United States Patent [19]

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[11] **3,751,040**

[45] **Aug. 7, 1973**

[54] **PLURAL ROTATABLE DRUM CHANCE DEVICE**

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[22] Filed: **May 28, 1971**

[21] Appl. No.: **148,108**

[52] **U.S. Cl.** ..... **273/143 R**

[51] **Int. Cl.** **A63f 5/04**

[58] **Field of Search** ..... 273/143 R, 143 A, 273/143 B, 143 C, 143 D, 143 E, 138 A, 1 E, 141 A, 142 J, 142 JA, 142 JB, 142 JC, 142 JD

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[57] **ABSTRACT**

A power driven amusement wheel device having a plurality of wheels mounted on a base for independent rotation wherein a power drive is selectively engageable and disengageable from the wheels and wherein a brake for retarding the rotational movement of each of the wheels is provided to be engageable and disengageable in response to the actuation and deactuation of any one of a plurality of switches by users of the amusement wheel device. The device is controlled such that retardation of the rotational movement of the wheels cannot occur prior to the passage of a predetermined period of time after initial actuation of the power drive.

2 Claims, 6 Drawing Figures

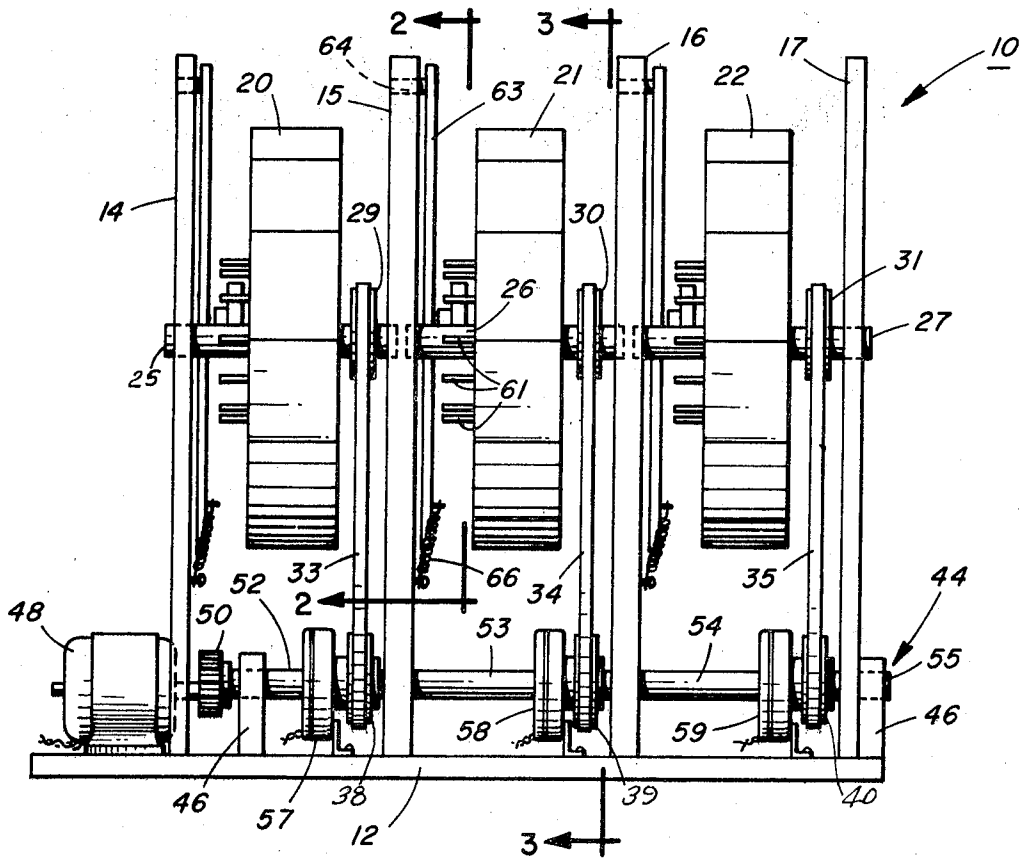


FIG. 1

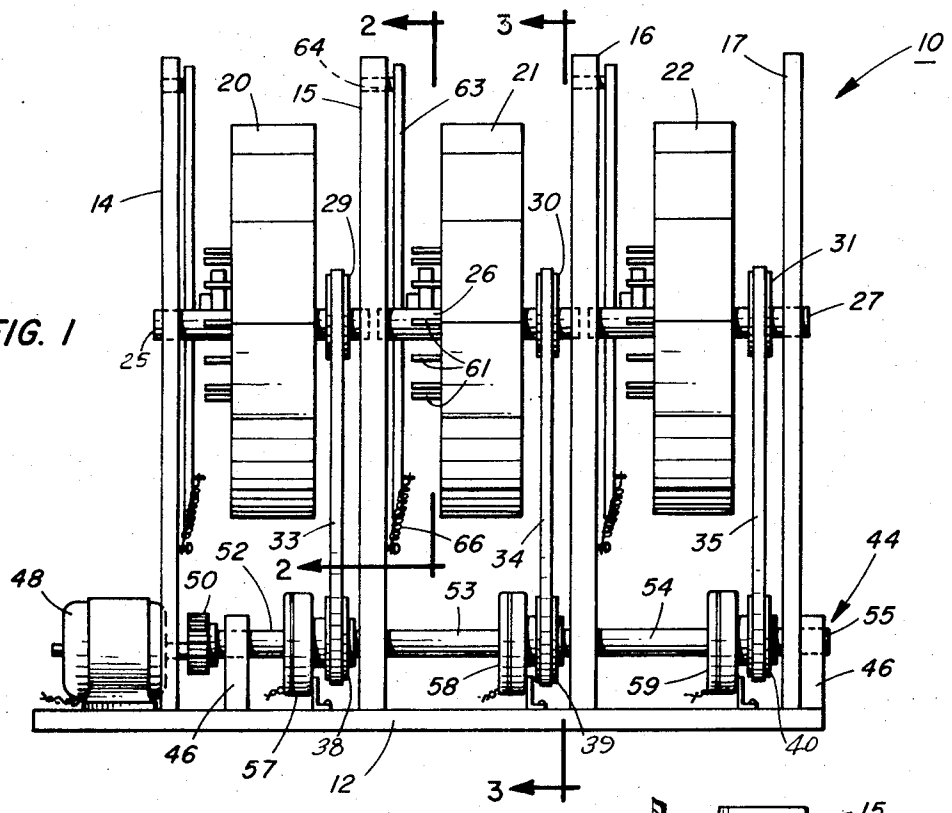


FIG. 2

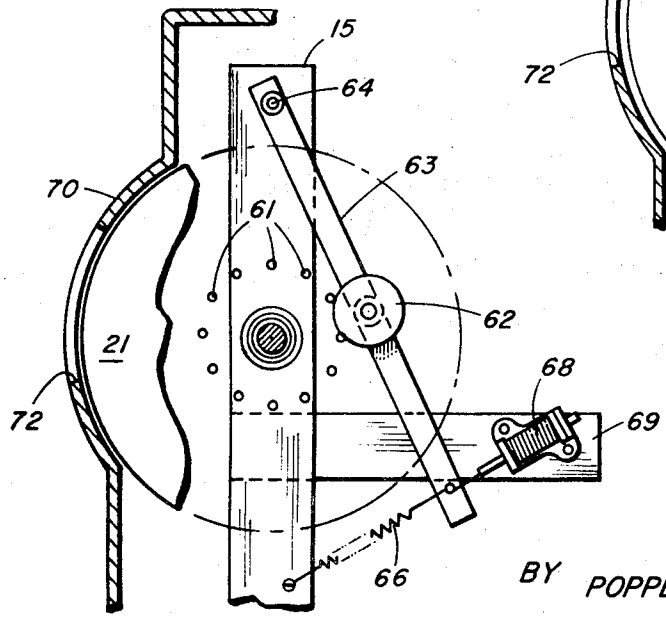
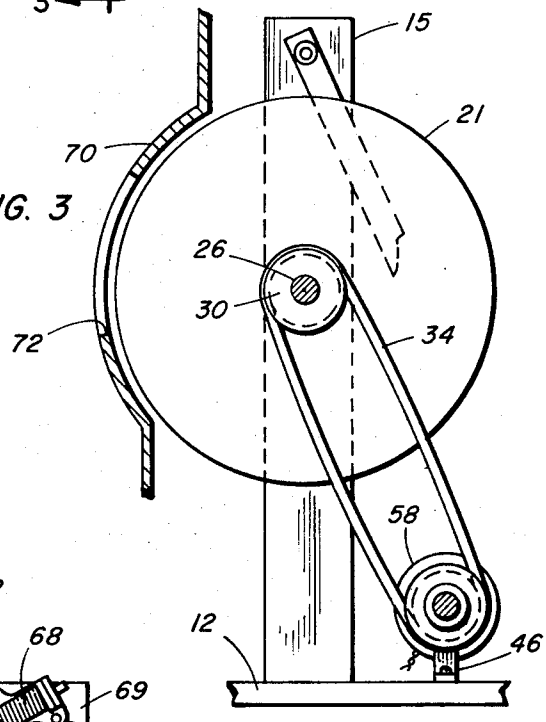


FIG. 3



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FIG. 4

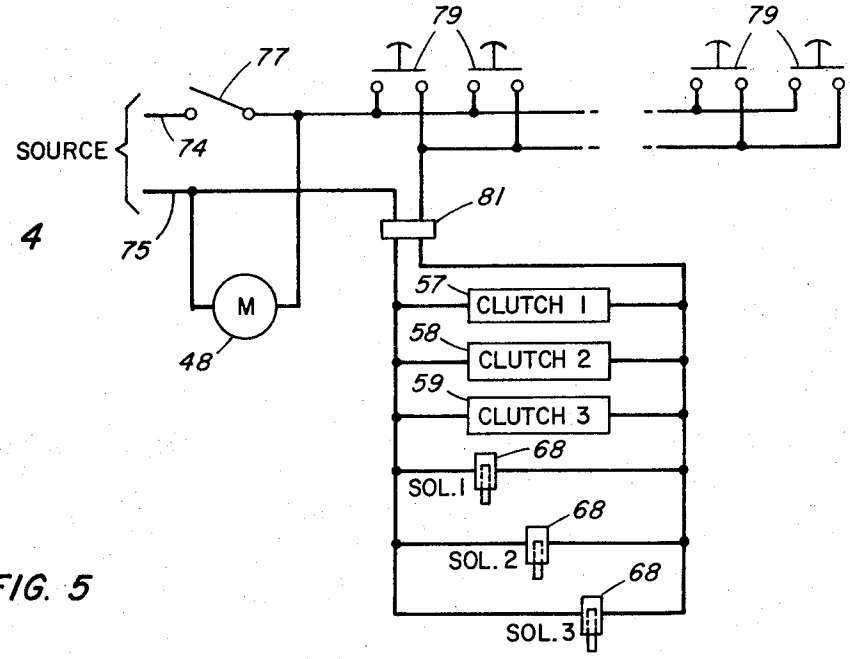


FIG. 5

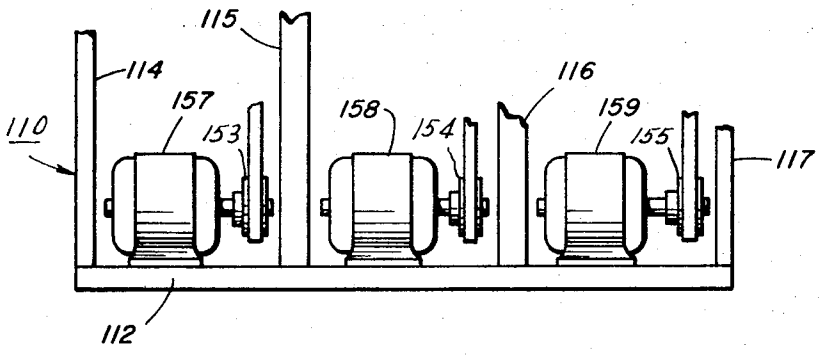
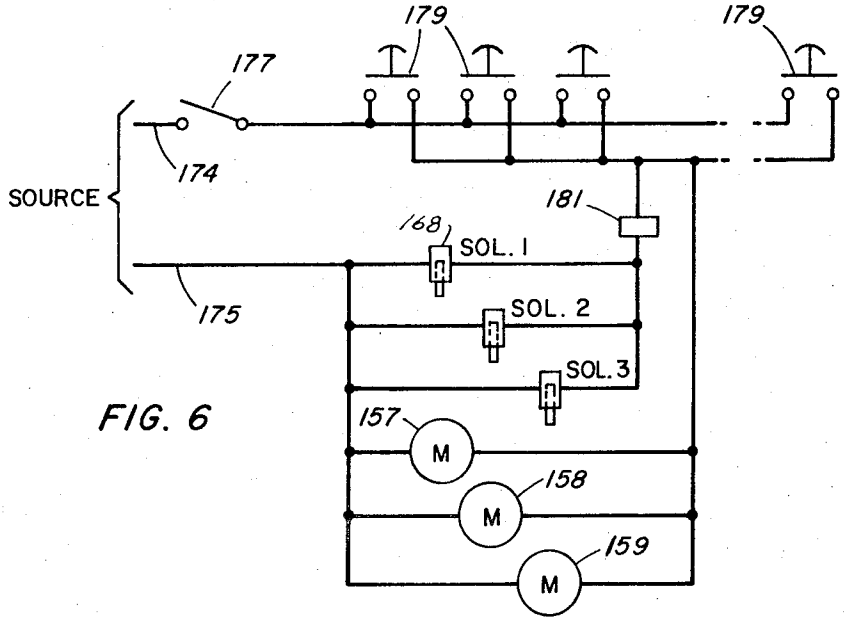


FIG. 6



PLURAL ROTATABLE DRUM CHANCE DEVICE

BACKGROUND OF THE INVENTION

This invention relates to the field of amusement devices. More particularly, this invention relates to power driven amusement or game devices wherein wheels or discs are utilized.

Many types of power driven amusement devices using wheels or discs are known to those skilled in the art. For the most part, however, such known amusement devices are of the type wherein operation of the device is in whole or in part within the control of an operator rather than a player. Such devices are often objectionable for various reasons thus making it desirable to provide an amusement device wherein control of the operation of the device is accomplished completely by a player.

Other known amusement devices are operable only to impart an initial acceleration to the device wheel whereafter the rotation of the wheel is immediately retarded. This mode of operation is considered by many to be disadvantageous commercially because there is no time between acceleration and retardation wherein the wheels can free-wheel thereby creating excitement and anticipation in the outcome of the game.

SUMMARY OF THE INVENTION

It is an object of this invention, therefore, to provide an amusement wheel device wherein control of the operation of the device is completely held by players of the game.

Another object of the present invention is to provide an amusement device wherein the wheels are permitted to rotate freely between the completion of their acceleration and the commencement of their retardation. These objects and others are achieved by the amusement wheel device of the present invention one embodiment of which may include a base, a plurality of wheels mounted on the base for independent rotation, a drive means for imparting rotational movement to the plurality of wheels, means for selectively connecting the drive means and the plurality of wheels, means for retarding the rotational movement of each of the plurality of wheels, and a means for operating the means for selectively connecting the drive and the plurality of wheels.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the present invention may be had from the following detailed description thereof, particularly when read in the light of the accompanying drawings wherein:

FIG. 1 is a front elevational view of the amusement wheel device of the present invention with the cover removed;

FIG. 2 is a partial cross-sectional view through the plane 2—2 of FIG. 1;

FIG. 3 is a partial cross-sectional view through the plane 3—3 of FIG. 1;

FIG. 4 is a schematic circuit diagram of an electrical control circuit for operating the amusement wheel device according to the invention as shown in FIG. 1;

FIG. 5 is a partial elevational view of a second embodiment of amusement device according to the invention; and

FIG. 6 is a schematic circuit diagram of an electrical control circuit for operating the amusement wheel device according to the invention as shown in FIG. 5.

DETAILED DESCRIPTION

Referring to FIG. 1, an amusement wheel device according to the present invention is shown and designated generally by the reference numeral 10.

Amusement wheel device 10 comprises a frame including a base 12 and a plurality of upwardly extending stanchions 14, 15, 16 and 17. Positioned in axial alignment between stanchions 14–17 are a plurality of game wheels 20, 21 and 22. Wheels 20, 21 and 22 are rigidly secured to axles 25, 26 and 27 respectively, the ends of which are supported within bearings mounted in stanchions 14–17.

Rigidly secured for rotation with axles 25, 26 and 27 are axle sheaves 29, 30 and 31 which accommodates the operable engagement threraround of drive belts 33, 34 and 35, respectively. In addition to passing around sheaves 29, 30 and 31, drive belts 33, 34 and 35 pass around drive sheaves 38, 39 and 40 which are rigidly mounted for rotation with a drive shaft which is designated generally by the reference numeral 44. Drive shaft 44 is rotatably supported on base 12 by bearing supports 46 and connected to a motor 48 by a speed reduction pinion and gear arrangement 50. Shaft 44 is divided effectively into four sections 52, 53, 54 and 55 by electro-mechanical clutches 57, 58 and 59. Thus, when each of clutches 57, 58 and 59 are engaged, the four sections of shaft 44 turn as a unit. With the clutches disengaged, however, each of the shaft sections 52, 53, 54 and 55 can rotate independently thus permitting game wheels 20, 21 and 22 to rotate independently of each other.

Each of game wheels 20, 21 and 22 is provided with a mechanism for retarding selectively its rotational movement. Each retarding mechanism is identical for each wheel, accordingly the retarding mechanism in use with respect to wheel 21 is described in detail as representative of the others. With particular reference to FIG. 2, the retarding mechanism for wheel 21 comprises a plurality of longitudinally extending pins 61 which are disposed concentrically about the axis of rotation of wheel 21 and which extend from its radial surface. Pins 61 are engageable by a roller 62 which is rotatably mounted on an arm 63 which is pivotally mounted by a pivot pin 64 at the upper end of stanchion 15.

The angular position of arm 63 and therewith roller 62 with respect to pins 61 is controlled by the cooperative effect of a tension spring 66 which urges arm 63 toward axial alignment with stanchion 15 and a solenoid valve 68 which urges arm 63 out of alignment with stanchion 15 against the effect of spring 66 when the solenoid is actuated. Solenoid 68 is mounted on an arm 69 which is secured to and extends laterally from stanchion 15.

The amount of travel of the actuator arm of solenoid 68 during actuation is such as to rotate arm 63 sufficiently to obviate any contact of roller 62 with pins 61 thus permitting the unretarded rotation of wheel 21. Upon the de-actuation of solenoid 68, spring 66 causes arm 63 to rotate in the clockwise direction thus causing roller 62 to engage pins 61 to retard the rotation of wheel 21 ultimately causing full retardation of the wheel.

The entire device is protected by a cover **70** which is provided with windows, e.g. window **72** as seen in FIGS. **2** and **3**, through which the wheels of the amusement device may be viewed by the players.

Having described the structure of amusement game device **10** in detail, consideration will now be given to its operation for a complete game cycle. At the commencement of a game cycle, clutches **57, 58** and **59** are engaged and motor **48** is started to thereby drive shaft **44** as a single unit through gears **50**. The rotational motion of shaft **44** is imparted to axles **25, 26** and **27**, and therewith wheels **20, 21** and **22** by transmission through drive belts **33, 34** and **35** and their associated sheaves.

During the start-up period, solenoids **68** are actuated to maintain rollers **62** out of contact with pins **61** whereby to permit unobstructed rotation of the game wheels. In this regard, it is considered to be desirable for purposes of participant's excitement to insure high speed rotation of wheels **20, 21** and **22** for a predetermined minimum period of time, within which period de-actuation of solenoid **68** is impossible. The manner in which this is accomplished is discussed below in detail.

With the game wheels **20, 21** and **22** rotating at high speed, and assuming that the above-mentioned predetermined minimum period of time has elapsed, a player may actuate a switch, as is discussed below, to de-energize motor **48** if the motor is of the type which is energized and de-energized for each cycle although it is to be recognized that motor **48** may be permitted to run constantly as is provided for in the control diagram shown in FIG. **4** and discussed below in detail, disengage clutches **57, 58** and **59**, and to de-actuate solenoids **68**. Upon the occurrence of these events, shafts **52, 53, 54** and **55** may rotate independently, game wheels **20, 21** and **22** may rotate independently, and arm **63** is rotated about pivot pin **64** by spring **66** to bring rollers **62** into engagement with pins **61**. The spring biased engagement of rollers **62** with pins **61** immediately commences to retard the rotation of the game wheels and continues the retardation until the wheels come to a halt. It should be noted that the rate of retarding the rotation of game wheels **20, 21** and **22** can be adjusted by varying the tension on springs **66** and therewith the force of engagement of rollers **62** against pins **61**. As will be clear to those skilled in the art, increased force of engagement between rollers **62** and pins **61** causes a more rapid retardation of the rotational movement of wheel **21** whereas a decrease in the force of engagement provides a slower retardation of the game wheels **20, 21** and **22**.

Considering now the control of amusement device **10**, a schematic diagram for an electrical control circuit useful in operating the device is shown in FIG. **4**. More specifically, main leads **74** and **75** are shown to be connected to a suitable source of power through a main switch **77**. In the diagram shown, motor **48** is a continuous running motor and is tapped into leads **74** and **75** electrically adjacent main switch **77**. A plurality of player operated switches **79** are provided in parallel, which switches serve to engage and disengage clutches **57, 58** and **59**, as well as to actuate and de-actuate solenoids **68**. A time delay relay **81** is provided which precludes de-energization of the circuit for a predetermined period of time after initial actuation. Thus, in order to commence a game cycle and assuming that switch **77** is closed and motor **48** is running, any one of player switches **79** may be actuated to engage clutches **57, 58** and **59**, and to actuate solenoids **68**. Upon the completion of the predetermined delay period of relay **81**, a further operation of any of player switches **79** will cause disengagement of clutches **57, 58** and **59** and de-actuation of solenoids **68** to permit retardation of the wheel rotation as is discussed above.

Another embodiment **110** of the invention is disclosed in FIGS. **5** and **6**. The embodiment of FIGS. **5** and **6** is exactly the same as that described above with respect to FIGS. **1–4** except that a plurality of driving motors are provided in substitution for the clutches **57, 58** and **59** of device **10**.

More particularly and with reference to FIG. **5**, an amusement wheel device **110** according to the invention can incorporate plural driving motors designated **157, 158** and **159**. These motors are mounted on a base **112** adjacent stanchions **114, 115, 116** and **117** which support wheel device structure which is exactly the same as that disclosed with respect to amusement wheel device **10**.

As is evident from FIG. **5**, however, the amusement wheel device of FIG. **5** provides for the driving of the amusement wheels by separate motors **157, 158** and **159**. These motors are connected to the rotating wheels by sheaves and belt drives **153, 154** and **155** respectively. In all other respects the structure of device **110** is exactly the same as that of device **10** as described in FIGS. **1–3**.

The control circuit for the embodiment of amusement wheel device disclosed in FIG. **5** is shown diagrammatically in FIG. **6**. Main leads **174** and **175** are connected to a suitable source of power through a main switch **177**. As is evident from FIG. **6**, motors **157, 158** and **159** are connected in parallel as are these solenoids **168** which are associated with the respective rotation retarding mechanisms discussed above with respect to the embodiment of FIGS. **1–4**. A plurality of player operated switches **179** are provided in parallel and serve to actuate and de-actuate both motors **157, 158** and **159** as well as solenoids **168**. A time delay relay **181** is provided to preclude de-energization of the solenoid circuit for a predetermined time after initial actuation.

Thus, in order to commence a game cycle and assuming that switch **177** is closed, any one of player switches **179** may be actuated to energize motors **157, 158** and **159** and to actuate solenoids **168**. Upon the completion of the predetermined delay period of relay **181**, a further operation of any of player switches **179** will cause de-energization of motors **157, 158** and **159** and de-actuation of solenoids **168** to permit retardation of the wheel motion as discussed above. If any of switches **179** is further operated prior to the completion of the delay period of relay **181**, motors **157, 158** and **159** will be de-energized and the wheels will rotate in a free-wheel unretarded motion until the subsequent de-actuation of solenoids **168**.

As will be recognized by those skilled in the art, the manner of manufacturing amusement devices **10** and **110** according to the invention is a matter of ordinary skill and can be accomplished using materials shown to those in this art. Further, although only two embodiments of the invention have been described above in detail, it is considered to be manifest that many modifications and variations thereof can be devised without departing from the spirit and scope of the invention.

I claim:

1. An amusement wheel device comprising:

a base having a plurality of upwardly extending stanchions;

a plurality of axles supported by said stanchions, said axles being coaxially disposed and longitudinally spaced;

a plurality of amusement wheels, one wheel being mounted on each one of said plurality of axles, said plurality of amusement wheels being mounted for free-wheeling rotation, each amusement wheel being rotatable independently of each other amusement wheel;

a plurality of drive means for imparting rotational movement to said plurality of wheels, each of said plurality of wheels being driven by an individual drive means;

a plurality of means connecting each said individual drive means to one of said plurality of wheels, each means connecting each said individual drive means to one of said plurality of wheels comprising a first sheave operably connected to said one wheel, a second sheave operably connected to said drive means and belt means for transmitting rotational movement between said first and second sheaves;

means for retarding rotational movement of each of said plurality of wheels, each said means for retarding comprising a plurality of pins arranged concentrically of the axis of rotation of an associated wheel, each of said plurality of pins being secured to said associated wheel and extending perpendicularly from a radially extending surface thereof, each of said pins being equally arcuately displaced from the next adjacent pins, a roller having a diameter greater than the arcuate distance between adjacent ones of said pins, said roller mounted on an arm, said arm being pivotally connected at one end to one of said upwardly extending stanchions, and means attached to the other end of said arm for pivoting said arm away from the axis of rotation of said wheel, said roller being positioned between the pivotally connected end of said arm and said other end of said arm, said means for pivoting said arm providing sufficient displacement of said arm to displace said roller to disengage said roller with said pins; and

circuit means connecting a plurality of manually actuable means to said drive means and said pivoting means for actuating said drive means and said pivoting means and deactuating said drive means and said pivoting means upon selective actuation and deactuation of any one of said manually actuable means.

2. An amusement device according to claim 1 wherein each said drive means is an electric motor, each said means for pivoting is a solenoid, and said circuit means is an electrical circuit including a time delay means for establishing a minimum time between actuation and deactuation of any of said manually actuable means.

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