



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/NL91/00215</p> <p>(22) International Filing Date: 30 October 1991 (30.10.91)</p> <p>(30) Priority data: 9100703 23 April 1991 (23.04.91) NL</p> <p>(71)(72) Applicant and Inventor: VAN BEEK, Maas [NL/NL]; Van Ghentlaan 29, NL-3771 JZ Barneveld (NL).</p> <p>(74) Agent: DE WIT, G., F.; Octrooi- en Merkenbureau De Wit B.V., Breitnerlaan 146, NL-2596 HG Den Haag (NL).</p> <p>(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CI (OAPI patent), CM (OAPI patent), DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), GN (OAPI patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, PL, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.</p>		<p>Published <i>With international search report.</i></p>
<p>(54) Title: BICYCLE HANDLE-BAR AND PARTS TO USE THEREWITH</p>		
<p>(57) Abstract</p> <p>Bicycle handle-bar with a curved end part (3, 13, 40) which is upwardly and in the riding direction forwardly directed and has a first catching part, and a second part (9, 18, 42) connected with it under an acute angle and bent downwardly and from there near to horizontally forming a second catching part (9, 18, 42), between the parts a coupling member (42, 58) or a weld (55) being present. A gear command member and/or brake lever may be located near said parts. A curved bracket (59) may be connected to the joint said parts. The invention encompasses also the coupling member (4), the brake lever (50-53), a bar end (13, 18; 40, 42) containing the two catching parts and the bracket (59).</p>		

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Bicycle handle-bar and parts to use therewith.

The invention relates to a bicycle handle-bar and further encompasses parts for the realisation of certain embodiments of that handle-bar and brake levers to use with said handle-bar.

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With bicycle handle-bars, especially handle-bars for race bicycles, the problem arises that holding the handle-bar in the long run may lead to cramping or at least is more tiring than now has appeared to be necessary. One of the reasons why bicycle handle-bars and especially race bicycle handle-bars cause more tiredness than seems necessary is that the arm bearing the hand holding the handle-bar generally has a from the shoulder somewhat downwardly sloping position or at the most is horizontal. The normal gripping action of the hand normally occurs about an axis which in the normal position of the wrist is about perpendicular to the forearm or at the side of the little finger slopes somewhat backwardly towards to the forearm.

20 In order to combine this position with a good and agreeable grip on the handle-bar already a bicycle handle-bar is known having a catching part which protrudes forwardly in the riding direction, is upwardly bent and suitable to lay a hand on it from above. Such a bicycle handle-bar, for instance a so-called oxen-head handle-bar for many riders is relatively agreeable indeed, because catching the handle-bar may be done in a more natural position than with having to catch for instance a horizontal part of the handle-bar which runs mainly in the riding direction.

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The invention is based on the insight, that it is possible to have this position, which is favourable for countering cramping and unnecessary tiredness, on two levels. This gives the possibility of variation of the position of the arm, which opposes cramping, allows for a certain alternation and, as practice has shown, is experienced as agreeable and little tiring.

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Accordingly it is provided according to a first aspect of the invention, that a second catching part is present, running in the riding direction backwardly, which starts from the first part under an acute angle with the end of
5 said first part is directed downwardly and in the riding direction backwardly and has an upwardly directed curvature, so that a portion is present which is upwardly bent in the riding direction and which is suitable to lay a hand on it in a lower position than on the first catching part.

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It is remarked that further handle-bars are known wherewith the end of the handle-bar is formed by a curved handle-bar and which mainly lies in a vertical plane parallel to the riding direction, which has a bent almost circular down-
15 wardly sloping part and a nearly horizontal part joining it. The circular downwardly sloping part has locally also the favourable position for the hand to catch the handle-bar. It is, however, not possible to find here a second equal favourable position.

20

With the invention one has to the contrary two such favourable positions which are located above each other.

With the invention the first upwardly bent part includes an
25 acute angle with the second downwardly in the riding direction backwardly bent part. To obtain a good position of the hand when cooperating with both parts, one needs not only that the mutual angle between the ends of these parts located near each other is acute, but the acute angle at the
30 inner side of the bent parts has to be carried out with a radius of curvature which is so small, that nowadays usual technics for bending tubes from which bicycle handle-bars generally are made, do not allow such a bending in steel or aluminium. Roughly it can be stated that the prolongation
35 of the axes of the ends of the bent first and second parts intersect or cross each other in a region, which lies within the prolongations of said parts. By reason hereof both catching parts are located so near to each other that it is normally possible to mount the gear command member of

the bicycle or the brake lever or both this commanding members in such a way that they are directly activatable in both positions which the hand can have namely catching the first part or the second part respectively.

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In principle the invention is applicable to race bicycles, sporting bicycle, mountain bikes and suchlike, but also the use of touring bicycles or bicycles for household purposes, such as home-work displacements, can be made considerably more agreeable.

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A special application of the invention is formed by a handle-bar with a mainly straight transverse bar at the end of which an upwardly bent bar end is mounted. With such a handle-bar the bar end is normally a separate part which is mounted to the end of the straight transverse bar. With the invention in that instance a separate part to be mounted to the ends of the transverse bar is provided, which parts contain the first and second catching parts.

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With a suchlike handle-bar it is preferably provided that at least one of the catching parts is bent back towards the middle of the handle-bar. Suchlike handle-bars need a relatively broad (also located far from each other) position of the hands, which with this embodiment of the invention is somewhat reduced. By reason thereof such a handle-bar has three catching portions, namely the straight transverse bar, at its end, the first upwardly bent part and the second downwardly bent part.

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Also with this handle-bar it is desirable, that at least the brake lever can be immediately activated in all three positions. Accordingly a further elaboration of the invention provides that a brake lever is mounted to a transverse bar and that the lever has a first activation part opposite the transverse bar and further activation parts opposite the catching parts.

35

The connection between the first and the second parts of

the invention can be realized in many ways, for instance by means of connection members, welding, glueing, forming the handle-bar from one piece and so on.

- 5 One of the methods which immediately and easily is applicable consists in use of connection members. Accordingly the invention provides also a connection member for joining the first and the second catching parts of a handle-bar as described earlier, which connection member is characterized
- 10 in that it has connection stubs connected to the ends of the catching parts and including an angle of $58 \pm 15^\circ$.

Because when applying the invention it often is desired that the gear command member and the brake lever are located in the immediate vicinity of both catching parts, it

15 may be a simple solution that the connecting member serves the purpose of bearing member for the gear command member and/or the brake lever.

- 20 Because these members generally are connected to activating cables it is according to a further elaboration of the above described connection member in some instances provided, that at least one of the connection stubs is provided with a passage for an activating cable for a brake or gear.
- 25 Preferably therewith it can be provided that it contains pivot mounting means for a gear command lever or a brake lever.

For application of the invention with the preferred embodiment, in which a first and a second catching part may be applied to a central part of the handle-bar, for instance the transverse bar of a handle-bar to which bar ends may be connected, the invention encompasses also a bar end device, which has two bent catching parts including an acute angle.

35 Such a bar end device may be mounted in the same way as is known for bar ends, the way in which a handle-bar is connected to a bar handle bearing part or by means of welding and so on. If such a loosable connection, for instance by means of a screw and nut is used, which forces wedge-shaped

portions away from each other in a tube end, it may be even advantageous, that the bar end devices are not applied with exactly the same angle, because no human being is completely symmetrical, especially if also muscular strength and natural attitude are taken into account. A suchlike more or less adaptable bar end device as well as an adaptable connection member of the earlier discussed type of the inventive handle-bar, gives the possibility of individual adaption, which in some cases, especially when peak performances are required, as is the case in cycling, may be an advantage. In cycling a non tiring position of the hands may be of great importance if it allows good control of the gear command member, the brake lever as well as the handle-bar. Specially when riding through hilly ground a continuous activating of the gear command in an easy position with both hands on the handle-bar mostly is an advantage. All these things are better obtainable with application of the invention than with handle-bars available up till now.

20 Specially with handle-bars for mountain bikes or ground bicycles or touring bicycles with a straight transverse bar it is important that the brake lever is immediately attainable in the three positions which the hand can take with the handle-bar according to the invention. Accordingly a normally on the straight transverse bar mounted brake lever can be carried out such, that it has a catching part and a prolongation with at the end thereof one or two further catching parts. Herewith the further catching parts with many embodiments will be located at both sides of the said
30 prolongation.

It is possible to connect both catching parts with each other by welding them to a sleeve having a cylindrical bore. In that instance it is possible to mount in these
35 bores a bracket, the centre part of which is displaced forwardly in the riding direction. This allows for several further positions of the hands, even combined with a support for the forearm, so that a great diversity of positions becomes available.

In the following the invention is further elucidated on hand of the drawing, in which:

- fig. 1 shows a plan view of a first embodiment of the invention;
5 fig. 2 is a side view thereof;
fig. 3 is a plan view of an other embodiment;
fig. 4 is a side view thereof;
fig. 5 is a part of a side view, in which preferred dimensions and angles have been indicated;
10 fig. 6 shows a detail of fig. 4 on a larger scale;
fig. 7 shows a partial plan view of a further embodiment of the invention;
fig. 8 is a side view thereof; and
15 fig. 9 is a view, taken obliquely from above of a further embodiment.

In fig. 1 with 1 a transverse bar of a handle-bar has been shown, of which the centre line in fig. 2 also has been
20 indicated with 1. The transverse bar part 1 is followed by a first part 2 which in the beginning slopes somewhat downwardly and furtheron is bent upwardly with a catching part 3. The end of this catching part 3 is formed by a connection member 4, which is provided with a pivot mounting
25 5 for a brake lever 6.

With an acute angle, indicated with 7, follows here a catching part 8 with an almost horizontal terminal part 9.

30 In a first position, which could be called the upper position, the inner side of the hand of the bicycle rider lies on part 3. In this position, which by reason of the upwardly slope is easy for the rider, can he attain the brake lever 6 easily.

35 If on the contrary he desires an other position, he may lay his hand on the catching part 8 of the part with the terminal part 9, in which position the brake lever 6 is also within his reach. By reason of the upward slopes in the

riding direction of the bicycle both positions are favourable for a non tiring catching, whereas nevertheless, especially with the catching part 8 a strong grip is possible. The variation of the position is an important item to
5 counter cramp forming during long rides.

In fig. 3 a plan view of an other embodiment of the invention has been shown. Here with 10 a transverse bar has been indicated which in known way is clamped into a handle-bar
10 support member 11, which is connected to the handle-bar pin 12. The member 10 of which the axis in fig. 4 also has been indicated with 10 is joined by a first part 13, which in the forward riding direction firstly is bent downwardly and furtheron upwardly, which part 13 together with a connecti-
15 on member which will be discussed furtheron forms a first catching part 14. The connection member 15 has a first stub 16, which is connected to the handle-bar part 13 and a second stub 17, which is connected to the second handle-bar part 18, which has a catching part 19. The connection
20 member 15 has a shaft 20 for a bicycle gear command element 21. A further pivot 22 supports the brake lever 23.

In fig. 5 some dimensions and angles have been indicated, which in practice have shown to be very favourable for
25 applicant, who with riding of a contest with a handle-bar of this shape ascertained a clearly smaller tiredness than with use of a conventional handle-bar. In this figure the horizontal has been indicated with line 24. Therefrom it appears that the angle of 58° , which in fact is a direction
30 change of $180 - 58 = 122^\circ$, over a very short length, indicated with 25, has been made, which cannot be obtained by bending a metal tube.

It is favourable, that the angle with respect to the hori-
35 zontal can be varied somewhat by clamping the handle bars somewhat differently in the member 11. The connection between both parts 13 and 18 can in principle also be realized by welding or by forming the unit from one piece.

In fig. 6 the connection member 15 has been further elucidated. In the connection stub 16 two bores 26 and 27 are present for a gear control cable 28 and a brake cable 29 respectively. The inner core 30 of the gear cable 28 at 31 is connected to a gear command member 32, which can rotate about pivot 33 and in a way known per se is fixed in a certain adjusted position. The core 34 of the brake cable 29 at 35 is connected to a brake lever 36, which can rotate about an axis 37. With 35' in interrupted lines the position of the connection 35 has been indicated when the brake is in the activated position.

Fig. 7 and 8 show the right end of a handle-bar with brake lever according to a further variation of the invention. At 38 the central bar 37 has a third catching part, which can be caught by the bicycle rider in addition to the first and second catching parts which are already discussed. At the end of the bar 37 in this embodiment an upwardly sloping part in the form of a bar end 40 has been applied by means of a weld 39, the catching part of which in fig. 8 has been shown at 41. At the upper end of this part 40 an initially perpendicular downwardly directed part 42 with a catching part 43 has been mounted.

In fig. 8 the bar 37 has been indicated in cross-section. On this bar a support member 44 is present for a brake lever 45, which can rotate about pivot 46 (fig. 7). The core 47 of the brake cable 48 is connected to the brake lever 45 at 49. This lever has a first part 50, which lies opposite the catching part 38; thereafter a joining portion 51 which extends itself forwardly in the riding direction with an end 52 bent in the transverse direction to which follows a two-sided lever 53 and 54, the lever 53 being in the reach of the hand when it cooperates with the catching part 41 and the lever 54 is in the reach of the hand, when it cooperates with the catching part 43. The parts 40 and 42 are welded to each other at 55.

The handle-bar shown in this embodiment has three catching

parts and consequently enables different riding positions, for instance relatively loosely laying on the bar at catching part 38, for more delicate rides cooperation with catching part 41 and at 43 with a strong grip to make
5 force, for instance in hilly ground. Of course the above indicated destinations of the different catching parts are completely individual and each rider may use the possibilities in its own way.

10 Fig. 9 shows a further elaboration of the handle-bar of fig. 7 and 8, in which parts having the same function as in these latter figures have been indicated with the same references. The cross bar 37 bears again the supporting
15 member 44 for a brake lever 55. The end of bar 37 is inserted in a sleeve 57, which by means of screws (not shown) is fixed to the bar without possibility of rotation or axial movement.

An end of part 40 is welded to sleeve 57 and at its other
20 end to a sleeve 58. A part 42 having the same function as part 42 in fig. 8 is welded to sleeve 58 and optionally to part 40. In sleeve 58 the end of a bracket 59 has been inserted and immobilized by nonshown screws. The bracket 59 consists of two halves connected to each other by means of
25 a socket 63. Additional catching parts are realized by means of sleeves 61 and 62, preferably of a somewhat soft material. Parts 40 and 42 and sleeves 61 and 62 form four different catching parts for the hand. Two other positions follow from the fact that the forearm may rest on 61 or 62
30 when the hand grips bracket 59 or its socket 63.

If desired the bracket 59 may be rotated about the axis of sleeve 58. Rotating it downwardly may give a seventh position with a very little tiring almost horizontal position
35 of the forearm resting on 62.

Though the idea of a forwardly protruding bracket is especially effective with the inventive construction with at least two catching parts, it can be also an improvement if

applied to other types of bicycle handle-bars.

Claims:

1. Bicycle handle-bar with a first catching part (2,13,40) which protrudes forwardly in the riding direction, slopes upwardly and is suitable to lay a hand on it from above, characterized by a second catching part (9,18,42) running
5 in the riding direction backwardly, which starts from the first part under an acute angle with the end of said first part, is directed downwardly and in the riding direction backwardly and has an upwardly directed curvature (8,19,43), so that a portion is present which is upwardly
10 bent in the riding direction and which is suitable to lay a hand on it in a lower position than on the first catching part.
2. Bicycle handle-bar according to claim 1, characterized
15 in that a gear command member (21) is mounted near the joint between the first (2,13,40) and the second (9,18,42) catching parts, such that it is easily attainable when the rider's hand rests on the first catching part as well as when said hand rests on the second catching part.
- 20 3. Bicycle handle-bar according to claim 1 or 2 with a brake lever, characterized in that the brake lever (23) is located at the joint between the first (13) and the second (18) catching part.
- 25 4. Bicycle handle-bar according to claim 3, characterized in that the brake lever (23) is pivotably mounted in a connection member (4) between the first (13) and the second (18) catching parts.
- 30 5. Bicycle handle-bar according to one or more of the preceding claims of the type with a mainly straight transverse bar (37) at the end of which an upwardly bent bar end is mounted, characterized in that the bar end contains
35 first and second catching parts as defined in claim 1.
6. Bicycle handle-bar according to claim 5, characterized

in that at least one of the catching parts (40) is bent back towards the middle of the handle-bar.

7. Bicycle handle-bar according to claim 5 or 6, characterized in that a brake lever (45) is mounted to a transverse bar (37) and that the lever has a first activation part (50) opposite the transverse bar and further activation parts (53,54) opposite the catching parts.
8. Connection member (4) for joining the first (13) and the second (18) catching parts of a handle-bar according to one or more of the claims 1-7, characterized in that it has connection stubs (16,17) connected to the ends of the catching parts (13,18) and including an angle of $58 \pm 15^\circ$.
9. Connection member according to claim 8, characterized in that at least one of the connection stubs (16) is provided with a passage for an activating cable for a brake or gear.
10. Connection member according to claim 8 or 9, characterized in that it contains pivot mounting means for a gear command lever (36) or a brake lever (32).
11. Bar end device for a handle-bar with a mainly straight transverse bar (37), characterized in that it has two bent catching parts (40,42) including an acute angle.
12. Brake lever provided with an activating part (50) having means to be pivotably mounted, characterized in that the activating part (50) has an extension (51,52) with at its end one or two further activation parts (53,54).
13. Bicycle handle-bar according to 5, 6 or 7, characterized in that the connection between the two catching parts (40,42) contains a sleeve (57) having a cylindrical bore the axis of which is parallel to the transverse bar.
14. Bicycle handle-bar according to claim 13, characterized in that in the bores at both sides of the handle bar a

bracket (59) is mounted, the centre part (63) of which is displaced forwardly in riding direction.

15. Bicycle handle-bar according to claim 14, characterized
5 in that a portion of the bracket adjacent the sleeves (57) is covered with a catching part of a somewhat resilient cushion material.

16. Bracket suitable for use in a bicycle handle-bar according to claim 14 or 15, characterized in that it consists
10 of a bar (59) having cylindrical coaxial end portions (64) and a central part (63) bent away from the axis of the said end portions.

15 17. Bar end device according to claim 11 and adapted to cooperate with a bracket according to claim 16, characterized in that the two bent catching parts (40,42) are welded to a sleeve (58) having a bore parallel to the transverse bar.

FIG.1

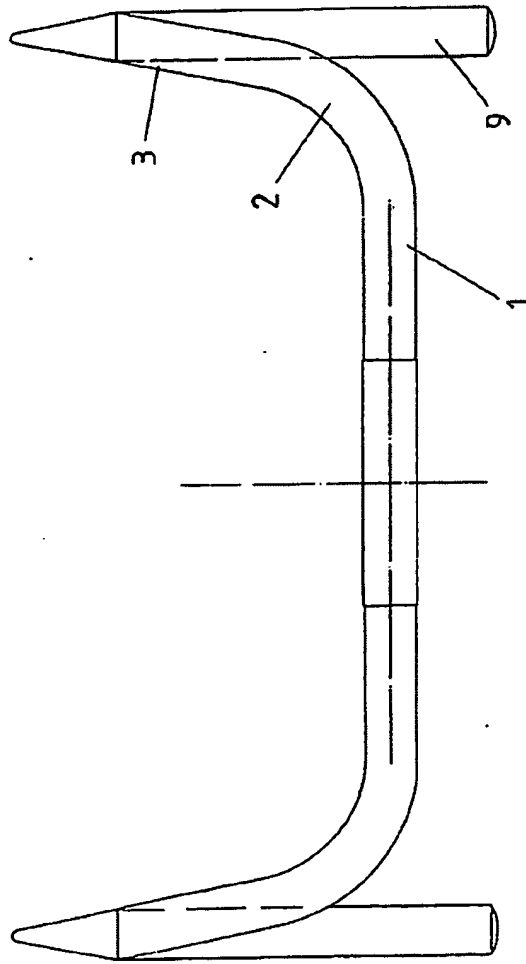


FIG.2

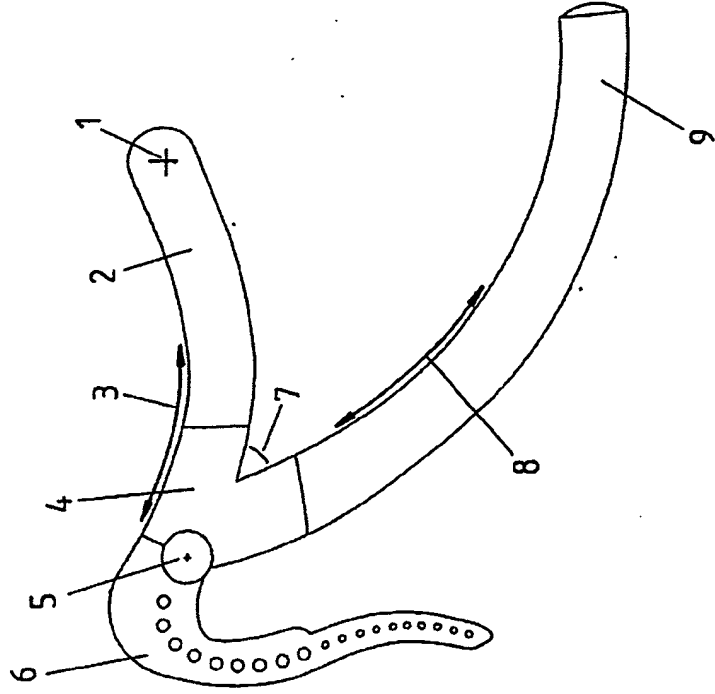


FIG. 3

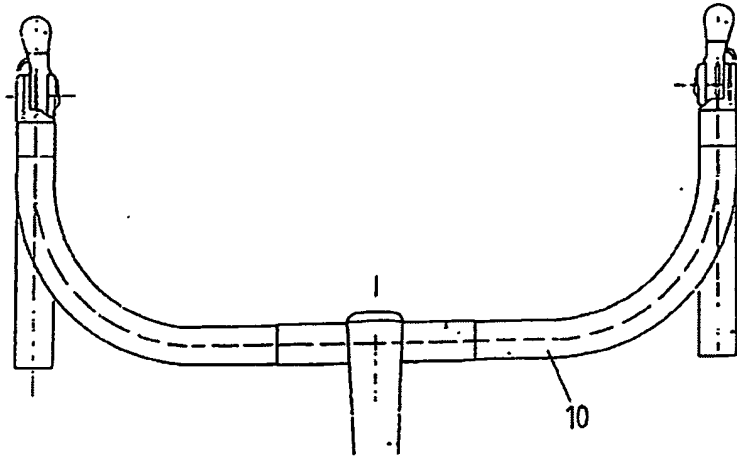


FIG. 4

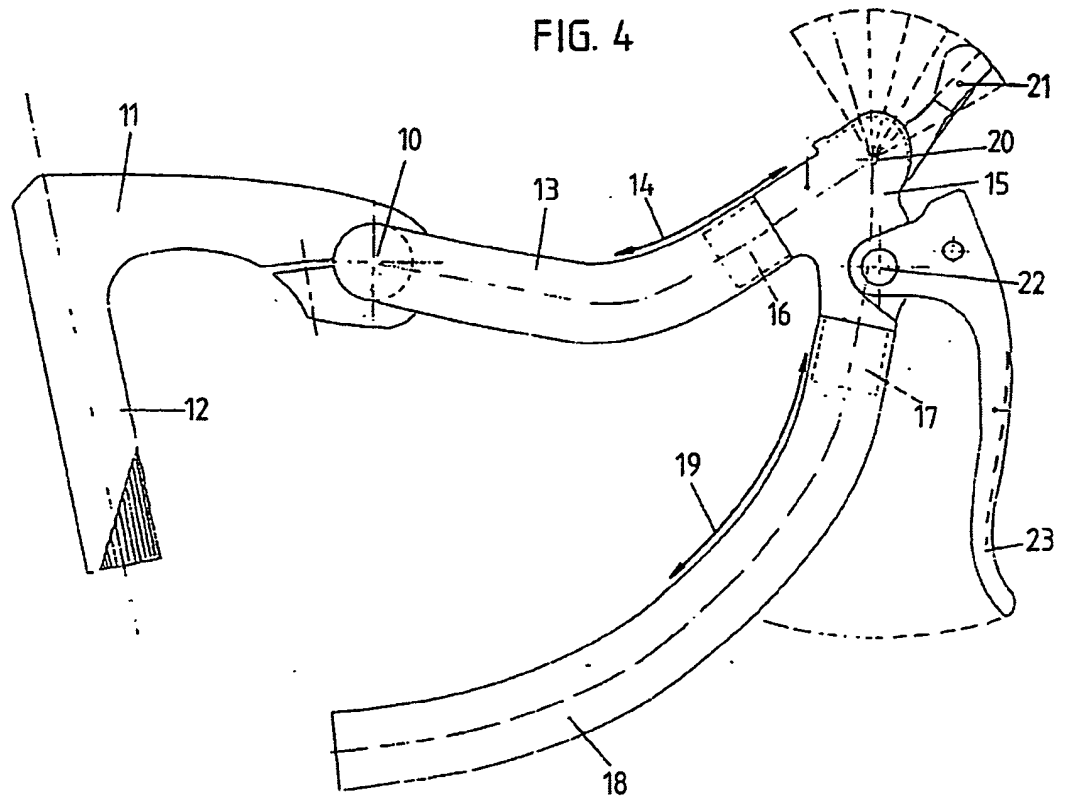


FIG. 5

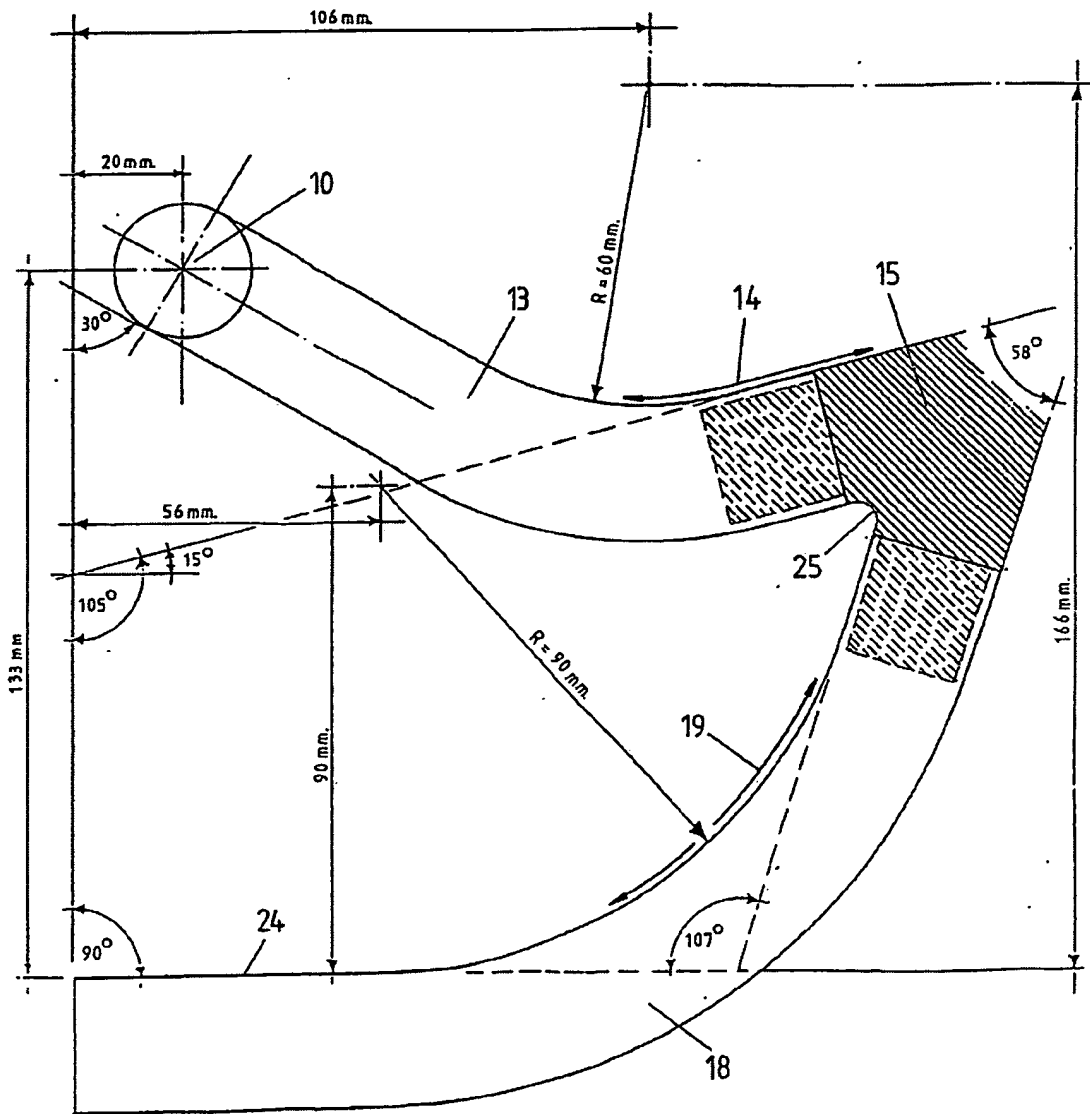
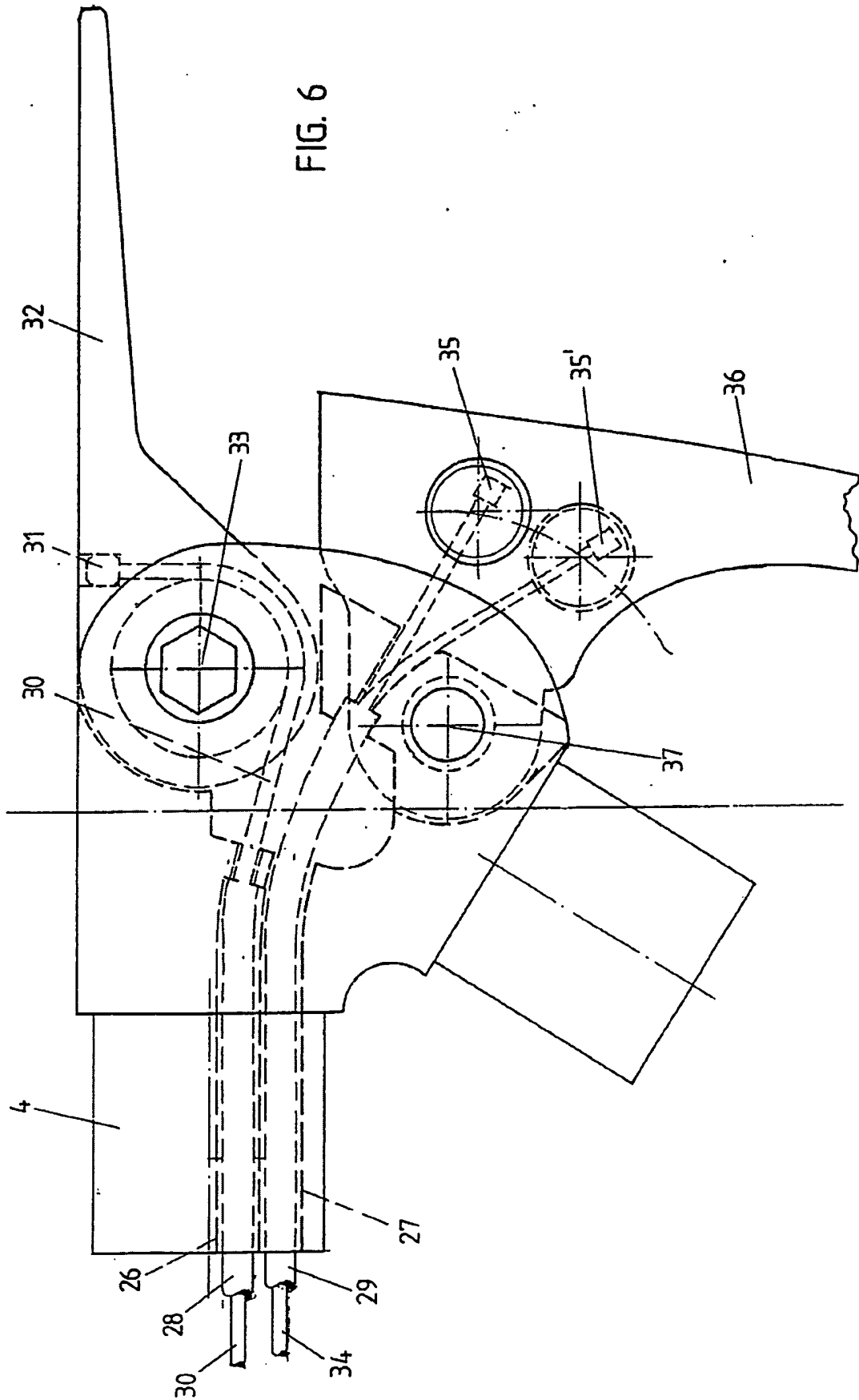


FIG. 6



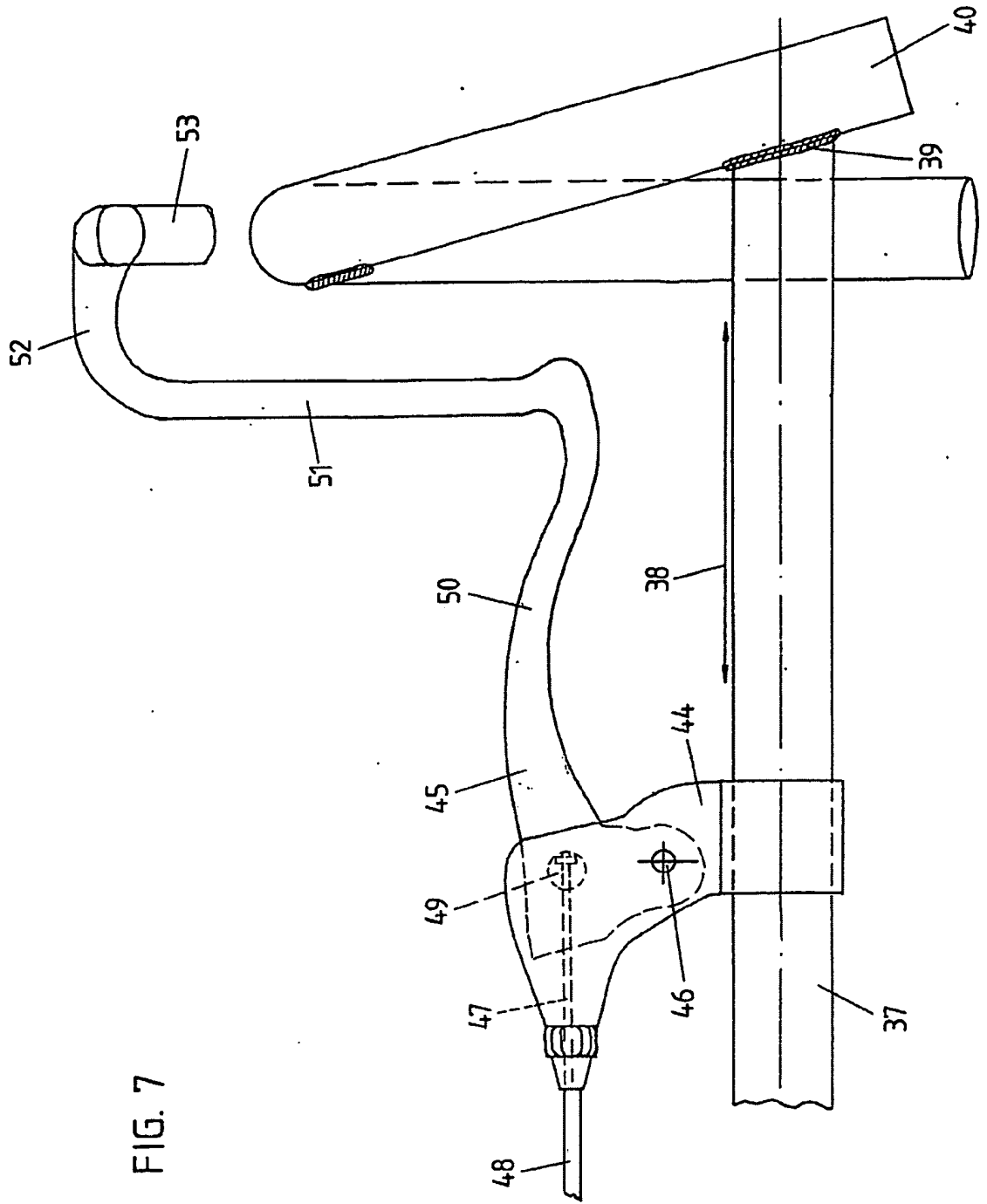


FIG. 7

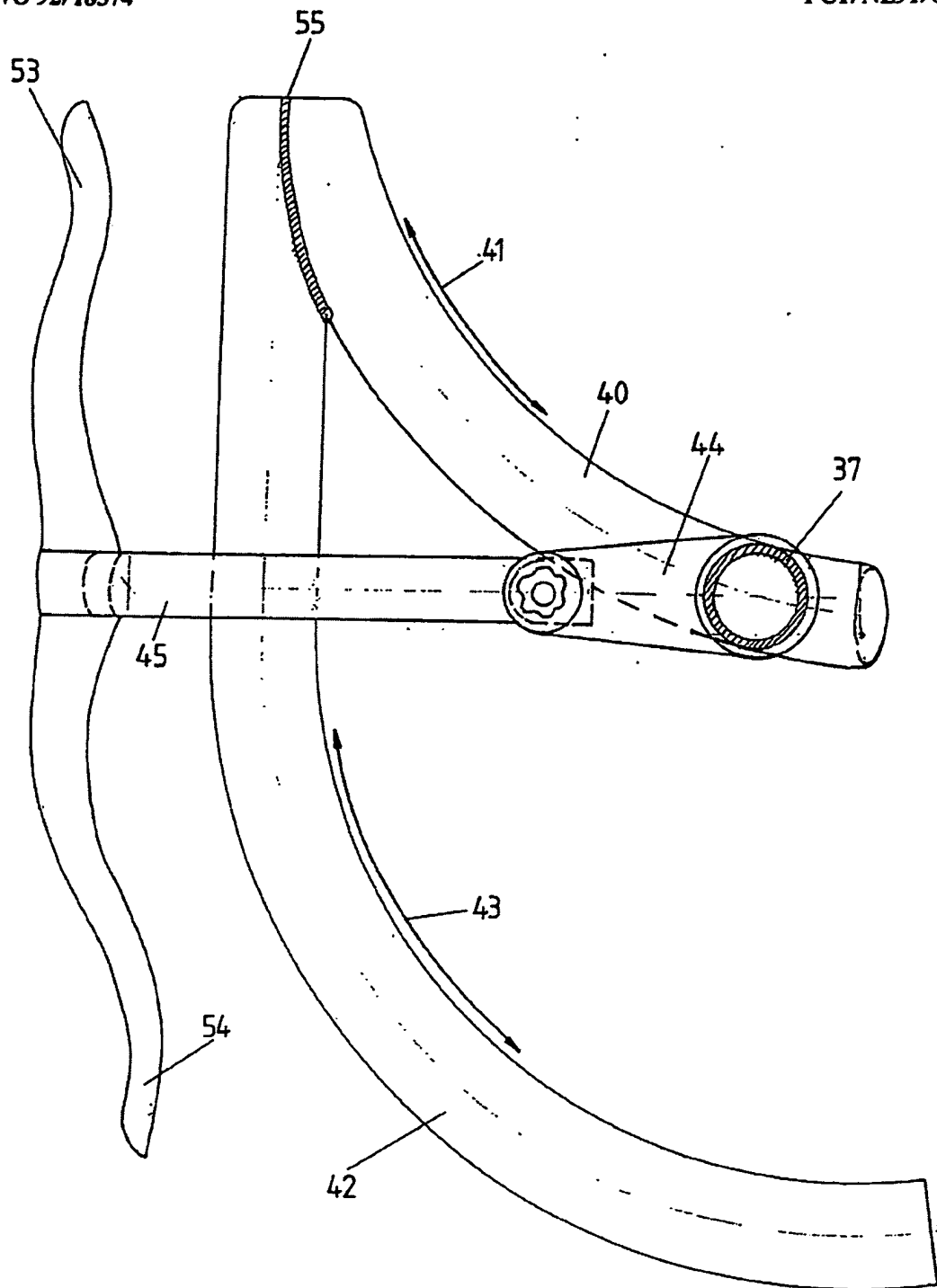


FIG. 8

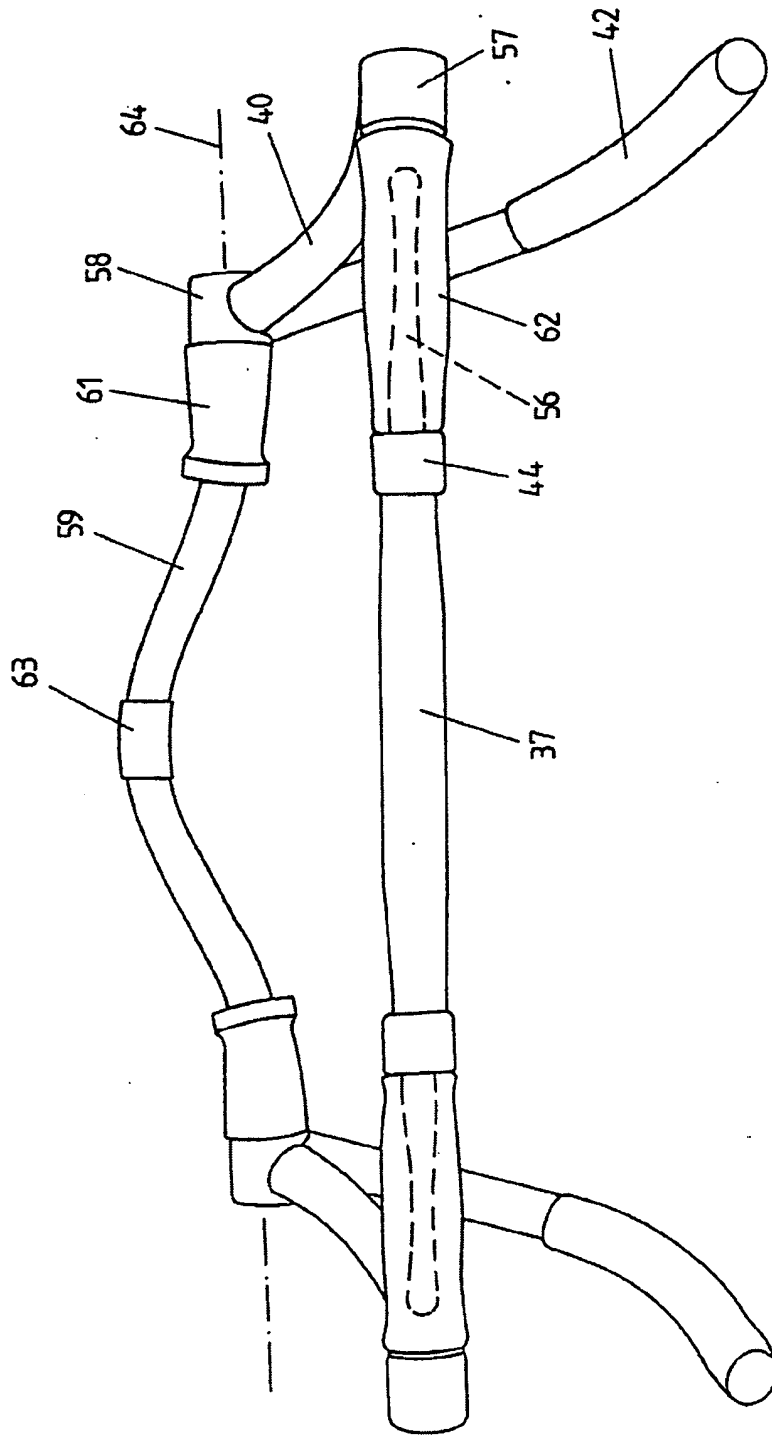
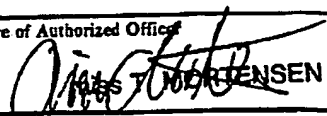


FIG. 9

INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 91/00215

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl.5 B 62 K 21/12		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl.5	B 62 K	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	EP,A,0035359 (SHIMANO INDUSTRIAL CO., LTD) 9 September 1981, see abstract; figures	1,3-5,8 -11
Y	---	2
A	---	7
Y	EP,A,0035372 (SHIMANO INDUSTRIAL CO., LTD) 9 September 1981, see abstract; figures	2
A	---	1-10
X	DE,A,3139861 (A.C. BRODDACK) 21 April 1983, see figures	1,2,5-7 ,11
A	---	3,14-17
	--- -/-	
<p>¹⁰ Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
27-01-1992	03. 04. 92	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	 J. MORTENSEN	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		Relevant to Claim No.
Category	Citation of Document, with indication, where appropriate, of the relevant passages	
X	EP,A,0335610 (D.C. LENNON) 4 October 1989, see abstract; figures ---	1,3,5
A	EP,A,0335610 -----	13-17

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

V. OBSERVATION WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹

This International search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claim numbers because they relate to subject matter not required to be searched by this Authority, namely:
2. Claim numbers because they relate to parts of the International application that do not comply with the prescribed requirements to such an extent that no meaningful International search can be carried out, specifically:
3. Claim numbers because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²

This International Searching Authority found multiple inventions in this International application as follows:

1. Claims 1-11, 13-17
1. Claim 12

1. As all required additional search fees were timely paid by the applicant, this International search report covers all searchable claims of the International application
2. As only some of the required additional search fees were timely paid by the applicant, this International search report covers only those claims of the International application for which fees were paid, specifically claims:
3. No required additional search fees were timely paid by the applicant. Consequently, this International search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:
1-11, 13-17
4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- The additional search fees were accompanied by applicant's protest.
 No protest accompanied the payment of additional search fees.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

NL 9100215
SA 52729

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 26/03/92. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A- 0035359	09-09-81	US-A- 4462267	31-07-84
EP-A- 0035372	09-09-81	None	
DE-A- 3139861	21-04-83	None	
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