60614 U.S. PTO
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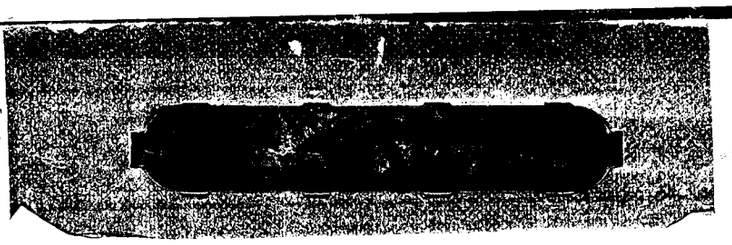
Class	Subclass	ISSUE CLASSIFICATION
84	601	SCANNED



5886274

UTILITY SERIAL NUMBER	PATENT DATE	PATENT NUMBER
	MAR 23 1999	5886274

SERIAL NUMBER	FILING DATE	CLASS	SUBCLASS	GROUP ART UNIT	EXAMINER
08/891,580	07/11/97	084	601	2837	Donels

APPLICANTS

STANLEY JUNGLEIB, PORTOLA VALLEY, CA.

CONTINUING DATA********
VERIFIED

FOREIGN/PCT APPLICATIONS********
VERIFIED

FOREIGN FILING LICENSE GRANTED 11/28/97

Foreign priority claimed 35 USC 119 conditions met	Verified and Acknowledged	AS FILED	STATE OR COUNTRY	SHEETS DRWGS.	TOTAL CLAIMS	INDEP. CLAIMS	FILING FEE RECEIVED	ATTORNEY'S DOCKET NO.
☐ yes ☒ no ☐ yes ☒ no	Examiner's Initials	→	CA	12	45	2	$1,320.00	P0[illegible]

ADDRESS

MARC A SOCKOL
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2225 EAST BAYSHORE ROAD
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TITLE

SYSTEM AND METHOD FOR GENERATING, DISTRIBUTING, STORING AND PERFORMING MUSICAL WORK FILES

U.S. DEPT. OF COMM./ PAT. & TM—PTO-436L (Rev.12-94)

PARTS OF APPLICATION FILED SEPARATELY

DAWKINS
Applications Examiner

NOTICE OF ALLOWANCE MAILED

10-27-98

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SUPERVISORY PATENT EXAMINER
ART UNIT 2837
Primary Examiner

CLAIMS ALLOWED

Total Claims	Print Claim
45	1

ISSUE FEE

Amount Due	Date Paid
$1320.00	12/11/98

DRAWING

Sheets Drwg.	Figs. Drwg.	Print Fig.
11-12	14	1

ISSUE BATCH NUMBER K85

PREPARED FOR ISSUE 10-27-98

Label Area

WARNING: The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 368. Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.

Form PTO-436A-1

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ISSUE FEE IN FILE

60614 U.S. PTO
08/891580
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PATENT APPLICATION

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APPROVED FOR LICENSE
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CONTENTS

Date Entered or Counted			Date Received or Mailed
	1.	*Application* _____ *papers.*	
	2.	IDS	10-24-97
	3.	Rej. 3	6-22-98
10-1-98	4.	Amdt A	9-25-98
10-26-98 SM	5.	Notice of allowance	10/27/98 MF
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	7.	Issue Fee	12/11/98
	8.	[redacted] Supp Declaration	12/11/98
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EXAMINER		4538	11/28/79
TYPIST		"	"
VERIFIER		"	"
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INDEX OF CLAIMS

Claim Final	Claim Original	Date 6-5-80	Date 10-23-80						
1	1								
2	2								
3	3								
4	4								
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6	6								
1- 7	7								
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SYMBOLS

- ✓ ..... Rejected
- = ... Allowed
- - (Through numberal) Canceled
- + ... Restricted
- N ..... Non-elected
- I ..... Interference
- A ..... Appeal
- O ..... Objected

Claim Final	Claim Original	Date							
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SEARCHED

Class	Sub.	Date	Exmr.
84	601, 645	6/15/98	
84	601, 645	10/23/98	
	604, 600		
434	307A		

SEARCH NOTES

APS Text Search (see inside)	Date	Exmr.
	6/15/98	

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
84	ALL ABOVE	10/23/98	

(RIGHT OUTSIDE)

ATENT NUMBER

PPLICATION SERIAL NUMBER
08/891580

PPLICANT'S NAME (PLEASE PRINT)
Jungleib

REISSUE, ORIGINAL PATENT NUMBER

INTERNATIONAL CLASSIFICATION

G	10	H		7/00	
~~G~~	~~11~~	~~C~~			
~~H~~	~~03~~	~~M~~			

ORIGINAL CLASSIFICATION

CLASS	SUBCLASS
84	601

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)			

GROUP ART UNIT: 2837

ASSISTANT EXAMINER (PLEASE STAMP OR PRINT FULL NAME)
JEFFREY W. DONELS

PRIMARY EXAMINER (PLEASE STAMP OR PRINT FULL NAME)
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SUPERVISORY PATENT EXAMINER
ART UNIT 2837

PTO 270
REV. 5-91)

ISSUE CLASSIFICATION SLIP

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

60614 U.S. PTO
08/891580
07/11/97

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

09/05/1997 RWOOD1 00000026 08891580
01 FC:101 770.00 OP
02 FC:103 550.00 OP
03 FC:102 400.00 OP

PTO-1556
(5/87)

Case Docket No.: PA612

BOX PATENT APPLICATION
ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Sir:
Transmitted herewith for filing is the patent application of
Applicant: **Stanley Jungleib**
Title: **System and Method for Generating, Distributing, Storing and Performing Musical Work Files**

Enclosed are:
[x] 34 pages of specification, claims and abstract.
[x] 12 sheets of [X] informal [ ] formal drawing(s).
[x] A declaration and power of attorney.
[x] An assignment transmittal.
[x] An assignment of the invention to: Seer Systems, Inc.
Please record the assignment and return to the undersigned.
[ ] A certified copy of a _____ application.
[ ] An associate power of attorney.
[ ] A verified statement to establish small entity status under 37 CFR §§ 1.9 and 1.27.
[ ] PTO Form-1449 and copies of cited art.

The filing fee has been calculated as shown below:

For	(Col. 1) No. Filed	(Col. 2) No. Extra	Small Entity Rate	Small Entity Fee	or	Other Than a Small Entity Rate	Other Than a Small Entity Fee
Basic Fee				$385.00			$770.00
Total Claims	45 - 20 =	25	x $11 =	$		x $22 =	$550.00
Indep. Claims	8 - 3 =	5	x $40 =	$	or	x $80 =	$400.00
Multiple Dependent Claims Present [0]			+ $130 =	$		+ $260 =	$0.00
*If the difference in column 1 is less than zero, enter 0 in column 2			Total	$	or	Total	$1720.00

[ ] Please charge my Deposit Account No. 06-0600 the amount of $_____. **A duplicate copy of this sheet is enclosed.**

[x] A check in the amount of $1760.00 to cover the filing fee [x] and recording of assignment is enclosed.

[x] The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. 06-0600. **A duplicate copy of this sheet is enclosed.**
[x] Any additional filing fees required under 37 CFR § 1.16.
[x] Any patent application processing fees under 37 CFR § 1.17.
[ ] The issue fee set in 37 CFR § 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR § 1.311(b).

Dated: 7/10/97

Respectfully submitted,

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60614 U.S. PTO
08/891580
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IN THE

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S):	Stanley Jungleib
SERIAL NO.:	Unknown
FILING DATE:	On Even Date Herewith
TITLE:	System and Method for Generating, Distributing, Storing and Performing Musical Work Files
EXAMINER:	Unknown
GROUP ART UNIT:	Unknown
ATTY.DKT.NO.:	PA-612

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

CERTIFICATE OF EXPRESS MAIL

SIR: EM555844756US

"Express Mail" mailing label number EM555844756US

Date of Deposit: July 11, 1997

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Assistant Commissioner for Patents, Washington, D.C. 2023l.

Deposited by: Isis Nieto

(Signature of person mailing paper or fee)

PATENT

SYSTEM AND METHOD FOR GENERATING, DISTRIBUTING, STORING AND PERFORMING MUSICAL WORK FILES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to Musical Instrument Digital Interface (MIDI) technology, and more particularly to a system and method for generating, distributing, storing and performing musical work files.

2. Description of the Background Art

Music is one of the most popular forms of creative expression. Accordingly, musical system designers have attempted to provide composers with musical tools, such as Musical Instrument Digital Interface (MIDI) technology and General MIDI, for facilitating the creation, distribution, storage and performance of musical works.

MIDI is an international standard that specifies a hardware setup and a software protocol for controlling electronic music instruments. The hardware setup is a serial communications network that runs quickly enough to play very complex music in real time. The software protocol is comprehensive and flexible, and provides a mechanism for encoding basic note playing, performance

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expression, sound selection and elaborate modes of tape machine and theatrical control. Although MIDI is compact, flexible and lends itself to multimedia applications, traditional MIDI equipment is commonly acknowledged as far too complex for consumers to handle. Further, MIDI compositions are system dependent, and thus, for example, musical information intended by the composer to represent the sounds of a grand piano may be reproduced by a first player system as a bass guitar and by a second player system as a flute.

In response to the complexity and system dependence of MIDI, music system designers created General MIDI which recommends standards and common practices for providing more predictable results and a greater ease of use. Thus, musical information intended by the composer to represent the sounds of a grand piano will be played by all player systems which implement General MIDI as a grand piano. However, because of several critical limitations including a lack of variety, a lack of playing audio samples and poor expressive quality, composers have found General MIDI to be inhibiting.

Therefore, a system and method are needed to provide composers with a musical tool that facilitates generation, distribution, storage and performance of musical information without compromising composer intention, creativity and sound quality.

SUMMARY OF THE INVENTION

The present invention provides a system and method for composing and playing back musical works. The system includes a sound bank containing at least one instrument sound, an input device for receiving music control signals, a sequencer coupled to the input device for storing the music control signals, and a work manager coupled to the sound bank and to the sequencer for generating a musical work file containing the music control signals and at least a portion of the sound bank. The system further includes a synthesizer engine coupled to the input device for processing the music control signals based on the instrument sounds contained in the sound bank, a mixer coupled to the synthesizer engine for mixing effects with the processed music control signals, and a speaker system coupled to the mixer for converting the mixed music control signals to sound.

The method includes the steps of receiving music control signals, receiving at least a portion of a sound bank containing at least one instrument sound, and storing the music control signals and received sound bank portion as a musical work file. The method further includes the steps of processing the music control signals based on the instrument sounds contained in the sound bank, mixing

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effects with the processed music control signals, and converting the mixed music control signals to sound.

Because, in addition to the MIDI changes, the work manager stores the sound bank to the musical work file, the system and method provide all the information needed to perform the musical piece. Thus, system independence is achieved. That is, unlike systems implementing standard MIDI, the system and method forward data representing the instrument sounds and topology information needed to perform the piece. Unlike systems implementing General MIDI, the system and method enable creation and modification of an infinite variety of custom instrument or non-instrument sounds and thus is not limited to a predetermined set of 128 instruments (plus percussion). Predictable consumer MIDI performance, which was hitherto impossible to achieve, is now rendered certain by this invention.

It will be further appreciated that since the entire system and method is implemented in software, it is possible to maintain any number of channels and any number of tracks, but, of course, limited by processor speed, system bandwidth and memory availability. Thus, the system and method may include an equal number of channels and tracks so that each channel can be stored on a single track.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a music network system in accordance with the present invention;

FIG. 2 is a block diagram illustrating details of the composer server of FIG. 1;

FIG. 3 is a block diagram illustrating details of the composition system of FIG. 2;

FIG. 4a illustrates a sound editor for a synthetic voice;

FIG. 4b illustrates a waveform generated by a digital sound editor which uses Pulse Code Modulation (PCM) techniques;

FIG. 4c illustrates a combined sound editor;

FIG. 4d illustrates a sound editor user interface;

FIG. 5 is a block diagram illustrating details of the work manager of FIG. 3;

FIG. 6 illustrates an example musical work file;

FIG. 7 is a block diagram illustrating details of the player client of FIG. 1;

FIG. 8 is a block diagram illustrating details of the player system of FIG. 7;

FIG. 9 is a flowchart illustrating a method for composing a musical work;

FIG. 10 is a flowchart illustrating details of the FIG. 9 step of compiling the musical work file; and

FIG. 11 is a flowchart illustrating a method for performing a channel of the musical work file.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 is a block diagram of a music network system 100 in accordance with the present invention. Music network system 100 includes a composer server 110 coupled via a computer network 120 such as the Internet to a player client 125. Composer server 110 receives input control signals representing sound via a Musical Instrument Digital Interface (MIDI) input device 105 such as a conventional synthesizer keyboard, and uses a composer sound output device 115 to convert the control signals to sound. Player client 125 may receive the control signals and other data from composer server 110 via computer network 120 or via a compact disk (CD) 135, and uses a client sound output device 130 to convert the control signals and other data to sound. It will be appreciated that the player client 125 may also be connected to a MIDI input device 105, in which case the player client 125 can be configured to operate as another composer server 110.

FIG. 2 is a block diagram illustrating details of composer server 110 including a Central Processing Unit (CPU) 205, such as an Intel Pentium® microprocessor or a Motorola Power PC® microprocessor, coupled to a signal bus 225. Composer server 110 further comprises a Random Access Memory (RAM) 210, a Graphical User Interface (GUI) 215 which includes input devices such as a keyboard and a mouse and an output device such as a Cathode Ray Tube (CRT) display, and a disk drive 220, each coupled via signal bus 225 to CPU 205. Composer server 110 further includes a communications interface 230 coupled between signal bus 225 and computer network 120 (FIG. 1), and a data storage device 235 such as a magnetic disk coupled to signal bus 225.

An operating system 260 includes a program that controls processing by CPU 205, and is typically stored in data storage device 235 and loaded into RAM 210 for execution. A composition system 240 contains programs for creating synthesizer files such as a sound bank 250, a sample bank 252 and an effect bank 254, programs for using the synthesizer files to generate music sequences, programs for synthesizing music from the sequences, and programs for generating an integral musical work file 255 to be forwarded to the player client 125. Composition system 240 also may be stored in

Attorney Docket No. 08455.0180

data storage device 235 and loaded into RAM 210 for execution by CPU 205.

Sound bank 250 is a data file containing at least the instrument sounds needed by the composer, and is typically stored in data storage device 235 but may be stored at some predetermined location in computer network 120. Sample bank 252 is a data file containing audio clips of specific sounds such as a dog's bark, a cat's meow, a water drop, etc., and may be stored in data storage device 235 or at some predetermined location in computer network 120. Effect bank 254 is a data file containing effect algorithms and effect parameters for creating musical effects such as reverberation, chorus, etc., and may also be stored in data storage device 235 or at some predetermined location in computer network 120. A synthesizer driver 245 is a program for controlling performance of the musical sequence on composer sound output device 115 (FIG. 1), and also may be stored in data storage device 235 and loaded into RAM 210 for execution by CPU 205.

FIG. 3 is a block diagram illustrating details of composition system 240, which includes a synthesizer engine 305 coupled to signal bus 225 (FIG. 2) for processing input control signals from input device 105. These input control signals may include instrument

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sound selections, music sequence data, initial topology such as initial mix and effect parameters, and topology changes such as mix and effect parameter changes.

Synthesizer engine 305 via sequencer 325 converts the input control signals or sequence control signals to a raw musical data 330 audio sequence. Synthesizer engine 305 processes the raw musical data 330 audio sequence based on the composer's instrument sound selections, and delivers the processed sequence to mixer 310. Mixer 310 uses the initial topology information to configure mixer 310 and the musical effects 313 such as reverb 315 and chorus 320. Example mix variables for a stereo mixer 310 include synthesizer volume, synthesizer pan, audio volume, audio pan, audio reverb send, audio chorus send, reverb return level, reverb return balance, chorus return level, chorus return balance, etc. It will be appreciated that the characteristics of reverb 315 and chorus 320 are defined by the effect algorithms contained in effect bank 254, which may be created or edited by an effects editor 322. The composer via MIDI input device 105 may modify the effect parameters to modify the effects 313. Mixer 310 then mixes the effects 313 into the processed raw musical data 330 audio sequence, and forwards the mix to synthesizer driver 245 for conversion to sound.

Synthesizer engine 305 also forwards to sequencer 325 the input control signals representing the MIDI-based musical sequences and topology changes created by a composer. Sequencer 325 compiles and stores the signals in a predetermined time-based format as raw musical data 330, which may be stored in data storage device 235 or on a compact disk 135. Sequencer 325 preferably includes a sequencer editor 335 for enabling modifications such as cut, paste, repeat, modify instrument sound selection, change pitch, change topology, etc. of stored raw musical data 330. Synthesizer engine 305 can retrieve the modified raw musical data 330 for conversion via mixer 310 to sound.

Input control signals may also include work links, which reference work link data such as previously created sounds, effects, samples, etc. Work link data may be stored at locations anywhere in network system 100. Accordingly, to incorporate instrument sounds, synthesizer engine 305 retrieves the composer-selected instruments sounds either from local sound bank 250 or from the locations in system 100 referenced by work links. Similarly, to incorporate samples, the synthesizer engine 305 retrieves the samples either from the local sample bank 252 or from the locations in system 100 referenced by work links. To incorporate effects, the synthesizer engine 305 retrieves the effects either from local effect bank 254 or

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from the locations in system 100 referenced by work links. Synthesizer engine 305 temporarily stores work linked sounds into sound bank 250, work linked effects into effect bank 254 and work linked samples into sample bank 252 for easy and efficient playback.

Composition system 240 further includes a sound editor 340 coupled to sound bank 250 for enabling a composer to add instrument sounds to, delete instrument sounds from or modify instrument sounds contained in sound bank 250. Creating and modifying instrument sounds may be implemented by processing sounds synthetically, by digitally modifying a sound sample or by a combined method. Sound editor 340 is described in greater detail with reference to FIGs. 4a, 4b, 4c and 4d.

Composition system 240 also includes a work manager 345 which reformats, imports and exports sound bank 250, sample bank 252, effect bank 254 and raw musical data 330 into a predetermined file format, and stores the re-formatted data to a musical work file 255. Work manager 345 further maintains file legitimacy, allows real-time edit buffering and file maintenance, and in general allows updated industry standard tools to export their data into the present system 100 without the responsibility of maintaining the integrity of musical work file 255. Work manager 345 is described in greater detail with reference to FIG. 5.

Because, in addition to the raw musical data 330, musical work file 255 includes sound bank 250, sample bank 252 and effect bank 254, musical system 100 provides all the information needed to perform the musical piece. Thus, system independence is achieved. That is, unlike systems implementing standard MIDI, composition system 240 forwards data representing the instrument sounds and topology information needed to perform the piece. Unlike systems implementing General MIDI, composition system 240 enables creation and modification of an infinite variety of custom instrument or non-instrument sounds and thus is not limited to a predetermined set of 128 instruments (plus percussion). Predictable consumer MIDI performance, which was hitherto impossible to achieve, is now rendered certain by this invention.

It will be further appreciated that since the entire composition system 240 is implemented in software, it is possible to maintain any number of channels and any number of tracks, but, of course, limited by processor speed, system bandwidth and memory availability. In the preferred embodiment, composition system 240 includes an equal number of channels and tracks so that each channel can be stored on a single track. For example, composition system 240 may manage 1024 channels and 1024 tracks.

FIGs. 4a, 4b, 4c and 4d illustrate four alternative types of sound editors 340. Namely, FIG. 4a illustrates a sound editor 340' for generating a synthetic voice. Sound editor 340' includes an oscillator 405 for receiving a trigger and responsively generating a sound signal, a filter 410 coupled to oscillator 405 for modifying the sound signal, and an amplifier 415 coupled to filter 410 for controlling the sound signal. Sound editor 340' further includes a real-time modulation block 420 coupled to oscillator 405, filter 410 and amplifier 415 for receiving the trigger signal and animating the behavior of oscillator 405, filter 410 and amplifier 415. FIG. 4b illustrates a waveform captured by a digital sound editor 340'' which uses Pulse Code Modulation (PCM) techniques to convert the analog sample to a digital signal. FIG. 4c illustrates a combined sound editor 340''' topology which includes a digital audio sample 425 coupled to a processing block 430 for synthetically modifying digital audio sample 425. FIG. 4d shows a sound editor user interface 340'''' used to combine individual sounds into practical and expressive instruments. In addition to arranging instruments arbitrarily in the space of loudness and pitch, these editors typically provide further parameterization of each instrument for volume, pan, transposition, delay and effects processing at a global level.

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FIG. 5 is a block diagram illustrating details of work manager 345, which includes a header utilities engine 505, a data Input/Output (I/O) engine 510 and a work certifier 515.

Header utilities engine 505 assigns and stores in musical work file 255 header data including musical work file identification (ID) information such as a work file name, the composer's name, a serial number, a composition system 240 version number, etc. Header utilities engine 505 may also compute and store in musical work file 255 the number of channels needed by player client 125 to perform the musical work.

Data I/O engine 510 retrieves, reformats and stores sound bank 250, sample bank 252, effect bank 254 and raw musical data 330 into musical work file 255. Data I/O engine 510 may also use resource data 513 to compute and store initialization data indicating initial channel parameters, an approximation of the time needed to download sounds from sound bank 250, and a sequential list of topology changes needed during performance of the musical work.

Work certifier 515 checks for data integrity and authenticates musical work file 255 by, for example, stamping the file 255 with a certificate, password key or encryption key. Thus, a composer server

110 may authenticate the musical work file 255 and only an authorized player client 125 may perform the work.

FIG. 6 illustrates an example musical work file 255, which includes work file ID 605, initialization data 610, a copy of sound bank 250, a copy of sample bank 252, a copy of effect bank 254, a copy of raw musical data 330 and certification 635. Raw musical data 330 includes the music sequence 615, the effect parameter changes 620, the mix parameter changes 625 and work links 630. Although in this embodiment a copy of the work link data referenced by work links 630 is not included as part of musical work file 255, an equivalent embodiment may include the copy. In this embodiment, player client 125 may download the needed work link data in real time from its source, e.g., from composer server 110 or from computer network 120. It will be appreciated that the different tracks and thus the different channels may be stored separately as raw musical data 330.

FIG. 7 is a block diagram illustrating details of player client 125 which includes a CPU 705, such as an Intel Pentium® microprocessor or a Motorola Power PC® microprocessor, coupled to a signal bus 725. Player client 125 further comprises RAM 710, a GUI 715 which

includes input devices such as a keyboard and mouse and an output device such as a Cathode Ray Tube (CRT) display, and a CD drive 720, each coupled via signal bus 725 to CPU 705. Player client 125 further includes a communications interface 730 coupled between signal bus 725 and computer network 120 (FIG. 1), and a data storage device 735 such as a magnetic disk coupled to signal bus 725.

An operating system 750 is a program that controls processing by CPU 705, and is typically stored in data storage device 735 and loaded into RAM 710 for execution. A player system 740 includes programs for decoding musical work file 255, programs for setting the topology and programs for controlling the performance of the musical work. Player system 740 may be stored in data storage device 735 and loaded into RAM 710 for execution by CPU 705. Upon receipt, musical work file 255 may be stored in data storage device 735 and loaded into RAM for easy access by player system 740. Player system 740 is described in greater detail with reference to FIG. 8. A synthesizer driver 745 is a program for controlling client sound output device 130 (FIG. 1), and is also typically stored in data storage device 735 and loaded into RAM 710 for execution by CPU 705.

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FIG. 8 is a block diagram illustrating player system 740, which includes a certifier 805 for examining certification 640 to authenticate musical work file 255 and to determine the rights of player client 125 to perform musical work file 255. The certifier 805 also enables gathering needed work link data which is referenced by work links contained in raw musical data 330. Player system 740 includes a sequencer 810 coupled to certifier 805 for playing the raw musical data 330 contained in musical work file 255.

Player system 740 includes a synthesizer engine 815 coupled to sequencer 810 for adding instrument sounds to the music sequence 615 by retrieving the composer-selected instrument sounds from sound bank 250 contained in musical work file 255 or from the locations referenced by the work links 630. Player system 740 further includes, coupled between synthesizer engine 815 and synthesizer driver 745, a mixer 820 configured according to mix parameters 625; and includes musical effects including reverb 825 and chorus 830 coupled to mixer 820 which are configured according to algorithms in effect bank 254 and corresponding effect parameters 620. Mixer 820 mixes the music sequence 615 and the effects. It will be appreciated that player system 740 operates in conjunction with operating system 750 (for example, various

versions of Windows by Microsoft Corporation) for loading and unloading sounds from data storage device 235.

FIG. 9 is a flowchart illustrating a preferred method 900 for composing a musical work. Method 900 begins with step 910 by sound editor 340 enabling creation of sounds for storage in sound bank 250. Sound editor 340 in step 915 enables modification of sounds stored in sound bank 250, possibly to create new sounds. The composer via MIDI input device 105 in step 920 selects sounds for the instruments to be played on a first channel by player client 125. Step 920 may include selecting one of the sounds from sound bank 250, or selecting a previously created sound from a location somewhere within network 120 and adding a work link 630 to reference that location. It will be appreciated that step 920 may further include selecting a fall-back sound, such as one of GM sounds 1-128, to use if the custom sound is unavailable at the start of the sequence.

Effects editor 322 in step 925 may be used to create effects for storage in effect bank 254, and in step 930 enables modification of the effects stored in effect bank 254 possibly to create new effects. The composer via MIDI input device 105 in step 935 selects the effects to be used by player client 125 on the first channel. Step 925

may include selecting one of the effects from effect bank 254, or selecting a previously created effect from a location somewhere within network 120 and adding a work link 630 to reference that location.

Sequencer 325 in step 940 records a music sequence including topology changes as part of raw musical data 330 to be used on the first channel. Step 940 includes receiving other input control signals such as intonation and expression information from MIDI input device 105 and passing the signals through synthesizer engine 305 to sequencer 325 for storage. Sequencer editor 335 in step 945 enables the composer to edit raw musical data 330, e.g., to edit the music sequences, to edit pitches, to edit effects, to copy, to paste, etc.

Sequencer 325 in step 950 retains the music sequence data 615 including the composer-selected instrument sounds, the performance, the mixer and effect changes, etc. as raw musical data 330. In step 955, a determination is made whether to record musical data to another channel. If so, then method 900 returns to step 910. Otherwise, work manager 345 compiles sound bank 250, sample bank 252, effect bank 254 and all channels of raw musical data 330 into a musical work file 255. Step 960 is described in greater detail with reference to FIG. 10. Method 900 then ends.

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FIG. 10 is a flowchart illustrating details of step 960 (FIG. 9), which begins by header utilities engine 505 in step 1005 creating and storing to musical work file 255 a work file ID for identifying the musical work. Data I/O engine 510 in step 1010 uses resource data 513 and raw musical data 330 to compute initialization data 610 representing the initial state of the music sequence as created by the composer, and stores the initialization data 610 to musical work file 255. Initialization data 610 includes the initial topology parameters. The data I/O engine 510 retrieves and stores in step 1015 the sound bank 250, in step 1018 the sample bank 252 and in step 1022 the effect bank 254 to musical work file 255. The data I/O engine 510 in step 1025 retrieves and stores raw musical data 330, which includes music sequence 615, effect parameter changes 620, mix parameter changes 625 and work links 630 for all channels, to musical work file 255. In step 1030, work certifier 520 adds certification 640 to musical work file 255 so that player client 125 can authenticate and verify right to perform musical work file 255. Step 960 then ends.

FIG. 11 is a flowchart illustrating a method 1100 for performing a channel of musical work file 255. Method 1100 begins with step 1105 by communications interface 730 or CD drive 720 of

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player client 125 receiving musical work file 255. Certifier 805 in step 1110 examines certification 640 to determine whether player client 125 is certified to perform the musical work file 255. If not, then method 1100 ends. Otherwise, certifier 805 forwards at least a portion of a first channel contained in musical work file 255 to sequencer 810, which in step 1115 forwards the corresponding channel portion to synthesizer engine 815.

For the first channel portion, synthesizer engine 815 in step 1120 downloads the composer-selected initial mix parameters 625 from raw musical data 330 of musical work file 255 to mixer 820, and in step 1125 downloads the composer-selected initial effect parameters 620 from raw musical data 330 of musical work file 255 to the selected effects. Synthesizer 815 in step 1130 retrieves from sound bank 250 the instrument sounds referenced by the music sequence 615, and in step 1135 downloads any instruments, mixes, effects or other work link data from the locations specified by work links 630.

Synthesizer engine 815 in step 1136 determines whether all sounds needed to perform the musical work are available. If so, then method 1100 proceeds to step 1140. If a custom sound is unavailable, synthesizer engine 1136 determines whether a fall-back sound such as a GM sound is available to replace it. If not, then

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synthesizer engine in step 1139 posts an error message and method 1100 then ends. Otherwise, method 1100 references the available fall-back sounds and proceeds to step 1140.

In step 1140, synthesizer 815 synthesizes and forwards the corresponding channel portion to synthesizer driver 745, which in conjunction with client sound output device 130 (FIG. 1) converts the synthesized channel portion to sound. In step 1145, sequencer 810 determines whether musical work file 255 includes another channel portion to be performed. If so, then method 1100 returns to step 1115. Otherwise, method 1100 ends.

The foregoing description of the preferred embodiments of the invention is by way of example only, and other variations of the above-described embodiments and methods are provided by the present invention. Components of this invention may be implemented using a programmed general purpose digital computer, using application specific integrated circuits, or using a network of interconnected conventional components and circuits. The embodiments described herein have been presented for purposes of illustration and are not intended to be exhaustive or limiting. Many variations and modifications are possible in light of the foregoing teaching. The system is limited only by the following claims.

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WHAT IS CLAIMED IS:

1. A composition system comprising:

a sound bank containing at least one instrument sound;

an input device for receiving music control signals;

a sequencer coupled to the input device for storing the music control signals; and

a work manager coupled to the sound bank and to the sequencer for generating a musical work file containing the music control signals and at least a portion of the sound bank.

2. The composition system of claim 1 further comprising a sound editor for modifying the sound bank.

3. The composition system of claim 2 wherein modifying the sound bank includes adding instrument sounds to, deleting an instrument sound from and modifying an instrument sound contained in the sound bank.

4. The composition system of claim 1 wherein the input device is a MIDI input device.

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5. The composition system of claim 4 wherein the input device is a computer keyboard.

6. The composition system of claim 1 wherein the work manager includes a header utilities engine for generating a header to the musical work file.

7. The composition system of claim 6 wherein the header includes a title, a serial number and the composer's name.

8. The composition system of claim 1 wherein the work manager includes a work certifier for certifying the musical work file.

9. The composition system of claim 1 wherein the work manager includes a data I/O engine for storing the at least a portion of the sound bank and the music control signals into the musical work file.

10. The composition system of claim 9 wherein the music control signals include a work link, and the data I/O engine further stores the work link to the musical work file.

11. The composition system of claim 9 wherein

the music control signals include a music sequence, mix changes and effect changes; and

the data I/O engine further stores the music sequence, the mix changes and effect changes to the musical work file.

12. The composition system of claim 11,

further comprising an effect bank storing effect and mix algorithms; and

wherein the data I/O engine stores the effect bank to the music work file.

13. The composition system of claim 1,

further comprising a sample bank; and

wherein the work manager stores the sample bank to the music work file.

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14. The composition system of claim 1 further comprising

a synthesizer engine coupled to the input device for processing the music control signals based on the instrument sounds contained in the sound bank;

a mixer coupled to the synthesizer engine for mixing effects with the processed music control signals; and

a speaker system coupled to the mixer for converting the mixed music control signals to sound.

15. The composition system of claim 14 wherein

the music control signals include a work link specifying a location storing work link data;

the data I/O engine further stores the work link to the musical work file; and

the synthesizer engine retrieves the work link data stored at the location specified by the work link.

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16. A method comprising the steps of:

receiving music control signals;

receiving at least a portion of a sound bank containing at least one instrument sound; and

storing the music control signals and received sound bank portion as a musical work file.

17. The method of claim 16 further comprising the step of modifying the sound bank.

18. The method of claim 17 wherein the step of modifying the sound bank includes adding instrument sounds to, deleting an instrument sound from and modifying an instrument sound contained in the sound bank.

19. The method of claim 16 wherein the step of receiving music control signals is achieved using a MIDI keyboard.

20. The method of claim 16 further comprising the step of generating a header to the musical work file.

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21. The method of claim 20 wherein the header includes a title, a serial number and the composer's name.

22. The method of claim 16 further comprising the step of certifying the musical work file.

23. The method of claim 22 wherein the music control signals include a music sequence, mix changes and effect changes, and further including the step of storing the music sequence, the mix changes and the effect changes to the musical work file.

24. The method of claim 23 wherein the music control signals include a work link, and further including the step of storing the work link to the musical work file.

25. The method of claim 16 further comprising the steps of

processing the music control signals based on the instrument sounds contained in the sound bank;

mixing effects with the processed music control signals; and

converting the mixed music control signals to sound.

26. A composition system comprising:

means for receiving music control signals;

means for receiving at least a portion of a sound bank containing at least one instrument sound; and

means for storing the music control signals and received sound bank portion as a musical work file.

27. A computer-readable medium storing program code for causing a computer to perform the steps of:

receiving music control signals;

receiving at least a portion of a sound bank containing at least one instrument sound; and

storing the music control signals and received sound bank portion as a musical work file.

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28. A player system comprising:

an input terminal for receiving a musical work file containing topology information, music sequence data and a sound bank which includes at least one instrument sound;

a synthesizer coupled to the input terminal for processing the music sequence data based on the topology information and the sound bank; and

a speaker system coupled to the synthesizer for converting the processed music sequence data to sound.

29. The player system of claim 28 wherein the input terminal includes a CD drive.

30. The player system of claim 28 wherein the input terminal includes a network communications interface.

31. The player system of claim 28 further comprising a mixer for mixing effects with the processed music sequence data.

32. The player system of claim 31 wherein the topology information includes initial effect parameters for controlling the effects.

33. The player system of claim 31 wherein the topology information further includes initial mix parameters for controlling the mixer.

34. The player system of claim 31 wherein

the music sequence data includes a work link specifying a location storing work link data; and

the synthesizer engine retrieves the work link data referenced by the work link.

35. The player system of claim 28 further comprising a certifier for certifying right of the player system to convert the processed music sequence to sound.

36. A method comprising the steps of:

receiving a musical work file containing topology information, music sequence data and a sound bank which includes at least one instrument sound;

processing the music sequence data based on the topology information and the sound bank; and

converting the processed music sequence data to sound.

37. The method of claim 36 wherein the step of receiving a musical work file is achieved by a CD drive.

38. The method of claim 37 wherein the step of receiving a musical work file is achieved by a network communications interface.

39. The method of claim 36 further comprising the step of mixing effects with the processed music sequence data.

40. The method of claim 39 wherein the topology information includes initial effect parameters for controlling the effects.

41. The method of claim 39 wherein the topology information further includes initial mix parameters for controlling the step of mixing.

42. The method of claim 36

wherein the music sequence data includes a work link specifying a location storing work link data; and

further comprising the step of retrieving the work link data from the location specified by the work link.

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43. The method of claim 36 further comprising the step of certifying right of the player system to convert the processed music sequence to sound.

44. A player system comprising:

means for receiving a musical work file containing topology information, music sequence data and a sound bank which includes at least one instrument sound;

means for processing the music sequence data based on the topology information and the sound bank; and

means for converting the processed music sequence data to sound.

45. A computer-readable medium storing program code for causing a computer to perform the steps of:

receiving a musical work file containing topology information, music sequence data and a sound bank which includes at least one instrument sound;

processing the music sequence data based on the topology information and the sound bank; and

converting the processed music sequence data to sound.

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SYSTEM AND METHOD FOR GENERATING, DISTRIBUTING, STORING AND PERFORMING MUSICAL WORK FILES

ABSTRACT OF THE DISCLOSURE

A composition and playback system includes a sound bank containing at least one instrument sound, an input device for receiving music control signals, a sequencer coupled to the input device for storing the music control signals, and a work manager coupled to the sound bank and to the sequencer for generating a musical work file containing the music control signals and at least a portion of the sound bank. The system further includes a synthesizer engine coupled to the input device for processing the music control signals based on the instrument sounds contained in the sound bank, a mixer coupled to the synthesizer engine for mixing effects with the processed music control signals, and a speaker system coupled to the mixer for converting the mixed music control signals to sound.

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ATTORNEY'S DOCKET NO.: PA612

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled "**System and Method for Generating, Distributing, Storing and Performing Musical Work Files,**" the specification of which:

[X] is attached hereto.
[ ] was filed on _____ as U.S. Application No.
or PCT International Application No. _____
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International application, having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)		Priority Claimed		
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below.

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application Number)	(Filing Date)	(Status -- patented, pending, abandoned)
(Application Number)	(Filing Date)	(Status -- patented, pending, abandoned)

POWER OF ATTORNEY: I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

John S. Ferrell, Reg. No. 34,593; J. Eppa Hite, Reg. No. 30,266;
Gregory J. Koerner, Reg. No. 38,519;
Arnold M. de Guzman, Reg. No. 39,955; Lloyd E. Dakin Jr., Reg. No. 38,423;
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08/794,089

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole inventor: Stanley Jungleib

Inventor's signature Stanley Jungleib Dated: 970710

Residence 33 Tintern Lane #5, Portola Valley, California 94028

Post Office Address same Citizenship USA

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Z6TT20" 08ST6880

PRINT OF DRAWINGS
AS ORIGINALLY FILED

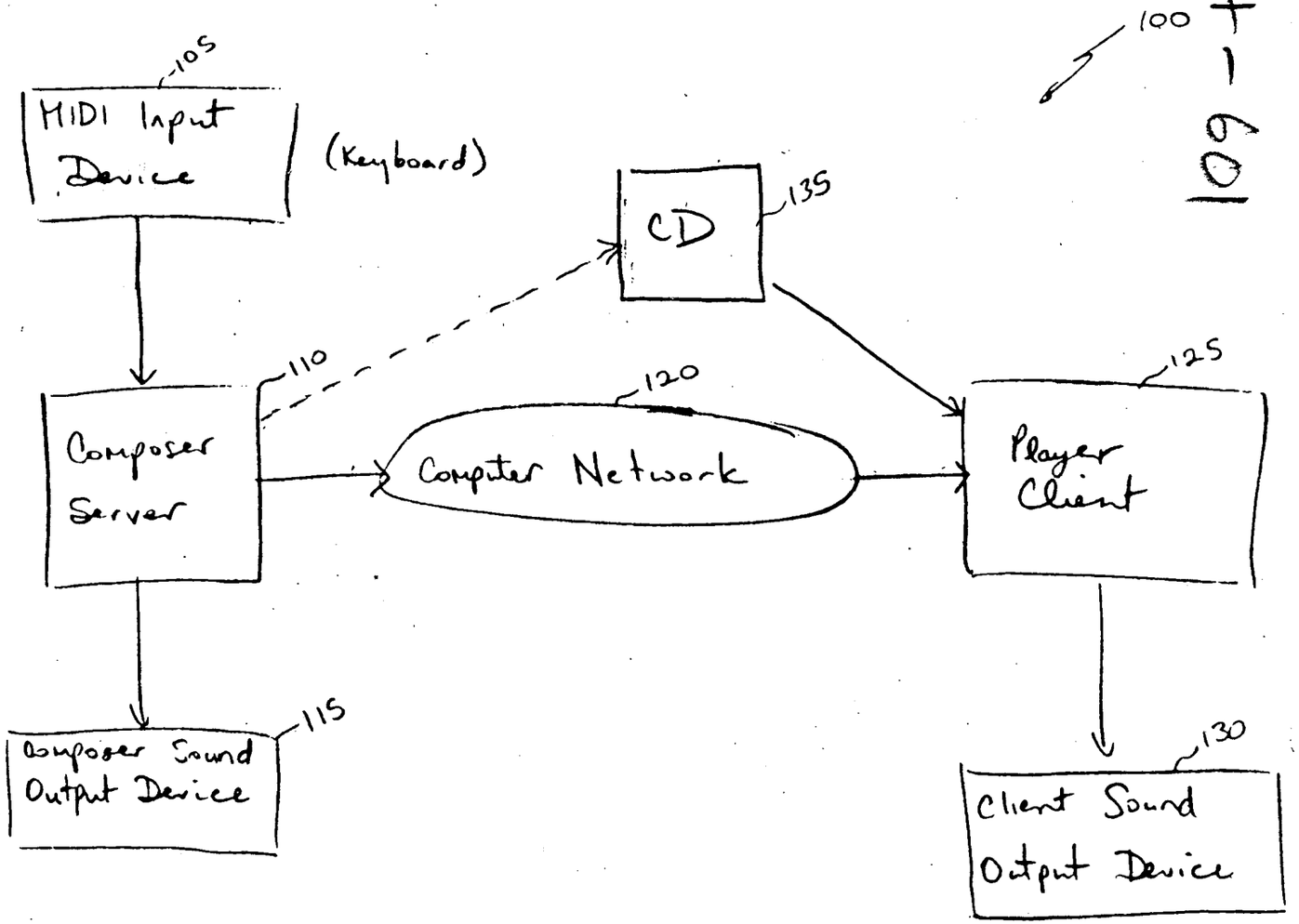

FIG. 1

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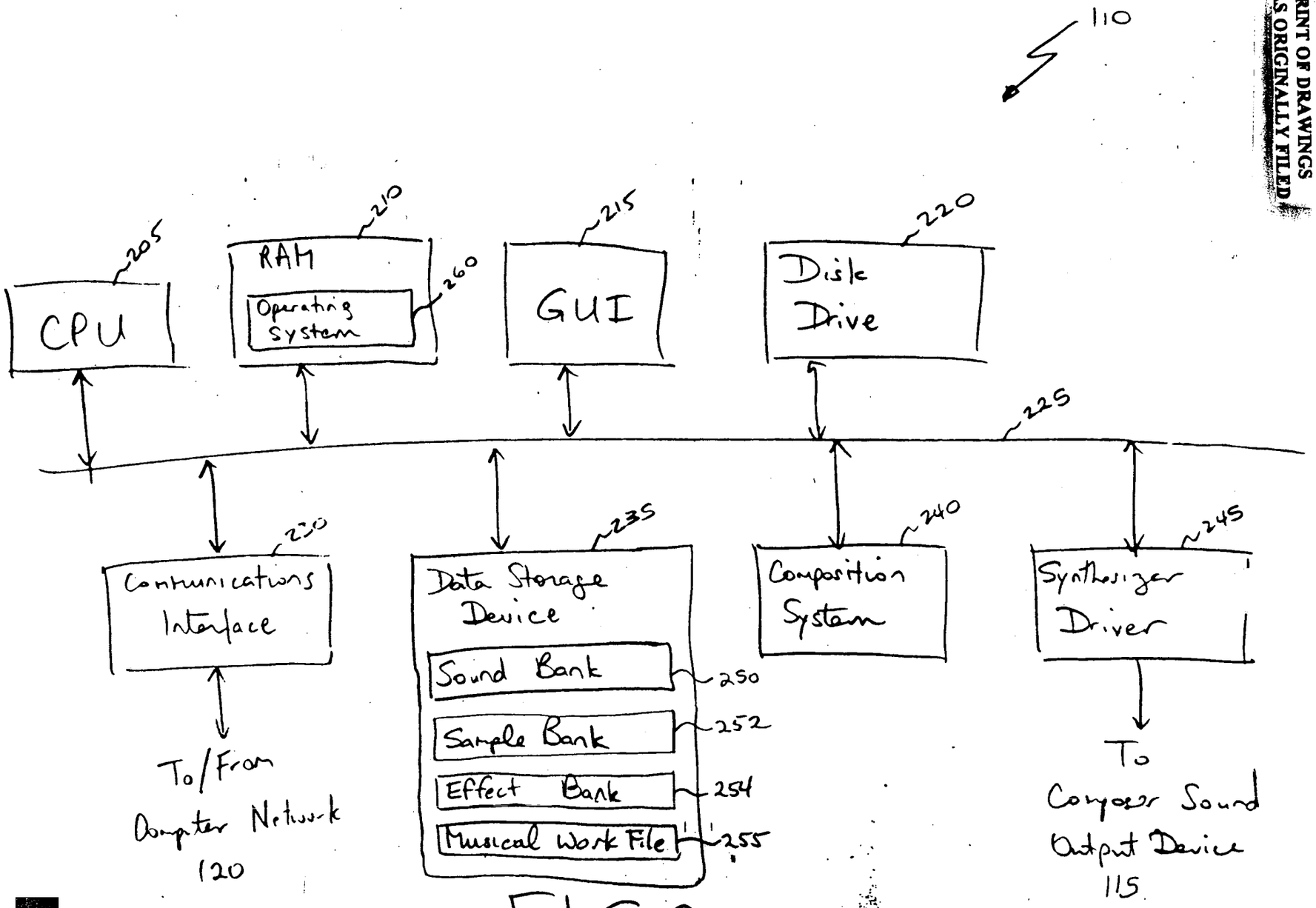

FIG. 2 (Composer Server)

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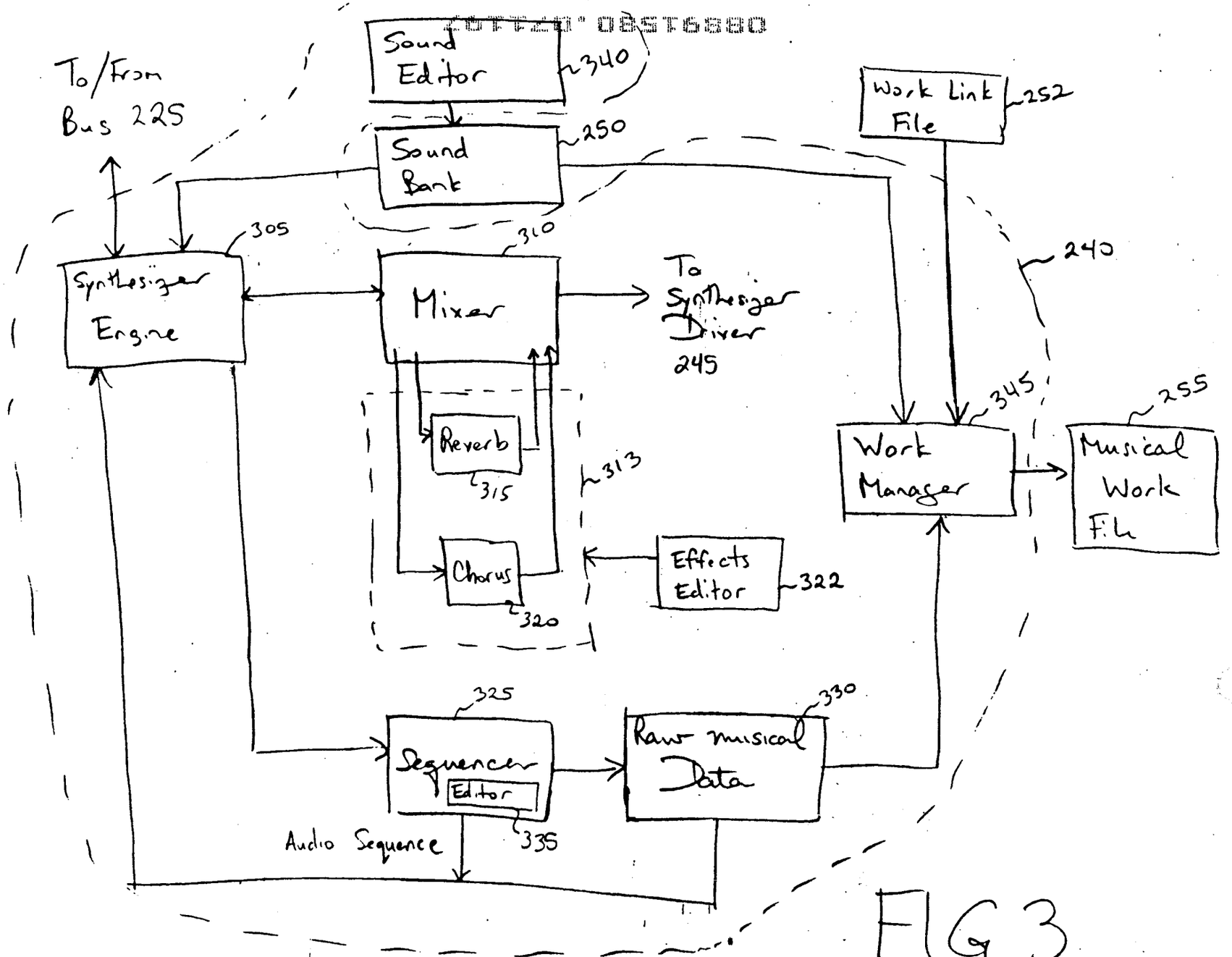

FIG. 3
(Composition System)

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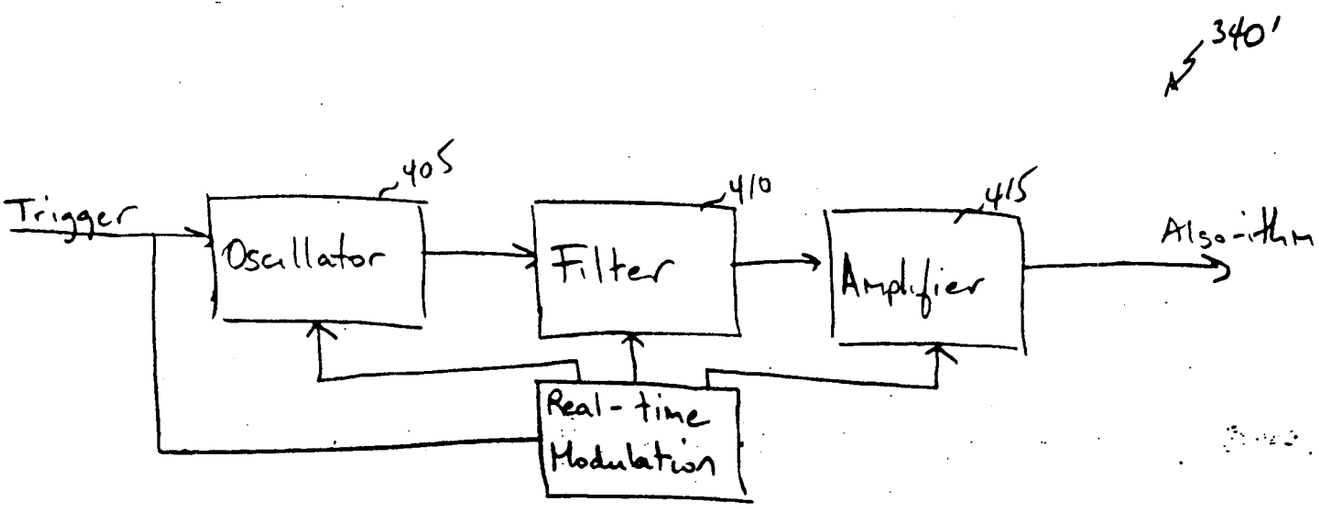

FIG. 4a (Synthetic Voice Sound Editor)

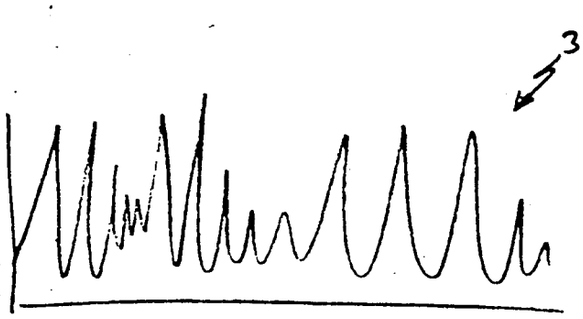

FIG. 4b (Modifiable Voice Sound Editor)

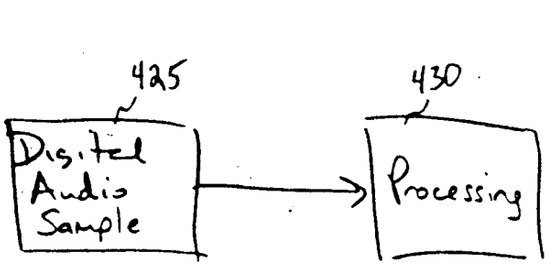

FIG. 4c (Combined Sound Editor)

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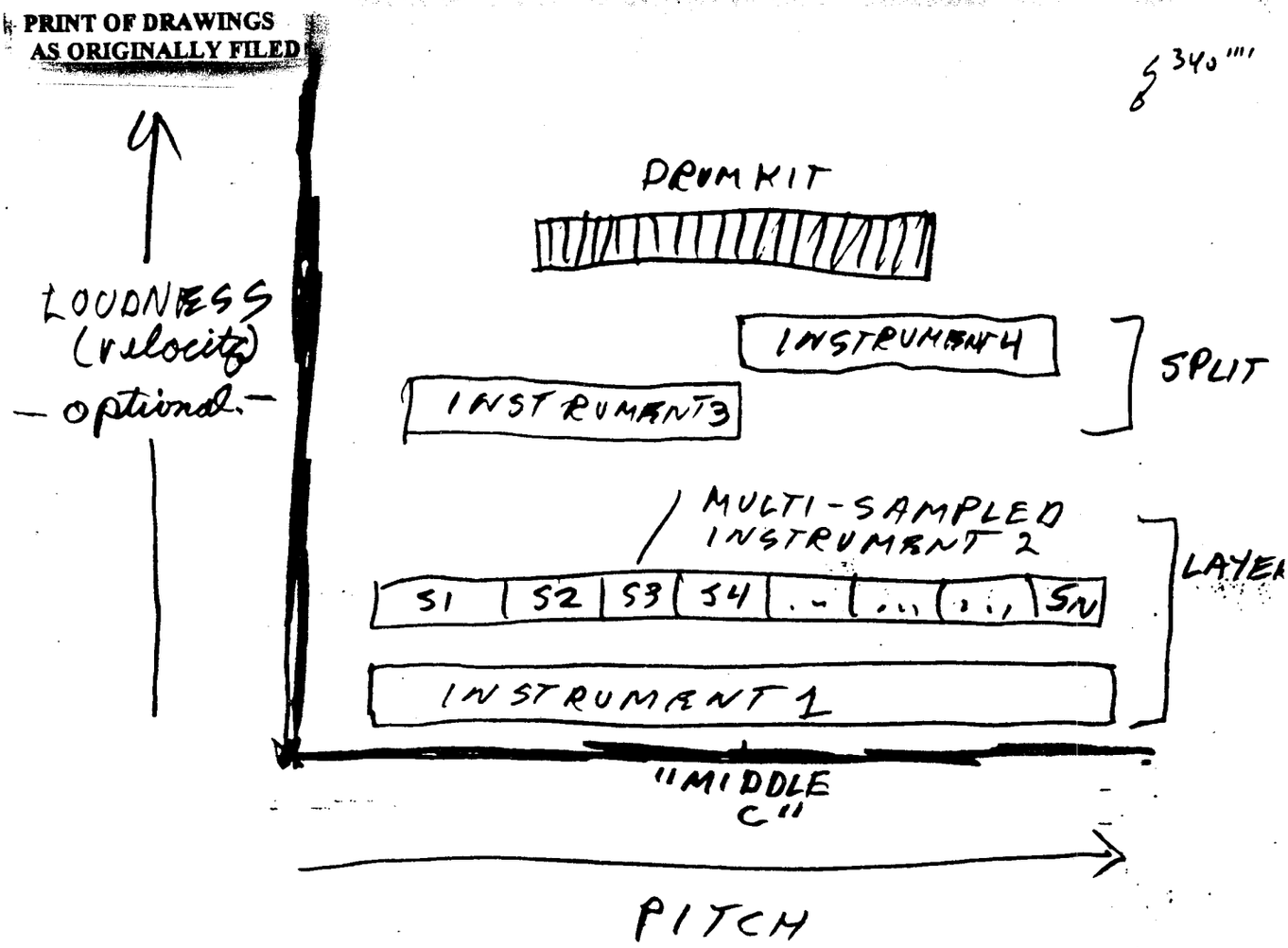

FIG 4d

VOICE COMBINATION EDITOR

USER INTERFACE

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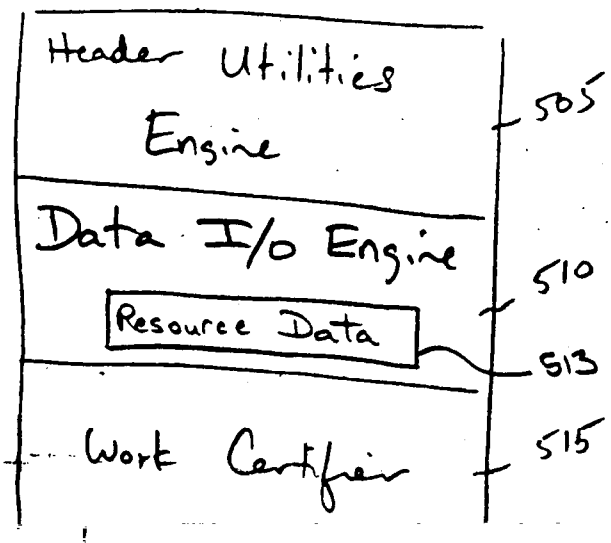

FIG. 5 (Work Manager)

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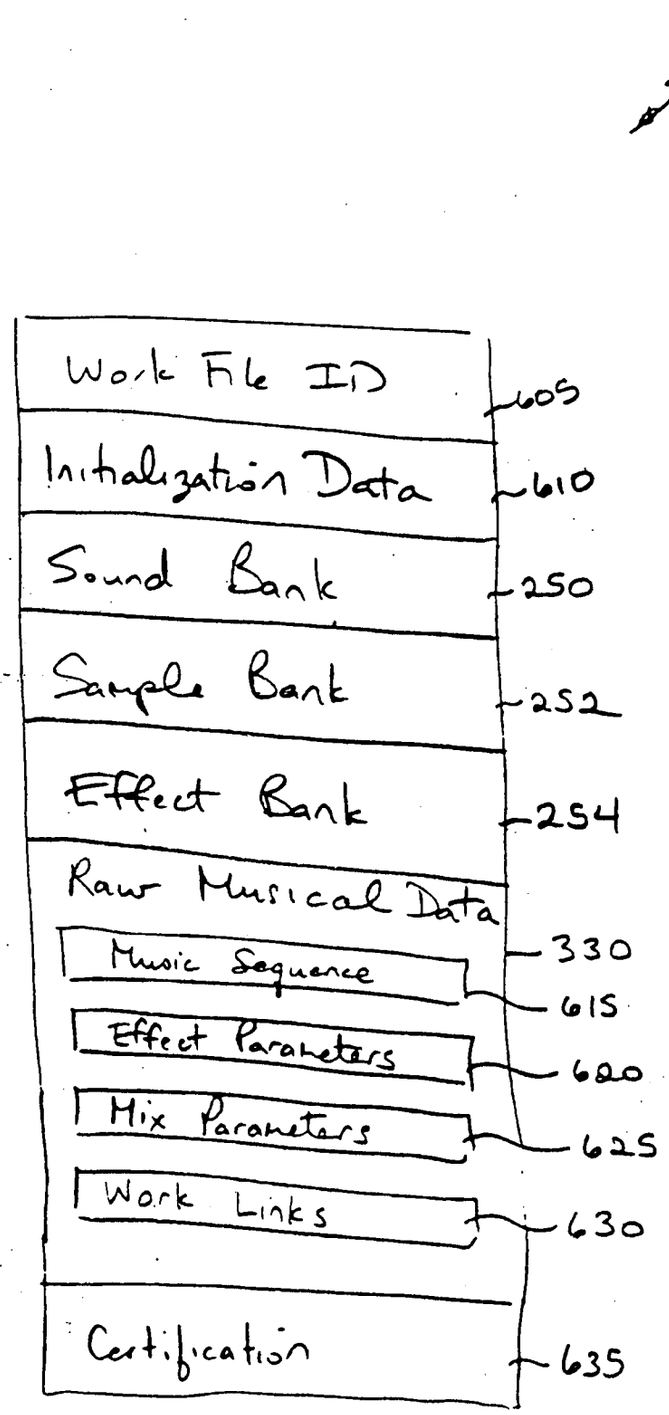

FIG 6 (Musical Work File)

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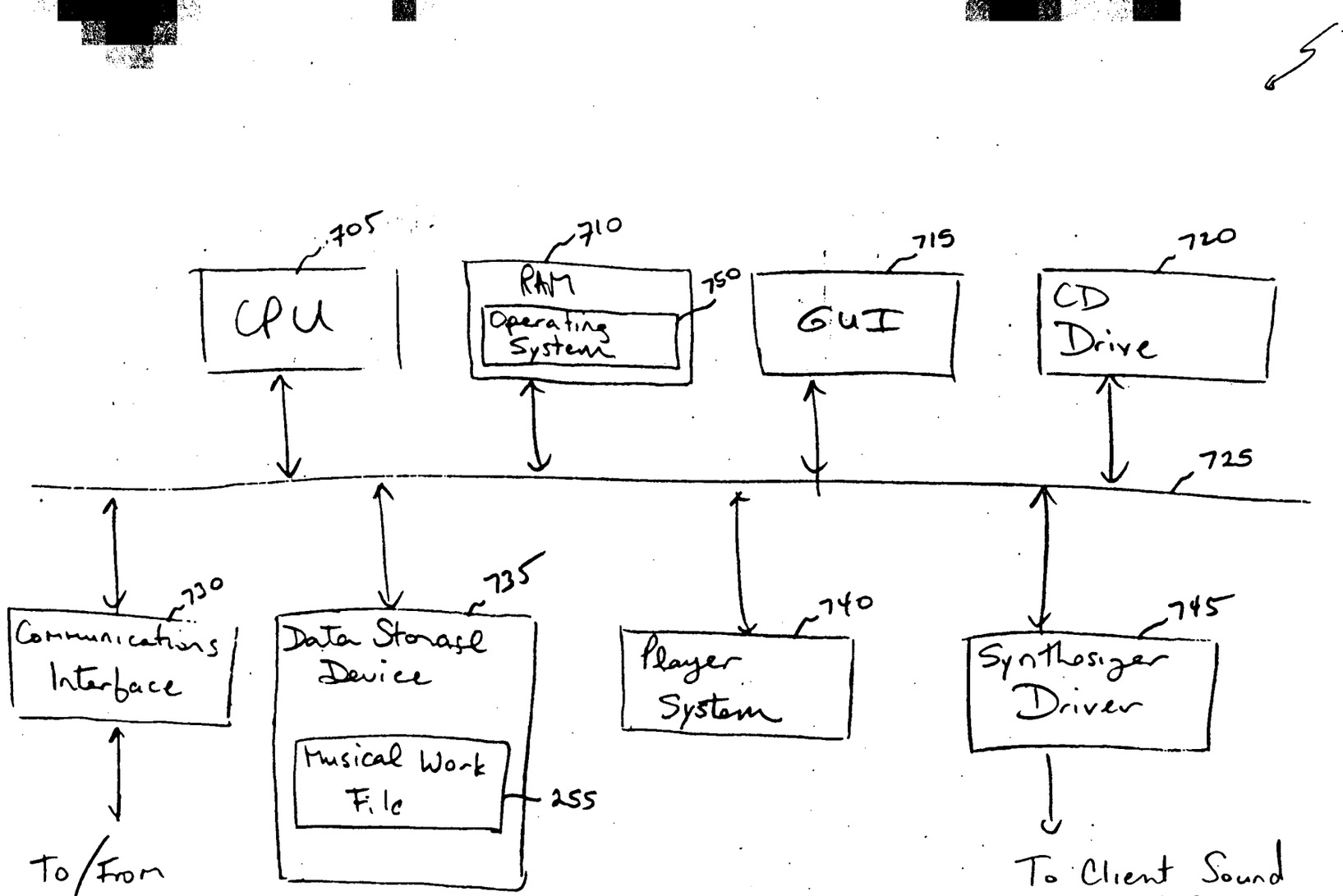

FIG. 7 (Client)

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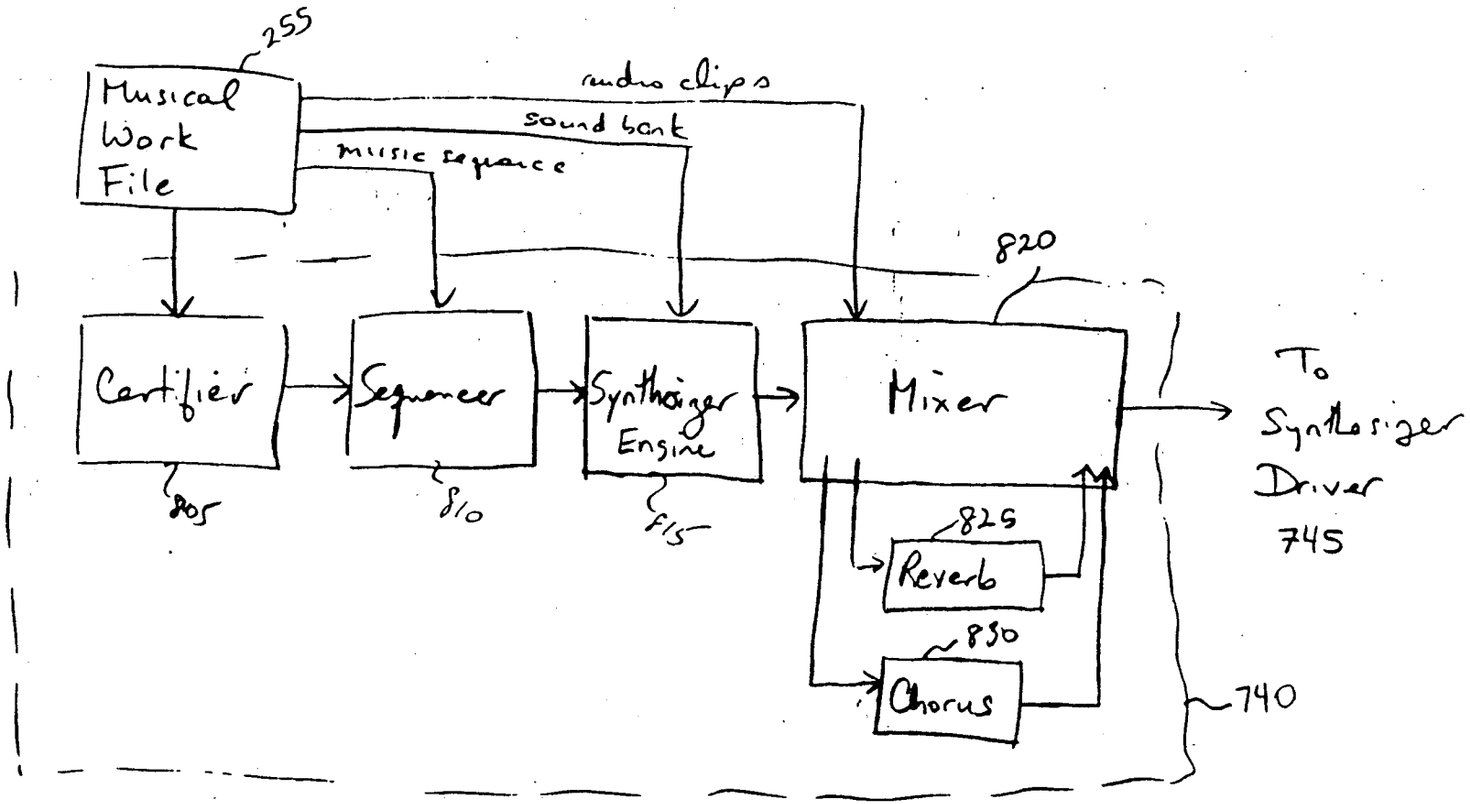

FIG. 8

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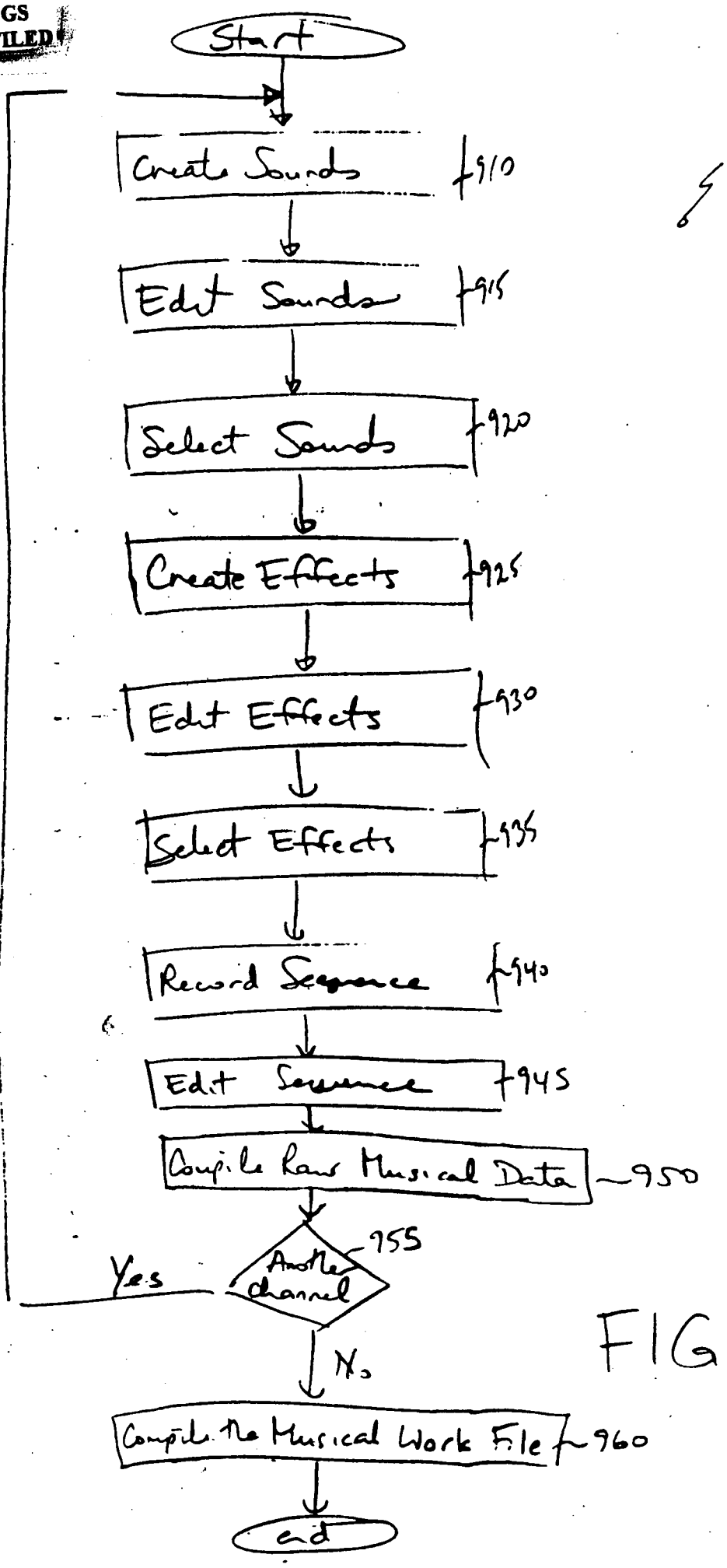

FIG. 9 (Cancelled)

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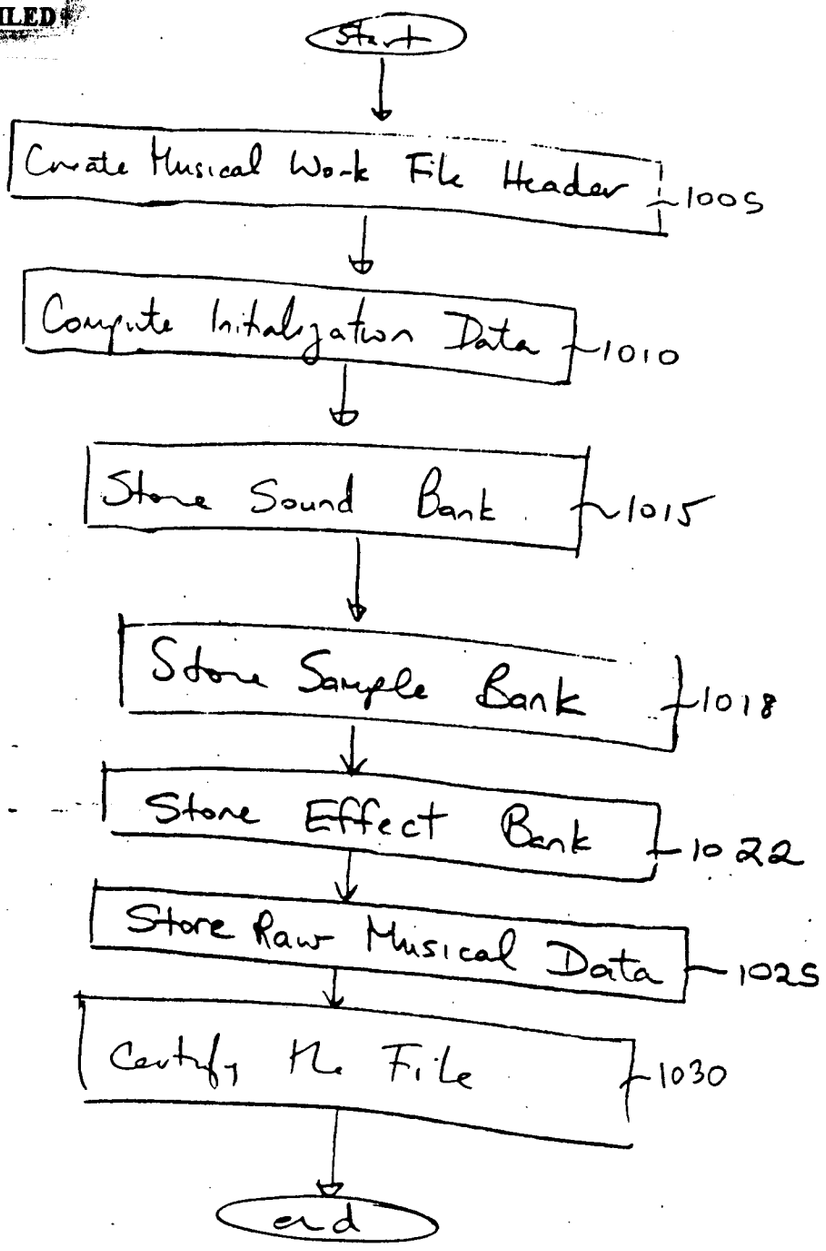

FIG. 10

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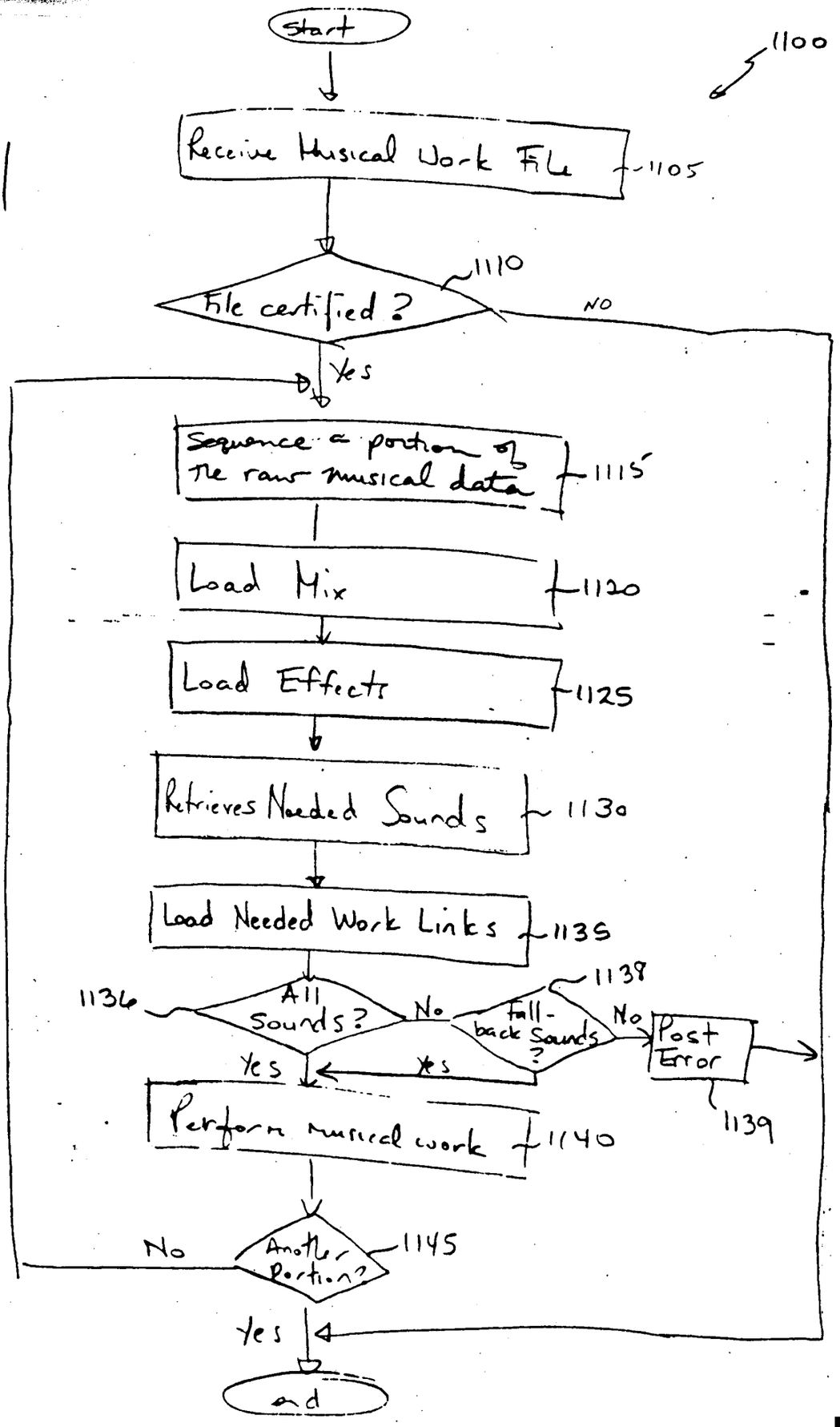
FIG. 11
(Performing)



18

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 1996

Application or Docket Number

CLAIMS AS FILED - PART I

HHT 1/1

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	45 minus 20=	* 25
INDEPENDENT CLAIMS	8 minus 3 =	* 5
MULTIPLE DEPENDENT CLAIM PRESENT		

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
	385.00	OR		770.00
X$11=		OR	X$22=	550
X40=		OR	X80=	400
+130=		OR	+260=	
TOTAL		OR	TOTAL	1720

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 45	Minus	** 45	=
Independent	* 8	Minus	*** 8	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$11=		OR	X$22=	
X40=		OR	X80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$11=		OR	X$22=	
X40=		OR	X80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$11=		OR	X$22=	
X40=		OR	X80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Form PTO 1130
(REV 2/94)

PACE DATA ENTRY CODING SHEET

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

1ST EXAMINER	DATE
2ND EXAMINER	DATE

60614 U.S. PTO
08/891580

07/11/97

APPLICATION NUMBER	TYPE APPL	FILING DATE MONTH DAY YEAR	SPECIAL HANDLING	GROUP ART UNIT	CLASS	SHEETS OF DRAWING

TOTAL CLAIMS	INDEPENDENT CLAIMS	SMALL ENTITY?	FILING FEE	FOREIGN LICENSE	ATTORNEY DOCKET NUMBER

CONTINUITY DATA

CONT CODE	STATUS CODE	PARENT APPLICATION SERIAL NUMBER	PCT APPLICATION SERIAL NUMBER	PARENT PATENT NUMBER	PARENT FILING DATE MONTH DAY YEAR
			PCT/		
			PCT/		
			PCT/		
			PCT/		
			PCT/		

PCT/FOREIGN APPLICATION DATA

FOREIGN PRIORITY CLAIMED	COUNTRY CODE	PCT/FOREIGN APPLICATION SERIAL NUMBER	FOREIGN FILING DATE MONTH DAY YEAR

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OCT 24 1997
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IN THE

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S): Stanley Jungleib

SERIAL NO.: 08/891,580

FILED: July 11, 1997

TITLE: System and Method for Generating, Distributing, Storing and Performing Musical Work Files

EXAMINER: Pearlene Foster

GROUP ART UNIT: Unknown

ATTY.DKT.NO.: PA612

INFORMATION DISCLOSURE STATEMENT
Under 37 C.F.R. §§ 1.56, and 1.97-1.99

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Pursuant to the provisions of 37 C.F.R. §§ 1.56 and 1.97-99 of the Rules of Practice in Patent Cases, enclosed herewith is form PTO-1449 listing several references, copies of which are enclosed. The Examiner is requested to make these references of official record in the application. The references cited may be material to examination of the application and are submitted in compliance with Applicant's duty of disclosure as defined by 37 C.F.R. § 1.56.

No representation is made or intended as to the completeness of this list, nor is the inclusion of any reference on this list an admission that it is prior art or pertinent to this application.

Respectfully submitted,

Stanley Jungleib

Dated: October 20, 1997

By: _____

J. Eppa Hite, Reg. No. 30,266
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on the date printed below:

Dated: October 20, 1997

By: _____
J. Eppa Hite

FORM PTO-1449

OIPE OCT 24 1997 PATENT & TRADEMARK OFFICE

INFORMATION DISCLOSURE CITATION IN AN APPLICATION

(Use several sheets if necessary)

Attorney's Docket No. (Optional)	Application No.
PA612	08/891,580
Applicant: Stanley Jungleib	
Filing Date: July 11, 1997	Group Art Unit: Unknown

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		Michael Casey and Paris Smaragdis, "NetSound ICMC96 Paper", Proceedings of the International Computer Music Conference 1996, Hong Kong, reprinted at http://sound.media.mit.edu/~mkc/icmc96/icmc96.html
		Jim Aikin, "MIDI Meets the Internet", KeyBoard, July 1997, p. 36

EXAMINER	DATE CONSIDERED
J. Donels	10/26/98

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

OIPE OCT ... 1997 JC3 PATENT & TRADEMARK

NetSound ICMC96 Paper

Published in *Proceedings of the International Computer Music Conference* 1996, Hong Kong

By Michael Casey and Paris Smaragdis

MIT Media Lab Machine Listening Group

Abstract

We describe a sound and music specification protocol called *NetSound* that is oriented towards networked low-bandwidth, native-signal-processing sound synthesis applications. One such application is music distribution on the internet. We describe the concept behind *NetSound* and outline a prototype implementation that uses *Csound*, a synthesis specification language designed and implemented at the MIT Media Lab, as a client-side real-time synthesis engine.

NetSound

NetSound is a sound and music description system, currently prototyped in *Csound*, in which sound streams are described by decomposition into a sound-specification description representing arbitrarily complex signal processing algorithms, and event lists comprising scores or MIDI files; as such, *NetSound* is an example of Model-Based Audio. This description is analogous to the *Adobe Postscript* language for image and text information in which construction information for fonts and images is separated from raw ASCII text. As a network sound transmission protocol, *NetSound* has the advantage of being able to transmit a wide selection of sounds using a descriptive format that does not require a high-bandwidth channel. Since description-based audio represents acoustic events as parameterized units, a great deal of control over the resulting sound is offered. In order to time-compress a sound stream, for example, a scalar multiplier can be applied to all event duration values, or a synthesis algorithm such as phase-vocoder resynthesis can be specified and appropriate time-frequency modifications made from a simple control function. The use of complex instrument descriptions and appropriately parameterized score makes it possible to specify descriptions of complete sound tracks or musical pieces using a very small amount of data. Other synthesis languages' instruments, such as the MUSIC-N languages, and commercial synthesizer implementations can be translated into *Csound* syntax. On the note level, *NetSound* has its own event-specification format but is also capable of reading and playing MIDI files.

NetSound as a sound specification protocol

Object-based representations for sound synthesis can be thought of as a series of audio processing building blocks that are threaded into a signal processing network for each class of sound. Each sound instance produces a copy of the signal-processing template for that class of sound. These data structures are constructed on the client side by the *Csound* compiler. Once constructed and memory resident, the signal processing networks can be executed in real time under the control of a score or MIDI file event list. *Csound* features a complex dynamic execution environment that adjusts memory requirements as needed and maintains efficiency by optimized allocation and reallocation of memory.

Specification and Distribution using *NetSound*

The process of designing a sound stream using *NetSound* comprises the specification of the required sound synthesis algorithms or selection from pre-existing synthesis units, such as wavetable synthesis, FM synthesis, phase-vocoder or additive synthesis. A standard sequencing program is used to construct the temporal structure of the required sound stream as a MIDI file or the readable *Csound* score format. Sound streams are computed in real time and synthesized buffer by buffer by a network client- i.e. an executable on the network users computer. The resulting audio sample data is not stored or transmitted, only the descriptions and the necessary sampled sounds or synthesis data are stored and transmitted by

the network server. It is important to note that *NetSound* is not a compression protocol; the process does not include a transcription from mixed audio to *NetSound* format. We consider *NetSound* as a distribution tool that reflects the manner in which music and sound tracks are constructed for multimedia applications. That is, a small number of sounds or algorithms are utilized for generating a large amount of audio data. *NetSound* renders the data into sound without requiring large storage or throughput capacity.

NetSound and General MIDI

General MIDI comprises a fixed set of 128 apriori defined sound wavetables. Extensions to general MIDI include a number of sound effects as well extensions to the basic instrumental set. While general MIDI has been a useful tool it is somewhat limited in its definition of the available sound palette. The General Music extensions offer a protocol for including user-definable wavetables for sounds, these are encoded using MPEG compression and a limit of twenty seconds is suggested for the length of these tables. In contrast, *NetSound* exploits a suite of synthesis algorithms comprising the most widely-used sound synthesis techniques from the field of computer music as well as wavetable synthesis; including user-definable wavetables. The synthesis template library includes a version of FM synthesis, granular synthesis for sound textures, fof synthesis for voice, karplus-strong/waveguide synthesis for physical modeling, and additive synthesis or phase-vocoder for detailed control over sound resynthesis. As well as sound production algorithms, *NetSound* also includes a set of sound effects algorithms such as reverberation, echo, delay, phasing and flanging. As with the synthesis algorithms, these can be combined to form composite signal processing units of arbitrary complexity.

Network Advantages of *NetSound*

Most of the existing network audio protocols rely on lossy audio compression techniques in order to reduce the bandwidth of an audio data stream. There are also protocols that are able to stream and uncompress buffered audio data in real time; for example, at the time of writing RealAudio(tm) is able to deliver 1 channel of compressed music over a 28.8kbit communications channel at a resynthesis sampling rate of 11kHz. The quality of these techniques varies as a function of the compression ratio. Real-time compressed audio streams are good for browsing audio material but do not offer a quality that is acceptable for high-fidelity sound reproduction. High-quality compression schemes such as MPEG do not reduce the data enough to make transmission of large quantities of audio data feasible in a small amount of time. All of the existing techniques exhibit a linear relationship between the length of the original audio stream and the size of the compressed file. *NetSound* has the advantage of requiring far less server throughput capacity and storage capacity than exisiting protocols. It is also far more comprehensive in its sound palette than General MIDI. *NetSound* also has the potential to represent sound streams with a data packet that is sub-linearly or scalar related to the size of the resulting data stream.

Client-side computational efficiency versus Bandwidth

Since *NetSound* utilizes *Csound* as a real-time software synthesis engine, issues of computational requirements must be addressed. The decision to exploit client-side computing resources is born out of the observation that current network activity is limited by client/server throughput rather than available processor cycles. As long as that is the case, a tradeoff between processor usage and bandwidth requirements must be made. In terms of processor usage, the most efficient method of audio synthesis is sample playback. If the resulting sound stream comprises a single sample stream with no rate conversion or amplitude scaling then the minimum processor load is observed. However, an algorithmic synthesis technique such as fof synthesis or granular synthesis requires far more mathamatical operations per audio sample, but also requires much less sound specification information for synthesis. Thus there is an complex relationship between computational efficiency and bandwidth requirement for specification. Thus, the art of network sound design involves the careful consideration of computational resources and bandwidth availability. It is possible to exploit the merits of both when specifying sound streams using *NetSound*, in situations where bandwidth is plentiful, sample-based synthesis techniques are perhaps preferable. However, when processor cycles are likely to be available, other synthesis techniques, such

as additive synthesis, or phase-vocoder synthesis may be incorporated to reduce network bandwidth requirements at the expense of increased central processor load.

Conclusion and Future Work

NetSound is currently well suited to synthesizing the types of sound and music that are produced in a modern multimedia production studio. It is the goal of *NetSound* to eliminate the pre-mastering stage of multimedia sound production in favor of distributing algorithmic synthesis descriptions, any necessary audio samples or analysis signals, and structured event lists for the sound stream. This information is currently implicitly represented in a modern multi-media studio because as yet, there are no standards for exporting information relating to the specification of signal-processing networks. The future of software sound synthesis is somewhat dependent on such protocols, *NetSound* is perhaps a first in this regard. We are currently investigating the use of parametric models for non-musical synthesis, such as foley-type sound effects, so that commonly required classes of sounds can be specified by a small number of parameters and sound class information. The modular nature of *Csound* affords easy inclusion of new synthesis models into the *NetSound* protocol. As software synthesis starts to become embedded in multimedia technologies, we believe that the principals outlined above will become a governing factor in software-based sound design.

Michael Casey
Paris Smaragdis
Last modified: Fri Dec 20 14:23:02 EST

for five streams: The license for 100 si]7
neous streams costs around $12,000 per year.

Shockwave Streaming Sound

It may have been Macromedia's implementation of simple streaming audio for Shockwave that opened the doors for us to stream RealAudio files without server software. Recently hitting around 15 million downloads, the Shockwave plug-in has also been widely accepted. A sound file exported from Macromedia's Mac-based digital audio editor, SoundEdit 16, can be put on a server and streamed to a Shockwave interface.

To stream audio files with Shockwave you need SoundEdit 16 (Mac) or Director 5 (Win 3.1/95). You'll also need Afterburner — a free utility that compresses and outputs the Web-friendly files. No special server software is required. Afterburner is available from www.macromedia.com and includes template HTML files and the player. To hook up to your own audio, you merely insert the location of your file into the HTML document. The player is somewhat limited, however, in that it can't rewind or fast-forward.

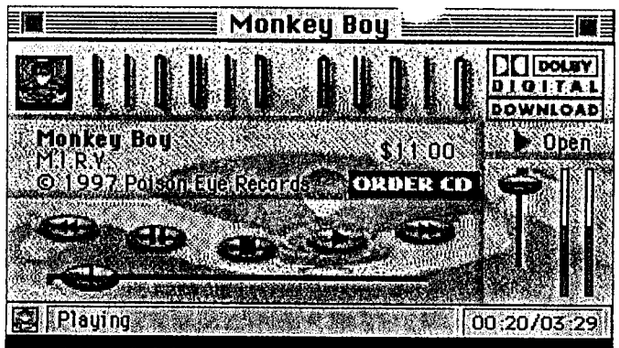

Fig. 3. Liquid Audio's standard plug-in interface. Selecting the "Order CD" button currently takes you to a Web-based form, but the company hopes to have more advanced purchasing options available this summer.

To create Shockwave streaming audio, you have to downsample your source file to 16-bit, 22kHz and choose the appropriate Kbytes/second (kbps) for your targeted audience before you export the audio as a .SWA file. A good rule of thumb for conversion is that processing will take about three times as long as the file runs in real time. Both the Mac and Windows platforms have batch processing capabilities, so it's possible to gang up a batch of these files to be processed and leave

MIDI Meets the Internet

An Old Dog Learns a New Trick

By Jim Aikin

Been surfing the Web lately? Once the initial rush has subsided, you may have noticed that the experience is, to put it politely, somewhat less sensually gratifying than network television. The splashy graphics take forever to download, broken links are common, and the whole experience is eerily silent. (We won't even talk about how badly edited much of the text is.)

For people who are trying to sell you their products over the Web, or merely to enhance their company's image, anything that would cause you to experience irritation or, worse, lose interest entirely is a *problem*. Download time is limited by the speed of your modem, and it will be a year or two before faster pipelines are in place. Silence, though — we can do something about that.

Music can be added to a Web site in several different ways. In fact, the race to establish a standard format for Web music has gotten pretty heated. Every week brings fresh announcements of breakthrough technology. The main solutions, though, fall into two familiar categories: audio and MIDI.

Audio — even streaming audio, which is not the highest quality sound you've ever heard — has the advantage that the person on the receiving end can hear exactly what the developer intended them to hear. All they need is speakers, and most multimedia-ready computers have those. The disadvantage of audio is that it's high-bandwidth. A lot of data has to be transmitted and received every second, without interruption, for the listener to have an experience of the musical kind. And that data has to compete with the graphics.

MIDI is a stunningly appropriate solution for music on the Web. It's a relatively compact, low-bandwidth data format, which makes it ideal either for streaming (real-time playback) or for downloading an entire song file that can then be played back by your browser software. The disadvantage of MIDI is that it's at the mercy of the playback system in your computer. If all you have is a Soundblaster 16 with 2-op FM synthesis, the results will tend to be dismal. General MIDI, however, serves as a baseline standard for Web MIDI playback. Any GM synth or soundcard should be able to provide more than adequate musical performance for any MIDI-equipped site.

You may not even need the hardware. Several vendors are now providing plug-ins that do *host processor synthesis*, also known as software synthesis. This tends to require a faster computer, and even then can be so processor-intensive that it slows down your whole system. The advantage of host processor synthesis over soundcard playback is that a Web site developer can have greater assurance that you'll hear exactly the music that they intended, no matter what your hardware.

Yamaha's MIDplug (for URLs, see page 51) software synthesizer, which adheres, more or less, to Yamaha's XG format, is available for free download. It's not the only option. Macintosh owners can take advantage of the QuickTime Musical Instruments, or InVision Interactive's CyberSynth, both of which are GM soundsets. Microsoft has licensed the Roland Sound Canvas soundset, and is making it available as a software synthesizer.

What if you're not satisfied with General MIDI? You smart dog; you get an extra cookie. Thomas Dolby Robertson (better known as Thomas Dolby the *quondam* rock star) would like to talk to you about RMF. Also about Beatnik. His company, Headspace, has unveiled an ambitious suite of tools for interactive Web music. The core of the system is the Rich Music Format (RMF), a new file type that can encapsulate not only a Standard MIDI File but also alternate samples to fill special musical requirements, as well as copyright information and other useful goodies.

Beatnik comes in two flavors — the browser plug-in and the Beatnik Editor. The latter is used to create RMF files that can be played from any Beatnik-capable site. In addition to extending the GM sound set with custom samples, Beatnik allows an HTML page to be fully interactive musically: Numerous "expressive" parameters of the music, such as tempo and percussive interjections, can change in response to the end user's mouse movements.

The fact that the Headspace playback engine has been licensed by Sun Microsystems for inclusion in the Java programming language guarantees that Beatnik will be a serious contender. But of course, Microsoft is also a serious contender. Their Interactive Music Control, which is being included in Microsoft Internet Explorer, presents a different vision of interactive music on the Net.

Spearheading Microsoft's effort are programmers Todor Fay and Melissa Grey. Longtime *Keyboard* readers may remember Todor and Melissa from Blue Ribbon Software, makers of SuperJam (see Keyboard Report, April '94). When Microsoft acquired Blue Ribbon, it also acquired the SuperJam engine, a form of which is now embedded in the Interactive Music Control. This engine makes a MIDI soundtrack more entertaining by introducing minor variations within the current musical style. As with Beatnik, the MIDI performance is generated from a file by the plug-in rather than being streamed over the Net. Ditto for the quasi-random musical output from Koan, a plug-in from Sseyo.

Wildcat Canyon's Webtracks plug-in allows realtime streaming of MIDI data from a Web site; like Koan and the Interactive Music Control, Webtracks plays back using whatever synthesizer is hooked up to the computer. LiveUpdate's Crescendo plug-in also supports streaming, and LiveUpdate is working on their own software synthesizer, Crescendo Plus — not to mention a new development that reportedly is going to be able to play back synced MIDI and audio. And somebody else is sure to announce a major software release before this issue hits the newsstands. (For more background information, see "MIDI Rocks the Web" in the March/April '97 issue of *Music & Computers*.)

If your main interest in Web music is showcasing your own creative efforts, MIDI is not a very good solution. But if you're looking for opportunities as a composer or arranger of commercial music, a million downloads of MIDI playback plug-ins are bound to be good news. If you understand the file types and can handle the editing programs, get your résumé out there — or better yet, set up your own site with relevant demos. That way, Web developers can beat a path to your door. ■

UNITED STATES PARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/891,580	07/11/97	JUNGLEIB S	PA612

MM51/0622

MARC A SOCKOL
CARR DEFILIPPO AND FERRELL
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2225 EAST BAYSHORE ROAD
PALO ALTO CA 94303

EXAMINER	
DONELS, J	

ART UNIT	PAPER NUMBER
2837	3

DATE MAILED: 06/22/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
08/891,580	Jungleib
Examiner	**Group Art Unit**
Jeff Donels	2837

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-45* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-45* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claims 7,21,35,37,38,43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7,21fail to point out and distinctly claim Applicant's invention, as "the composer's name" is not positively recited and lacks antecedent basis. Correction is required.

Claims 35,43 fail to point out and distinctly claim Applicant's invention, as the phrase "certifying right of the player system" is not clear and does not make sense grammatically. Correction is required.

Claims 37,38 fail to point out and distinctly claim Applicant's invention, as it is not clear how a method step of 'receiving a musical work file' is "achieved" by a CD player or a network communication interface. Correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al.

Regarding Claims 1-45, Sato et al. discloses a karaoke system having a plurality of terminals and a center system (Col. 5) which comprises a computer-readable medium 3 which has a musical work file (MIDI karaoke file) containing music control signals, effects/topology (note file see Col. 5, lines 26-27), a portion of a sound bank (PCM file), a header (quick reference file) which contains a composer name, title, etc. Sato does disclose a CD drive 3, a network interface 4 and a MIDI controller 2, but not explicitly disclose the recited means and method steps for editing and modifying the musical work files. Official Notice is taken that it is notoriously old and well-known to one of ordinary skill in the art that such means and recited method steps would be necessary to create such musical work files before they are used by a device such as that taught by Sato et al. It would have been obvious to one of ordinary skill in the art to adapt the teachings of Sato et al. with such means and method steps so as to allow the user to create such files.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Goede, Umeda et al., Bell et al., Aoki et al., Lisle et al., and Nakai et al. are further cited to show related teachings in the art of electronic musical instruments.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Donels whose telephone number is (703) 308-3115. The examiner can normally be reached on Monday - Thursday from 8:30 AM - 6:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Shoop, can be reached on (703) 308-3103. The fax number for this Technology Center is (703) 305-3431.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center receptionist whose telephone number is (703) 308-1782.

JWD
June 15, 1998

JEFF DONELS
PATENT EXAMINER
TECH CENTER 2800

Notice of References Cited

Application No.	Applicant(s)		
08/891,580	Jungleib		
Examiner	Group Art Unit	Page 1 of 1	
Jeff Donels	2837		

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
x	A	5,811,706	9/22/98	Van Buskirk et al.	84	604
	B					
	C					
	D					
	E					
	F					
	G					
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	I					
	J					
	K					
	L					
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FOREIGN PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
	N						
	O						
	P						
	Q						
	R						
	S						
	T						

NON-PATENT DOCUMENTS

*		DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
	U		
	V		
	W		
	X		

* A copy of this reference is not being furnished with this Office action.
(See Manual of Patent Examining Procedure, Section 707.05(a).)

PRINT OF DRAWING
AS ORIGINALLY FILED

Attachment 3

The drawings submitted with this application were declared informal by the applicant. Accordingly they have not been reviewed by a draftsperson at this time. When formal drawings are submitted, the draftsperson will perform a review.

Direct any inquires concerning drawing review to the Drawing Review Branch (703) 305-8404.

playing time of **karaoke** songs; Toshiki Nakai, et al., 434/307A; **84/609**; 434/308 [IMAGE AVAILABLE]

3. 5,484,291, Jan. 16, 1996, Apparatus and method of playing **karaoke** accompaniment; Toshiki Nakai, et al., 434/307A; **84/610**; 386/102; 434/318 [IMAGE AVAILABLE]

=> d his

(FILE 'USPAT' ENTERED AT 15:34:54 ON 15 JUN 1998)
L1 113 S 84/CLAS AND (MOD OR MODS)
L2 15 S 84/CLAS AND MIDI AND KARAOKE AND PCM AND FILE#
L3 3 S L2 AND MIDI KARAOKE FILE#

=> d 1-3

1. 5,589,947, Dec. 31, 1996, **Karaoke** system having a plurality of terminal and a center system; Masuhiro Sato, et al., 386/96; **84/645**; 348/13; 386/98, 102 [IMAGE AVAILABLE]

2. 5,494,443, Feb. 27, 1996, **Karaoke** system and method of managing playing time of **karaoke** songs; Toshiki Nakai, et al., 434/307A; **84/609**; 434/308 [IMAGE AVAILABLE]

3. 5,484,291, Jan. 16, 1996, Apparatus and method of playing **karaoke** accompaniment; Toshiki Nakai, et al., 434/307A; **84/610**; 386/102; 434/318 [IMAGE AVAILABLE]

=>

CLAIMS:

CLMS(1)

What . . .
m;
h. means for reading from the second memory values of the sinusoidal wave function at the respective address points PQ **mod** N, where Q = 0, 1, . . . N, to produce read-out signals;
i. second multiplication means for multiplying the. . .

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  *          U. S.   P A T E N T   T E X T   F I L E                    *
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         27885 84/CLAS
         16381 TOPOLOG?
L1           12 84/CLAS AND TOPOLOG?

=> d l1 1- pno
1.       5,754,095       [IMAGE AVAILABLE]
2.       5,728,963       [IMAGE AVAILABLE]
3.       5,614,686       [IMAGE AVAILABLE]
4.       5,604,323       [IMAGE AVAILABLE]
5.       5,471,007       [IMAGE AVAILABLE]
6.       5,448,010       [IMAGE AVAILABLE]
7.       5,212,334       [IMAGE AVAILABLE]
8.       4,984,276       [IMAGE AVAILABLE]
9.       4,915,001       [IMAGE AVAILABLE]
10.      4,843,627       [IMAGE AVAILABLE]
11.      4,659,996       [IMAGE AVAILABLE]
12.      4,468,997       [IMAGE AVAILABLE]

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  *      APS is unavail     Thanksgiving Day, Chris     Day,          *
  *      and New Year's Day.                                           *
  *                                                                    *
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  *          U. S.   P A T E N T   T E X T   F I L E                   *
  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

=> s sound bank# and file# and music?
         89602 SOUND
         46614 BANK#
             2 SOUND BANK#
               (SOUND(W)BANK#)
        678572 FILE#
         18315 MUSIC?
L1           0 SOUND BANK# AND FILE# AND MUSIC?

=> d 1-2
'L1' HAS NO ANSWERS
L1             0 SEA FILE=USPAT SOUND BANK# AND FILE# AND MUSIC?

=> d l1 1-2
'L1' HAS NO ANSWERS
L1             0 SEA FILE=USPAT SOUND BANK# AND FILE# AND MUSIC?

=> s sound bank#
         89602 SOUND
         46614 BANK#
L2           2 SOUND BANK#
               (SOUND(W)BANK#)

=> d 1-2

1.  5,502,772, Mar. 26, 1996, Speaker having improved sound square,
**sound** **bank**, sound angle, sound wedge and sound radiators; Charles
J. Felder, 381/386; 181/199; 381/87 [IMAGE AVAILABLE]

2.  4,585,930, Apr. 29, 1986, Slotless magnetic card reader; Martin
Casden, 235/449, 382, 486 [IMAGE AVAILABLE]

=> s midi and table# and file#
          1107 MIDI
        554128 TABLE#
        678572 FILE#
L3         353 MIDI AND TABLE# AND FILE#

=> s l3 and instrument#
        143848 INSTRUMENT#
L4         261 L3 AND INSTRUMENT#

=> s l4 and music?
         18315 MUSIC?
L5         246 L4 AND MUSIC?

=> s l5 and title#
         50006 TITLE#
L6          41 L5 AND TITLE#

=> s l6 and (cpu or computer#)
```

```
          56133 CPU
         214764 COMPUTER#
L7           39 L6 AND (CPU OR COMPUTER#)

=> d l7 1-39 pno
1.       5,745,103       [IMAGE AVAILAB
```

GAU 2837

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

RECEIVED
SEP 2 9 1998
GROUP 2100

4/A

10-1-98
T. Flaherty

APPLICANT:	Stanley Jungleib
SERIAL NO.:	08/891,580
FILING DATE:	July 11, 1997
TITLE:	System and Method for Generating, Distributing, Storing and Performing Musical Work Files
EXAMINER:	J. Donels
ART UNIT:	2837
ATTY. DKT. NO:	612US

CERTIFICATE OF MAILING

I hereby certify that this paper is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on the date printed below:

Date: 9/22/98 Eppa Hite

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

AMENDMENT

In response to the Office Action mailed June 22, 1998, please amend the above-identified application as follows:

In the claims:

A1

7. (Once Amended) The composition system of claim 6 wherein the header includes a title, a serial number, and [the] a composer's name.

A2

21. (Once Amended) The method of claim 20 wherein the header includes a title, a serial number, and [the] a composer's name.

A3

28. (Once Amended) A player system that can receive and play downloadable-in-real-time musical data, comprising:

an input terminal for receiving a musical work file containing downloadable-in-real-time topology information, downloadable-in-real-time music sequence data, and a sound bank which includes at least one downloadable-in-real-time instrument sound;

a synthesizer capable of adding downloadable-in-real-time sounds, said synthesizer being coupled to the input terminal for processing the music sequence data based on the topology information and the sound bank; and

a speaker system coupled to the synthesizer for converting the processed music sequence data to sound.

A4

35. (Once Amended) The player system of claim 28 further comprising a certifier for certifying rights of the player system to convert the processed music sequence to sound.

36. (Once Amended) A method for playing a musical work file comprising the steps of:

receiving [a] said musical work file containing downloadable-in-real-time topology information, downloadable-in-real-time music sequence data, and a sound bank which includes at least one downloadable-in-real-time instrument sound;

processing the music sequence data based on the topology information and the sound bank; and

converting the processed music sequence data to sound.

cont. A4

37. (Once Amended) The method of claim 36 [wherein the step of receiving a] comprising the further step of transmitting said musical work file [is achieved] by a CD drive.

38. (Once Amended) The method of claim 36 [37 wherein the step of receiving a] comprising the further step of transmitting said musical work file [is achieved] by a network communications interface.

43. (Once Amended) The method of claim 36 further comprising the step of certifying rights of the player system to convert the processed music sequence to sound. A5

44. (Once Amended) A player system that can receive and play downloadable-in-real-time musical data, comprising:

means for receiving a musical work file containing downloadable-in-real-time topology information, downloadable-in-real-time music sequence data, and a sound bank which includes at least one downloadable-in-real-time instrument sound;

means for processing the music sequence data based on the topology information and the sound bank; and

means for converting the processed music sequence data to sound.

45. (Once Amended) A computer-readable medium storing program code for causing a computer to perform the steps of:

receiving a musical work file containing downloadable-in-real-time topology information, downloadable-in-real-time music sequence data, and a sound bank which includes at least one downloadable-in-real-time instrument sound;

processing the music sequence data based on the topology information and the sound bank; and

converting the processed music sequence data to sound.

REMARKS

Claims 1-45 are pending and have all been rejected in this case. Applicant is amending claims 7, 21, 28, 35-38, and 43-45, and respectfully requests that the Examiner reconsider the application in view of the foregoing amendments and the following remarks.

Rejection under 35 U.S.C. § 112

On page 2 of the Office Action, the Examiner rejected claims 7, 21, 35, 37, 38, and 43 under 35 U.S.C. § 112, second paragraph.

Regarding claims 7 and 21, the Examiner indicated that "the composer's name" lacks antecedent basis. Applicant is amending claims 7 and 21 to recite "*a* composer's name" (emphasis added)

Regarding claims 35 and 43, the Examiner asserted that the phrase "certifying right of the player system" is not clear and does not make sense grammatically. Applicant is amending claims 35 and 43 to recite "certifying *rights* of the player system" (emphasis added).

Regarding claims 37 and 38, the Examiner asserted that it is not clear how a method step of receiving a musical work file is achieved by a CD player or a network communication interface. Applicant is amending claims 37 and 38 to recite that a CD drive or a network communication interface transmits a musical work file. Amended claims 37 and 38 recite respectively: "The method of claim 36 comprising the further step of transmitting said musical work file by a CD drive," and "The method of claim 36 comprises the further step of transmitting said musical work file by a network communications interface."

Rejection under 35 U.S.C. § 103(a)

On page 3 the Examiner rejected claims 1-45 under 35 U.S.C. § 103(a) as unpatentable over U.S. patent No. 5, 589,947 to *Sato et al,* which, as the Examiner correctly indicated, discloses a karaoke system. Applicant respectfully traverses.

Claims 1-27 of the invention relate to *generating* a music work file *from which a player system performs or produces sound* (page 17, lines 1-4). In contrast, the *Sato* karaoke system reproduces (or produces) music and video of music pieces (*Sato,* abstract). That is, the Sato karaoke system generates sound from a sound source, which is totally different from a sound-source (music work file) generator of the claimed invention. Therefore, claims 1-27 are patentably distinguished from *Sato.*

Amended independent claim 28 recites in relevant part: "A player system that can receive and play downloadable-in-real-time musical data, comprising:

an input terminal for receiving a musical work file containing downloadable-in-real-time topology information, downloadable-in-real-time music sequence data, and a sound bank including at least one downloadable-in-real-time instrument sound;

a synthesizer capable of adding downloadable-in-real-time sounds, said synthesizer being coupled to the input terminal for processing the music sequence data based on the topology information and the sound bank . . . ."

Independent claims 36, 44, and 45 recite corresponding limitations. The player system of the claimed invention is thus in many aspects patently distinguished from *Sato.* The player system itself can receive and play downloadable-in-real-time sounds because "player system 740 operates in conjunction with [an] operating system . . . for loading and unloading sounds from data storage device 235" (page 17, line 21 through page 18, line 2). The

claimed player system 740, which is part of player client 125 (FIG. 7), is on one side of computer network 120 (FIG. 1). Data storage device 235, which is part of composer server 110 (FIG. 2), is on another side of computer network 120 (FIG. 1). Consequently, data from data storage device 235 is "downloadable" through network 120 to player system 740. Further, data in storage device 235 can be represented by work links 630, which is downloadable "in real time" (page 15, lines 12-15). Therefore data in storage device 235 is downloadable-in-real-time.

Topology information, sequence data, and a sound bank contained in a musical work file of the claimed invention are also downloadable in real time. Topology information (page 14, lines 16-18) is downloadable. Further, this download can be done "*during performance of the musical work*" (page 14, lines 14-18, emphasis added), which is "real time." Therefore, topology information is downloadable in real time. Additionally, "*. . . topology changes as part of raw musical data 330 . . .*" (page 19, line 6, emphasis added) supports that topology information is downloadable in real time because raw musical data 330 stored in data storage device 235, which, as discussed above, is downloadable in real time.

Music sequence data (FIG. 6, item 615), part of downloadable-in-real-time raw musical data 330 (FIG. 6), is downloadable-in-real-time.

Sound bank 250 includes work linked sounds (page 11, lines 2 and 3) linked by "work links" 630 (FIG. 6, item 630) or instrument sounds from locations referenced by the work links 630 (page 17, lines 12-15). Because work links are part of downloadable-in-real-time raw musical data 330, work links are downloadable in real time. Therefore, the sound bank includes "downloadable-in-real-time sounds."

Synthesizer 815 can add instrument sounds from sound bank 250 (page 17, lines 10-14). As discussed above, instrument sounds from sound bank 250 are

downloadable in real time. Therefore, the claimed synthesizer 815 is "capable of adding downloadable-in-real-time instrument sounds."

Because the claimed player system of the invention can receive downloadable-in-real-time sound data, the player system allows for "*modification of an infinite variety of custom instrument or non-instrument sounds*" (page 4, lines 11-13, emphasis added) immediately or during music playback. In contrast, the *Sato* karaoke system is a "fixed" system and *Sato* does not teach, suggest, or make obvious downloadable-in-real time sound data that enables flexibility (through modification) and customization. The *Sato* karaoke system receives musical information that has been recorded on an optical memory disk in OMDD 3 (col. 5, lines 17-19). Those skilled in the art will recognize that once the information is recorded on an optical disk, the information is inflexible. The note file, words file, and PCM files of *Sato*, recorded on the OMDD, are also inflexible.

Sato MIDI controller 2 reads information from OMDD 3 (col. 5, lines 52-53), which cannot add downloadable-in-real-time data. Therefore, Sato MIDI controller 2 is patently different from the synthesizer of the claimed invention.

For the above differences, each independent claim 28, 36, 44, and 45 is patently distinguished from *Sato*, and therefore is patentable. Dependent claims 27-35 and 37-43, depending from claims 28 and 36 respectively, are therefore patentable for at least the same reasons.

SUMMARY

In conclusion, Applicants respectfully request that the Examiner withdraw the rejections of the pending claims and pass the application to issue. If the Examiner has questions regarding this case, the Examiner is invited to contact Applicant's undersigned attorney.

Respectfully submitted,

Stanley Jungleib

Date: 9/22/98

By: _____

Eppa Hite, Reg. No. 30,266
Carr & Ferrell LLP
2225 East Bayshore Road, Suite 200
Palo Alto, CA 94303
Phone (650) 812-3400
Fax (650) 812-3444

#4

In re application of: Stanley Jungleib

Serial No.: 08/891,580 Atty. Docket No.: 612US

Filing Date: July 11, 1997

Title: System and Method for Generating, Distributing, Storing and Performing Musical Work Files.

OIPE JC24 SEP 25 1998 PATENT & TRADEMARK OFFICE

RECEIVED SEP 29 1998 GROUP 2100

ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Sir:
Transmitted herewith is an amendment in the above-identified application.

[ ] Small entity status of this application under 37 CFR §§ 1.9 and 1.27 has been established by a verified statement previously submitted.

[ ] A verified statement to establish small entity status under 37 CFR §§ 1.9 and 1.27 is enclosed.

[X] No additional fee is required.

The filing fee has been calculated as shown below:

	(Col. 1)		(Col. 2)	(Col. 3)	Small Entity		or	Other Than a Small Entity	
	Claims Remaining After Amendment		Highest Number Previously Paid For	Number of Extra Claims Present	Rate	Additional Fee	or	Rate	Additional Fee
Total	45*	minus	**20 45	0	x $11 =	$	or	x $22 =	$
Indep.	8*	minus	***8	0	x $41 =	$		x $82 =	$
[ ] First Presentation of Multiple Dependent Claims					+$135 =	$		+$270 =	$
					Total Fee	$		Total Fee	$

* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.

*** If the Highest Number Previously Paid For" IN THIS SPACE is less than 3, write "3" in this space. The "Highest Number Previously Paid For" (Total or Independent) is the highest number found from the equivalent box in Col. 1 of a prior amendment or the number of claims originally filed.

[ ] Please charge my Deposit Account No. 06-0600 in the amount of $____. **A duplicate copy of this sheet is attached.**

[ ] A check in the amount of $_____ is attached.

[X] The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 06-0600. **A duplicate copy of this sheet is attached.**

[x] Any filing fees under 37 CFR § 1.16 for the presentation of extra claims.
[x] Any patent application processing fees under 37 CFR § 1.17.

Dated: 9/22/98

Respectfully submitted,

Eppa Hite, Reg. No. 30,266
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UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/891,580	07/11/97	JUNGLEIB S	PA612

MM51/1027

MARC A SOCKOL
CARR DEFILIPPO AND FERRELL
SUITE 200
2225 EAST BAYSHORE ROAD
PALO ALTO CA 94303

EXAMINER	
DONELS,J	

ART UNIT	PAPER NUMBER
2837	3

DATE MAILED: 10/27/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Notice of Allowability

Application No.	Applicant(s)
08/891,580	Jungleib
Examiner	**Group Art Unit**
Jeff Donels	2837

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

☒ This communication is responsive to *amendment filed 9/25/98*.

☒ The allowed claim(s) is/are *1-45*.

☐ The drawings filed on _____ are acceptable.

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE **THREE MONTHS** FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

☒ Applicant MUST submit NEW FORMAL DRAWINGS

☒ because the originally filed drawings were declared by applicant to be informal.

☐ including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. _____.

☐ including changes required by the proposed drawing correction filed on _____, which has been approved by the examiner.

☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal lettter addressed to the Official Draftsperson.

☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

☐ Interview Summary, PTO-413

☐ Examiner's Amendment/Comment

☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

☐ Examiner's Statement of Reasons for Allowance

WILLIAM M. SHOOP JR.
SUPERVISORY PATENT EXAMINER
ART UNIT 2837

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Van Buskirk et al. is further cited to show related teachings in the art of electronic musical instruments.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Donels whose telephone number is (703) 308-3115. The examiner can normally be reached on Monday - Thursday from 8:30 AM - 6:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Shoop, can be reached on (703) 308-3103. The fax number for this Technology Center is (703) 305-3431.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center receptionist whose telephone number is (703) 308-1782.

JWD
October 23, 1998

WILLIAM M. SHOOP, JR.
SUPERVISORY PATENT EXAMINER
ART UNIT 2837

FORM PTO-892 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	SERIAL NO.	GROUP ART UNIT	ATTACHMENT TO PAPER NO.	
NOTICE OF REFERENCES CITED	08/891,580	2107		5
	APPLICANT(S) Jungleib			

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	A	5,736,663	4/1998	Aoki et al.	--	--	4/7/96
	B	5,728,962	3/1998	Goede	--	--	3/14/94
	C	5,589,947	12/1996	Sato et al	84	645(X)	
	D	5,484,291	1/1996	Nakai et al	84	610(X)	
	E	5,453,570	9/1995	Umeda et al	84	645(X)	
	F	5,119,711	6/1992	Bell et al	84	645(X)	
	G	5,054,360	10/1991	Lisle et al	84	645	
	H						
	I						
	J						
	K						

FOREIGN PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS
	L						
	M						
	N						
	O						
	P						
	Q						

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

	R	
	S	
	T	
	U	

EXAMINER	DATE	
Jeff Donels	June 15, 1998	Form892ccs2106b

* A copy of this reference is not being furnished with this office action.
(See Manual of Patent Examining Procedure, section 707.05(a).)

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

MM51/1027

MARC A SOCKOL
CARR DEFILIPPO AND FERRELL
SUITE 200
2225 EAST BAYSHORE ROAD
PALO ALTO CA 94303

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/891,580	07/11/97	045	DONELS, J 2837	10/27/98

First Named Applicant: JUNGLEIB,

35 USC 154(b) term ext. = 0 Days.

TITLE OF INVENTION: SYSTEM AND METHOD FOR GENERATING, DISTRIBUTING, STORING AND PERFORMING MUSICAL WORK FILES

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3 PA612	084-601.000	K85	UTILITY	NO	$1320.00	01/27/99

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.
If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

A. Pay FEE DUE shown above, or

B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number.
Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PATENT AND TRADEMARK OFFICE COPY

4100

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Stanley Jungleib
SERIAL NO.:	08/891,580
FILING DATE:	7/11/97
TITLE:	System and Method for Generating, Distributing, Storing and Performing Musical Work Files.
EXAMINER:	J. Donels
GROUP ART UNIT:	2837
ATTY.DKT.NO.:	PA612US

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Issue Fee, Assistant Commissioner for Patents, Washington, D.C. 20231, on the date printed below:

Dated: 12/8/98

Tuan V. Ngo

THE HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS
WASHINGTON, D.C. 20231

LETTER TO THE CHIEF DRAFTSMAN

SIR:

Subject to the approval of the Primary Examiner in the above-entitled patent application, please substitute the enclosed eleven (11) sheets of formal drawings containing fourteen (14) figures for the eleven (11) sheets of informal drawings containing fourteen (14) figures previously submitted.

Respectfully submitted,

Stanley Jungleib

Dated: 12/8/98

By: _____
Tuan V. Ngo, Reg. No. P-44,259

CARR & FERRELL LLP
2225 East Bayshore Road, Suite 200
Palo Alto, CA 94303
TEL: (650) 812-3400
FAX: (650) 812-3444

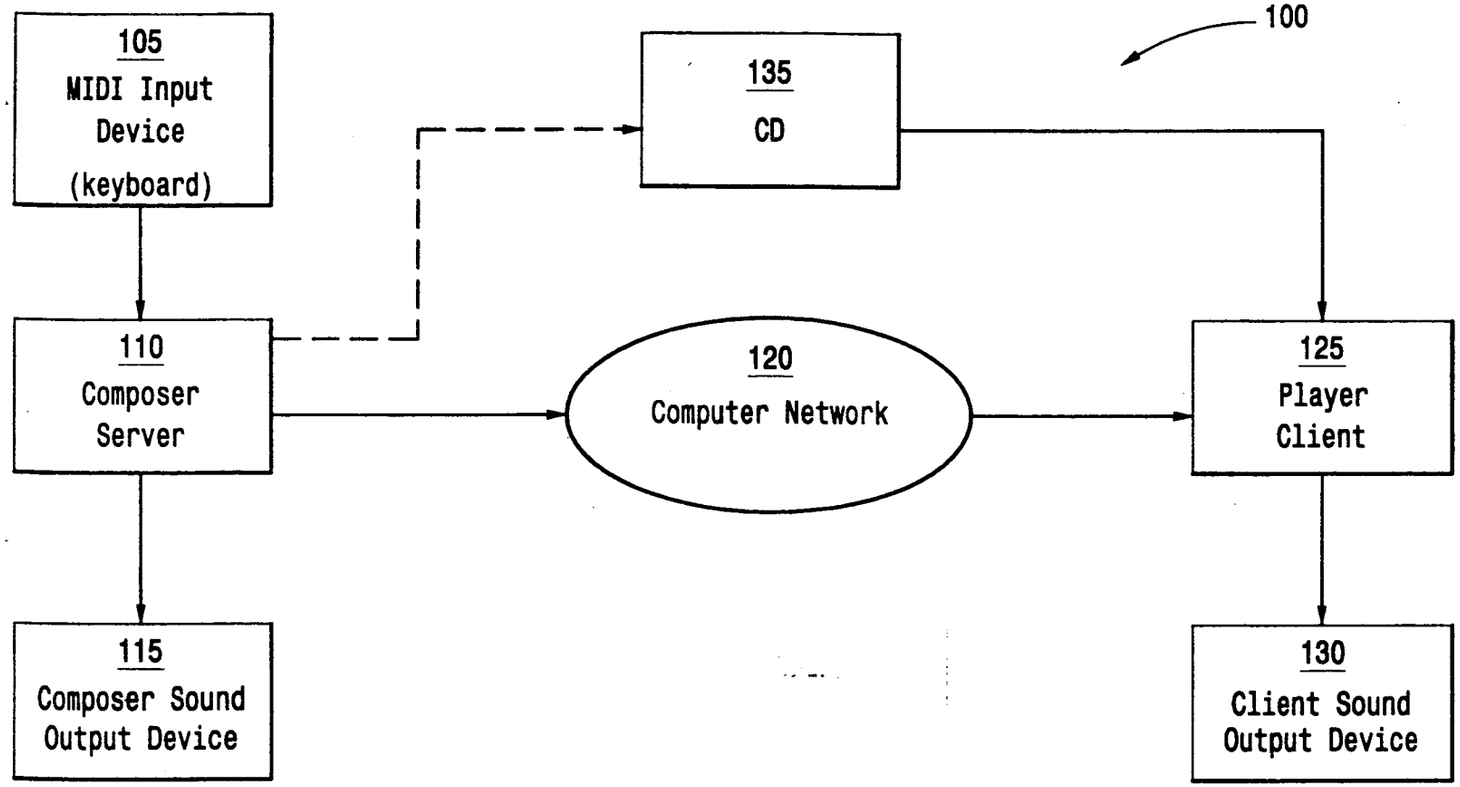


FIG. 1

APPROVED
DRAFTSMAN
O.G. FIG.
CLASS
SUBCLASS
BY

5889274

APPROVED BY DRAFTSMAN
O.G. FIG.
CLASS SUBCLASS

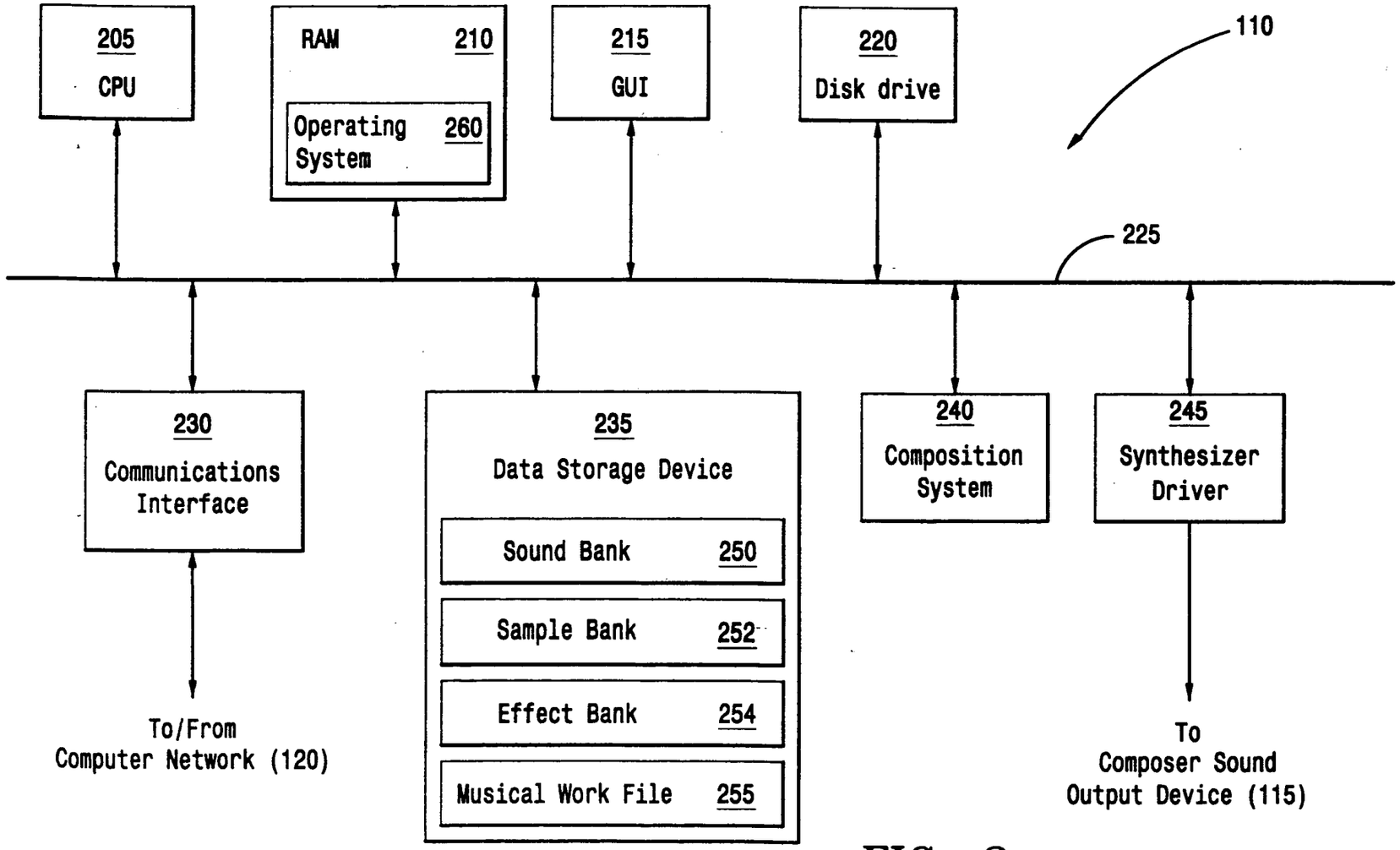


FIG. 2

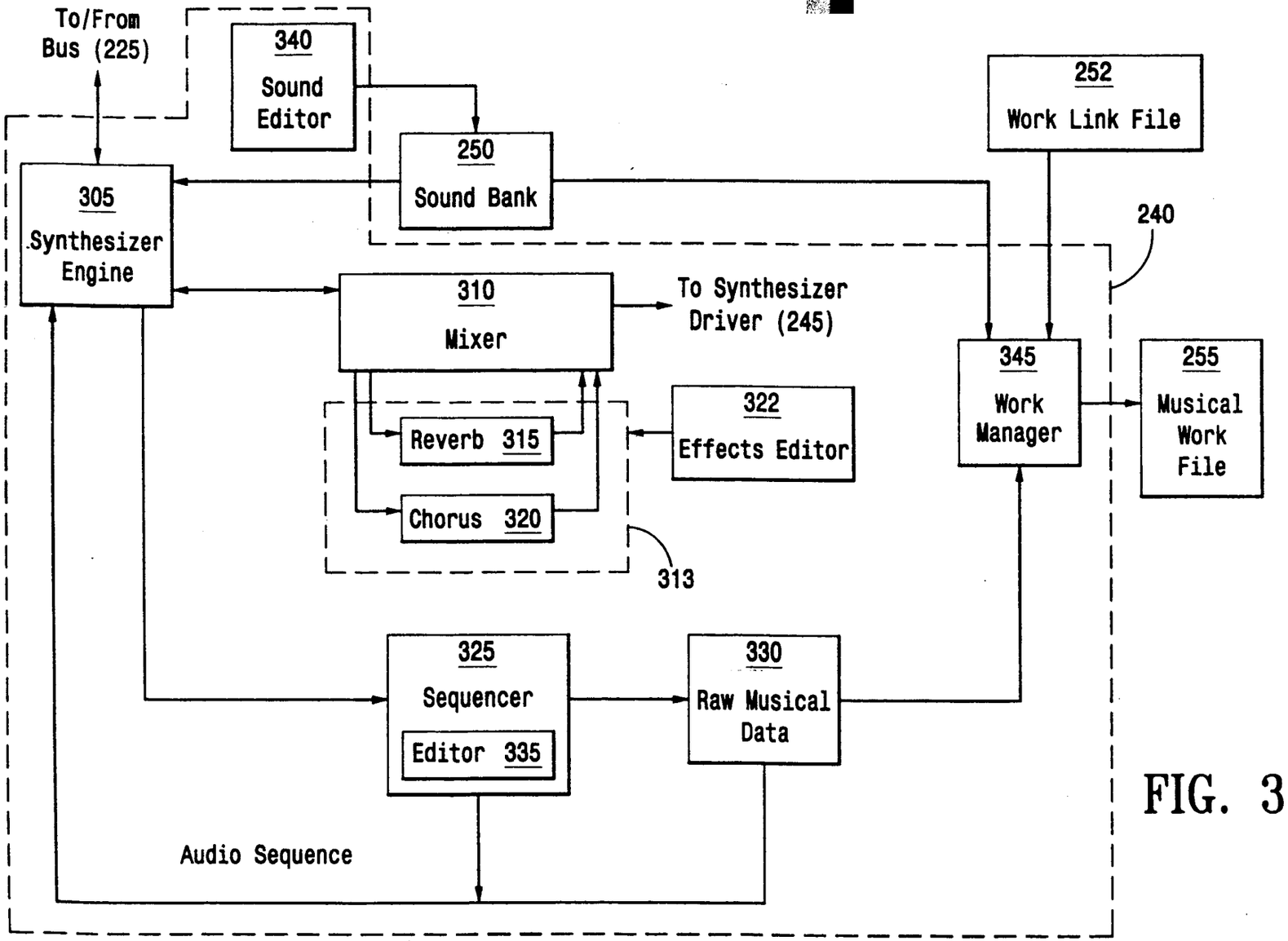


FIG. 3

APPROVED
BY
DRAFTSMAN
O.G. FIG.
CLASS
SUBCLASS

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

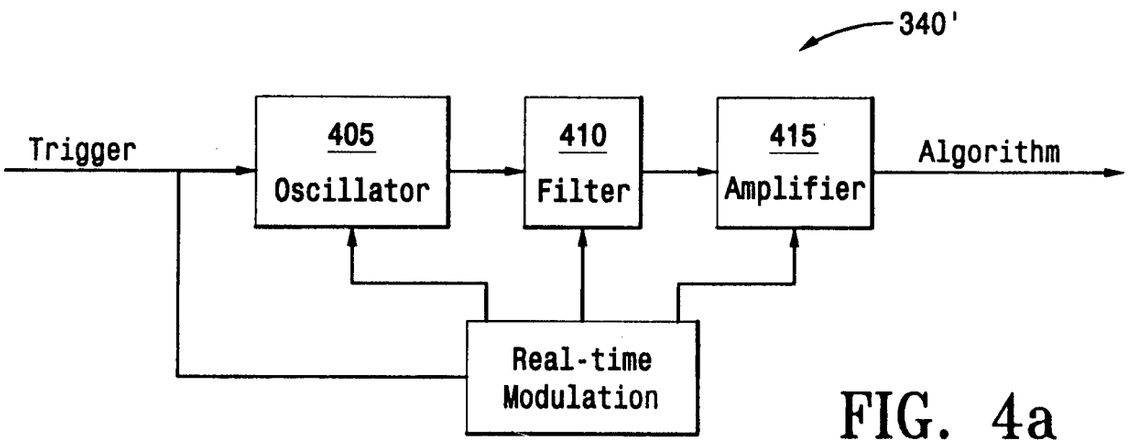


FIG. 4a

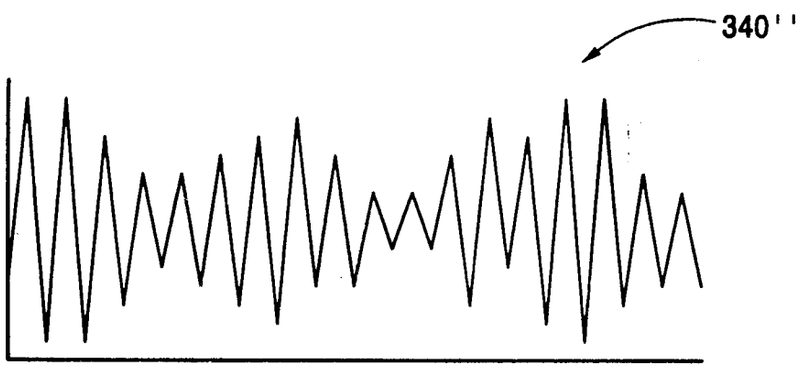


FIG. 4b

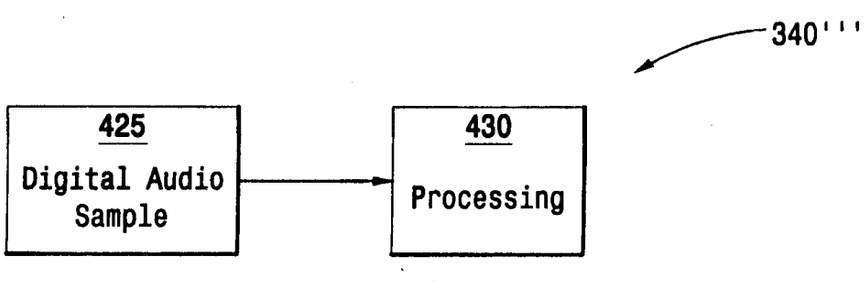


FIG. 4c

APPROVED BY DRAFTSMAN	O.G. FIG.	
	CLASS	SUBCLASS

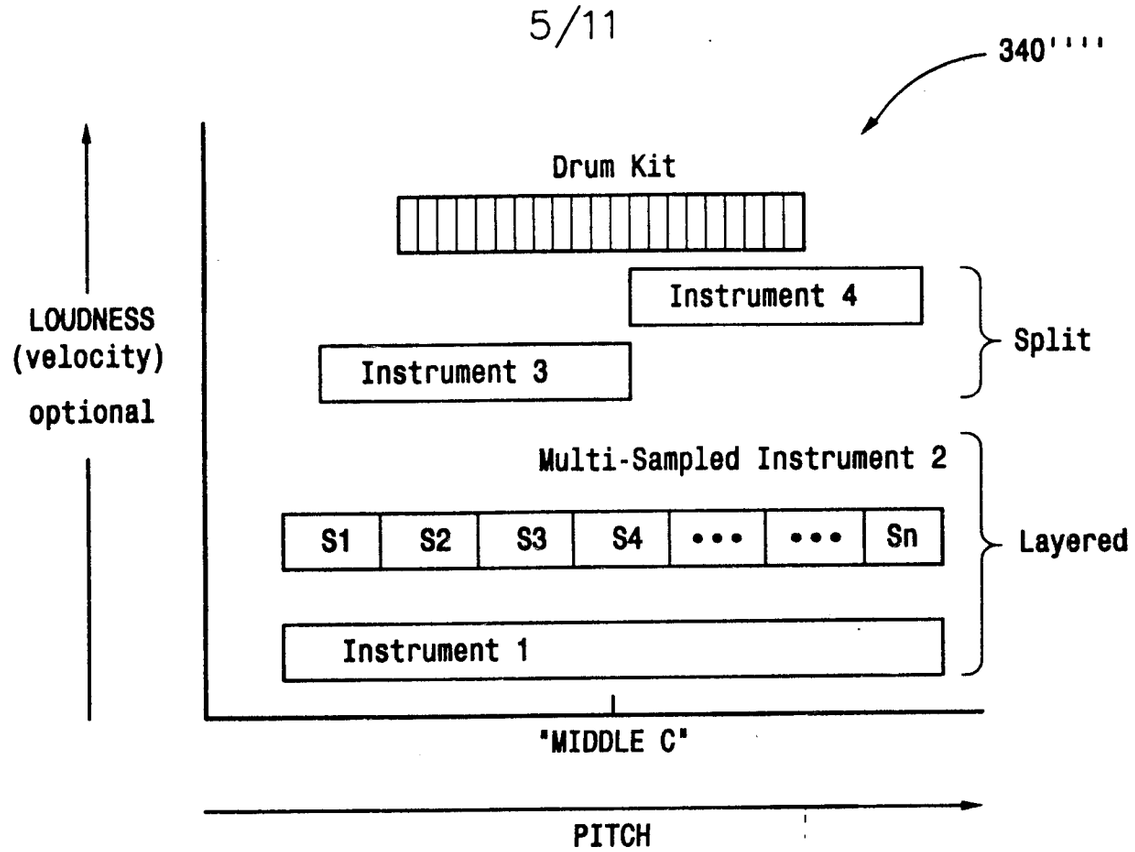


FIG. 4d

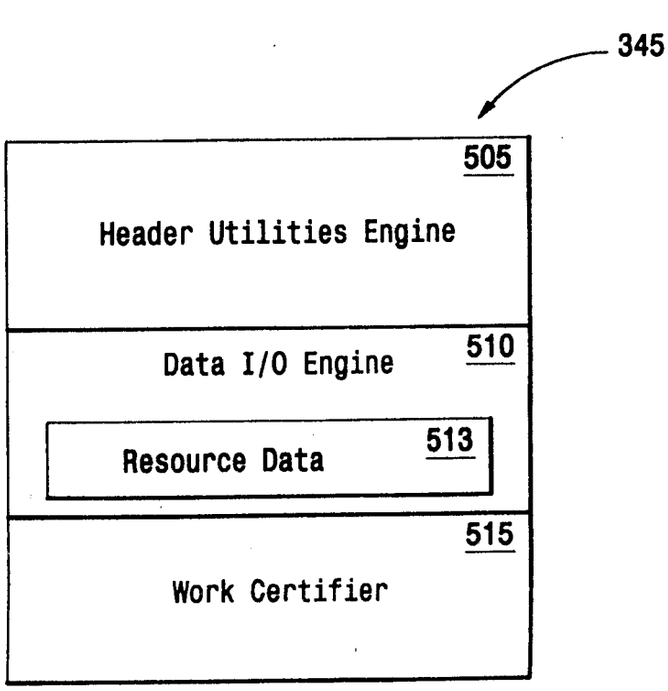


FIG. 5

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

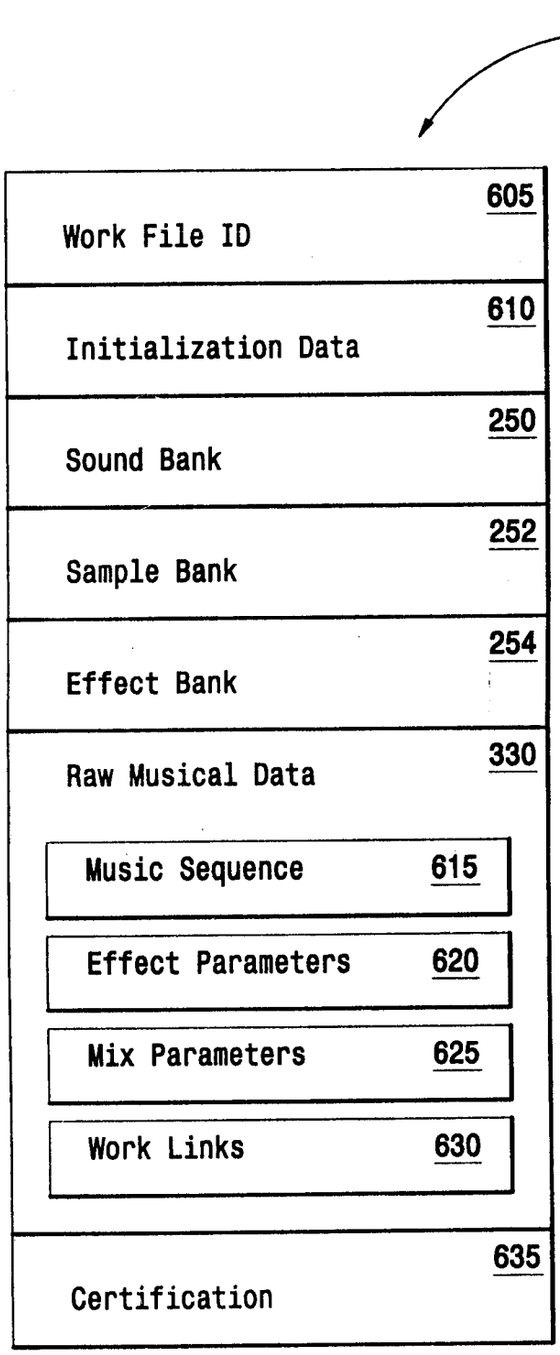


FIG. 6

APPROVED
BY
DRAFTSMAN
O.G. FIG.
CLASS
SUBCLASS

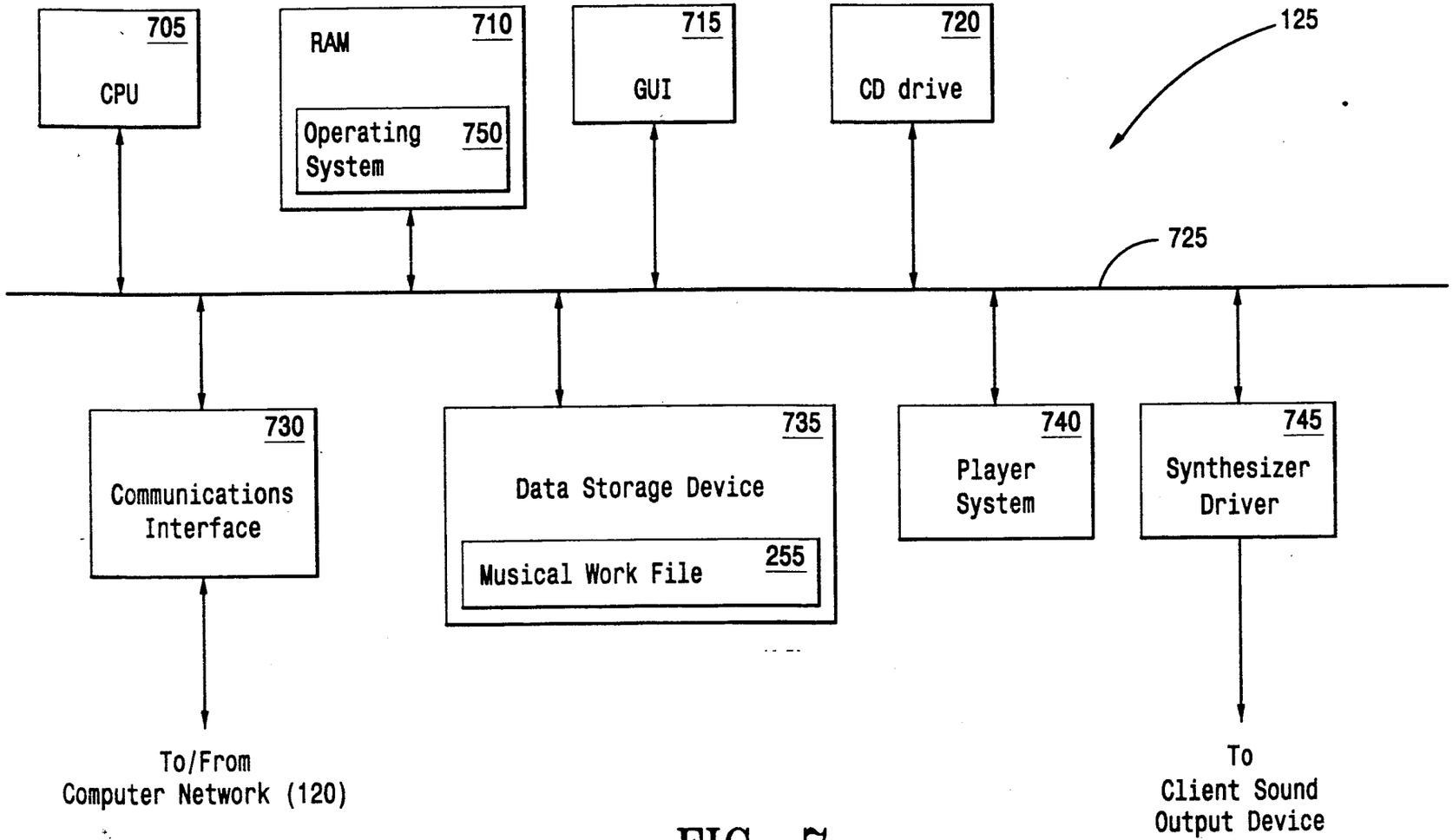
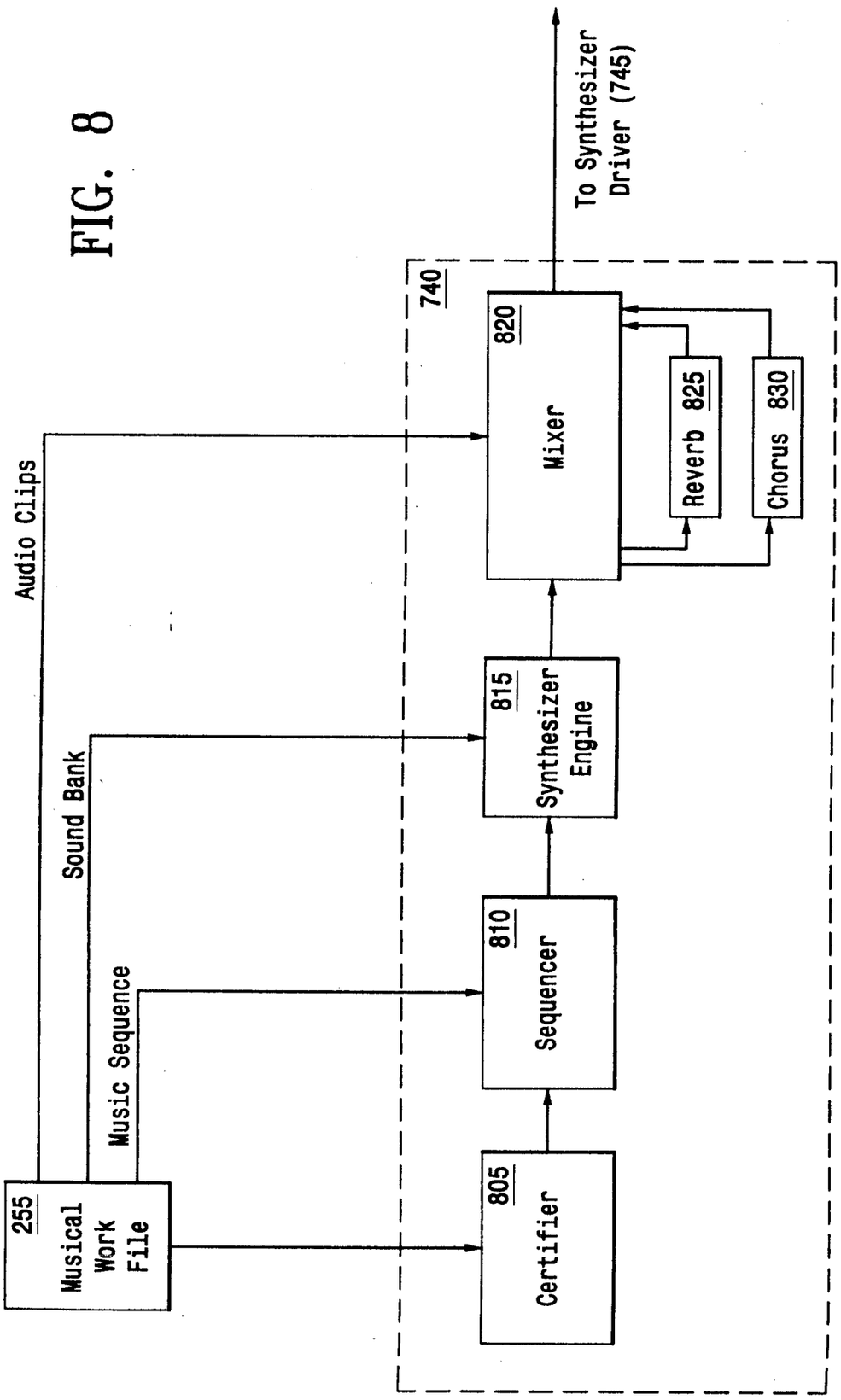


FIG. 7

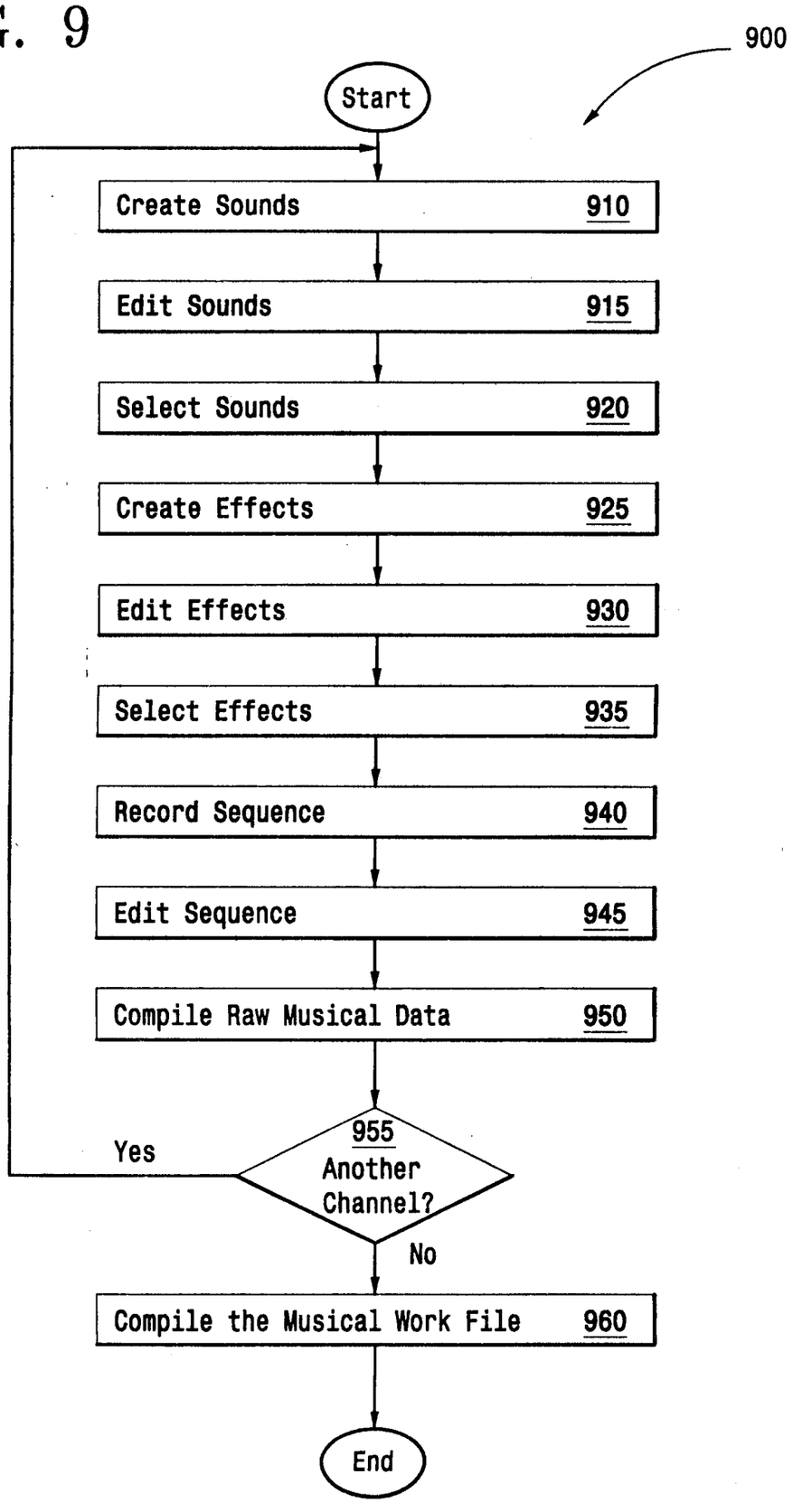
APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 8



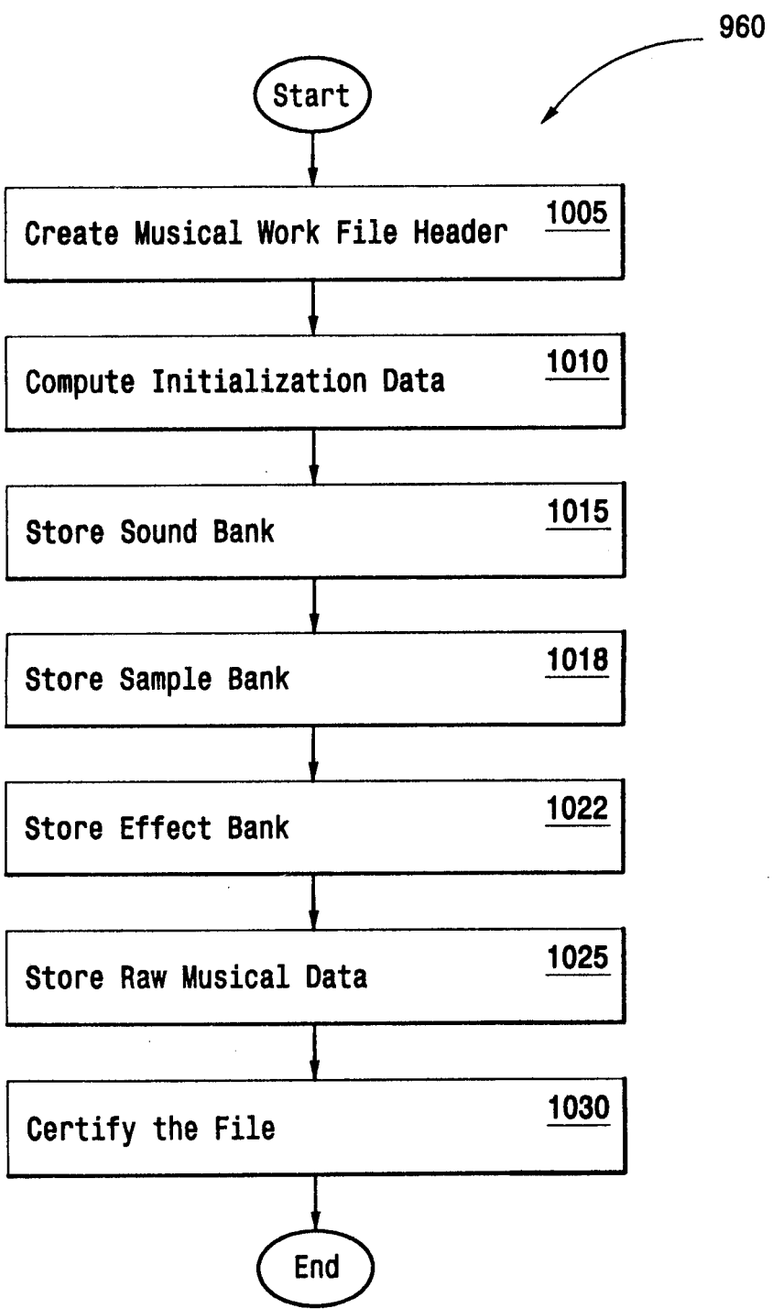
APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 9



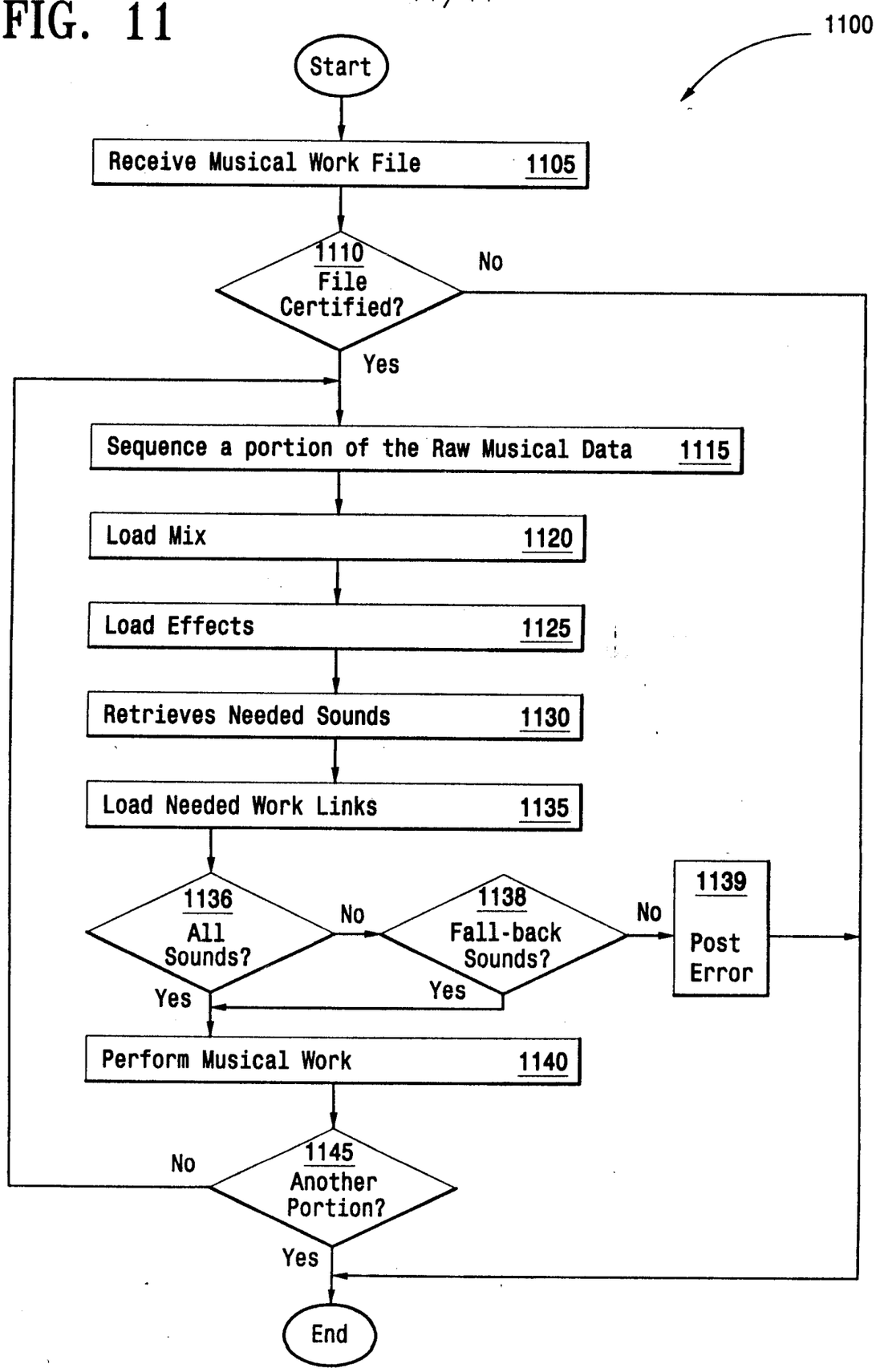
APPROVED BY DRAFTSMAN	O.G. FIG.	
	CLASS	SUBCLASS

FIG. 10



APPROVED BY DRAFTSMAN	O.G. FIG.	
	CLASS	SUBCLASS

FIG. 11



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12/8/98 (Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/891,580	07/11/97	045	DONELS, J 2837	10/27/98

First Named Applicant: JUNGLEIB, 35 USC 154(b) term ext. = 0 Days.

TITLE OF INVENTION: SYSTEM AND METHOD FOR GENERATING, DISTRIBUTING, STORING AND PERFORMING MUSICAL WORK FILES

PAPER TO BE ENTERED

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3 PA612	084-601.000	K85	UTILITY	~~NO~~ Yes	~~$605.00~~ $1320.00	01/27/99

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☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

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1 Carr & Ferrell, LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
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(A) NAME OF ASSIGNEE: Seer Systems, Inc.

(B) RESIDENCE: (CITY & STATE OR COUNTRY) Los Altos, California

Please check the appropriate assignee category indicated below (will not be printed on the patent)

☐ individual ☒ corporation or other private group entity ☐ government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):

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The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature) [signature] Reg # P-44,259 (Date) 12/8/98

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01 FC:242 605.00 OP
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8

Atty. Dkt. No. PA612US

Applicants or Patentees: Stanley Jungleib
Serial or Patent No.: 08/891,580
Filed or Issued: 07/11/97
For: System and Method for Generating, Distributing, Storing and Performing Musical Work Files

VERIFIED STATEMENT (DECLARATION) CLAIMING
SMALL ENTITY STATUS
(37 CFR 1.9 (f) and 1.27 (c)) - SMALL BUSINESS CONCERN

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I hereby declare that I am:

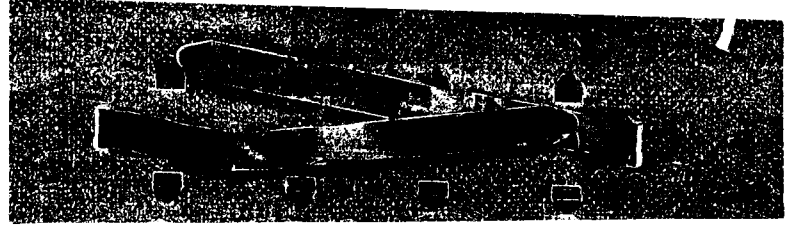
[ ] the owner of the small business concern identified below:
[X] an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN Seer Systems, Inc.
ADDRESS OF CONCERN 301 South San Antonio Road, Los Altos, CA 94022

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.2, and reproduced in 37 CFR 1.9 (d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled "System and Method for Generating, Distributing, Storing and Performing Musical Work Files", by inventor Stanley Jungleib described in

[ ] the specification filed herewith.
[X] application serial no. 08/891,580, filed 07/11/97.
[ ] patent no._____, issued _____.



PTO UTILITY GRANT
Paper Number 9

The United States of America

The Commissioner of Patents and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to an statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extension.

Bruce Lehman
Commissioner of Patents and Trademarks

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