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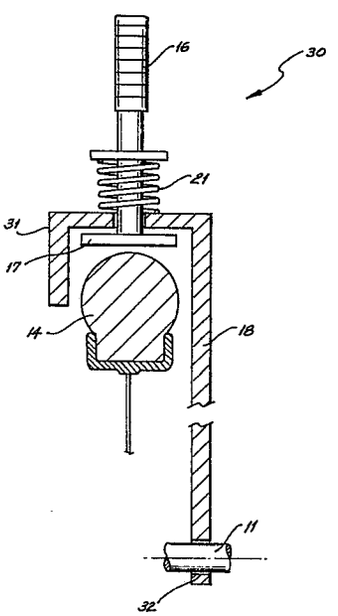
(54) Aid for propelling wheelchairs.

(57) A wheelchair propelling aid including a lever (18) pivotally attached to an axle (11) supporting a wheel (10) of the chair, a wheel gripping assembly (15) attached to the lever (18) and a gripping assembly actuator (16) also attached to said lever (18) so as to be operated by a user of the chair in gripping and driving the wheel (10).



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"AID FOR PROPELLING WHEELCHAIRS"

The present invention relates to wheelchairs and more particularly to apparatus to aid a user of the chair in propelling it.

It is a disadvantage of known wheelchairs that the grip ring provided on each wheel requires the user to reach across the tyre of the wheel in order to propel the wheelchair. In wet weather this reaching across the tyre results in the arms and clothing of the user becoming soiled due to material coming off the wheels as they rotate. Additionally the positioning of these grip rings is not advantageous and is not an efficient method of propelling a wheelchair.

It is an object of the present invention to overcome or substantially ameliorate the above disadvantages.

There is disclosed herein a wheelchair propelling aid for wheelchairs having a number of wheels to be driven by a user of the chair, said aid including a movable hand grip having a grippable hand position so as to be gripped by the user of the chair, said grip to be adapted to be mounted on the chair so as to be movably engaged about the axis of the wheels and wheel engaging means fixed to said handle grip and selectively actuable from said end by the user so that the wheel can be gripped and driven by the user by pushing said end.

A preferred form of the present invention will now be described by way of example with reference to the accompanying drawings, wherein:

Figure 1 schematically depicts a wheel of a wheelchair with an aid positioned adjacent the wheel, which aid is adapted to be manipulated by a user of the wheelchair in propelling the wheelchair;

Figure 2 is an enlarged view of the portion A of Figure 1;

Figure 3 is an alternative aid to that of Figure 1;

Figure 4 is a schematic perspective view of the mounting of the aid of Figure 1 on the central shaft of the

wheel;

Figure 5 is a schematic part sectioned end elevation of the aid and wheel of Figure 1;

Figures 6 and 9 are part sectioned side elevations of further propelling aids to be used with a wheelchair;

Figures 7, 8 are sectioned front elevations of further propelling aids to be used with a wheelchair;

Figure 10 is a schematic side elevation of a still further aid to gripping the wheel of a wheelchair;

Figure 11 schematically depicts a side elevation of a portion of the aid of Figure 10;

Figure 12 is a schematic side elevation of a pistol grip operation aid in gripping the tyre of a wheelchair;

Figure 13 is a schematic side elevation of a cable actuating grip to be used in gripping the tyre of a wheelchair;

Figure 14 is a schematic front elevation of a caliper to be used with the grip of Figure 13 to engage the tyre of the wheelchair; and

Figure 15 is a schematic front elevation of the caliper of Figure 14 in a wheel engaging position.

In Figure 1 there is schematically depicted a wheel 10 of a wheelchair, which wheel 10 is mounted on a central shaft 11 from which radially extend a plurality of spokes 12 which are fixed to an outer rim 13 which supports a tyre 14. Positioned adjacent the periphery of the tyre 14 is an aid 15 adapted to be manipulated by an occupant of the wheelchair in propelling the wheelchair.

More particularly with reference also to Figures 2 and 5, the aid 15 includes a lever 16 adapted to be gripped by the occupant of the wheelchair and moved in a clockwise or anti-clockwise direction about the shaft 11. Attached to the lower extremity of the lever 16 is a tyre gripping member 17 which is adapted to frictionally engage the tyre 14 so that upon the lever 16 being moved about the shaft 11, the wheel 10 is caused to rotate. To secure the lever 16 and member 17 in a position adjacent the tyre 14, there is provided a linkage 18 which is pivotally coupled to the

central shaft 11 and extends radially therefrom to a position radially outwardly of the tyre 14. The outer extremity of the linkage 18 has a flange 19 through which the lever 16 may slidably pass. Fixed to the lever 16 is a further flange 20. Extending between the flanges 19 and 20 is a spring 21 which biases the lever 16 to a radially outer position.

Turning now to Figure 4, there is schematically depicted a means of pivotally mounting the linkage 18 on the shaft 11. More particularly, the lever 18 is fixed to a sleeve 22 which is slidable about a stationary axle 23 which rotatably supports the shaft 11. Formed in the sleeve 22 is a slot 24 which slidably receives a pin 25 fixed to the axle 23. The pin 25 and slot 24 act to define the angular limit positions of the lever 18 to thereby prevent the aid 15 falling to a position beyond the reach of the occupant of the wheelchair.

In use of the above aid 15, the occupant of the wheelchair grips the lever 16 and applies a radially inward force to it to cause the member 17 to frictionally engage the tyre 14. Thereafter the lever 16 is pushed forward taking with it the wheel 10 thus propelling the wheelchair. Upon the lever 16 progressing to the forward limits of the users reach, the radial force is relieved thereby permitting the lever 16 to move to a radially outer position whereby the member 17 is no longer in contact with the tyre 14. Thereafter the aid 15 is returned to its initial position whereby it is again ready for frictional engagement with the tyre 14.

Now with particular reference to Figure 3, there is schematically depicted a further means of fixing the aid 15 to the wheelchair. In this particular embodiment the lever 16 is slidably held in a guide plate 26 which is provided with a slot 27 along which the lever 16 is guided in its movement about the shaft 11. Again the lever 16 would be biased to its radially outer position.

Turning now to Figure 6 there is schematically

illustrated an aid 30 adapted to engage the tyre 14 so that a user of the aid 30 may cause rotation of the tyre 14 by frictional engagement therewith via the member 17 and lever 16. Again the lever 16 is biased to a radially outer position by the spring 21. In the present instance the linkage 18 is provided with a generally U-shaped upper part 31 which substantially encompasses the radially outer peripheral surfaces of the tyre 14 so as to be retained in a position generally co-extensive with the tyre 14. This enables the linkage 18 to be provided with solely a passage 32 through which the shaft 11 passes.

In Figures 7 and 8 there are schematically depicted two further devices which may be used to bring the member 17 into frictional engagement with the tyre 14.

Firstly with reference to Figure 7 there is schematically depicted a lever arrangement 40 having a first handle 41 fixed to the lever 18 and a second handle 42 pivotally coupled by means of a pin 43 to the first handle, which handles 41 and 42 are arranged to be gripped by a user of the wheelchair. Upon the user causing pivoting movement of the handle 42 towards the handle 41, the member 17 is caused to move toward the tyre 14. Extending between the member 17 and handle 42 is a shaft 44 which receives a pin 45 at its upper end, which pin 45 is received within a slot 46 formed in the handle 42.

Now with reference to Figure 8, there is further depicted a leverage mechanism 50 which includes a first handle 51 fixed to the lever 18. There is further included a second handle 52 pivotally coupled to the first handle 51 by means of a pin 53. Extending between the second handle 52 and member 17 is a shaft 54 which upon a user of the wheelchair grasping the handles 51 and 52 may cause the member 17 to frictionally engage the tyre 14.

Turning now to Figure 9, there is schematically depicted an arrangement 50 adapted to frictionally engage the rim 13. The arrangement 50 includes two friction pads 51 which are brought into frictional engagement with the rim 13 so as to cause rotation of the wheel 10. The friction

pads 51 are attached to linkages 52 and 53 which are pivotally coupled to the lever 18 by means of pins 54. The linkage 52 is provided with a slot 55 and the linkage 53 with a pin 56 which is slidably received within the slot 55. Extending from adjacent the junction of the linkages 52 and 53 is a shaft 57 which may be caused to move upwardly by a lever mechanism to cause inward pivoting of the linkages 52 and 53 so that the pads 51 frictionally engage the rim 13.

In Figures 10 and 11 there is depicted a tyre gripping assembly 50 to be used in conjunction with a lever 51 to grip the tyre 52 of a wheelchair. The assembly 50 includes a handle 53 to be gripped by a user of the wheelchair. The handle 50 is provided with two slots 54 and 55 through which pins 56 and 58 may slide. The pins 56 and 58 are fixed to the lever 51 by means of a bracket. Additionally there is attached to the handle 53 an adjustable tyre engaging member 57 which is threadably received within the passage formed in the handle 53. Accordingly, member 57 has an extremity which is adjustable relative to the surface of the tyre.

In operation of the assembly 50 a user of the wheelchair may engage the tyre 52 by causing pivoting of the handle 53 about the pin 56 in an upward direction or alternatively, by causing pivoting of the handle 53 about the pin 58 to move the handle 53 downwardly. Once the tyre is engaged by the member 57 the lever 51 may then be pushed by the user so as to cause rotation of the tyre 52.

Now with reference to Figure 12 wherein there is schematically depicted a pistol grip tyre engaging assembly 60 which includes a handle 61 and a trigger 62. The handle 61 is fixed to the lever 63 which is pivotally attached to the axle about which the wheel 64 rotatably moves. The trigger 62 is pivotally attached to the lever 63 by means of a pin 65. Adjustably attached to an extremity of the trigger 62 is a tyre engaging member 66 which is adapted to frictionally engage the tyre 67 upon a user of the wheelchair causing movement of the trigger 62 upwards of the handle 61.

The assembly 60 is operated in a similar manner to the previously described devices in that a user of the wheelchair may operate the trigger 62 to frictionally engage the tyre 67 and thereby cause rotation of the tyre 67 to propel the wheelchair.

Turning now to Figures 13, 14 and 15 wherein there is schematically depicted a cable operated assembly to engage the wheel of a wheelchair. The assembly includes a cable operating assembly 70 which includes a handle 71 pivotally attached to a lever 72. The lever 72 would be pivotally supported on an axle supporting wheel and the axle of the wheelchair. One end of the handle 71 is adapted to engage the cable 73 which passes through a sheath 74. Cable 73 is supported by a brake. Accordingly, upon the handle 71 rotating in an anti-clockwise direction (relative to Figure 13) the cable 73 would be moved.

The other end of the cable 73 extends to a caliper assembly 75 including two pivoting brackets 76 which would be pivotally supported on the lever 72 so as to be movable between a position of non-engagement with the wheel and tyre 77 (as depicted in Figure 14) to a position frictionally engaging the wheel and tyre 77 (as depicted in Figure 15). The two brackets 76 define in combination a cavity within which is located a movable part 79 fixed to the extremity of cable 73. The member 79, upon being moved by the cable 73 causes pivoting of the brackets 76 from the position depicted in Figure 14 to the position depicted in Figure 15 whereby the tyre is frictionally engaged allowing a user of the wheelchair to cause rotation of the tyre.

In each of the above described devices the means by which the wheel is engaged has been depicted and described as engaging the outer rim or tyre of the wheel. It should be appreciated that the wheel can be formed with a disc or drum which could be gripped by a pad or other means to thereby propel the wheel. Accordingly the present invention is not restricted to any means by which the tyre is engaged.

CLAIMS

1. A wheelchair propelling aid for wheelchairs having a number of wheels to be driven by a user of the chair, said aid including a movable hand grip having a grippable hand position so as to be gripped by the user of the chair, said grip to be adapted to be mounted on the chair so as to be movably engaged about the axis of the wheels and wheel engaging means fixed to said handle grip and selectively actuable from said end by the user so that the wheel can be gripped and driven by the user by pushing said end.

2. The aid of claim 1 wherein said grip is an elongated member to be gripped at one end of said lever by the user, and to be pivotally attached at the other end to a shaft supporting one of said wheels.

3. The aid of claims 1 or 2, wherein said wheel engaging means includes a wheel engaging portion movable from an engaging position in driving contact with said wheel to a non-engaging position free of said wheel.

4. The aid of claim 3 wherein said engaging means includes a lever pivotally attached to said members adjacent said end and being operatively associated with said portion to cause movement thereof between said engaging and non-engaging positions.

5. The aid of claim 4 wherein said engaging portion includes a caliper adapted to frictionally engage the wheel.

6. The aid of claim 5 wherein said lever and caliper are operatively coupled by a cable.

7. The aid of claim 4 wherein said wheel engaging means includes a disc or drum fixed to the wheel and said portion is adapted to selectively engage said disc or drum.

8. A wheelchair propelling aid substantially as hereinbefore described with reference to the accompanying drawings.

9. A wheelchair having an aid according to any one of claims 1 to 8.

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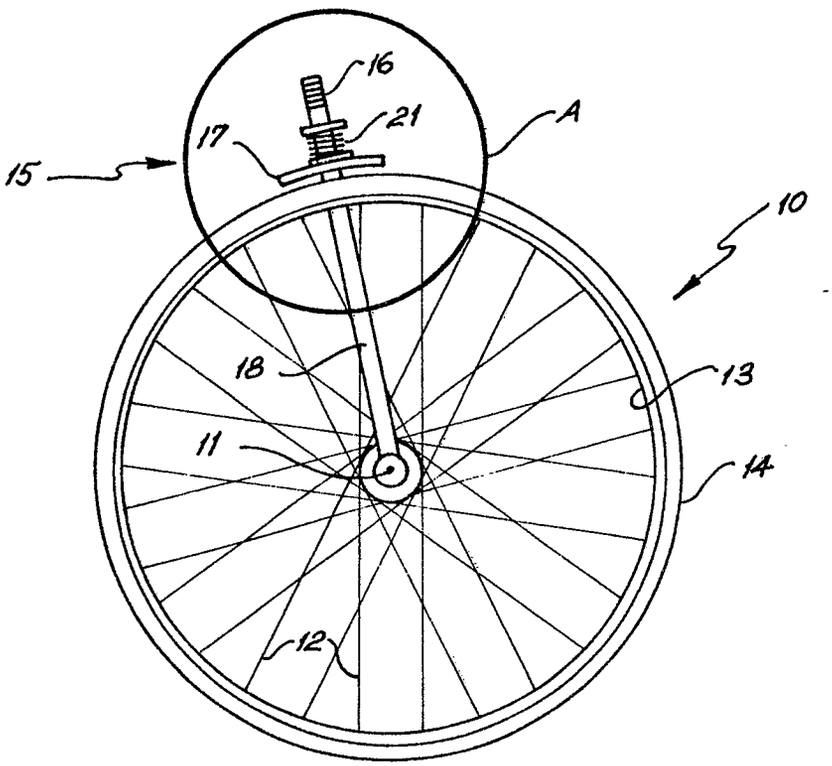

FIG. 1

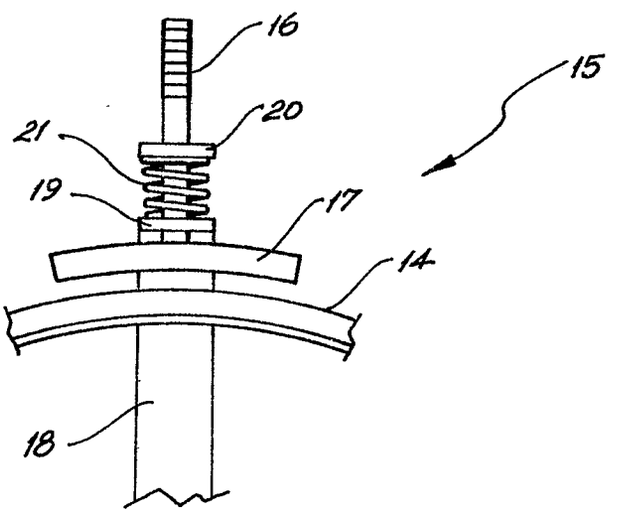

FIG. 2

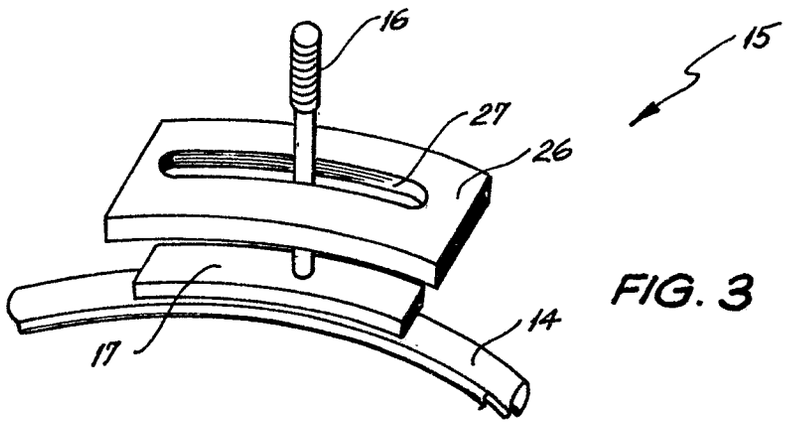

FIG. 3

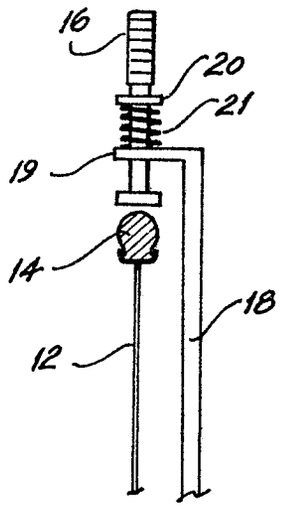

FIG. 5

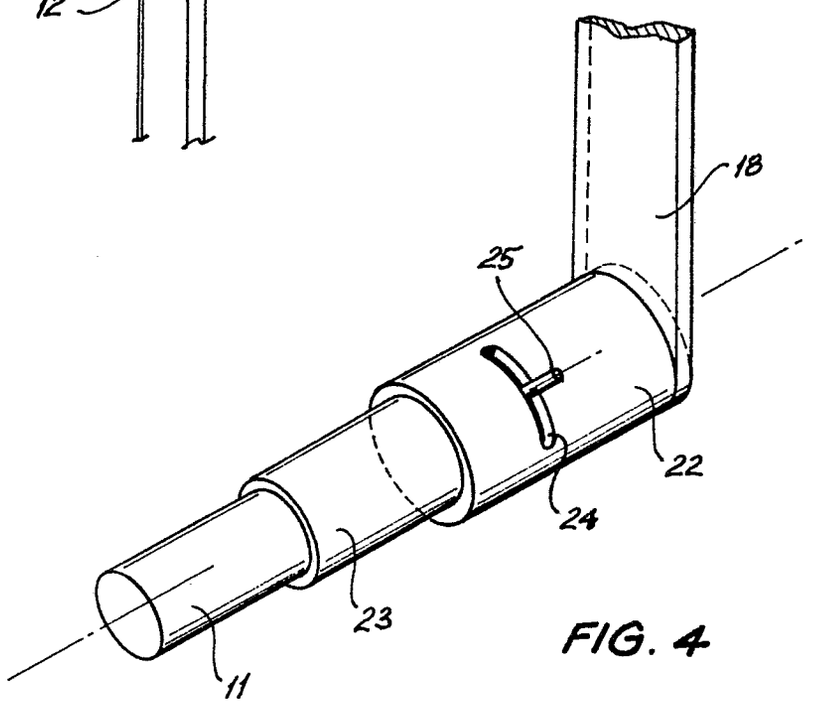

FIG. 4

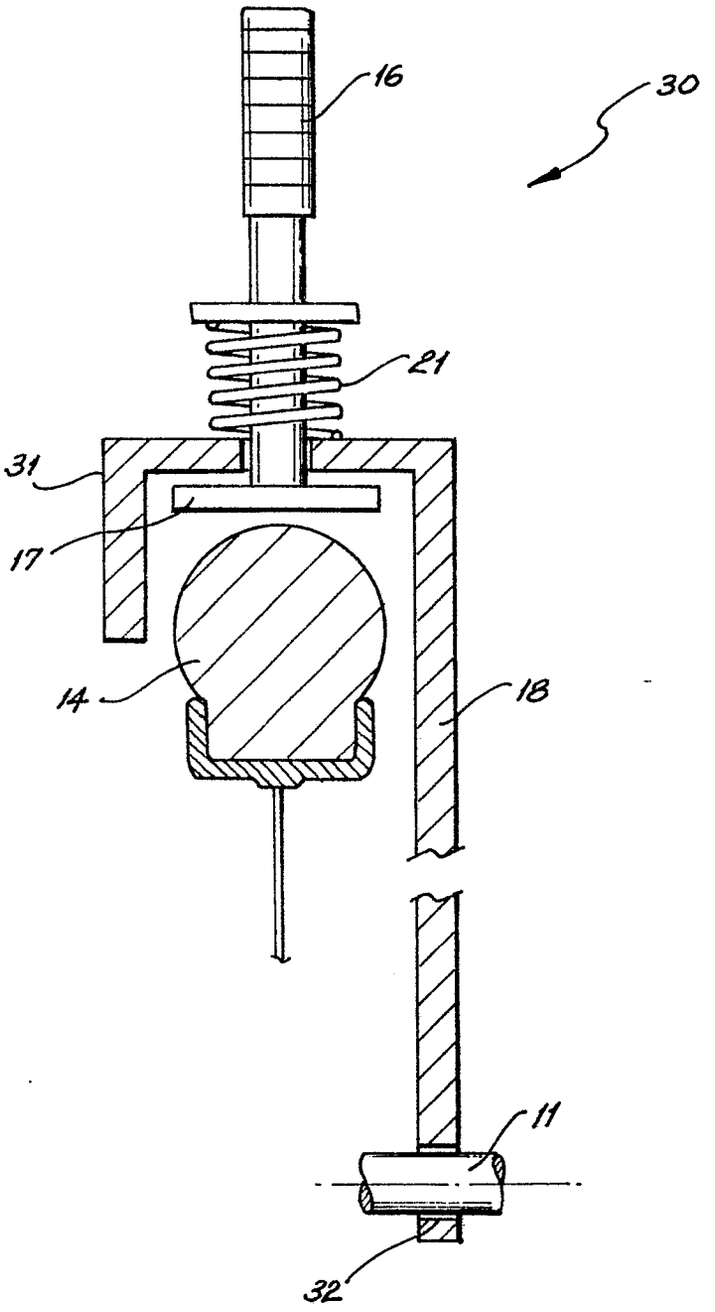

FIG. 6

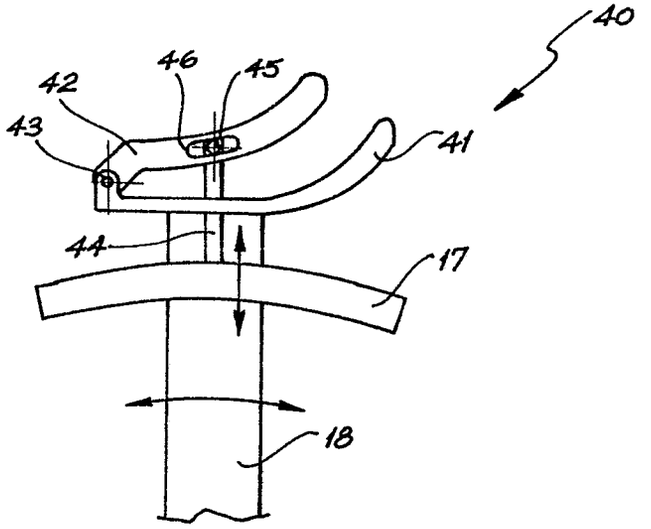

FIG. 7

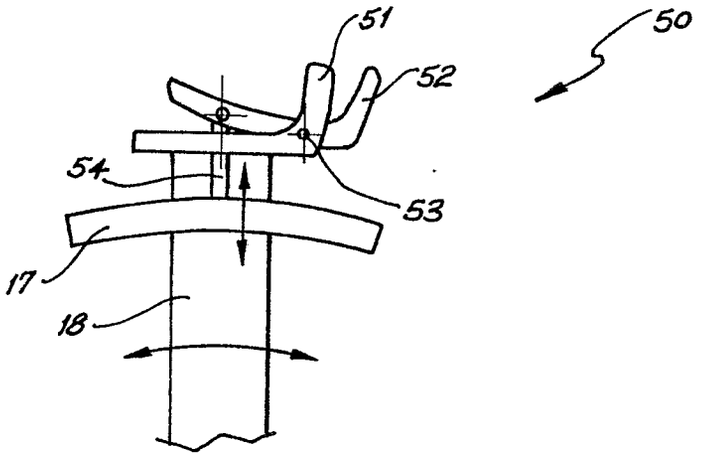

FIG. 8

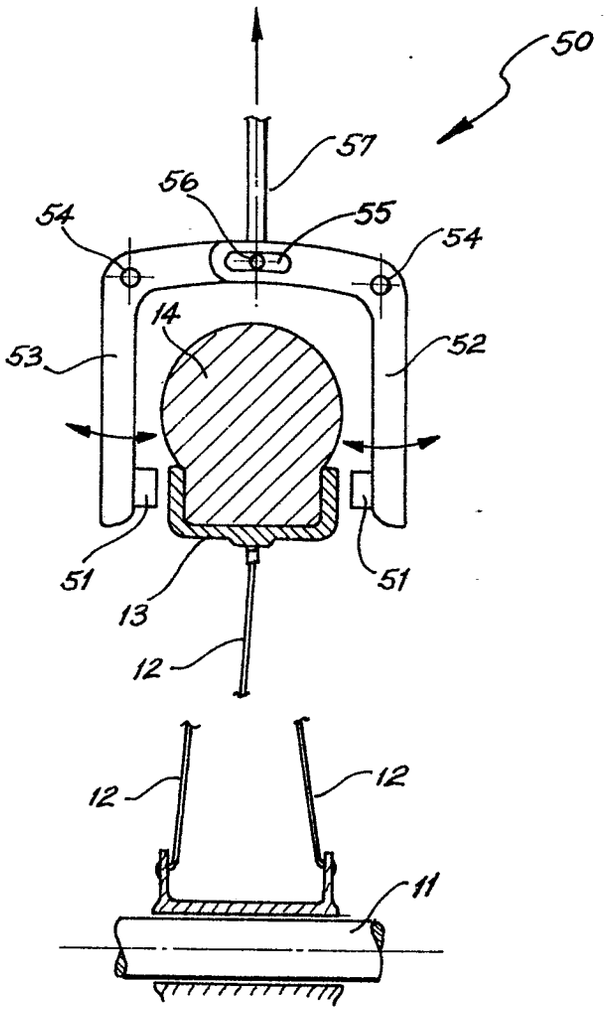

FIG. 9

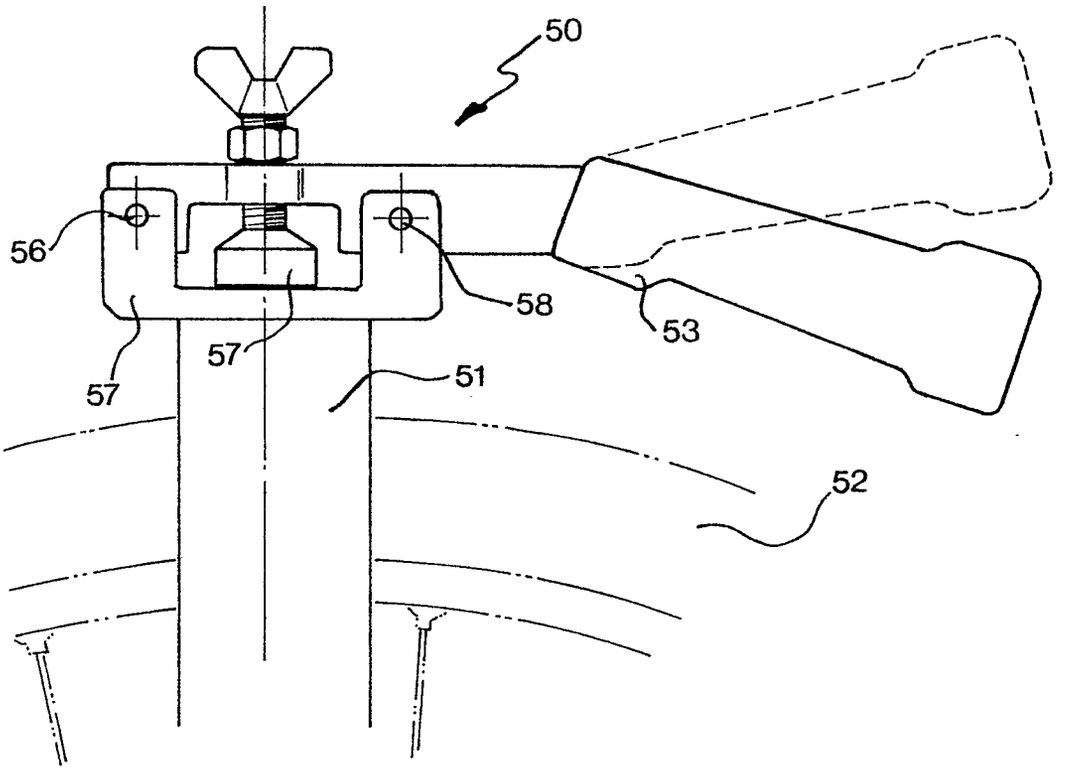

FIG. 10

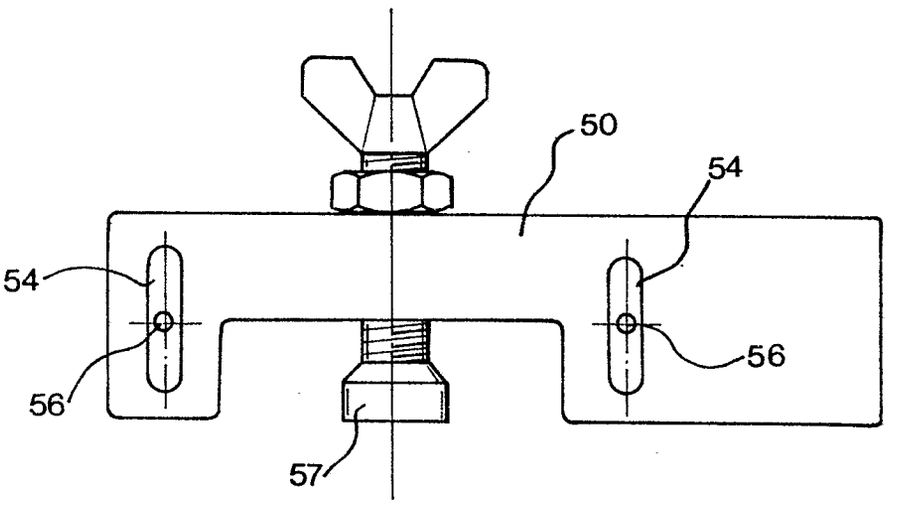

FIG. 11

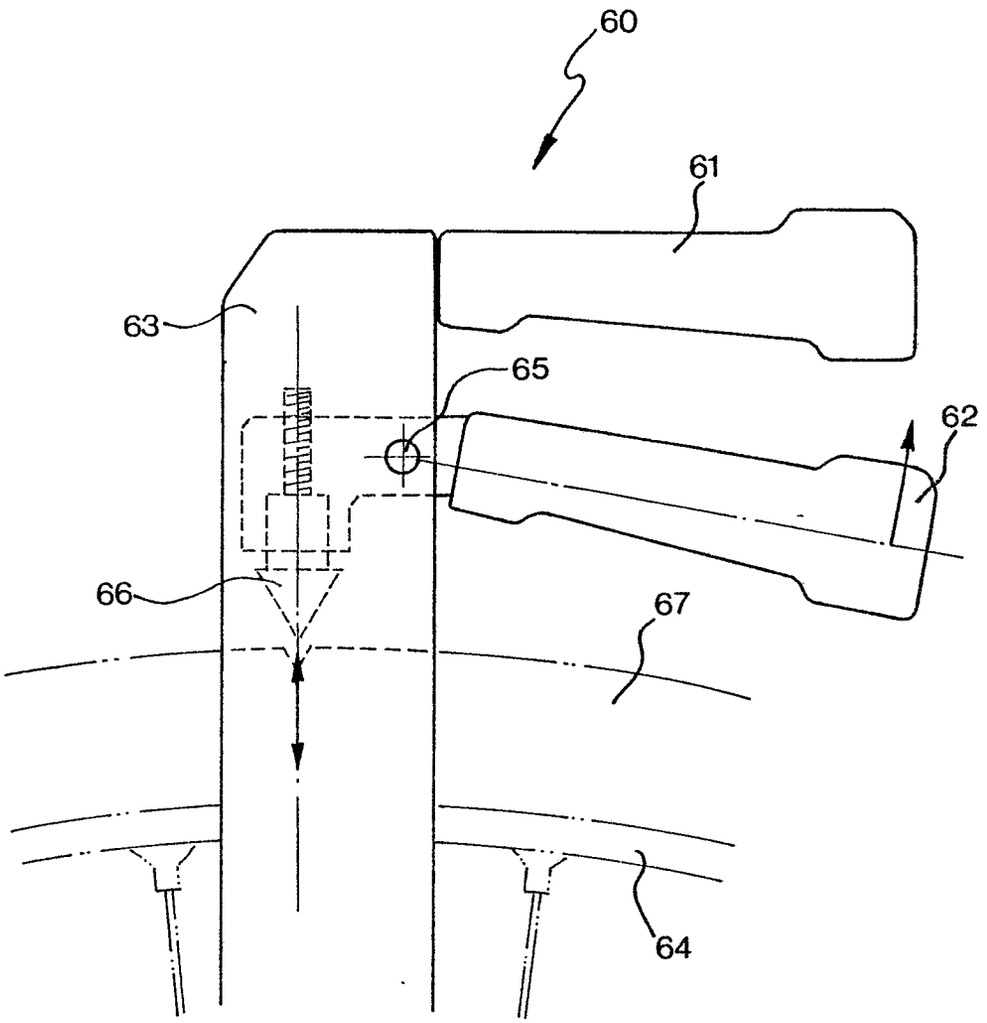

FIG. 12

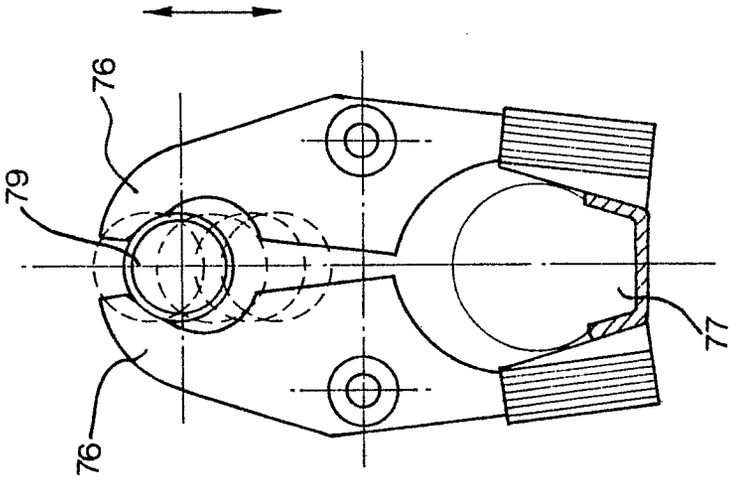

FIG. 15

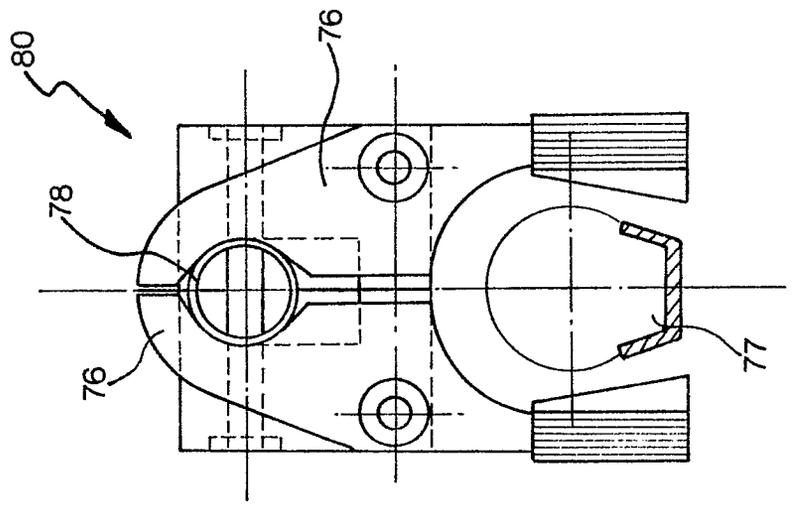

FIG. 14

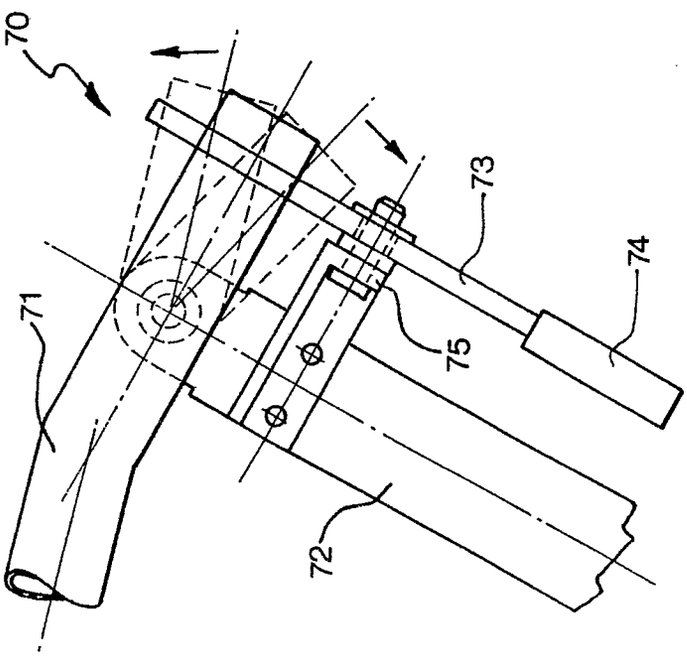

FIG. 13

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 82 30 2844.4

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. 3)
X	FR - A - 2 163 307 (J.M. ARNAS) * complete document *	1-4,9	A 61 G 5/02
X	DE - A1 - 2 642 278 (K. BACKFISCH) * claim 1; page 6, lines 5 to 9; page 9, line 12 to page 10, line 19; fig. 1 *	1-4,7,9	
X,Y	US - A - 3 189 368 (J.F. PETERSEN) * claim 1; column 4, lines 43 to 66; fig. 1 to 5 *	1-6,9	TECHNICAL FIELDS SEARCHED (Int.Cl. 3)
Y	EP - A1 - 0 023 414 (SHIMANO INDUSTRIAL CO. LTD.) * claim 1; fig. 1 *	5,6	A 61 G 5/02 B 62 L 1/16

CATEGORY OF CITED DOCUMENTS

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
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

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Berlin	27-08-1982	PETTI