

- [54] **RECORD CARD HOLDER AND ACOUSTICAL DEVICE**
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[58] **Field of Search**.....274/4 J, 4 R, 11; 35/35 C; 179/100.2 MI, 100.2 T

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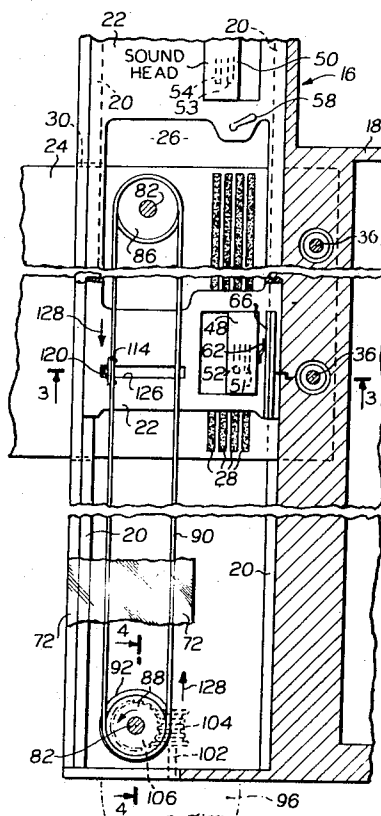
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[57] **ABSTRACT**

This sound recording and/or reproducing apparatus employs a card with a sound track having different channels extending parallel to an edge of the card and to each other. A sound head moves downward across the card and then in a reverse direction upward. One sound channel is effective on the down move of the sound head and a different one on the up move. A modification has a carriage that moves for a distance twice as great as the length of the sound track with multiple sound heads in positions to come over the different channels successively. Relative movement of the head and sound track can be motorized or can be manual and in accordance with a visible timer. Electric switches make different channels successively effective.

16 Claims, 11 Drawing Figures



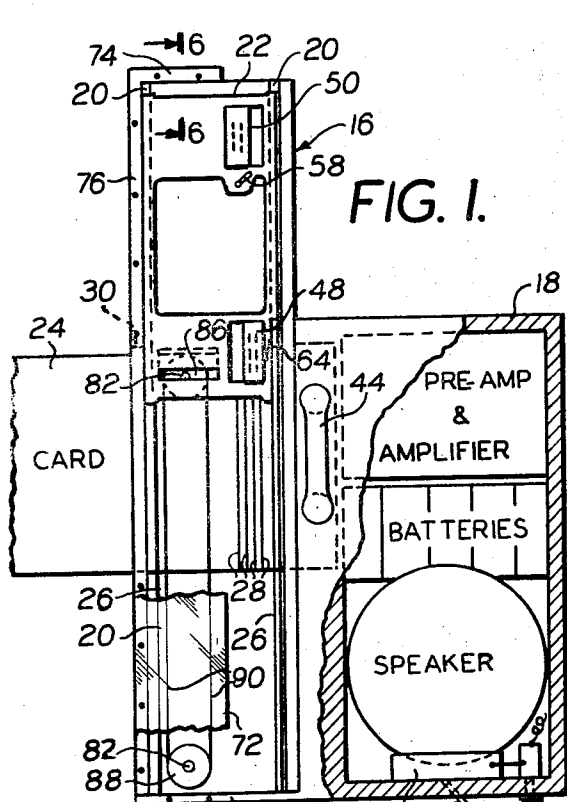


FIG. 1.

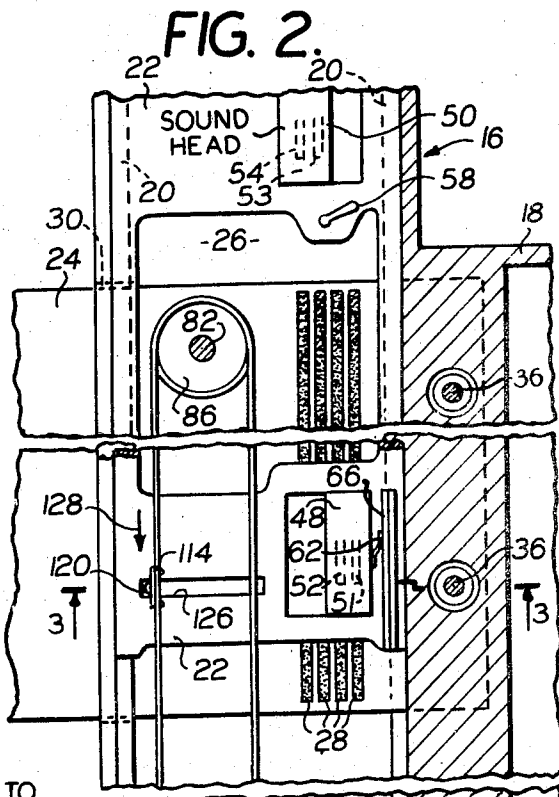


FIG. 2.

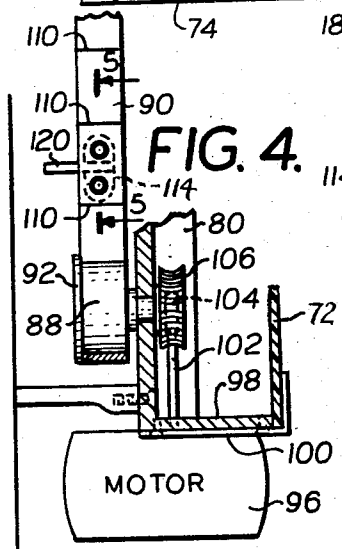


FIG. 4.

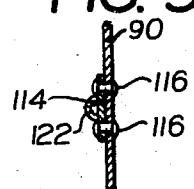


FIG. 5.

FIG. 6.

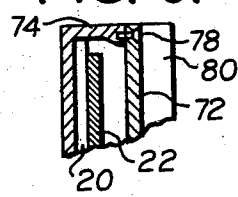


FIG. 8.

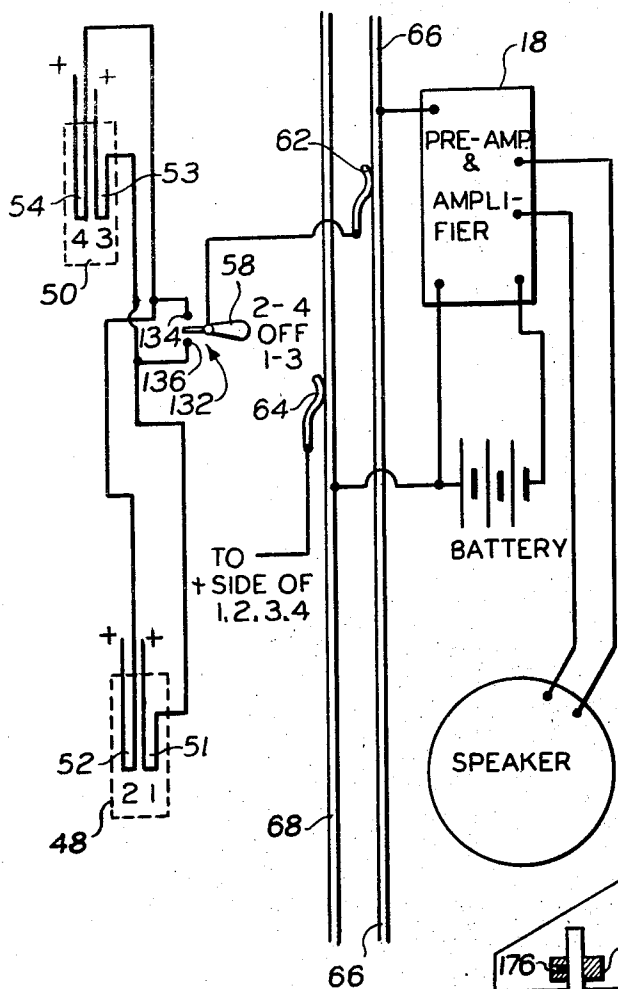


FIG. 10.

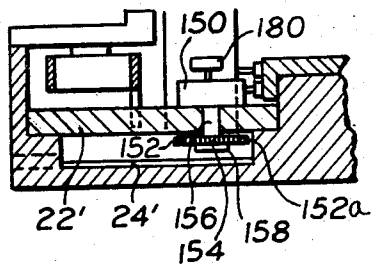
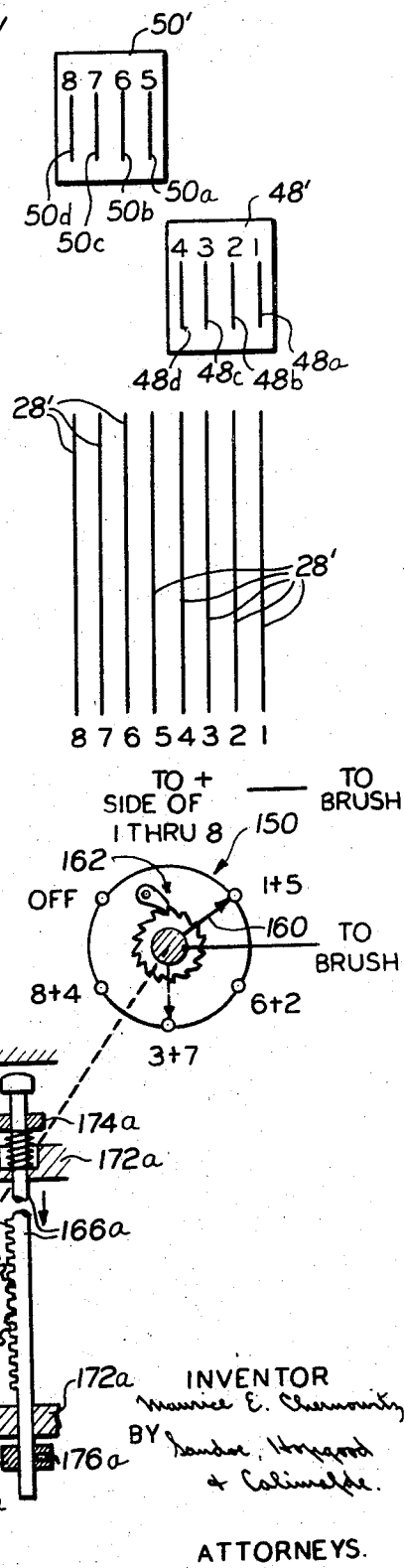


FIG. 9.



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RECORD CARD HOLDER AND ACOUSTICAL DEVICE

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention makes available a new way for the recording and/or reproducing, as well as the convenient storage, of short sound data. The device is made to be used preferably with flat cards of standard size, which can easily be stored, on which sound is recorded or from which sound is played back. With sound cards there is the obvious advantage that such separate units of sound can be heard at will in any order desired and then filed away. In addition to having sound tracks, the cards can feature printed pictures or text or both to provide full audio-visual effects and can be used for business, entertainment, as well as in the teaching of any subject matter, such as foreign languages.

This invention relates to sound recording and reproducing apparatus and more especially to apparatus in which the record is a sound track extending parallel to the edge of a card. The sound track is short compared to spiral and helical tracks; and it is an object of this invention to increase the playing time of a card record while still retaining the feature of having the track extend parallel to an edge of the card. With this invention, a multi-channel track is used. A recording and/or reproducing head, referred to herein as a "sound head", moves downward across one channel and at the completion of the downward stroke, reverses and moves upward along a parallel channel to double the effective length of the sound track. With four channels, the effective length of the sound track can be doubled again, and by greater numbers of channels, the effective length can be further increased.

Additional playing time can be obtained by having the card held in a frame that is adjustable transversely of the direction of relative movement of the audio means and the sound track so as to bring successive parallel sound tracks into operative position.

The stroke of the apparatus can be increased so that it is greater than the height of the card and greater than the length of the track by having more than one sound head with the heads connected, for example to a common carriage, so that as one head reaches the end of the sound track, another head starts from the other end to traverse a different channel by moving in the same direction as the first head which has now run beyond the end of the track.

In order to have the channels close together, this invention uses sound heads that have a number of tracking elements attached to the same head and spaced transversely of the direction of movement of the head along the track by the spacing of the channels from one another. The expression "tracking element" is used herein to designate that part of either a recording or reproducing apparatus that is adjacent to the track, or channel of the track; and the expression "channel" is used herein to designate the part of a single or multiple channel track that cooperates with a tracking element of a sound head.

In order to make different channels effective at different times, the invention has switch means associated with the carriage that moves the sound head along the track. With a manually operated carriage, the handle

by which the carriage is moved changes the position of the switch means as the direction of movement of the handle is reversed. With a mechanically operated carriage, relative movement of the carriage along its support actuates the switch means as the carriage approaches the end of the support or track

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

BRIEF DESCRIPTION OF DRAWING

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views:

FIG. 1 is a diagrammatic view, partly broken away and in section, showing sound recording and/or reproducing apparatus made in accordance with this invention;

FIG. 2 is a greatly enlarged fragmentary view of a part of the apparatus shown in FIG. 1, the section being taken on the line 2—2 of FIG. 3;

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 2 and showing also structure located above the section line on which FIG. 2 is taken, some of this structure being shown in phantom in FIG. 2;

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a fragmentary sectional view taken on the line 6—6 of FIG. 1;

FIG. 7 is a fragmentary top plan view of one end of the apparatus shown in FIG. 1;

FIG. 8 is a wiring diagram for the apparatus shown in the other figures;

FIG. 9 is a diagrammatic view showing a modification of the invention to include eight sound channels;

FIG. 10 is a fragmentary sectional view similar to FIG. 3 but taken in the plane of section of the switch and switch actuator shown in FIG. 9; and

FIG. 11 is a sectional view similar to part of FIG. 3 but showing a modified construction for holding the card and providing adjustment transverse of the sound tracks for bringing different sound tracks into operative position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows a sound recording and/or reproducing apparatus comprising a frame 16 which includes a housing 18 for holding batteries, a speaker or microphone or both, and the circuitry for the apparatus other than the sound heads and switches for making different sound channels effective.

In the construction illustrated, the frame 16 has tracks 20 which extend for a greater length than the length of the housing 18; and there is a carriage 22 which is supported by the tracks 20 and which is movable along the tracks either manually or mechanically, as will be hereinafter explained.

A card 24 carries a sound track 28 which, in the embodiment of the invention shown in FIGS. 1-8, includes four channels 28. These channels 28 are actually shown as separate tracks in the drawing for clearer illustration and the expression "sound track" is used to designate

the combined sound channels, whether on separate or multiple tracks, as previously explained.

The card 24 is inserted through a slot 30 in one side of the frame 16, as best shown in FIG. 3. The card is pushed into the apparatus until the inner edge of the card strikes against a wall 34. There are pins 36 which fit through openings in the card 24 to anchor the card in a fixed and predetermined position in the apparatus. These locking pins 36 for holding the card in position can be of various constructions. One simple construction is shown in FIG. 3, using two pins 36 at spaced locations along the height of the card. Such positive locks are preferable to clamps which have no portion extending through openings in the cards, but such clamps can be used if the apparatus is made with end walls at opposite ends of the wall 34 for holding the card against movement in all directions except in and out of the holder, while the clamp provides restraint against such in and out movement.

The portion of the apparatus that holds the card can be made as the movable element, and the sound heads can then be at fixed locations. The card holder can be made adjustable transversely of the sound track for use with additional sound tracks on the same card if desired, to increase the playing or recording time.

Each of the pins 36 has a collar 40 and there is a spring 42 urging the collar 40 downward. A handle 44 (FIGS. 1 and 3) is connected with the upper ends of both pins 36 so that the pins can be raised and lowered simultaneously with one hand.

The carriage 22 supports two sound heads 48 and 50. The sound head has tracking elements 51 and 52 which operate over the first and second, respectively, of the channels 28 counting from right to left in FIG. 2. The sound head 50 has tracking elements 53 and 54 which operate over the third and fourth, respectively, of the sound channels 28.

The sound heads 48 and 50 are staggered, being spaced from one another, in the direction of the length of the tracks 20, by a distance substantially equal to the height of the card 24 so that as the tracking elements 51 and 52 of the sound head 48 reach the lower ends of the first two channels 28, the tracking elements 53 and 54 of the second sound head 50 reach the upper ends of the third and fourth channels 28 to continue the recording or reproducing of the apparatus without interruption.

When four channels and two sound heads are used, as in FIGS. 1 and 2, the record on the card, if a continuous record is desired, is made to extend from the upper end of the right-hand channel 28 and along that channel to the lower end of the card and to continue from the upper end of the third channel from the right to the lower end of that channel. The recording on the two remaining channels, i.e., the second and fourth channels from the right, are recorded for reproduction with the carriage 22 moving in the opposite direction, i.e., upwardly along the tracks 20. Thus the record continues from the bottom of the fourth channel 28 to the upper end of the card and then from the bottom of the second channel 28 to the upper end of the card.

It will be evident that since the tracking elements 52 and 54 move along their channels during the downward movement of the carriage, and the tracking elements 51 and 53 move along their channels during the third

upward movement of the carriage, it is necessary to inactivate the different tracking elements other than the one in use when moving in one direction. This is done by means of switch means including a handle 58 located on top of the carriage 22, as shown in FIGS. 1 and 2. In the preferred construction, this handle 58 is used to move the carriage 22 along the tracks, when the apparatus is operated manually. The handle 58 is preferably connected with the switch arranged to make the tracking elements for the downward recorded channels effective when the switch handle 58 is pushed downwardly, and the tracking elements for the upwardly recorded channels effective when the handle 58 is pushed the other way to move the carriage upward along the tracks.

In order to connect the movable sound heads 48 and 50 with the fixed circuitry in the housing 18, there are brushes 62 and 64 (FIG. 3) which contact with conductors strips 66 and 68 located along the fixed structure of the apparatus above one of the tracks 20. These brushes will be more fully described in connection with the wiring diagram of FIG. 8.

There is a cover 72 extending for the full length of the tracks 20 and projecting over the left-hand portion of the carriage 22. This cover 72 is broken away along most of the height of FIGS. 1 and 2 in order to show the structure beneath it. The cover rests on end walls 74 and a side wall 76 to which the cover is attached by fastening means such as screws 78, as shown in FIG. 7. To prevent sagging of the cover on its side opposite the wall 76, there is an upwardly extending flange 80 which provides an angle construction at the right-hand side of the cover 72.

At widely spaced locations along the cover 72, there are studs 82 secured to the cover by fastening means such as nuts 84. These studs 82 provide axles for wheels 86 and 88. The wheel 86 is an idler but the wheel 88 is driven, as will be explained more fully in connection with FIG. 4.

There is an endless belt 90 (FIG. 2) which extends around the wheels 86 and 88. This belt is held on the wheels 86 and 88 by flanges 92 at the lower ends of each of the wheels, the flanges having a radial extent substantially equal to the thickness of the belt 90. It will be understood that the expression "belt" is used herein in a generic sense to include constructions other than belts of continuous material, for example: link belts including chains, and in the case of a chain belt, the wheels would preferably be sprocket wheels.

FIG. 4 shows the wheel 88 driven by an electric motor 96 which is fastened to a flange 98 on the cover 72 by a bracket 100. The motor 96 has an armature shaft 102 that drives a worm 104 to rotate a worm wheel 106 secured to the axle that rotates the wheel 88. The motor 96 runs at a constant speed and is geared to the wheel 88 so that with the particular radius of the wheel 88, the lineal speed imparted to the belt 90 is the speed at which the sound heads are intended to move along the channels of the sound track.

The belt 90 is made with markings on it such as colored stripes 110 and there is a window through which an operator of the machine can see the belt 90 when using the apparatus manually. When constructed for manual operation, the cover 72 is made of clear plastic so that the entire area of the cover 72 provides a window for watching the belt 90.

When operating the apparatus manually, the operator can move the carriage 22 at a rate which coincides with a particular marking on the belt which is at a convenient location to correlate it with a part of the carriage so as to maintain a carriage speed equal to the belt speed. The belt can be used for timing the speed of the carriage for manual operation in either direction by merely using the downwardly or the upwardly moving run of the belt as the guide.

If the belt 90, motor 96 and driving mechanism are made strong enough, the carriage 22 can be driven mechanically by power from the motor 96. This is done by providing a bracket 114 (FIG. 4) attached to a short length of the belt 90 by fastening means such as rivets 116. The bracket 114 is short enough to pass around the wheels 86 and 88. A pin 120 fits into a socket 122 (FIG. 5) through a slot 126 (FIG. 2) in the carriage 22. With the belt moving in the direction indicated by the arrows 128, and with the pin 120 in the position shown in FIG. 2, the carriage 22 moves downwardly along the track 20 at the lineal speed of the belt 90. As the pin 120 travels around the lower part of the periphery of the wheel 88, the carriage slows down and the pin 120 moves toward the right along the slot 126. By the time the pin 120 is directly below the axle 82, the pin no longer has any component of movement parallel to the track 20 and the carriage 22 momentarily stops.

As the pin 120 continues to move counterclockwise with the rotation of the wheel 88, the pin 120 moves from its contact with the lower end of the slot 126 into contact with the upper edge of the slot and the carriage 22 moves upward along the track 20 with accelerating motion. If the diameter of the pin 120 is equal to the distance between the upper and lower edges of the slot 126, the carriage 22 will stop momentarily but for no dwell at the lower end of its stroke. To the extent that the upper and lower edges of the slot 126 are spaced from one another by a distance greater than the diameter of the pin 120, there is a dwell at the end of the carriage stroke while the pin 120 moves from the bottom to the top of the slot. This dwell should be kept to a minimum.

As the pin 120 travels upward with the right-hand run of the belt 90, the carriage 22 makes its return stroke; and the carriage stops and reverses as the pin 120 travels around the upper wheel 86. Because of the change of speed of the carriage at the ends of its stroke, the sound channels are recorded so as to have a silent period at their end portions over which the tracking elements are located while the carriage is stopping and reversing its movement.

The apparatus can be changed from a mechanically to a manually operated device by removing the pin 120 from the socket in the bracket 114.

FIG. 8 is a wiring diagram for the apparatus shown in the previous figures. The tracking elements 51-54 are shown with numbers 1-4, respectively, below them to designate the numbers of the channels over which each of these tracking elements operates. The tracking elements shown are supplied with power from the contact strip 68 through the brush 64. The brush 62, operating along the contact strip 66, is connected with the fixed circuitry in the housing 18 and connects this fixed circuitry with switch means 132 connected to and operated by the handle 58. This switch means 132 is in its off position when midway between its upper and

lower positions and is so shown in FIG. 8. When the handle 58 is pushed downward, it moves the switch means clockwise and closes the circuit to an upper contact 134 which activates the channels 1 and 3. When moved in the opposite direction, the switch means 132 closes the circuit through a contact 136 to actuate the tracking elements for the channels 2 and 4.

FIG. 9 shows a modified construction. Two sound heads 48' and 50' correspond to the sound heads 48 and 50, previously described. Each sound head has four tracking elements, indicated diagrammatically as 48a, 48b, 48c and 48d, and there are numbers 1, 2, 3 and 4, respectively, at each of these tracking elements to indicate the channel over which each tracking element moves, these channels being shown by parallel lines 28'. The sound head 50' has four tracking elements 50a, 50b, 50c and 50d, with numbers 5-8, respectively, to indicate the particular channels with which these tracking elements cooperate. The only essential difference between the arrangement shown in FIG. 9 and that shown in FIG. 8 is that somewhat more elaborate switching means are necessary because of the fact that the sound heads make two strokes in each direction in recording or reproducing the total capacity of the card on which the sound channels 28' are located.

FIG. 10 shows a modification of the construction shown in FIG. 3 and illustrates switch means 150 located on a carriage 22' which moves back and forth along tracks, as in the embodiment described in connection with FIGS. 1-8. Similar parts in FIG. 10 are indicated by the same reference characters as in the other Figures but with a prime appended.

The switch means 150, which is a five-position switch, is operated by a rack 152 which rotates a pinion 154 on a shaft 156. The pinion 154 drives the shaft 156 through a slip clutch 158 and the shaft 154 rotates a brush 160 (FIG. 9) of the switch means 150. A pawl and ratchet 162 prevents counterclockwise movement of the brush 160.

The rack 152 is on a push rod 160 which projects beyond one end of the carriage into position to strike against an abutment 170 located at the lower end of the travel of the carriage 22'. The push rod 166 slides in bearings 172 on the carriage, and the stroke of the push rod 166 is determined by collars 174 and 174', the latter of which is held in place by a set screw 176 to permit adjustment of the stroke. A spring 178 restores the push rod 166 to its original position when the carriage reverses its direction and backs away from the abutment 170.

There is another rack 152a which meshes with the other side of the pinion 154 for rotating the pinion when the carriage reaches the upper end of its return stroke. This rack 152a is on a push rod 166a which cooperates with an abutment 170a. At each end of the stroke, therefore, one of the push rods 166 or 166a moves the switch means to its next positions.

After the completion of four strokes, the switch means 150 has the brush 160 in its off position. To start the apparatus again, the switch means 150 is manually operated by a knob 180 (FIG. 10) to reset the brush 160 (FIG. 9) of the switch means 150 in its starting position. The manual reset can be done away with by using a four-position switch which will return to starting position after two complete strokes of the carriage.

With such a switch, some other means can be provided for an automatic stop.

The sound heads are preferably universal heads which can be used for both recording and reproducing. A two-position switch 184 (FIG. 1) is moved into different positions for recording or reproducing. The switching system can be adapted for recording or playing various stereo and double mono effects, if desired, with manual controls that can override the automatic sequence.

FIG. 11 shows a modified form of the card holder which differs from the structure of FIG. 3 in that it provides for transverse adjustment of the card to locate different sets of sound tracks under the sound head or heads. Parts shown in FIG. 3 are indicated by the same reference characters with a prime appended.

A card 24' rests on a card-holding frame 186 which is movable on the fixed frame 22' of the apparatus between the full line and dotted line positions shown in FIG. 11. The frame 186 is operated manually by a knob 188 connected to the frame 186 by a rod 190 which slides axially in a guide 192 in the fixed frame 22'.

At the right hand end of the card-holding frame 186 there is a bracket 194 for holding the locator pins 36' that hold the card in a fixed location on the frame 186. This bracket 194 can be of one-piece construction with the frame 186 or can be otherwise connected to the frame 186 for movement as a unit therewith. A stop 196 on the fixed frame limits movement of the frame 186 in one direction; and a shoulder 198 at the left hand end of the guide 192 limits movement of the frame 186 in the other direction.

With the parts in their dotted line positions shown in FIG. 11, the sound tracks 28a are in position to cooperate with the sound heads of the apparatus. When the frame 186 is shifted to its full-line position, other sound tracks 28' are brought into position to cooperate with the sound heads.

The provision of shifting the card 24' transversely of the direction of extent of its sound tracks provides twice as much playing time for the sound recorded on the card. Further increase can be obtained by having more than two transversely adjustable positions for the card-holder frame 186 and a corresponding increase in the number of sets of sound tracks on the card. Provisions for bringing more sets of sound tracks selectively into working positions can be effected by having additional sets of holes in the card 24', spaced from one another transversely of the direction of extent of the sound tracks, for receiving the pins 36' to hold the card 24' in different positions without moving the frame 186.

The preferred embodiments of the invention have been illustrated and described, and the invention is defined in the appended claims.

What is claimed is:

1. Apparatus including a card having a sound track extending parallel to an edge of the card, the sound track having a plurality of parallel sound channels, audio means including a housing with sound reproducing means carried thereby, a frame including a support on which a card rests with the faces of the card substantially horizontal, and holding means movable between a first position that retains the card against horizontal movement and in a predetermined fixed location on

said support and a second position that releases the card for replacement by another card, guiding means for guiding the housing along a horizontal course over the sound track on the card when the card is retained in said fixed position, and characterized by means for adjusting the card and the holding means as a unit horizontally from one fixed position to another in a direction transverse of the direction of extent of the sound track to bring different sound channels into position for cooperation with the audio means.

2. Apparatus including a card having a sound track extending parallel to an edge of the card, audio means including a housing with a sound head carried thereby, a frame including a card support and holding means movable between a first position that retains the card against horizontal movement and in a predetermined fixed location on said support and a second position that releases the card for replacement by another card, guiding means for guiding the housing along a course over the sound track on the card when the card is retained in said fixed position, characterized by a surface of the card having a plurality of parallel sound channels on the sound track on said surface, the sound reproducing means being in simultaneous operative relation to different sound channels on the same surface at the same time, and means for selectively adjusting the audio means to reproduce sound successively from the different channels while the card remains in fixed position with respect to the holding means, characterized by different channels of the sound track being recorded in different directions for use of different channels when the audio means is moving in different directions along the guiding means, and automatic means effective at the reversal in the direction of movement of the audio means to operate the means for selectively adjusting the audio means to change the reproduction of said audio means to a channel that is recorded in a different direction.

3. The apparatus described in claim 2 characterized by an actuator that moves the means for selectively making the different channels effective in a predetermined sequence as the actuator is moved progressively into different positions.

4. Apparatus including a card having a sound track extending parallel to an edge of the card, audio means including a housing with sound reproducing means carried thereby, a guide on which the housing is movable back and forth along said sound track, a frame including a card support, and holding means that retain the card on said support, characterized by the card having a plurality of parallel sound channels on the sound track, and further characterized by different channels of the sound track being recorded in different directions for use of different channels when the audio means is moving in different directions along the guide, and further characterized by power means, motion-transmitting means driven by the power means continuously in the same direction, and an actuator carried by said motion-transmitting means and moved continuously thereby with elongated orbital movement and permanently connected with the audio means for reciprocating the audio means back and forth along the sound track at substantially uniform speed with the motion-transmitting means driven continuously in the same direction.

5. The apparatus described in claim 4 characterized by the different channels constituting continuations of a common record as the reproducing means are moved first in one direction for a full stroke and then back in the opposite direction in a return stroke.

6. The apparatus described in claim 4 characterized by means for automatically activating said means for selectively adjusting the respective audio means, corresponding with respective channels, in an intended sequence.

7. The apparatus described in claim 6 characterized by the means for selectively adjusting the audio means to reproduce sound from different channels being rotary switch means, actuating mechanism for moving the switch means into a different position at each end of a stroke of the audio means, said actuating mechanism including a switch operating element, that moves said switch means through a portion and only a portion of its rotation with each actuation, and an abutment element for moving the switch-operating element, one of said elements being with the audio means for movement back and forth with the audio means and the other of said elements being at a fixed location in position to contact the element that moves back and forth.

8. The apparatus described in claim 4 characterized by the card having silent end portions at the beginnings of the channels of the sound track for a distance corresponding to at least the travel of the audio means to accelerate to audio-operating speed after reversal of the direction of movement of the audio means.

9. Apparatus including a card having a sound track extending parallel to an edge of the card, audio means including a housing with a sound head carried thereby, a frame including holding means for retaining the card and holding it in fixed position with respect to the frame, guiding means for guiding the sound head housing along a course over the sound track on the card when the card is retained in said fixed position, characterized by there being a plurality of openings in the card and a plurality of protuberances including spaced posts in the holder in position to extend through the openings for holding the card against shifting in one plane, and the holder having a clip portion that opens to permit removal of a card from the posts and that closes to hold the card on the posts and clamped by the clip portion against displacement normal to said plane.

10. Apparatus including a card having a sound track extending parallel to an edge of the card, audio means including a housing with a sound head carried thereby, a frame including holding means for retaining the card and holding it in fixed position with respect to the frame, guiding means for guiding the sound head housing along a course over the sound track on the card when the card is retained in said fixed position, characterized by the guide being of substantially greater length than the sound track, and the sound track having two channels parallel to one another and substantially coextensive and transversely offset from one another, and the audio means having two heads transversely offset so that each head is in position to operate along a different one of the channels, the heads being spaced from one another in the direction of extent of the sound tracks by a distance substantially equal to the length of the sound track, means for moving the heads as a unit whereby the second head reaches the beginning of the

second channel at substantially the same time that the first head reaches the end of the first channel.

11. The apparatus described in claim 10 characterized by the card having two additional channels for use by movement of the sound heads in opposite directions than when used with the first two channels, each of the heads having two tracking elements, one in contact with one of the first two channels and the other in contact with one of the two additional channels, and means for selectively making the first two channels or the two additional channels effective with the audio means.

12. The apparatus described in claim 11 characterized by the card having still other channels for use in repeated movement of the sound heads through a stroke, the sound heads having as many tracking elements as there are channels, the means for moving the heads as a unit being a carriage to which both the heads are secured, the means for selectibely making the different channels effective being supported from and movable as a unit with the carriage, and said means being movable into successive positions for determining which channel of a track is to be effective, bumpers at opposite ends of the carriage and movable with the carriage, motion-transmitting means by which movement of the bumpers relative to the carriage operates said means into successive positions, and fixed abutments at opposite ends of the guide means in the path of the bumpers.

13. Apparatus including a card having a sound track extending parallel to an edge of the card, audio means including a housing with a sound head carried thereby, a frame including holding means for retaining the card and holding it in fixed position with respect to the frame, guiding means for guiding the sound head housing along a course over the sound track on the card when the card is retained in said fixed position, characterized by the card having a plurality of parallel sound channels on the sound track, and means for adjusting the audio means to operate along different channels while the card remains in fixed position with respect to the holding means, characterized by a handle for moving the audio means along the track, said handle being movable into different positions by pressure against it to move the audio means in different directions along the track, the means for adjusting the audio means being a switch, and the switch being connected with and operated by the handle when the handle moves into said different positions.

14. Apparatus including a card having a sound track extending parallel to an edge of the card, audio means including a housing with a sound head carried thereby, a frame including holding means for retaining the card and holding it in fixed position with respect to the frame, guiding means for guiding the sound head housing along a course over the sound track on the card when the card is retained in said fixed position, characterized by a timer comprising a motor-operated element having a part that moves at a speed equal to the speed at which the sound head housing is intended to move along the channels of the sound track, a housing in which the motor-operated element is enclosed, and a window in the housing through which an operator moving the sound head manually can watch the motor-operated element and conform the speed of the manual movement with that of the motor-operated element.

15. Apparatus including a card having a sound track extending parallel to an edge of the card, audio means including a housing with a sound head carried thereby, a frame including holding means for retaining the card and holding it in fixed position with respect to the frame, guiding means for guiding the sound head housing along a course over the sound track on the card when the card is retained in said fixed position, characterized by a timer comprising a motor-operated element having a part that moves at a speed equal to the speed at which the sound head housing is intended to move along the channels of the sound track, the motor-operated element being an endless belt, wheels at opposite ends of the belt and around which the belt passes to reverse its direction of travel, at least one part of the belt being visible in position for timing the rate of travel of the sound head when operated manually along the channel.

16. The apparatus described in claim 15 characterized by a track along which the housing of the sound head moves, the track being located under said housing; a cover on the housing and in relatively fixed relation to the track, the endless belt and its wheels being carried by the cover on the underside thereof, axles for the wheels extending down from the cover, a fastening connected with the belt, and a pin extending down from the fastening into a slot in the housing, said slot extending across the full width of both sides of the belt in the space between said sides so that the pin drives the housing along the track while the pin travels as a unit with the belt and drives the housing at reduced speed and to a stop followed by increasing speed in the opposite direction as the pin passes around the arc of each wheel around which the belt reverses its run.

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