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SPRUSON & FERGUSON

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

Kabushiki Kaisha Sigma, of No.32-3, Seijo 9-chome, Setagaya-ku, Tokyo, JAPAN,
hereby apply for the grant of a standard patent for an invention entitled:

Coin Payout Apparatus in Gaming Device

which is described in the accompanying complete specification.

Details of basic application(s):-

<u>Basic Applic. No:</u>	<u>Country:</u>	<u>Application Date:</u>
62-156078	JP	14 October 1987
62-163641	JP	28 October 1987

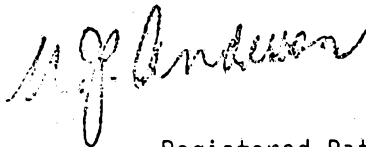
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DATED this TWELFTH day of OCTOBER 1988

Kabushiki Kaisha Sigma

By:



Registered Patent Attorney

TO: THE COMMISSIONER OF PATENTS
OUR REF: 74912
S&F CODE: 56061

AMENDMENTS ACCEPTED AND AMENDMENTS

RECEIVED

14-9-90

DECLARATION IN SUPPORT OF A
CONVENTION APPLICATION FOR A PATENTIn support of the Convention Application made for a
patent for an invention entitled:

Title of Invention COIN PAYOUT APPARATUS IN GAMING DEVICE

I/~~WE~~ Katsuki MANABEFull name(s) and
address(es) of
Declarant(s)c/o
of Kabushiki Kaisha Sigma, No.32-3, Seijo 9-chome,
Setagaya-ku, Tokyo, Japan

do solemnly and sincerely declare as follows:-

Full name(s) of
Applicant(s)1. ~~I am/We are the applicant(s) for the patent~~

(or, in the case of an application by a body corporate)

1. I am/~~WE~~ are authorised by

KABUSHIKI KAISHA SIGMA,

the applicant(s) for the patent to make this declaration on
its/~~their~~ behalf.2. The basic application(s) as defined by Section 141 of the
Act ~~was/were~~ made

Basic Country(ies)

in Japan

Priority Date(s)

on 14 October 1987 and 28 October 1987

Basic Applicant(s)

Both by KABUSHIKI KAISHA SIGMA

Full name(s) and
address(es) of
inventor(s)3. ~~I am/WE are the actual inventor(s) of the invention referred
to in the basic application(s)~~

(or where a person other than the inventor is the applicant)

3. Kouichi IIMURA

of TM Haimu 102, No.2-9-8, Midorigaoka, Atsugi-shi,
Kanagawa-ken, Japan

(respectively)

is/~~are~~ the actual inventor(s) of the invention and the facts upon
which the applicant(s) is/~~are~~ entitled to make the application are
as follows:Set out how Applicant(s)
derive title from actual
inventor(s) e.g. The
Applicant(s) is/are the
assignee(s) of the
invention from the
inventor(s)The applicant is the assignee of the invention from the
inventor.4. The basic application(s) referred to in paragraph 2 of this
Declaration was/~~were~~ the first application(s) made in a Convention
country in respect of the invention (s) the subject of the application.

Declared at Tokyo, Japan this 28th day of October 19 88

Katsuki Manabe

Signature of Declarant(s) (President) 11/81

To: The Commissioner of Patents

(12) PATENT ABRIDGMENT (11) Document No. AU 3-23697/88
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 604360

(54) Title
COIN PAYOUT APPARATUS IN GAMING DEVICE

International Patent Classification(s)
(51)⁴ G07D 001/00 G07F 017/34

(21) Application No. : 23697/88 (22) Application Date : 13.10.88

(30) Priority Data

(31) Number	(32) Date	(33) Country
62-156078	14.10.87	JP JAPAN
62-163641	28.10.87	JP JAPAN

(43) Publication Date : 20.04.89

(44) Publication Date of Accepted Application : 13.12.90

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(56) Prior Art Documents
AU 519137 46460/79 G07F 17/34, 11/10
AU 51704/73 55.7
AU 44084/72 55.2

(57) Claim

1. A coin payout apparatus in a gaming device which includes a coin hopper storing therein a plurality of coins;

coin guide connected to said hopper for successively delivering coins in edge-to-edge relationship from said hopper to a coin dispensing opening, said coin payout apparatus comprising;

a rotary arm pivotally supported to said coin guide, said rotary arm having one end portion movable toward and away from a leading coin in said coin guide;

a coin ejecting roller rotatably supported to said one end portion of said rotary arm, said coin ejecting roller being in rotatal contact with an outer peripheral surface of said leading coin in said coin guide;

a biasing means connected to said one end portion of said rotary arm for biasing said one end toward said leading coin; and

a supplemental coin ejecting means positioned in confrontation with said coin ejecting roller, said supplemental coin ejecting means being rotatably supported for ejecting said leading coin in cooperation with said coin ejecting roller.

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S & F Ref: 74912

FORM 10

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COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE:

Class Int Class

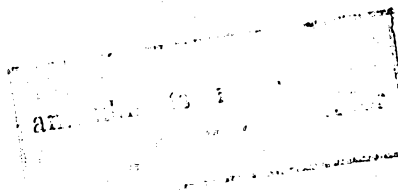
Complete Specification Lodged:

Accepted:

Published:

Priority:

Related Art:



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Complete Specification for the invention entitled:

Coin Payout Apparatus in Gaming Device

The following statement is a full description of this invention, including the best method of performing it known to me/us

COIN PAYOUT APPARATUS IN GAMING DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to a coin payout apparatus for use in a gaming device such as a slot machine. More particularly, the invention relates to the coin payout apparatus at a tip end portion of a coin guide in the gaming device.

Generally, in a coin payout apparatus of this type, a plurality of coins are accumulated in a coin hopper, and a predetermined numbers of coins are automatically dispensed one by one in accordance with a game result from a coin dispenser opening through the coin guide. According to one conventional coin payout apparatus, each one of the coins springs out of the coin guide tip end which is in communication with the coin dispensing opening as disclosed in U.S. Patent 4,518,001 assigned to International Game Technology.

However, after termination of coin payout, coin cheating may be conducted against coins retained in the coin guide by unfare raking or scraping by means of a pin or the like. Further, such remaining coins may undergo mischief. In this regard, the conventional apparatus does not provide sufficient countermeasures against such cheating and mischief. Further, accurate coin counting with simple construction is further required in accordance with the game

SUMMARY OF THE INVENTION

It is the object of the present invention to overcome or substantially ameliorate the above disadvantages.

There is disclosed herein a coin payout apparatus in a gaming device which includes a coin hopper storing therein a plurality of coins;

coin guide connected to said hopper for successively delivering coins in edge-to-edge relationship from said hopper to a coin dispensing opening, said coin payout apparatus comprising;

a rotary arm pivotally supported on said coin guide, said rotary arm having one end portion movable toward and away from a leading coin in said coin guide;

a coin ejecting roller rotatably supported to said one end portion of said rotary arm, said coin ejecting roller being in rotatal contact with an outer peripheral surface of said leading coin in said coin guide;

a biasing means connected to said one end portion of said rotary arm for biasing said one end toward said leading coin; and,

a supplemental coin ejecting means positioned in confrontation with said coin ejecting roller, said supplemental coin ejecting means being rotatably supported for ejecting said leading coin in cooperation with said coin ejecting roller.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred form of the present invention will now be described by way of example with reference to the accompanying drawings, wherein:

Fig. 1 is a perspective view showing a coin payout apparatus according to a first embodiment of this invention;

Figs. 2(a) through 2(c) show schematic illustrations for description of operations according to the first embodiment;

Fig. 3 is a schematic illustration of description of cheat-preventive manner according to the is embodiment;

Fig. 4 is a perspective view showing a coin payout apparatus according a second embodiment of this invention; and

Fig. 5 is a view partly showing a block diagram according to the second embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

KLN/25451

A first embodiment according to this invention will be described with reference to Figs. 1 thru 3. A coin guide 1 is adapted to guide travel of coin 2 successively delivered in single edge-to-edge array from a coin hopper (not shown) toward a coin dispensing opening (not shown). The coin guide 1 is elevated from the hopper. The coin guide 1 includes a pair of guide plates 3 and 4 confronting with each other and spaced away from each other by a spacer 5. The spacer 5 defines sufficient width or space 6 slightly larger than a thickness of the coin so as to allow the coin to pass therethrough in edge-to edge configuration as shown in Figs. 2(a) to 3. This space 6 is uniformly provided in a direction of travel of the coins, so that the space functions as a guide passage for the coin.

At a tip end portion 1a of the coin guide 1, a rotary arm 7 is pivotably supported, and which is directed in a direction substantially parallel with the payout direction of the coin as indicated by the arrow. The rotary arm 7 has an intermediate portion pivotably supported by a shaft 8 so that the arm 7 is pivoted in a substantially radial direction of the coin 2.

A kick or ejector roller 9 is rotatably supported at one end (upper end in Fig. 1) of the rotary arm 7. The ejector roller 9 is directed in a direction perpendicular to the rotary arm 7, and is positioned in confrontation with an open outlet end of the coin guide 1. An outer peripheral

surface of the kick roller 9 is in rotational contact with an outer peripheral end surface of the coin 2a (hereinafter simply referred to as a first coin 2a).

A biasing means such as a coil spring 10 is disposed between a coin guide 1 and the one end portion of the rotary arm 7, so that the rotary arm 7 is normally biased toward the outer peripheral surface of the first coin 2a. Further, a supplemental coin ejecting means such as an auxiliary roller 17 is rotatably provided at one distal end of the coin guide 1. When the lower half portion of the first coin 2a is brought to a position where the lower half portion of the coin is interposed between the kick roller 9 and the supplemental ejecting means 17, the coin will be ejected in the direction shown by the arrow in Fig. 1 because of the biasing force of the coil spring 10.

A locking roller 12 is rotatably supported to another end portion of the rotary arm 7. The locking roller 12 extends in parallel with the kick roller 9. Further, the coin guide 1 is formed with an arcuate slot 11 engageable with the locking roller 12. The locking roller 12 has an outer peripheral surface which is in selective rotational contact with an outer peripheral surface of a subsequent second or third coin 2b or 2c.

A protrusion piece 13 protrudes from a side edge of the another end portion of the rotary arm 7. Further, a sensor 14 is fixedly secured to the coin guide 1 and at a position



adjacent to the protrusion piece 13. The sensor 14 generates an output ON/OFF signal (pulse signal) upon every discharge of the coins responsive to the every rocking motion of the rotary arm 7. That is, the protrusion piece 13 is movable toward and away from the sensor 14 by the rocking motion of the rotary arm 7, so that every coin payout is detected by the sensor 14. The sensor 14 may preferably be a non-contact type sensor such as, for example, a magnetic proximity switch and photocoupler. This detection signal is transmitted to a counter (not shown), so that coin payout number is counted.

At another side edge of the another end portion of the rotary arm 7, there is provided a stop member 15. Further, a stop means 16 is fixedly secured to the coin guide 1. The stop member 15 is brought into abutment with the stop means 16, so that excessive rocking motion of the rotary arm 7 can be prevented.

Operational mode according to the first embodiment will next be described. First, as shown in Fig. 2(a), each of the coins 2a, 2b and 2c is forcibly supplied from the hopper in edge-to-edge alignment in the coin guide passage. In this case, the one end of the rotary arm 7 is urged toward the upper half peripheral portion of the first coin 2a by the biasing force of the coil spring 10, and the locking roller 12 is spaced away from the second coin 2b.

Next, as shown in Fig. 2(b), each of the coins is



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further elevated by the driving force from the hopper, so that the first coin 2a squeeze itself between the ejecter roller 9 and the auxiliary ejecter roller 17 against biasing force of the coil spring 10. As a result, the locking roller 12 is moved toward a boundary defined between the subsequent coins 2b and 2c. In this instance, the kick roller 9 is in contact with the maximum diameter portion of the first coin 2a. Further, simultaneously, the protrusion piece 13 is moved into the sensor 14, so that the pulse signal is outputted therefrom. This output signal implies the one coin payout, and the output signal is transmitted into the counter (not shown).

Thereafter, as shown in Fig. 2(c), when the coins are further advanced, the kick roller 9 is brought into contact with the lower half peripheral surface of the first coin 2a. As a result, the one end of the rotary arm 7 is rapidly moved radially inwardly with respect to the coin because of the biasing force of the coil spring 10, and accordingly, the kick roller 9 and the auxiliary roller 17 spring out the coin 2a.

Then, as shown in Fig. 2(d), the second coin 2b will be at stand-by position for the subsequent payout operation. In this state, the rotary arm 7 is at suspending position defined by the stop member 15 and the stop means 16. Such operations are repeatedly carried out for successive coin payout.



The first embodiment as described above also provides coin cheat-preventive function. Upon termination of coin payout for a player, the gaming machine is subjected to a coin payout for the next game. Fig. 3 shows a stand-by state of the coin payout device for the next game. If the first coin 2a is intended to be raked out by using a pin or the like, the upper half portion of the coin is brought into abutment with the kick roller 9, and the one end of the rotary arm 7 may be moved to a direction radially outwardly of the coin 2a against the biasing force of the coil spring 10. However, in this case, since the second coin 2b is not moved upwardly because of non-service state of the gaming machine, the lock roller 12 is moved toward the second coin and is abutted at the upper half portion thereof. Accordingly, the upper end portion of the rotary arm 7 cannot be further moved any more, to thereby prevent the first coin from being removed out. That is, advancing movement of the first coin 2a is still interrupted by the kick roller 9. (During the service state, the lock roller 12 will be entered into the boundary between the second and the third coins, so that the kick roller 9 can further be moved radially outward direction of the coin 2a to permit the coin to pass therethrough.) By the suitable determination of the dimension of the rotary arm 7 relative to the coin 2, cheat-preventive function can be given in this embodiment.

According to this embodiment, in addition to the cheat

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preventive function, movement of the rotary arm 7 is detectable by the projection piece 13 and the sensor 14. Therefore, additional coin payout number detector is not required. Instead, by the utilization of the rotary arm per se, coin payout number can be detected, to thus render the overall device simple. Further, the cheat preventive function can be provided mechanically, not electrically. Therefore, even at the general failure of power supply, coin cheating is still avoidable.

A second embodiment according to the present invention will be described with reference to Figs. 4 and 5 wherein like parts and components are designated by the same reference numerals and characters as those shown in the first embodiment. According to the second embodiment, a supplemental coin ejector means 17A is in the form of a star shape 21. The star shaped member 21 also serves as a count cam rotatably provided to the coin guide 1. Between a pair of neighbouring projections 22 and 22, a recessed portion 22a is defined in which a part of the outer peripheral surface of the coin 2 is supportedly held. At a side of the count cam 21, a counting sensor 14A is provided. The sensor 14A has C-shape as shown in Fig. 4, so that projections 22 can pass through the open space of the sensor 14A. Similar to the first embodiment, a non-contact type sensor such as a photocoupler and magnetic proximity switch is incorporated in the sensor 14A, so as to count each one of the



projections 22 for producing a corresponding pulse signal.

As shown in Fig. 4, the rotary arm 7 has another end (lower end) pivotally supported to the coin guide 1 by means of a shaft 8A. However, the rotary arm 7 can be pivotally supported at its intermediate portion so as to rotatably provide the locking roller 12 at the another end similar to the first embodiment.

As shown in Fig. 5, the count sensor 14A is connected to a preset counter 24, so that the output pulse signal from the sensor 14A is sent to the counter 24. In the preset counter 24 stored are preset count values each corresponding to coin payout numbers in accordance with the game result. If the pulse signal from the count sensor 14A reaches preset value, the counting is over, and a pulse signal is outputted for a reset. A central processing unit (CPU) 25 is connected to the preset counter 24. The CPU 25 controls entire system for sending the preset count value to the preset counter 24.

The preset counter 24 is also connected to a driver 26 which is connected to a locking means 27 for locking the count cam 11. The locking means 27 includes an electromagnetic solenoid having a plunger 27a. In response to the output signal from the preset counter 24, the driver 26 moves the locking means 27, so that the plunger 27a of the electromagnetic solenoid 27 extends into the recessed portion 22a of the count cam 14A. As a result, further



rotation of the count cam 14A is prevented.

The preset counter 24 is connected to an alarm unit 28 which is also connected to the count sensor 14A. When the output signal from the preset counter 24 is ANDed with the output signal from the count sensor 14A, the unit 28 generates alarm. That is, that the output signal from the preset counter 24 is inputted into the alarm unit 18 implies that necessary coin payout is completed. However, if the output signal is sent from the count sensor 14A to the alarm unit 28 after the output signal from the preset counter 24 is inputted into the alarm unit 28, it can be recognized that unfair cheating is conducted. Therefore, this logical product generates the alarm. Incidentally, the electromagnetic solenoid 27 and the alarming unit 28 can be used selectively, or be co-used.

Next, an operation according to the second embodiment will be described. For the coin payout, each of the coins 2a, 2b,, is delivered upwardly in edge-to-edge relationship as shown in Fig. 2 from the hopper (not shown). In this case, the one end portion of the rotary arm 7 is urged radially inwardly with respect to the coin by the biasing force of the spring 10. Further, when each of the coins is further elevated, the first coin 2a is thrust into a space between the kick roller 9 and the star shaped count cam 17A, so that the kick roller 9 is moved in radially outward direction with respect to the coin. When the first



coin 2a is further advanced and the maximum diameter portion of the coin 2a passes through the kick roller 9, the kick roller 9 can be moved radially inwardly relative to the coin because of the biasing force of the coil spring 10. As a result, the coin 2a springs out of the kick roller 9. In this instance, the first coin 2a is in abutment with one of the projections 22 of the star shaped count cam 17A, so that the count cam 17A is angularly rotated in a direction indicated by an arrow X. Upon this angular rotation, one of the remaining projections 22 of the star shaped count cam 17A passes through the count sensor 14A, to thereby generate the pulse signal. This pulse signal is subjected to counting at the preset counter 24.

Such operation is repeatedly carried out until the count number reaches the preset value given by the CPU 25. Then, the electromagnetic solenoid 27 is actuated to interlock the count cam 17A. As a result, further coin payout is prevented. If cheating is thereafter conducted, the alarm unit 18 is actuated.

According to the second embodiment, similar to the first embodiment, coin payout is directly detected, to thereby facilitate coin payout counting with high accuracy and high stability.

While the invention has been described in detail and with reference to specific embodiment thereof, it would be apparent for those skilled in the art that various changes



and modifications can be made therein without departing from
the spirit and scope of the invention.



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The claims defining the invention are as follows:

1. A coin payout apparatus in a gaming device which includes a coin hopper storing therein a plurality of coins;

coin guide connected to said hopper for successively delivering coins in edge-to-edge relationship from said hopper to a coin dispensing opening, said coin payout apparatus comprising;

a rotary arm pivotally supported to said coin guide, said rotary arm having one end portion movable toward and away from a leading coin in said coin guide;

a coin ejecting roller rotatably supported to said one end portion of said rotary arm, said coin ejecting roller being in rotatal contact with an outer peripheral surface of said leading coin in said coin guide;

a biasing means connected to said one end portion of said rotary arm for biasing said one end toward said leading coin; and

a supplemental coin ejecting means positioned in confrontation with said coin ejecting roller, said supplemental coin ejecting means being rotatably supported for ejecting said leading coin in cooperation with said coin ejecting roller.

2. The coin payout apparatus as claimed in claim 1, wherein said rotary arm has an intermediate portion pivotally supported to said coin guide.

3. The coin payout apparatus as claimed in claim 2, wherein said rotary arm has another end portion, and further comprising; a locking roller rotatably supported to said another end portion, said locking roller being in selective rotational contact with subsequent coins in said coin guide, said locking roller being brought to a boundary defined between subsequent second and third coins in said coin guide when said coin ejecting roller is in contact with said outer peripheral portion of said leading coin.

4. The coin payout apparatus as claimed in claim 2, further comprising a detecting means for detecting rocking numbers of said rotary arm, said detecting means comprising a first component fixedly secured to said coin guide, and second component provided integral with said another end of said rotary arm.

5. The coin payout apparatus as claimed in claim 4, wherein said first component comprises a non-contact type detecting element, and said second component comprises a protruding piece movable toward and away from said detecting element, said detecting element generating a pulse signal in response to entry of said protruding piece thereinto.

6. The coin payout apparatus as claimed in claim 1, wherein said supplemental coin ejecting means comprises a count cam in rotational contact with said leading coin, said count cam having a star shape configuration provided with a plurality of projections defining a recessed portion therebetween, said leading coin being rotationally supported in said recessed portion.

7. The coin payout apparatus as claimed in claim 6, further comprising a sensor disposed adjacent said count cam, each of said projections of said count cam being adapted to pass through said sensor during angular rotation, and said sensor generating a pulse signal upon every passing of said projections therethrough.

8. The coin payout apparatus as claimed in claim 7 further comprising a preset counter connected to said sensor, and a locking means connected to said preset counter for preventing said count cam from its rotation, said preset counter counting said pulse signal from said sensor and generating an output signal upon reaching a reset count value, said output signal being transmitted to said locking means.

9. The coin payout apparatus as claimed in claim 8, further comprising alarm unit connected to said preset counter and said sensor, said alarming unit being operable upon receiving said output signal from said preset counter and said pulse signal from said sensor.

10. The coin payout apparatus as claimed in claim 8 wherein said preset value corresponds to coin numbers to be dispensed in accordance with a game result.

11. A coin payout apparatus substantially as hereinbefore described with reference to the accompanying drawings.

DATED this SIXTH day of September 1990
Kabushiki Kaisha Sigma

Patent Attorneys for the Applicant
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23697/88

FIG. 1

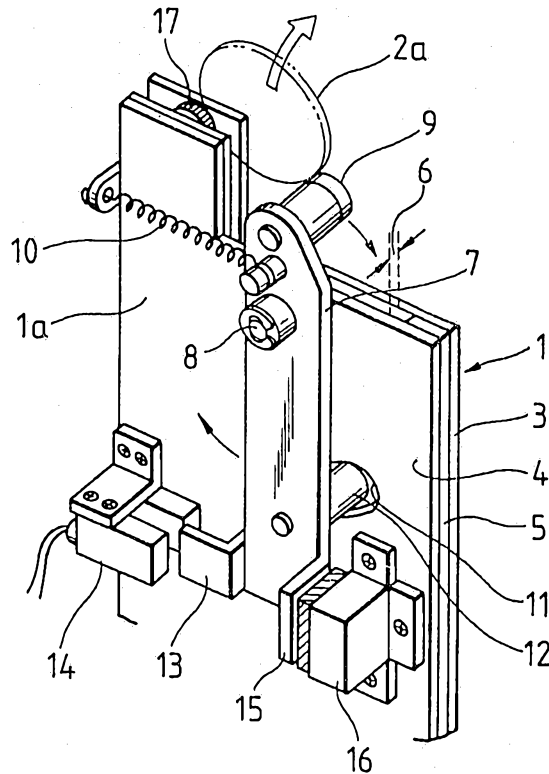
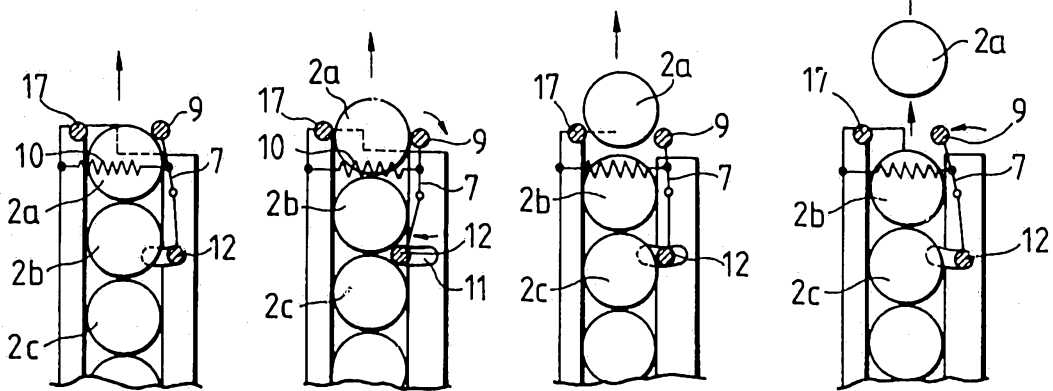


FIG. 2(a) FIG. 2(b) FIG. 2(c) FIG. 2(d)



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FIG. 3

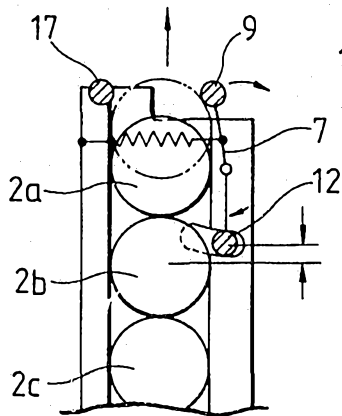


FIG. 4

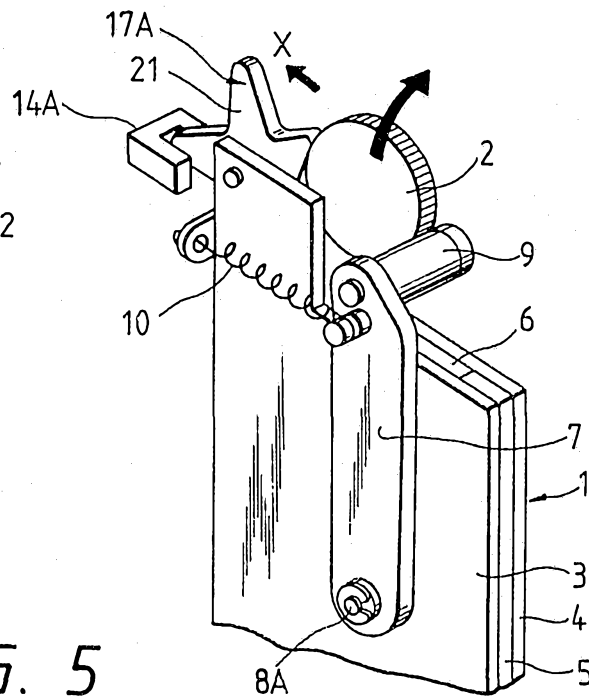


FIG. 5

