

[54] PORTABLE VOICE MESSAGE GENERATOR

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[51] Int. Cl. G11b 3/30, G11b 3/78

[58] Field of Search 179/100.4 R, 100.4 D, 100.1 C, 179/100.1 PS, 100.2 CA, 100.2 MD, 100.3 B; 35/8 A, 9 A, 9 C, 35 L; 235/61.11 B; 274/1 R, 1 A, 1 G, 9 R, 9 RA; 340/174.1 C; 84/1.28

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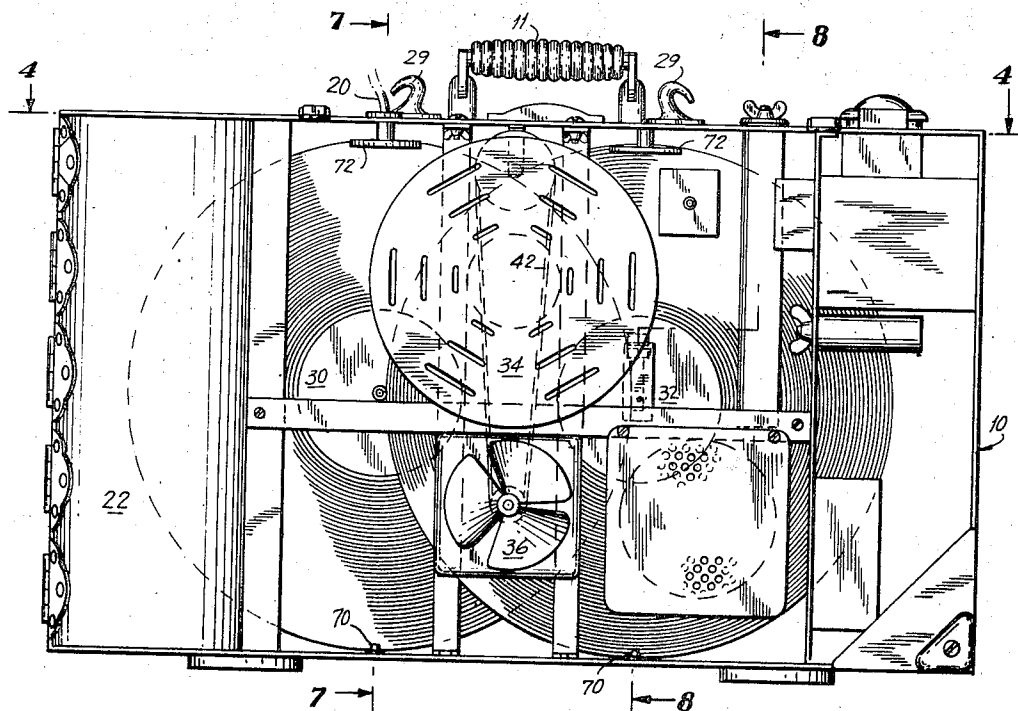
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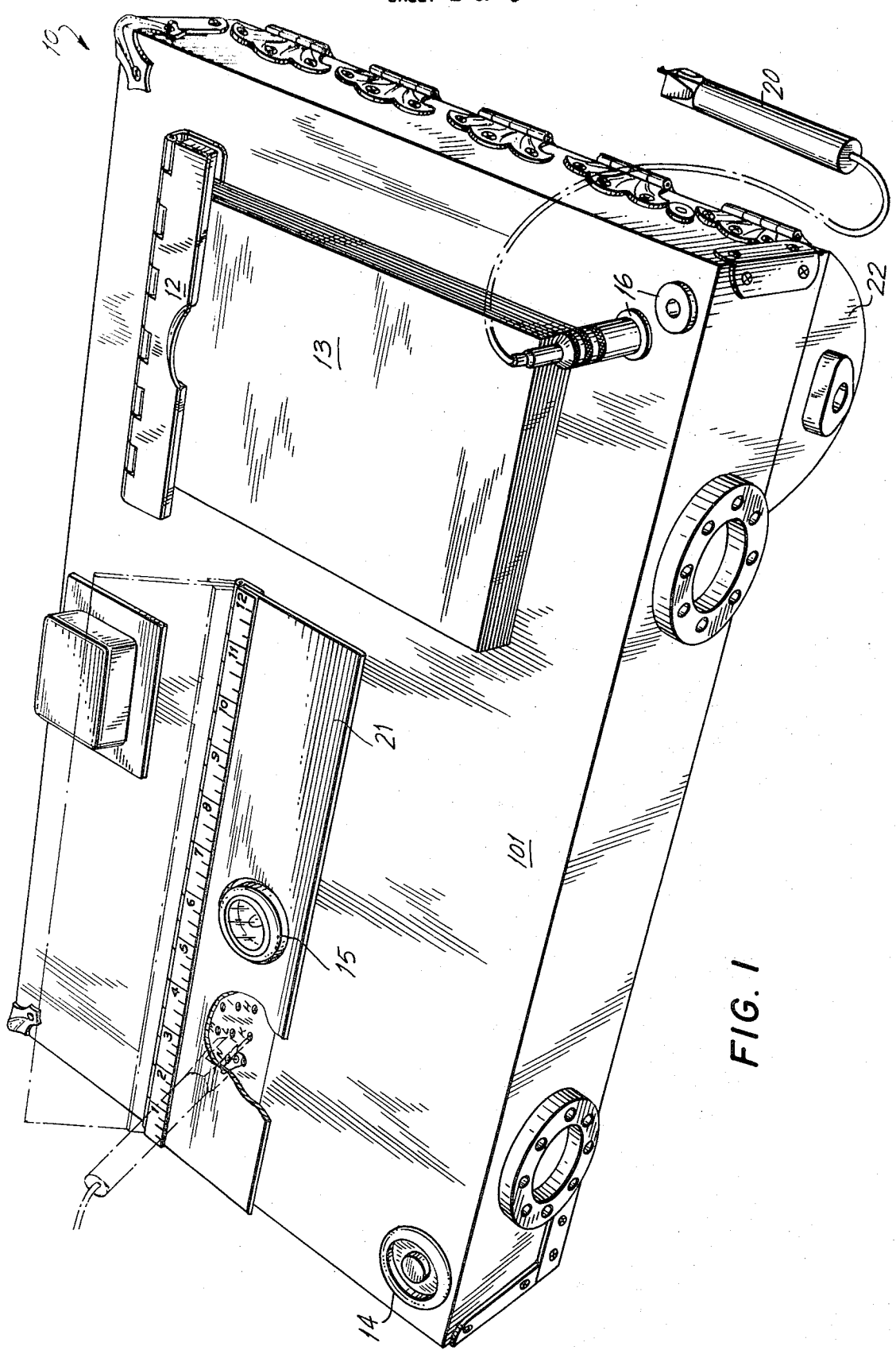
Primary Examiner—Raymond F. Cardillo, Jr.
Attorney, Agent, or Firm—Lilling & Siegel

[57] ABSTRACT

A pair of circular record disks are mounted, in partially overlapping relationship, inside a carrying case and in close proximity to one surface thereof. The records are rotated by a frictional-engagement mechanism powered by an electrical motor and are impressed with a plurality of recorded message elements on parallel grooves; each of these grooves being accessible from the outside of the carrying base by means of a perforation in the surface of the case. Any one of the prerecorded message elements may be broadcast by inserting a pickup wand, incorporating a needle connected to a transducer, into the appropriate perforation in the carrying case and allowing it to rest on the groove below the perforation. An electronic amplifier, connected to the pick-up wand, and a speaker, connected to the output side of the amplifier, are also mounted in the carrying case. Any message whose vocabulary is restricted to the pre-recorded components may be generated and broadcast by sequentially inserting the pick-up wand into the appropriate perforations in the surface of the carrying case.

7 Claims, 15 Drawing Figures





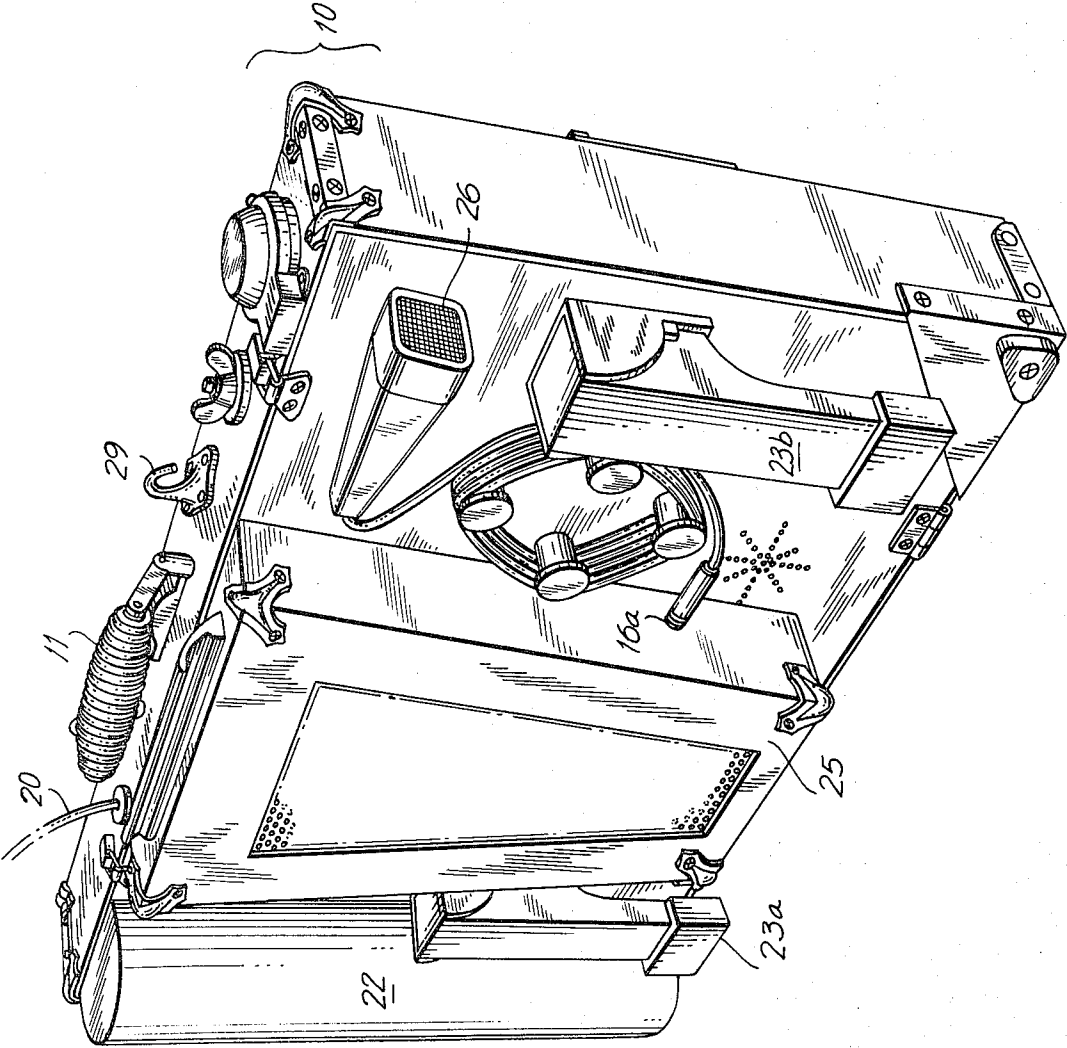
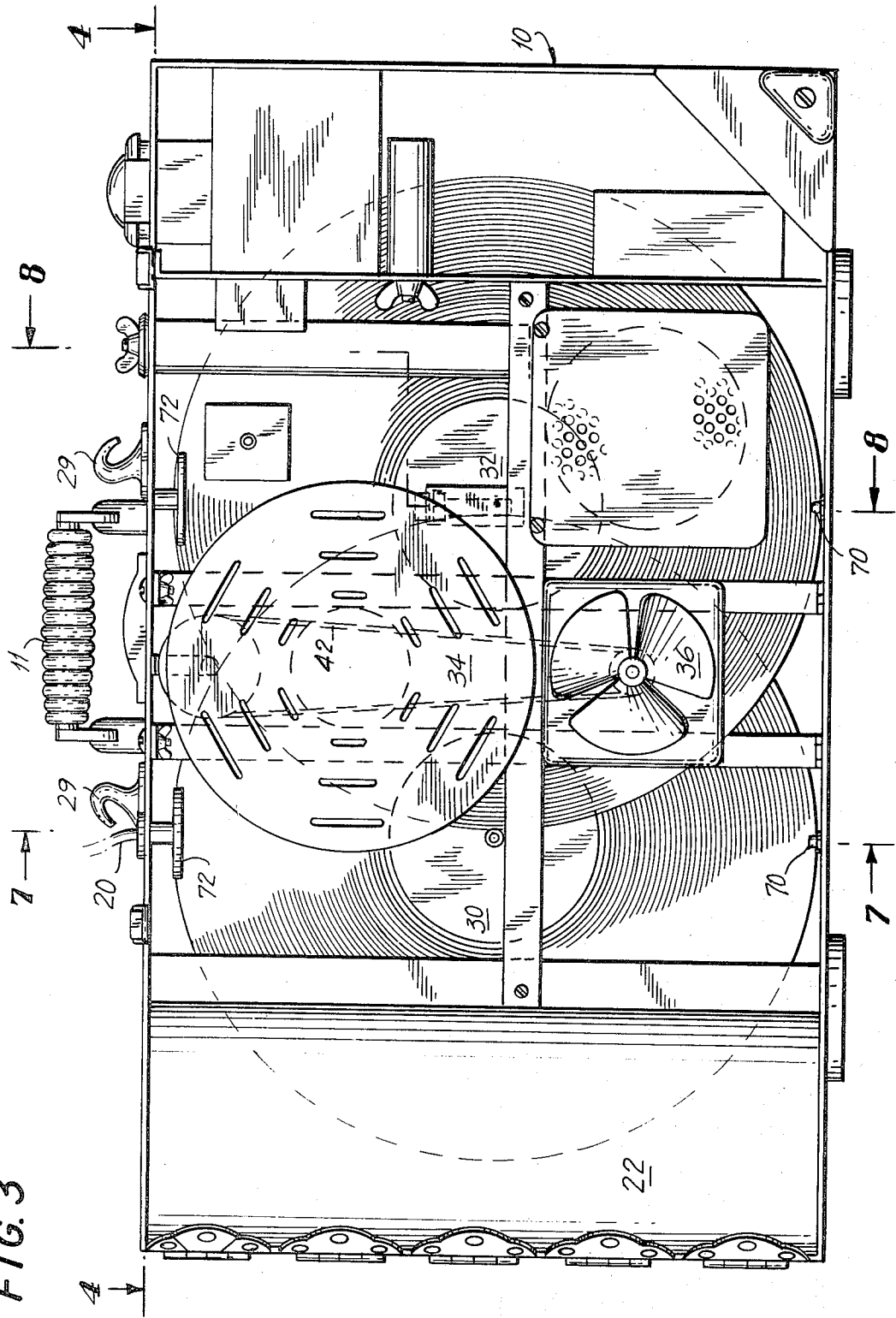


FIG. 2

FIG. 3



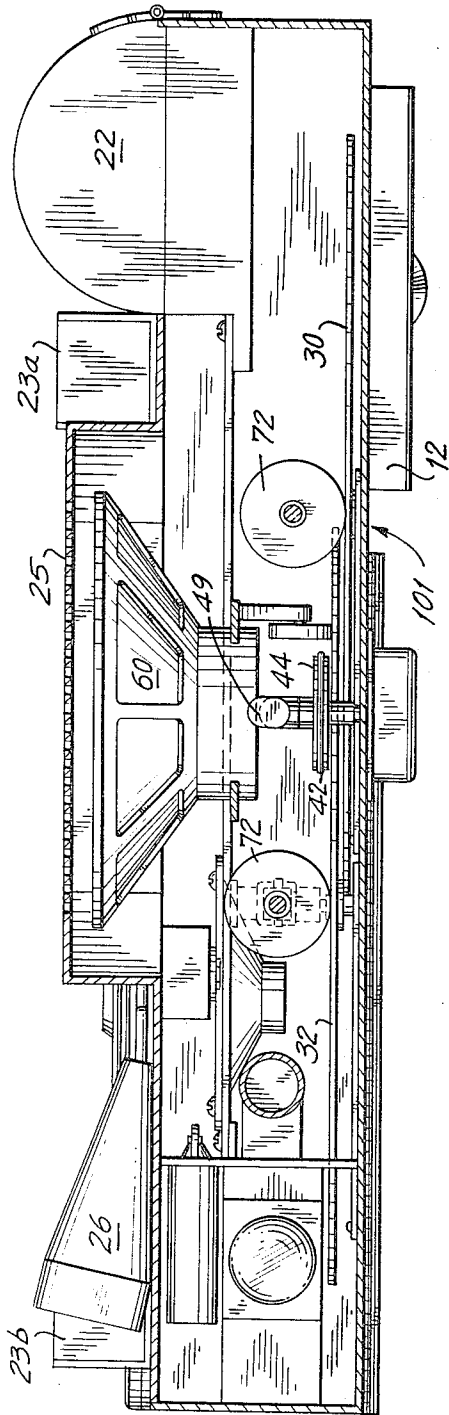


FIG. 4

FIG. 6

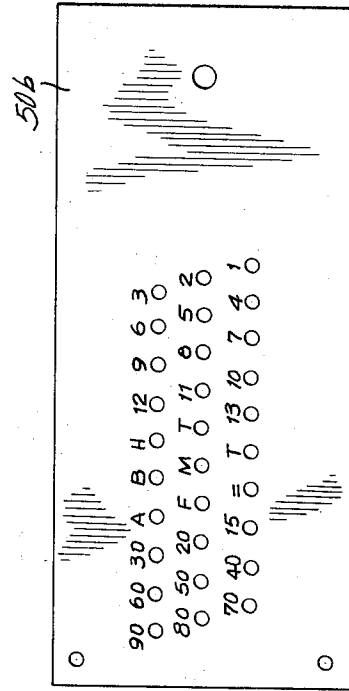
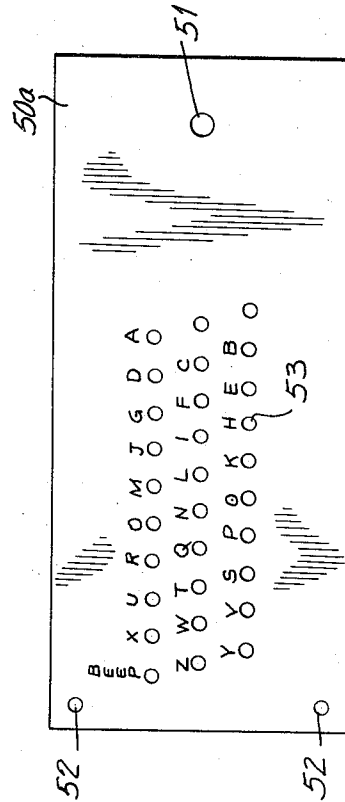


FIG. 5



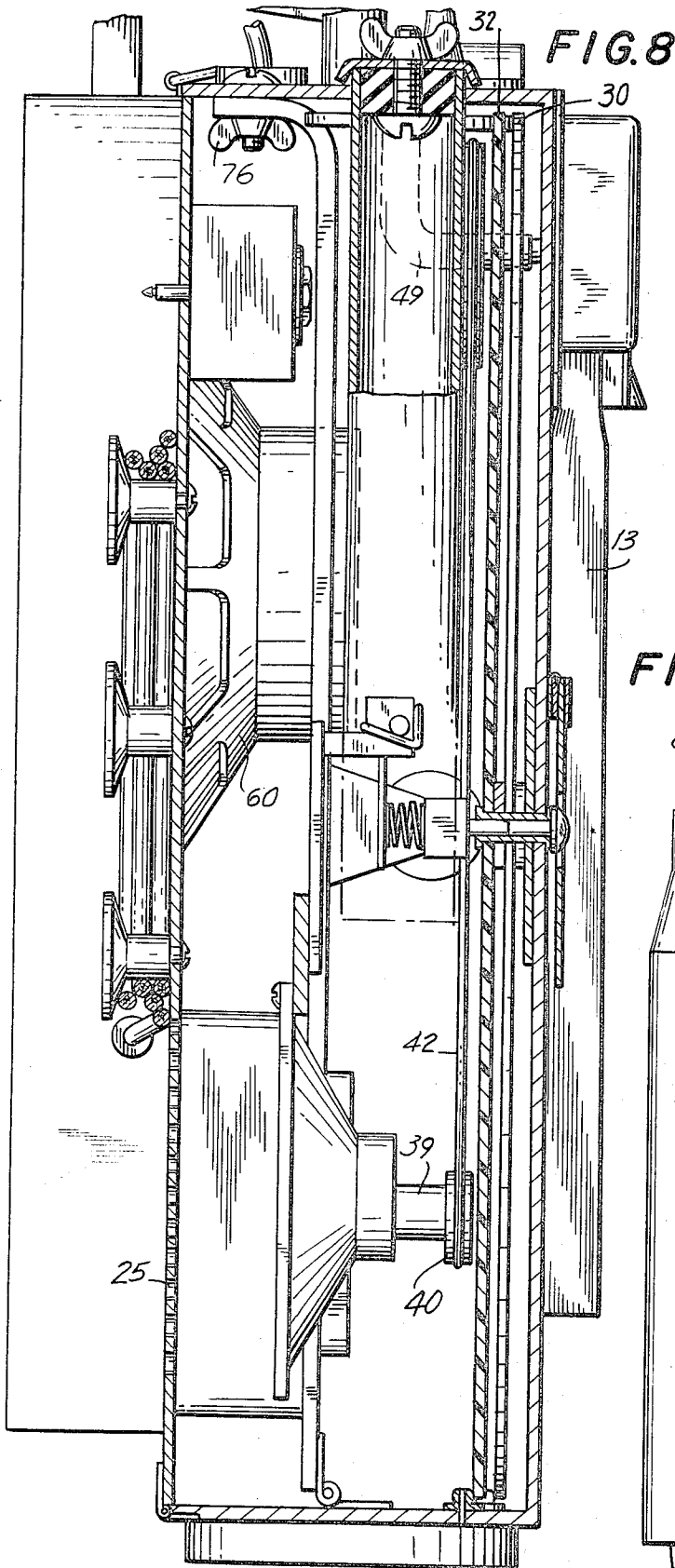
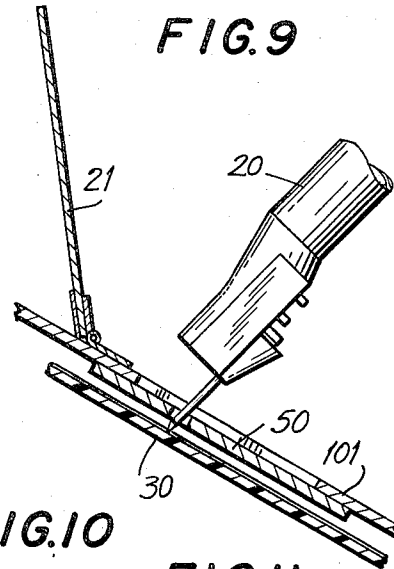


FIG. 10

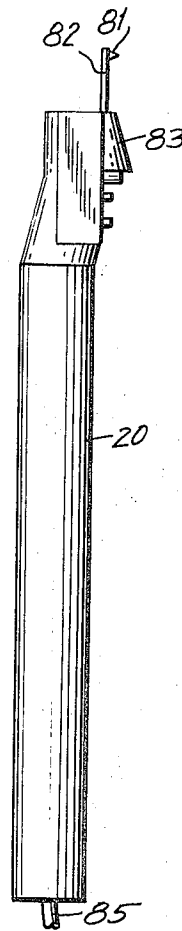
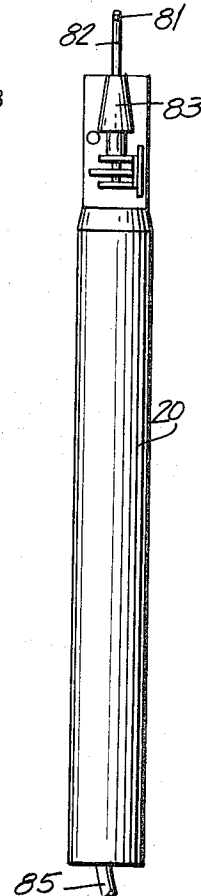
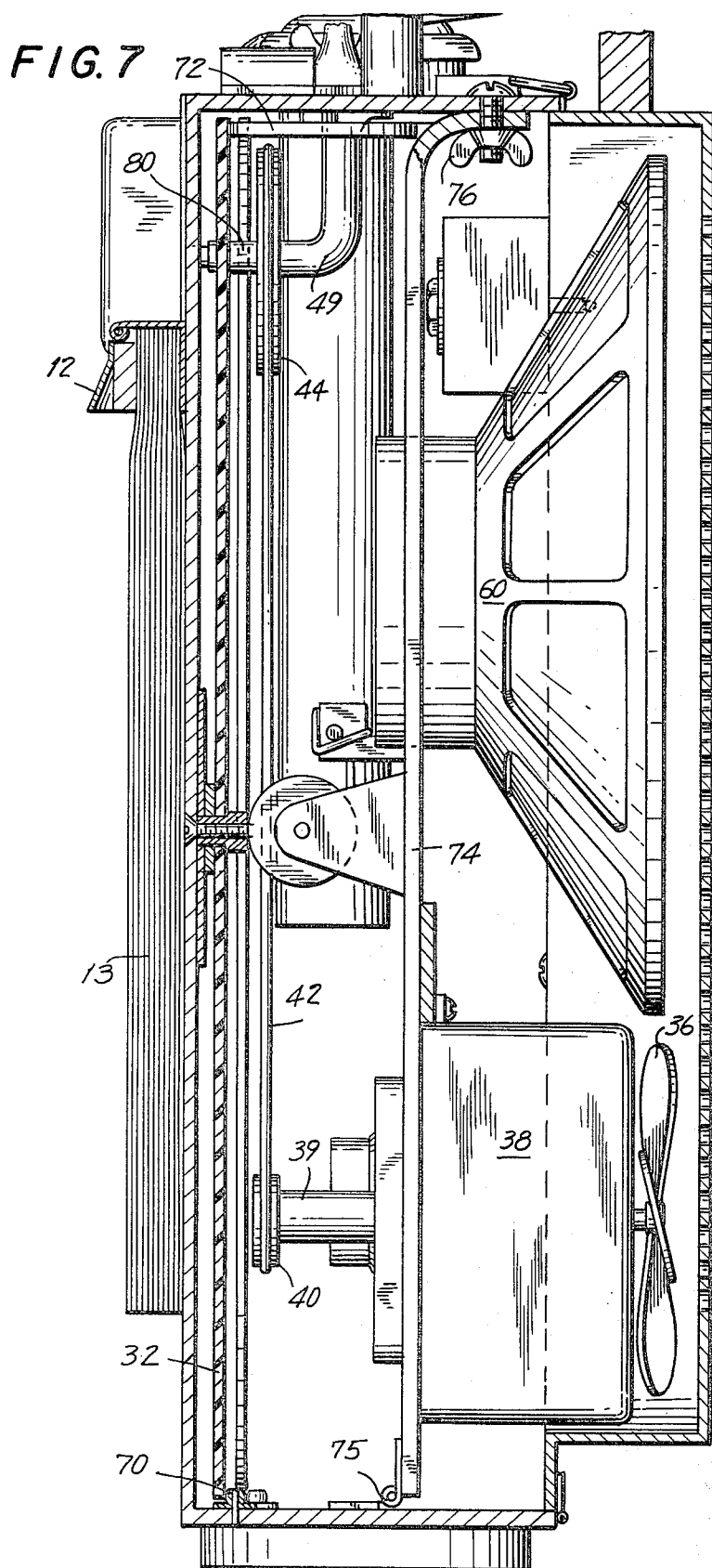
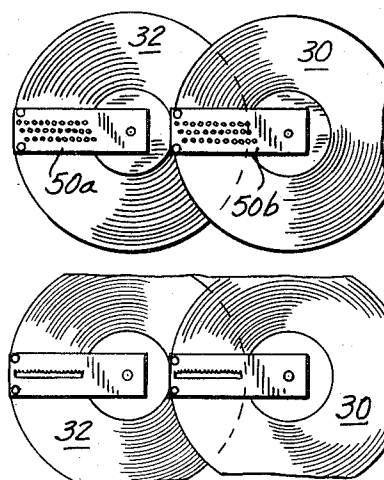
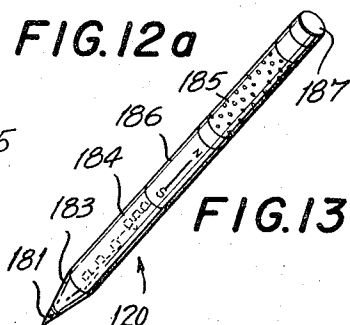


FIG. 11





PORTABLE VOICE MESSAGE GENERATOR

RELATED DISCLOSURE

This application is related to my co-pending U.S. Pat. application, Ser. No. 227,759 (filed Feb. 22, 1972), filed concurrently herewith and entitled "VOICE MESSAGE GENERATOR."

BACKGROUND OF THE INVENTION

The present invention relates to devices capable of generating voice messages by combining elements of a prerecorded vocabulary.

More particularly, the invention relates to improvements in message generators, enabling such a device to be made portable and thereby increase its utility and effectiveness.

Message generating devices, as disclosed herein, may be used for a variety of purposes; as musical instruments, training devices, as encoders, language translators, as aids to handicapped persons, and many similar applications.

As a teaching machine the device may be provided with records carrying the sounds formally associated with the letters of the alphabet, and the words corresponding to the written numerals; by activating the device, in a manner described below, a child learning to read will come to associate the appropriate sounds and words with their written forms since each time a particular symbol is selected the corresponding sound will be generated at the output speaker of the message generator.

Similarly, someone wishing to learn the sounds and words associated with the same symbols in a foreign language, or in a code — the Morse code for example — can be provided with records carrying the appropriate messages.

Another potential use of the message generator is as a sound-effect machine for use in theatrical productions, recording studios and the like. Each groove of the records used in such an application would be impressed with a particular sound — i.e., that of an approaching train — and the selector portion of the generator appropriately marked.

SUMMARY

The present disclosure teaches the construction and use of a device for the generation of a message, or sound pattern, ultimately decipherable by the human ear. The message is composed by pre-recording its component sounds on parallel tracks of one or more record disks and successively playing back these component sounds in the desired sequence by placing a pick-up cartridge into contact with them.

The preferred embodiment of the invention utilizes the standard long-playing recording disk, 12 inches in diameter and rotating at 33-1/3 revolutions per minute, as its storage medium for message components. Approximately 30 elements may be stored on one face of such a record, each element being repeated on five parallel grooves, to compensate for slight misalignments in the mounting of the disks and in the positioning of the pick-up relative to the record grooves.

Two such records are readily housed in a portable case approximating in size a conventional attache case; the records being mounted in a partially overlapping relation to reduce the dimensions of the envelope.

Playback from these records is by means of a pick-up wand incorporating a sensing needle and attached transducer, the pick up being inserted into holes in the cover of the case, these holes being equal in number to the available message elements and positioned so as to bring the pick-up into contact with a particular groove, or group of grooves carrying the appropriate sounds.

It is a primary aim of the invention to describe the manner in which the requisite mechanical, electrical and electronic components may be combined into the portable message generating device described above.

It is another object of the invention to teach details of construction and operation leading to the greatest economy and utility in the building and use of such a device.

Other aims and uses of the invention will become apparent from the discussion below.

BRIEF DESCRIPTION OF THE DRAWINGS

The preferred embodiment of the invention will be described in detail by reference to the accompanying drawings, in which:

FIG. 1 is a perspective view of a portable voice message generator of the invention;

FIG. 2 is another perspective view of the embodiment of FIG. 1, as seen from below;

FIG. 3 is a view of the bottom of the message generator of FIG. 1, indicating the location of some of the major internal components;

FIG. 4 is a side view, in section along line 4—4 of FIG. 3, of the preferred embodiment of the invention;

FIG. 5 shows a representative selector card, as used in the portable voice message generator;

FIG. 6 is an alternate selector card;

FIG. 7, is a sectioned edge view of the embodiment of FIG. 1, taken along section line 7—7 of FIG. 3;

FIG. 8 is another sectioned edged-view of the message generator, taken along section line 8—8 of FIG. 3;

FIG. 9 is a side-view of the pick-up wand of the invention in contact with a record;

FIG. 10 and FIG. 11 are side and frontal views, respectively, of the wand shown in FIG. 9;

FIG. 12 indicates, schematically, the superposition of the two records of the preferred embodiment and the relative location of the corresponding selector cards;

FIG. 12a shows an alternate embodiment of the selector card, as superimposed on the record disks of the invention;

FIG. 13 is another pick-up wand, incorporating an amplifier and speaker; and

FIG. 14 illustrates a particular method of mounting the needle and transducer of a pick-up wand, as used in the embodiment of FIG. 13.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

The preferred embodiment of the portable voice message generator of FIG. 1 has its operating components mounted in, and on, a carrying box 10. The components mounted on its top surface 101 include clamp 12, for the purpose of retaining a writing pad 13, on-off switch 14, magic-eye 15, input sockets 16 and selector cover 21. A pick-up wand 20 is also shown in FIG. 1, with its associated connector 18 plugged into one of the input sockets 16.

The same carrying case 10 is shown in FIG. 2 as viewed in perspective towards its base, opposite the top surface 101. The components visible in this view include a carrying handle 11, power cord 20, amplifier 22, speaker cover 25, pivotable supports 23a and 23b for enabling the device to be positioned at an incline on a desk or a like surface, as well as an additional input jack 16a to which a portable microphone 26 is connected; when not in use, the microphone 26 is held against the case by means of spring clamps, and its cord is wound around retaining bollards fixed into the base of the case 10.

FIG. 3 shows the base of the message generator with the bottom of the carrying case 10 and the components mounted externally thereon omitted. Many of the major elements of the internal mechanism of the generator are visible in this view, including records 30 and 32, cooling fan 36, speaker 34, record support idlers 72 and support buttons 70. Also shown are the carrying handle 11 and hooks 29 which alternately serve for the storage of the power-cord 20, or be used as attachments for a carrying strap, not illustrated, whereby the case 10 may be suspended from the shoulder while transported from one place to another.

FIG. 4 is a side — view of the message generator of FIG. 1, shown sectioned along line 4—4 of FIG. 3. A drive motor 38 is shown whose shaft 39 carries a pulley 40 in whose groove a transmission belt 42 is placed. The endless belt 42 loops around the pulley 40 and another pulley 44 whose shaft rides in a bearing machined into a support bracket 49. The alignment of the drive is also illustrated in FIG. 7.

The shaft of the pulley 44 is covered with an elastomer sleeve aligned with the cusp formed by the overlapping disks of the records 30 and 32. A slight interference fit obtains between the edges of the records and the deformable sleeve 80, forming a frictional drive system which impels both records into rotation, in the same sense, upon the activation of the motor 38.

FIG. 4 also shows the manner in which the records 30 and 32 are arranged to lie in close proximity to the upper surface 101 of the carrying case, overlying one-another by almost half of their diameters. The recording surface of the disks 30 and 32 face the surface 101 from the inside of the case and are made assessable, to the pick-up wand 20, by means of suitable perforations; these perforations being overlain by cards 50 which, in turn, are normally covered by selector cover 21.

In the form illustrated in FIG. 5, a selector card 50a is perforated by 30 access holes in three rows of 10, each row being slightly offset with respect to the other two. These perforations are so arranged that they overlie, when mounted in the machine over pins passing through locating holes 51 and 52, the perforations in the surface 101 giving access to the thirty groups of grooves in the record on which the several message elements have been pre-recorded.

The locating hole 51 is aligned with the center of the record and the distance from it to a particular one, 53 for example, of the 30 perforations represents the radial distance from a particular pre-recorded sound track on the record from its center of rotation. In the record corresponding to the selector card 50a, the particular track under hole 53 is impressed with the sound of the letter K, and the card is appropriately marked.

Selector card 50b, shown in FIG. 6, is functionally identical to the card 50a described above and is used in conjunction with a record whose grooves are impressed with the words — one, two, three, four, five, six, seven, ten, eleven, twelve, teen, twenty, thirty, forty, fifty, sixty, seventh, eighty, ninety, hundred, thousand, million, billion, equals, and, and from — with which the spoken equivalents of any arithmetic computation involving addition and subtraction may be assembled.

As an example of the utility of the message generator here disclosed, the device may be used, loaded with the two records corresponding to selector cards 50a and 50b, by a mute child attending an elementary school class in which the teacher and other children are not proficient in the hand signals mutes normally resort to to communicate. By inserting the pick-up wand 20 sequentially through the perforations in the selector cards, the mute child can compose answers to questions in spelling and arithmetic, borrowing the recorded voice for his own.

The relative alignment of the records 30 and 32, and of the selector cards 50a and 50b, is shown in the schematic sketch of FIG. 12. FIG. 12a shows two similar records 130 and 132, overlain by selector cards 150a and 150b which differ from the corresponding selector cards 50a and 50b by having a slot cut into their surfaces along a radial track, intersecting the center of the record below, with dead-ended cut-outs branching from the slot at radial positions corresponding to the message element tracks in the record. In this embodiment of the selector card the pick-up wand is not sequentially inserted into holes to contact the desired record groove but moved along the slot and pressed into the aforementioned branching cut-outs.

FIG. 7 is a transverse section, along line 7—7 of FIG. 3, of the portable message generator, viewed from one edge of the carrying case 10. The manner in which some components of the mechanism, notably the drive motor 38 and the speaker 60, are attached to a mounting plate 74, supported by hinge 75 along one edge and threaded fasteners 76 along the other, is illustrated. By removing the fasteners 76, it is possible to swing the mounting plate 74 away from the suspension of the records 30 and 32, and thereby permit the insertion and changing of these records.

FIG. 8 is another edge-view of the device — as seen from the opposite edge of the case 10, relative to the view of FIG. 7 — indicating the arrangement of components inside the carrying case.

FIG. 9 is a partial section, showing the manner of engagement of the record 30 by pick-up wand 20; the selector cover 21 being lifted to expose selector card 50, and to permit the insertion of tip 82, carrying needle 81, through the orifices of the selector card.

Details of the wand 20 are also shown in FIGS. 10 and 11, indicating the needle 81, the tip 82 and the transducer element 83. These components form a replaceable pick-up cartridge of the Astatic type and are mounted at one end of the wand 20; the transducer output signal is fed into the amplifier 22 via electrical lead 85, terminating in plug 18.

An alternate embodiment of the wand is illustrated in FIGS. 13 and 14. In this embodiment the pick-up wand 120 is a self-contained broadcast system incorporating an amplifier 184 and a speaker 185. The wand 120 is powered by a small battery 186 and is turned on, and

tuned, by means of knob 187; a pick-up transducer 183 receives its mechanical input from needle 181 in contact with the undulating profile of a groove in the record 30.

It is evident that the portable message generator disclosed in this application can also take form in embodiments which deviate from the details described above; the number of records may vary from two, the manner of recording and of recovering the recorded message elements may be changed — to a magnetic band or cylinder, for example — and changes may be made in the mechanical, electrical and electronic components incorporated therein, without deviating from the teachings of this disclosure.

What is claimed is:

1. A compact, portable teaching device about the size of an attache case for the generation of audible messages from pre-recorded sound components, comprising: an enclosure having a substantially flat outer surface, and a substantially constant cross-section perpendicular thereto, and a carrying handle; a pair of support members pivotably secured to the bottom of said enclosure for enabling said device to be positioned at an incline on a desk or the like; recorded means comprising at least two substantially thin, flat, circular disks of plastic material carrying on the flat surface thereof a multiplicity of pre-recorded message elements in concentric, parallel, circular arc-shaped tracks; the flat surface of each disk substantially overlaps the flat surface of a second disk so as to minimize the cross sectional area of said enclosure; support means for each disk, rotatably secured within said enclosure, such that said disks are rotatable about their center axes in planes parallel to, and spaced interiorly from, the outer surface of said enclosure, and such that the flat surfaces of the disks are parallel to the outer surface and at least a portion of each track on each disk is in an unobstructed straight line to a portion of the outer surface; said enclosure having means providing access to the said recorded means; drive means, for impelling said support means into rotational motion in a uniform, angular velocity; transducer means having a pick-up needle element attached to follow undulations in the tracks, the transducer being intended to be hand-held

for reading said pre-recorded message elements on said tracks and the conversion of same into electrical signals of fluctuating intensity; broadcast means including amplifying means electrically connectable to said transducer for the conversion of said signals to audible sound; and selector means in the form of at least one aperture card having a plurality of rows of apertures, the card being disposed above said outer surface such that each aperture in the card is in line with an opening in the outer surface and with one of said tracks; whereby said needle of said transducer means can be inserted through an aperture and opening and thus brought into contact with one of said tracks; an indicia on said aperture card, whereby each of said pre-recorded message elements on the tracks are identified and the needle of the transducer means can be manually positioned in contact with any track such that the identified audible message can be broadcast; and cover means for shielding said aperture card when not in use.

2. The device according to claim 1, wherein each of said disks carries on the surface thereof a multiplicity of parallel tracks in which a number of adjacent tracks are impressed with recordings of the same pre-recorded message element.

3. The device according to claim 1, wherein the tracks on the disks occupy a major portion of the concentric circular arcs on one or both sides of said disks.

4. The device according to claim 3, wherein said major portion is more than nine-tenths of a full circular arc.

5. The device according to claim 1, wherein said pick-up needle is rigidly attached to one extremity of an elongated wand.

6. The device according to claim 5, wherein said wand is provided with a hollow interior space and said amplifying means and said broadcast means are housed therein.

7. The device according to claim 1, wherein the tracks on the disks occupy a major portion of the concentric circular arcs on one or both sides of said disks.

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