United States Patent [19]

Nakada

[11] **3,760,088**

[45] **Sept. 18, 1973**

[54] **AUTOMATIC RHYTHM PLAYING APPARATUS**

[75] Inventor: **Akira Nakada**, Shizuoka-ken, Hamamatsu-shi, Japan

[73] Assignee: **Nippon Gakki Seizo Kabushika Kaisha**, Hamanatsu-shi, Shizuoka-ken, Japan

[22] Filed: **Apr. 24, 1972**

[21] Appl. No.: **247,311**

[30] **Foreign Application Priority Data**

Apr. 27, 1971 Japan 46/27732
Apr. 27, 1971 Japan 46/27733

[52] **U.S. Cl.** **84/1.03**, 83/1.24
[51] **Int. Cl.** **G10h 1/00**
[58] **Field of Search** ..... 84/1.01, 1.03, 1.17, 84/1.24, DIG. 22

[56] **References Cited**

UNITED STATES PATENTS

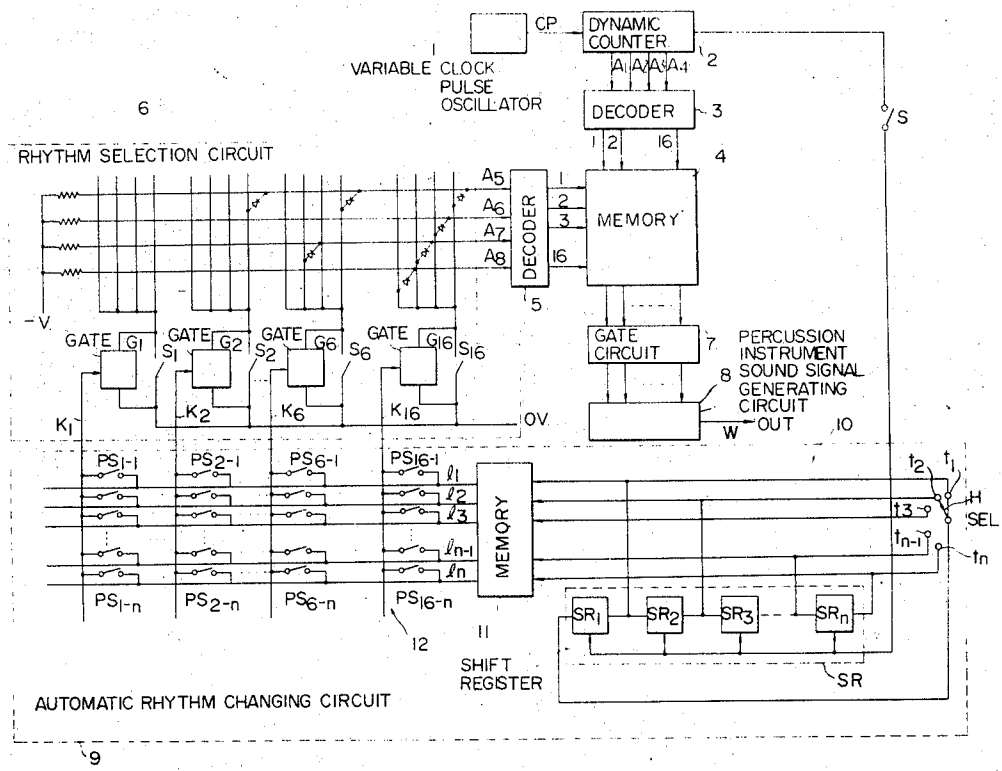
3,624,263	11/1971	Uchiyama	84/1.03
3,719,767	3/1973	Matumoto et al.	84/1.01
R26,521	2/1969	Park	84/1.03
3,358,068	12/1967	Campbell	84/1.01
3,546,355	12/1970	Maynard	84/1.03
3,548,066	12/1970	Freeman	84/1.03
3,567,838	3/1971	Tennes et al.	84/1.01
3,629,480	12/1971	Harris	84/1.03
3,646,242	2/1972	Okamoto	84/1.03
3,649,736	3/1972	Van der Kooij	84/1.03

Primary Examiner—Richard B. Wilkinson
Assistant Examiner—Stanley J. Witkowski
Attorney—S. Delvalle Goldsmith et al.

[57] **ABSTRACT**

An automatic rhythm playing apparatus has a memory which stores note arrangements for a plurality of rhythms. Timing pulse trains representing the rhythm patterns of the note arrangements of specific percussion instrument sounds for a selected rhythm are read out of the memory by circulating address signals and a stationary address signal proper to the selected rhythm. Required percussion instrument sound signals are produced in response to the pulses, and a rhythm sound signal composed of the percussion instrument sound signals is obtained therefrom. The automatic rhythm playing apparatus also has an automatic rhythm changing circuit which is capable of changing the stationary address signal at every one or two measures in accordance with a preset order and thereby automatically changing the rhythm. The apparatus further has a rhythm pattern changing circuit which is capable of generating percussion instrument sound signals having rhythm patterns which are anomalous compared with standard rhythms by gating the outputs of the memory by means of control pulses having a selectively variable period.

6 Claims, 5 Drawing Figures



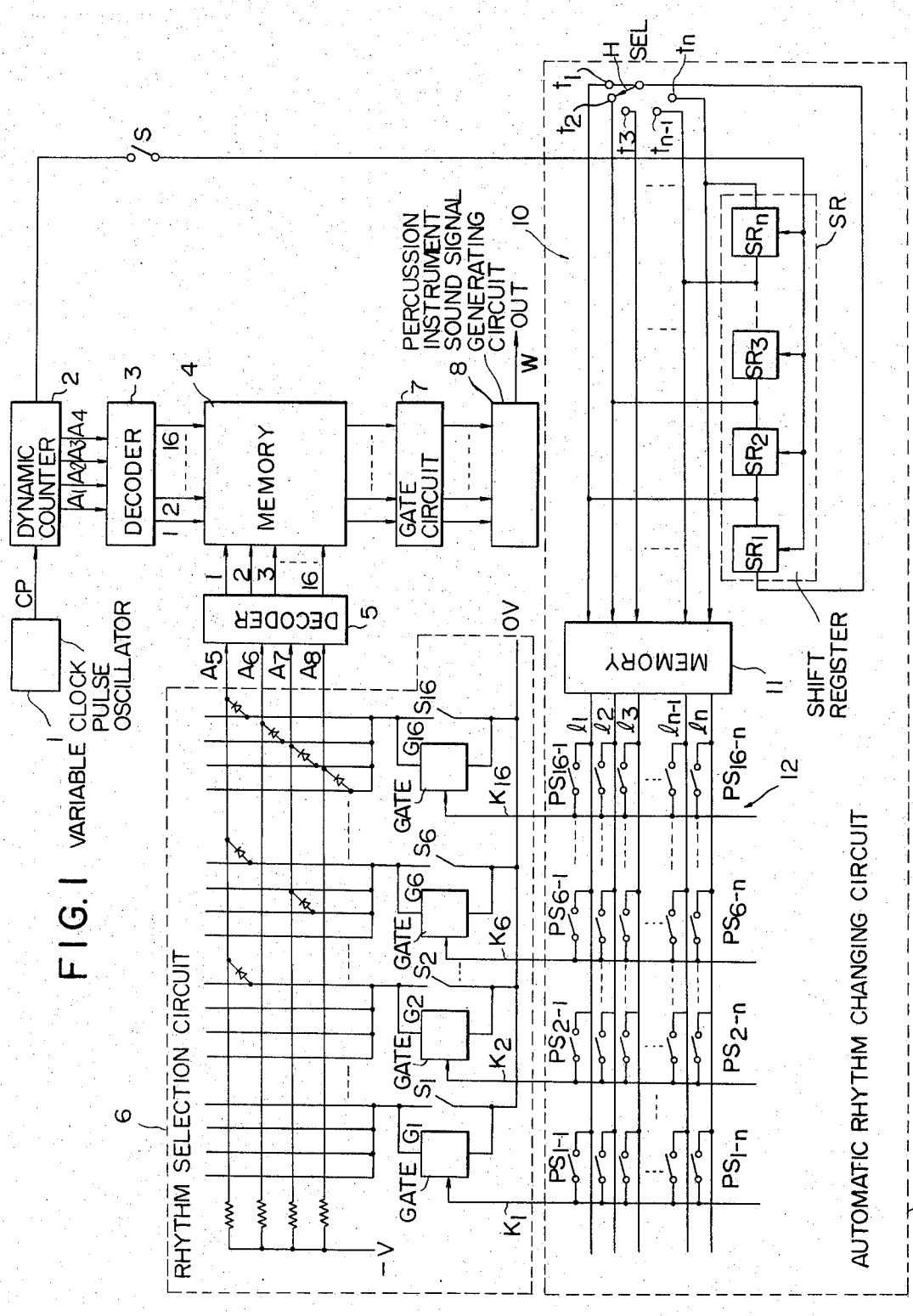

VARIABLE CLOCK PULSE OSCILLATOR
CP
DYNAMIC COUNTER
A1 A2 A3 A4
DECODER
MEMORY
GATE CIRCUIT
PERCUSSION INSTRUMENT SOUND SIGNAL GENERATING CIRCUIT
OUT
DECODER
A5 A6 A7 A8
RHYTHM SELECTION CIRCUIT
GATE
K1 K2 K6 K16
S1 S2 S6 S16
G1 G2 G6 G16
+V
-V
0V
MEMORY
SHIFT REGISTER
SR SR1 SR2 SR3 SRn
SEL H
t1 t2 t3 tn-1 tn
PS1-1 PS1-n PS2-1 PS2-n PS6-1 PS6-n PS16-1 PS16-n
l1 l2 l3 ln-1 ln
AUTOMATIC RHYTHM CHANGING CIRCUIT
S

FIG. 1

FIG. 2

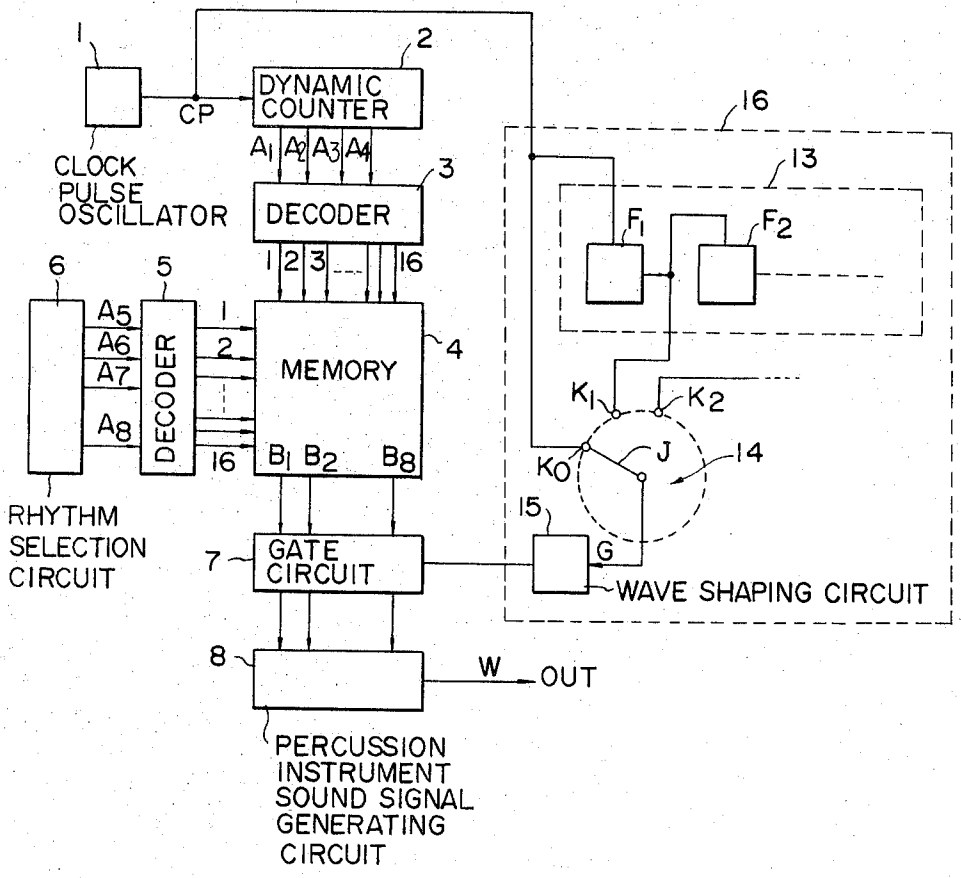

1
2
DYNAMIC COUNTER
CP
CLOCK PULSE OSCILLATOR
A1 A2 A3 A4
3
DECODER
1 2 3 16
6
5
A5
A6
A7
A8
DECODER
1
2
16
MEMORY
4
B1 B2 B8
RHYTHM SELECTION CIRCUIT
7
GATE CIRCUIT
8
W
OUT
PERCUSSION INSTRUMENT SOUND SIGNAL GENERATING CIRCUIT
16
13
F1
F2
K1
K2
K0
J
14
15
G
WAVE SHAPING CIRCUIT

FIG. 3a

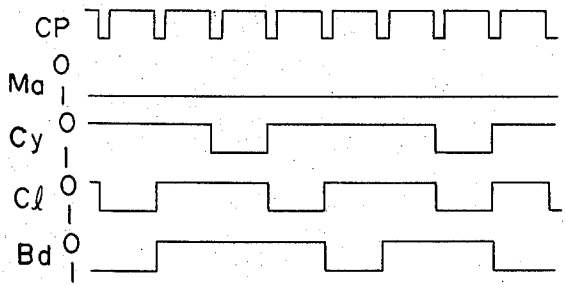


FIG. 3b

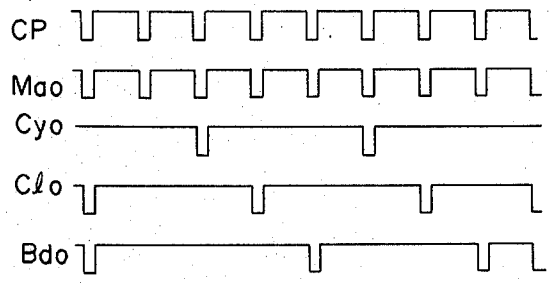
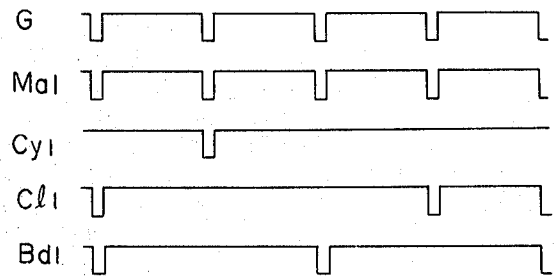


FIG. 3c



AUTOMATIC RHYTHM PLAYING APPARATUS

This invention relates to an automatic rhythm playing apparatus and, U. S. particularly, to an automatic rhythm playing apparatus which is capable of automatically changing a rhythm during performance of the apparatus and also is capable of producing various types of special rhythm patterns besides standard rhythm patterns.

The applicant of the present invention proposed in the copending U.S. patent application Ser. No. 239,178 filed Mar. 29, 1972 entitled "An Automatic Rhythm Playing Apparatus" an automatic rhythm playing apparatus which comprises memory means storing information corresponding to note arrangements of a plurality or rhythms for each of percussion instruments, first address means for providing circulating address signals to the memory means, second address means for providing stationary address signals corresponding to a selected rhythm to be sounded to the memory means, said memory means producing output signals having the note arrangement of the selected rhythm in response to the circulating and stationary address signals, and means for producing percussion instrument sound signals by application thereto of the output signals of the memory means thereby to obtain a rhythm sound signal consisting of a plurality of percussion instrument sound signals.

The proposed automatic rhythm playing apparatus sufficiently performs its function if a single rhythm is to be played continuously throughout the whole performance of a music number. The proposed apparatus, however, is incapable of automatically changing the rhythm during performance of the apparatus. It is also incapable of producing special rhythms which are different from the standard rhythms stored in the memory and therefore may be considered anomalous compared with the standard rhythms.

It is, therefore, an object of the invention to provide an automatic rhythm playing apparatus which is capable of automatically changing the rhythm in accordance with a preset order without any particular manipulation during the performance of the apparatus. According to the invention, tediousness or monotonousness which tends to accompany the playing of one single rhythm throughout the whole performance of a musical number is eliminated and the effect of the performance can be enhanced to a large extent.

It is another object of the invention to provide an automatic rhythm playing apparatus which is capable of selectively producing various rhythm patterns of anomalous types besides standard rhythm patterns. This feature of the invention affords variety to the rhythm pattern and thereby gives, so to speak, a human touch to the performance of the rhythm by the apparatus.

These and other objects and features of the invention will become more apparent from the description made hereinbelow with reference to the accompanying drawings in which:

FIG. 1 is a block diagram showing one preferred embodiment of the automatic rhythm playing apparatus according to the invention;

FIG. 2 is a block diagram showing another embodiment of the automatic rhythm playing apparatus according to the invention; and

FIG. 3*a* to 3*c* are respectively waveform charts. FIGS. 3*a* and 3*b* illustrate examples of waveforms appearing in the parts of the apparatus shown in FIG. 2 when it plays a selected rhythm (e.g. bossanova), and FIG. 3*c* illustrates examples of waveforms appearing in the parts of the apparatus shown in FIG. 2 when it plays a selected special rhythm which is a variation of bossanova.

Referring to FIG. 1, a clock pulse oscillator 1 has tempo adjusting means for changing the oscillating frequency of clock pulses. The clock pulses CP from the oscillator 1 are applied to a dynamic counter 2. The dynamic counter 2 may, for example, be of a four-staged one comprising flip-flops connected in series in four stages. The counter 2 successively receives the clock pulses CP and repeats its counting operation, being reset at every 16th pulse. Accordingly, there are 16 states of outputs A_1 to A_4 of the ounter 2, i.e. from 0000 up to 1111. The outputs A_1 to A_4 are fed to a decoder 3. The decoder 3 provides outputs only to an output line which corresponds to either one of the aforementioned 16 states. This output of the decoder 3 is applied to a memory 4 as an address signal.

A rhythm selection circuit 6 is provided for obtaining an address signal proper to each of various rhythms. The rhythm selection circuit 6 has 16 rhythm selection switches S_1 to S_{16} respectively corresponding to one of the rhythms of, for example, march, tango, cha-cha-cha, swing, waltz, slow rock, jazz rock, bossanova, rumba, beguine, ballad, rock 2, rock 3, bossanova II, mambo and samba (Reference should be made to the aforementioned co-pending application). The rhythm selection circuit 6 is further provided with gates G_1 to G_{16} which are respectively connected in parallel with these rhythm selection switches S_1 to S_{16}. Either one of states of outputs A_5 to A_8 as shown in Table I which is peculiar to a selected rhythm is obtained by closing one of the switches which corresponds to the selected rhythm or by causing, as will be described later, a desired gate among the gates G_1 to G_{16} to be selectively opened upon application thereto of a rhythm designating signal from an automatic rhythm changing circuit 9.

Table I

SW	Rhythm	A_5	A_6	A_7	A_8
S_1	march	1	1	1	1
S_2	tango	0	1	1	1
S_3	cha-cha-cha	1	0	1	1
S_4	swing	0	0	1	1
S_5	waltz	1	1	0	1
S_6	slow rock	0	1	0	1
S_7	jazz rock	1	0	0	1
S_8	bossanova I	0	0	0	1
S_9	rumba	1	1	1	0
S_{10}	beguine	0	1	1	0
S_{11}	ballad	1	0	1	0
S_{12}	rock 2	0	0	1	0
S_{13}	rock 3	1	1	0	0
S_{14}	bossanova II	0	1	0	0
S_{15}	mambo	1	0	0	0
S_{16}	samba	0	0	0	

In the Table I rhythms corresponding to the states of address signals A_5 to A_8 are shown as examples. There are 16 states of the outputs A_5 to A_8, i. e. from 0000 to 1111 either one of which is fed to a decoder 5. The state thus fed to the decoder 5 remains unchanged until the selected rhythm is changed. The decoder 5 provides an output only to an output line corresponding to the aforementioned state. This output of the decoder 5 is also applied to the memory 4 as an address signal.

Decoders 3 and 5 are of the type capable of converting four binary inputs into sixteen digital outputs and are well known, as referred to for example in U.S. Pat. No. 3,610,801 to Fredkin et al (decoding matrix 19).

The memory 4 consists, for example, of a read only memory. Read only memories of this type are well known as disclosed for example in U.S. Pat. No. 3,529,299 to Chung and require only routine effort of a person skilled in the art to utilize the memory for performing the desired functions in accordance with the present invention. At addresses in the memory 4 to be accessed by the address signals from the decoders 3 and 5, information is stored in accordance with the note arrangement of each rhythm. The information is successively read out by the address signals A_1 to A_4 and A_5 to A_8 thereby producing successive outputs for each percussion instrument sound. Since at this time the state of the address signals A_1 to A_4 is repeated at every 16th pulse of the clock pulses CP, the state of outputs of the memory 4 is also repeated. Thus, measures of each rhythm are repeatedly obtained.

The outputs of the memory 4 are applied to a percussion instrument sound signal generating circuit 8 via a gate circuit 7. The gate circuit 7 includes, though not shown in FIG. 1, gate elements respectively corresponding to the outputs of the memory 4 and a wave-shaping circuit which receives the pattern pulses and produces control signals of a sharp waveform. The outputs B_1 to B_8 of the memory 4 respectively correspond to maracas, claves, cymbals, snare drum, high conga, low conga, bongo and bass drum. When the output is "1", a percussion instrument sound signal corresponding to this output is produced from the percussion instrument sound signal generating circuit 8. The percussion instrument sound signal generating circuit 8 has eight sound source circuits which respectively produce sound signals of maracas, claves, cymbals, snare drum, high conga, low conga, bongo and bass drum in response to the output signal of the memory 4. A rhythm sound signal which is composed of the percussion instrument sound signals produced in the circuit 8 is led to a common output line W.

An automatic rhythm changing circuit 9 comprises a ring counter 10, a memory 11 and a preset switch matrix circuit 12. The ring counter 10 includes a shift register SR having stages SR_1 to SR_n and a stage selection switch SEL which is provided for selecting a stage of the shift register to be used. The overflow outputs of the dynamic counter 2 are applied through a switch S to each stage of the shift register SR as shift pulses. The first stage of the shift register SR has previously been provided by some suitable means with a signal 1 which is stored there. Accordingly, each time the overflow output of the dynamic counter 2 is applied to the shift register SR, the signal 1 is shifted from the stage SR_1 to SR_2, SR_3 . . . SR_n. The output of each stage SR_1 to SR_n of the shift register SR is connected to the input of the memory 11. The stage selection switch SEL has terminals t_1 to t_n connected respectively to the output of each stage SR_1 to SR_n and a movable contact H connected to the input of the first stage SR_1. The movable contact H is connected to a selected one of the terminals t_1 to t_n, so that the signal 1 from the shift register stage connected to the selected terminal is fed back to the input of the stage SR_1. Accordingly, if, for example, the contact H is connected to the terminal t_2, the shift register stage SR_3 and the subsequent stages are not used.

Since the overflow pulse from the dynamic counter 2 is produced for every one measure or two measures, a required number of the stages of the shift register SR for a piece of music consisting, for example, of 100 measures is 100 or 50. (For convenience of explanation, it is now assumed that the overflow pulse from the counter 2 is produced for every one measure in FIG. 1.)

The output pulse 1 of any one stage of the shift register SR during its shifting operation is applied to the input of the next stage and also to the memory 11 in which the signal is stored. The time during which the signal is stored in the memory 11 corresponds to the time of one measure.

The memory 11 has a plurality of output lines l_1 to l_n. Lines K_1 to K_{16} respectively connected to the control terminals of the gates G_1 to G_{16} are provided across the output lines l_1 to l_n. Preset switches $PS_{1\text{-}1}$ to $PS_{1\text{-}n}$, . . . $PS_{16\text{-}1}$ to $PS_{16\text{-}n}$ are respectively connected to the lines l_1 to l_n at one end and the lines K_1 to K_{16} at the other end at places where the lines l_1 to l_n cross the lines K_1 to K_n, thereby constituting a preset switch matrix circuit 12.

When the preset switch PS is closed, the output of the memory 11 is applied as a rhythm designating signal to the corresponding gate among the gates G_1 to G_{16} so as to open the gate. Thus, as in the case wherein the rhythm selection switch connected in parallel with the gate is closed, either one of the states of the stationary address signals A_5 to A_8 is produced.

Assume now that a music number is played in such a manner that the mood of the music is changed during performance by changing its rhythm. If, for example, the first to eight measures are to be played in the rhythm of tango and the ninth to eighteenth measures in the rhythm of cha cha cha, the preset switches $PS_{2\text{-}1}$ to $PS_{2\text{-}8}$ and $PS_{6\text{-}9}$ to $PS_{6\text{-}18}$ are closed, while all other preset switches remain open. The contact H of the stage selection switch SEL is switched to the terminal t_{18}.

When the overflow pulse of the dynamic counter 2 is applied to the shift register SR, the signal 1 in the stage SR_1 is shifted to the stage SR_2. At this time, the signal 1 is stored in the memory 11 which, in turn, provides an output to the line l_1. This output is applied to the gate G_2 via the preset switch $PS_{2\text{-}1}$ and causes the gate G_2 to be opened. Accordingly, the stage of the address signals A_5 to A_8 from the rhythm selection circuit 6 becomes 0111. After one measure the signal 1 is shifted from the stage SR_2 to the stage SR_3 and simultaneously is applied to the memory 11. Then the memory 11 provides an output to the line l_2. This output is applied to the gate G_2 via the present switch $PS_{2\text{-}2}$. The address signals A_5 to A_8 remain 0111. The performance continues in this manner until the eighth measure ends. When the signal 1 is shifted from the stage SR_9 to the stage SR_{10} to start the ninth measure, the output of the stage SR_9 is supplied to the memory 11, thereby producing an output on the line l_9. This output is applied to the gate G_6 via the preset switch $PS_{6\text{-}9}$. Accordingly, the state of the address signals A_5 to A_8 of the rhythm selection circuit 6 becomes 1011, whereby the rhythm of cha-cha-cha is now selected. Subsequently, outputs are successively produced on the lines l_{10}, l_{11} . . . l_{18} as measures advance. Since the gate G_6 remains open, the ap-

paratus continues to play the rhythm of cha-cha-cha. When the signal 1 is shifted from the stage SR_{18}, the signal 1 is shifted to the stage SR_1 via the stage selection switch SEL. Accordingly, the next shift pulse causes the signal 1 to be shifted from the stage SR_1 to the stage SR_2, thereby changing the rhythm to tango. Memory 11 is also a read only memory of a type well known and may be for example of the type shown in U.S. Pat. No. 3,156,829 to Richards which would require only routine effort on the part of a person skilled in the art to utilize for the purposes of the present invention.

In the above described example, the rhythm of the music is changed from the first rhythm to the second rhythm and this change is repeated thereafter during performance of the music. It is of course possible to preset, by selectively closing the preset switches, a plurality of selected rhythms in a desired order over the whole piece of music and automatically switch the rhythm from one to another during the performance of the music.

According to the foregoing embodiment, the player is relieved from the troublesome operation for changing a rhythm during performance of a music by presetting a plurality of rhythms to be played by means of the preset switches. This greatly simplifies the performance of electronic musical instruments. Further, if switching of rhythms in one piece of music is made in such a manner that a plurality of rhythms of the same time are switched one from another, it will add variety to the mood of the music and improve the effect of the performance.

In case the automatic changing of the rhythm is not required, the switch S is opened and a desired rhythm is selected by closing either one of the rhythm selection switches S_1 to S_{16}.

Referring now to FIG. 2, another embodiment of the automatic rhythm playing apparatus according to the invention will be described. This embodiment is adapted for producing rhythms having an anomalous rhythm pattern compared with a standard rhythm pattern. The construction for obtaining predetermined standard rhythm sound signals are substantially the same as in the previously described embodiment and description thereof will be omitted.

A rhythm pattern changing circuit 16 is provided between a clock pulse oscillator 1 and a gate circuit 7. The rhythm pattern changing circuit 16 comprises a clock frequency dividing circuit 13 having one or more flip-flop stages, for example, F_1, F_2 . . . , a rhythm pattern change switch 14 and a waveshaping circuit 15.

The switch 14 has a plurality of fixed contacts K_0, K_1, K_2 . . . and a movable contact J. The circuit 16 is constructed so that a signal CP from the clock pulse oscillator 1 is supplied to the contact K_0 and also to the first frequency dividing stage F_1 of the frequency dividing circuit 13 so as to provide predetermined outputs of the frequency dividing stages F_1, F_2 . . . to the contacts K_1, K_2 . . . In the embodiment shown in FIG. 2, the output of the first stage F_1 is supplied to the contact K_1, the output of the stage F_2 to the contact K_2 etc. The signal G received by the movable contact J is formed into a pulse having a sharp rising waveform in the waveshaping circuit 15 and thereafter is supplied to the gate circuit 7 as a control signal.

If a certain rhythm, for example bossanova, is selected in a rhythm selection circuit 6 with the switch 14 in the stage shown in FIG. 2, eight clock pulses corresponding to one measure provided by the clock pulse oscillator 1 cause the memory 4 to produce a state of output *Ma* corresponding to maracas in the rhythm of bosanova at the output B_1, a state of output *Cl* corresponding to claves at the output B_2. a state of output Cy corresponding to cymbal at the output B_3 and a state of output *Bd* corresponding to bass drum at the output B_8 respectively as shown in FIG. 3*a*.

The signals produced at the outputs B_1, B_2, B_3 and B_8 of the memory 4 are applied to the gate circuit 7. The gate circuit 7 is controlled by the output pulse of the waveshaping circuit 15 provided for forming the clock pulse CP into a pulse having a sharp waveform, and produces a pulse having a waveform which is substantially the same as the clock pulse when the output of the memory 4 is 1 . Consequently, when the memory 4 produces the signals shown in FIG. 3*a*, a percussion instrument sound signal generating circuit 8 is provided at its respective input terminals with a pulse output Ma_0 corresponsing to maracas, a pulse output Cy_0 corresponding to cymbals, a pulse output Cl_0 corresponding to claves and a pulse output Bd_0 corresponding to bass drum respectively as shown in FIG. 3*b*.

Thus, the percussion instrument sound signal generating circuit 8 produces the percussion instrument sound signals corresponding to the rhythm of bossanova.

If the contact of the switch 14 is switched to K_1 from the above described state, the signal CP is divided by two in frequency in the frequency dividing circuit 13. Accordingly, a train of pulses G shown in FIG. 3*c* which consists of every other pulse of the train of pulses CP shown in FIG. 3*b* is applied to the input of the waveshaping circuit 15 for waveshaping. Hence, pulse trains Ma_1, Cy_1, Cl_1 and Bd_1 as shown in FIG. 3*c* respectively corresponding to maracas, cymbals, claves and bass drum are applied to the percussion instrument sound generating circuit 8 notwithstanding that the memory 4 provides the states of output as shown in FIG. 3*a* to the gate circuit 7 in the same manner as previously described. Accordingly, the circuit 8 provides percussion instrument sound signals which are equivalent to the percussion instrument sound signals produced by the successive application of the first, second, . . . clock pulses CP to the memory 4 when the switch 14 is switched to the contact K_0 except for the signals corresponding to the second, fourth, sixth . . . pulses which are removed therefrom. This output from the circuit 8 forms an anomalous rhythm pattern compared with the rhythm pattern of bossanova stored in the memory 4.

Likewise, if the contact J of the switch 14 is switched to the contact K_2, the percussion instrument sound signal generating circuit 8 produces percussion instrument sound signals consisting of signals identical with the percussion instrument sound signals produced by switching the switch 14 to the contact K_0 excluding the signals corresponding to the second, third and fourth pulses and the sixth, seventh and eighth pulses, etc. Similarly, various anomalous rhythms are produced by switching the switch 14 to the contacts K_3, K_4 etc.

According to the present invention, various rhythm patterns which are anomalous compared with a standard rhythm pattern obtained by switching of the rhythm pattern selection switch 14 to the contact K_0 can selectively be obtained by switching the switch 14 to a selected contact. Thus, the apparatus according to

the invention gives variety and a human touch to the performance of the rhythm playing apparatus by a mere addition of the frequency dividing circuit **13** and a switch **14**.

In the foregoing embodiment, various kinds of pulse trains can be obtained as the control signal by modifying the frequency dividing circuit **13** in various ways such as providing a feedback circuit therein. If, for example, a standard rhythm pattern is one including triplets, various rhythm patterns which are anomalous to the standard rhythm pattern can easily be obtained.

What I claim is:

1. An automatic rhythm playing apparatus comprising rhythm memory means storing information and producing output signals corresponding to note arrangements of a plurality of rhythms for each of percussion instruments employed, first address means for providing circulating address signals to said memory means, second address means for providing stationary address signals corresponding to a selected rhythm to be sounded to said memory means, said memory means producing said output signals having the note arrangement of the selected rhythm for each of the percussion instruments employed in response to said circulating and stationary address signals, means for producing percussion instrument sound signals by application thereto of the output signals of said memory means thereby to obtain a rhythm sound signal consisting of a plurality of percussion instrument sound signals and automatic rhythm changing means for receiving a pulse at each cycle of said circulating address signals and supplying to said second address means a rhythm designating signal which changes the state of said stationary signals in a preset order thereby to change the rhythm automatically during performance of the apparatus.

2. An automatic rhythm playing apparatus as defined in claim **1** in which said automatic rhythm changing means comprise a shift register having a plurality of stages which receives a pulse at each cycle of said circulating address signals and shifts a signal 1, a rhythm change memory which, having a plurality of inputs respectively connected to the output of each stage of said shift register, stores the signal 1 during a predetermined period of time and provides a signal to the output line corresponding to the signal 1 among a plurality of output lines and a preset switch matrix circuit which has a plurality of cross lines arranged across the output lines of said rhythm change memory and corresponding in number to the kinds of rhythms used in the apparatus and a plurality of preset switches respectively connected between one of the output lines and one of the cross lines and being capable of designating a rhythm in a preset order and which provides the output of said rhythm change memory as a rhythm designating signal.

3. An automatic rhythm playing apparatus as defined in claim **2** in which said shift register comprises a stage selection switch which is connected thereto so that only a desired stage among said plurality of stages can selectively be used.

4. An automatic rhythm playing apparatus as defined in claim **1** in which said second address means comprises a plurality of rhythm selection switches, a plurality of gates respectively connected in parallel with said rhythm selection switches and opened by application thereto of the rhythm designating signal from said automatic rhythm changing means, a rhythm selection signal generating circuit for generating a rhythm selection signal corresponding to the opened gate and a decoder for decoding the output of said rhythm selection signal generating circuit into an address signal peculiar to the selected rhythm.

5. An automatic rhythm playing apparatus comprising memory means storing information corresponding to note arrangements of a plurality of rhythms for each of percussion instruments employed, first address means for providing circulating address signals to said memory means, second address means for providing stationary address signals corresponding to a selected rhythm to be sounded to said memory means, said memory means producing output signals having the note arrangement of the selected rhythm for each of the percussion instruments employed in response to said circulating and stationary address signals, gate circuit means having a plurality of gate elements which respectively control the output signals of the memory means, means for generating percussion instrument sound signals responsive to the outputs of said gate circuit means and rhythm pattern changing means for changing the rhythm pattern by applying control signals with a variable period to each gate element of said gate circuit means.

6. An automatic rhythm playing apparatus as defined in claim **5** in which said rhythm pattern changing means comprise a clock pulse frequency dividing circuit including at least one flip-flop stage and succesively frequency dividing the clock pulses, selection switch means for selecting the clock pulses and the frequency divided output or outputs of said frequency dividing circuit and a waveshaping circuit for forming control signals to be applied to said gate circuit by waveshaping the selected signal from said selection switch means.

* * * * *