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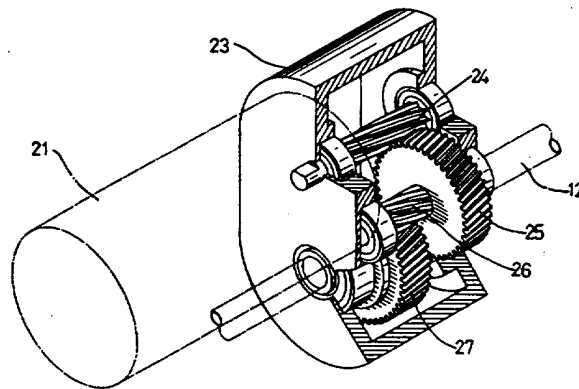
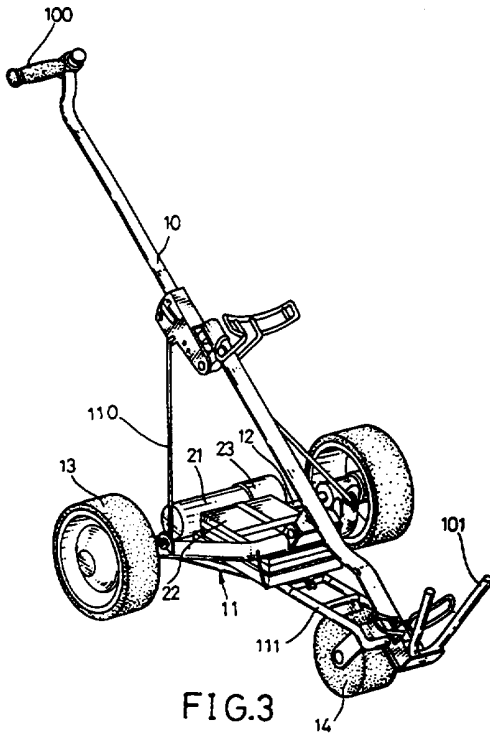
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B7H HC H727  
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(56) Documents Cited  
GB 2318104 A GB 2224984 A GB 2126315 A  
GB 2123362 A GB 2076928 A GB 0515861 A  
GB 0413281 A US 3941198 A

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UK CL (Edition Q ) B7H HDV H727, F2Q  
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(54) Abstract Title  
Power transmitting device for a golf trolley

(57) A power transmitting device for a golf trolley includes an intermediate gear shaft 26 and an intermediate gear wheel 25 co-axially and co-rotatably connected to the intermediate gear shaft 26, an output gear 27 engaged with the intermediate gear shaft 26 and co-rotatably mounted to an axle 12 of the golf trolley, and an input gear shaft 24 engaged with the intermediate gear wheel 25. The input gear shaft 24 is driven by a motor and a speed reduction rate between the input gear shaft 24 and the output gear wheel 27 is in the range 30:1 to 38:1.



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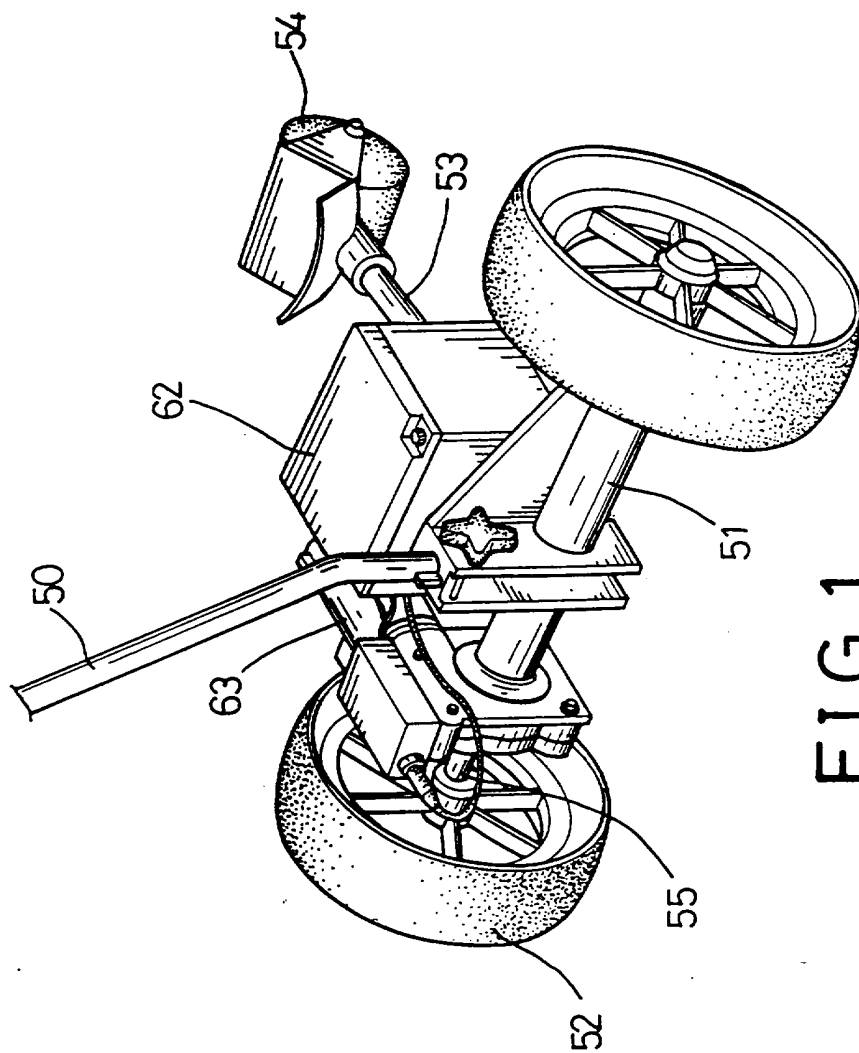


FIG.1  
PRIOR ART

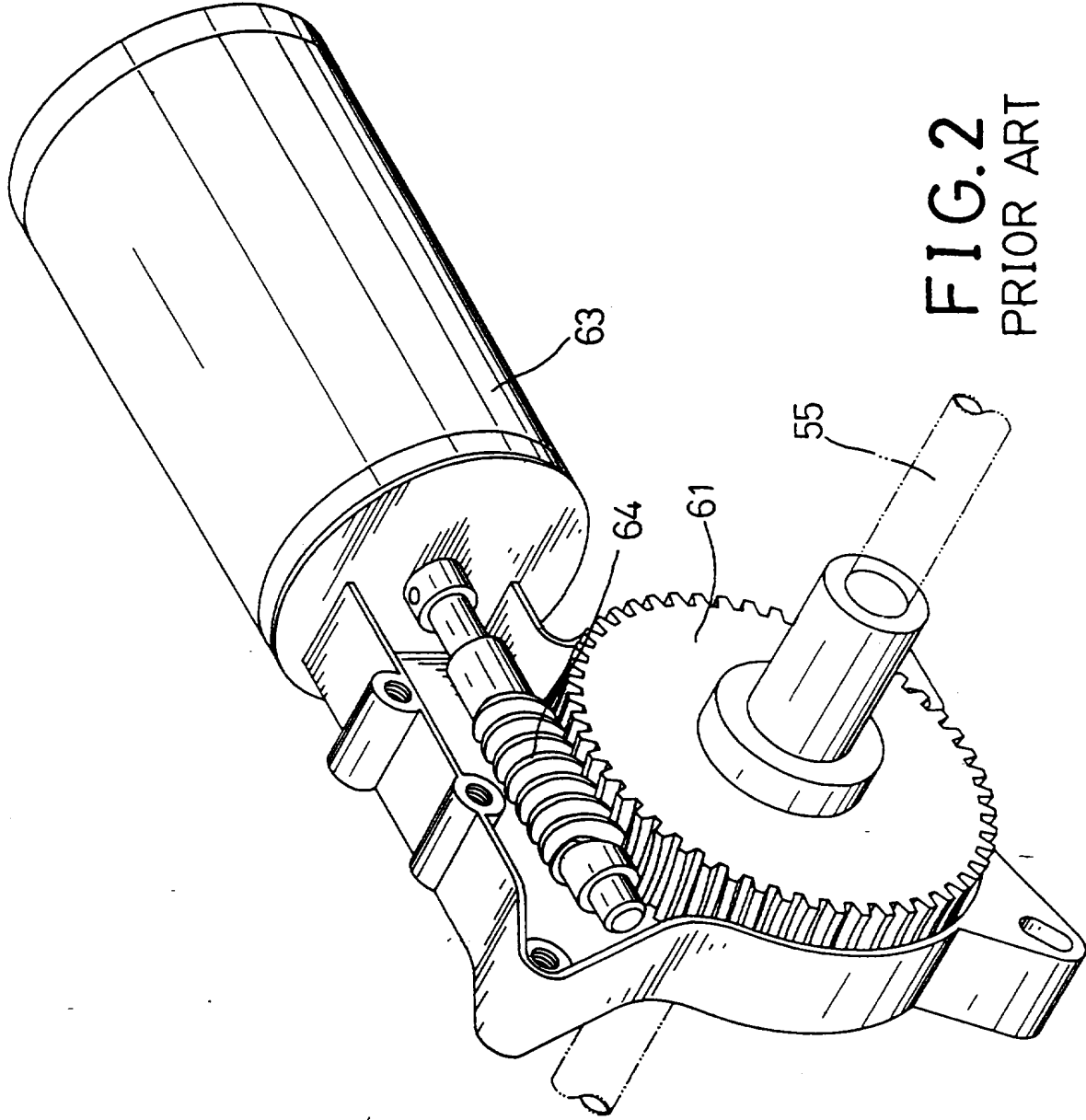


FIG. 2  
PRIOR ART

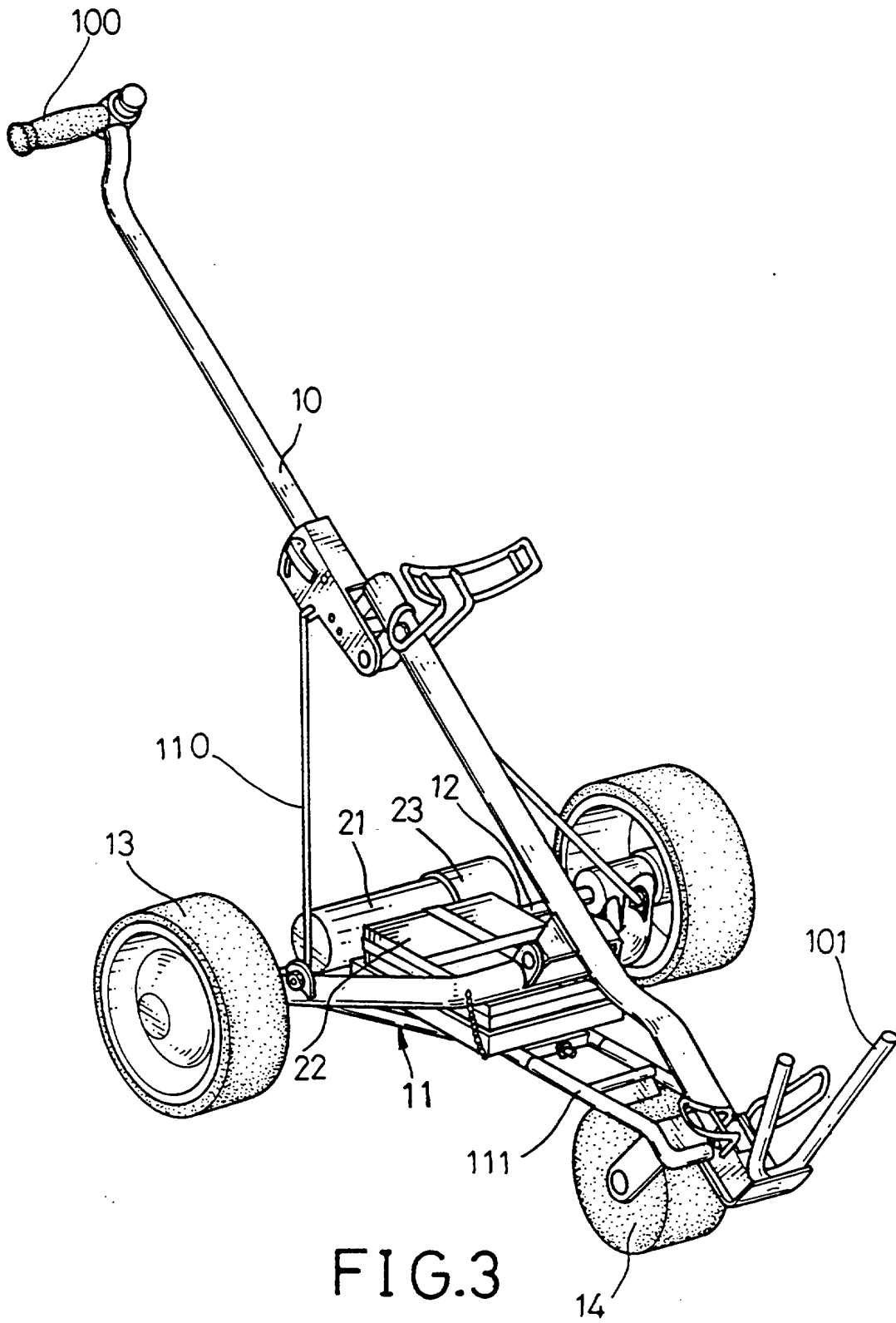


FIG.3

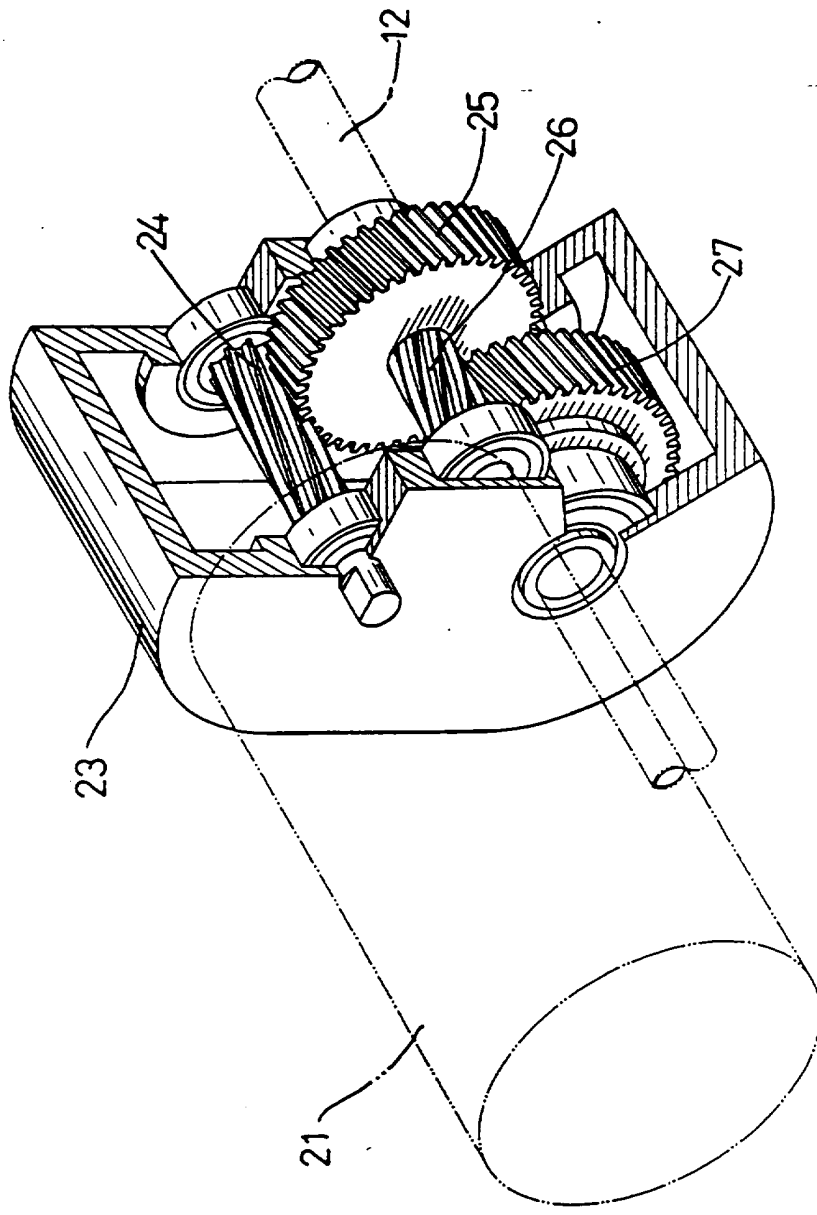


FIG.4

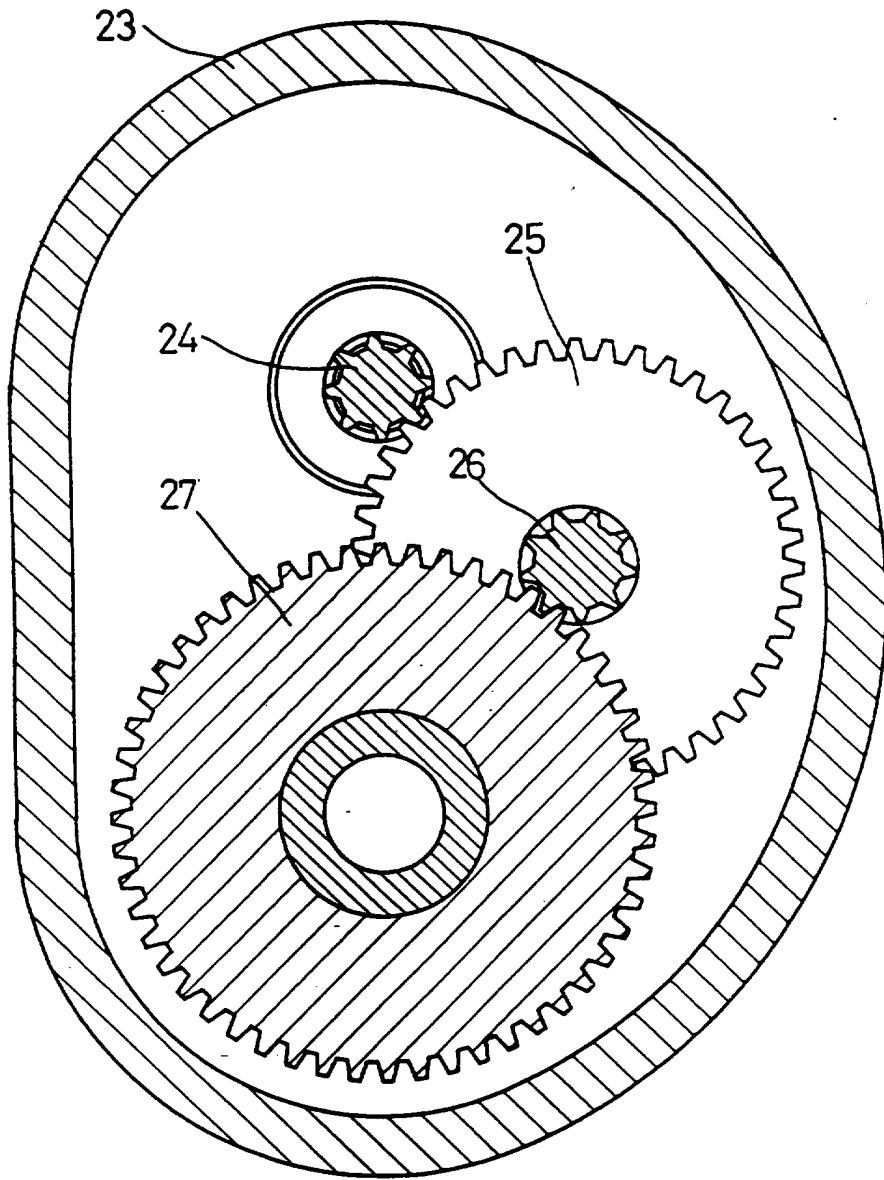


FIG. 5

POWER TRANSMITTING DEVICE FOR A GOLF TROLLEY

This invention relates to a power transmitting device for a golf trolley.

5           Figures 1 and 2 of the accompanying drawings show a conventional golf trolley having a power transmitting device which is linked to a motor and includes a set of gears so as to enable a golfer effectively and easily to carry a set of golf clubs around a golf course. The golf trolley generally includes a main frame 50 and  
10           a tube 51 transversely connected to a lower end thereof, an axle 55 rotatably received in the tube 51 so as to connect two wheels 52 to two ends thereof, and a tube 53 extending perpendicularly from the tube 51 so as to connect a front wheel 54 to a distal end thereof.  
15           The power transmitting device includes a worm wheel 61 co-rotatably mounted to the axle 55, and a worm 64 engaged with the worm wheel 61, wherein the worm 64 is driven by the motor 63 which is powered by a battery means 62. In order to reach a suitable and economical  
20           r.p.m. output (2800 to 3750 r.p.m.) of the motor 63, a large speed reduction ratio is necessary in order to save the battery power and to have a suitable speed when in use. However, the large speed reduction ratio requires a large worm wheel 61 which results in  
25           considerable weight and consequent higher battery power consumption.

          According to the present invention, there is provided a power transmitting device for a golf trolley and comprising:-

30           a multi-stage gear reduction means having an input shaft and an output shaft, wherein the reduction ratio is in the range from 30:1 to 38:1.

          Preferably the reduction ratio is in the range from 30:1 to 34:1.

35           Preferably the multi-stage gear reduction means is a two-stage gear reduction.

Conveniently the device includes:-

an intermediate gear shaft and an intermediate gear wheel which is co-axially and co-rotatably connected to the intermediate gear shaft;

5 an output gear wheel engaged with the intermediate gear shaft and adapted to be co-rotatably mounted to an axle of the golf trolley, and

an input gear shaft engaged with the intermediate gear wheel and driven by a motor.

10 A desirable speed reduction ration is 31.06:1.

This can be achieved by an arrangement in which the input gear shaft has 8 teeth and the intermediate gear wheel has 43 teeth, and the output gear wheel has 52 teeth the said intermediate gear shaft has 9 teeth.

15 Preferably the shafts and gear wheels are bevel gears.

The power transmitting device of the present invention is intended to mitigate and/or obviate the above-mentioned problems associated with the known device.

20

The present invention provides a power transmitting device for a golf trolley, wherein the wheels of the golf trolley can rotate at 90 to 120 r.p.m. when the motor is actuated.

25

For a better understanding of the present invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

30

Figure 1 is a perspective view of a known golf trolley having a conventional power transmitting device;

Figure 2 is an illustrative perspective view showing a worm engaged with a worm wheel and a motor of the conventional power transmitting device;

35

Figure 3 is a perspective view of a golf trolley having an embodiment of a power transmitting device in



accordance with the present invention;

Figure 4 is an illustrative cut-away, perspective view showing an arrangement of the power transmitting device of the present invention; and

5 Figure 5 is a section through the arrangement of the power transmitting device of Figure 4.

Referring to Figure 3, a golf trolley includes a main frame 10 having an upper end with a handle 100 and a lower end with a support 101, a truss assembly 11  
10 connected below the main frame 10 and connected to the main frame by two rods 110 and an extension portion 111. A rotatable axle 12 extends transversely from the truss assembly 11 and has two wheels 13 connected to two ends of the axle 12. A front wheel 14 is rotatably  
15 connected to the extension portion 111 which is connected to the lower end of the main frame 10.

Further referring to Figures 4 and 5, a power transmitting device in accordance with the present invention generally includes a battery means 22 (Fig.  
20 3) disposed on the truss assembly 11, a gear box housing 23 and a motor 21 which is powered by the battery means 22. In the gear box housing 23, an intermediate gear shaft 26 and an intermediate gear wheel 25 are co-axially and co-rotatably connected to  
25 each other; each of the intermediate gear shaft 26 and the intermediate gear wheel 25 are bevel wheels and respectively have 9 teeth and 43 teeth. An output gear wheel 27 being a bevel gear and having 52 teeth is engaged with the intermediate gear shaft 26 and co-  
30 rotatably mounted to the axle 12 of the golf trolley. An input gear shaft 24 being a bevel gear and having 8 teeth is engaged with the intermediate gear 25 and directly driven by the motor 21. Other types of gears can be used without departure from the present  
35 invention. It is to be noted that a speed reduction rate between the input gear shaft 24 and the output

gear wheel 27 is 31.06:1.

It is experienced that a golfer generally walks at a speed of 71-90 m/min and the diameter of the wheel 13 is typically 250 mm. As such, rotation of the wheels  
5 13 at 90-120 r.p.m. is believed to meet the desired speed of movement of the golfer. Generally, as mentioned in the description of the prior art, a suitable and economical r.p.m. output for the motor 21 is 2800 to 3750 r.p.m. so that the speed reduction  
10 ratio of 31.06:1 will successfully reduce an output r.p.m. of the wheels 13 to 90-120 r.p.m..

The power transmitting device of the present invention can easily be fitted to golf trolleys presently used and has a compact size. Furthermore,  
15 the motor 21 is operated at a most efficient r.p.m. so that the motor will produce the desired power output and saves electricity of the battery 22. The golf trolley equipped with the power transmitting device of the present invention can handle most topographical  
20 conditions of the golf course and its speed meets the requirement of the golfer.

CLAIMS

1. A power transmitting device for a golf trolley and comprising:-

5 a multi-stage gear reduction means having an input shaft and an output shaft, wherein the reduction ratio is in the range from 30:1 to 38:1.

2. A power transmitting device according to claim 1, wherein the reduction ratio is in the range from 30:1 to 34:1.

10 3. A power transmitting device according to claim 1 or 2, wherein the multi-storage gear reduction means is a two-stage gear reduction.

4. A power transmitting device according to claim 3, wherein includes:-

15 an intermediate gear shaft and an intermediate gear wheel which is co-axially and co-rotatably connected to the intermediate gear shaft;

20 an output gear wheel engaged with the intermediate gear shaft and adapted to be co-rotatably mounted to an axle of the golf trolley, and

an input gear shaft engaged with the intermediate gear wheel and driven by a motor.

25 5. A power transmitting device according to claim 4, wherein the speed reduction ratio between the input gear shaft and the output gear wheel is 31.06:1.

30 6. A power transmitting device according to claim 5, wherein the input gear shaft has 8 teeth and the intermediate gear wheel has 43 teeth, and the output gear wheel has 52 teeth the said intermediate gear shaft has 9 teeth.

7. A power transmitting device according to claim 4, 5 and 6, wherein the intermediate gear shaft, the input gear shaft, the intermediate gear wheel and the output gear wheel are bevel gears.

35 8. A power transmitting device according to any preceding claim, wherein includes a compact housing.

9. A power transmitting device according to claim 1, substantially as hereinbefore described with reference to, and as illustrated in, Figures 3 to 5 of the accompanying drawings.

5 10. A golf trolley fitted with a power transmitting device according to any preceding claim.



Application No: GB 9727269.4  
Claims searched: 1-10

Examiner: Alan Habbijam  
Date of search: 25 February 1999

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

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

UK Cl (Ed.Q): F2Q : B7H (HDV, HC727)

Int Cl (Ed.6): A63B 55/08 : B60K 7/00

Other: Online:WPI EPODOC PAJ

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X,E	GB 2318104 A (JUNG-CHENG WU) See especially Figs 9&10 and related description.	1,8&10 at least
X	GB 2224984 A (VAUSE) See gearing arrangement 26,27,28:the Fig.	1,3,4,8&10
X	GB2126315 A (MITSUBISHI DENKI) See especially Figs 2,4&9 and related description.	1,3,4&8
X	GB 2123362 A (WHEELPOWER LTD) See reduction gearing 12.	1,3,4,8&10
X	GB 2076928 A (MITSUBISHI DENKI) See especially Figs 2,4,7&8.	1,3,4&8
X	GB 0515861 (JOURJAN) See Figs 1&2	1,3,4&8
X	GB 0413281 (ALLMANNA SVENSKA) See The Fig.	1,3,4&8
X	US 3941198 (KAPPAS) See especially Fig 4.	1,3,&10

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

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