMPUTER
CD ROM
84
FLOPPY OR RAM CARD
86
KEYBOARD
90
DIGITIZED VOICE DECODER
36
SPEAKER

FIG. 11

APPARATUS, SYSTEM AND METHOD FOR RECORDING AND/OR RETRIEVING AUDIO INFORMATION

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an apparatus, system and method for recording and/or retrieving audio information. It particular, the apparatus, system and method hereof acts as an audio label for voice identifying a product to which the label can be attached.

2. Description of the Relevant Art

Identity, contents and instructions for use or assembly of a product are often written in a manual associated with the product or on a label attached to the product. Written information in manuals or on labels are provided on almost every product available to help the consumer or user of the product identify the product and the proper use of that product. While written information is satisfactory for the majority of people, written information is sometimes meaningless to the visually impaired or illiterate consumer. Pursuant to Americans With Disabilities Act of 1990, and similar regulations relating thereto, counseling of impaired consumers as to certain products may require that information regarding the product be presented in other than written form.

As the expected life span of the population increases, the number of elderly people who are visually impaired also increases. Often times, elderly people have difficulty reading simple instructions regarding the products necessary for their continued well being. Such products certainly would include prescription medicants having labels which dictate time and quantity of dosage. Moreover, immigrants, or people of which the native language is unrecognizable or is their second language, those people require help in understanding information about a product. Often times, immigrants learn to speak their new language before they can read or write the language. Similar to elderly people, immigrants may also find it less difficult to recognize and understand audio information as opposed to counter-part written information.

With the rapid rise in both immigrant and elderly population, it is important that product information be brought to their attention in a simple, easily recognizable fashion. Misinformation regarding attain products could prove hazardous to the ill-informed buyer or user. It is therefore important that the information being fed to the user or buyer be one that he or she is most familiar with and therefore can, be more easily recognized.

SUMMARY OF THE INVENTION

The problems outlined above are in large part solved by the apparatus, system and method of the present invention. That is, the recording and/or retrieving apparatus, system and method hereof provides easily recognizable audio information to the buyer or user about the product of interest. The present invention uses an audio label which can be adapted for and attached or attachable to various products. Voice or audio information can be transmitted and stored inside the label for subsequent playback or retrieval by the consumer.

A manufacturer, instructor, or even the consumer himself can record his voice concerning the product and place that voice information inside the label for subsequent playback by the consumer. Alternatively, the manufacturer, instructor, or consumer can record his voice concerning the product corresponding to a bar code placed upon the product. The bar code can be read and audio information corresponding to that bar code be output to the consumer as an instructional device using existing bar code labels associated with many off-the-shelf products. Using either technique, i e., an audio label which contains voice information or a bar code which can access voice information, the consumer can rapidly assimilate familiar voice information concerning the product instead of running the risk of misreading a conventional written label. Not only is the audio labeling apparatus, system and method hereof more convenient for the end user, but it is also more easily input and, if need be, changed by the manufacturer, instructor or consumer. In the dynamic world to which we live, rapid communication of information is necessary to meet the growing demands in the marketplace.

Broadly speaking, the present invention contemplates an instructional apparatus comprising a label which can be attached to a product. As used herein, "product" includes any commodity having an outer packaged configuration of various size and shape. The product may include, e.g., consumable or non-consumable goods which may be contained in a package or bottle. An exemplary consumable good may include prescription or non-prescription medicine, etc. Non-consumable goods may include any good which is packaged with a label, manual or has a warning as to proper operation or use of the good.

According to one embodiment of the present invention, the label includes a microphone mounted proximate to the external surface of the label to aid in converting an identifying vocal message to an electrical signal. A storage device may be operatively coupled to the microphone to sequentially receive and store the electrical signal. The storage device can operate in either analog or digital format. If the storage device stores analog format information, an analog input filter is used to receive the electrical signal and at least two sample and hold circuits are coupled to sequentially receive an analog format of the electrical signal. An array of addressable storage calls can be addressed to programmably write the analog format in a page addressed methodology. Alternatively, the storage device may operate in digital format using an analog input filter with sample and hold circuits placed on the input of an analog-to-digital converter. The analog-to-digital converter an receive the analog format and convert the analog format to digital format. An array of addressable storage cells can then programmably write or read the digital format into or from select calls.

According to one aspect of the above embodiment, a record switch may be mounted on the outer surface of the label. Upon activation, the record switch initiates the storage cycle such that the vocal message is transmitted from the microphone mounted upon the outer surface of the label to the storage device located within the label.

In accordance with another embodiment of the present invention, the label need not include a microphone. Instead, the label receives an electrical signal sent from a programming unit remotely placed from the label. Accordingly, the label may include at least one electrode mounted on the outer surface of the label and a storage device coupled to the electrodes to sequentially receive and store an electrical signal sent from the remote programming unit. Thus, the remote programming unit is separate from the label and can

access the label either remotely or by physical contact with the label. The programming unit includes a microphone and a record switch foe transmitting the vocal message into the storage device when the record switch is activated. Electrical signals from the microphone can be sent over a transmission path to the electrodes mounted on the outer surface of the label. The transmission path may include either an optical transmission path or physical connection between the label electrodes and the programming unit.

According to one aspect of either of the above embodiments, the vocal message stored within the label can be addressed and retrieved in a form substantially near its original format. The retrieved vocal message is sent to the consumer as telephone quality voice indicative of the identifiable characteristics associated with the product. The vocal message is retrieved from the storage device and sent to a speaker which receives a stored electrical signal from the device and converts the signal to a telephone quality voice signal substantially similar to the original vocal message placed within the device. Thus, the output voice signal is not internally synthesized. Instead, the output voice signal is simply the original voice message recalled in a form substantially similar to the original form. Similar to the microphone, the speaker can be associated with either the label or it can be mounted separate from the label on a remote programming unit. If the microphone and speaker are placed on the label, the label is self-contained and the remote programming unit is not needed. Conversely, if the microphone and speaker an placed on or connected to a remote programming unit, the label can be made much smaller since it need not contain the microphone, speaker and many of the other record/retrieval elements. A remote programming unit is therefore useful whenever the label must be small or inexpensive. A single remote programming unit can therefore be used with numerous labels to record and retrieve information into and from each label. Also, the record and playback function may be separated onto different units to restrict unauthorized programming of the label. Thus, one unit can only record and the other unit can only playback the recorded information.

According to yet another embodiment of the present invention, the label includes a bar code label attachable to a product. A vocal message can be recorded into a storage device corresponding to the bar code label. The storage device is remote from the bar code label and upon reading the bar code label, the vocal message stored therein is reproducibly retrieved so as to indicate the identifiable characteristics associated with the product. Therefore, according to this embodiment of the present invention, bar code information commonly placed upon existing products can be read and corresponding vocal message associated with the bar code can be output to the consumer. When a bar code is read from a product, bar code digital information is sent to the storage device which then activates a pre-programmed vocal message within a voice recorder and sends that message to a speaker which then reproduces the recorded message as telephone quality audio output.

The present invention also contemplates an audio labeling system including both a label and a remote programming unit for recording information into the label or retrieving information from the label via the programming unit. The label of the audio labeling system includes electrodes and a storage device or voice recorder mounted proximate to or within the label. The programming unit includes a record switch that, when activated, allows a vocal message to be written into the storage device and a play switch that, when activated, allows a stored electrical signal to be read into a speaker mounted on the outer surface of the unit.

According to one aspect of the audio labeling system, the remote programming unit can communicate with the electrodes using a transmission path (e.g., optical, infrared, etc.) which allows the label and remote programming unit to communicate with each other. According to another aspect of the system, the remote programming unit includes at least one lead on the outer surface of the unit which can be physically contacted or connected to at least one electrode on the outer surface of the label. Accordingly, whenever programming or reprogramming is desired, the operator merely brings the remote programming unit in optical, infrared or physical contact with the label to either place one or more voice messages within the label or read from the label current voice messages.

The present invention also contemplates a method for audio labeling a product. The method includes the steps of attaching a label bearing an audio recorder to a product. Audio signals or vocal messages can be sent to the label where those signals are then recorded within the recorder. Upon demand, the audio signals can be subsequently retrieved from the recorder to, for example, audibly discern the contents of that product.

According to one aspect of the present method, changes in audio signals can be reprogrammed into the recorder to indicate a change in product to which the label is affixed. Thus, a label can be attached to a product such as a bottle of prescription medicine and, after the medicine has been fully used, the label can be reprogrammed and placed on a different bottle of medicine having the attached label reprogrammed indicating a different instructions for use. The present invention can therefore be used to identify any characteristic associated with the product, including product type, contents of the product or pertinent instructions for use. Of course, all these characteristics being delivered in an easily recognizable verbal format from an audio storage device or recorder which may be affixed to the product itself.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the accompanying drawings to which:

FIG. **1** is a perspective view of a product;

FIG. **2** is a perspective view of a label according to one embodiment of the present invention attachable to a portion of the product;

FIG. **3** is a cross-sectional view of the label according to another embodiment of the present invention attachable to a portion of the product;

FIG. **4** is a cross-sectional view along plane **4**—**4** of FIG. **2**;

FIG. **5** is a perspective view along plane **5**—**5** of FIG. **3**;

FIG. **6** is a cross-sectional view of the label according to another embodiment of the present invention;

FIG. **7** is a block diagram of the vocal message signal path according to one embodiment of the present invention;

FIG. **8** is a perspective view of a remote programming unit according to the present invention;

FIG. **9** is a cross-sectional view along plane **9**—**9** of FIG. **8**;

FIG. **10** is a block diagram of the vocal message signal path according to another embodiment of the present invention; and

FIG. **11** is a perspective view and block diagram of an instructional apparatus for recording and retrieving a vocal message corresponding to a bar code.

While the invention is susceptible to various modifications and alternative forms, the specific embodiment thereof has been shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that the drawings are not intended to limit the invention to the particular form disclosed, but on the contrary, the intention is to cover all modifications, equivalence and alternatives thereof which fall within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE INVENTION

Turning now in the drawings, FIG. **1** illustrates a product **10** having characteristics which can be recorded as described below. Product **10** can be manufactured in various shapes and sizes and can contain contents which can be identified in voice recorded and/or retrieved audio or voice information. Product **10** may be a consumable or non-consumable good. An exemplary consumable good such as a prescription or non-prescription drug may be packaged in a bottle with device **12** affixed thereto. Instead of or in addition to a written label placed on the bottle indicating quantity and time of dosages, label **12** can be accessed to accord and to retrieve vocal messages of such dosages. A consumer therefore can quickly retrieve the physician's voice, pharmacist's voice or his or her own voice information of the necessary dosage information. Moreover, as the dosage changes, the consumer, physician or pharmacist can update or reprogram the voice information placed within label **12**. Without departing from the scope of the present invention, product **10** includes any consumable or non-consumable product bearing important information necessary for the proper consumption or use of the product. Voice information can be recorded into label **12** attachable to product **10** by either the manufacturer, instructor, or end user. The programmed vocal message can be updated or reprogrammed periodically to indicate instructional changes accorded to the product.

Referring to FIG. **2**, one embodiment of a label **12** is shown in FIG. **2** as numeral **12**a. Self-contained label **12**a includes all the necessary elements for recording and retrieving identifying voice information associated with product **10**. Arranged on or proximate to the outer surface of self-contained label **12**a is a microphone **14** which, when held near a person's voice, can convert the voice information to a corresponding electrical signal. Microphone **14** is of common design and is capable of receiving directional voice while not receiving substantial amounts of background noise.

Also associated with label **12**a are a plurality of sound channels or ports **16** arranged radially inward around the circumference of label **12**a. Sound ports **16** allow retrieved voice information to exit label **12**a when play/record button **18** is activated in a play mode. Play/record button **18** can be a two-way switch for enabling either a play mode or a record mode. If button **18** is placed in a play mode, then voice information stared within label **12**a can be played or retrieved through sound ports **16**. Conversely, if play/record button **18** is activated in a record mode, then sound information can be sent to and recorded within label **12**a via microphone **16**.

While any form of coupling or attachment between label **12**a and product **10** falls within the scope of this invention, FIG. **2** illustrates one form of attachment whereby one end of product **10** can be placed within a tapered collar **20** of label **12**a. Thus, if product **10** is cylindrical in shape, such as a prescription medicine bottle, the cylindrical container can

be inserted into one end of label **12**a. Once inserted, product **10** remains attached until released by a pulling force or a releasing mechanism (not shown).

Label **12**a as well as alternative embodiments of labels **12**b and **12**c, etc. may also include an earplug jack or adaptor **22**. Adaptor **22** can receive a male end of an earplug of common design. The earplug (not shown) can be inserted into the user's ear to aid those who are hearing impaired.

Referring to FIG. **3**, an alternative low-profile label **12**b is shown. Low-profile label **12**b can be made much smaller than self-contained label **12**a. Label **12**b contains only those elements necessary to input or output electrical signals into or from the label. Conversion of a vocal message to or from the electrical signal is performed separate from label **12**b. Accordingly, label **12**b includes a storage device **24** and at least one electrode **26** mounted on an external surface of label **12**b. Preferably, storage device **24** and electrode **26** are are mounted on a flexible printed circuit (PC) board **28**. PC board **28** is coupled to one side of a double-sided tape **30**. The other side of double-sided tape **30** can therefore be conformed and attached to various surfaces, possibly being arcuate surfaces such as, for example, the side-wall of a cylindrically shaped product **10**.

Illustrated in FIG. **4** is a cross-sectional view of the label **12**a shown in FIG. **2**. The inside walls **32** of tapered collar **20** may be resilient to allow one end of product **10** to be relaeasibly secured to label **12**a. Arranged proximate the outer wall of label **12**a is microphone **14**, play/record button **18** and at least one sound port **16**.

Tapered collar **20** allows product **10** to be slid between the outwardly resilient inside walls **32** of collar **20**. Tapered collar **20** is intended to be the same geometrical shape as a portion of product **10** regardless of the general shape of that product.

Extending inward from port **16** is a sound baffle area **34** used to distribute the sound from speaker **36** contained within speaker chamber **38**. Speaker chamber **38** thereby not only houses speaker **36**, but also creates the sound waves that escape label **12**a through sound ports **16**.

Coupled to microphone **14** and play/record button **18** is a storage device **24**. Storage device **24** may include a single integrated circuit or several integrated circuits (with or without additional discrete components) placed on a PC board **28**. PC board **28** serves as routing of conductors placed therein. Each conductor is selectively connected to various input/output pins associated with microphone **14**, play/record button **18** and/or speaker **36**. As will be described below, input from microphone **14** and play/record button **18** activates recording of voice information into storage device **24**. In addition, input from device **24** and from play/record button **18** activates speaker **36** for subsequent dispersion from label **12**a through sound ports **16**.

Associated with the recording and retrieval of voice information to and from storage device **24**, is a power source or battery pack **40** shown in FIG. **4**. Batteries of battery pack **40** can be interchanged via a cap **42** removably secured at one end of label **12**a.

Shown as a front view along plane **5**—**5** of FIG. **3**, FIG. **5** illustrates the outwardly projecting face of low-profile label **12**b. Associated with the outer surface or face of label **12**b is storage device **24** and one or more conductive electrodes **26** placed on the surface of PC board **28**. Electrodes **26** can be made of highly conductive copper or aluminum and are attachable to electrical leads **44** placed within PC board **28**. Leads **44** can be connected, for example, to various pins of an integrated circuit containing

all necessary electrical functions of storage device **24**. The electrical functions associated with storage device **24** will be described below.

Although conductive electrodes **26** are preferred, other transmissive receptors may he used to transient or receive information from a remote programming unit **46** described below. Because low-profile label **12**b contains only electrical storage and access means and does not contain only all the necessary elements to store and retrieve voice information, various elements to achieve such functions are placed on remote programming unit **46** as shown in FIG. **8**. Programming unit **46** can communicate via electrodes **26** to and from storage unit **24**. Programming unit **46** may contain matching electrodes or leads **48**, as shown in FIG. **8**. Leads **48** may couple to electrodes **26** similar to a male/female coupling or, alternatively, can simply contact male-to-male. Still further, electrodes **26** and leads **28** can function as optical receivers and detectors to send voice information over an optical transmission path. Still further, other forms of transmission may be used such as, e.g., infrared, character recognition and/or bar code reader (as described below).

FIG. **6** illustrates a cross-sectional view of another label **12**c which can be extremely miniaturized. Miniaturized label **12**c utilizes less surface area by placing storage device **24** on one side of PC board **28** and electrode **26** on the other side of PC board **28**. A cover **50** partially covers storage device **24** and provides a surface upon which double-sided tape **30** is placed. Tape **30** is of sufficient size to adhere to or stick upon the outer surface of product **10**. Other forms of attachment other than a tape can be used. For example, suction cups, glue, or VELCRO® can be used in lieu of, or in addition to, tape **30**. Whatever attachment form is chosen, it is important that it be flexible to allow device **24** to adhere to an arcuate or curved outer surface of product **10**. The miniaturized version of label **12**c thereby can be placed on extremely small products or in less-obtrusive areas of the product. It is within the realm of integrated circuit technology to make storage device **24** extremely small and thereby allowing miniaturized label **12**c to be less than 1 or 2 inches square or less than 1 or 2 inches in diameter. Preferably, storage device **24** is encapsulated **52** as shown in FIGS. **3**, **5** and **6**. Encapsulation **52** such as epoxy encapsulation prevents contaminants from entering device **24** and disrupting normal electrical operations.

Illustrated in FIG. **7** is a block diagram of an analog circuit embodiment of the present invention. Specifically, voice information recording and retrieval can occur in either analog or digital format. FIG. **7** illustrates complete analog format, whereas FIG. **10** utilizes a conversion from analog-to-digital and from digital-to-analog. Preferably, the present invention utilizes complete analog storage and retrieval and thereby can be incorporated on a single storage device **24** available from Information Storage Devices, Inc. part Nos. 1012, 1016 or 1020, and generally described in U.S. Pat. Nos. 4,890,259 and 4,989,179 (herein incorporated by reference). As described in U.S. Pat. Nos. 4,890,259 and 4,989,179, storage device **24** includes an analog input filter **54** which receives analog electrical signals from microphone **14** and converts those signals to filtered analog output which is then input to at least two sample and hold circuits **56** which sequentially sample interleaved analog information and addressably write that information to an army of addressable storage cells, preferably EEPROM cells or flash memory **58**. Row and column decoding of storage cells **58** is achieved using clock address sequencer **60**. Power is supplied via power source or battery pack **40** to produce voltage boost necessary to program EEPROM cells.

Once addressed via central and timing logic associated with sequencer **60**, electrical signals stored within array **58** are output to speaker **36**. Control and timing logic within sequencer **60** also provides necessary owing for input of record (or write) information as opposed to output of retrieved (or read) information.

FIG. **8** illustrates a remote programming unit **46** capable of communicating with either low-profile label **12**b or miniaturized label **12**c. Communication path is achieved over a transmission channel between unit **46** and labels **12**b or **12**c, or by physical contact of electrical leads **48** with electrodes **26**.

By using a remote programming unit **46**, similar to that shown in FIG. **8**, a manufacturer, instructor or consumer can input or program his voice information into one or more distal or connectable labels **12**b or **12**c. Moreover, the manufacturer, instructor or user can reprogram new or additional voice information with a single remote programmer **46** usable with any label having receptor electrodes or transmissive receivers. One or more labels can be associated with numerous products of various sizes, shapes and/or identifying characteristics.

Instead of a single play/record button **18** placed on the label **12**a, as shown in FIG. **2**, play/record button **18** can be separated into a separate play button **62** and record button **64**. During record routine, record button **64** is actuated and the manufacturer, instructor or user speaks into microphone **14**. Analog electrical signals are emitted from the microphone **14** through electrical leads **48** and onto electrodes **26**. The encoded voice information is then fed onto label **12**b or **12**c and stored sequentially in a block of storage cells **58**. During retrieval of voice information, play button **62** is actuated causing sequencer **60** to address specific storage cells **58** containing recorded electrical signals of analog format. The signals are then output via electrodes/leads **26** and **48** to speaker **38**, wherein the electrical signals are converted to acoustical sound waves discernable to the listener.

FIG. **9** illustrates a cross-sectional view of remote programming unit **46** shown in FIG. **8**. By grasping programming unit **46**, and directing electrical leads **48** toward electrodes **26**, the manufacturer, instructor or user of product **10** can record and/or retrieve voice information indicative of an identifiable characteristic associated with product **10**. Earphones (not shown) can be attached to remote programming unit **46** to aid the hearing impaired. Battery pack **40** provides power to reprogram storage device **24** upon electrical contact between electrodes **26** and electrical leads **48**. If electrical contact is not made, programming power may be provided within label **12**b and **12**c.

Although compete analog format is preferred, a digital format may be used similar to that shown in FIG. **10**. In particular, sample-and-hold analog input can be converted by analog-to-digital converter **66** to a digital format. Digital information can then be stored in an array of storage cells **68** of conventional design, preferably a RAM exceeding one Megabit in size. Power can be supplied from battery pack **40** to refresh data stored therein. A clock address sequencer **60** may also be used to provide correct row and column sequence and addressing scheme. Upon retrieval, stored digital information is sent from storage cells **68** to digital-to-analog converter **70** which then amplifies the analog signal for proper reading by speaker **36**. Alternative storage elements, other than RAM, may be used to store the digital information, including, but not limited to, static, dynamic, EEPROM, flash, core, bubble, light wave, magnetic, masked

ROM a CD ROM. Clock address sequencer **60** orchestrates the memory address sequencing for play to record of the voice information. During the playback mode, the digital-to-analog converter **70** receives sequential information from the storage device **68** and converts this data into analog electrical signals readable by speaker **36**.

Other digital techniques such as a digital signal processor (not shown) using a suitable voice coder/decoder algorithm such as, but not limited to, continuously variable slope delta modulation (CVSD), sub-band coders, or coded excited linear prediction (CELP) can also be implemented in the present digital design shown in FIG. **10**. An exemplary encoder/decoder is Texas Instrument part No. TMS3477NL, an exemplary analog filter is Texas Instrument part No. TSP66C61NL and an exemplary memory device is Texas Instrument part No. TMS62256. Moreover, a suitable flash memory device may be useable as storage cells **68**, and is produced by INTEL Corp., part No. I48F512. An advantage of flash memory is that, contrary to dynamic RAM, flash memory cells, once programmed, need not be continuously refreshed.

If digital conversion and storage techniques are used, a digital signal processor (DSP) may be employed. A suitable DSP is part No. TMS320C10 manufactured by Texas Instruments, Inc. An exemplary analog-to-digital converter or digital-to-analog converter is manufactured by Analog Devices, Inc., part No. AD7569. A digital signal processor combined with proper A/D or D/A converters could be combined with a suitable memory device such as those mentioned above, and using a sub-band coder algorithm as described in T. P. Barnwell, et al., "A real time speech sub-band coder using the TMS32010", IEEE Southcon (1984).

According to another embodiment of the instructional apparatus of the present invention, a bar code reader may be used to convert universal bar-code formats commonly printed on a bar-code label **72** into digital signals that can be interpreted by a terminal **74** remote from product **10** onto which label **72** is affixed. Terminal **74** can be placed at the point-of-sale area or it can be hand-held and usable by a consumer when browsing the shelves containing product **10**. Thus, a consumer can rapidly assimilate vocal messages stored within hand-held terminal **74** by merely scanning bar code labels **72** arranged on the shelves. The consumer can thereby listen to recorded vocal messages placed within terminal **74** which identify the unique product upon which the bar code label is attached. Identifiable characteristics such as the contents of the product, type of product or instructions for use of the product being scanned are all verbally delivered to the consumer to aid his or her recognition of the product's preferred use. While conventional bar code systems identify products, the information is generally limited to the product name and/or price. Moreover, voice information retrieved from conventional bar code systems are generally computer synthesized and not actual reproduced human voice recordable by the manufacturer, instructor or consumer as in the present invention. The familiarity of a human voice (possibly the user's own voice) provides a substantial advantage over synthesized voice. Not only is actual recorded voice clearer than synthesized voice, but it can be recorded in, for example, the user's foreign language in a form familiar to the user.

When bar code **72** is read, digital information from the bar code activates a pre-programmed vocal message stored within terminal **74** concerning any information which is deemed necessary by the programmer, and which could be made available in a plurality of languages selectable by the user. Vocal messages can be reprogrammed by adding a suitable record circuit. Features such as automatic tabulation of the cost of the products, display price, special product promotions, advertising, instructional information about the product, reduced price information, etc. may also be added.

Digital bar code, i.e., a stamp-sized patch of alternating thick and thin stripes with different spacings on a white background imprint, is a highly effective alternative to keyboard data entry. Bar-code scanning is faster and more accurate than key entry, optical character recognition and magnetic stripe encoding. Furthermore, bar code offers significant advantages and flexibility of media, simple placement and is relatively immune to electromagnetic fields. Still further, bar code information is generally placed on products sent from the manufacturer to the wholesale or retail stores and thereby generally available to consumers at the checkout line or while browsing the store shelves. Almost all products that are widely distributed for sale are now marked with bar codes. Retail stores or consumers themselves have access to bar code **72** via a central computer **78** placed within terminal **74**. The computer can access vocal information regarding product **10** stored in memory and sends the information to terminals **74** for vocal reproduction and possibly display. Central computer **[70]** *78* accesses bar code **72** using what is commonly called a wand **80**. The hand-held wand **80** contains an optical LED sensor sensitive to 655 nanometer (nm) visible red light, 700 nm visible red light and 820 nm infrared energy, a photodetector IC (integrated circuit), and precision aspheric optics. A suitable hand-held wand **80** may be purchased from Hewlett Packard Corporation, Part Nos. HBCR, HBCS, HEDS, and/or 16800A. Regardless of which bar code wand **80** is chosen, wand **80** interfaces with central computer **78** placed upon hand-held or point-of-sale terminal **74**. Central computer **78** accesses various memory **[**medium**]** *media* such as hand disk drive **81**, CD ROM **82**, floppy disk or RAM card **84** as shown in FIG. **11**. A plurality of vocal messages can be stored in the memory medium and addressed by computer **78** to operate as a voice recorder capable of recording voice messages within the chosen medium or to retrieve verbal **[**message**]** *messages* placed therein. A keyboard **86** can be placed proximate the outer surface of terminal **74** to access computer **78** and the various operational capabilities associated with computer **78**. If desired, information can be presented on a local display **88**. Moreover, vocal information can be retrieved from the chosen medium over selective addresses via computer **78** to a digitized voice decoder **90** of common design. The digitized voice recorder **90** preferably uses a suitable digital signal processor (DSP) such as Texas Instruments, Inc. Parts No. TMS320C10 with analog-to-digital and digital-to-analog convertors in a suitable voice coder data compression algorithm such as sub-band coder or other algorithm as described above. Retrieved vocal messages from decoder **90** can then be output to a speaker **36** so that the consumer can listen to instructional vocal messages regarding product **10**.

If the amount of vocal information is extremely large, drive **[80]** *81*, ROM **82** and floppy or RAM card **84** can be placed at a remote site with access using electrode-lead contacts, radio-linked or infrared-linked transmissive paths as described above so that the hand-held unit can be made fairly small. CD ROM can store large amounts of digital audio information necessary to include substantial information concerning all the possible products to which bar code labels may identify. Audio information concerning all necessary information regarding a product can be quite lengthy and thereby requires large amounts of storage medium provided by the present invention.

Terminal **74** operates according to a simple addressing or matching methodology wherein wand **80** is scanned across code **72**. Computer **78** then searches its memory (i.e., hard disk drive **80**, CD ROM **82** or floppy/RAM card **84**) for a bar code and verbal message match. When a match is found, computer **78** transfers the appropriate stored digital data to a digital voice decoder **90**. The decoded information is then converted into soundwaves by speaker **36** for identification by the listener/user.

The foregoing description of the present invention has been directed to particular embodiments. It will be apparent, however, to those skilled in the art that modifications and changes in either the apparatus, system and/or method may be made without departing from the scope and spirit of the invention. Therefore, it is the Applicants' intention that the following claims cover all such equivalent modifications and variations which fall within the true spirit and scope of this invention.

What is claimed is:

1. A method for audio labeling products with a reusable label, comprising:

releasibly securing a label bearing an audio recorder to a first product;

sending a first verbal message concerning said first product to said label;

recording said first verbal message in said recorder;

subsequently retrieving said first verbal message in audio format from said recorder;

releasing said label from said first product and thereafter releasibly securing said label to a accord product;

while erasing said first verbal message, sending a second verbal message concerning said second product to said label;

recording said second verbal message in said recorder; and

subsequently retrieving said second verbal message in audio format from said recorder.

2. The method as recited in claim **1**, wherein said recording step comprises inputting an electrical signal corresponding to said first and second verbal messages into an addressable array of storage elements.

3. The method as recited in claim **1**, wherein said retrieving step comprises:

outputting a stored first and second electrical signal corresponding to said first and second verbal messages from so addressable array of storage elements; and

converting said first and second electrical signals to signals similar to said first and second verbal messages.

4. An instructional apparatus, comprising:

a bar code label attachable to a product;

recording means capable of recording a vocal message into a storage device corresponding to said bar code label, wherein said recording means comprises a voice recorder capable of recording said vocal message as telephone quality voice input; and

retrieving means capable of reproducibly retrieving said vocal message indicative of an identifiable characteristic associated with said product, wherein

said retrieving means comprises a speaker operable to re-produce and vocalize said recorded vocal message as telephone quality voice output.

5. An instructional apparatus, comprising:

a voice recorder capable of recording a vocal message as telephone quality voice input;

a memory medium storing the vocal message prerecorded as telephone quality voice input; and

a playback terminal linked by a transmissive path to the memory medium, wherein the playback terminal is adapted to reproducibly retrieve the vocal message from the memory medium upon receiving from a bar code reader a bar code signal corresponding to the vocal message, wherein the bar code signal results from scanning of a bar code label attachable to a product, and wherein the vocal message is indicative of an identifiable characteristic associated with the product.

6. The apparatus of claim 5, wherein the memory medium is located at a site remote from that of the playback terminal, and wherein the transmissive path comprises a radio-linked or infrared-linked path.

7. The apparatus of claim 5, wherein the memory medium comprises one or more compact disks.

8. The apparatus of claim 5, wherein the vocal message is prerecorded by a manufacturer of the product.

9. The apparatus of claim 5, wherein the vocal message comprises a voice familiar to a user of the product.

10. The apparatus of claim 5, wherein the identifiable characteristic associated with the product comprises the content of the product.

11. The apparatus of claim 5, further comprising a speaker coupled to the playback terminal, wherein the speaker is operable to reproduce and vocalize the vocal message as telephone quality voice output.

12. A method for providing product information, said method comprising:

recording a vocal message as telephone quality voice input;

receiving a bar code signal from a bar code reader, wherein the bar code signal results from scanning of a bar code label attachable to a product; and

retrieving the prerecorded vocal message corresponding to the bar code signal from a memory medium, wherein the vocal message is prerecorded as telephone quality voice input, and wherein the vocal message is indicative of an identifiable characteristic associated with the product.

13. The method of claim 12, wherein said retrieving comprises receiving the vocal message from the memory medium over a radio-linked or infrared-linked path to a remote location.

14. The method of claim 12, wherein the memory medium comprises one or more compact disks.

15. The method of claim 12, wherein the vocal message is prerecorded by a manufacturer of the product.

16. The method of claim 12, wherein the vocal message comprises a voice familiar to a user of the product.

17. The method of claim 12, wherein the identifiable characteristic associated with the product comprises the content of the product.

18. An instructional apparatus, comprising:

a voice recorder capable of recording a vocal message as non-synthesized audio signal;

a memory medium storing the prerecorded, non-synthesized audio signal; and

a playback terminal linked by a transmissive path to the memory medium, wherein the playback terminal is adapted to reproducibly retrieve the audio signal from the memory medium upon receiving from a bar code reader a bar code signal corresponding to the audio signal, wherein the bar code signal results from scan-

ning of a bar code label attachable to a product, and wherein the audio signal is indicative of an identifiable characteristic associated with the product.

19. The apparatus of claim 18, wherein the memory medium is located at a site remote from that of the playback terminal, and wherein the transmissive path comprises a radio-linked or infrared-linked path.

20. The apparatus of claim 18, wherein the memory medium comprises one or more compact disks.

21. The apparatus of claim 18, wherein the audio signal is prerecorded by a manufacturer of the product.

22. The apparatus of claim 18, wherein the identifiable characteristic associated with the product comprises the content of the product.

23. The apparatus of claim 18, further comprising a speaker coupled to the playback terminal, wherein the speaker is operable to reproduce and make audible the audio signal as telephone quality audio output.

24. A method for providing product information, said method comprising:

recording a vocal message as non-synthesized audio signal;

receiving a bar code signal from a bar code reader, wherein the bar code signal results from scanning of a bar code label attachable to a product; and

retrieving the prerecorded, non-synthesized audio signal corresponding to the bar code signal from a memory medium, wherein the audio signal is indicative of an identifiable characteristic associated with the product.

25. The method of claim 24, wherein said retrieving comprises receiving the audio signal from the memory medium over a radio-linked or infrared-linked path to a remote location.

26. The method of claim 24, wherein the memory medium comprises one or more compact disks.

27. The method of claim 24, wherein the audio signal is prerecorded by a manufacturer of the product.

28. The method of claim 24, wherein the identifiable characteristic associated with the product comprises the content of the product.

29. An instructional apparatus comprising:

a bar code reader operable to scan a bar code label attachable to a product and produce a corresponding bar code signal;

a voice recorder capable of recording a vocal message as telephone quality voice input;

a listening station comprising a speaker and coupled to the bar code reader, wherein the listening station is adapted to receive the bar code signal from the bar code reader, to receive the vocal message corresponding to the bar code signal, and to reproduce and vocalize the vocal message, wherein the vocal message is prerecorded as telephone quality voice input, and wherein the vocal message is indicative of an identifiable characteristic associated with the product; and

a retrieval system remotely coupled to the listening station, wherein the retrieval system comprises a memory medium storing the vocal message, and wherein the retrieval system is adapted to reproducibly retrieve the vocal message from the memory medium and transmit the vocal message to the listening station.

30. The apparatus of claim 29, wherein the retrieval system is remotely coupled to the listening station using a radio-linked or infrared-linked path.

31. The apparatus of claim 29, wherein the memory medium comprises one or more compact disks.

32. The apparatus of claim 29, wherein the vocal message is prerecorded by a manufacturer of the product.

33. The apparatus of claim 29, wherein the vocal message comprises a voice familiar to a user of the product.

34. The apparatus of claim 29, wherein the identifiable characteristic associated with the product comprises the content of the product.

35. An instructional apparatus, comprising:

a bar code reader operable to scan a bar code label attachable to a product and produce a corresponding bar code signal;

a voice recorder capable of recording a vocal message as non-synthesized audio signal

a listening station comprising a speaker and coupled to the bar code reader, wherein the listening station is adapted to receive the bar code signal from the bar code reader, to receive the non-synthesized prerecorded audio signal corresponding to the bar code signal, and to re-produce and make audible the audio signal, wherein the audio signal is indicative of an identifiable characteristic associated with the product; and

a retrieval system remotely coupled to the listening station, wherein the retrieval system comprises a memory medium storing the audio signal, and wherein the retrieval system is adapted to reproducibly retrieve the audio signal from the memory medium and transmit the audio signal to the listening station.

36. The apparatus of claim 35, wherein the retrieval system is remotely coupled to the listening station using a radio-linked or infrared-linked path.

37. The apparatus of claim 35, wherein the memory medium comprises one or more compact disks.

38. The apparatus of claim 35, wherein the audio signal is prerecorded by a manufactures of the product.

39. The apparatus of claim 35, wherein the identifiable characteristic associated with the product comprises the content of the product.

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