



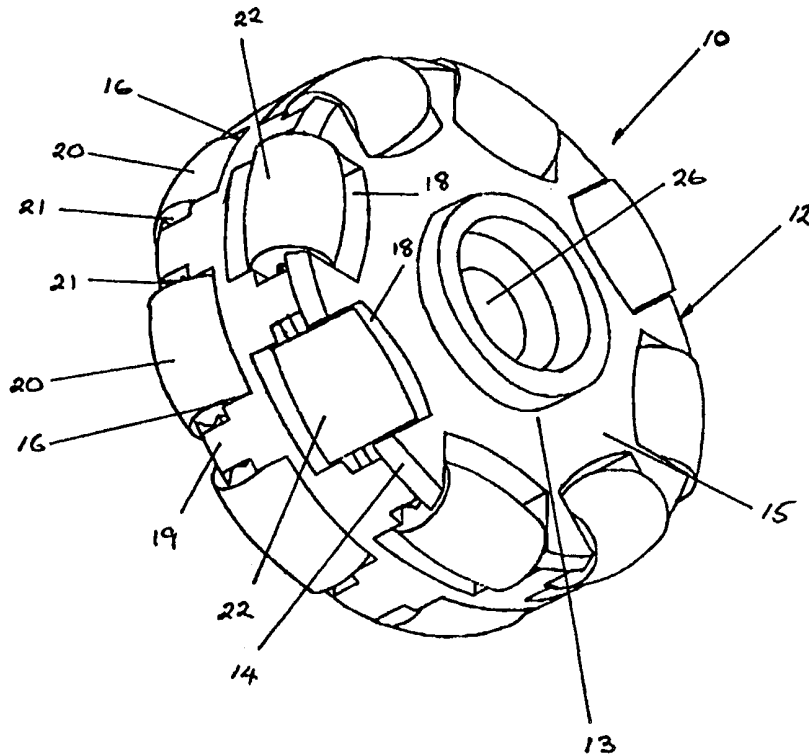
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/AU99/00704 (22) International Filing Date: 31 August 1999 (31.08.99) (30) Priority Data: PP 5606 1 September 1998 (01.09.98) AU (71) Applicant (for all designated States except US): OSCAR INVESTMENTS PTY. LIMITED [AU/AU]; 2 Jasmine Street, Botany, NSW 2019 (AU). (72) Inventor; and (75) Inventor/Applicant (for US only): GUILLE, Henry, Burford [AU/AU]; 2 Jasmine Street, Botany, NSW 2019 (AU). (74) Agent: SMEETON, Anthony, Richard; Davies Collison Cave, Level 10, 10 Barrack Street, Sydney, NSW 2000 (AU).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p>

(54) Title: IMPROVED WHEEL

(57) Abstract

A wheel (10) having a one piece main body (12), which includes a hub portion (13) rotatable about a primary axis of rotation and a rim portion (14). The main body (12) has two groups of mounting recesses (16, 18) therein, the groups of recesses (16, 18) being disposed in two generally parallel spaced apart planes with respect to the direction of the primary axis, the recesses (16, 18) in each group being circumferentially spaced apart and disposed in the region of the rim portion (14) and on opposite sides of the main body (12). The wheel (10) further includes a plurality of rollers (20, 22) arranged in two groups each roller (20, 22) being associated with a respective one of the mounting recesses (16, 18), each roller (20, 22) having axles at each end and being rotatable about a respective roller axis which extends generally transverse of the primary axis. Each roller (20, 22) is partially received within a respective mounting recess (16, 18) and in the mounted position projecting beyond the outer surface of the rim portion (14) of the main body (12), the axles being located in axle slots (21) at each end of each recess (16, 18).



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IMPROVED WHEEL

This invention relates generally to wheels or rollers and more particularly, to an improved wheel or roller which is adapted to provide for movement in more than one
5 direction.

A wheel of this general type is shown in Australian Registered Design No. 105884. This wheel comprises a wheel body with a series of rotatable rollers mounted in the region of the peripheral edge of the wheel body, the rotation axis of each roller being at right angles
10 to the axis of rotation of the wheel. The rollers are mounted in slots formed in the wheel body and are retained in position by a retaining plate. The rollers project beyond the outer peripheral edge of the main body so that the wheel can move in a first direction at right angles to the axis of rotation of the wheel body and a second direction parallel to the axis of rotation of the wheel body by rotation of the rollers. The wheel body comprises two parts,
15 each part having a series of rollers mounted thereto. The two parts are secured together so that the assembly comprises two groups of rollers arranged side by side with the rollers in one group being offset to the rollers in the other group. While the above wheel has been found to perform satisfactorily, there are some problems associated with its assembly because of the relatively large number of parts. Other examples of wheels of this general type are
20 described in US Designs 318219, 309254, and US Patents 565138, 4335899 and 1305535.

According to the present invention, there is provided a wheel which includes one piece a main body, which includes a hub portion rotatable about a primary axis of rotation and a rim portion, the main body having therein two groups of mounting recesses, the groups of
25 recesses being disposed in two generally parallel spaced apart planes with respect to the direction of the primary axis, the recesses in each group being circumferentially spaced apart and disposed in the region of the rim portion and on opposite sides of the main body, the wheel further including a plurality of rollers arranged in two groups each roller being associated with a respective one of the mounting recesses, each roller having axle portions
30 at each end and being rotatable about a respective roller axis which extends generally

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transverse of the primary axis, each roller being partially received within a respective mounting recess and in the mounted position projecting beyond the outer surface of the rim portion of the main body the axle portions being located in axle slots at each end of the recess.

5

In one form of the invention, the axle slots open to an open side at the peripheral edge portion of the main body. In another form, the axle slots open to an open side of the sides of the main body.

10 In one preferred form, the axle slots include resiliently deformable flanges or lips at their open side which enable the axle portions to snap fit into the slots.

Preferably, the recesses are in each group separated by sections of the main body so that the recesses are isolated from one another. It is further preferred that the recesses have 15 curved inner walls so that when viewed in cross section is about the same dimension or slightly larger than the cross sectional dimension of the roller associated therewith.

According to one preferred embodiment, the wheel further includes outer covers on respective opposite sides of the main body, the two covers each including a hub portion and 20 a rim portion and having a plurality of mounting recesses therein each of which is associated a respective recess in the main body so that together they form a pocket for receiving one of the rollers. In this particular embodiment, the axle mounting slots are closed by an inner wall portion of an associated cover so as hold the axle captive therein.

25 Preferably, the main body includes a generally circular disc-like element having sides and an outer circumferential face, the recesses opening outwardly from respective side faces to the outer face. In the particular embodiment having covers, the covers are disc-like and are of complementary diameter to the main body.

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Preferred embodiments of the invention are described with reference to the accompanying drawings, and in those drawings :

Figure 1 is a plan view of a wheel according to one embodiment of the present invention;

5 Figure 2 is a perspective view of the wheel shown in Figure 1;

Figure 3 is a schematic isometric view of the wheel shown in Figures 1 and 2;

Figure 4 is a schematic isometric view of a wheel according another embodiment of the present invention;

Figure 5 is a side elevation of the wheel body of the wheel shown in Figure 4;

10 Figure 6 is a sectional view taken along the line A-A in Figure 5;

Figure 7 is a side elevation of a cover member of the wheel shown in Figure 4;

Figure 8 is a sectional view of the cover member shown in Figure 7;

Figure 9 is a partially cut away view of the wheel shown in Figure 4;

Figure 10 is a side elevation of the roller axle;

15 Figure 11 is an end view of the axle shown in Figure 10; and

Figure 12 is a sectional view of one of the rollers.

Referring to Figures 1 to 3 of the drawings there is shown a wheel generally indicated at 10 which includes a one piece main body 12.

20

The main body 12 includes a hub portion 13 rotatable about a primary axis of rotation A-A and a rim portion 14 having side faces 11 and 15 and an outer circumferential face 19. The main body has formed therein two groups of mounting recesses 16 and 18 which are formed in the rim portion 14. The groups of recesses 16 and 18 are disposed in two
25 generally parallel spaced apart planes with respect to the direction of the primary axis A-A.

The recesses in each group are circumferentially spaced apart and disposed in the region of the rim portion 14 and on opposite sides of the main body. The main body is generally in the form of a circular disc shaped element.

30 The recesses 16 and 18 have a curved wall portion and open outwardly from

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respective side faces 11 and 15 and circumferential face 19. The recesses further include axle mounting slots 21 which open outwardly from the circumferential face 19. The slots 21 include a vertical end wall 41 and a V-shaped base wall 42. The hub portion 13 includes an aperture 26 for receiving a wheel axle as is conventional. The axle mounting slots 21 include
5 resilient flanges or lips 43.

The wheel further includes a plurality of rollers arranged in two groups 20 and 22 each roller being associated with a respective one of the mounting recesses described above.

Each roller includes a roller body 24 with the outer surface 26 of the roller body being
10 curved in the general axial direction. Each roller is rotatable upon a respective roller axle 27 having end portions 28 receivable in slots 21 the axis of rotation of which extends generally transverse of the primary axis A-A. The axle end portions 28 are adapted to snap fit into the slots 21 by deformation of the flanges or lips 43. In addition, the axles are retained by adhesive. Each roller is partially received within the mounting recess and in the
15 mounted position projects beyond the outer face 19 and one of the side faces 11 or 15 of the main body 12.

Referring to Figures 3 to 11 of the drawings there is shown a wheel generally indicated at 10 which includes a main body 12 and outer covers 30 and 32 the three parts
20 being secured together by means of screws 40 which mount each cover to the main body.

The main body 12 includes a hub portion 13 rotatable about a primary axis of rotation A-A and a rim portion 14 having side faces 11 and 15 and an outer circumferential face 19. The main body has formed therein two groups of mounting recesses 16 and 18 which are
25 formed in the rim portion 14. The groups of recesses 16 and 18 are disposed in two generally parallel spaced apart planes with respect to the direction of the primary axis A-A.

The recesses in each group are circumferentially spaced apart and disposed in the region of the rim portion 14 and on opposite sides of the main body. The main body is generally in the form of a circular disc shaped element.

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The recesses 16 and 18 have a curved wall portion and open outwardly from respective side faces 1 and 15 and circumferential face 19. This is best illustrated in Figure 3. The recesses further include axle mounting slots 21. The hub portion 13 includes an aperture 26 for receiving a wheel axle as is conventional.

5

The wheel further includes a plurality of rollers arranged in two groups 20 and 22 each roller being associated with a respective one of the mounting recesses described above. Each roller includes a roller sleeve 23 and a roller body 24 with the outer surface 26 of the roller body being curved in the general axial direction. Each roller is rotatable upon a
10 respective roller axle 27 having end portions 28 receivable in slots 21 the axis of rotation of which extends generally transverse of the primary axis A-A. Each roller is partially received within the mounting recess and in the mounted position projects beyond the outer face 19 and one of the side faces 11 or 15 of the main body 12.

15 The roller axle has end portions which are mounted within the axle mounting slots 21. The sleeve 23 is locatable on the axle for rotation thereon.

The two covers 30 and 32 each are in the form of circular disc like elements and include a hub portion 34 and a rim portion 35. Each cover is provided with a plurality of
20 mounting recesses 38 therein which are complementary to a respective recess 16 or 19 in the main body 12 so that together they form a pocket for receiving one of the rollers. When assembled the inner side wall of the cover overlies the axial mounting slots 21 so as to retain the roller axle in position. Apertures 39 are provided in each cover for providing access to the mounting recesses.

25

As best seen in Figures 1 and 3 the rollers in one group 20 are offset and arranged to overlap the rollers in the other group 22.

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Finally, it is to be understood that various alterations, modifications and/or additions may be incorporated into the various constructions and arrangements of parts without departing from the spirit or ambit of the invention.

THE CLAIMS

1. A wheel which includes a one piece main body, which includes a hub portion rotatable about a primary axis of rotation and a rim portion, the main body having therein two groups of mounting recesses, the groups of recesses being disposed in two generally parallel spaced
5 apart planes with respect to the direction of the primary axis, the recesses in each group being circumferentially spaced apart and disposed in the region of the rim portion and on opposite sides of the main body, the wheel further including a plurality of rollers arranged in two groups each roller being associated with a respective one of the mounting recesses, each roller
10 having axles at each end and being rotatable about a respective roller axis which is extends generally transverse of the primary axis, each roller being partially received within a respective mounting recess and in the mounted position projecting beyond the outer surface of the rim portion of the main body, the axles being located in axle slots at each end of each recess.
- 15 2. A wheel according to claim 1 wherein the axle slots open to the peripheral edge portion of the main body.
3. A wheel according to claim 1 wherein the axle slots open to the sides of the main
20 body.
4. A wheel according to claim 2 or claim 3 wherein the axle slots include resiliently deformable flanges at their opening which enable the axle portions to snap fit into the slots.
5. A wheel according to any preceding claim, wherein the recesses are separated from
25 one another by sections of the main body so that the recesses are isolated from one another.
6. A wheel according to any preceding claim, wherein the recesses have curved inner walls so that the pocket when viewed in cross section is about the same dimension or slightly larger than the cross sectional dimension of the roller associated therewith.

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7. A wheel according to any preceding claim further including outer covers securable to respective opposite sides of the main body, the two covers each including a hub portion and a rim portion and having a plurality of mounting recesses therein each of which is associated a respective recess in the main body so that together they form a pocket for receiving one of
5 the rollers.

8. A wheel according to claim 7 wherein the axle mounting slots are closed by an inner wall portion of an associated cover so as to hold the axle captive therein.

10 9. A wheel according to any preceding claim wherein the main body includes a generally circular disc-like element having side faces and an outer circumferential face, the recesses opening outwardly from respective side faces and the outer face.

10. A wheel according to claim 9 wherein the covers are disc-like and are of
15 complementary diameter to the main body.

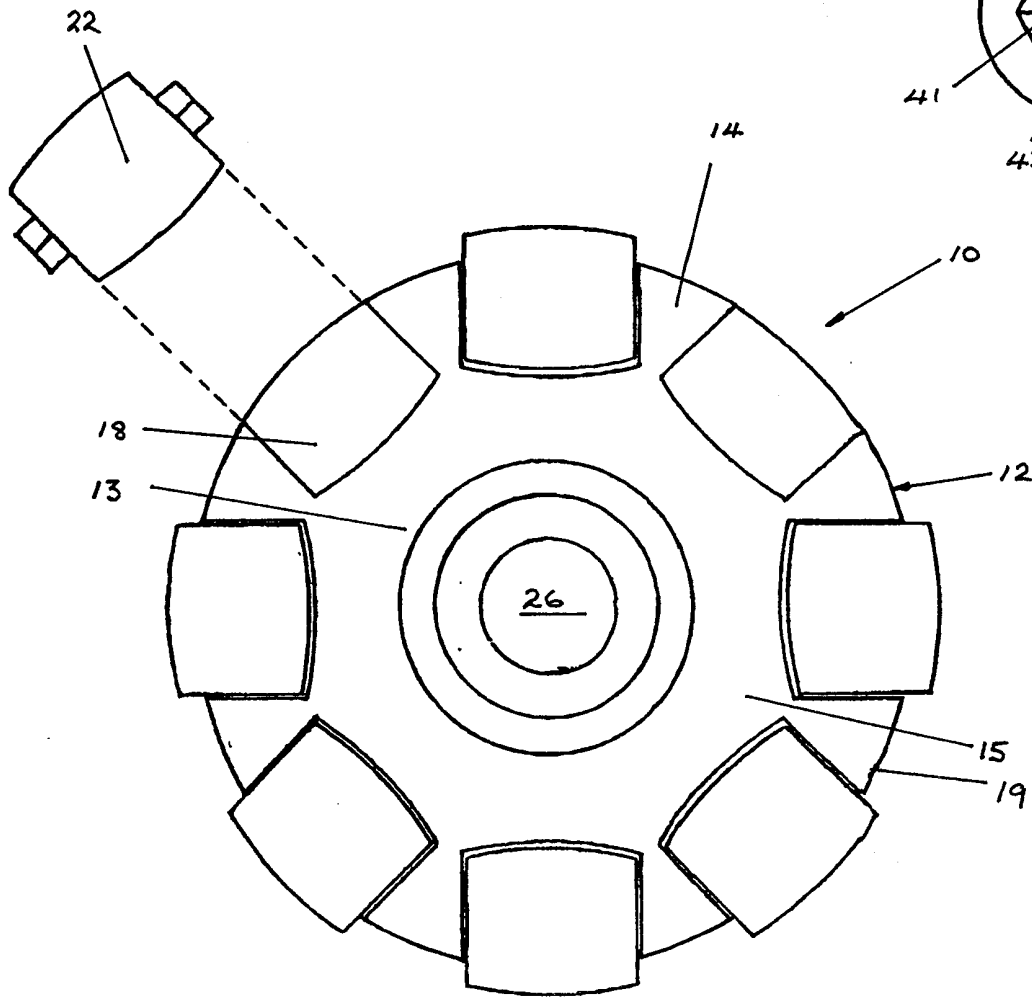
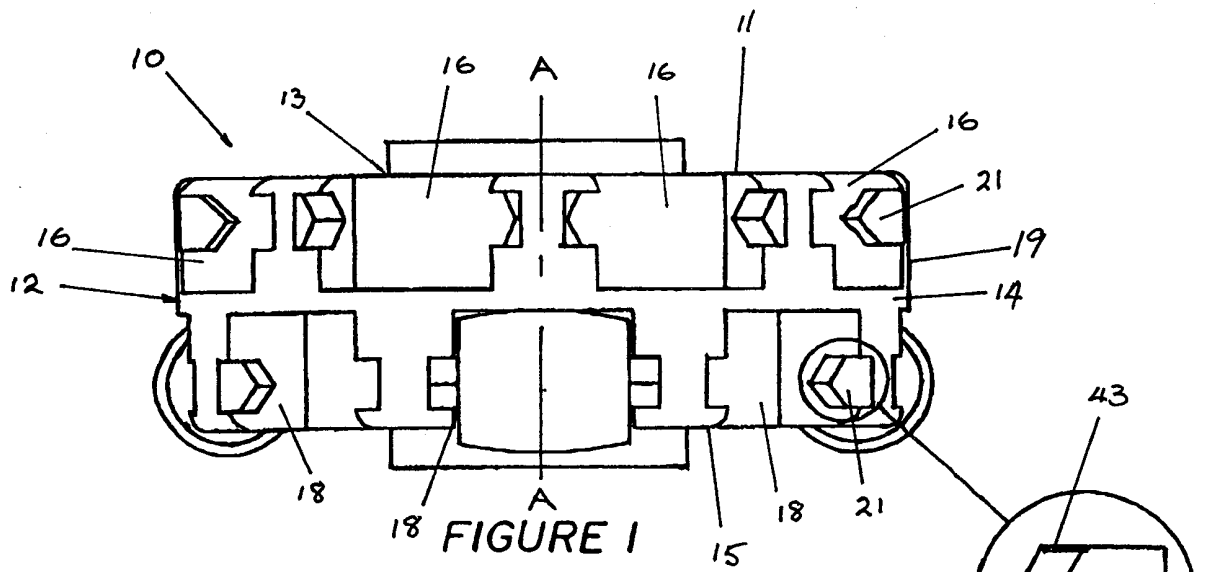
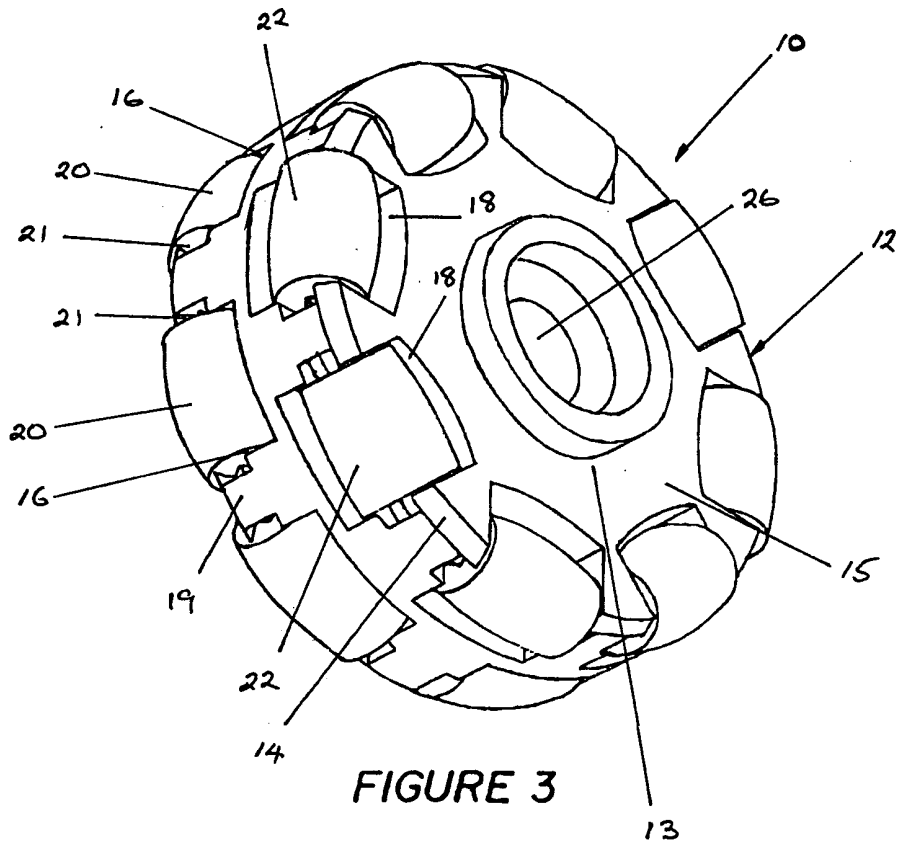


FIGURE 2



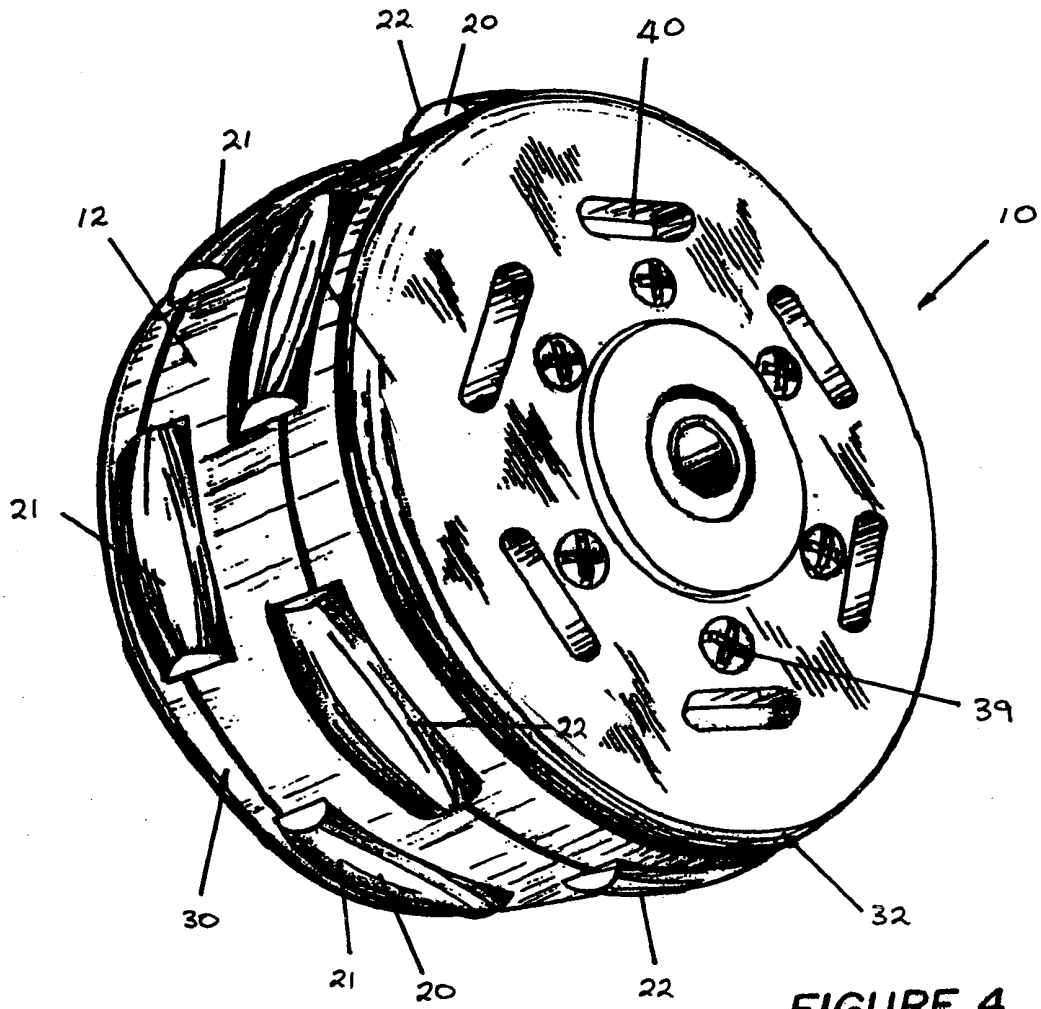


FIGURE 4

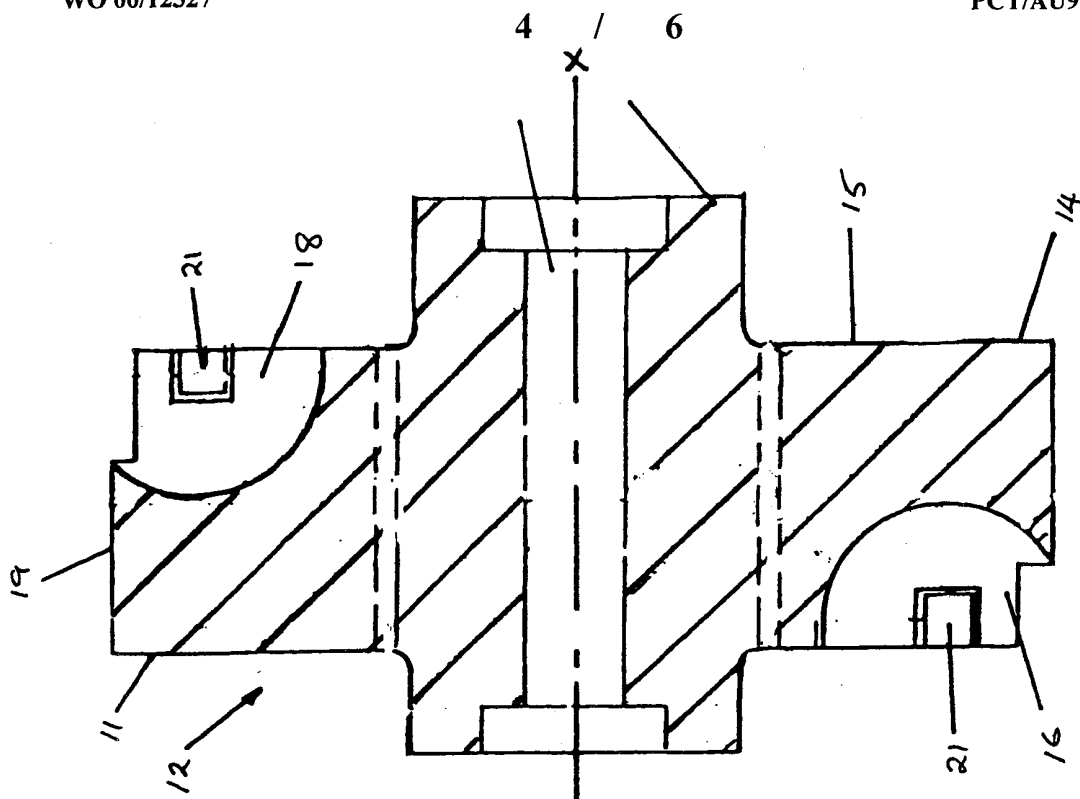


FIGURE 6

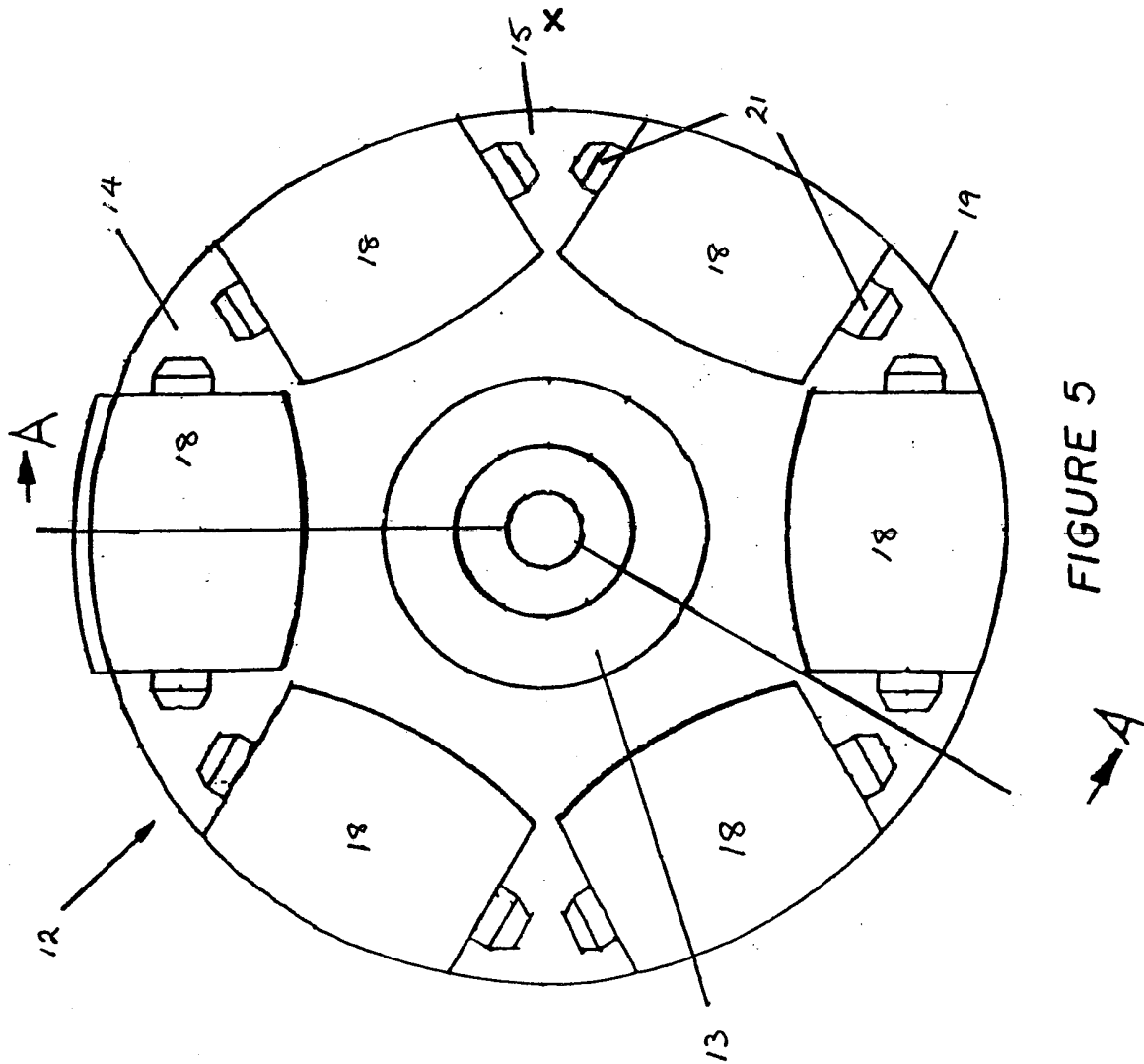


FIGURE 5

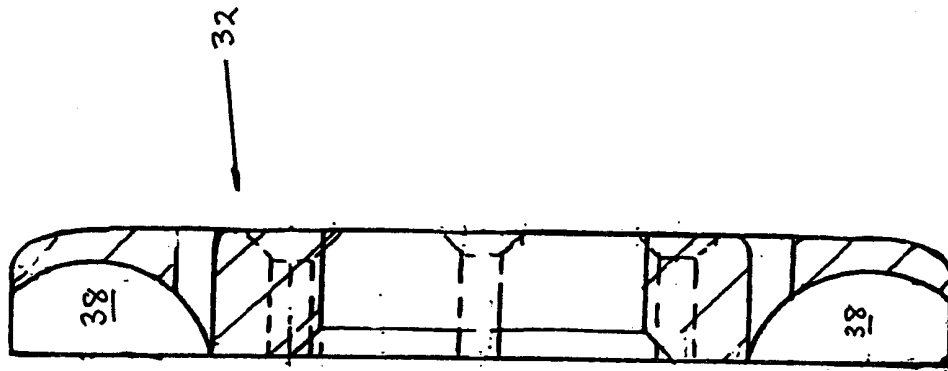


FIGURE 8

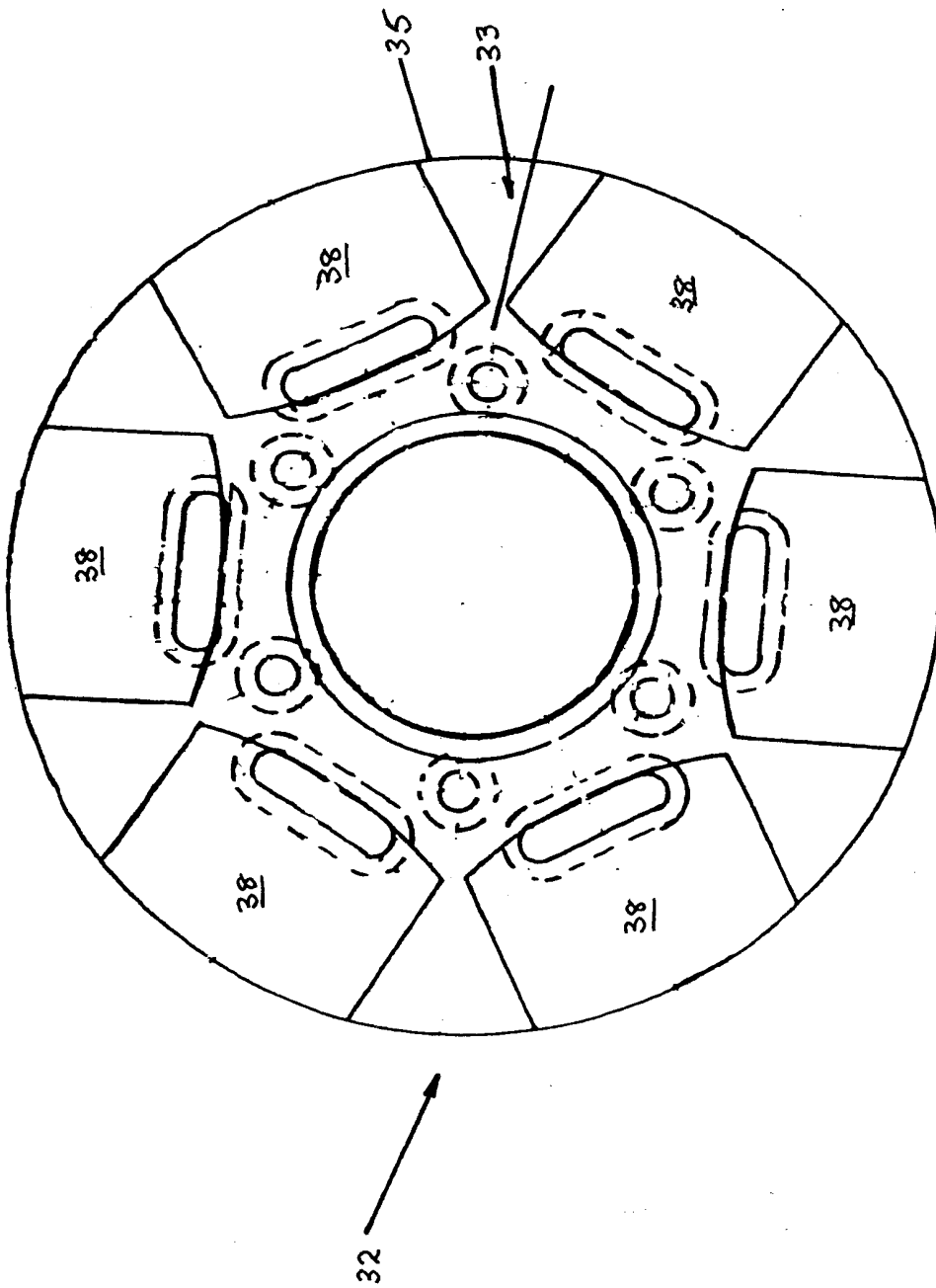


FIGURE 7

FIGURE 9

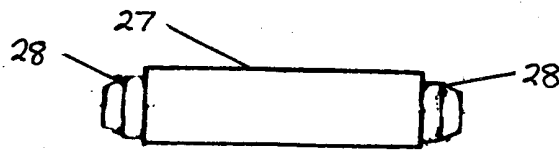
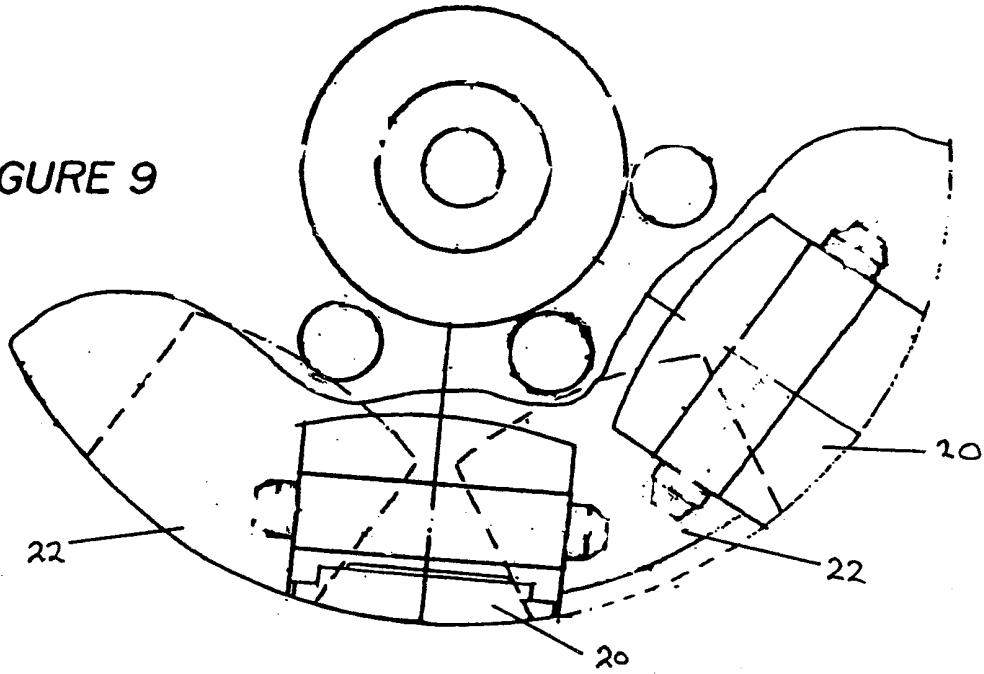
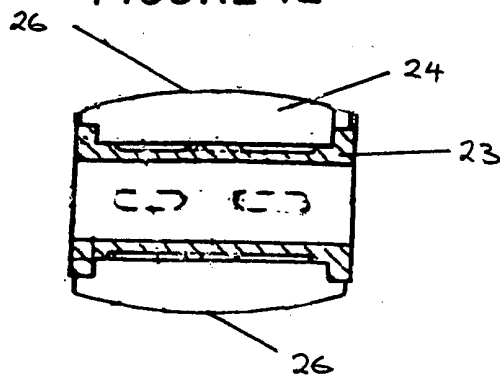


FIGURE 10



FIGURE 11

FIGURE 12



INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 99/00704

A. CLASSIFICATION OF SUBJECT MATTER				
Int Cl ⁶ : B60B 19/12				
According to International Patent Classification (IPC) or to both national classification and IPC				
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Minimum documentation searched (classification system followed by classification symbols) IPC B60B 19/-				
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US D318791 (GUILLE) 6 August 1991 Figures	1-10		
X	US 4335899 A (HISCOCK) 22 June 1982 Whole document	1-10		
X	US 4223753 A (BRADBURY) 23 September 1980 Figures 1-4	1-10		
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 99/00704

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3882885 A (MCCAIN) 13 May 1975 Figures 5, 6; column 3, line 64 - column 4, line 33	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU 99/00704

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Patent Document Cited in Search Report		Patent Family Member	
US	4335899	GB	2052403

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