

Sept. 7, 1965

V. HECHLER IV

3,205,316

HYPNOTIC ANESTHESIA PROCESS AND APPARATUS FOR PERFORMING SAME

Filed April 3, 1961

3 Sheets-Sheet 1

FIG. 1

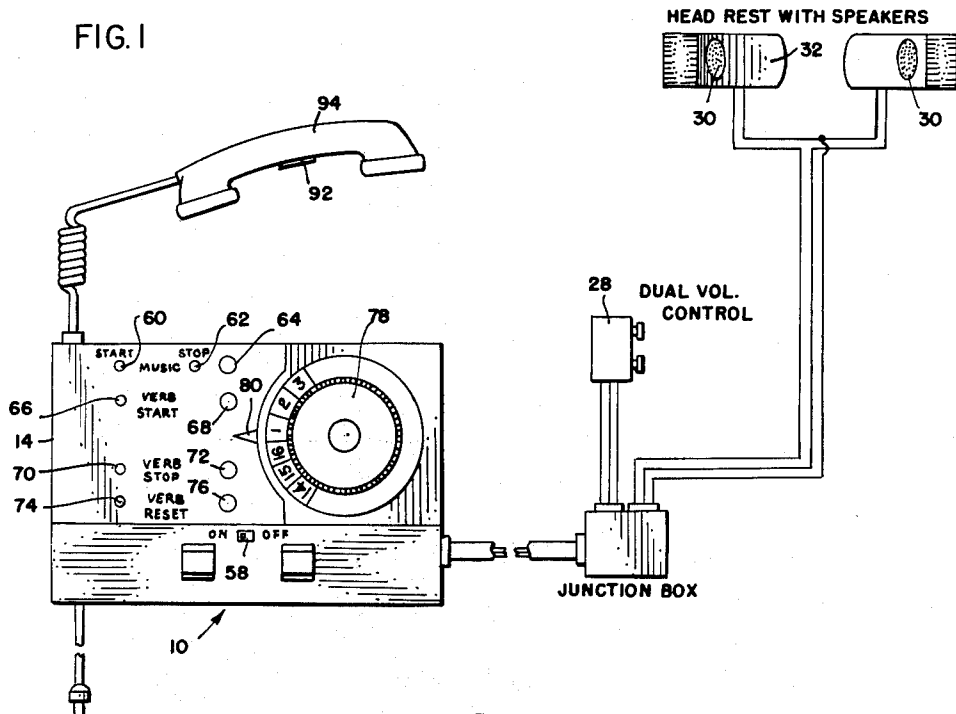
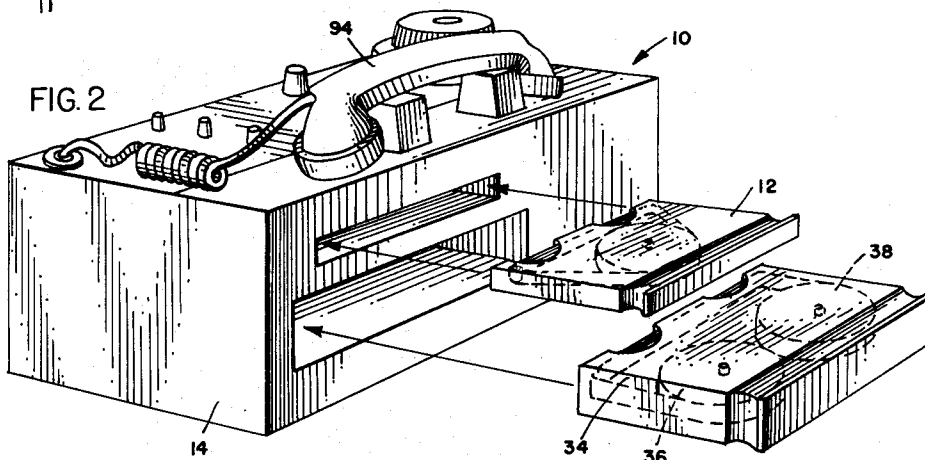


FIG. 2



INVENTOR:

VALENTINE HECHLER IV

BY

Watson P. LaBarge

ATTY

Sept. 7, 1965

V. HECHLER IV

3,205,316

HYPNOTIC ANESTHESIA PROCESS AND APPARATUS FOR PERFORMING SAME

Filed April 3, 1961

3 Sheets-Sheet 2

FIG. 4

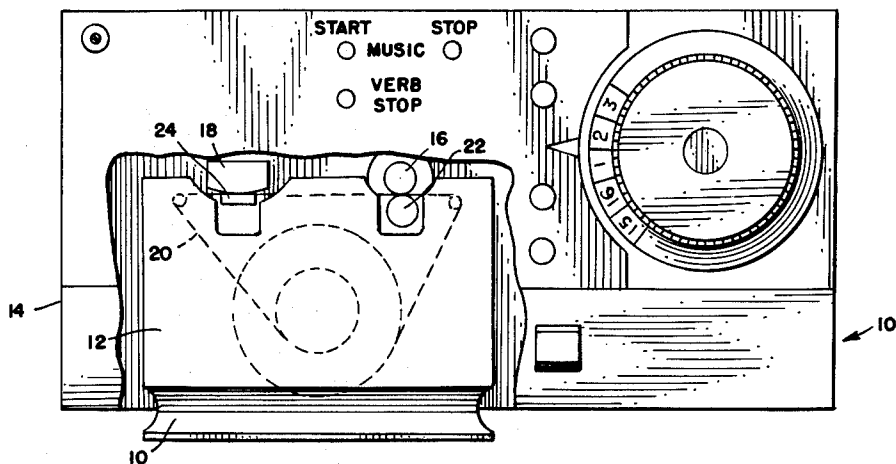
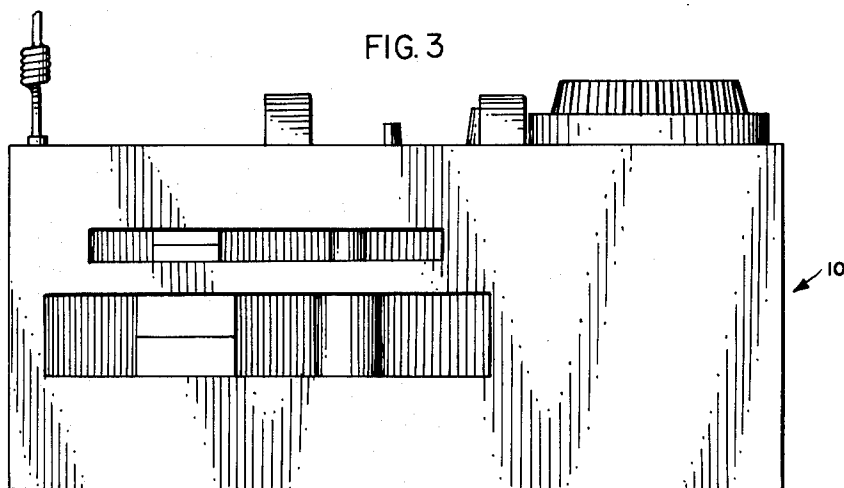


FIG. 3



INVENTOR:

VALENTINE HECHLER IV

BY

Robert D. Harbaugh

ATT'Y

Sept. 7, 1965

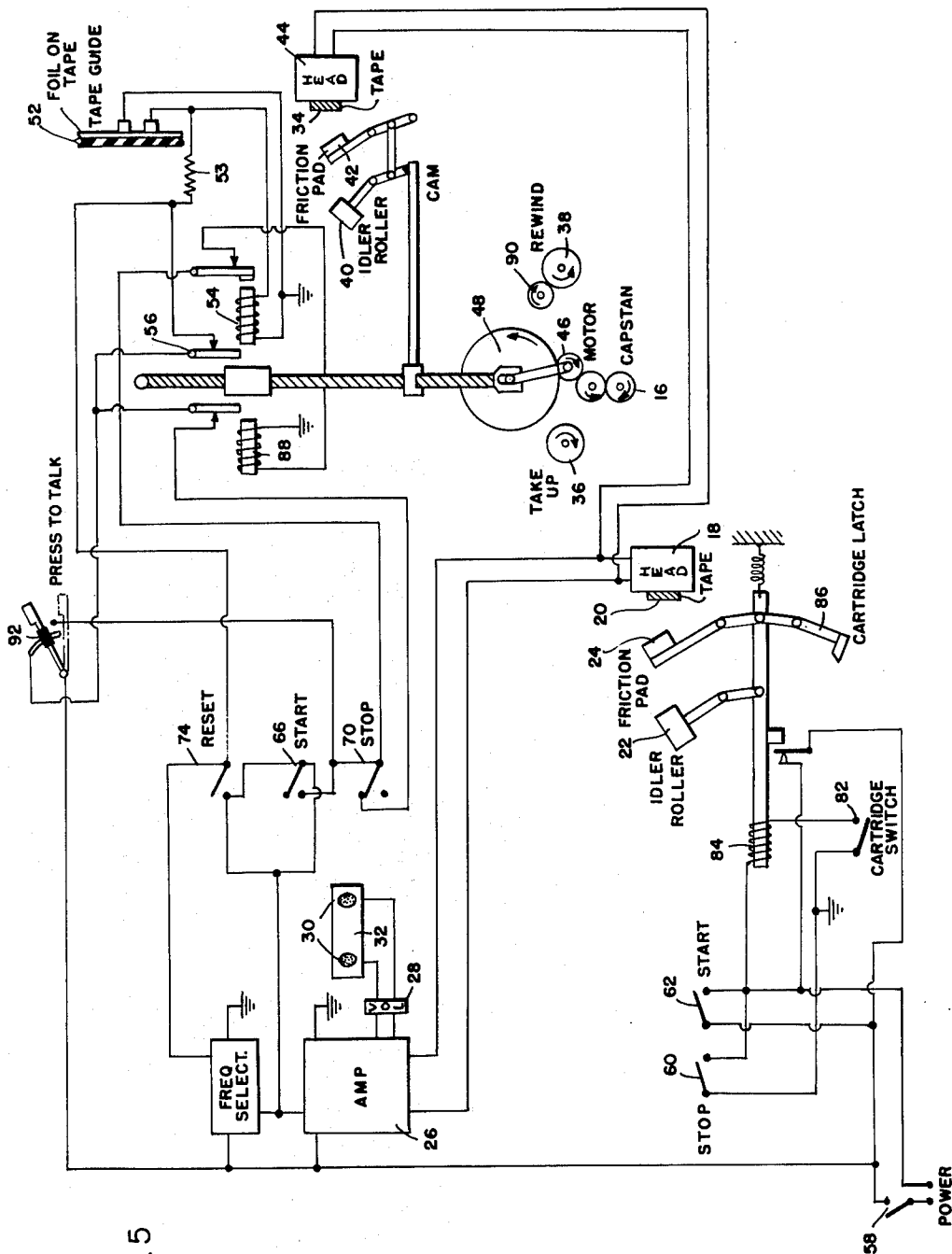
V. HECHLER IV

3,205,316

HYPNOTIC ANESTHESIA PROCESS AND APPARATUS FOR PERFORMING SAME

Filed April 3, 1961

3 Sheets-Sheet 3



INVENTOR:

VALENTINE HECHLER IV

BY

Robert D. Harbaugh

ATT'Y

1

3,205,316

HYPNOTIC ANESTHESIA PROCESS AND APPARATUS FOR PERFORMING SAME

Valentine Hechler IV, Northfield, Ill., assignor to Webcor, Inc., Chicago, Ill., a corporation of Illinois
Filed Apr. 3, 1961, Ser. No. 100,177
4 Claims. (Cl. 179—100.2)

This invention relates in general to an improved method and control for the use of hypnosis as an anesthesia and more particularly for placing a patient ultimately in an overall partial trance but with a highly concentrated effect localized in the operative area whereby the patient is consciously cooperative with the doctor yet feels no sensation of pain in the operative area. Very often such an area is an area much less in expanse than that which would be established with a nerve block by chemical anesthetic.

Doctors and psychologists have for a long time agreed that two primary components are responsible for the patient's perception of pain. One is damage to tissue which irritates nerve cells or exposes their sensory endings to other than normal stimulation; the other is psychological and varies widely with the anxiety of apprehension of the patient. The patient's psychological repulsion to the use of a needle to inject drugs and the use of gases plus the knowledge of unpleasant aftereffects and the length of time for these methods to take effect and to wear off make the patient extremely nervous, apprehensive, and a tense, unwilling, even uncooperative, patient.

Moreover, injections deep within the flesh where nerve blocks are necessary in administering pain-relieving drugs swell the tissues, require absorption, and also enhance the possibility of infection. Such are particularly significant where made in the mouth which is quite sensitive and unsterile. Quite often injections must be repeated to provide sufficient anesthesia time for the doctors to complete necessary operative work, and they merely add to the complications.

Hypnosis has been used many, many years to suppress consciousness of pain during an operation, but has fallen in disrepute because of its ancient mysticism in the minds of uninitiated patients and the ineptness or personality complications of some doctors to administer it properly and their anathema to those who could. Another factor, related to an endeavor to standardize and also diminishing the use of hypnotics, was the advent of chemical anesthesia.

Far from being outmoded, however, hypnosis, properly applied and properly terminated, possesses properties that can supplant chemical anesthesia in many instances where patients are intolerant of or sensitive to chemical anesthetics or where the use of chemicals is dangerous to the health of or repugnant to the patient. With cardiac and diabetic patients proper hypnotism provides the only safe way to remove pain from patients requiring operative work. In all instances hypnosis has many advantages as a supplement to the administration of chemicals if such is required.

In order to utilize hypnosis by itself or as an adjunct for anesthesia, doctors heretofore have had to be virtually psychiatrists to induce a proper trance by personal efforts, deepen it, and terminate it without harm to the patient, and also to manage the patient's reactions to the induction to the trance and to himself.

The present invention makes it possible for a doctor with little or no experience to handle hypnotic anesthesia safely and surely without oversight of essential instructions for the welfare of the patient and without needless attention during the trance development and the retraction to partial consciousness while inducing the necessary deepened localized anesthesia in the operative area. The

2

patient is at all times under the ready control of the doctor for any conditions that may arise.

Many advantages accrue when hypnotic anesthesia is properly accomplished by safe and sure process that can be repeated endlessly without variation and with increasing acceptance by the patients. Fear of pain is eliminated and patients, who otherwise would endeavor to avoid treatment because of aftereffects experienced with drugs and their aversion to the use of a hypodermic needle, readily submit to treatment in a relaxed and restful condition conducive to the best operative procedures and end results. A doctor is freed from concern regarding sudden movements of the patient occurring due to muscle and nerve reactions, including many which occur even with drug anesthetics. In dentistry particularly, gagging and retching are eliminated, thereby simplifying all phases of operative problems. Moreover, when necessary to supplement hypnotic anesthesia with chemical anesthesia, or vice versa, injections used are greatly reduced in quantity and are easily administered. Healthy tissue is not swollen with heavy injections of chemical anesthesia, and the recovery of the patient is not only much more rapid, but in practically every case the patient feels as though awakened and refreshed from a restful nap.

It is also well known that musical compositions can have a soothing effect and are quite helpful in cutting down a patient's apprehension by relaxing him. Other types of sound and music dominate the attention of the patient and merely tend to recess pain perception. Previous attempts have been made to combine music with sound frequencies to distract the attention of the patient from painfulness of a treatment, but such has met with little success with the patients although it relieves the doctor of some technical psychological problems or techniques. These prior methods conduct music to the patient through ear phones and generally, as the dentist commences working, a low frequency sound is transmitted to the ears. The sound that is transmitted resembles that of a waterfall or a radio tuned between stations, and may even be indiscriminate noise. It is often referred to as "white sound." As the extraction or drilling treatment begins, this "white sound" is gradually brought up to a point where the pain is allegedly blocked or drowned out and along with it also the music. The dampening of the sounds of drilling with a distracting roar or sound is expected in some degree to quell the pain. However, it is also annoying enough to the patient to augment the attention to pain sought to be distracted and certainly defeats the relaxing effect of the music. Moreover, the memory of the ordeal with dominating sounds is emotionally unfavorable and the pain is still remembered.

It is, therefore, the primary object of this invention to provide a method to eliminate the painful sensations normally experienced and remembered by a patient during and following operative work that causes pain, and further to eliminate the shortcomings and the objectionable effects of previous methods and devices.

For purposes of a clearer understanding and not by way of limitation, the description will be directed to the field of dentistry as by way of example.

A specific object of this invention is to provide an improved method of psychologically anesthetizing a dental patient against the pain experienced during dental treatment yet maintaining conscious cooperation with the doctor at all times in a relaxed condition of pleasant feeling.

Another object of this invention is to provide an improved method of psychologically preparing a dental patient quickly to provide a localized anesthesia that can be changed from area to area at the suggestion of the doctor, and, wherever located, eliminates pain during the performance of dental treatment and eliminates also

any conscious memory of pain and all unpleasant after-effects that are unavoidable with other anesthetics.

A further object of this invention is to provide an improved method of psychologically anesthetizing a patient against pain in a desired operative area which can be automatic in operation once started and maintains such without the doctor's attention during any phase of the operation or treatment.

A still further object of this invention is to provide an improved and regularized method of placing a patient in a conscious or semiconscious but cooperative condition with an anesthetized restricted area that can be located and relocated at the suggestion of pain normally experienced during dental treatment to another portion of the body.

Another object of this invention is to provide an improved method of placing a dental patient in a somnambulist condition which is completely controllable by the dentist, yet is impersonal, repetitive, and safe clinically, through the use of prerecorded tapes.

Another object of this invention is to provide an improved magnetic tape recording apparatus capable of reproducing prerecorded music and prerecorded verbalism either independently or simultaneously.

A further object of this invention is to provide an improved magnetic tape recording apparatus which is semiautomatic in operation to permit prerecorded music and verbalism to be stereophonically reproduced at the same time.

A still further object of this invention is to provide an improved magnetic tape recording apparatus for receipt of two separate prerecorded tape cartridges to be operated simultaneously at different speeds.

Another object of this invention is to provide an improved tape recording apparatus for receipt of a mobius loop, prerecorded tape cartridge for continuous stereophonic playing of music and coordinated therewith for receipt in spaced relationship a multiband prerecorded verbalism tape cartridge to be selectively reproduced at controlled intervals to be superimposed upon the music.

A further object of this invention is to provide an improved semiautomatic magnetic tape recording apparatus for placing a patient in a hypnotic state by continuous transmission of music and selected verbalism at spaced intervals from prerecorded tapes to the patient with secondary communication means connected therewith whereby a doctor may communicate with the patient with the voice superimposed upon the music in the same manner as the prerecorded verbalism is superimposed on the music.

These being among the objects of the present invention, other and further objects and advantages will become apparent to those skilled in the art from the following description and drawings relating thereto and the appended claims.

In the drawings:

FIG. 1 is a pictorial schematic of the component parts of the apparatus of this invention;

FIG. 2 is a partially exploded view in frontal perspective illustrating the relationship of the tape cartridges of the recording device of this apparatus;

FIG. 3 is a view in side elevation of the recording device illustrated in FIG. 2 with the tape cartridges removed;

FIG. 4 is a top plane view, partially cut away, of the recording device of FIG. 2 illustrating the upper tape cartridge in operating position; and

FIG. 5 is a pictorial schematic illustrating the relationship of the primary linkages and electrical connections of the recording device of this invention.

The present invention contemplates the method of desensitizing any given operative area from conscious pain in accordance with a pattern that can be performed regularly and safely with little if any attention of the doctor in which stereophonic music of harmonious character, preferably involving diatonic intervals and

major chords, is listened to continuously by the patient at a sound level and binaural balance determined by the patient as a participant in a pleasant experience.

The binaural perception produced by the music is a continuing reference for spatial fixation, the two culminating in a compound conceptual fixation and concentration of deep magnitude for relaxation and submissiveness to suggestions.

The binaural sounds may be selected by the patient from a group of recordings for a further effect of acceptance and participation by the patient in the procedure, and with the selected binaural recording being listened to through two speakers placed quite close to the patient's ears, not only are the other sounds of the office and local environment such as street sounds and conversations blocked out, but the doctor can listen to what is occurring and, if need be, interrupt to terminate the procedure if an emergency arises merely by speaking loudly. Otherwise, communication is preferably had with the patient through the same speakers to which the patient is listening with a spatial fixation, with the doctor's voice appearing to come also from the same point of fixation provided by the binaural effect.

When the patient has adjusted to listening to the music and is in a comfortable position, a button is pressed whereby suggestions and hypnotic guidance, preferably prerecorded in the doctor's voice, are intermixed with the music, preferably at an even pitch harmonious with the key in which the music is played.

The recorded verbalisms of the doctor further relax the patient into a medium to light trance. This is carried on by the tape recording for a predetermined time of a few minutes' duration. The tape can run its full length and be rewound for a repeat if necessary or interrupted and rewound at any time the results warrant it. Thereupon, the verbalism is resumed with another tape recording or track which renders numb by suggestion a certain part of the body that is mobile, such as the hand; whereupon the reproduction is stopped and rewound for repeated use if desired, and the doctor can make any suitable tactual test to determine the effectiveness of the numbness by personally asking questions of the patient to that effect.

Another verbalism recording is selected and started which brings the patient to the point of moving the anesthetized member into contact with the operative area, named either in the recording or by interruption by the doctor, to which the numbness is then transferred, and further activity of cooperation by the patient is brought to rest. The recording is then stopped and rewound for immediate repetition if necessary.

Another verbalism is then started which brings the patient back to a cooperative consciousness yet maintains the anesthetized numbness in the operative area as well as its further transfer by personal suggestion of the doctor. This recording, in bringing the patient to conscious cooperation, provides the recovery and posthypnotic suggestion which protect the patient against any mental reaction and preferably bring the patient to the point where all that remains for full return to consciousness is the removal of the numbness by an audible and visually-perceived snap of the doctor's fingers.

When this partial recovery recording is stopped and rewound, the need for further verbalisms is terminated, but the binaural music continues to maintain the suggested reference fixation to assist in the maintenance of the localized anesthesia and its further transfer by suggestion if desired.

Although the doctor can perform the series of verbalisms personally, the combination therewith of the selected music with its binaural space perception fixation and the conveyance of the combination to the patient in compliance with a single fixation of all sources of sound are inductive of quick response, sureness of effects, and safe results. Even with the conscious extraction or deep

drilling of teeth closest to the cortical nerve centers, aftereffects of pain, sagging cheeks or jaws, or the wear-off of drugs chemically and physically from drug bloated tissue previously experienced are entirely eliminated.

Moreover, with such background and fixation music or sounds selected by the patient, there is a wider tolerance for the verbalisms spoken by a doctor; nevertheless, it is preferred that they be recorded, preferably upon tape tracks ready for immediate selection and use to avoid errors in words or their effect and also the burden of memorization by the doctor or the diversion of his attention to give them when the time could be gainfully used with another patient already prepared for operative work.

In order to provide the necessary condition of the patient quickly and effectively without undue attention of the doctor, referring now to the figures and more specifically to FIGS. 1, 2 and 4, it is preferred to provide a semiautomatic reproduction device, indicated generally by the numeral 10, wherein a continuous-playing, pre-recorded, endless musical tape cartridge 12 of the mobius loop type is selected and inserted into palying position in a housing 14. A single tape drive capstan 16 and pickup head 18 contact the magnetic tape 20 of cartridge 12 on one side of the tape, and a solenoid positioned idler wheel 22 and friction pad 24 are moved against the other side of the tape to place the tape into playing position. Referring more specifically to FIGS. 1 and 5, the music on this tape is recorded stereophonically and likewise reproduced through the pickup head 18, amplifier 26, sound balancer and volume control 28, and speakers 30 mounted in a head rest 32 of a dental chair in proximity, but preferably not against the ears of the patient.

Driven by the same continuously running capstan 16, but on a different area thereof, is a one-inch wide tape 34 having sixteen tracks thereon and wound to pass between two comparatively small diameter spools 36 and 38 whose axes are preferably parallel. Only enough tape is required to provide five to eight minutes of playing time in one direction at approximately three inches per second. The special width prevents improper use on commercial machines, and the speed is adequate for voice fidelity yet hybrid for commercial recorder speeds so that much of the voice tone and calmness are lost if improperly reproduced other than by a calculated plan.

A solenoid positioned idler wheel 40 and friction pad 42 press and disengage the tape 34 against the capstan 16 and pickup head 44 to draw the tape 34 for reproduction purposes over a pickup head 44 which is either movable vertically selectively to operate a single pickup magnet with respect to one of the sixteen tape tracks, or a multi-magnet head, the output of whose pickups is selectively switched to the input of amplifier 26.

The spindles of the tape cartridges are driven from a motor 46 along with the capstan 16 and include a pulley 48 shifted by a solenoid from one spindle to the other to drive the supply spindle for fast rewind in one position and the other spindle for takeup in the play position. Conventional brake control, not shown, may be alternately applied to the undriven spindle.

The verbalism tape 34, mounted in a cartridge 50, is also slipped into place and then moved downwardly to engage the spindles in drive relationship and provides near its "start" end a metal foil element 52, which causes a "short" or bridge that releases the solenoid from its rewind position. Also, each one of the verbalism tracks upon the tape is provided with an inaudible tone or frequency recorded at the other end thereof and, when this is reached and picked up by the head and amplified, a frequency discriminating circuit tuned to that frequency provides the circuit for actuating the rewind solenoid 54 which carries a self-holding switch 56 that is shorted out as already mentioned.

The control of the apparatus is such that a panel is provided, as shown in FIG. 1, in which a master switch

and four push buttons are provided along with corresponding telltale lights noted as follows:

Master switch 58

"Music" start 60, stop 62, and light 64

"Verbalism" start 66 and light 68

"Verbalism" stop 70 and light 72

"Verbalism" reset 74 and light 76

A dial 78, controlling a sixteen-position rotating switch cooperating with a position V-light 80, is employed to select and indicate what verbalism track is selected.

After the mobius loop music cartridge is inserted in place, it closes a switch 82 in series with the start switch 60 and, when the start switch is pressed, the idler wheel 22 is moved through action of solenoid 84 into contact with the rotating capstan 16 with the tape 20 between them. This draws the tape past the stereo pickup head 18 as held taut by the felt pad 24, also advanced against the head by the solenoid 84 simultaneously with the idler wheel. The light 64 goes on, and this relationship continues until the stop button 62 is pressed to short out the solenoid. A latch 86 also operated by the solenoid 84 prevents removal of the cartridge 12 until the stop button is pressed. Also, when the solenoid 84 is de-energized, the light 64 goes out. Thus, the start button is ineffective until a cartridge is inserted and then, when pressed, the music is brought into continuous operation until the stop button is pressed. No light showing when the start button is pressed warns that no cartridge is in working position.

When verbalisms are started by actuation of button 66 after the dial selection is made, a solenoid 88 is energized to do two things; it advances the idler wheel 40 and friction pad 42 to press the tape 34 against the capstan 16 and head 44, respectively, and also positions the pulley 48 against reversing idler 90 to drive the windup reel 38 while applying a brake against the supply reel 36.

The tracks on the verbalism tape are monaural and may be fed into the right-hand stereo amplifier or into both the stereo input mixers. If into the right-hand side, the naturalness of the situation is maintained because that is the operative position and the expected speaking position of the doctors. If into both, then the perceptual orientation of the verbalism is coincident with the fixation established for the patient. Either one has its advantages, but the latter is preferred.

In conjunction with the stopping of the verbalism this is done in two ways, the stop button 70 on the panel and also a press-to-speak button 92 on a doctor's hand phone 94. The button on the panel is preferably interlocked with the start button so that the start button has to be pressed to release the stop button. The button on the phone is only held down by continued finger pressure. Both de-energize the verbalism solenoid 88 which limits movement of pulley 48 to something less than the movement necessary to accomplish a rewind. In this intermediate position the reversing pulley 48 is brought to a neutral position, and the idler roller 40 is lowered, leaving the friction pad 42 still in contact with the tape 34 and head 44 as a friction brake holding the tape in position.

The reset button 74 energizes the verbalism solenoid 54 without any stop latch and thereafter the reversing pulley is swung fully to its reversing position until the solenoid 54 is grounded out by a pair of rings 94 being bridged by the foil 52 on the tape. Thus, the reset button can return the tape to its starting position any time before the end of the verbalism track is reached. The operation of the reset button also operates to release the stop button if it has been pressed.

To those skilled in the art, it is readily apparent from the above description how the several objects and advantages of this invention are attained. What was once a painful and fearful experience is now a painless and pleasant experience. Not only is there an immense benefit to the patient but a great saving in cost and time to the

dentist plus the elimination of needless worry as to patients having conflicting ailments such as diabetes, heart conditions, or allergies. In addition the patient is completely relaxed, making it easier for the dentist to perform since there is no tightening of facial muscles or movement by the patient. The patient will, even though in a hypnotic state, respond to directions of the dentist such as to extract saliva or other material periodically from the mouth.

It will be apparent that this invention may differ in many respects and details from the particular method disclosed. All modifications which do not go beyond the scope of the invention will readily suggest themselves to those skilled in the art. It is, therefore, not intended that the invention be limited to the exact method and apparatus described, but only to the invention concept as defined in the appended claims.

What is claimed:

1. An apparatus for reproducing sounds recorded on magnetic tapes comprising a housing, a first cartridge having a spool journaled therein with an endless tape disposed thereon, a second cartridge having a pair of spools journaled therein with a tape disposed thereon, receiving slots formed in said housing slidably receiving and securing said first and second cartridges, a first reproducing head, a second reproducing head, a capstan member, said first cartridge having spaced openings adjacent an edge thereof, first tape advancing means for said first cartridge including an idler member movable through one of said cartridge openings toward the capstan member to grip and traverse the tape and a pad member movable through another of said cartridge openings toward said first reproducing head to press said tape into contact therewith, said second cartridge having spaced openings adjacent an edge thereof, second tape advancing means for said second cartridge including an idler member movable through one of said cartridge openings towards the capstan member to grip and traverse the tape and a pad member movable through another of said cartridge openings toward said second reproducing head to press said tape into contact

therewith, drive means for unwinding the tape from one spool and winding it onto the other spool of said second cartridge, said drive means rotating said capstan member and control means to selectively actuate either said first or second tape advancing means either simultaneously or independently whereby the recorded sounds on one tape may be superimposed upon the sounds on the other tape if desired.

2. The invention as set forth in claim 1 wherein said first cartridge having a spool journaled therein with an endless tape disposed thereon comprises a single track magnetic tape in the form of a mobius loop with music recorded thereon.

3. The invention as set forth in claim 1 wherein said second cartridge having a pair of spools journaled therein with a tape disposed thereon comprises a multitrack magnetic tape with verbalisms recorded thereon having an end secured to each of the spools to be selectively fed or rewound from one spool to the other.

4. The invention as called for in claim 3 wherein the multitrack magnetic tape having verbalisms recorded thereon is selectively controlled whereby only verbalisms on one of said multitracks are reproduced.

References Cited by the Examiner

UNITED STATES PATENTS

2,586,666	2/52	Kuhlik	179—100.2
2,894,700	7/59	Roberts	179—100.2
2,899,507	8/59	Martel	179—100.2
2,986,140	5/61	Gardner et al.	128—1
3,001,025	9/61	Gaubert	179—100.2
3,014,477	12/61	Carlin	128—1.03

OTHER REFERENCES

The Audio Cyclopeda, Howard M. Tremaine, copyright 1959, Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. TK 5981 T72 (pp. 235 and 244 used).

IRVING L. SRAGOW, *Primary Examiner*.

DAVID G. REDINBAUGH, *Examiner*.