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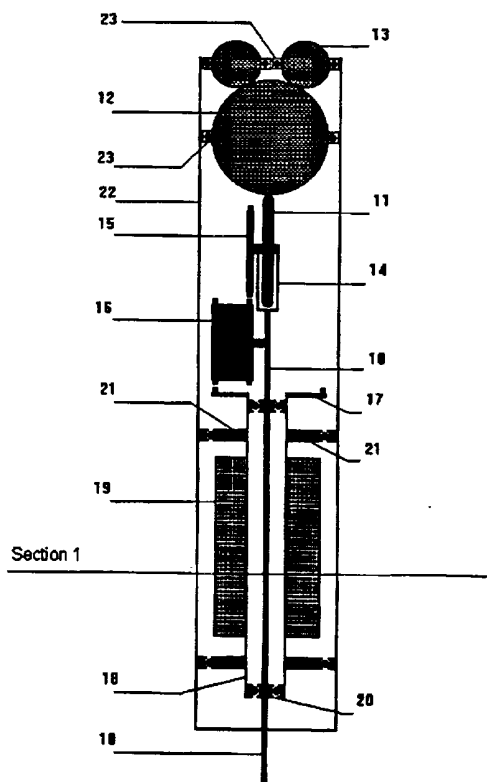
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GB 1495436 A **WO 98/08572 A**

(58) Field of Search
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INT CL⁶ **A63B 22/02 69/00 , F16H 35/00 35/18 37/02**
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(54) Abstract Title
Rolling sphere propulsion unit

(57) A propulsion unit, which, when part of a cluster of such propulsion units placed onto a controlling device, becomes part of a directional conveying/walking machine. The four surface spheres 13, of each propulsion unit, will turn with a uniform speed and direction within 360 degrees. The direction in which the spheres turn is controlled by the directing rod 10, which is mounted inside the drive tube 18, and held in position and able to turn independently of the drive tube, by bearings 20. The drive tube is mounted inside of, and turned by, the electric motor 19. It has a sprocket 17 at the top end which turns an intermediate sprocket 16 which turns the sprocket 15 attached to the wheel 11 driving the main sphere 12 which drives the surface spheres. The drive tube is held in position, and turns independently of the housing, by bearings 21.

Figure 1



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Figure 1

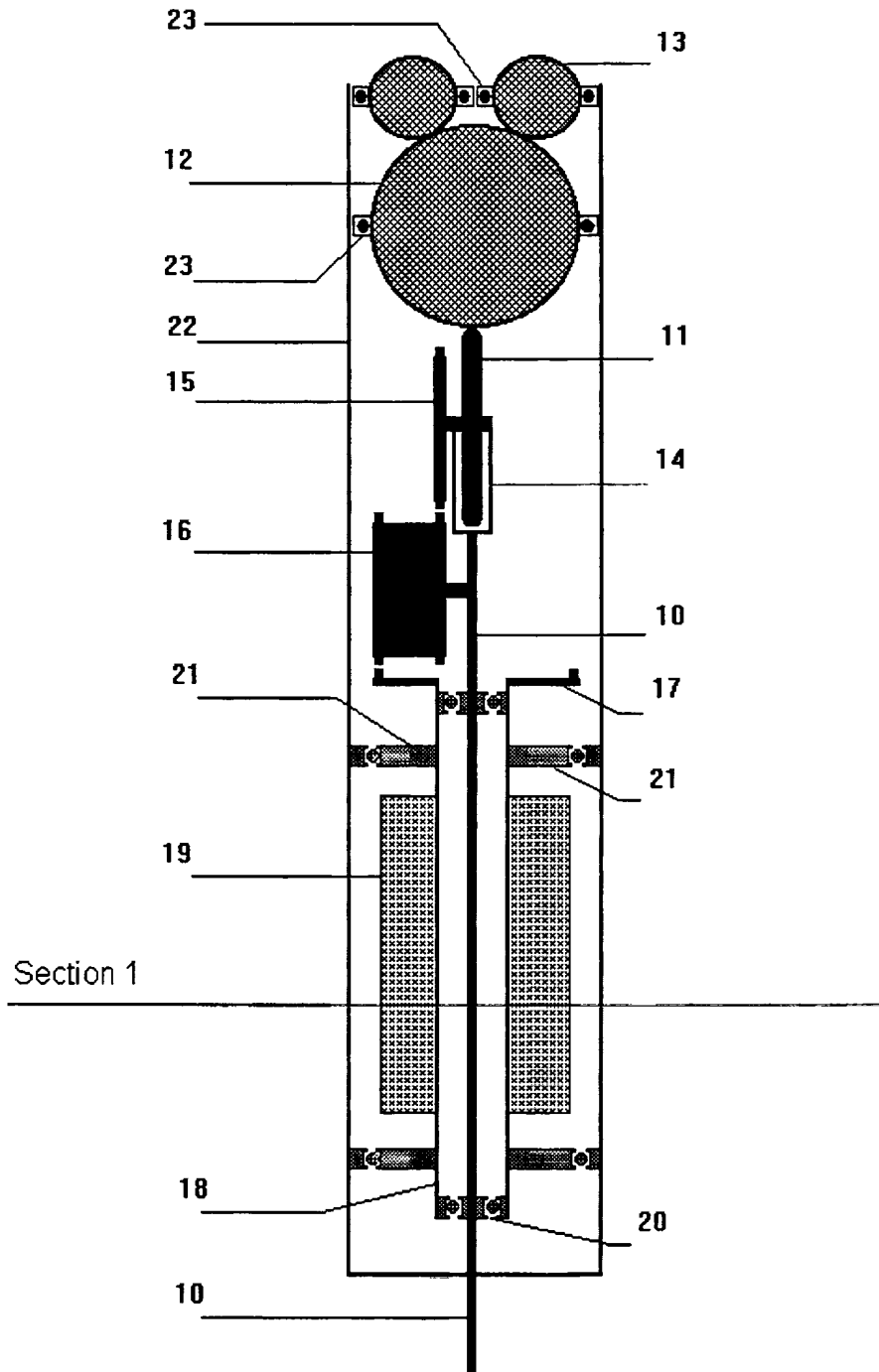


Figure 2

Section 1

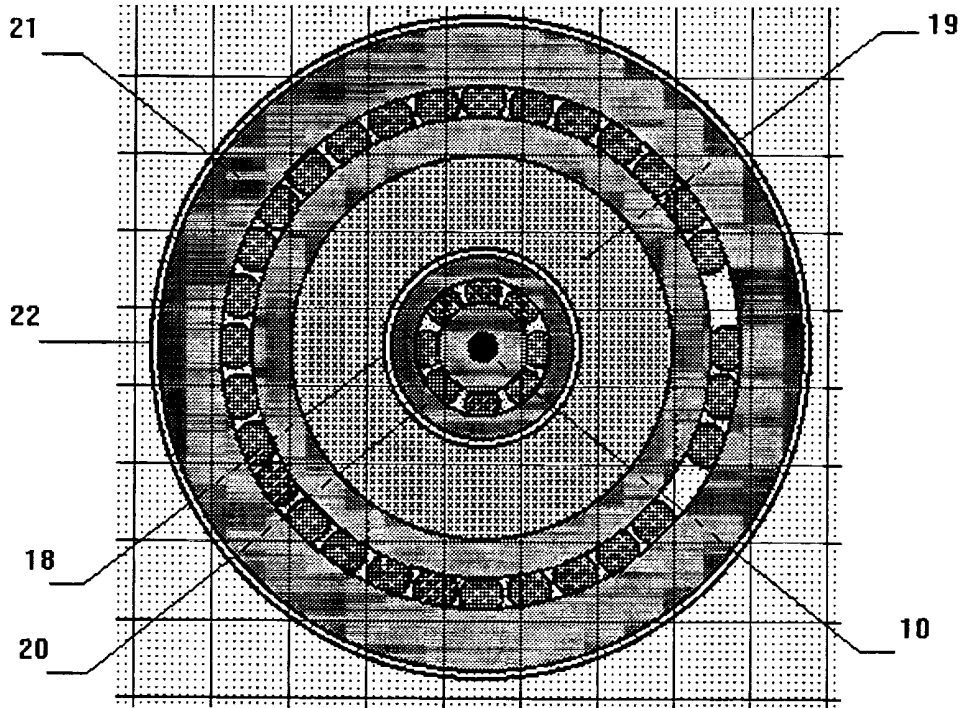


Figure 3

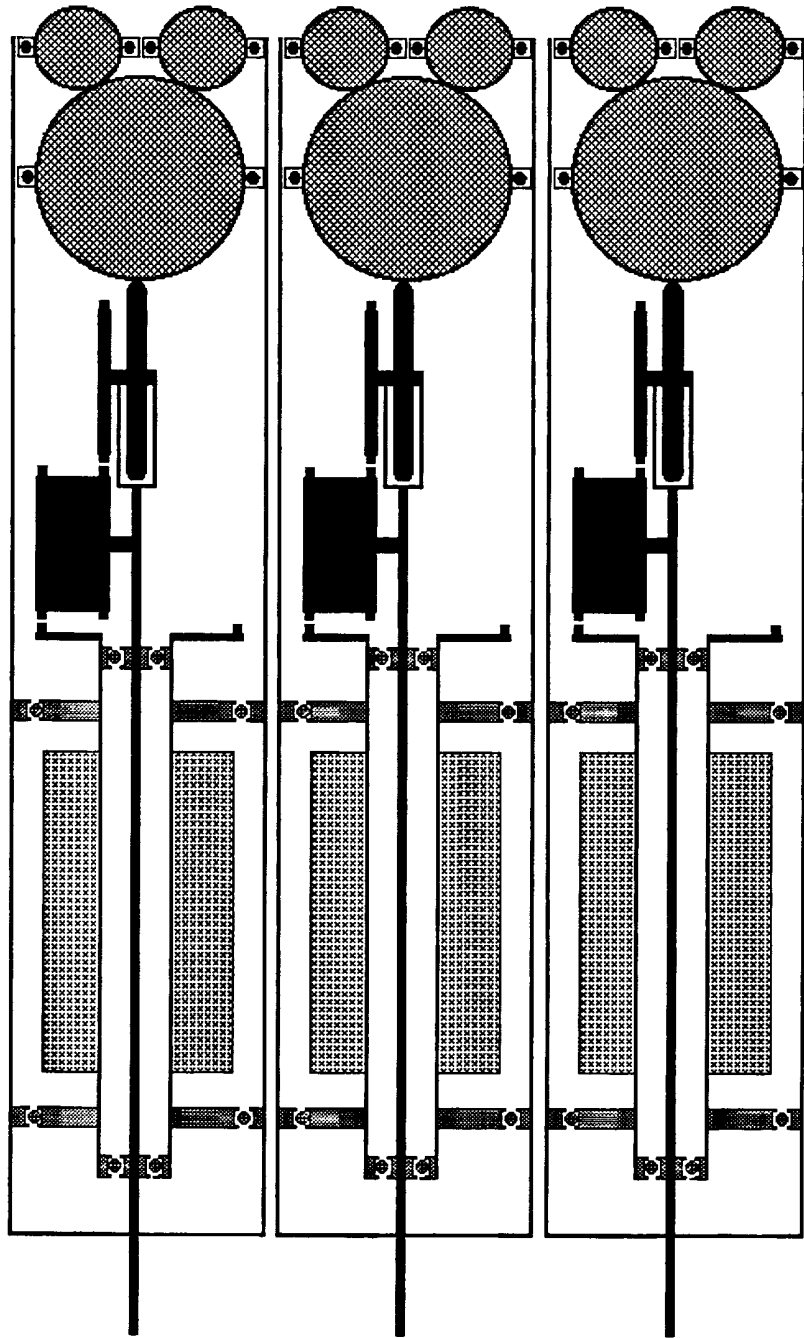


Figure 4

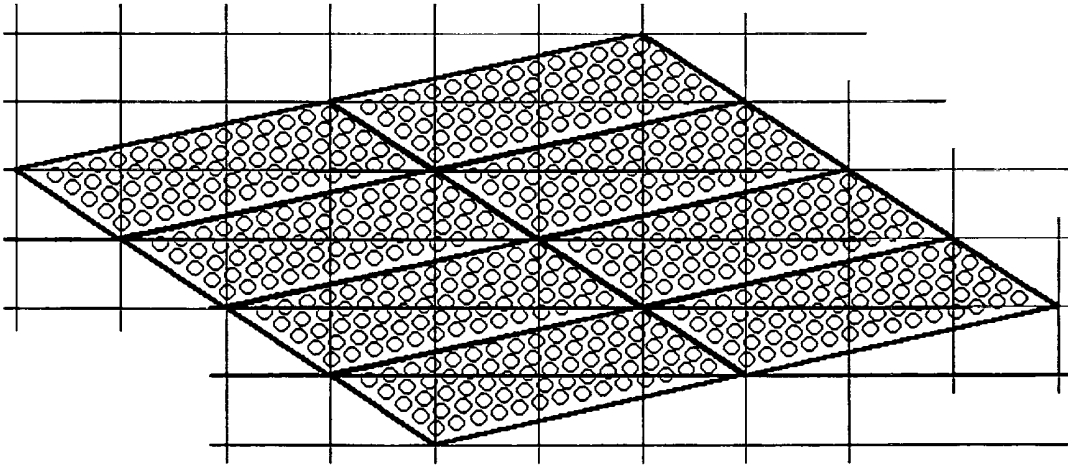
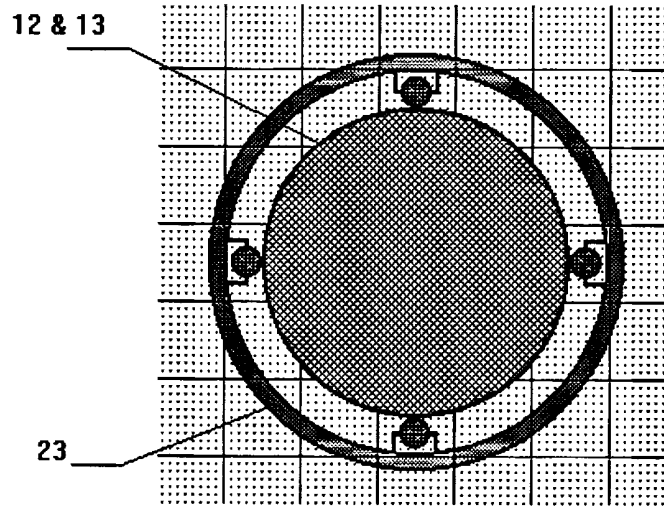


Figure 5



ROLLING SPHERE PROPULSION UNIT

This invention relates to a rolling sphere propulsion unit.

Conveyor belts or walking/running machines are well known devices which comprise of a surface that moves in a single direction for the propulsion of an object, or for a person to walk on the spot.

According to the present invention there is provided a propulsion unit, which, when part of a cluster of units placed onto a controlling device, becomes a conveying/walking machine, which is directional in any one of 360 degrees.

As the surface spheres of the propulsion units turn, the person standing on the spheres will be propelled across the surface in the direction of the turning spheres. To prevent himself from falling off the edge he must start to walk towards the centre. The direction in which the spheres turn may be altered mid-stream to change the direction that the person on the surface has to walk.

If it were possible to force the spheres to change direction and speed, as the person walking on the surface changes direction and speed, there would be an opportunity to use the machine in a 'virtual reality' application, to, with the use of hydraulics, provide a walking platform, of approximately two yards square, that can tilt to simulate inclines and declines in the walker's path.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:-

Figure 1 shows an elevation section of a whole single propulsion unit.

Figure 2 shows a plan section of the unit as indicated on Figure 1 as Section1.

Figure 3 shows the units arranged side by side.

Figure 4 shows the effect of clustering a number of the propulsion units to create a walking surface.

Figure 5 shows a plan of a stabiliser and sphere.

Referring to the drawings, the propulsion unit comprises a directing rod 10 which can be positioned in any one of 360 degrees, enabling the wheel 11 to drive the main sphere 12 in any one of 360 degrees. The main sphere will drive the surface spheres 13, of which there are four, in a uniform speed and direction.

The wheel 11 is turned by sprocket 15, which is mounted outside the wheel's fork 14.

Sprocket 15 is turned by sprocket 16, mounted on the directing rod, which is turned by sprocket 17.

Sprocket 17 is attached to, and turned by, the drive tube 18 which is mounted inside of and powered by the electric motor 19.

The inner bearing 20 enables the drive tube 18 to turn freely against the directing rod 10.

The outer bearing 21 enables the drive tube 18 to turn freely against the housing 22.

The sphere stabilisers 23 hold the spheres 12 and 13 in position.

Each surface sphere can be further layered with four more spheres to reduce the size of, and increase the concentration of, the spheres at the surface.

CLAIMS

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1. A rolling sphere propulsion unit comprising of four surface spheres, a main sphere, a directing rod and wheel, a drive tube and an electric motor, all housed in a tube of an inner diameter equal to that of the overall diameter of the main sphere's stabiliser and arranged together so that the surface spheres are driven at a uniform speed, which is variable, and a uniform direction, which is variable within 360 degrees.
2. A rolling sphere propulsion unit as claimed in Claim 1 wherein the surface spheres are mounted on top of, and driven by, the main sphere.
3. A rolling sphere propulsion unit as claimed in Claim 1 or Claim 2, wherein the main sphere is driven by the wheel.
4. A rolling sphere propulsion unit as claimed in Claim 3 wherein the wheel is positioned by the directing rod, which can turn in 360 degrees.
5. A rolling sphere propulsion unit as claimed in Claim 3 wherein the wheel is driven by a sprocket driven by an intermediate sprocket, mounted on the directing rod, driven by the sprocket attached to the drive tube.
6. A rolling sphere propulsion unit as claimed in Claim 5 wherein the drive tube is driven by the electric motor, which is housed around the drive tube.
7. A rolling sphere propulsion unit as claimed in Claim 6 wherein the drive tube turns freely against the directing rod via inner bearings.
8. A rolling sphere propulsion unit as claimed in Claim 6 wherein the drive tube turns freely against the housing via outer bearings.
9. A rolling sphere propulsion unit as claimed in Claim 1 or Claim 2 wherein stabilisers hold the spheres in place.
10. A rolling sphere propulsion unit, substantially as described herein, with reference to Figures 1-5 of the accompanying drawings.



Application No: GB 9813047.9
Claims searched: 1 to 10

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Date of search: 27 October 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

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Int Cl (Ed.6): A63B 22/02, 69/00; F16H 35/00, 35/18, 37/02

Other: On-Line Database: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB1495436 (GIBBS) - Figure 1	
A	WO 98/08572A (CARMEIN) - Figure 9	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.