



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
04.10.2001 Bulletin 2001/40

(51) Int Cl.7: **G07F 17/34**

(21) Application number: **00500048.4**

(22) Date of filing: **28.03.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Sierra Picon, Bernardo**
28980 Parla (Madrid) (ES)

(74) Representative: **Carpintero Lopez, Francisco**
HERRERO & ASOCIADOS, S.L.
Alcalá, 35
28014 Madrid (ES)

(71) Applicant: **SEGA, S.A.**
E-28980 Parla (Madrid) (ES)

(54) **Images cyclical viewer for gaming machines**

(57) Of the type which incorporate a frame or case (1-2) on which moves a continuous band (10) bearing a row of images which appear sequentially to the player on the machine display, which band is driven by an electric motor (5), controlled by an encoder (17) and a sensor (20) incorporating as transmission means for said band (10) a toothed crown (7) which reduces the moment of inertia of the drive system, incorporating a sup-

port (14), with an adjustable angular position, for mounting encoder (13) which can thus also be adjusted in position and which is assisted by a protection lid (16, incorporating on one side face a large recess (22) which allows to house within it printed circuit board (24) for viewer control, and incorporates a transverse tunnel (28) for internal electrical connection of encoder (13) to circuit board (24).

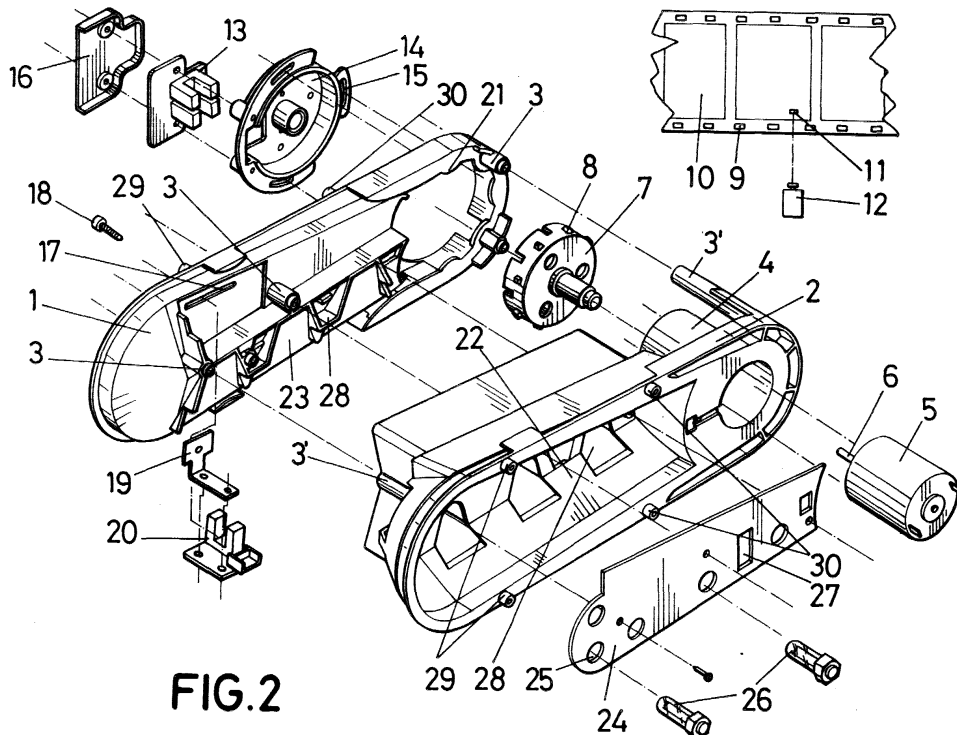


FIG.2

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a cyclical image viewer, specifically designed for gaming machines which dispense a cash prize when obtaining certain combinations of images which appear in a set of viewers, which to an extent resemble revolving drums.

[0002] The object of the invention is to obtain a small, compact viewer, capable of showing the player a single image or three or more images depending on the characteristics of the game played on the machine, by means of a different arrangement of the viewer on its support structure.

BACKGROUND OF THE INVENTION

[0003] The applicant is titular of Spanish Patent application no. 9701952, in which a cyclic image viewer for gaming machines is disclosed, of the type which employ as support for said images a continuous flexible band on which the images are longitudinally aligned, and provided with an elongated frame which in one end is provided with a tail drum for the aforementioned continuous band, which drum in turn determines a housing for the band driving motor, a DC motor aided by an NC, also provided in said drum a deep perimetral groove which allows the position detector to pass freely, which detector consists of a preferably plastic small plate conveniently attached to the inner face of the continuous band and meant to intersect the light beam of a photoemitter and a photosensor which determine a position sensor for the '0' reference of the continuous band, that is, to define a reference point for the cyclical viewer in order to control the displacement of the continuous band.

[0004] The elongated configuration of said frame and therefore of the viewer as a whole is meant to allow said viewer to simultaneously show the player several images so that, after each turn, through the corresponding view window of the machine display the player may view the image on the winning line as well as the immediately previous and following images, by means of a substantially parallel position of the major axis of the viewer with respect to the plane of the machine display.

DESCRIPTION OF THE INVENTION

[0005] The cyclical image viewer disclosed by the invention, based on a basic structure similar to that of the aforementioned Invention Patent, has been considerably improved in order to eliminate certain problems of the earlier viewer and also to offer a number of further advantages which will become apparent in the course of the present description.

[0006] More specifically, and according to one of the characteristics of the invention, the viewer frame incorporates means which allow the aforementioned ar-

5 rangement considerably parallel to the machine display, as well as an arrangement perpendicular to said plane, so that in the former case the viewer displays several images simultaneously to the player, as explained above, while in the latter case the viewer shows only a single image to the player, that which corresponds to the curvature semi-cylinder of the continuous band, to which end the frame incorporates or defines, not only illumination parabolas which are opened to one of its major or straight surfaces, but also a parabola provided with means for fixing illumination lamps in said semi-cylindrical end area.

[0007] According to a further characteristic of the invention, the aforementioned revolving tail drum for the continuous band has been replaced by a simple toothed crown, with which the moment of inertia of the viewer is considerably reduced, as the mass in rotation is substantially less. This allows the continuous band to move more quickly, so that the game may proceed at a faster pace, as well as improving the stopping operation of the band, which stops immediately instead of slightly overtaking the stop position and slowly return to its correct position, as occurs with conventional viewers.

[0008] A further characteristic of the invention is based on the fact that the crenels located in the end of the viewer corresponding to the motor coupling, for guidance of the continuous band, have an arched configuration, reducing the coefficient of friction of the latter and therefore simplifying its displacement.

[0009] The frame is also provided with a side recess to house the command printed circuit and the viewer lamps, without occupying external space.

[0010] Also provided is a transverse tunnel in the frame which connects the aforementioned recess to the opposite face of the viewer and which therefore allows the electrical connection of the printed circuit board housed in said recess and the position sensor or encoder of the continuous band, located in the opposite face of the viewer.

[0011] According to a further characteristic of the invention, said encoder or sensor is mounted on a support which in turn is connected to the frame by a support provided with fixing tabs with slits which are aligned forming a circumference, so that said support may rotate about the frame and therefore allows to adjust the position of the encoder in the general context of the viewer.

[0012] Said frame or case is also split into two parts in order to simplify assembly and removal of the continuous band and the other elements which make up the device.

[0013] Returning to the means which allow to change the operational position of the viewer with respect to the machine display, these are in the form of pins attached to the side of the two parts which make up the frame, which pins when correctly positioned allow to couple the frame as a whole to a grooved support duly associated to the fixed structure of the machine, which allows a simple coupling and decoupling of the viewer by a simple

insertion or extraction of said pins in the corresponding support grooves, in one or other position provided for the viewer.

[0014] The encoder is also provided with a protection lid conveniently attached to the encoder support, and the drive motor is directly coupled to the viewer frame, providing a greater sturdiness and precision in the coupling.

DESCRIPTION OF THE DRAWINGS

[0015] Further characteristics and advantages of the present invention will become apparent in view of the accompanying drawings of an example of a preferred embodiment, where for purposes of illustration and in no way meant as a definition of the limits of the invention, the following is shown:

[0016] Figure 1.- Shows, according to a schematic perspective representation, a cyclical image viewer for gaming machines constructed according to the improvements of the invention.

[0017] Figure 2.- Shows a perspective exploded view of the viewer of the above figure.

[0018] Figure 3.- Shows the set of the previous figure, duly assembled, along the longitudinal line which passes through the motor shaft.

[0019] Figure 4.- Shows, finally, a further sectional view of the viewer as a whole, along a line perpendicular to that of the previous figure.

PREFERRED EMBODIMENT OF THE INVENTION

[0020] In view of these figures one can see how the viewer disclosed comprises a frame or case consisting of two parts (1) and (2), laterally connecting through spacers (3-3') and secured for example by screws which passing through spacers (3') are screwed inside spacers (3), incorporating said part or semi frame (2) a cylindrical housing (4) for the driving motor, whose shaft (6) crosses the base of said housing (4) to join a toothed crown (7) whose teeth (8) are meant to engage marginal orifices or openings (9) of the image-bearing continuous band (10), which continuous band is provided at a certain point with a housing (11) for a tab (12) which acts on encoder or sensor (13) by which the "0 point" is defined, in order to adequately control said band, along with the functional characteristics of motor (5), which is a point by point motor which in turn allows to control the angular displacement.

[0021] Encoder (13) is mounted on semi frame (1) assisted by a support (14) provided perimetrally with grooved flaps (15) which allow to adjust the angular position of said support (14) with respect to the frame within certain limits, and therefore also the angular position of encoder (13), in order to correctly adjust it, encoder (13) being attached to frame (14) by means of screws which in addition comprise the means of attachment of a protection lid (16) for it.

[0022] This semi-frame (1) is provided with a groove (17) for implementation and securing, aided by screw (18), of an angular plate (19), support of the conventional sensor (20) which is also involved in the positional control of continuous band (10).

[0023] Said continuous band (10) is suitably adapted to toothed crown (7) which carries it, with the help of pushers (21) operatively provided on semi-frame (1) and which have a specific property, as seen clearly in figures 2 and 4, of having a rounded configuration, defining a tangent and practically point like contact with continuous band (10), ensuring a minimal friction between these elements.

[0024] In the other semi-frame (2) is provided a large recess (22), which serves a double purpose: on one hand to allow establishment of conventional parabolas (23), together with the other semi-frame (1), and on another hand to allow implementation within it, that is, inside the viewer as a whole, of the classic printed circuit board (24) on which is mounted the viewer control circuit, board (24) on which are also provided housings (25) for the lamps which enhance the visibility of the images shown to the player on the machine display, so that in this case where there is also a front parabola (23') in the end of the viewer opposite motor (5), with its corresponding lamps for the specific case when the viewer is only showing a single image of continuous band (10) to the player.

[0025] Since said printed circuit board (24) is located on the viewer face opposite encoder (13), the circuit board (24) is provided with an opening (17) operationally opposed to a tunnel (28) defined in both halves of frame (1-2), such that through said window and tunnel passes the connection cable which connects encoder (13) to the circuit.

[0026] Finally, both parts (1) and (2) which make up the frame are provided in their outer surface with pairs of pins (29-30) meant to be inserted in grooves provided in the aforementioned machine frame which have not been shown in the drawings, so that when pins (29) are used the viewer adopts a horizontal position, with its major axis perpendicular to the plane of the machine display, in which case the viewer will show only a single image of continuous band (10) to the player, or when attached by means of one pin (29) and one of pins (30) it will adopt a basically parallel position to said display simultaneously showing several images of continuous band (10).

Claims

1. Cyclical image viewer for gaming machines, of the type incorporating a relatively elongated frame, on which an band which bears a row of images moves, driven by an electric motor mounted on one end of the frame, where the movement of the aforementioned continuous band is controlled by an encoder

and by a sensor which allow both to reset the continuous band at a "0 point" and to count the advance motions of it which correspond to steps between images, **characterised in that** the means of driving said continuous band (10) involves a toothed crown (7) conveniently coupled to the shaft of driving motor (8), which motor is directly coupled to frame (2) within a housing (4) provided in the latter, so that the low weight of toothed crown (7) reduces the moment of inertia of the drive system allowing a greater speed of continuous band (10).

2. Cyclical image viewer for gaming machines, as claimed in claim 1, **characterised in that** the frame (1) incorporates in the operational area of toothed crown (7) a number of pushers (21) which press continuous band (10) against said crown (7) and which adopts a rounded configuration, so that they touch continuous band (10) tangentially minimising the coefficient of friction.

3. Cyclical image viewer for gaming machines, as claimed in claim 1, **characterised in that** frame (1-2) is provided on one lateral face with a large recess (22) which defines a housing for printed circuit board (24) for controlling the viewer, as well as for the sockets of lamps (26) which enhance the use of continuous band (10), with these elements integrated within the space of the viewer.

4. Cyclical image viewer for gaming machines, as claimed in claims 1 and 3, **characterised in that** printed circuit board (24) is provided with an opening (27) while the viewer frame is provided with a tunnel (28), which allow internal connection of said board (24) and encoder (13) placed on the opposite side of the viewer.

5. Cyclical image viewer for gaming machines, as claimed in claim 1, **characterised in that** encoder (13) is assisted by a support (14) provided with marginal grooved flaps (5), whose grooves are aligned in a circumference, so that the mounting of said support (14) on frame (1-2) allows a certain angular displacement of support (14), in order to regulate the position of encoder (13).

6. Cyclical image viewer for gaming machines, as claimed in claims 1 and 5, **characterised in that** encoder (13) is assisted by a protection lid (16) which is attached to encoder support (14) with the same assembly screws of the latter.

7. Cyclical image viewer for gaming machines, as claimed in above claims, **characterised in that** the frame is structured in two parts (1) and (2) in order to simplify assembly and removal of the various elements of the viewer.

8. Cyclical image viewer for gaming machines, as claimed in above claims, **characterised in that** the frame (1-2) incorporates on its sides pairs of pins (29) and (30) which allow to couple said viewer by a simple plugging in on a frame previously attached to the structure of the machine and provided with open slots for said pins to insert, so that one pair of pins (29) of said parts (1) and (2) of the frame allow to couple the viewer to the aforementioned frame in a position such that its major axis is clearly perpendicular to the machine display, with the viewer showing only a single image of its continuous band, or in a position clearly parallel to said plane by the combined use of pins (29) and (30), in which case the viewer simultaneously shows several images of continuous band (10) in the machine display.

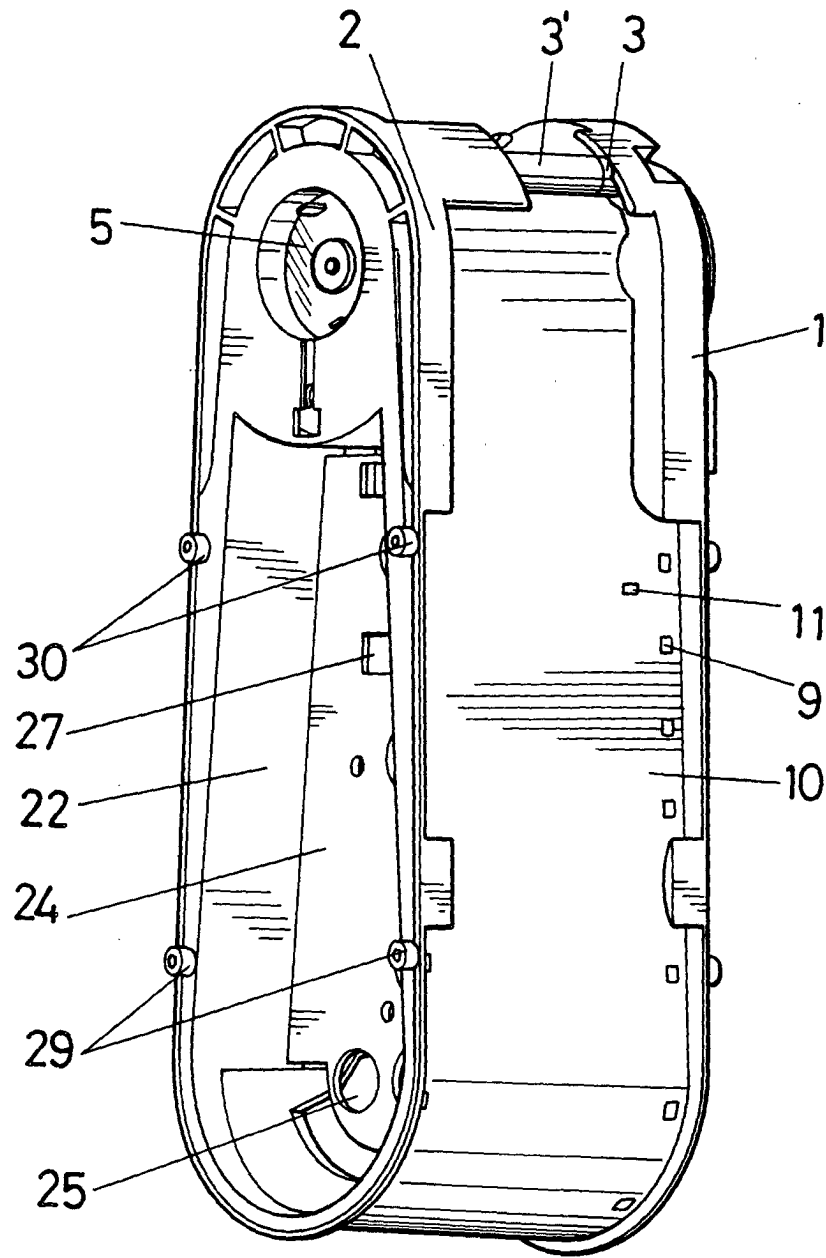


FIG.1

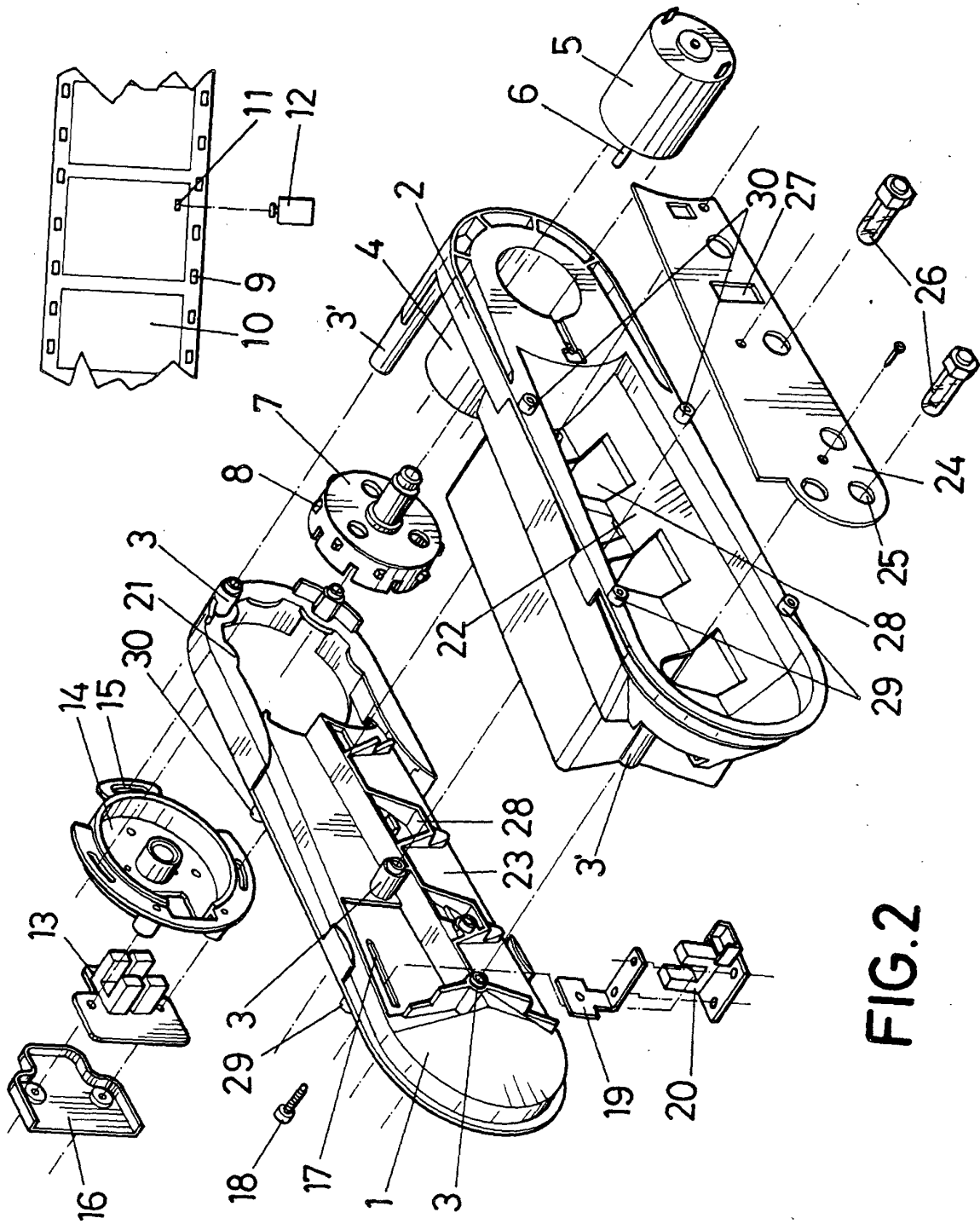


FIG.2

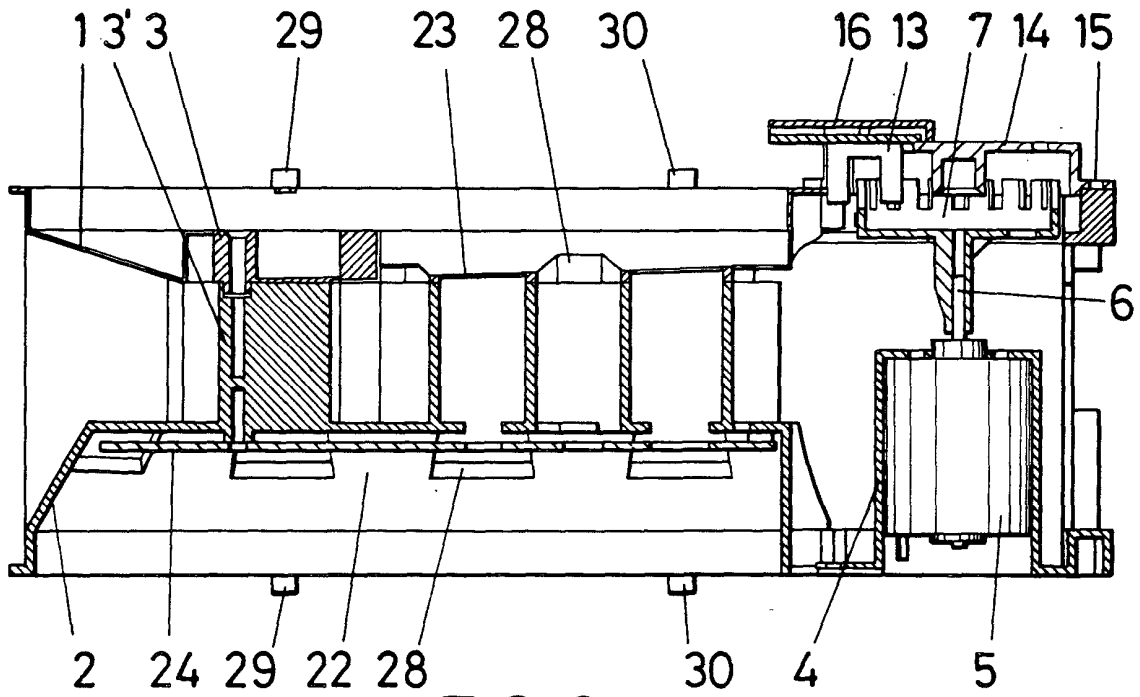


FIG. 3

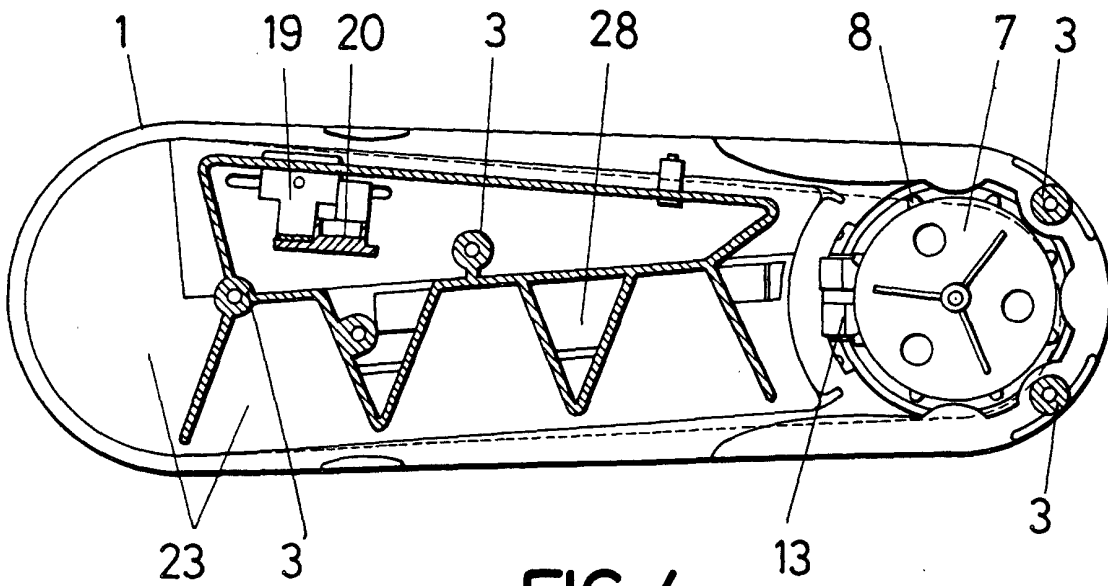


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 50 0048

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 629 980 A (GESPAMAR SL) 21 December 1994 (1994-12-21) * abstract * * column 3, line 25 - line 50 * * column 6, line 34 - line 44 *	1,7,8	G07F17/34
A	DE 196 34 939 A (ADP GAUSELMANN GMBH) 5 March 1998 (1998-03-05) * the whole document *	1,2	
A	WO 95 22128 A (STARPOINT ELECTRICS LTD ;JEFFS ANTHONY MICHAEL (GB)) 17 August 1995 (1995-08-17) * abstract *	1	
A	WO 94 17500 A (STARPOINT ELECTRICS LTD ;PARTRIDGE DAVID (GB); HOLMES ROBERT ALAN) 4 August 1994 (1994-08-04) * abstract; figures 1,6 * * page 5, line 11 - page 6, line 2 *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			G07F
Place of search	Date of completion of the search	Examiner	
THE HAGUE	31 August 2000	Lindholm, A-M	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 50 0048

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-08-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0629980 A	21-12-1994	ES 2074003 A	16-08-1995
		ES 1025037 U	01-11-1993
		ES 1025905 U	16-02-1994
		ES 1027548 U	01-09-1994
		AT 170648 T	15-09-1998
		BR 9401788 A	10-01-1995
		DE 69412920 D	08-10-1998
		DE 69412920 T	21-01-1999
		SI 629980 T	28-02-1999
DE 19634939 A	05-03-1998	ES 2126518 A	16-03-1999
		GB 2316791 A,B	04-03-1998
WO 9522128 A	17-08-1995	DE 19581599 T	24-07-1997
		GB 2301473 A,B	04-12-1996
		JP 9508828 T	09-09-1997
WO 9417500 A	04-08-1994	AU 5864794 A	15-08-1994
		EP 0682797 A	22-11-1995