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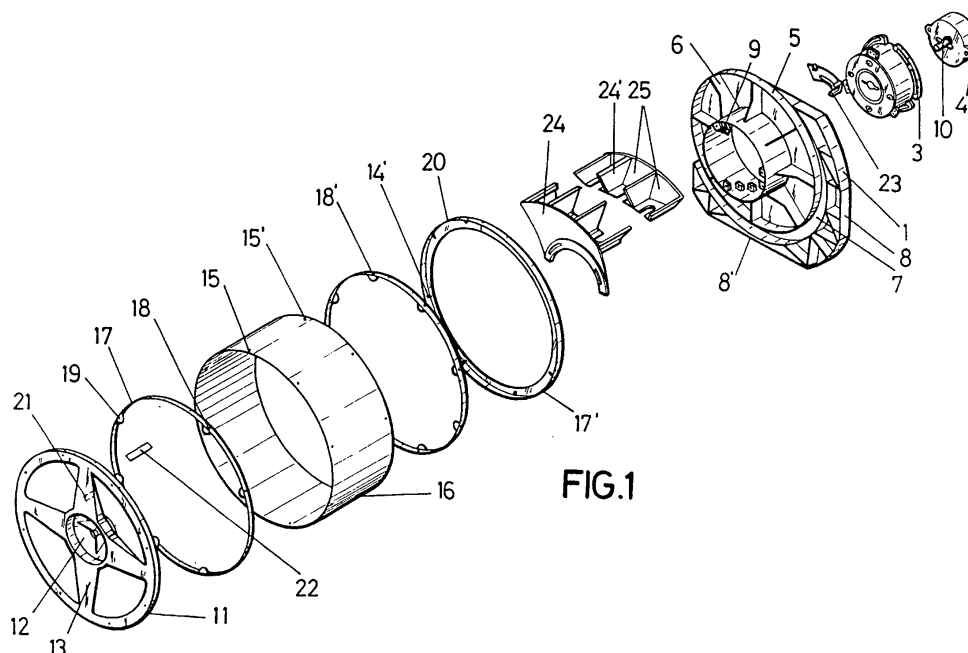
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(54) **IMAGE-CARRIER ROLLER FOR RECREATIONAL MACHINES**

(57) Its structure is based on a support base (1) which is considerably flat, inside which an axial neck (2) is provided which is meant to house the enveloping support (3) for the electric motor (4) which drives the drum, whose drive shaft (10) is connected to a ring (11) provided with a perimetral ring (17) to which in turn is connected the images-bearer continuous band (16), and whose other mouth, overhanging, is stiffened by a sec-

ond ring (20), which moves in a channel (7) of the support base (1). Support (3) of the electric motor (4) can be adjusted in its position within the axial neck (2) so that ring (11) can be set at different distances from the support base (1) in order to adapt the unit for continuous images-bearer bands (16) of different widths, with the drive unit housed within the drum itself formed by axial neck (2), from which support base (1) only projects slightly, with a minimum volume occupied by the unit.



**FIG.1**

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## Description

### OBJECT OF THE INVENTION

[0001] The present invention relates to an images-bearer reel meant for use in gaming machines, reel designed and structured in order to allow adjustment of the axial dimension of its operational surface, that is, the width of the continuous band which bears the images, within a large range of possibilities to this effect, without any change in its structural elements, and in addition having a minimal moment of inertia, ensuring optimal operating conditions and a great reduction in volume, and thus allowing its mounting in a minimum space within the gaming machine it is meant for.

### BACKGROUND OF THE INVENTION

[0002] Images-bearer reels for gaming machines are known which are constructed from a cylindrical cage in which are present two identical end discs, related to each other by a number of crossbeams, so that on the latter a continuous band is placed which adopts a cylindrical form and which bears the images which are part of the game, so that they are sequentially visible through windows made to this effect in the machine display, one window provided per reel.

[0003] Such reels have problems resulting mainly from their considerable weight, resulting in a high moment of inertia which causes problems both in starting and stopping the reels, which naturally, due to the type of activity of these machines, occurs very often.

[0004] An additional problem with this type of reels is that its size, both radially and axially, is pre-set, that is, they are invariable, so that a specific reel model is required for each band width, which obviously implies high investment costs in moulds for obtaining these reels.

[0005] Reels of this type are generally supported by their own shaft, that is, by the shaft of the driving electric motor, so that this electric motor assisted by the corresponding support generally consists of a physically separate element to the reel, at least in part, with the resulting volume occupied and the problems arising when, as is often the case, the space available in the gaming machine for mounting these reels is very limited.

[0006] There are also problems in attaching the image-bearing continuous band to the reel which supports it, particularly since the position of this band is critical for an adequate and necessary control respect to the images appearing on the screen.

### DESCRIPTION OF THE INVENTION

[0007] The images-bearer reel which the invention discloses resolves the above problems in a fully satisfactory manner, as well as providing further advantages which will become apparent in this description.

[0008] With this object, and more specifically, the reel

which the invention proposes is constructed from a clearly flat support base provided with an axial neck, preferably cylindrical, which defines a housing for the motor, which has a special support encasing it, which may be attached in various positions within the above mentioned axial neck, specifically in positions further along or further behind in the axis, with the aid of a number of perforated pins which emerge from the surface of this axial neck at several levels.

[0009] The shaft of the electric motor is designed to directly receive a disk provided with a nucleus for attachment to this shaft and a number of radial arms which connect the nucleus to an outer band, which band has a dihedral cross section and is provided in its cylindrical area with a number of inner tabs, preferably distributed uniformly and intended for a correct positioning of the images-bearer continuous band, which will be provided for this purpose with a number of aligned orifices on each of its edges, with the attachment of the continuous band to the band aided by an inner elastically deformable band, also provided with orifices opposite the above mentioned tabs.

[0010] In an alternative embodiment, coupling of the drum to the electric motor shaft is achieved by simple pressure by introducing it between elastic forks placed on the disk itself, specifically in its inner central section.

[0011] In a further alternative embodiment, connection of the end disc supporting the reel itself, coupled to the electric motor shaft, and the latter's pin is achieved by four spears which form two clips diametrically opposite the disc, with said clips embracing the electric motor shaft pin, thus performing two complementary functions: joining the motor shaft and disc and acting as a radial-flexor element between these element.

[0012] The other end of the continuous band, the one nearest the support base, is stiffened by means of an outer band and an inner ring similar to those described above, but here without the above mentioned outer band with radial arms since, as mentioned above, it is a mere stiffening element which is only connected to the continuous band, with this second outer band - inner ring set mounted on a second cylindrical neck present in the support base, with a diameter considerably smaller than the aforementioned internal neck but axially much shorter.

[0013] This support base has two adjacent extensions placed immediately outside the second perimetral or enveloping neck, meant to allow attaching the set in two different positions, either through a vertical attachment edge or a horizontal edge, depending on the ideal conditions for the slot machine which the reel is intended for.

[0014] As an alternative however, the aforementioned support based of the reel may be mounted on an anchoring with the aid of a manually actuated ratchet device.

[0015] According to another characteristic of the invention, the radial arms which relate the outer band to the electric motor shaft decrease in both width and thick-

ness towards the above mentioned outer band, so that in the area where they meet the latter they are completely flat, giving the reel great axial stability.

**[0016]** According to this structure and as mentioned above, the reel is very light and has a minimal moment of inertia; by selecting different perforated pins in the axial neck of the support base the position of the electric motor can be adjusted and in consequence the position of the disk opposite the support base with respect to the latter can also be adjusted to adapt it to different widths of the images-bearer continuous band; in any event the electric motor is housed in the axial neck of the support base, that is, inside the cylindrical reel formed by the images-bearer continuous band, so that the volume occupied by the reel is that of the reel itself, that is, of the above mentioned continuous band, slightly increased by the support base which, as mentioned before, is basically flat and which occupies a minimal volume.

**[0017]** The cylindrical reel is also complemented by a support with several spaces of a size similar to that of the images on the continuous band, which are meant to house illumination lamps, with the particular property that the depth of the support can be adjusted so that it adapts to the width of the reel band.

**[0018]** In addition, one of the two parts of this lamp support is provided in its outer lateral surface with a large opening which simplifies handling the lamps from outside the support.

**[0019]** Finally, it should be noted that the band can have a very large width, in which case the system can be placed vertically, adopting the shape of a general cylindrical body with an internal mast.

## DESCRIPTION OF THE DRAWINGS

**[0020]** Further advantages and characteristics of the invention according to an example of a preferred embodiment will become apparent in view of the accompanying drawings where for purposes of illustration and in a non-limiting sense the following is shown:

**[0021]** Figure 1 shows a perspective exploded view of an images-bearer reel for gaming machines constructed according to the object of the present invention.

**[0022]** Figure 2 shows, also in a perspective view, the same unit of the previous figure, suitably assembled.

**[0023]** Figure 3 shows an enlargement of a cross section of the coupling between an outer band and its inner ring for attaching and stiffening one of the ends of the reel itself formed by the images-bearer continuous band.

**[0024]** Figure 4 shows a perspective view of a reel accessory meant to be housed within it, and more specifically to serve as a support for the illumination lamps which by illuminating the continuous band allow a better view of the images it bears. This support, which makes up a lamps box, is adjustable in width.

**[0025]** Figure 5 shows a front view of the end disk of the images-bearer reel of the invention, where one can

see the pressure attachment of the corresponding shaft of the electric motor.

**[0026]** Figure 6 shows a sectional view along the A-A line of the previous figure.

**[0027]** Figure 7 shows an alternative embodiment where the band is very wide, in which case the images-bearer reel is a cylinder mounted vertically.

**[0028]** Figure 8 shows a perspective exploded view of the alternative embodiment for the electric motor support base with an anchoring aided by a manually operated ratchet device.

**[0029]** Figure 9 shows a cross sectional enlarged view of the anchoring system of the previous figure.

**[0030]** Figure 10 shows a perspective enlargement of one of the ratchet devices used in the attachment device of the previous figure.

**[0031]** Figure 11 shows a front view of the support disc for the reel itself which can be coupled to the electromotor drive shaft.

**[0032]** Figure 12 shows a diametrical sectional view of a detail of this same disc along the B-B line of figure 10.

**[0033]** Figure 13 shows inset C of figure 11 which corresponds to the disc anchoring or attachment, considerably enlarged.

**[0034]** Figure 14 finally shows a perspective detail of the "lamps box" similar to the one in figure 4 but according to an alternative embodiment.

## PREFERRED EMBODIMENT OF THE INVENTION

**[0035]** In view of these figures one can see how the images-bearer reel disclosed in the invention is constructed from a support base (1) preferably injected from a plastic material, considerably flat and provided with an axial cylindrical neck (2) of a size suitable for receiving within it support (3) of electric motor (4) which drives the reel, with a number of radial plates (6) placed between the cylindrical neck (2), which has a considerable axial length, and a second enveloping neck (5), of a substantially greater diameter and lower axial length, which plates stiffen these conveniently so that outer neck (5) is left exposed in a large sector of approximately half the support base (1), while the remaining part extends in a channel (7) which divides the neck from an external extension which defines two extensions (8, 8') which are quite perpendicular to each other for attaching the reel set to the machine, so that extension (8) allows a vertical attachment and extension (8') allows a horizontal attachment.

**[0036]** Within axial neck (2) are a number of perforated pins (9) at different axial heights and angularly staggered in order to facilitate injecting the part, pins which are to be selectively used to attach the electric motor (4) support (3), so that, depending on the pins (9) selected, the attack end of the electric motor (4) shaft will be more or less forward within the general unit, i.e., it will be axially displaceable with respect to support base (1).

**[0037]** The electric motor (4) is provided with a shaft (10) to which a ring (11) is meant to be attached, provided with a central nucleus (12) which carries the means of attachment to shaft (10) and a number of radial arms (13) which connect said nucleus (12) to ring (11) itself, materialised as an L-bar band, as seen particularly in figure 3, provided with a number of interior tabs (14), evenly distributed and designed to insert in orifices (15) which are operationally provided in the images-bearer continuous band (16), so that the inner diameter of this band or ring (11) matches the outer diameter of the reel itself defined by continuous band (16), and the separation and sizes of tabs (14) match orifices (15).

**[0038]** Shaft (10) of the electric motor (4), in an example of a preferred embodiment, is attached by a simple pressure of elastic forks (26) which can be clearly seen in figures 5 and 6 and the corresponding insets, forks (26) placed on ring (11) itself matching its inner central section, and meant to prevent any radial or axial play from appearing in the coupling system.

**[0039]** Coupling of the corresponding edge of the continuous band (16) to ring (11) is made possible by the elastic deformation of said band, and the attachment is complemented by an elastically deformable inner ring (17) also provided with orifices (18) placed opposite orifices (15) of the continuous band (16) and jointly crossed by tabs (14), with ring (17) made of an elastically deformable material which simplifies its coupling and decoupling within the exterior rigid ring (11), provided with tabs (19) which facilitate manual handling of it during disassembly.

**[0040]** Collaborating with said ring (11) is a second ring (20) meant to stiffen the other opening of the continuous band (16), ring (20) which also has an L-shaped cross section, the same inner tabs (14') complementary to orifices (18') of inner ring (17') described above, with this ring (20) - ring (17') set mounted on the second enveloping cylinder or neck (5) of support base (1) and therefore moving within channel (7).

**[0041]** As a complement of the structure described, on one of radial arms (13) of ring (11) is a housing (21) for an obturator tab (22) which acts on a traditional optical reader (23) which is conveniently connected to support (3) of electric motor (4), with these elements controlling the position of the images-bearer continuous band (16).

**[0042]** Continuous band (16) will preferably be translucent, as is conventional, with a thin wall and may be backlit to improve the vision of the images shown in the gaming machine display, for which purpose support (24) can be provided within the reel and conveniently attached to support base (1), as shown in figure 4 which, as electric motor (4) and its support (3), is housed within the imaginary cylinder of the reel defined by continuous band (16), with support (24) provided with a variable number of housings (25) of a size matching the size of the images on continuous band (16), meant to receive illumination lamps which can be activated simultane-

ously or individually depending on the rules of the game of the machine, without this affecting the essence of the invention at all.

**[0043]** Support (24), which constitutes a lamps box, consists of two parts as clearly shown in figure 4, one also labelled as (24) and the other as (24'), which as can be seen are connected by axial insertion to give support (24) a greater or lesser width, and so adapt its size to the different band widths of the reel.

**[0044]** In an alternate embodiment, when band (16') is very wide, the set can be applied so that it operates vertically, in which case the set adopts the configuration of a cylinder with an inner mast (27) with a lower anchoring plate (28), as shown in figure 7.

**[0045]** Nevertheless, instead of using said continuous band (16) with its internal illumination a number of displays are incorporated, one for each projected image of the continuous band, which displays can show any of the images which are part of the game, duly programmed.

**[0046]** Returning to support base (1), it may adopt the embodiment example of figure 8, provided only with extension (8') for horizontal attachment and provided in its end with two open loops (29) for attachment, in one case, of step (30) provided in a ruled anchoring bar (31), with two end steps (32) so that in step (30) placed matching on of steps (32) and inside it, one of the edges of lower extension (8') of support (1) is anchored, while the other edge of loop (29) provided in the opposite side of extension (8') forms the seam of ratchet (33), which has a heel-shaped bottom part (34), an arm which acts as a spring (35) and a top part which operates as a clamping element (36) for actuation, and provided with side pins (37) for mounting, so that by an angular motion as a lever, one end of extension (8') inserts in inner step (30) of anchoring (31), while the other end of said extension (8') slides along the surface of ratchet (33), causing it to turn, so that when it reaches the bottom of extension (8') of support (1), ratchet (33) recovers its original position due to the elasticity of spring (35), remaining in said position with any attempts of extracting the support, which movement will make said support lock even more tightly.

**[0047]** Disassembly shall require an upwards pressure applied on top part (36) of ratchet (33), so that extension (8') is unlocked and freed from the anchoring of said ratchet (33), with anchoring (32) provided with orifices (38) for its corresponding attachment to the part of the machine where the set is mounted.

**[0048]** Also as an alternative, as relates to the attachment of ring (11) to electric motor shaft (10), this attachment may be provided by four spears (39) which form two diametrically opposite clips, as seen particularly in figure 11, clips which embrace the pin of shaft (10) of electric motor (4), performing two functions, coupling of ring (11) and shaft (10) of the motor and functioning as a radial flexor element between these components.

**[0049]** Finally, returning to support (24) for implemen-

tation of the lamp sets, while maintaining the structure described with reference to figure 4, the possibility is provided of incorporating to one of the side walls of its two component elements a large opening (40) to allow handling the lamps housed within it without having to disassemble the images-bearer continuous band.

**[0050]** In any case an extremely compact and light reel is obtained, providing an optimum performance and great ease of installation.

## Claims

1. Images-bearer reel for gaming machines from among those incorporating a number of visors, through which the player is sequentially shown a combination of changing images which belong to corresponding reels which revolve inside the machine and are duly controlled, characterised in that it is constructed from a substantially flat support base (1), and provided with means of attachment to the frame of the gaming machine in question, in which an axial cylindrical neck (2) is set which defines a housing for the electric motor (4) which drives the images-bearer continuous band (16), electric motor (4) which can have different axial positions within this neck (2), with the provision that the outlet shaft (10) of the electric motor is connected to a ring (11) which in turn is connected to one of the openings of the cylindrical ring configured by the continuous band (16), whose end or opening is left overhanging with no other connection to the driving unit.
2. Images-bearer reel for gaming machines, as in claim 1, characterised in that the before mentioned ring (11) is provided with an axial nucleus (12) through which it is connected to outlet shaft (10) of electric motor (4), a nucleus (12) from which a number of radial arms (12) which join said nucleus to an outer hoop (11) to which the aforementioned corresponding opening of the continuous band (16) is attached.
3. Images-bearer reel for gaming machines, as in claim 2, characterised in that radial arms (13) of the support disc of continuous band (16) have a width and thickness which gradually decrease outwards, becoming completely flat when they reach outer ring (11).
4. Images-bearer reel for gaming machines, as in claim 1, characterised in that the other opening of the cylinder formed by continuous band (16), opposite ring (11), is stiffened by means of an enveloping ring (20).
5. Images-bearer reel for gaming machines, as in pre-

vious claims, characterised in that both ring (11) corresponding to the disc which carries continuous band (16) as well as ring (20) which stiffens the other end of this continuous band, have an L-shaped cross section and incorporate in the inner surface a number of radial tabs (14) meant to connect to orifices (15, 15') of the corresponding marginal areas of continuous band (16), and in orifices (18, 18') made in turn on inner rings (17, 17') which clamp the end areas of continuous band (16) against outer rings (11) and (20), with rings (17, 17') elastic and deformable to allow their assembly and disassembly.

6. Images-bearer reel for gaming machines, as in previous claims, characterised in that support base (1) incorporates in addition to the above mentioned axial neck (2) for coupling the electric motor, a second perimetral neck (5) of a considerably greater diameter and a small axial height, which acts as a guide for the reinforcement ring (20) of the corresponding end of the continuous band (16) and its corresponding ring (17').
7. Images-bearer reel for gaming machines, as in previous claims, characterised in that axial neck (2) of support base (1) incorporates a number of pins (9) staggered both axially and angularly, intended for attaching an enveloping support (3) for electric motor (4), and which allow adjusting the position of said electric motor and therefore of the end of its outlet shaft (10) in order to change the separation of ring (11) from said support base (1) and therefore to adapt the set to images-bearer continuous bands (16) of different widths.
8. Images-bearer reel for gaming machines, as in previous claims, characterised in that shaft (10) of electric motor (4) is secured by pressure using elastic forks (26) placed in the inner central area of ring (11).
9. Images-bearer reel for gaming machines, as in previous claims, characterised in that it includes a support (24) with housings (25) as a lamp box, a support (24) which consists of two parts (24, 24') which can be joined to each other so that they may slide on each other, so that the width may be adapted to any band width of the drum.
10. Images-bearer reel for gaming machines, as in previous claims, characterised in that for bands (16) which are very wide, a general configuration is provided with a cylindrical body having an anchoring plate (28) so that it can be placed vertically with an inner mast (27).
11. Images-bearer reel for gaming machines, as in

claim 1, characterised in that support base (1) is provided with a lower extension (8) by which it is attached to an anchoring bar (31) provided with means of attachment to the machine frame, with the anchoring aided by a ratchet (33) with a heel (34) and an arm acting as a spring (35), by which one of the ends of lower extension (8') is anchored to the corresponding anchoring bar (31), while the other end is previously locked in an inner step (30) of said anchoring bar (31).

12. Images-bearer reel for gaming machines, as in claims 1 to 7, characterised in that shaft (10) of electric motor (4) is coupled to the nucleus (12) of ring (11) with the help of four spears (39) which form two clips diametrically opposite ring (11), embracing shaft (10) of electric motor (4) to couple the ring and the shaft.
13. Images-bearer reel for gaming machines, as in claim 9, characterised in that one of parts (24) which form the lamps box has a large opening (40) in one of its sides with which provides a direct access for handling the lamps or illumination means located within said box.

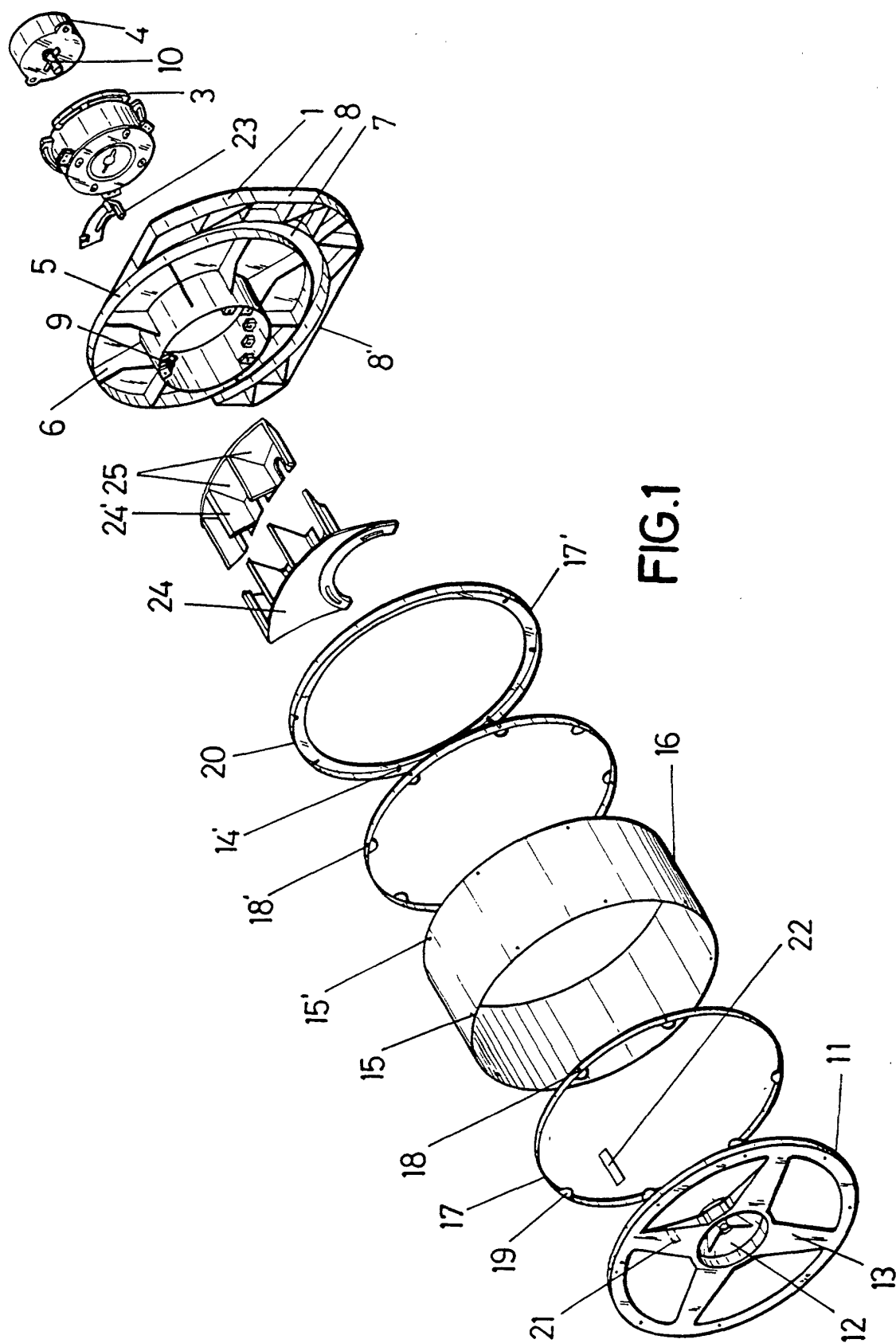


FIG.1

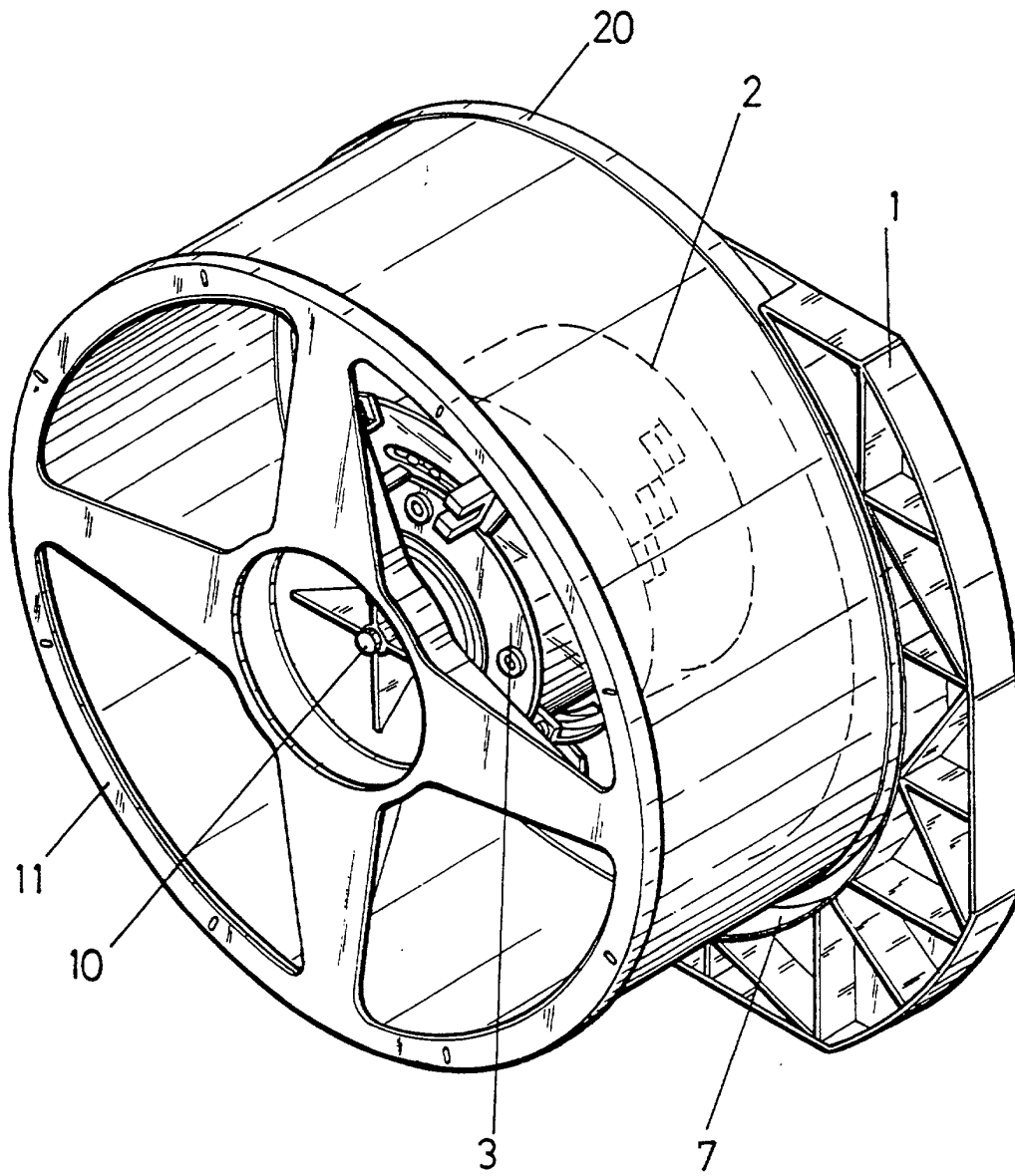


FIG.2



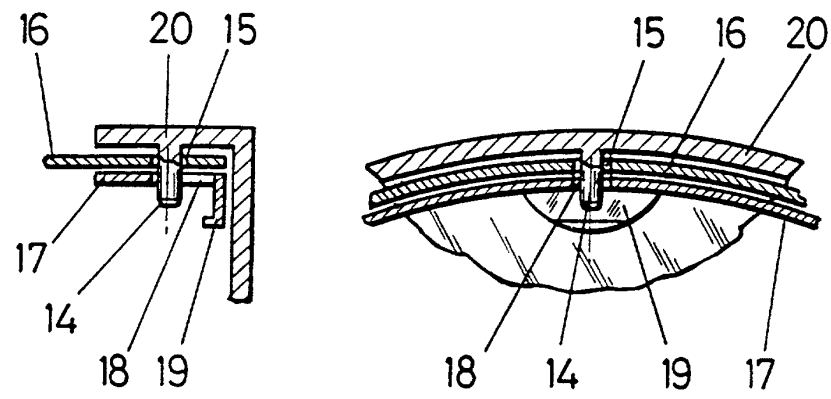


FIG.3

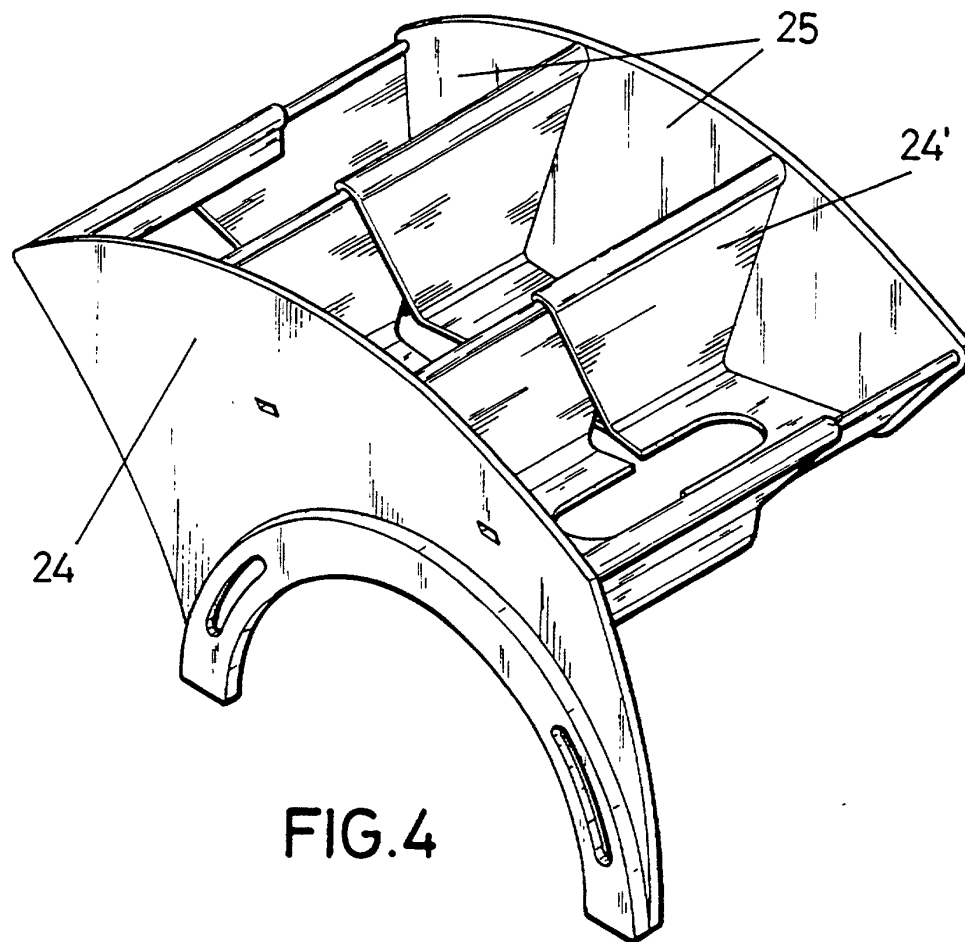


FIG.4

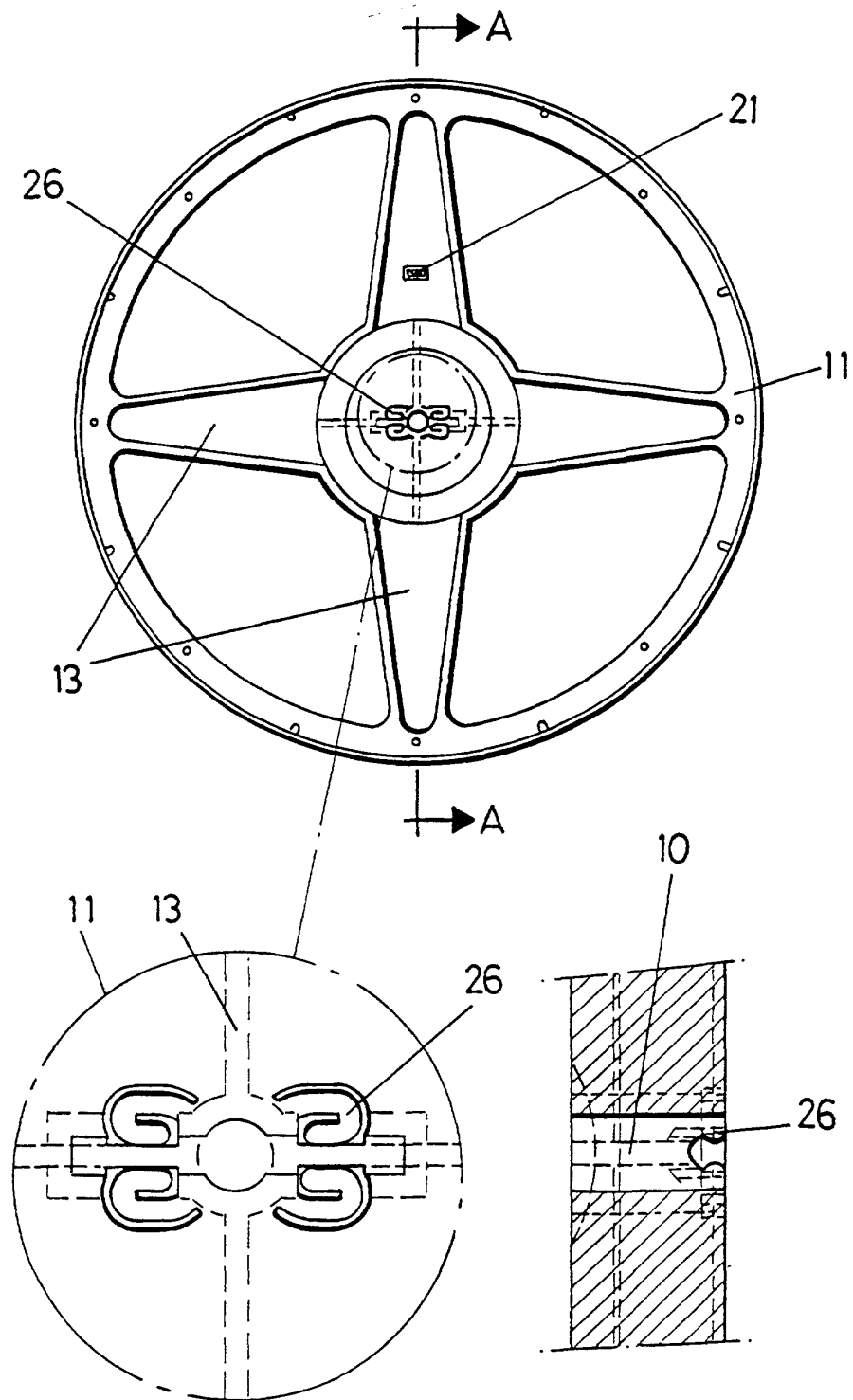
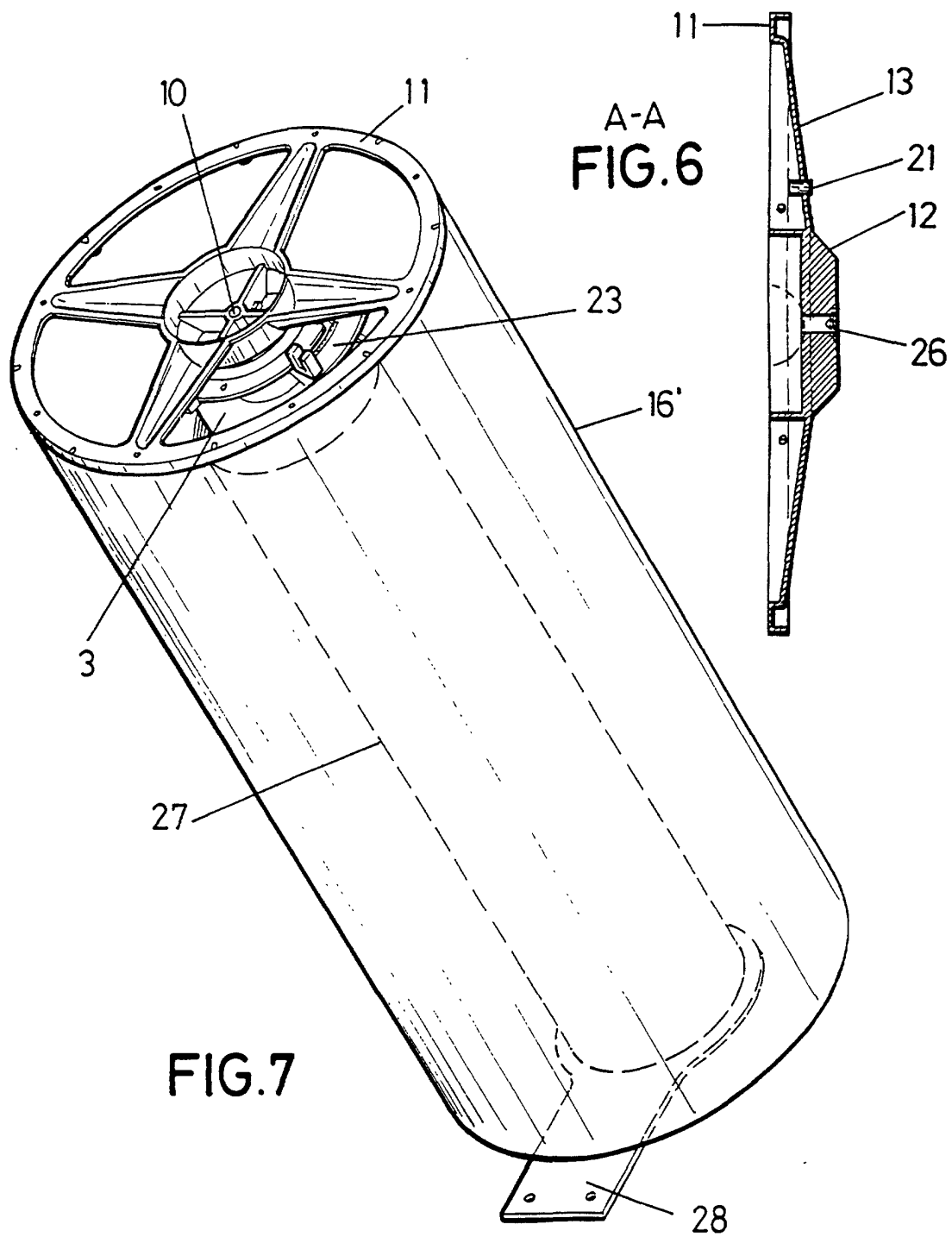


FIG.5



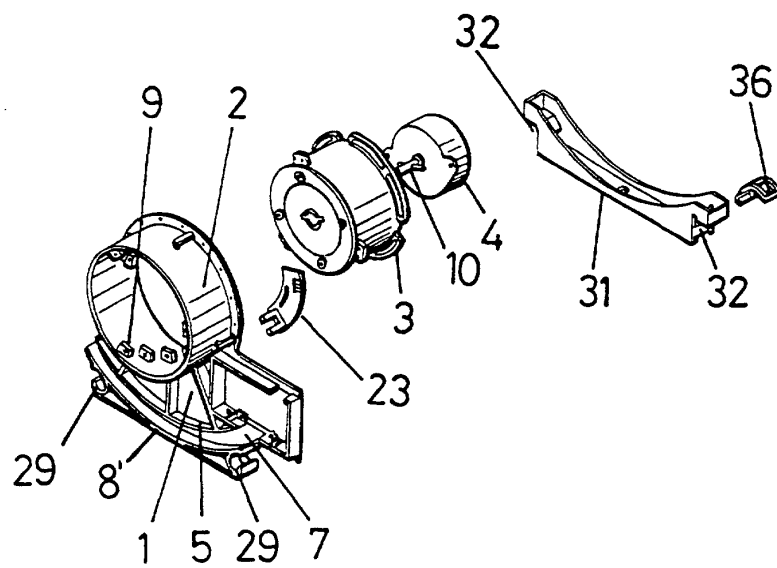


FIG.8

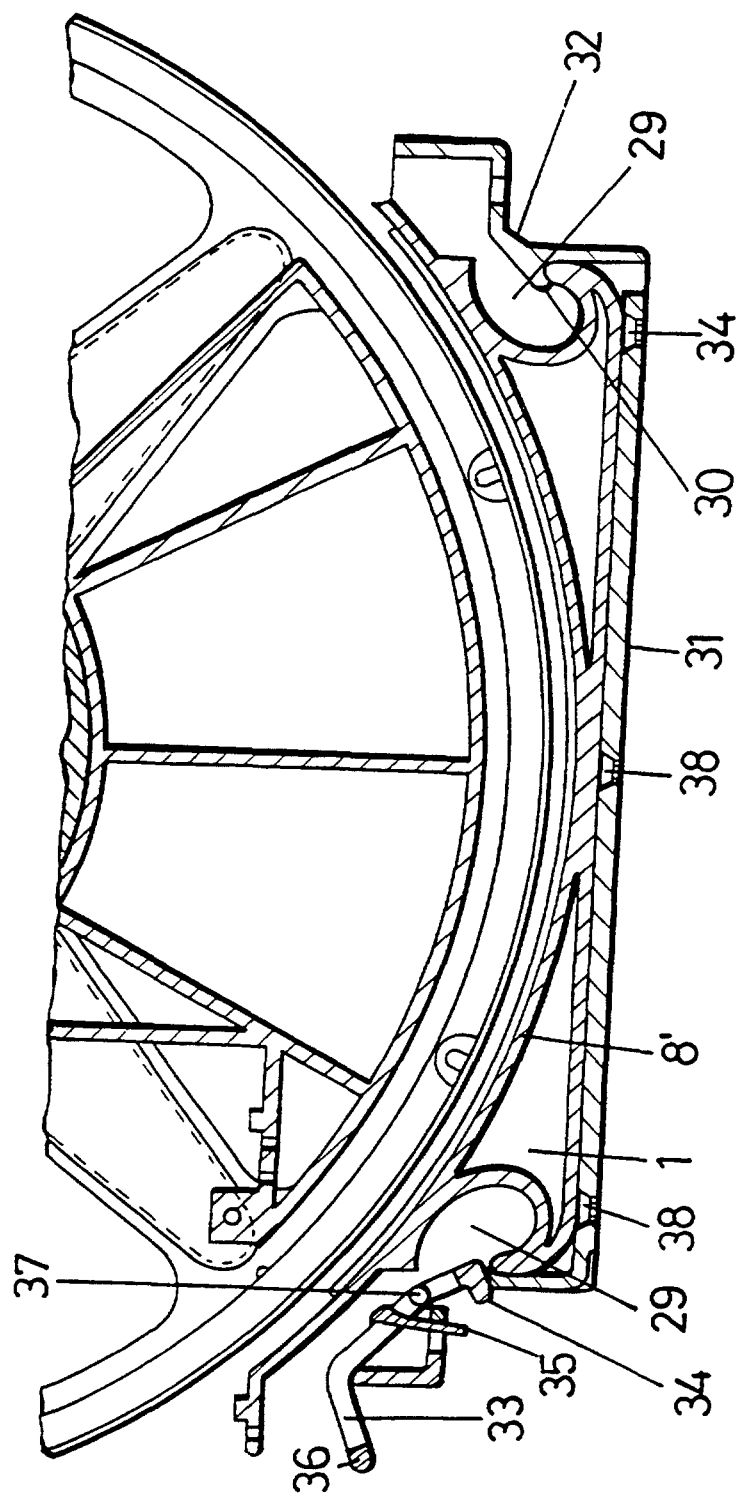


FIG. 9

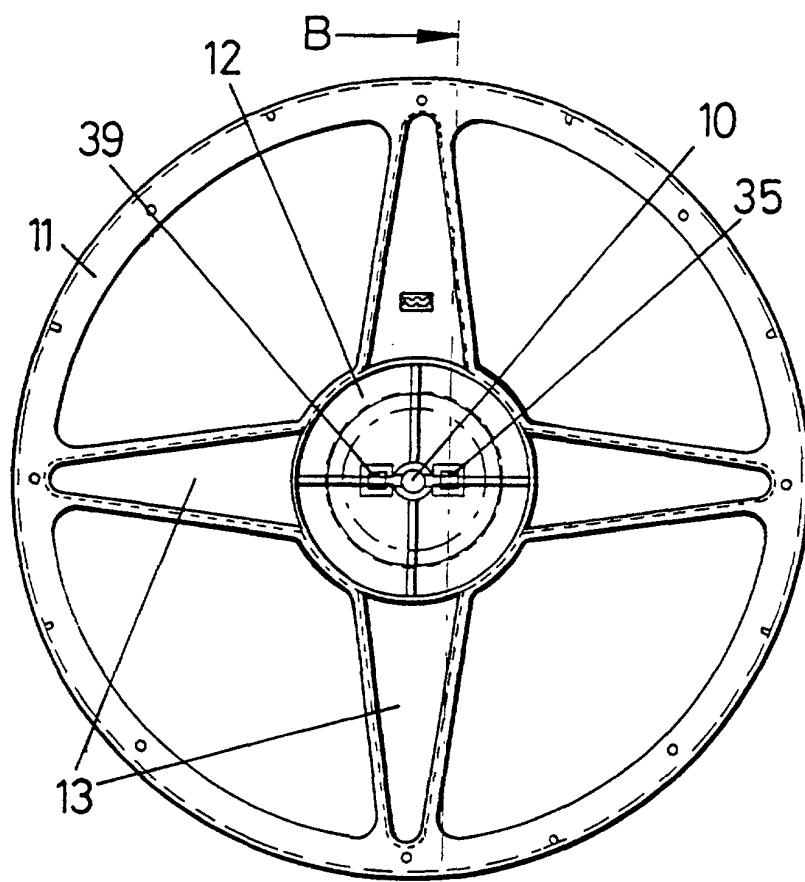


FIG. 11

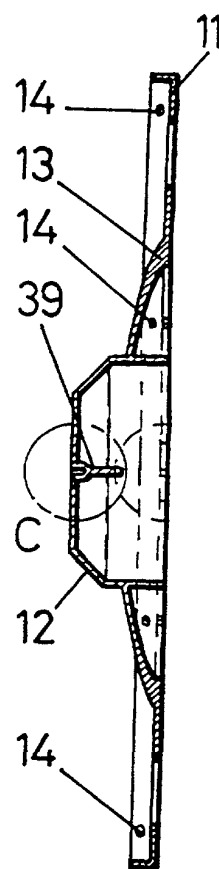


FIG. 12

B-B

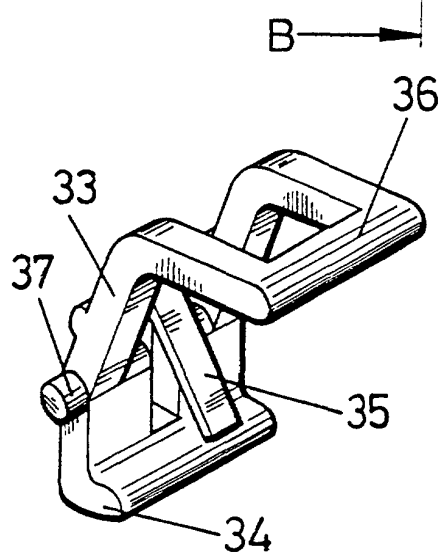


FIG. 10

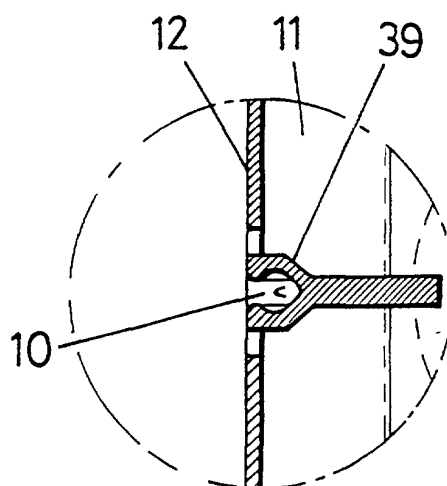
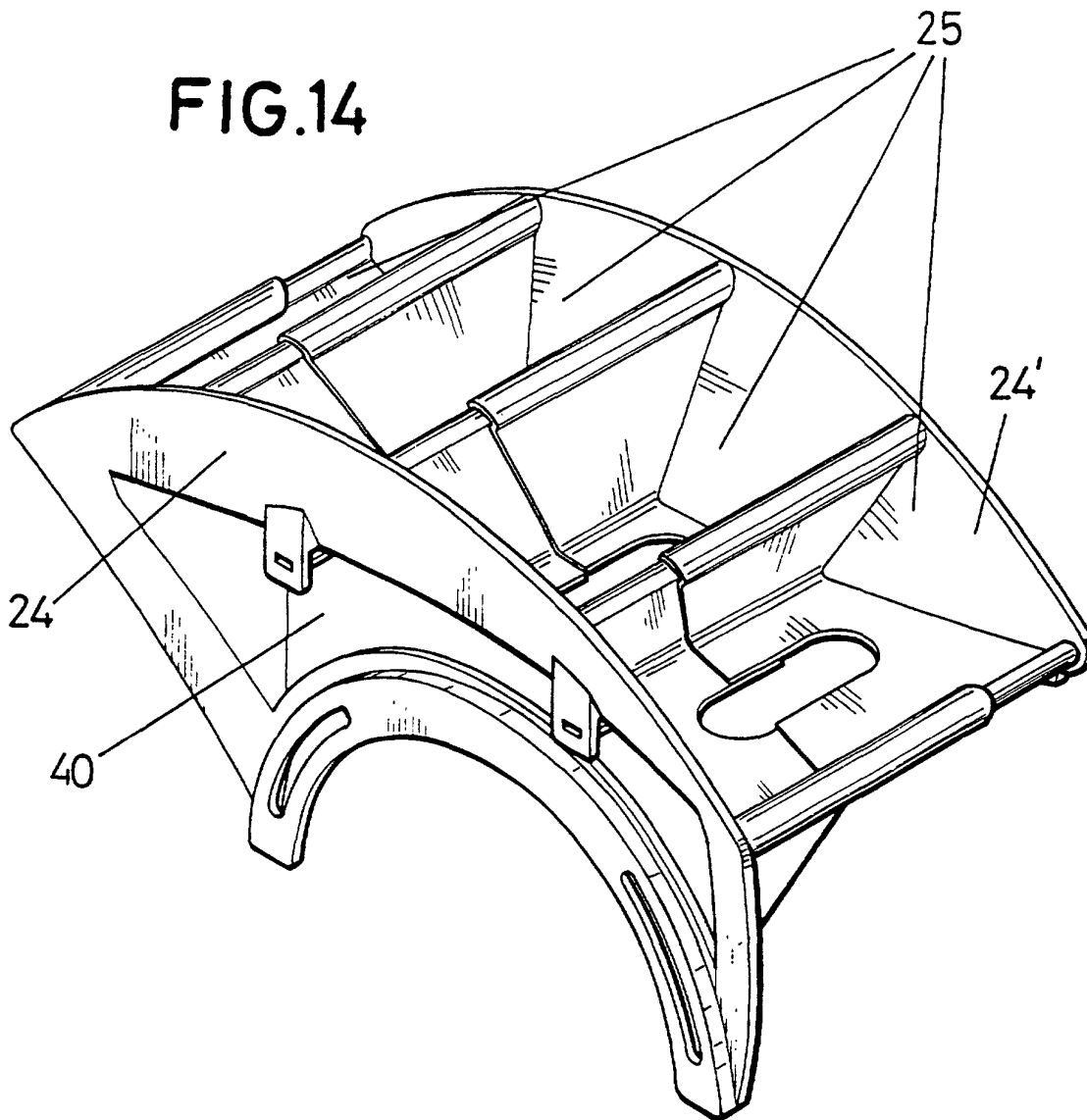


FIG. 13

C

FIG.14



## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/ES 99/00264A. CLASSIFICATION OF SUBJECT MATTER <sup>6</sup>:

IPC6: G07F17/34

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: G07F17/34, A63F5/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CIBEPAT, EPODOC, WPI, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                         | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X<br>A    | ES 2102963 A (INDUSTRIAS LORENZO, S.A.), 1 August 1997 (01.08.97),<br>the whole document.                                  | 1<br>2, 8, 9, 11, 13  |
| A         | WO 9305484 A (STARPOINT ELECTRICS, Ltd), 18 March 1993 (18.03.93),<br>page 5, line 26 - page 8, line 3; figures.           | 1-3, 8, 9, 13         |
| A         | US 4621815 A (YAMAMOTO), 11 November 1986 (11.11.86),<br>column 2, line 23 - column 3, line 28; figures.                   | 1, 3-5, 8             |
| A         | GB 2182478 A (STARPOINT ELECTRICS, Ltd), 13 May 1987 (13.05.87),<br>page 2, line 43 - page 3, line 42; figures.            | 1, 7, 9, 11           |
| A         | WO 9103036 A (BELL-FRUIT MANUFACTURING) 7 March 1991 (07.03.91),<br>page 8, line 16 - page 12, line 19; figures 9a, 11-13. | 1-4, 8                |



Further documents are listed in the continuation of Box C.



See patent family annex.

## \* Special categories of cited documents:

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Date of the actual completion of the international search  
27 December 1999 (27.12.99)Date of mailing of the international search report  
10 January 2000 (10.01.00)

Name and mailing address of the ISA/

Authorized officer

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Telephone No.



## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/ES99/00264

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                                                                                                                                                                                                                                                                                                                                                                                                                                 | Publication<br>date                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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